



Disadvantaged Business Enterprise Disparity Study: Volume I

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About the Project Team

NERA Economic Consulting is a global firm of experts dedicated to applying economic, finance and quantitative principles to complex business and legal challenges. For over half a century, NERA's economists have been creating strategies, studies, reports, expert testimony and policy recommendations for government authorities and the world's leading law firms and corporations. We bring academic rigor, objectivity and real world industry experience to bear on issues arising from competition, regulation, public policy, strategy, finance and litigation.

NERA's clients value our ability to apply and communicate state-of-the-art approaches clearly and convincingly, our commitment to deliver unbiased findings, and our reputation for quality and independence. Our clients rely on the integrity and skills of our unparalleled team of economists and other experts backed by the resources and reliability of one of the world's largest economic consultancies. With its main office in New York City, NERA serves clients from more than 25 offices across North America, Europe and Asia Pacific.

NERA's employment and labor experts advise clients on a wide range of issues both inside and outside the courtroom. We have provided expert testimony on statistical issues both at the class certification phase (on issues of commonality and typicality) and at the liability phase (for class or pattern-and-practice cases). Our experts have extensive experience examining issues of statistical liability in discrimination and other wrongful termination claims. We also provide detailed statistical analyses of workforce composition to identify potential disparities in hiring, layoffs, promotions, pay, and performance assessments, and have conducted studies on labor union issues and on affirmative action programs for historically disadvantaged business enterprises.

NERA Managing Director Dr. Jon Wainwright led the NERA project team for this Study. Dr. Wainwright heads NERA's disparity study practice and is a nationally recognized expert on business discrimination and affirmative action. He has authored books, papers, and numerous research studies on the subject, and has been repeatedly qualified to testify on these and other issues as an expert in state and federal courts. At NERA, Dr. Wainwright directs and conducts economic and statistical studies of discrimination for attorneys, corporations, governments and non-profit organizations. He also directs and conducts research and provides clients with advice on adverse impact and economic damage matters arising from their hiring, performance assessment, compensation, promotion, termination or contracting activities.

About the Project Team

SRB Communications is a State of Maryland certified MBE/WBE led by Dr. Sheila Brooks. SRB is an award winning full-service strategic communications agency specializing in multicultural advertising, public relations, media relations and broadcast production. SRB helps clients develop brand identity, positioning and strategies in marketing, outreach, public education and public relations campaigns through integrated media formats in video production, print and digital media. On this project, the SRB team held responsibility for all of the stakeholder and community outreach functions.

CR Dynamics & Associates, Inc. is a City of Baltimore and State of Maryland certified MBE owned by Charles and Patricia Ramos. CR Dynamics is one of the top contact/call centers in the United States, providing services to private industry and government agencies. Over the past ten years, their perceptiveness in delivering critical program management supported with high-tech solutions has become invaluable to their clients. CRD provides a variety of services, including provision of help desk services, inbound travel counseling, order taking, reservations and outbound market research survey work. On this project, CRD provided CATI survey services for both the race/gender misclassification survey and the mail survey non-respondent survey.

1st Choice LLC is a State of Maryland certified MBE/WBE led by Michelle Bell. 1st Choice is an award-winning consulting agency with over 13 years of experience providing administrative support to diverse clients from the public, non-profit and private sectors. 1st Choice is a nationwide leader in providing high quality administrative labor services that are evaluated and cross-referenced with each project's Statement of Work. 1st Choice employees are highly proficient in industry standard information tools and software, and have core competencies across multiple industries. On this project, 1st Choice had responsibility for providing temporary personnel to supplement NERA staff for the data collection and processing tasks in the Disparity Study.

Law Office of Don O'Bannon, P.C. Attorney Don O'Bannon is a principal in the Law Office of Don T. O'Bannon in Dallas, Texas. He is the former Vice President of Business Diversity and Development for DFW International Airport and past chairman of the Airport Minority Advisory Council. Mr. O'Bannon is a past recipient of the DBE Advocate of the Year award from the Fort Worth Metropolitan Chamber of Commerce, the Business Advocate of the Year award from the Dallas-Fort Worth Hispanic Contractors' Association, and the Chairman's Award from the Dallas-Fort Worth Black Contractors' Association. On this project, Mr. O'Bannon provided a review of case law, conducted interviews with public sector personnel and with local business owners and co-drafted selected study recommendations.

CVV Transcripts, LLC is a Veterans Administration-verified Service-Disabled-Veteran Owned, and SBA Economically-Disadvantaged-Woman Owned Small Business based in Mesa, Arizona and led by founder Jennifer MacGregor. CVV provides court reporting and transcription of meetings, hearings, conference sessions, interviews, interrogations, depositions and court proceedings for a variety

of government agencies, commercial businesses, small businesses and non-profit organizations. On this project, CVV provided transcription services for all of the business owner and public sector personnel interviews.

J&D Data Services is a small business owned by Mr. Joe Deegan and based in Plano, Texas. After a long career with ScanTron, Mr. Deegan started his own business to offer a solid and proven alternative to the time consuming and expensive job of key data entry long associated with mail surveys. The firm helps its clients conserve their surveying resources by designing and delivering survey instruments that can be electronically and automatically scanned upon return and sent directly to electronic format. J&D Data Services has conducted numerous surveys of M/W/DBEs and non-M/W/DBEs on behalf of the NERA team. On this assignment, they provided printing, postage, mail-out and mail-back service for the contract and subcontract data collection, the mail survey and the business owner interviews.

Report Qualifications/Assumptions and Limiting Conditions

This report is for the exclusive use of the State of Maryland (“the State”). There are no third-party beneficiaries with respect to this report, and NERA Economic Consulting does not accept any liability to any third party.

Information furnished by others, upon which all or portions of this report is based, is believed to be reliable but has not been independently verified, unless otherwise expressly indicated. Public information and industry and statistical data, including contracting, subcontracting and procurement data, are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information.

The opinions expressed in this report are valid only for the purpose stated herein and as of the date of this report. No obligation is assumed to revise this report to reflect changes, events or conditions that occur subsequent to the date hereof.

All decisions in connection with the implementation or use of advice or recommendations contained in this report are the sole responsibility of the client.

In portions of this report, NERA has commented on legal issues. NERA’s comments are based on its understanding of relevant law and industry best practice, as informed by legal counsel retained by NERA. However, NERA’s comments are not, and should not be construed as, legal advice to the State. NERA recommends that the State seek and obtain advice from its own legal counsel in connection with its affirmative action programs and with this report.

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Executive Summary

A. Introduction

During the 2012 Session of the Maryland General Assembly, House Bill 1370 reauthorized the State of Maryland’s Minority Business Enterprise Program (“MBE Program”) for four years, until July 1, 2016. This bill also provided for the State’s certification agency, the Maryland Department of Transportation (MDOT), to commission a Study of the Minority Business Enterprise (“MBE”) program to ensure compliance with constitutional mandates and programmatic best practices.¹ During the 2013 Session, the House Bill 1353 and Senate Bill 188 extended the MBE program for an additional year, until July 1, 2017.

MDOT commissioned a team led by NERA Economic Consulting to conduct the Study. The results of NERA’s Study, *Business Disparities in the Maryland Market Area*,² provided the evidentiary record necessary for the State’s consideration of whether to implement renewed MBE policies that comply with the requirements of the courts and to assess the extent to which previous efforts have assisted minority-owned and women-owned businesses (“M/WBE) to participate on a fair basis in the State’s contracting and procurement activities.

The 2017 Study found both statistical and anecdotal evidence consistent with the presence of business discrimination against M/WBEs in the State’s relevant market area. The present document, which is a continuation of that Study, provides additional detail on federally-assisted and state-funded contracting and subcontracting activity at MDOT’s State Highway Administration (SHA), Maryland Transit Administration (MTA), and Maryland Aviation Administration (MAA).³

B. Defining the Relevant Markets

Chapter II describes how the relevant geographic and product markets were defined for this Study. These definitions were derived empirically, based on the Master Contract/Subcontract Database assembled for the Study. The relevant geographic and product markets were then used to focus and frame the quantitative and qualitative analyses in the remainder of the Study.

¹ The applicable framework that establishes the legal standards governing race-conscious public contracting programs is articulated in two seminal Supreme Court cases. In *City of Richmond v. J.A. Croson Company*, 488 U.S. 469 (1989), the Court held that strict scrutiny applies to state and local race-conscious programs. In *Adarand Constructors, Inc. v. Peña*, 515 U.S. 200 (1995), the Court held that strict scrutiny also applies to federal race-conscious contracting programs. An overview of these cases and other applicable case law is provided in NERA Economic Consulting (2017), pp. 347-366.

² NERA Economic Consulting (2017).

³ With few exceptions, the underlying data in this document is drawn from NERA’s 2017 Study, including the results of the contract and subcontract data collection, telephone surveys, econometric analyses, mail surveys, and business owner interviews. Throughout this Study, results are documented for SHA, MTA, and MAA collectively in the “MDOT” tables as well as for each mode individually. With a few exceptions, individual tables for SHA, MTA, and MAA appear in Appendix III and Appendix IV.

The Master Contract/Subcontract Database contains information on 3,322 prime contracts or purchase orders and 14,851 associated subcontracts active during State fiscal years 2010-2014.⁴ These contracts and purchases had a total award value of \$7.45 billion and a total paid value of \$4.03 billion (*See* Table 2.1).⁵ Contracts and subcontracts in the database were catalogued according to State fiscal year and whether they were for Construction; Architecture & Engineering and Other Construction-Related Services (“AE-CRS”); Maintenance; Information Technology (“IT”); Services; or Commodities, Supplies & Equipment (“CSE”). The firms performing these contracts and subcontracts were catalogued according to geographic location, primary industry, race, and gender.

The Master Contract/Subcontract Database was analyzed to determine the geographic radius around MDOT that accounts for approximately 75 percent of aggregate contract and subcontract spending. MDOT’s relevant geographic market area was determined to include the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area (*See* Tables 2.3 and 2.4).

The Master Contract/Subcontract Database was also analyzed to determine those detailed industry categories that account for at least 99 percent of contract and subcontract spending by MDOT. Overall, we determined that MDOT’s relevant product market includes firms in 202 different North American Industrial Classification System (“NAICS”) Industry Groups and 461 different NAICS Industries (*See* Tables 2.5 through 2.10).

C. DBE Availability in the MDOT Market Area

Chapter III estimates the percentage of establishments in MDOT’s relevant market area that are owned by minorities or women. For each industry category, DBE availability was defined as the number of DBEs divided by the total number of business establishments in the relevant contracting market area, weighted by the dollars attributable to each detailed industry. Determining the total number of establishments in the relevant market is more straightforward than determining the number of DBE establishments in those markets. The latter task has three main parts: (1) identifying all listed DBEs in the relevant market; (2) verifying the ownership status of listed DBEs; and (3) estimating the number of unlisted DBEs in the relevant market. Table A1 below provides an executive level summary of the current DBE availability estimates derived in the Study. Availability estimates for more detailed industries within the major procurement categories appear in Tables 3.17 through 3.22.

⁴ The State fiscal year runs from July 1st through June 30th. Contract totals include both contracts that were directly let by SHA, MTA, and MAA as well as contracts that were let by SHA and MTA federal-aid subrecipients.

⁵ Payments on contracts that were not substantially complete at the time of the Study data collection were excluded from the paid dollar totals.

Table A1. Overall Estimated DBE Availability Percentages in the MDOT Market Area: All Contracts

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.99	3.39	4.76	1.05	20.18	13.64	33.82	66.18
PAID DOLLARS	11.10	3.50	4.55	1.00	20.15	13.97	34.12	65.88
CONSTRUCTION								
AWARD DOLLARS	13.67	5.17	3.07	0.71	22.62	16.38	39.00	61.00
PAID DOLLARS	13.55	5.33	3.09	0.67	22.64	16.40	39.04	60.96
AE-CRS								
AWARD DOLLARS	8.32	2.22	4.91	1.27	16.72	11.64	28.36	71.64
PAID DOLLARS	8.18	2.20	4.90	1.28	16.57	11.45	28.02	71.98
MAINTENANCE								
AWARD DOLLARS	11.76	3.96	3.37	1.43	20.52	11.31	31.83	68.17
PAID DOLLARS	13.19	4.44	3.46	1.28	22.38	12.05	34.42	65.58
IT								
AWARD DOLLARS	14.34	3.78	14.08	1.29	33.50	12.33	45.82	54.18
PAID DOLLARS	15.52	3.30	12.98	1.24	33.04	12.88	45.92	54.08
SERVICES								
AWARD DOLLARS	16.14	3.21	5.22	0.65	25.21	18.41	43.62	56.38
PAID DOLLARS	15.96	3.13	4.66	0.58	24.32	20.51	44.83	55.17
CSE								
AWARD DOLLARS	11.22	3.79	7.86	1.00	23.88	11.80	35.68	64.32
PAID DOLLARS	11.50	3.83	7.96	1.01	24.31	11.92	36.23	63.77

Source: Table 3.15.

Notes: (1) "Award" indicates that the availability measures are weighted according to dollars awarded; (2) "Paid" indicates that the availability measures are weighted according to dollars paid; (3) Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Table A2. Overall Estimated DBE Availability Percentages in the MDOT Market Area: Federally-Assisted Contracts

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.39	3.30	4.28	1.04	19.00	13.53	32.54	67.46
PAID DOLLARS	10.48	3.46	4.28	1.02	19.25	13.59	32.84	67.16
CONSTRUCTION								
AWARD DOLLARS	13.86	5.14	3.07	0.65	22.72	16.81	39.54	60.46
PAID DOLLARS	13.76	5.34	3.12	0.62	22.83	16.81	39.64	60.36
AE-CRS								
AWARD DOLLARS	8.28	2.21	4.89	1.27	16.66	11.61	28.27	71.73
PAID DOLLARS	8.20	2.21	4.90	1.28	16.59	11.48	28.07	71.93
MAINTENANCE								
AWARD DOLLARS	8.23	3.07	4.18	1.17	16.65	10.18	26.83	73.17
PAID DOLLARS	8.56	3.03	6.06	0.93	18.58	11.00	29.58	70.42
IT								
AWARD DOLLARS	14.07	2.94	11.02	1.26	29.30	12.48	41.78	58.22
PAID DOLLARS	13.89	2.90	10.82	1.27	28.87	12.39	41.26	58.74
SERVICES								
AWARD DOLLARS	10.50	3.22	5.22	1.22	20.16	12.89	33.05	66.95
PAID DOLLARS	11.39	3.61	5.81	1.30	22.11	12.53	34.64	65.36
CSE								
AWARD DOLLARS	5.29	1.75	2.66	0.40	10.10	8.11	18.22	81.78
PAID DOLLARS	5.49	1.81	3.04	0.30	10.63	8.12	18.75	81.25

Source: Table 3.16.

Notes: See Table A1.

D. Statistical Disparities in Business Formation and Business Owner Earnings

1. Census Bureau's American Community Survey

Chapter III demonstrates that current DBE availability levels in MDOT's market area are substantially lower in most instances than those that we would expect to observe if commercial markets operated in a race- and gender-neutral manner and that these levels are statistically significant.⁶ In other words, minorities and women are substantially and significantly less likely to own their own businesses as the result of discrimination than would be expected based upon their observable characteristics, including age, education, geographic location and industry. We find that these groups also suffer substantial and significant earnings disadvantages relative to comparable nonminority males, whether they work as employees or entrepreneurs.

For example, we found that overall annual average wages for African Americans in 2010-2014 were 37.0 percent lower in the MDOT market area than for nonminority males who were otherwise similar in terms of geographic location, industry, age and education (*See* Table 4.1). This difference is large and statistically significant. Large, adverse, and statistically significant wage disparities were also observed for Hispanics (29.5 percent lower), Asians (25.1 percent lower), Native Americans (36.9 percent lower), persons reporting two or more races (29.8 percent lower), and nonminority women (32.8 percent lower). These disparities are consistent with the presence of market-wide discrimination. Comparable results were observed when the analysis was restricted to Construction, AE-CRS, Maintenance, IT, Services, or CSE. That is, large, adverse, and statistically significant wage disparities were observed for all minority groups and for nonminority women throughout the MDOT market area.

This analysis demonstrates that minorities and women earn substantially and significantly less than their nonminority male counterparts in the MDOT market area. Such disparities are consistent with race and gender discrimination in the labor force that, in addition to its direct effect on workers, also reduces the future availability of DBEs by stifling opportunities for minorities and women to progress through those internal labor markets and occupational hierarchies that are most likely to lead to entrepreneurial opportunities. These disparities reflect more than mere "societal discrimination"⁷ because they demonstrate the nexus between discrimination in the job market and reduced entrepreneurial opportunities for minorities and women. Other things equal, these reduced entrepreneurial opportunities in turn lead to lower DBE availability levels than would be observed in a race- and gender-neutral market area.

Next, we analyzed race and gender disparities in business owner earnings. We found, for example, that overall annual earnings for self-employed African Americans in 2010–2014 were 41.8 percent lower in the MDOT market area than for nonminority males who were otherwise similar in terms of geographic location, industry, age and education (*See* Table 4.8). This

⁶ Typically, for a given disparity statistic to be considered "statistically significant" there must be a substantial probability that the value of that statistic is unlikely to be due to chance alone. *See also fn.* 74.

⁷ *City of Richmond v. J.A. Croson Co.*, 488 U.S. 469, 485 (1989).

difference is large and statistically significant. Large, adverse, and statistically significant wage disparities were also observed for Hispanics (23.4 percent lower), Asians (8.1 percent lower), Native Americans (43.8 percent lower), persons reporting two or more races (37.1 percent lower) and nonminority women (39.1 percent lower). These disparities are consistent with the presence of market-wide discrimination. Similar results were observed when the analysis was restricted to the Construction, AE-CRS, Maintenance, IT, Services, or CSE sectors.

As was the case for wage and salary earners, minority and female entrepreneurs earned substantially and significantly less from their efforts than similarly situated nonminority male entrepreneurs. These disparities are a symptom of discrimination in commercial markets that directly and adversely affect DBEs. Other things equal, if minorities and women cannot earn remuneration from their entrepreneurial efforts comparable to that of nonminority males, growth rates will slow, business failure rates will increase, and business formation rates may decrease. Combined, these phenomena result in lower DBE availability levels than would otherwise be observed in a race- and gender-neutral market area.

Next, we analyzed race and gender disparities in business formation (*See* Tables 4.15 to 4.23). As with earnings, in most cases we observed large, adverse, and statistically significant disparities consistent with the presence of discrimination in these markets in the overall economy, and in the Construction, AE-CRS, Maintenance, IT, Services, and CSE sectors. In the overall economy (*See* Table 4.17), business formation rates for African Americans were 2.4 percentage points lower than for comparable nonminority males. Large, adverse, and statistically significant reductions in business formation were also observed for Hispanics (1.4 percentage points lower), Native Americans (2.8 percentage points lower), persons reporting two or more races (1.4 percentage points lower), and nonminority women (1.2 percentage points lower).

2. Census Bureau's Survey of Business Owners

As a further check on the statistical findings in this chapter, we examined evidence from the Census Bureau's *Survey of Business Owners and Self-Employed Persons* (SBO) (*See* Tables 4.25 to 4.30). The size of the disparities facing minority-owned and women-owned firms in the MDOT market area is very large. For example, although 19.5 percent of all firms in the market area are owned by African Americans, these firms earned less than 4.1 percent of all sales and receipts. Hispanic-owned firms are 8.4 percent of all firms in the market area, yet they earned only 3.0 percent of all sales and receipts. Asian-owned firms are 10.0 percent of all firms in the market area, but earned only 8.3 percent of sales and receipts. Native American-owned firms are 0.1 percent of all firms in the market area, but earned only 0.02 percent of sales and receipts. Women-owned firms are 39.2 percent of all firms in the market area, but these firms earned only 13.9 percent of sales and receipts. Overall, these data show large, adverse, and statistically significant disparities between DBEs' share of overall revenues and their share of overall firms in both the U.S. as a whole, and in the MDOT market area in particular.

E. Statistical Disparities in Credit/Capital Markets

In Chapter V, we analyzed the most recent as well as earlier data from the Survey of Small Business Finances ("SSBF") conducted by the Federal Reserve Board and the U.S. Small

Business Administration. We also analyzed data from nine customized matching mail surveys that NERA conducted throughout the nation since 1999. Additionally, we reviewed the most current research being conducted in this area, using data from the Kauffman Firm Survey, audit studies, and other sources. These data, in general, examine whether discrimination exists in the small business credit market.

Credit market discrimination can have an important effect on the likelihood that DBEs will succeed. Moreover, discrimination in the credit market might even prevent such businesses from opening in the first place. This analysis has been held by some courts to be probative of a public entity's compelling interest in remedying discrimination.⁸ We provide qualitative and quantitative evidence supporting the view that DBE firms, and African American firms most acutely, suffer discrimination in this market.

The analyses in Chapter V employ data from a variety of sources. First and foremost are data from the Federal Reserve Board for the key years of 1993, 1998 and 2003, as these are the primary years of availability for this most important data source of small business finance by race and gender. Next, in addition to the 1993, 1998 and 2003 Federal Reserve data, Chapter V also analyzes similar datasets collected through NERA's own surveys conducted in 1999 and 2007 and mirroring the relevant sections of the earlier Federal Reserve Board surveys. Results from the NERA credit surveys are consistent with the results obtained from the 1993-2003 Federal Reserve Board data. Finally, Chapter V provides an overview of the most recent available research on commercial credit market discrimination, spanning the time period from 2008 forward. Most of this review focuses on analyses using data from the Kauffman Firm Survey, the largest and longest longitudinal survey of new businesses in the world. Analyses of the Kauffman data are consistent with those obtained from the 1993-2003 Federal Reserve Board data and the 1999-2007 NERA credit survey data.

Taken as a whole, these data provide qualitative and quantitative evidence consistent with the presence of discrimination against minorities in the credit market for small businesses. For example, we find that African American-owned firms are much more likely to report being seriously concerned with credit market problems and report being less likely to apply for credit because they fear the loan would be denied. Moreover, after controlling for a large number of characteristics of the firms, we find that African American-owned firms, Hispanic-owned firms, and to a lesser extent other minority-owned firms, are substantially and statistically significantly more likely to be denied credit than are nonminority-owned firms. We find some evidence that women are discriminated against in this market as well. The principal results are as follows:

- Minority-owned firms were more likely to report that they did not apply for a loan over the preceding three years because they feared the loan would be denied (*see* Tables 5.15, 5.22, 5.29);

⁸ See, e.g., *Northern Contracting, Inc. v. Illinois Department of Transportation*, No. 00-C-4515, 2005 WL 2230195 (N.D. Ill. Sept. 8, 2005); *Concrete Works of Colorado v. City and County of Denver*, 321 F.3d 950, *cert. denied*, (10th Cir. 2003).

- When minority-owned firms applied for a loan, their loan requests were substantially more likely to be denied than non-minorities, even after accounting for differences like firm size and credit history (*see* Tables 5.8, 5.9, 5.18, 5.19, 5.25, 5.26);
- When minority-owned firms *did* receive a loan, they were obligated to pay higher interest rates on the loans than comparable nonminority-owned firms (*see* Tables 5.13, 5.14, 5.21, 5.27);
- A larger proportion of minority-owned firms than nonminority-owned firms report that credit market conditions are a serious concern (*see* Tables 5.3, 5.4, 5.5, 5.6, 5.7, 5.17, 5.24);
- A larger share of minority-owned firms than nonminority-owned firms believes that the availability of credit is the most important issue likely to confront them in the upcoming year (*see* Tables 5.5, 5.6);
- There is no evidence that discrimination in the market for credit is significantly different in the South Atlantic census division⁹ or in the construction and construction-related professional services industries than it is in the nation or the economy as a whole (Chapter V, various tables);
- There is no evidence that the level of discrimination in the market for credit has diminished between 1993 and 2003 (Chapter V, various tables);
- Evidence from NERA's own 1999-2007 credit surveys, which contained questions similar to the relevant portions of the SSBF, is fully consistent with the findings drawn from the earlier SSBF data (*see* Tables 5.30, 5.31); and
- Post-2007 evidence from non-SSBF sources, particularly the Kauffman Firm Survey, yields results that are fully consistent with those drawn from the earlier SSBF data (*see* Chapter V, Section L).

We conclude that there is evidence of discrimination against DBEs in the MDOT market area in the small business credit market. This discrimination is particularly acute for African American-owned small businesses where, even after adjusting for differences in assets, liabilities, and creditworthiness, the loan denial rates remain substantially higher than for nonminority male-owned small businesses.

F. Public Sector Utilization vs. Availability in MDOT Contracting and Purchasing Markets

Chapter VI analyzes the extent to which DBEs were utilized on contracts active at MDOT during State fiscal years 2010-2014 and compares this utilization rate to the availability of DBEs in the

⁹ This division includes Maryland as well as Delaware, Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia and the District of Columbia.

relevant market area. Tables B1 and B2 provide an executive summary of the utilization findings for the Study by industry category and DBE type. Table B1 shows DBE and non-DBE utilization measured by dollars awarded for all contracts and purchases examined during the study period. Table B2 shows comparable DBE and non-DBE utilization measured by dollars paid.

Table B1. DBE Utilization in Contracting at MDOT: All Contracts (Dollars Awarded)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	4.59	3.81	4.96	4.64	11.26	1.96	5.36
Hispanic	8.12	1.09	1.91	4.72	1.86	0.31	4.24
Asian	2.30	17.39	0.86	25.67	1.38	0.87	5.99
Native American	0.81	0.06	0.07	0.00	0.01	0.00	0.36
Minority Total	15.82	22.35	7.81	35.03	14.52	3.14	15.95
Nonminority female	8.74	7.23	9.32	8.84	4.54	2.77	7.42
DBE Total	24.56	29.57	17.12	43.87	19.05	5.91	23.37
Non-DBE Total	75.44	70.43	82.88	56.13	80.95	94.09	76.63
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	3,083,346,877	1,770,472,644	811,264,376	158,961,034	1,189,264,351	440,585,034	7,453,894,316
Prime Contracts	887	234	227	166	287	1,521	3,322
Subcontracts	11,154	1,174	1,233	134	1,021	135	14,851

Source and Notes: Table 6.1.

Table B2. DBE Utilization in Contracting at MDOT: All Contracts (Dollars Paid)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	4.63	3.56	5.01	9.50	18.39	1.38	5.50
Hispanic	6.79	0.87	3.94	4.63	3.66	0.36	4.25
Asian	1.66	19.02	1.76	13.11	0.13	0.96	5.96
Native American	0.81	0.05	0.00	0.00	0.04	0.00	0.43
Minority Total	13.89	23.50	10.71	27.25	22.22	2.70	16.14
Nonminority female	9.97	7.13	11.33	6.57	3.30	2.34	7.87
DBE Total	23.86	30.63	22.04	33.82	25.52	5.04	24.00
Non-DBE Total	76.14	69.37	77.96	66.18	74.48	94.96	76.00
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	2,033,386,289	1,006,656,259	141,150,664	61,993,592	398,014,575	385,706,032	4,026,907,409

Prime Contracts	698	234	151	144	241	1,519	2,987
Subcontracts	9,051	1,172	442	57	817	114	11,653

Source: Table 6.2.

Table B3. DBE Utilization in Contracting at MDOT: Federally-Assisted Contracts (Dollars Awarded)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	3.97	3.54	0.17	8.61	1.86	1.47	3.50
Hispanic	8.85	1.16	1.80	15.02	4.29	0.02	5.53
Asian	2.32	18.09	0.00	0.76	0.07	0.57	7.25
Native American	0.82	0.06	0.00	0.00	0.00	0.00	0.47
Minority Total	15.96	22.85	1.98	24.39	6.22	2.06	16.76
Nonminority female	8.99	7.40	8.84	13.75	11.76	2.59	8.40
DBE Total	24.95	30.26	10.82	38.13	17.98	4.65	25.15
Non-DBE Total	75.05	69.74	89.18	61.87	82.02	95.35	74.85
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	2,757,270,003	1,663,703,079	190,438,399	9,877,013	258,612,340	169,308,682	5,049,209,517
Prime Contracts	816	221	12	6	28	44	1,127
Subcontracts	10,185	1,084	88	22	212	53	11,644

Source and Notes: Table 6.3.

Table B4. DBE Utilization in Contracting at MDOT: Federally-Assisted Contracts (Dollars Paid)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	3.78	3.28	0.03	8.59	9.04	0.02	3.49
Hispanic	7.26	0.92	6.39	13.18	11.99	0.02	4.96
Asian	1.51	19.67	0.00	0.92	0.40	0.58	7.14
Native American	0.89	0.05	0.00	0.00	0.00	0.00	0.56
Minority Total	13.44	23.91	6.42	22.69	21.42	0.62	16.14
Nonminority female	10.10	7.29	0.00	15.79	14.40	0.88	8.74
DBE Total	23.54	31.21	6.42	38.48	35.82	1.50	24.88
Non-DBE Total	76.46	68.79	93.58	61.52	64.18	98.50	75.12
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	1,836,144,797	947,994,813	19,513,022	7,901,720	44,094,212	161,426,453	3,017,075,017

Prime Contracts	643	221	6	5	13	42	930
Subcontracts	8,400	1,082	22	13	90	32	9,639

Source: Table 6.4.

Finally, in Chapter VI, we compared the use of DBEs on all MDOT contracts and subcontracts from the study period to our measure of DBE availability in the relevant market area. If DBE utilization is lower than measured availability in a given category, we report this result as a disparity.

Table C1 provides a top-level summary of our disparity findings for the Study for each major procurement category using dollars awarded. Table C2 provides comparable results using dollars paid.

Table C1. Utilization, Availability and Disparity Results for MDOT Contracting, Overall and by Contracting Category—All Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	5.36	10.99	48.76 ****
Hispanic	4.24	3.39	
Asian	5.99	4.76	
Native American	0.36	1.05	34.47 ****
Minority-owned	15.95	20.18	79.05 ***
Nonminority female	7.42	13.64	54.39 ****
DBE total	23.37	33.82	69.11 ****
CONSTRUCTION			
African American	4.59	13.67	33.61 ****
Hispanic	8.12	5.17	
Asian	2.30	3.07	74.81
Native American	0.81	0.71	
Minority-owned	15.82	22.62	69.94 ****
Nonminority female	8.74	16.38	53.33 ****
DBE total	24.56	39.00	62.96 ****
AE-CRS			
African American	3.81	8.32	45.78 ****
Hispanic	1.09	2.22	49.26 ***
Asian	17.39	4.91	
Native American	0.06	1.27	4.77 ****
Minority-owned	22.35	16.72	
Nonminority female	7.23	11.64	62.06 ****
DBE total	29.57	28.36	
MAINTENANCE			
African American	4.96	11.76	42.19 ****
Hispanic	1.91	3.96	48.38 ****
Asian	0.86	3.37	25.41 ****
Native American	0.07	1.43	5.12 ****

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
Minority-owned	7.81	20.52	38.05 ****
Nonminority female	9.32	11.31	82.40
DBE total	17.12	31.83	53.8 ****
IT			
African American	4.64	14.34	32.33 ****
Hispanic	4.72	3.78	
Asian	25.67	14.08	
Native American	0.00	1.29	0.00 ****
Minority-owned	35.03	33.50	
Nonminority female	8.84	12.33	71.7 ****
DBE total	43.87	45.82	95.72
SERVICES			
African American	11.26	16.14	69.78 ****
Hispanic	1.86	3.21	57.94 ***
Asian	1.38	5.22	26.49 ****
Native American	0.01	0.65	2.05 ****
Minority-owned	14.52	25.21	57.58 ****
Nonminority female	4.54	18.41	24.64 ****
DBE total	19.05	43.62	43.68 ****
CSE			
African American	1.96	11.22	17.48 ****
Hispanic	0.31	3.79	8.25 ****
Asian	0.87	7.86	11.08 ****
Native American	0.00	1.00	0.00 ****
Minority-owned	3.14	23.88	13.17 ****
Nonminority female	2.77	11.8	23.43 ****
DBE total	5.91	35.68	16.56 ****

Source: Table 6.5.

Notes: (1) "*" indicates an adverse disparity that is statistically significant at the 15% level or better (85% confidence). "***" indicates an adverse disparity that is statistically significant at the 10% level or better (90% confidence). "****" indicates the disparity is significant at a 5% level or better (95% confidence). "*****" indicates significance at a 1% level or better (99% confidence). (2) An empty cell in the Disparity Ratio column indicates that no adverse disparity was observed for that category.

Table C2. Utilization, Availability and Disparity Results for MDOT Contracting, Overall and by Contracting Category–All Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	5.50	11.10	49.56 ****
Hispanic	4.25	3.50	
Asian	5.96	4.55	
Native American	0.43	1.00	42.64 ***
Minority-owned	16.14	20.15	80.09 ***
Nonminority female	7.87	13.97	56.31 ****
DBE total	24.00	34.12	70.36 ****
CONSTRUCTION			
African American	4.63	13.55	34.16 ****
Hispanic	6.79	5.33	
Asian	1.66	3.09	53.67 ****
Native American	0.81	0.67	
Minority-owned	13.89	22.64	61.35 ****
Nonminority female	9.97	16.40	60.79 ****
DBE total	23.86	39.04	61.12 ****
AE-CRS			
African American	3.56	8.18	43.54 ****
Hispanic	0.87	2.20	39.54 ****
Asian	19.02	4.90	
Native American	0.05	1.28	3.65 ****
Minority-owned	23.50	16.57	
Nonminority female	7.13	11.45	62.28 ****
DBE total	30.63	28.02	
MAINTENANCE			
African American	5.01	13.19	37.96 ****
Hispanic	3.94	4.44	88.72
Asian	1.76	3.46	50.69 ****
Native American	0.00	1.28	0.00 ****
Minority-owned	10.71	22.38	47.85 ****
Nonminority female	11.33	12.05	94.07
DBE total	22.04	34.42	64.03 ****
IT			
African American	9.50	15.52	61.24 ****
Hispanic	4.63	3.30	
Asian	13.11	12.98	
Native American	0.00	1.24	0.00 ****
Minority-owned	27.25	33.04	82.48 ****
Nonminority female	6.57	12.88	51.02 ****
DBE total	33.82	45.92	73.66 ****

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	18.39	15.96	
Hispanic	3.66	3.13	
Asian	0.13	4.66	2.82 ****
Native American	0.04	0.58	6.82 ****
Minority-owned	22.22	24.32	91.38
Nonminority female	3.30	20.51	16.07 ****
DBE total	25.52	44.83	56.92 ****
CSE			
African American	1.38	11.50	12.00 ****
Hispanic	0.36	3.83	9.33 ****
Asian	0.96	7.96	12.08 ****
Native American	0.00	1.01	0.00 ****
Minority-owned	2.70	24.31	11.11 ****
Nonminority female	2.34	11.92	19.64 ****
DBE total	5.04	36.23	13.91 ****

Source: Table 6.6.

Table C3. Utilization, Availability, and Disparity Results for MDOT Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.50	10.39	33.71 ****
Hispanic	5.53	3.30	
Asian	7.25	4.28	
Native American	0.47	1.04	45.05 **
Minority-owned	16.76	19.00	88.18
Nonminority female	8.40	13.53	62.04 ****
DBE total	25.15	32.54	77.31 ****
CONSTRUCTION			
African American	3.97	13.86	28.63 ****
Hispanic	8.85	5.14	
Asian	2.32	3.07	75.57
Native American	0.82	0.65	
Minority-owned	15.96	22.72	70.25 ****
Nonminority female	8.99	16.81	53.44 ****
DBE total	24.95	39.54	63.10 ****

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
AE-CRS			
African American	3.54	8.28	42.72 ****
Hispanic	1.16	2.21	52.26 ***
Asian	18.09	4.89	
Native American	0.06	1.27	5.07 ****
Minority-owned	22.85	16.66	
Nonminority female	7.40	11.61	63.75 ****
DBE total	30.26	28.27	
MAINTENANCE			
African American	0.17	8.23	2.11 ****
Hispanic	1.80	3.07	58.76 ***
Asian	0.00	4.18	0.04 ****
Native American	0.00	1.17	0.00 ****
Minority-owned	1.98	16.65	11.88 ****
Nonminority female	8.84	10.18	86.85
DBE total	10.82	26.83	40.33 ****
IT			
African American	8.61	14.07	61.15 ****
Hispanic	15.02	2.94	
Asian	0.76	11.02	6.91 ****
Native American	0.00	1.26	0.00 ****
Minority-owned	24.39	29.30	83.25 ***
Nonminority female	13.75	12.48	
DBE total	38.13	41.78	91.28
SERVICES			
African American	1.86	10.50	17.70 ****
Hispanic	4.29	3.22	
Asian	0.07	5.22	1.34 ****
Native American	0.00	1.22	0.00 ****
Minority-owned	6.22	20.16	30.86 ****
Nonminority female	11.76	12.89	91.23
DBE total	17.98	33.05	54.40 ****
CSE			
African American	1.47	5.29	27.73 ****
Hispanic	0.02	1.75	0.97 ****
Asian	0.57	2.66	21.55 ****
Native American	0.00	0.40	0.00 ****
Minority-owned	2.06	10.10	20.37 ****
Nonminority female	2.59	8.11	31.91 ****
DBE total	4.65	18.22	25.51 ****

Source and Notes: See Table 6.7.

Table C4. Utilization, Availability, and Disparity Results for MDOT Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.49	10.48	33.29 ****
Hispanic	4.96	3.46	
Asian	7.14	4.28	
Native American	0.56	1.02	54.96
Minority-owned	16.14	19.25	83.87 *
Nonminority female	8.74	13.59	64.30 ****
DBE total	24.88	32.84	75.77 ****
CONSTRUCTION			
African American	3.78	13.76	27.50 ****
Hispanic	7.26	5.34	
Asian	1.51	3.12	48.26 ****
Native American	0.89	0.62	
Minority-owned	13.44	22.83	58.88 ****
Nonminority female	10.10	16.81	60.09 ****
DBE total	23.54	39.64	59.39 ****
AE-CRS			
African American	3.28	8.20	40.02 ****
Hispanic	0.92	2.21	41.50 ****
Asian	19.67	4.90	
Native American	0.05	1.28	3.88 ****
Minority-owned	23.91	16.59	
Nonminority female	7.29	11.48	63.55 ****
DBE total	31.21	28.07	
MAINTENANCE			
African American	0.03	8.56	0.39 ****
Hispanic	6.39	3.03	
Asian	0.00	6.06	0.00 ****
Native American	0.00	0.93	0.00 ****
Minority-owned	6.42	18.58	34.58 ****
Nonminority female	0.00	11.00	0.00 ****
DBE total	6.42	29.58	21.72 ****
IT			
African American	8.59	13.89	61.90 ****
Hispanic	13.18	2.90	
Asian	0.92	10.82	8.46 ****
Native American	0.00	1.27	0.00 ****
Minority-owned	22.69	28.87	78.58 ****
Nonminority female	15.79	12.39	
DBE total	38.48	41.26	93.25

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	9.04	11.39	79.30 *
Hispanic	11.99	3.61	
Asian	0.40	5.81	6.92 ****
Native American	0.00	1.30	0.00 ****
Minority-owned	21.42	22.11	96.89
Nonminority female	14.40	12.53	
DBE total	35.82	34.64	
CSE			
African American	0.02	5.49	0.39 ****
Hispanic	0.02	1.81	0.99 ****
Asian	0.58	3.04	19.21 ****
Native American	0.00	0.30	0.00 ****
Minority-owned	0.62	10.63	5.86 ****
Nonminority female	0.88	8.12	10.84 ****
DBE total	1.50	18.75	8.01 ****

Source and Notes: See Table 6.8.

G. Anecdotal Evidence

Chapter VII presents the results of a large-scale mail survey we conducted of DBEs and non-DBEs about their experiences and difficulties in obtaining contracts. The survey quantified and compared anecdotal evidence on the experiences of DBEs and non-DBEs as a method to examine whether any differences might be consistent with past or present discrimination.

We found that DBEs that have been hired in the past by non-DBE prime contractors to work on public sector contracts with DBE goals are rarely hired—or even solicited—by these prime contractors to work on projects without DBE goals. The relative lack of DBE hiring and, moreover, the relative lack of solicitation of DBEs in the absence of affirmative efforts by MDOT and other public entities in the market area show that business discrimination continues to fetter DBE business opportunities in the relevant markets (*See Tables 7.9 and 7.10*).

We found that DBEs in the relevant market area report suffering business-related discrimination in large numbers and with statistically significantly greater frequency than non-DBEs. Moreover, we found that these differences remain statistically significant even when firm size and other “capacity”-related owner characteristics are held constant. Large disparities were observed in every category, including applying for surety bonds, applying for commercial loans, obtaining price quotes from suppliers, hiring workers from union hiring halls, having to do inappropriate or extra work not required of comparable non-DBEs, applying for commercial or professional insurance, working or attempting to work on private sector prime contracts, working or attempting to work on private sector subcontracts, functioning without hindrance or harassment on the work site, joining or dealing with trade associations, working or attempting to work on public sector subcontracts and prime contracts, and receiving timely payment for work

performed. The incidence of reported disparate treatment for DBEs in these cases ranged between 200 percent and 2300 percent higher than for non-DBEs. (*See Tables 7.3–7.6*).

We also found that DBEs in these markets are more likely than similarly situated non-DBEs to report that specific aspects of the regular business environment make it harder or impossible for them to conduct business, and less likely than similarly situated non-DBEs to report that specific aspects of the regular business environment make it easier for them to conduct business. In particular, bonding requirements, insurance requirements, previous experience requirements, the cost of bidding or proposing, large project sizes, the price of supplies or materials, late notice of bid/proposal deadlines, and prior dealings with project owners were all found to be statistically significantly more problematic for DBEs than non-DBEs—even when holding firm size and other “capacity”-related owner characteristics constant (*See Tables 7.7 and 7.8*).

Chapter VII also presents the results from a series of in-depth personal interviews conducted with almost 200 DBE and non-DBE business owners and representatives from MDOT’s market area. Similar to the survey responses, the interviews strongly suggest that minorities and women continue to suffer discriminatory barriers to full and fair access to MDOT, other public sector, and private sector contracts. Participants reported negative perceptions of DBE competence and qualifications; being held to higher performance standards than for non-DBEs; harassment at the workplace/jobsite; abuses by primes of the payment process, and in the compliance process; exclusion from industry networks; discrimination in access to commercial loans, surety bonds, and commercial/professional insurance; difficulties in obtaining work on public sector projects; and difficulties obtaining work on private sector or “non-goals” projects.

We conclude that the statistical evidence presented in this report is consistent with these anecdotal accounts of contemporary business discrimination. The results of the surveys and the personal interviews are the types of anecdotal evidence that, especially in conjunction with the Study’s extensive statistical evidence, the courts have found to be highly probative of whether, without affirmative interventions, MDOT would be a passive participant in a discriminatory local market area.

I. Introduction

During the 2012 Session of the Maryland General Assembly, House Bill 1370 reauthorized the State of Maryland’s Minority Business Enterprise Program (“MBE Program”) for four years, until July 1, 2016. This bill also provided for the State’s certification agency, MDOT, to commission a Study of the MBE program to ensure compliance with constitutional mandates and programmatic best practices. During the 2013 Session, the House Bill 1353 and Senate Bill 188 extended the MBE program for an additional year, until July 1, 2017.

MDOT commissioned a team led by NERA Economic Consulting to conduct the Study. The results of NERA’s Study, *Business Disparities in the Maryland Market Area*,¹⁰ provided the evidentiary record necessary for the State’s consideration of whether to implement renewed MBE policies that comply with the requirements of the courts and to assess the extent to which previous efforts have assisted M/WBEs to participate on a fair basis in the State’s contracting and procurement activities.

The 2017 Study found both statistical and anecdotal evidence consistent with the presence of business discrimination against M/WBEs in the State’s relevant market area. The present document, which is a continuation of that Study, provides additional detail on federally-assisted and state-funded contracting and subcontracting activity at SHA, MTA and MAA.

The present Study is contained in seven chapters, and is designed to answer the following questions:

- Chapter I: Introduction
- Chapter II: What is the relevant geographic market for MDOT and how is it defined? What are the relevant product markets for MDOT and how are they defined?
- Chapter III: What percentage of all businesses in MDOT’s market area are owned by minorities and/or women? How are these availability estimates constructed?
- Chapter IV: Do minority and/or female wage and salary earners earn less than similarly situated nonminority males? Do minority and/or female business owners earn less from their businesses than similarly situated nonminority males? Are minorities and/or women in MDOT’s market area less likely to be self-employed than similarly situated nonminority males? How do the findings in MDOT’s market area differ from the national findings on these questions? How have these findings changed over time?

¹⁰ NERA Economic Consulting (2017).

- Chapter V: Do minorities and/or women face discrimination in the market for commercial capital and credit compared to similarly situated nonminority males? How, if at all, do findings locally differ from findings nationally?
- Chapter VI: To what extent have DBEs been utilized by MDOT on contracts and purchases active during the study period, and how does this utilization compare to the availability of DBEs in the relevant market area?
- Chapter VII: How many DBEs experienced disparate treatment in the study period? What types of discriminatory experiences are most frequently encountered by DBEs? How do the experiences of DBEs differ from those of similar non-DBEs regarding difficulties in obtaining prime contracts and subcontracts?

In assessing these questions, we present in Chapters II through VII a series of quantitative and qualitative analyses that compare minority and/or female outcomes to nonminority male outcomes in all of these business-related areas. The Executive Summary, above, provides a brief overview of our key findings and conclusions.

II. Defining the Relevant Markets

A. Preparing the Master Contract/Subcontract Database

1. Overview

The first step in our evaluation of DBE availability and participation for MDOT is to define the relevant market area for its contracting and procurement activity. Markets have both a geographic dimension and a product, or industry, dimension.¹¹ Both aspects of market definition are considered in this chapter. For this Study, we define the relevant geographic market area based on MDOT's historical contracting and subcontracting records. This market dimension is determined empirically by examining the zip code distribution of utilized contractors and subcontractors.

It is also important to be exacting in determining product markets. The extent of disparity may differ from industry to industry just as it does among geographic locations.¹² Documenting the specific industries that comprise MDOT's contracting activities and the relative importance of each to contract and subcontract spending is important because it allows for: (1) implementation of precise availability estimation methods, (2) more narrowly tailored contract-level goal-setting, and (3) overall DBE availability estimates that are a weighted average of underlying industry-level availability estimates, rather than a simple average, resulting in more narrowly tailored annual goals. The weights used are the proportion of dollars awarded or paid within each industry and allow the overall availability measure to be influenced more heavily by availability in those industries where more contracting dollars are spent, and less heavily by availability in those industries where relatively fewer contracting dollars are spent.

We define the product market dimension by estimating which North American Industrial Classification System (NAICS) codes best describe each identifiable contractor, subcontractor, subconsultant, or supplier in those records.¹³ In both cases, the definitions are weighted according to how many dollars were spent with firms from each zip code or NAICS code, respectively, so that locations and industries, respectively, receiving relatively more contracting dollars receive relatively more weight in the estimation of DBE availability. Once the geographic and industry parameters of MDOT's market area have been defined, we can restrict our subsequent analyses to business enterprises and other phenomena within this market area. Restricting our analyses in this manner narrowly tailors our findings to MDOT's specific market area and contracting circumstances.

¹¹ See, e.g., Areeda, P., L. Kaplow, and A. Edlin (2013).

¹² See Wainwright (2000), documenting that, in general, the similarities in the amount of discrimination present in different industries and geographic locations significantly outweigh the differences.

¹³ Executive Office of the President, Office of Management and Budget (2012).

2. MDOT Contracting and Purchasing

MDOT provided NERA with prime contract and purchase order award and payment records (“prime contracts”)¹⁴ covering State fiscal years 2010-2014.¹⁵ These data were retrieved from MDOT’s Financial Management Information System (“FMIS”).

For each prime contract active during the study period, the data included: the business name and address of the prime contractor, a description of the contract or purchase, the associated agency for which the work was performed, the contract or purchase order number, start date, total award amount, the total current paid amount, and whether any federal (USDOT) funds were used. We also cross-referenced business names and addresses with the State’s Certified MBE/DBE Directory and other directories (*See* Chapter III) to obtain additional contractor race and gender information.

Using information from work categories, contract descriptions, and industry classifications, each prime contract was then classified by NERA into one of MDOT’s six major procurement categories: Construction; Architecture-Engineering and Other Construction-Related Professional Services (“AE-CRS”);¹⁶ Maintenance; Information Technology (“IT”); Services; and Commodities, Supplies, and Equipment (“CSE”). Additionally, we focused our research on contracts that were classified as “large” purchases, with a value exceeding \$25,000.¹⁷

In this manner, a total of 4,435 prime contracts were identified from MDOT records as comprising the contract universe.¹⁸ According to MDOT records, these 4,435 prime contracts had a cumulative award value of \$7.98 billion and a cumulative paid value (as of the time the data were collected) of \$4.75 billion.

Not all prime contracts have significant subcontract opportunities, however. In particular, contracts valued at \$50,000 or less in Construction, AE-CRS, Maintenance, IT and Services do not frequently have such opportunities. The same is true in the CSE category for contracts under \$1 million. Of the 4,435 prime contracts in the contract universe, 2,599 were deemed to have significant subcontract opportunities (leaving 1,836 smaller contracts without such

¹⁴ We examined spending in State of Maryland Expenditure Object Codes 07 (Motor Vehicle Operation and Maintenance), 08 (Contractual Services), 09 (Supplies and Materials), 10 (Equipment Replacement), 11 (Equipment Additional), and 14 (Land, Building & Structures).

¹⁵ The State’s fiscal year runs from July 1st through June 30th.

¹⁶ Construction-related professional services includes engineering services, architectural services, construction management services, testing services, environmental consulting services, and other construction-related consulting services.

¹⁷ \$25,000 is the Category III Small Procurement threshold pursuant to COMAR 21.05.07.04.

¹⁸ Excluded from the universe were contracts not subject to the State’s MBE Statute per State Finance and Procurement Article §14-302(a)(1)(i)1-2 and per COMAR 21.01.03.01.A. We also excluded contracts with foreign companies, as it was not practical to collect data from overseas. Contracts with foreign companies accounted for less than 0.3% of all contract dollars.

opportunities). These 2,599 prime contracts had a cumulative award value of \$7.79 billion, or 98 percent of all award dollars in the contract universe, and a cumulative paid value of \$4.59 billion, or 97 percent of all paid dollars in the contract universe.

We drew a random sample of 1,452 prime contracts from this base of 2,599 prime contracts, or 56 percent of all prime contracts with significant subcontract opportunities. The sample was stratified according to procurement category and modal administration—SHA, MTA or MAA.¹⁹ These 1,452 sampled contracts had a cumulative award value of \$7.04 billion, or 91 percent of all award dollars in the sample universe, and a cumulative paid value of \$4.16 billion, or 91 percent of all paid dollars in the sample universe.

We conducted a careful review of the available subcontract data for these 1,452 prime contract records, and determined that the available subcontract information was incomplete. In consultation with MDOT, NERA developed a plan to directly contact the prime contractors and vendors that performed these contracts in order to verify the existing data and to supplement it with additional subcontract records where appropriate. As noted above, prime contracts valued at \$50,000 or greater in Construction, AE-CRS, Maintenance, IT and Services were included in this data collection effort, as were prime contracts in CSE valued at \$1M or greater. Prime contracts in Construction, AE-CRS, Maintenance, IT and Services that were under \$50,000 and prime contracts in CSE that were under \$1M were not included in the data collection effort. Those prime contracts did, however, remain in the overall study universe for subsequent analysis.

After an intensive data collection effort and with assistance from MDOT, we were able to obtain relevant information for 1,352 prime contracts, or 93 percent of all prime contracts sampled, and 14,565 associated subcontracts. The total award dollar value of the 1,352 prime contracts, according to MDOT records, was \$6.71 billion, or 95 percent of all awarded dollars in our sample, and the total paid dollar value was \$3.91 billion, or 94 percent of all paid dollars in our sample. These percentages are sufficiently large to be well representative of the entire universe of MDOT contracts and subcontracts being examined for this Study.

Dollar values reported by prime contractors did not always match MDOT exactly.²⁰ According to prime-reported amounts, the total awarded dollar value of the 1,352 prime contracts obtained was \$6.96 billion and the total paid dollar value was \$4.70 billion. In order to achieve consistency with the subcontract dollar values we collected, we use prime reported dollar amounts for the remainder of the relevant analyses in this report.

¹⁹ The largest contracts in each stratum were sampled with certainty and the remainder were sampled with replacement.

²⁰ For award dollars, the difference is primarily due to change orders, renewals, and extensions that occurred after collection of the initial records by MDOT but prior to NERA receiving the requested information from the prime contractor. For paid dollars, it is primarily due to the passage of time between collection of the initial records from MDOT and receipt of the requested information from the prime contractor.

In all, therefore, a total of 1,352 prime contracts and 14,565 associated subcontracts were collected from prime contractors, with a total awarded value of approximately \$6.96 billion and a total paid value of \$4.70 billion. These 1,352 prime contracts and 14,565 associated subcontracts were then combined with the 1,836 prime contracts without significant subcontracting opportunities to obtain an overall sample of 3,188 prime contracts and 14,565 associated subcontracts. Additionally, we then removed, from the paid dollar column only, contracts that were not substantially complete at the time we performed the data collection for this Study. We made this adjustment so as not to skew the picture of subcontract activity presented in the Study. Certain contracts require a different mix of subcontract industries in the early phases of a project than in the latter phases. By removing contracts that are not substantially complete from the paid dollar totals, we minimize the possibility that not yet completed contracts can alter the distribution of industries from what we would see if all contracts analyzed were 100 percent complete.²¹

3. Federal-Aid Subrecipient Grants

In addition to these “direct” records of MDOT’s own contracting, purchasing, and associated subcontracting, we obtained records of federal transportation funds that MTA and SHA passed through to various local government entities throughout Maryland (“subrecipients”) during the same study time period, pursuant to various USDOT Federal Highway Administration (“FHWA”) and Federal Transit Administration (“FTA”) funding programs.²² Under the federal regulations governing the DBE Program, any subrecipient of such FHWA or FTA funding must abide by the DBE Program rules.²³

MDOT’s records for subrecipient contracting included the following data elements: subrecipient name, contract number, award date, expiration date, prime contract award amount, prime contract paid amount, prime contractor business name, subcontractor business name, subcontractor award amount, subcontractor paid amount, subcontractor DBE status, prime contractor address, and subcontractor address. Overall, we obtained records for 50 MTA subrecipient grants and 84 SHA subrecipient grants, with a total award dollar value of \$299.6 million.²⁴

²¹ For purposes of the Study, a contract was considered to be substantially complete if at least 75 percent of the total award amount had been paid and the procurement category was in Construction, Maintenance, IT or Services.

²² MAA does not administer subrecipient grants.

²³ See 49 C.F.R. § 26.21. For recipients or subrecipients of Federal Transit Administration (“FTA”) or Federal Aviation Administration (“FAA”) funds, more than \$250,000 must be received in any given FFY before the DBE Program rules must be followed. There is no such threshold, however, for FHWA recipients or subrecipients.

²⁴ See Appendix B for a listing of all MTA and SHA subrecipients included in the Master Contract/Subcontract Database

Together, as shown below in Tables 2.1 and 2.2, these direct and subrecipient prime contracts and subcontracts comprise the Master Contract/Subcontract Database compiled for this Study. Table 2.1 shows, for each major procurement category, the total number of prime contracts and associated subcontracts awarded, the total number of prime contracts and associated subcontracts substantially completed, total dollars awarded, and total dollars paid. Table 2.2 shows comparable information restricted to federally-assisted contracts (including subrecipient contracts).

Table 2.1. Summary of Master Contract/Subcontract Database: MDOT Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED (\$)	DOLLARS PAID (\$)
CONSTRUCTION			3,083,346,877	2,033,386,289
<i>Prime Contracts</i>	887	698	1,897,183,054	1,148,190,495
<i>Subcontracts</i>	11,154	9,051	1,186,163,823	885,195,793
AE-CRS			1,770,472,644	1,006,656,259
<i>Prime Contracts</i>	234	234	994,579,928	526,015,845
<i>Subcontracts</i>	1,174	1,172	775,892,716	480,640,414
MAINTENANCE			811,264,376	141,150,664
<i>Prime Contracts</i>	227	151	604,412,068	98,224,511
<i>Subcontracts</i>	1,233	442	206,852,308	42,926,153
IT			158,961,034	61,993,592
<i>Prime Contracts</i>	166	144	128,437,132	46,977,181
<i>Subcontracts</i>	134	57	30,523,902	15,016,411
SERVICES			1,189,264,351	398,014,575
<i>Prime Contracts</i>	287	241	956,261,566	261,248,715
<i>Subcontracts</i>	1,021	817	233,002,784	136,765,860
CSE			440,585,034	385,706,032
<i>Prime Contracts</i>	1,521	1,519	412,205,092	362,766,648
<i>Subcontracts</i>	135	114	28,379,943	22,939,384
GRAND TOTAL			7,453,894,316	4,026,907,409
<i>Prime Contracts</i>	3,322	2,987	4,993,078,840	2,443,423,395
<i>Subcontracts</i>	14,851	11,653	2,460,815,476	1,583,484,015

Source: NERA calculations from Master Contract/Subcontract Database, 2010-2014.

Notes: (1) Prime Contract dollar amounts are net of subcontract amounts; (2) Number of Paid Contracts and Dollars Paid exclude contracts that were not substantially complete.

Table 2.2. Summary of Master Contract/Subcontract Database: Federally-Assisted MDOT Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED (\$)	DOLLARS PAID (\$)
CONSTRUCTION			2,757,270,003	1,836,144,797
<i>Prime Contracts</i>	816	643	1,723,774,077	1,072,221,119
<i>Subcontracts</i>	10,185	8,400	1,033,495,926	763,923,678
AE-CRS			1,663,703,079	947,994,813
<i>Prime Contracts</i>	221	221	920,794,803	489,181,160
<i>Subcontracts</i>	1,084	1,082	742,908,276	458,813,653
MAINTENANCE			190,438,399	19,513,022
<i>Prime Contracts</i>	12	6	113,453,861	5,349,444
<i>Subcontracts</i>	88	22	76,984,538	14,163,579
IT			9,877,013	7,901,720
<i>Prime Contracts</i>	6	5	5,672,000	4,722,700
<i>Subcontracts</i>	22	13	4,205,012	3,179,021
SERVICES			258,612,340	44,094,212
<i>Prime Contracts</i>	28	13	222,657,563	24,323,168
<i>Subcontracts</i>	212	90	35,954,778	19,771,044
CSE			169,308,682	161,426,453
<i>Prime Contracts</i>	44	42	161,546,713	159,105,042
<i>Subcontracts</i>	53	32	7,761,969	2,321,410
GRAND TOTAL			5,049,209,517	3,017,075,017
<i>Prime Contracts</i>	1,127	930	3,147,899,018	1,754,902,633
<i>Subcontracts</i>	11,644	9,639	1,901,310,499	1,262,172,384

Source: NERA calculations from Master Contract/Subcontract Database, 2010-2014.

Notes: (1) Prime Contract dollar amounts are net of subcontract amounts; (2) Number of Paid Contracts and Dollars Paid exclude contracts that were not substantially complete.

B. Geographic Market Definition for Contracting and Procurement

To determine the geographic dimension of MDOT's contracting and procurement markets, we used the Master Contract/Subcontract Database, as described in the previous section, to obtain the zip codes and thereby the county and state for each contractor and subcontractor establishment identified in the database. Using this location information, we then calculated the

percentage of MDOT contract and subcontract dollars awarded to establishments by state and county during the study period. The geographic market area is defined as that region which accounts for approximately 75 percent of overall contracting and procurement spending by a given state or local government agency. Contractors and vendors with locations in the geographic market area account for the large majority of contracting and procurement expenditures by MDOT during the study period.

Table 2.3. Distribution of MDOT Contracting Dollars by Geographic Location, State Fiscal Years 2010-2014

Location	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Total (%)
<i>Dollars Awarded</i>							
Inside MDOT Market Area	87.6	94.3	90.1	89.6	93.1	74.8	89.7
Outside MDOT Market Area	12.4	5.7	9.9	10.4	6.9	25.2	10.3
<i>Dollars Paid</i>							
Inside MDOT Market Area	86.2	95.5	88.4	91.5	85.6	76.4	87.7
Outside MDOT Market Area	13.8	4.5	11.6	8.5	14.4	23.6	12.3
<i>Dollars Awarded</i>							
Inside Maryland	78.7	91.3	71.6	79.8	90.2	71.5	82.4
Outside Maryland	21.3	8.7	28.4	20.2	9.8	28.5	17.6
<i>Dollars Paid</i>							
Inside Maryland	77.0	93.0	72.2	79.2	84.6	76.4	81.3
Outside Maryland	23.0	7.0	27.8	20.8	15.4	23.6	18.7

Source: See Table 2.1.

Note: “MDOT Market Area” includes the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area. See below and fn. 39.

As shown in Table 2.3, the overall share of expenditures inside the geographic market area is 89.7 percent of dollars awarded and 87.7 percent of dollars paid. The share is approximately 75.0 percent or greater in all major procurement categories regardless of whether dollars awarded or dollars paid is used as the metric. The average share (combining award and paid dollar figures) is highest in AE-CRS, followed by IT, Services, Maintenance, Construction, and finally CSE.²⁵ For

²⁵ For informational purposes, Table 2.3 also shows the share of awards and payments inside and outside the State of Maryland.

purposes of this Study, therefore, MDOT’s geographic market area is comprised of the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area.²⁶

Table 2.4 shows the geographic distribution across all procurement categories of contract and procurement dollars by county within the MDOT market area.

Table 2.4. Distribution of MDOT Contract Award Dollars by State and County, Inside the Market Area, 2010-2014

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
MD	BALTIMORE CITY	1,506,605,292	22.54	22.54
MD	BALTIMORE	1,322,187,475	19.78	42.33
MD	ANNE ARUNDEL	814,217,155	12.18	54.51
MD	PRINCE GEORGES	497,836,631	7.45	61.96
MD	MONTGOMERY	492,698,354	7.37	69.33
MD	HOWARD	472,865,757	7.08	76.41
MD	HARFORD	283,799,447	4.25	80.65
MD	ALLEGANY	269,381,285	4.03	84.69
DC	DISTRICT OF COLUMBIA	204,007,216	3.05	87.74
MD	CARROLL	109,330,601	1.64	89.37
VA	FAIRFAX	107,652,120	1.61	90.98
MD	CHARLES	80,165,030	1.20	92.18
MD	KENT	79,887,304	1.20	93.38
MD	FREDERICK	68,811,632	1.03	94.41
DE	NEW CASTLE	64,882,423	0.97	95.38
MD	WASHINGTON	54,971,223	0.82	96.20
VA	LOUDOUN	41,238,937	0.62	96.82
VA	STAFFORD	38,946,216	0.58	97.40
VA	ARLINGTON	29,785,538	0.45	97.85

²⁶ The Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area include, in Virginia, Arlington County, Clarke County, Culpeper County, Fairfax County, Fauquier County, Loudoun County, Prince William County, Rappahannock County, Spotsylvania County, Stafford County, Warren County, Alexandria city, Fairfax city, Falls Church city, Fredericksburg city, Manassas city, and Manassas Park city; and in West Virginia, Jefferson County.

Defining the Relevant Markets

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
MD	WICOMICO	26,685,653	0.40	98.25
MD	GARRETT	19,834,472	0.30	98.54
DE	KENT	13,919,830	0.21	98.75
MD	QUEEN ANNES	11,035,385	0.17	98.92
MD	TALBOT	10,217,574	0.15	99.07
DE	SUSSEX	9,969,010	0.15	99.22
VA	PRINCE WILLIAM	9,295,178	0.14	99.36
VA	FALLS CHURCH CITY	8,801,343	0.13	99.49
VA	FAUQUIER	4,336,524	0.06	99.56
MD	CAROLINE	4,015,195	0.06	99.62
MD	WORCESTER	3,965,381	0.06	99.67
MD	DORCHESTER	3,398,625	0.05	99.73
VA	WARREN	2,999,577	0.04	99.77
VA	MANASSAS CITY	2,923,744	0.04	99.81
MD	CALVERT	2,908,641	0.04	99.86
MD	SAINT MARYS	2,042,950	0.03	99.89
VA	CLARKE	1,990,668	0.03	99.92
VA	ALEXANDRIA CITY	1,687,161	0.03	99.94
VA	FREDERICKSBURG CITY	1,247,371	0.02	99.96
MD	CECIL	1,177,020	0.02	99.98
MD	SOMERSET	536,335	0.01	99.99
VA	CULPEPER	367,866	0.01	99.99
WV	JEFFERSON	358,303	0.01	100.00
VA	MANASSAS PARK CITY	39,079	0.00	100.00
VA	SPOTSYLVANIA	29,763	0.00	100.00
VA	FREDERICK	9,000	0.00	100.00
WV	HARRISON	7,508	0.00	100.00
VA	FAIRFAX CITY	5,554	0.00	100.00

Source: See Table 2.1.

Outside the market area, counties with a significant amount of spending activity (defined by NERA as geographies that accounted for more than approximately 1.0 percent of total spending among three or more vendors) included:

CONSTRUCTION

YORK, PA
FRANKLIN, OH
LAWRENCE, PA
CHESTER, PA
MONTGOMERY, PA
ALLEGHENY, PA
WESTMORELAND, PA
RICHMOND CITY, VA
MECKLENBURG, NC
KANAWHA, WV
COOK, IL
GLOUCESTER, NJ
FULTON, PA
BERGEN, NJ
CUMBERLAND, PA
AE-CRS
PHILADELPHIA, PA
NEW YORK, NY
HAMILTON, OH
DAUPHIN, PA
ALLEGHENY, PA
ORANGE, CA
DELAWARE, OH
WAKE, NC
DELAWARE, PA

MAINTENANCE

MIDDLESEX, MA
DELAWARE, PA
MAINTENANCE, CONT'D
ONTARIO PROVINCE, CANADA
MECKLENBURG, NC
SUFFOLK, NY
HARTFORD, CT
TRUMBULL, OH
ADAMS, PA
DUPAGE, IL
FRANKLIN, OH

SERVICES

ONTARIO PROVINCE, CANADA
DELAWARE, PA
FULTON, GA
PHILADELPHIA, PA
COOK, IL
ALLEGHENY, PA
CSE
COOK, IL
FULTON, GA
CHESTER, PA
ESSEX, NJ
ALLEN, IN
ALLEGHENY, PA

MONTGOMERY, PA

HENNEPIN, MN

LOS ANGELES, CA

DALLAS, TX

MECKLENBURG, NC

C. Product Market Definition for Contracting and Procurement

Using the major procurement categories for each prime contract, and the primary NAICS codes assigned by NERA to each prime contractor and subcontractor in the Master Contract/Subcontract Database, we identified the most important Industry Groups within each contracting and procurement category, as measured by total dollars awarded. The relevant NAICS codes and their associated dollar weights appear below in Tables 2.5 through 2.10 for Construction, AE-CRS, Maintenance, IT, Services, and CSE, respectively.

Each Industry Group (four-digit NAICS) identified in Tables 2.5 through 2.10 consists of several more detailed Industries (four- and six-digit NAICS) and is also part of a more aggregated Industry Sub-sector (three-digit NAICS). Overall, MDOT contracting awards occur in 72 NAICS Industry Sub-sectors, 202 NAICS Industry Groups and 461 NAICS Industries. In Construction, contract spending occurs across 61 NAICS Industry Sub-sectors, 151 NAICS Industry Groups and 303 NAICS Industries. In Architecture & Engineering, spending occurs across 25 NAICS Industry Sub-sectors, 43 NAICS Industry Groups and 62 NAICS Industries. In Maintenance, spending occurs across 54 NAICS Industry Sub-sectors, 129 NAICS Industry Groups and 227 NAICS Industries. In IT, spending occurs across 22 NAICS Industry Sub-sectors, 39 NAICS Industry Groups and 55 NAICS Industries. In Services, spending occurs across 64 NAICS Industry Sub-sectors, 152 NAICS Industry Groups and 283 NAICS Industries. In CSE, spending occurs across 50 NAICS Industry Sub-sectors, 123 NAICS Industry Groups and 199 NAICS Industries.

Many industries are part of MDOT's contracting activities. However, Tables 2.5 through 2.10 demonstrate that actual contracting and subcontracting opportunities are not distributed evenly among these industries. The distribution of contract expenditures is, in fact, highly skewed. In Construction, we see from Table 2.5 that just six Industry Groups alone (NAICS 2373, 2382, 2381, 2362, 4247 and 2389) account for over three-fourths of all award dollars, just 14 Industry Groups account for over 90 percent, and the remainder is distributed among another 137 Industry Groups.

Table 2.5. Distribution of MDOT Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Construction

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
2373	Highway, Street, and Bridge Construction	45.34	45.34
2382	Building Equipment Contractors	9.33	54.67
2381	Foundation, Structure, and Building Exterior Contractors	8.17	62.84
2362	Nonresidential Building Construction	5.38	68.23
4247	Petroleum and Petroleum Products Merchant Wholesalers	4.87	73.09
2389	Other Specialty Trade Contractors	4.00	77.09
4842	Specialized Freight Trucking	3.07	80.15
2383	Building Finishing Contractors	2.28	82.43
2379	Other Heavy and Civil Engineering Construction	1.81	84.24
4233	Lumber and Other Construction Materials Merchant Wholesalers	1.51	85.75
2371	Utility System Construction	1.22	86.96
3351	Electric Lighting Equipment Manufacturing	1.15	88.12
5413	Architectural, Engineering, and Related Services	1.10	89.22
5617	Services to Buildings and Dwellings	1.08	90.29
3323	Architectural and Structural Metals Manufacturing	0.96	91.25
3273	Cement and Concrete Product Manufacturing	0.89	92.14
5616	Investigation and Security Services	0.89	93.03
5619	Other Support Services	0.76	93.79
4889	Other Support Activities for Transportation	0.58	94.37
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	0.55	94.92
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.50	95.42
3359	Other Electrical Equipment and Component Manufacturing	0.41	95.83
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.35	96.18
2123	Nonmetallic Mineral Mining and Quarrying	0.33	96.51
4539	Other Miscellaneous Store Retailers	0.24	96.75
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.24	96.99
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.18	97.17
4821	Rail Transportation	0.16	97.33
5613	Employment Services	0.16	97.49

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4442	Lawn and Garden Equipment and Supplies Stores	0.16	97.65
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	0.15	97.80
3399	Other Miscellaneous Manufacturing	0.15	97.95
3342	Communications Equipment Manufacturing	0.15	98.10
4884	Support Activities for Road Transportation	0.14	98.24
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.13	98.37
4543	Direct Selling Establishments	0.12	98.50
5629	Remediation and Other Waste Management Services	0.12	98.62
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	0.12	98.73
3339	Other General Purpose Machinery Manufacturing	0.10	98.83
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.10	98.93
3311	Iron and Steel Mills and Ferroalloy Manufacturing	0.08	99.02
	Balance of industries (110 industry groups)	0.88	100.00
<i>TOTAL - \$3,083,346,877</i>			

Source: See Table 2.1.

In AE-CRS (Table 2.6), there is an even more concentrated pattern—one Industry Group alone (NAICS 5413) accounts for more than 85 percent of all award dollars and three Industry Groups account for over 95 percent, with the balance distributed among another 40 Industry Groups.

Table 2.6. Distribution of MDOT Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: AE-CRS

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5413	Architectural, Engineering, and Related Services	86.55	86.55
2379	Other Heavy and Civil Engineering Construction	5.24	91.79
5416	Management, Scientific, and Technical Consulting Services	4.16	95.96
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.72	96.67
5619	Other Support Services	0.58	97.25
6242	Community Food and Housing, and Emergency and Other Relief Services	0.56	97.82
5418	Advertising, Public Relations, and Related Services	0.47	98.29
5417	Scientific Research and Development Services	0.40	98.69
2373	Highway, Street, and Bridge Construction	0.32	99.01

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
	Balance of industries (34 industry groups)	0.99	100.00
	<i>TOTAL - \$1,770,472,644</i>		

Source: See Table 2.1.

In Maintenance (Table 2.7), just five Industry Groups account for more than three-fifths of all awards, 10 Industry Groups account for over three-fourths, and the remainder is distributed among 119 additional Industry Groups.

Table 2.7. Distribution of MDOT Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Maintenance

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3365	Railroad Rolling Stock Manufacturing	38.36	38.36
2382	Building Equipment Contractors	7.99	46.35
2373	Highway, Street, and Bridge Construction	7.15	53.50
5616	Investigation and Security Services	5.17	58.67
2389	Other Specialty Trade Contractors	3.99	62.66
4852	Interurban and Rural Bus Transportation	3.40	66.06
5617	Services to Buildings and Dwellings	3.08	69.14
4884	Support Activities for Road Transportation	2.77	71.91
4882	Support Activities for Rail Transportation	2.30	74.21
2379	Other Heavy and Civil Engineering Construction	2.05	76.26
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2.01	78.26
5612	Facilities Support Services	1.88	80.15
5413	Architectural, Engineering, and Related Services	1.76	81.91
4851	Urban Transit Systems	1.74	83.64
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	1.71	85.35
2362	Nonresidential Building Construction	1.55	86.90
2381	Foundation, Structure, and Building Exterior Contractors	1.16	88.06
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	1.04	89.10
3342	Communications Equipment Manufacturing	0.84	89.94
4543	Direct Selling Establishments	0.70	90.64
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	0.70	91.33
4411	Automobile Dealers	0.66	91.99

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3363	Motor Vehicle Parts Manufacturing	0.59	92.59
7211	Traveler Accommodation	0.48	93.07
5621	Waste Collection	0.48	93.54
4842	Specialized Freight Trucking	0.45	94.00
4233	Lumber and Other Construction Materials Merchant Wholesalers	0.44	94.43
5613	Employment Services	0.41	94.84
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.40	95.24
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.35	95.58
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	0.34	95.92
5416	Management, Scientific, and Technical Consulting Services	0.31	96.23
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.29	96.51
3323	Architectural and Structural Metals Manufacturing	0.27	96.78
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	0.24	97.03
4442	Lawn and Garden Equipment and Supplies Stores	0.24	97.27
4246	Chemical and Allied Products Merchant Wholesalers	0.23	97.49
8111	Automotive Repair and Maintenance	0.23	97.72
2371	Utility System Construction	0.21	97.93
5415	Computer Systems Design and Related Services	0.21	98.14
4441	Building Material and Supplies Dealers	0.14	98.28
3351	Electric Lighting Equipment Manufacturing	0.13	98.41
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.12	98.53
3273	Cement and Concrete Product Manufacturing	0.10	98.63
5622	Waste Treatment and Disposal	0.10	98.73
3364	Aerospace Product and Parts Manufacturing	0.09	98.82
4881	Support Activities for Air Transportation	0.09	98.91
4821	Rail Transportation	0.08	99.00
	Balance of industries (81 industry groups)	1.00	100.00
<i>TOTAL - \$811,264,376</i>			

Source: See Table 2.1.

In IT (Table 2.8), we see that just two Industry Groups account for over three-fifths of all award dollars, 8 Industry Groups account for 95 percent, and the remainder is distributed among 31 additional Industry Groups.

Table 2.8. Distribution of MDOT Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: IT

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5415	Computer Systems Design and Related Services	54.77	54.77
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	8.96	63.73
5413	Architectural, Engineering, and Related Services	7.95	71.68
5112	Software Publishers	7.64	79.32
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	6.92	86.24
3342	Communications Equipment Manufacturing	5.76	92.00
5613	Employment Services	1.86	93.86
3231	Printing and Related Support Activities	1.47	95.34
5416	Management, Scientific, and Technical Consulting Services	1.17	96.51
2382	Building Equipment Contractors	1.03	97.54
2379	Other Heavy and Civil Engineering Construction	0.28	97.82
3351	Electric Lighting Equipment Manufacturing	0.21	98.03
5172	Wireless Telecommunications Carriers (except Satellite)	0.20	98.23
8112	Electronic and Precision Equipment Repair and Maintenance	0.18	98.41
3341	Computer and Peripheral Equipment Manufacturing	0.18	98.59
5182	Data Processing, Hosting, and Related Services	0.16	98.75
4431	Electronics and Appliance Stores	0.15	98.90
3399	Other Miscellaneous Manufacturing	0.14	99.04
	Balance of industries (21 industry groups)	0.96	100.00
	<i>TOTAL - \$158,961,034</i>		

Source: See Table 2.1.

In Services (Table 2.9), we see that four Industry Groups account for two-thirds of all award dollars, 7 Industry Groups account for three-fourths, and the remainder is distributed among 145 additional Industry Groups.

Table 2.9. Distribution of MDOT Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Services

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4851	Urban Transit Systems	25.07	25.07
4821	Rail Transportation	20.01	45.08
4859	Other Transit and Ground Passenger Transportation	17.75	62.83
4247	Petroleum and Petroleum Products Merchant Wholesalers	4.09	66.92
4853	Taxi and Limousine Service	3.09	70.00
4543	Direct Selling Establishments	2.70	72.70
5413	Architectural, Engineering, and Related Services	2.47	75.17
3365	Railroad Rolling Stock Manufacturing	2.35	77.52
5415	Computer Systems Design and Related Services	2.15	79.67
5418	Advertising, Public Relations, and Related Services	1.98	81.65
5416	Management, Scientific, and Technical Consulting Services	1.78	83.42
5615	Travel Arrangement and Reservation Services	1.54	84.97
5613	Employment Services	1.29	86.26
5242	Agencies, Brokerages, and Other Insurance Related Activities	1.23	87.49
4855	Charter Bus Industry	1.07	88.56
2382	Building Equipment Contractors	1.03	89.60
4852	Interurban and Rural Bus Transportation	0.94	90.54
5241	Insurance Carriers	0.92	91.46
2211	Electric Power Generation, Transmission and Distribution	0.92	92.39
5419	Other Professional, Scientific, and Technical Services	0.86	93.25
5617	Services to Buildings and Dwellings	0.70	93.95
5172	Wireless Telecommunications Carriers (except Satellite)	0.60	94.55
8111	Automotive Repair and Maintenance	0.57	95.11
5619	Other Support Services	0.48	95.59
3342	Communications Equipment Manufacturing	0.46	96.06
5221	Depository Credit Intermediation	0.41	96.47
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	0.37	96.84

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5313	Activities Related to Real Estate	0.22	97.06
2379	Other Heavy and Civil Engineering Construction	0.16	97.22
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	0.15	97.37
4461	Health and Personal Care Stores	0.15	97.52
4411	Automobile Dealers	0.14	97.66
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.13	97.79
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.13	97.92
2373	Highway, Street, and Bridge Construction	0.12	98.04
8139	Business, Professional, Labor, Political, and Similar Organizations	0.12	98.16
5311	Lessors of Real Estate	0.11	98.27
2212	Natural Gas Distribution	0.11	98.38
2371	Utility System Construction	0.09	98.47
4413	Automotive Parts, Accessories, and Tire Stores	0.09	98.56
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.09	98.65
2362	Nonresidential Building Construction	0.08	98.73
9999	Services of public entities	0.06	98.80
6216	Home Health Care Services	0.06	98.86
4884	Support Activities for Road Transportation	0.05	98.91
3353	Electrical Equipment Manufacturing	0.05	98.96
2381	Foundation, Structure, and Building Exterior Contractors	0.04	99.00
	Balance of industries (105 industry groups)	1.00	100.00
	<i>TOTAL - \$1,189,264,351</i>		

Source: See Table 2.1.

Finally, in CSE (Table 2.10), we see that just two Industry Groups account for almost half of all award dollars, 9 Industry Groups account for almost three-fourths, and the remainder is distributed among 114 additional Industry Groups.

Table 2.10. Distribution of MDOT Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: CSE

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3361	Motor Vehicle Manufacturing	40.72	40.72
3342	Communications Equipment Manufacturing	7.94	48.66
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	5.74	54.40
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	5.73	60.13
4247	Petroleum and Petroleum Products Merchant Wholesalers	4.37	64.51
5415	Computer Systems Design and Related Services	3.04	67.55
2382	Building Equipment Contractors	2.73	70.27
3259	Other Chemical Product and Preparation Manufacturing	2.41	72.68
3365	Railroad Rolling Stock Manufacturing	2.12	74.81
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2.07	76.88
2212	Natural Gas Distribution	1.32	78.19
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1.28	79.48
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	1.26	80.73
5112	Software Publishers	1.04	81.77
8111	Automotive Repair and Maintenance	0.96	82.73
3331	Agriculture, Construction, and Mining Machinery Manufacturing	0.91	83.64
3273	Cement and Concrete Product Manufacturing	0.88	84.53
5413	Architectural, Engineering, and Related Services	0.83	85.36
4233	Lumber and Other Construction Materials Merchant Wholesalers	0.80	86.15
5172	Wireless Telecommunications Carriers (except Satellite)	0.74	86.90
3399	Other Miscellaneous Manufacturing	0.73	87.63
3353	Electrical Equipment Manufacturing	0.69	88.31
3351	Electric Lighting Equipment Manufacturing	0.67	88.98
4411	Automobile Dealers	0.66	89.64
3363	Motor Vehicle Parts Manufacturing	0.54	90.18
3323	Architectural and Structural Metals Manufacturing	0.54	90.72
2123	Nonmetallic Mineral Mining and Quarrying	0.47	91.19

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.46	91.65
4882	Support Activities for Rail Transportation	0.40	92.06
2373	Highway, Street, and Bridge Construction	0.38	92.44
3261	Plastics Product Manufacturing	0.36	92.80
3231	Printing and Related Support Activities	0.34	93.14
4413	Automotive Parts, Accessories, and Tire Stores	0.33	93.47
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.32	93.79
5616	Investigation and Security Services	0.30	94.09
4859	Other Transit and Ground Passenger Transportation	0.30	94.38
3359	Other Electrical Equipment and Component Manufacturing	0.28	94.66
4246	Chemical and Allied Products Merchant Wholesalers	0.27	94.93
5321	Automotive Equipment Rental and Leasing	0.27	95.20
4441	Building Material and Supplies Dealers	0.27	95.47
3329	Other Fabricated Metal Product Manufacturing	0.27	95.74
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.23	95.98
6213	Offices of Other Health Practitioners	0.22	96.20
3311	Iron and Steel Mills and Ferroalloy Manufacturing	0.20	96.40
4889	Other Support Activities for Transportation	0.20	96.60
5111	Newspaper, Periodical, Book, and Directory Publishers	0.18	96.78
4481	Clothing Stores	0.18	96.96
3241	Petroleum and Coal Products Manufacturing	0.16	97.12
5617	Services to Buildings and Dwellings	0.14	97.26
5171	Wired Telecommunications Carriers	0.13	97.39
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	0.13	97.52
3333	Commercial and Service Industry Machinery Manufacturing	0.12	97.65
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	0.12	97.77
3272	Glass and Glass Product Manufacturing	0.12	97.89
4884	Support Activities for Road Transportation	0.12	98.01
3339	Other General Purpose Machinery Manufacturing	0.11	98.12
2362	Nonresidential Building Construction	0.11	98.23
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	0.10	98.33
4241	Paper and Paper Product Merchant Wholesalers	0.09	98.42
5612	Facilities Support Services	0.09	98.51

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3335	Metalworking Machinery Manufacturing	0.07	98.58
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.07	98.65
3344	Semiconductor and Other Electronic Component Manufacturing	0.06	98.71
2389	Other Specialty Trade Contractors	0.06	98.77
5179	Other Telecommunications	0.05	98.82
2379	Other Heavy and Civil Engineering Construction	0.05	98.87
3341	Computer and Peripheral Equipment Manufacturing	0.05	98.92
6219	Other Ambulatory Health Care Services	0.05	98.96
3321	Forging and Stamping	0.04	99.01
	Balance of industries (54 industry groups)	0.99	100.00
	<i>TOTAL - \$440,585,034</i>		

Source: See Table 2.1.

The resulting percentage weights from these NAICS Sub-sectors, Groups, and Industries are used below in Chapter III to calculate average DBE availability figures for Construction, AE-CRS, Maintenance, IT, Services and CSE.²⁷

²⁷ After re-normalizing the percentage weights to sum to 100.

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III. DBE Availability in MDOT's Market Area

A. Introduction

Estimates of DBE availability are an important element of MDOT's disparity study since they provide benchmarks for assessing the effectiveness of its efforts to encourage DBE participation in its contracting and procurement activities. In addition, they provide a means by which to establish overall goals as well as contract-level goals for DBE participation that are tailored to its relevant market area.

For this Study, NERA used M/WBE availability as a proxy for DBE availability. The DBE and M/WBE populations have a high degree of correlation and overlap. There are two differences worth noting, however. First, to be certified as a DBE a business owner's personal net worth cannot exceed \$1,320,000, exclusive of equity in the owner's primary residence and in the business seeking certification.²⁸ Hence, not all M/WBEs can become DBEs. In practice, however, very few business owners have net worth levels in excess of \$1,320,000. According to the Federal Reserve's *2003 Survey of Small Business Finances* (the most recent available), about 7.7 percent of nonminority female small business owners and 8.5 percent of minority small business owners had business equity in excess of \$1,320,000 (in 2016 dollars).²⁹ The 2008-2009 recession reduced minority household wealth disproportionately more than nonminority household wealth. According to a 2011 study from the Pew Research Center, using data from the Census Bureau's *Survey of Income and Program Participation*, the median net worth of nonminority households fell 16.2 percent between 2005 and 2009. For African American households, the decline was 53.2 percent, while for Hispanic households the decline was 65.5 percent.³⁰ This trend has worsened throughout the economic recovery. A 2014 Pew Research Center report, using data from the Federal Reserve's *Survey of Consumer Finances*, finds that while the median wealth of non-Hispanic White households increased by 2.4 percent between 2010 and 2013, the median wealth of Black households declined by 33.7 percent, and the median wealth of Hispanic households declined by 14.3 percent.³¹

Second, it is possible for businesses owned by nonminority males to become certified DBEs if they can establish that they are socially and economically disadvantaged under the regulations.³² Hence, not all DBEs are necessarily M/WBEs. On balance, since so few DBEs have net worth levels in excess of \$1,320,000 and since a significant number of businesses owned by socially and economically disadvantaged nonminority males could potentially seek DBE certification

²⁸ 49 C.F.R. § 26.67.

²⁹ Calculations by NERA from 2003 SSBF data.

³⁰ See Taylor, *et al.* (2011).

³¹ See Kochnar and Fry (2014).

³² 49 C.F.R. § 26.67 and Appendix D.

(e.g., disabled persons, nonminority residents of Labor Surplus Areas, nonminority residents of HUB Zones), NERA's method may actually understate DBE availability to a small degree.³³

NERA's approach to availability measurement reflects USDOT's own compliance advice. According to the USDOT's guidance, "... if you have data about the number of minority and women-owned businesses (regardless of whether they are certified as DBEs) in your market area, or DBEs in your market area that are in other recipients' Directories but not yours, you can supplement your Directory data with this information. *Doing so may provide a more complete picture of the availability of firms to work on your contracts than the data in your Directory alone.*"³⁴

Many approaches to estimating availability suffer from internal inconsistency since the data employed to construct the availability numerator (*i.e.*, the total number of DBE establishments in the market area) are measured differently than the data employed to construct the availability denominator (*i.e.*, the total number of establishments in the market area). For example, the numerator might be drawn from an agency's internal list of certified DBEs while the denominator might be drawn from Census data. Since the methods used to identify and certify firms as DBEs are different from the methods used by the Census Bureau to count business establishments, such approaches inevitably compare "apples to oranges."

In this Study, we measure availability using an approach that ensures an "apples to apples" comparison between the availability numerator and denominator. This "Custom Census" method was pioneered by NERA and has been favorably reviewed by each court that has examined it to date. The Tenth Circuit found the custom census approach to be "a more sophisticated method to calculate availability than the earlier studies [by the other consultant in this case]."³⁵ Likewise, this method was successful in the defense of the DBE programs for Minnesota DOT³⁶ and Illinois DOT,³⁷ the DBE construction program for the City of Chicago,³⁸ and, most recently, in the successful defense of a DBE program challenge to U.S. DOT, the Illinois DOT, and the Illinois State Toll Highway Authority.³⁹

³³ For ease of exposition, we shall use the term DBE throughout the remainder of the report.

³⁴ See <https://www.transportation.gov/osdbu/disadvantaged-business-enterprise/10-tips-dot-dbe-contract-recipients> (emphasis added). This information was released as official guidance by USDOT at 49 C.F.R. §26.9. See also Wainwright and Holt (2010), pp. 33-44.

³⁵ *Concrete Works of Colorado, Inc. v. City and County of Denver*, 321 F.3d 950, 966 (10th Cir. 2003) ("*Concrete Works IV*"), *cert. denied*, 540 U.S. 1027 (2003).

³⁶ *Sherbrooke Turf, Inc. v. Minnesota Department of Transportation*, 345 F.3d 964 (8th Cir. 2003), *cert. denied*, 541 U.S. 1041 (2004).

³⁷ *Northern Contracting, Inc. v. Illinois Department of Transportation*, 473 F.3d 715 (7th Cir. 2007).

³⁸ *Builders Ass'n of Greater Chicago v. City of Chicago*, 298 F.Supp. 2d 725 (N.D. Ill. 2003).

³⁹ *Midwest Fence Corp. v. United States Department of Transportation, et al.*, 84 F.Supp. 3d 705 (N.D. Ill. 2015), *aff'd*, 2016 U.S App. LEXIS 19959 (7th Cir. November 4, 2016).

In addition to its favorable reception in the courts,⁴⁰ when properly executed, the Custom Census method is superior to other approaches for at least three reasons. First, as already mentioned, it provides an internally consistent and rigorous comparison between establishments in the availability numerator and those in the denominator. Second, it comports with the remedial nature of most DBE policies by measuring overall DBE availability in the relevant market area as opposed to only those businesses currently certified by an agency.⁴¹ Third, a properly executed Custom Census is less likely to be tainted by the effects of past and present discrimination than other methods.⁴²

The Custom Census method has seven steps. These are:

1. Create a database of representative and recent MDOT contracts in Construction, AE-CRS, Maintenance, IT, Services and CSE;
2. Identify MDOT's relevant geographic market from this database;
3. Identify MDOT's relevant product market from this database;
4. Count all business establishments in the relevant market area;
5. Identify listed DBE establishments in the relevant market area;
6. Verify the ownership status of listed DBEs; and
7. Verify the ownership status of all other firms in the relevant market area.

Steps 1-3 were described above in Chapter II. Steps 4-7 are described in more detail below.

B. Identifying Business Establishments in the Relevant Markets

DBE availability (unweighted) is defined as the number of DBEs divided by the total number of business establishments in MDOT's contracting market area—what we will refer to as the Baseline Business Universe.⁴³ Determining the total number of business establishments in the market area, however, is a less complex task than determining the number of minority- or women-owned establishments in those markets. The latter has three main parts: (1) identify all listed DBEs in the relevant market; (2) verify the ownership status of listed DBEs; and (3) estimate the number of unlisted DBEs in the relevant market. This section describes how these tasks were accomplished.

⁴⁰ See Wainwright and Holt (2010), pp. 30-44.

⁴¹ See *Northern Contracting*, 473 F.3d at 723 (“We agree with the district court that the remedial nature of the federal scheme militates in favor of a method of DBE availability calculation that casts a broader net.”).

⁴² See Section B.5., below, for further discussion of this point.

⁴³ To yield a percentage, the resulting figure is multiplied by 100.

It is important to note that NERA's availability analysis is free from variables tainted by discrimination. Our approach recognizes that discrimination may impact many of the variables that contribute to a firm's success in obtaining work as a prime or a subcontractor. Factors such as firm size, time in business, qualifications, and experience are all adversely affected by discrimination if it is present in the market area. Despite the obvious relationship, some commentators argue that disparities should only be assessed between firms with similar "capacities."⁴⁴

Several courts have properly refused to make the results of discrimination the benchmark for non-discrimination.⁴⁵ They have acknowledged that DBEs may be smaller, newer, and otherwise less competitive than non-DBEs *because of* the very discrimination sought to be remedied by race-conscious contracting programs. Racial and gender differences in these "capacity" factors are the *outcomes* of discrimination and it is therefore inappropriate as a matter of economics and statistics to use them as "control" variables in a disparity study.⁴⁶

1. Estimate the Total Number of Business Establishments in the Market

We used data supplied by Dun & Bradstreet to determine the total number of business establishments operating in the relevant geographic and product markets (these markets were discussed in the previous chapter). Dun & Bradstreet produces the most comprehensive publicly available database of business establishments in the U.S. This database contains over 17 million U.S. records and is updated continuously. Each record in Dun & Bradstreet represents a business establishment and includes the business name, address, telephone number, NAICS code, SIC code, business type, DUNS Number (a unique number assigned to each establishment by Dun & Bradstreet), and other descriptive information. Dun & Bradstreet gathers and verifies information from many different sources. These sources include, among others, annual management interviews, payment experiences, bank account information, filings for suits, liens, judgments and bankruptcies, news items, the U.S. Postal Service, utility and telephone service, business registrations, corporate charters, Uniform Commercial Code filings, and records of the Small Business Administration and other governmental agencies.

⁴⁴ See, e.g., La Noue (2006). Most of La Noue's expert report in *Gross Seed Company v. Nebraska Department of Roads*, No. 02-3016 (D. Neb. 2002), including his views on "capacity," was rejected by the court on the basis that it was legal opinion and not expert analysis. According to the court, "[legal analysis] is an issue solely for the Court and not for the presentation of expert testimony...." (see Defendants-Appellees' Brief, *Gross Seed Company v. Nebraska Department of Roads*, on appeal to the Eighth Circuit Court of Appeals).

⁴⁵ *North Shore Concrete and Assoc., Inc. v. City of New York*, No. 94-CV-4017, 1998 WL 273027 at *24-31 (E.D.N.Y. April 12, 1998) (firm size not a proper measure of capacity); *Concrete Works of Colorado, Inc. v. City and County of Denver, et al.*, 321 F.3d 950, 981, 983 (10th Cir. 2003), *cert. denied*, 540 U.S. 1027 (2003) ("MWBE construction firms are generally smaller and less experienced *because of* discrimination.... Additionally, we do not read *Croson* to require disparity studies that measure whether construction firms are able to perform a *particular contract*." (emphasis in the originals)). See also *Northern Contracting, Inc. v. State of Illinois, et al.*, 473 F.3d 715, 723 (7th Cir. 2007) ("We agree with the district court that the remedial nature of the federal scheme militates in favor of a method of DBE availability calculation that casts a broader net [than a simple count of the number of registered and prequalified DBEs]").

⁴⁶ *Concrete Works*, 321 F.3d at 981 (emphasis in the original). See also Wainwright and Holt (2010), Appendix B "Understanding Capacity," and Section B.5, below.

We used the Dun & Bradstreet database to identify the total number of businesses in each NAICS code that was identified as part of MDOT's product market. Table 3.1 shows the number of businesses identified in each NAICS Industry Group within the Construction category, along with the associated industry weight according to dollars awarded. Comparable data for AE-CRS, Maintenance, IT, Services and CSE appear in Tables 3.2 through 3.6.⁴⁷

Although numerous industries are represented in the MDOT Baseline Business Universe, contracting and subcontracting opportunities are not distributed evenly among them. Indeed, the distribution of contract expenditures is quite skewed, as documented above in Chapter II.⁴⁸

Table 3.1. Construction—Number of Establishments and Industry Weight, by NAICS Code

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	819	45.79	45.79
2382	Building Equipment Contractors	9,358	9.42	55.21
2381	Foundation, Structure, and Building Exterior Contractors	2,816	8.22	63.42
2362	Nonresidential Building Construction	2,462	5.43	68.86
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	4.91	73.77
2389	Other Specialty Trade Contractors	5,579	4.03	77.80
4842	Specialized Freight Trucking	255	3.10	80.90
2383	Building Finishing Contractors	5,051	2.29	83.19
2379	Other Heavy and Civil Engineering Construction	230	1.83	85.01
4233	Lumber and Other Construction Materials Merchant Wholesalers	946	1.52	86.54
2371	Utility System Construction	424	1.23	87.77
3351	Electric Lighting Equipment Manufacturing	57	1.16	88.93
5413	Architectural, Engineering, and Related Services	5,993	1.10	90.03
5617	Services to Buildings and Dwellings	7,805	1.08	91.11
3323	Architectural and Structural Metals Manufacturing	235	0.91	92.02
3273	Cement and Concrete Product Manufacturing	216	0.90	92.93
5616	Investigation and Security Services	1,632	0.89	93.82
5619	Other Support Services	66,060	0.76	94.58
4889	Other Support Activities for Transportation	2,373	0.58	95.17
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	209	0.56	95.72
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	855	0.45	96.18
3359	Other Electrical Equipment and Component Manufacturing	195	0.39	96.57

⁴⁷ The industry weights in Tables 3.1 through 3.12 differ slightly from those that appear above in Tables 2.5 through 2.10, because the weights used in Chapter III through the end of the report are based on those industries that account for 99 percent of award and paid dollars, whereas the industry weights in Chapter II are based on 100 percent of award and paid dollars.

⁴⁸ Analogous sets of weights using paid dollars were also produced. They are similar and not published here due to space considerations.

DBE Availability in MDOT's Market Area

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	0.33	96.91
2123	Nonmetallic Mineral Mining and Quarrying	14	0.31	97.21
4539	Other Miscellaneous Store Retailers	3,412	0.24	97.45
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	5	0.21	97.66
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	986	0.18	97.84
4821	Rail Transportation	38	0.17	98.01
4442	Lawn and Garden Equipment and Supplies Stores	320	0.16	98.17
3399	Other Miscellaneous Manufacturing	482	0.15	98.32
5613	Employment Services	820	0.15	98.46
3342	Communications Equipment Manufacturing	76	0.14	98.61
4884	Support Activities for Road Transportation	181	0.14	98.74
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.13	98.88
4543	Direct Selling Establishments	249	0.12	99.00
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	14	0.11	99.11
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	31	0.11	99.22
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	471	0.10	99.31
5629	Remediation and Other Waste Management Services	87	0.10	99.41
3339	Other General Purpose Machinery Manufacturing	9	0.09	99.50
3311	Iron and Steel Mills and Ferroalloy Manufacturing	34	0.09	99.58
5415	Computer Systems Design and Related Services	15,405	0.07	99.65
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	195	0.04	99.69
3255	Paint, Coating, and Adhesive Manufacturing	43	0.04	99.74
3241	Petroleum and Coal Products Manufacturing	47	0.04	99.78
5622	Waste Treatment and Disposal	103	0.04	99.81
3333	Commercial and Service Industry Machinery Manufacturing	106	0.03	99.85
3279	Other Nonmetallic Mineral Product Manufacturing	67	0.03	99.88
3353	Electrical Equipment Manufacturing	15	0.03	99.91
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	487	0.03	99.94
3221	Pulp, Paper, and Paperboard Mills	11	0.03	99.97
5416	Management, Scientific, and Technical Consulting Services	700	0.03	100.00

Sources: Dun & Bradstreet; DBE business directory information compiled by NERA. Notes: (1) The dollar-based industry weight and cumulative industry weight are expressed as percentages; (2) Cumulative percentages do not always sum to 100 because a very small number of NAICS codes identified as being in the study universe were not associated with establishments that had a presence in the market area.

Table 3.2. AE-CRS—Number of Establishments and Industry Weight, by NAICS Code

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	10,060	87.27	87.27
2379	Other Heavy and Civil Engineering Construction	230	5.28	92.55
5416	Management, Scientific, and Technical Consulting Services	37,237	3.88	96.43
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	61	0.72	97.15
5619	Other Support Services	66,060	0.59	97.74
6242	Community Food and Housing, and Emergency and Other Relief Services	11	0.57	98.31
5418	Advertising, Public Relations, and Related Services	653	0.46	98.77
5417	Scientific Research and Development Services	1,421	0.40	99.17
2373	Highway, Street, and Bridge Construction	819	0.32	99.49
5415	Computer Systems Design and Related Services	8,755	0.26	99.75
5613	Employment Services	820	0.25	100.00

Source and Notes: *See* Table 3.1.

Table 3.3. Maintenance—Number of Establishments and Industry Weight, by NAICS Code

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3365	Railroad Rolling Stock Manufacturing	13	38.75	38.75
2382	Building Equipment Contractors	9,358	8.07	46.82
2373	Highway, Street, and Bridge Construction	819	7.22	54.04
5616	Investigation and Security Services	1,632	5.22	59.25
2389	Other Specialty Trade Contractors	5,579	4.03	63.28
4852	Interurban and Rural Bus Transportation	32	3.43	66.72
5617	Services to Buildings and Dwellings	8,656	3.11	69.83
4884	Support Activities for Road Transportation	181	2.80	72.63
4882	Support Activities for Rail Transportation	311	2.32	74.95
2379	Other Heavy and Civil Engineering Construction	230	2.07	77.02
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	849	2.02	79.04
5612	Facilities Support Services	333	1.90	80.94
5413	Architectural, Engineering, and Related Services	5,696	1.76	82.70
4851	Urban Transit Systems	44	1.76	84.46
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	195	1.72	86.18
2362	Nonresidential Building Construction	2,462	1.55	87.73
2381	Foundation, Structure, and Building Exterior Contractors	1,702	1.14	88.87
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	710	1.05	89.92
3342	Communications Equipment Manufacturing	271	0.85	90.78
4543	Direct Selling Establishments	249	0.70	91.48
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	858	0.70	92.18
4411	Automobile Dealers	1,352	0.66	92.85
3363	Motor Vehicle Parts Manufacturing	43	0.59	93.44
7211	Traveler Accommodation	2,275	0.49	93.93
5621	Waste Collection	77	0.48	94.41
4842	Specialized Freight Trucking	255	0.46	94.86
5613	Employment Services	2,016	0.41	95.28
4233	Lumber and Other Construction Materials Merchant Wholesalers	869	0.41	95.68
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,015	0.37	96.05
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.35	96.40
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	600	0.34	96.74
5416	Management, Scientific, and Technical Consulting Services	700	0.28	97.02
3323	Architectural and Structural Metals Manufacturing	206	0.27	97.29
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	209	0.24	97.54
4442	Lawn and Garden Equipment and Supplies Stores	320	0.24	97.78
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	199	0.23	98.01

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NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4246	Chemical and Allied Products Merchant Wholesalers	201	0.23	98.24
2371	Utility System Construction	341	0.21	98.45
8111	Automotive Repair and Maintenance	1,984	0.19	98.64
5415	Computer Systems Design and Related Services	15,405	0.19	98.83
3351	Electric Lighting Equipment Manufacturing	29	0.13	98.95
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	986	0.12	99.07
3364	Aerospace Product and Parts Manufacturing	46	0.10	99.17
4441	Building Material and Supplies Dealers	362	0.09	99.26
4881	Support Activities for Air Transportation	79	0.09	99.35
5622	Waste Treatment and Disposal	103	0.09	99.45
4821	Rail Transportation	38	0.08	99.53
4885	Freight Transportation Arrangement	648	0.07	99.60
3273	Cement and Concrete Product Manufacturing	79	0.07	99.67
5629	Remediation and Other Waste Management Services	22	0.06	99.73
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	53	0.06	99.79
2211	Electric Power Generation, Transmission and Distribution	311	0.05	99.85
5222	Nondepository Credit Intermediation	79	0.04	99.89
4859	Other Transit and Ground Passenger Transportation	290	0.04	99.93
5313	Activities Related to Real Estate	3,606	0.04	99.96
2383	Building Finishing Contractors	3,118	0.04	100.00

Source and Notes: See Table 3.1.

Table 3.4. IT—Number of Establishments and Industry Weight, by NAICS Code

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	15,862	55.29	55.29
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	369	9.00	64.29
5413	Architectural, Engineering, and Related Services	7,060	8.02	72.31
5112	Software Publishers	1,145	7.72	80.03
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	600	6.99	87.01
3342	Communications Equipment Manufacturing	195	5.77	92.79
5613	Employment Services	2,016	1.88	94.67
3231	Printing and Related Support Activities	1,359	1.49	96.15
5416	Management, Scientific, and Technical Consulting Services	15,853	1.16	97.32
2382	Building Equipment Contractors	3,845	0.98	98.29
2379	Other Heavy and Civil Engineering Construction	230	0.28	98.57
3351	Electric Lighting Equipment Manufacturing	29	0.21	98.78
5172	Wireless Telecommunications Carriers (except Satellite)	668	0.21	98.99
3341	Computer and Peripheral Equipment Manufacturing	141	0.17	99.16
5182	Data Processing, Hosting, and Related Services	1,171	0.16	99.32
4431	Electronics and Appliance Stores	2,498	0.15	99.47
3399	Other Miscellaneous Manufacturing	482	0.14	99.61
2389	Other Specialty Trade Contractors	4,623	0.13	99.74
2371	Utility System Construction	83	0.13	99.87
8112	Electronic and Precision Equipment Repair and Maintenance	631	0.13	100.00

Source and Notes: See Table 3.1.

Table 3.5. Services—Number of Establishments and Industry Weight, by NAICS Code

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4851	Urban Transit Systems	44	25.32	25.32
4821	Rail Transportation	38	20.21	45.52
4859	Other Transit and Ground Passenger Transportation	290	17.92	63.45
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	4.13	67.58
4853	Taxi and Limousine Service	1,031	3.12	70.70
4543	Direct Selling Establishments	249	2.72	73.42
5413	Architectural, Engineering, and Related Services	7,060	2.47	75.88
3365	Railroad Rolling Stock Manufacturing	13	2.37	78.26
5415	Computer Systems Design and Related Services	15,862	2.17	80.43
5418	Advertising, Public Relations, and Related Services	850	1.95	82.37
5416	Management, Scientific, and Technical Consulting Services	40,088	1.79	84.17
5615	Travel Arrangement and Reservation Services	110	1.55	85.72
5613	Employment Services	2,016	1.30	87.02
5242	Agencies, Brokerages, and Other Insurance Related Activities	4,793	1.24	88.27
4855	Charter Bus Industry	104	1.08	89.35
2382	Building Equipment Contractors	9,283	1.04	90.39
4852	Interurban and Rural Bus Transportation	32	0.95	91.35
5241	Insurance Carriers	173	0.93	92.28
2211	Electric Power Generation, Transmission and Distribution	311	0.92	93.20
5419	Other Professional, Scientific, and Technical Services	16,085	0.86	94.07
5617	Services to Buildings and Dwellings	7,805	0.71	94.77
5172	Wireless Telecommunications Carriers (except Satellite)	668	0.61	95.38
8111	Automotive Repair and Maintenance	4,708	0.53	95.91
5619	Other Support Services	66,060	0.48	96.39
3342	Communications Equipment Manufacturing	195	0.45	96.85
5221	Depository Credit Intermediation	2,759	0.41	97.26
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	559	0.37	97.63
5313	Activities Related to Real Estate	3,606	0.22	97.85
2379	Other Heavy and Civil Engineering Construction	230	0.16	98.01
4461	Health and Personal Care Stores	1,714	0.15	98.17
4411	Automobile Dealers	1,352	0.14	98.31
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	849	0.13	98.43
2373	Highway, Street, and Bridge Construction	819	0.12	98.56
8139	Business, Professional, Labor, Political, and Similar Organizations	667	0.11	98.67
5311	Lessors of Real Estate	798	0.11	98.78
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,181	0.11	98.89
2212	Natural Gas Distribution	71	0.11	99.01
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	309	0.11	99.11
2371	Utility System Construction	424	0.09	99.20

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NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4413	Automotive Parts, Accessories, and Tire Stores	1,437	0.09	99.30
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	52	0.09	99.38
2362	Nonresidential Building Construction	2,462	0.08	99.47
6216	Home Health Care Services	1,253	0.06	99.53
4884	Support Activities for Road Transportation	1,051	0.05	99.57
3231	Printing and Related Support Activities	1,359	0.04	99.62
5182	Data Processing, Hosting, and Related Services	1,171	0.04	99.66
5179	Other Telecommunications	542	0.04	99.70
2381	Foundation, Structure, and Building Exterior Contractors	175	0.04	99.73
2389	Other Specialty Trade Contractors	956	0.04	99.77
3351	Electric Lighting Equipment Manufacturing	29	0.03	99.80
3363	Motor Vehicle Parts Manufacturing	43	0.03	99.83
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	139	0.03	99.86
5616	Investigation and Security Services	801	0.03	99.88
3262	Rubber Product Manufacturing	11	0.03	99.91
5611	Office Administrative Services	5,740	0.03	99.94

Source and Notes: *See* Table 3.1. Cumulative industry weight does not sum exactly to 100 due to a small amount of spending with public sector subcontractors in the Services category that were not individually categorized by NAICS code.

Table 3.6. CSE—Number of Establishments and Industry Weight, by NAICS Code

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3361	Motor Vehicle Manufacturing	36	41.13	41.13
3342	Communications Equipment Manufacturing	271	8.02	49.15
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	2,097	5.80	54.94
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	710	5.78	60.72
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	4.42	65.14
5415	Computer Systems Design and Related Services	15,862	3.07	68.21
2382	Building Equipment Contractors	9,358	2.75	70.96
3259	Other Chemical Product and Preparation Manufacturing	73	2.43	73.39
3365	Railroad Rolling Stock Manufacturing	13	2.15	75.54
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	849	2.09	77.62
2212	Natural Gas Distribution	71	1.33	78.95
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1,285	1.27	80.23
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	12	1.27	81.50
5112	Software Publishers	1,145	1.05	82.55
8111	Automotive Repair and Maintenance	5,556	0.95	83.50
3331	Agriculture, Construction, and Mining Machinery Manufacturing	58	0.91	84.40
3273	Cement and Concrete Product Manufacturing	168	0.89	85.29
5413	Architectural, Engineering, and Related Services	7,060	0.83	86.12
4233	Lumber and Other Construction Materials Merchant Wholesalers	869	0.81	86.93
5172	Wireless Telecommunications Carriers (except Satellite)	668	0.75	87.68
3399	Other Miscellaneous Manufacturing	482	0.74	88.41
3353	Electrical Equipment Manufacturing	70	0.69	89.10
3351	Electric Lighting Equipment Manufacturing	57	0.67	89.77
4411	Automobile Dealers	1,352	0.67	90.44
3323	Architectural and Structural Metals Manufacturing	206	0.54	90.98
3363	Motor Vehicle Parts Manufacturing	51	0.53	91.52
2123	Nonmetallic Mineral Mining and Quarrying	24	0.45	91.97
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	199	0.44	92.41
4882	Support Activities for Rail Transportation	311	0.41	92.81
2373	Highway, Street, and Bridge Construction	819	0.39	93.20
3261	Plastics Product Manufacturing	138	0.36	93.57
3231	Printing and Related Support Activities	1,359	0.34	93.91
4413	Automotive Parts, Accessories, and Tire Stores	836	0.33	94.24
4859	Other Transit and Ground Passenger Transportation	290	0.30	94.54
5616	Investigation and Security Services	1,632	0.29	94.82
3359	Other Electrical Equipment and Component Manufacturing	5	0.28	95.10
4441	Building Material and Supplies Dealers	362	0.27	95.38
4246	Chemical and Allied Products Merchant Wholesalers	201	0.27	95.64
5321	Automotive Equipment Rental and Leasing	479	0.26	95.90

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NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3329	Other Fabricated Metal Product Manufacturing	67	0.25	96.16
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	79	0.25	96.41
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.24	96.65
6213	Offices of Other Health Practitioners	1,206	0.23	96.87
3311	Iron and Steel Mills and Ferroalloy Manufacturing	34	0.20	97.07
4889	Other Support Activities for Transportation	2,373	0.20	97.27
4481	Clothing Stores	886	0.18	97.45
5111	Newspaper, Periodical, Book, and Directory Publishers	257	0.16	97.62
3241	Petroleum and Coal Products Manufacturing	64	0.16	97.78
5171	Wired Telecommunications Carriers	615	0.14	97.91
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	52	0.13	98.04
5617	Services to Buildings and Dwellings	4,050	0.13	98.17
3333	Commercial and Service Industry Machinery Manufacturing	106	0.12	98.30
3272	Glass and Glass Product Manufacturing	47	0.12	98.42
4884	Support Activities for Road Transportation	181	0.12	98.53
2362	Nonresidential Building Construction	2,462	0.11	98.65
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,781	0.11	98.76
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	218	0.10	98.86
5612	Facilities Support Services	333	0.09	98.95
3339	Other General Purpose Machinery Manufacturing	15	0.08	99.03
3335	Metalworking Machinery Manufacturing	33	0.07	99.10
4241	Paper and Paper Product Merchant Wholesalers	102	0.07	99.17
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	986	0.07	99.24
2389	Other Specialty Trade Contractors	4,623	0.06	99.30
3344	Semiconductor and Other Electronic Component Manufacturing	84	0.06	99.36
5179	Other Telecommunications	542	0.05	99.41
2379	Other Heavy and Civil Engineering Construction	230	0.05	99.45
3341	Computer and Peripheral Equipment Manufacturing	102	0.05	99.50
6219	Other Ambulatory Health Care Services	117	0.05	99.55
3321	Forging and Stamping	18	0.05	99.59
4851	Urban Transit Systems	44	0.04	99.64
5418	Advertising, Public Relations, and Related Services	653	0.04	99.68
4921	Couriers and Express Delivery Services	211	0.04	99.72
2383	Building Finishing Contractors	584	0.04	99.75
3262	Rubber Product Manufacturing	2	0.04	99.79
7139	Other Amusement and Recreation Industries	557	0.03	99.82
5221	Depository Credit Intermediation	2,759	0.03	99.85
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	2,331	0.03	99.88
4232	Furniture and Home Furnishing Merchant Wholesalers	431	0.03	99.91
2381	Foundation, Structure, and Building Exterior Contractors	862	0.03	99.94
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	209	0.03	99.97

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3328	Coating, Engraving, Heat Treating, and Allied Activities	41	0.03	100.00

Source and Notes: See Table 3.1.

2. Identify Listed DBEs

While extensive, Dun & Bradstreet does not sufficiently identify all businesses owned by minorities or women. Although many such businesses *are* correctly identified in Dun & Bradstreet, experience has demonstrated that many are also missed. For this reason, several additional steps were required to identify the appropriate percentage of DBEs in the relevant market.

First, NERA completed an intensive regional search for information on minority-owned and woman-owned businesses in the MDOT market area. Beyond the information already in Dun & Bradstreet, NERA's master directory included lists of DBEs from other public and private entities. Specifically, directories were included from: MDOT, Anne Arundel County, Charles County, City of Baltimore, Coppin State University, Delaware Department of Transportation, Diversity Information Resources, DiversityBusiness.com, Howard County, Montgomery County, Prince George County Public Schools, Small Business Administration, U.S. Department of Commerce Minority Business Development Agency, and the West Virginia Department of Transportation.⁴⁹

Tables 3.7 through 3.12 show the listed DBEs in Construction, AE-CRS, Maintenance, IT, Services and CSE, respectively. If the listed DBEs identified in Tables 3.7 through 3.12 are in fact *all* DBEs and are the *only* DBEs among all of the establishments in the relevant market identified in Tables 3.1 through 3.6, then an estimate of "listed" DBE availability is simply the number of listed DBEs divided by the total number of establishments in the relevant market. However, as we shall see below, neither of these two conditions holds true in practice and this is therefore *not* an appropriate method for measuring DBE availability.

There are two reasons for this. First, it is likely that some proportion of the DBEs listed in the tables is not actually minority-owned or women-owned. Second, it is likely that there are additional "unlisted" DBEs among all of the establishments included in Tables 3.1 through 3.6. Such businesses do not appear in any of the directories we gathered and are therefore not included as DBEs in these tables. Additional steps are required to test these two conditions and to arrive at a more accurate representation of DBE availability within the Baseline Business Universe. We discuss these steps below in Sections 3.a and 3.b.

⁴⁹ We also obtained information from certain entities that was duplicative of either Dun & Bradstreet or one or more of the other sources listed above. These entities are listed below in Appendix C. We were unable to obtain relevant lists or directories from a number of entities. The reasons for this include: (1) the entity did not have a list or the entity's list did not include race and sex information; (2) the entity was unresponsive to repeated attempts at contacts; or, (3) the entity simply declined to provide us the list. These entities, as well, are listed in Appendix C.

Table 3.7. Construction—Number of Listed DBE Establishments and Industry Weight (Dollars Awarded), by NAICS Code

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	164	45.79	45.79
2382	Building Equipment Contractors	1,003	9.42	55.21
2381	Foundation, Structure, and Building Exterior Contractors	395	8.22	63.42
2362	Nonresidential Building Construction	766	5.43	68.86
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	4.91	73.77
2389	Other Specialty Trade Contractors	516	4.03	77.80
4842	Specialized Freight Trucking	67	3.10	80.90
2383	Building Finishing Contractors	546	2.29	83.19
2379	Other Heavy and Civil Engineering Construction	41	1.83	85.01
4233	Lumber and Other Construction Materials Merchant Wholesalers	95	1.52	86.54
2371	Utility System Construction	85	1.23	87.77
3351	Electric Lighting Equipment Manufacturing	19	1.16	88.93
5413	Architectural, Engineering, and Related Services	1,387	1.10	90.03
5617	Services to Buildings and Dwellings	1,575	1.08	91.11
3323	Architectural and Structural Metals Manufacturing	36	0.91	92.02
3273	Cement and Concrete Product Manufacturing	15	0.90	92.93
5616	Investigation and Security Services	406	0.89	93.82
5619	Other Support Services	3,242	0.76	94.58
4889	Other Support Activities for Transportation	119	0.58	95.17
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	0.56	95.72
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	97	0.45	96.18
3359	Other Electrical Equipment and Component Manufacturing	29	0.39	96.57
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.33	96.91
2123	Nonmetallic Mineral Mining and Quarrying	1	0.31	97.21
4539	Other Miscellaneous Store Retailers	382	0.24	97.45
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1	0.21	97.66
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	64	0.18	97.84
4821	Rail Transportation	1	0.17	98.01
4442	Lawn and Garden Equipment and Supplies Stores	40	0.16	98.17
3399	Other Miscellaneous Manufacturing	104	0.15	98.32
5613	Employment Services	209	0.15	98.46
3342	Communications Equipment Manufacturing	16	0.14	98.61
4884	Support Activities for Road Transportation	27	0.14	98.74
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.13	98.88
4543	Direct Selling Establishments	22	0.12	99.00
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	4	0.11	99.11

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	2	0.11	99.22
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	35	0.10	99.31
5629	Remediation and Other Waste Management Services	30	0.10	99.41
3339	Other General Purpose Machinery Manufacturing	1	0.09	99.50
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	0.09	99.58
5415	Computer Systems Design and Related Services	5,875	0.07	99.65
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	28	0.04	99.69
3255	Paint, Coating, and Adhesive Manufacturing	9	0.04	99.74
3241	Petroleum and Coal Products Manufacturing	7	0.04	99.78
5622	Waste Treatment and Disposal	21	0.04	99.81
3333	Commercial and Service Industry Machinery Manufacturing	20	0.03	99.85
3279	Other Nonmetallic Mineral Product Manufacturing	11	0.03	99.88
3353	Electrical Equipment Manufacturing	3	0.03	99.91
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	30	0.03	99.94
3221	Pulp, Paper, and Paperboard Mills	1	0.03	99.97
5416	Management, Scientific, and Technical Consulting Services	188	0.03	100.00

Source and Notes: See Table 3.1.

Table 3.8. AE-CRS—Number of Listed DBE Establishments and Industry Weight (Dollars Awarded), by NAICS Code

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	1,925	87.27	87.27
2379	Other Heavy and Civil Engineering Construction	41	5.28	92.55
5416	Management, Scientific, and Technical Consulting Services	9,733	3.88	96.43
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	14	0.72	97.15
5619	Other Support Services	3,242	0.59	97.74
6242	Community Food and Housing, and Emergency and Other Relief Services	1	0.57	98.31
5418	Advertising, Public Relations, and Related Services	160	0.46	98.77
5417	Scientific Research and Development Services	269	0.40	99.17
2373	Highway, Street, and Bridge Construction	164	0.32	99.49
5415	Computer Systems Design and Related Services	3,661	0.26	99.75
5613	Employment Services	209	0.25	100.00

Source and Notes: See Table 3.1.

Table 3.9. Maintenance—Number of Listed DBE Establishments and Industry Weight (Dollars Awarded), by NAICS Code

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3365	Railroad Rolling Stock Manufacturing	2	38.75	38.75
2382	Building Equipment Contractors	1,003	8.07	46.82
2373	Highway, Street, and Bridge Construction	164	7.22	54.04
5616	Investigation and Security Services	406	5.22	59.25
2389	Other Specialty Trade Contractors	516	4.03	63.28
4852	Interurban and Rural Bus Transportation	5	3.43	66.72
5617	Services to Buildings and Dwellings	1,651	3.11	69.83
4884	Support Activities for Road Transportation	27	2.80	72.63
4882	Support Activities for Rail Transportation	37	2.32	74.95
2379	Other Heavy and Civil Engineering Construction	41	2.07	77.02
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	120	2.02	79.04
5612	Facilities Support Services	145	1.90	80.94
5413	Architectural, Engineering, and Related Services	1,350	1.76	82.70
4851	Urban Transit Systems	16	1.76	84.46
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	28	1.72	86.18
2362	Nonresidential Building Construction	766	1.55	87.73
2381	Foundation, Structure, and Building Exterior Contractors	248	1.14	88.87
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	43	1.05	89.92
3342	Communications Equipment Manufacturing	44	0.85	90.78
4543	Direct Selling Establishments	22	0.70	91.48
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	40	0.70	92.18
4411	Automobile Dealers	51	0.66	92.85
3363	Motor Vehicle Parts Manufacturing	3	0.59	93.44
7211	Traveler Accommodation	183	0.49	93.93
5621	Waste Collection	20	0.48	94.41
4842	Specialized Freight Trucking	67	0.46	94.86
5613	Employment Services	613	0.41	95.28
4233	Lumber and Other Construction Materials Merchant Wholesalers	88	0.41	95.68
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	112	0.37	96.05
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.35	96.40
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	179	0.34	96.74
5416	Management, Scientific, and Technical Consulting Services	188	0.28	97.02
3323	Architectural and Structural Metals Manufacturing	35	0.27	97.29
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	0.24	97.54
4442	Lawn and Garden Equipment and Supplies Stores	40	0.24	97.78

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	16	0.23	98.01
4246	Chemical and Allied Products Merchant Wholesalers	43	0.23	98.24
2371	Utility System Construction	55	0.21	98.45
8111	Automotive Repair and Maintenance	174	0.19	98.64
5415	Computer Systems Design and Related Services	5,875	0.19	98.83
3351	Electric Lighting Equipment Manufacturing	7	0.13	98.95
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	64	0.12	99.07
3364	Aerospace Product and Parts Manufacturing	8	0.10	99.17
4441	Building Material and Supplies Dealers	20	0.09	99.26
4881	Support Activities for Air Transportation	21	0.09	99.35
5622	Waste Treatment and Disposal	21	0.09	99.45
4821	Rail Transportation	1	0.08	99.53
4885	Freight Transportation Arrangement	141	0.07	99.60
3273	Cement and Concrete Product Manufacturing	2	0.07	99.67
5629	Remediation and Other Waste Management Services	8	0.06	99.73
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	10	0.06	99.79
2211	Electric Power Generation, Transmission and Distribution	27	0.05	99.85
5222	Nondepository Credit Intermediation	9	0.04	99.89
4859	Other Transit and Ground Passenger Transportation	109	0.04	99.93
5313	Activities Related to Real Estate	120	0.04	99.96
2383	Building Finishing Contractors	328	0.04	100.00
3365	Railroad Rolling Stock Manufacturing	2	38.75	38.75
2382	Building Equipment Contractors	1,003	8.07	46.82
2373	Highway, Street, and Bridge Construction	164	7.22	54.04

Source and Notes: See Table 3.1.

Table 3.10. IT—Number of Listed DBE Establishments and Industry Weight (Dollars Awarded), by NAICS Code

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	6,087	55.29	55.29
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	55	9.00	64.29
5413	Architectural, Engineering, and Related Services	1,623	8.02	72.31
5112	Software Publishers	195	7.72	80.03
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	179	6.99	87.01
3342	Communications Equipment Manufacturing	28	5.77	92.79
5613	Employment Services	613	1.88	94.67
3231	Printing and Related Support Activities	265	1.49	96.15
5416	Management, Scientific, and Technical Consulting Services	5,413	1.16	97.32
2382	Building Equipment Contractors	544	0.98	98.29
2379	Other Heavy and Civil Engineering Construction	41	0.28	98.57
3351	Electric Lighting Equipment Manufacturing	7	0.21	98.78
5172	Wireless Telecommunications Carriers (except Satellite)	39	0.21	98.99
3341	Computer and Peripheral Equipment Manufacturing	35	0.17	99.16
5182	Data Processing, Hosting, and Related Services	357	0.16	99.32
4431	Electronics and Appliance Stores	265	0.15	99.47
3399	Other Miscellaneous Manufacturing	104	0.14	99.61
2389	Other Specialty Trade Contractors	391	0.13	99.74
2371	Utility System Construction	30	0.13	99.87
8112	Electronic and Precision Equipment Repair and Maintenance	167	0.13	100.00

Source and Notes: See Table 3.1.

Table 3.11. Services—Number of Listed DBE Establishments and Industry Weight (Dollars Awarded), by NAICS Code

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
4851	Urban Transit Systems	16	25.32	25.32
4821	Rail Transportation	1	20.21	45.52
4859	Other Transit and Ground Passenger Transportation	109	17.92	63.45
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	4.13	67.58
4853	Taxi and Limousine Service	109	3.12	70.70
4543	Direct Selling Establishments	22	2.72	73.42
5413	Architectural, Engineering, and Related Services	1,623	2.47	75.88
3365	Railroad Rolling Stock Manufacturing	2	2.37	78.26
5415	Computer Systems Design and Related Services	6,087	2.17	80.43
5418	Advertising, Public Relations, and Related Services	208	1.95	82.37
5416	Management, Scientific, and Technical Consulting Services	10,630	1.79	84.17
5615	Travel Arrangement and Reservation Services	17	1.55	85.72
5613	Employment Services	613	1.30	87.02
5242	Agencies, Brokerages, and Other Insurance Related Activities	425	1.24	88.27
4855	Charter Bus Industry	35	1.08	89.35
2382	Building Equipment Contractors	984	1.04	90.39
4852	Interurban and Rural Bus Transportation	5	0.95	91.35
5241	Insurance Carriers	15	0.93	92.28
2211	Electric Power Generation, Transmission and Distribution	27	0.92	93.20
5419	Other Professional, Scientific, and Technical Services	2,585	0.86	94.07
5617	Services to Buildings and Dwellings	1,575	0.71	94.77
5172	Wireless Telecommunications Carriers (except Satellite)	39	0.61	95.38
8111	Automotive Repair and Maintenance	225	0.53	95.91
5619	Other Support Services	3,242	0.48	96.39
3342	Communications Equipment Manufacturing	28	0.45	96.85
5221	Depository Credit Intermediation	29	0.41	97.26
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	39	0.37	97.63
5313	Activities Related to Real Estate	120	0.22	97.85
2379	Other Heavy and Civil Engineering Construction	41	0.16	98.01
4461	Health and Personal Care Stores	47	0.15	98.17
4411	Automobile Dealers	51	0.14	98.31
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	120	0.13	98.43
2373	Highway, Street, and Bridge Construction	164	0.12	98.56
8139	Business, Professional, Labor, Political, and Similar Organizations	2	0.11	98.67
5311	Lessors of Real Estate	34	0.11	98.78
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	138	0.11	98.89
2212	Natural Gas Distribution	5	0.11	99.01

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	32	0.11	99.11
2371	Utility System Construction	85	0.09	99.20
4413	Automotive Parts, Accessories, and Tire Stores	50	0.09	99.30
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	9	0.09	99.38
2362	Nonresidential Building Construction	766	0.08	99.47
6216	Home Health Care Services	266	0.06	99.53
4884	Support Activities for Road Transportation	61	0.05	99.57
3231	Printing and Related Support Activities	265	0.04	99.62
5182	Data Processing, Hosting, and Related Services	357	0.04	99.66
5179	Other Telecommunications	66	0.04	99.70
2381	Foundation, Structure, and Building Exterior Contractors	38	0.04	99.73
2389	Other Specialty Trade Contractors	125	0.04	99.77
3351	Electric Lighting Equipment Manufacturing	7	0.03	99.80
3363	Motor Vehicle Parts Manufacturing	3	0.03	99.83
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	12	0.03	99.86
5616	Investigation and Security Services	225	0.03	99.88
3262	Rubber Product Manufacturing	0	0.03	99.91
5611	Office Administrative Services	939	0.03	99.94

Source and Notes: See Table 3.1.

Table 3.12. CSE—Number of Listed DBE Establishments and Industry Weight (Dollars Awarded), by NAICS Code

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3361	Motor Vehicle Manufacturing	3	41.13	41.13
3342	Communications Equipment Manufacturing	44	8.02	49.15
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	261	5.80	54.94
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	43	5.78	60.72
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	4.42	65.14
5415	Computer Systems Design and Related Services	6,087	3.07	68.21
2382	Building Equipment Contractors	1,003	2.75	70.96
3259	Other Chemical Product and Preparation Manufacturing	12	2.43	73.39
3365	Railroad Rolling Stock Manufacturing	2	2.15	75.54
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	120	2.09	77.62
2212	Natural Gas Distribution	5	1.33	78.95
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	353	1.27	80.23
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	3	1.27	81.50
5112	Software Publishers	195	1.05	82.55
8111	Automotive Repair and Maintenance	284	0.95	83.50
3331	Agriculture, Construction, and Mining Machinery Manufacturing	6	0.91	84.40
3273	Cement and Concrete Product Manufacturing	11	0.89	85.29
5413	Architectural, Engineering, and Related Services	1,623	0.83	86.12
4233	Lumber and Other Construction Materials Merchant Wholesalers	88	0.81	86.93
5172	Wireless Telecommunications Carriers (except Satellite)	39	0.75	87.68
3399	Other Miscellaneous Manufacturing	104	0.74	88.41
3353	Electrical Equipment Manufacturing	9	0.69	89.10
3351	Electric Lighting Equipment Manufacturing	19	0.67	89.77
4411	Automobile Dealers	51	0.67	90.44
3323	Architectural and Structural Metals Manufacturing	35	0.54	90.98
3363	Motor Vehicle Parts Manufacturing	3	0.53	91.52
2123	Nonmetallic Mineral Mining and Quarrying	1	0.45	91.97
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	16	0.44	92.41
4882	Support Activities for Rail Transportation	37	0.41	92.81
2373	Highway, Street, and Bridge Construction	164	0.39	93.20
3261	Plastics Product Manufacturing	24	0.36	93.57
3231	Printing and Related Support Activities	265	0.34	93.91
4413	Automotive Parts, Accessories, and Tire Stores	34	0.33	94.24
4859	Other Transit and Ground Passenger Transportation	109	0.30	94.54
5616	Investigation and Security Services	406	0.29	94.82

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3359	Other Electrical Equipment and Component Manufacturing	1	0.28	95.10
4441	Building Material and Supplies Dealers	20	0.27	95.38
4246	Chemical and Allied Products Merchant Wholesalers	43	0.27	95.64
5321	Automotive Equipment Rental and Leasing	13	0.26	95.90
3329	Other Fabricated Metal Product Manufacturing	14	0.25	96.16
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	12	0.25	96.41
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.24	96.65
6213	Offices of Other Health Practitioners	196	0.23	96.87
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	0.20	97.07
4889	Other Support Activities for Transportation	119	0.20	97.27
4481	Clothing Stores	166	0.18	97.45
5111	Newspaper, Periodical, Book, and Directory Publishers	53	0.16	97.62
3241	Petroleum and Coal Products Manufacturing	7	0.16	97.78
5171	Wired Telecommunications Carriers	92	0.14	97.91
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	11	0.13	98.04
5617	Services to Buildings and Dwellings	275	0.13	98.17
3333	Commercial and Service Industry Machinery Manufacturing	20	0.12	98.30
3272	Glass and Glass Product Manufacturing	7	0.12	98.42
4884	Support Activities for Road Transportation	27	0.12	98.53
2362	Nonresidential Building Construction	766	0.11	98.65
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	174	0.11	98.76
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	31	0.10	98.86
5612	Facilities Support Services	145	0.09	98.95
3339	Other General Purpose Machinery Manufacturing	2	0.08	99.03
3335	Metalworking Machinery Manufacturing	6	0.07	99.10
4241	Paper and Paper Product Merchant Wholesalers	11	0.07	99.17
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	64	0.07	99.24
2389	Other Specialty Trade Contractors	391	0.06	99.30
3344	Semiconductor and Other Electronic Component Manufacturing	13	0.06	99.36
5179	Other Telecommunications	66	0.05	99.41
2379	Other Heavy and Civil Engineering Construction	41	0.05	99.45
3341	Computer and Peripheral Equipment Manufacturing	18	0.05	99.50
6219	Other Ambulatory Health Care Services	21	0.05	99.55
3321	Forging and Stamping	5	0.05	99.59
4851	Urban Transit Systems	16	0.04	99.64
5418	Advertising, Public Relations, and Related Services	160	0.04	99.68
4921	Couriers and Express Delivery Services	42	0.04	99.72
2383	Building Finishing Contractors	93	0.04	99.75
3262	Rubber Product Manufacturing	2	0.04	99.79
7139	Other Amusement and Recreation Industries	62	0.03	99.82
5221	Depository Credit Intermediation	29	0.03	99.85

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	263	0.03	99.88
4232	Furniture and Home Furnishing Merchant Wholesalers	80	0.03	99.91
2381	Foundation, Structure, and Building Exterior Contractors	104	0.03	99.94
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	0.03	99.97
3328	Coating, Engraving, Heat Treating, and Allied Activities	4	0.03	100.00

Source and Notes: See Table 3.1.

3. Verify Listed DBEs

a. Introduction

It is likely that the race and gender classifications for businesses from Dun & Bradstreet and the race and gender classifications from DBE directories are not correct in all instances. Phenomena such as ownership changes, associate or mentor status, recording errors, or even misrepresentation, will lead to businesses being listed as DBEs in a particular directory even though they may not actually be owned by minorities or women. Other things equal, this type of error would cause our availability estimate to be biased upward from the actual availability number.

The second likelihood that must be addressed is that not all DBE businesses are necessarily listed—either in Dun & Bradstreet or in any of the other directories we collected. Such phenomena as geographic relocation, ownership changes, directory compilation errors, fear of stigmatization, and limitations in DBE outreach, could all lead to such establishments being unlisted. Other things equal, this type of error would cause our availability estimate to be biased downward from the actual availability number.

In our experience, we have found that both types of bias are not uncommon. For this Study, we corrected for the effect of these biases using statistical sampling procedures. We surveyed a large, stratified random sample of 75,000 records drawn from the Baseline Business Universe and measured how often and how they were misclassified (or unclassified) by race and gender status.⁵⁰

⁵⁰ A similar method, with respect to DBE establishments, was employed by the Federal Reserve Board to deal with similar problems in designing and implementing the *National Survey of Small Business Finances* for 1993 and 1998. See Haggerty, C., K. Grigorian, R. Harter and J. D. Wolken (2000).

Strata were defined according to NAICS industries and listed DBE status.⁵¹ In the telephone survey, up to 10 attempts were made to reach each business and speak with an appropriate respondent. Attempts were scheduled for a mix of day and evening, weekdays and weekends, and appointments were scheduled for callbacks when necessary. Of the 75,000 establishments in our sample, 23,054 (31%) were listed DBEs and 51,946 (69%) were unclassified by race or gender. Of these 75,000 establishments, however, 14,875 (20%) were excluded as “unable to contact.” Exclusions resulted from a variety of reasons including disconnected and wrong phone numbers, and establishments that were no longer in business.⁵² Of the remaining 60,125 establishments, 18,697 (31%) were listed DBEs and the remaining 41,428 establishments (69%) were unclassified.

The first part of the survey tested whether our sample of listed DBEs was correctly classified by race and/or gender. The second part of the survey tested whether the unclassified establishments (that is, those putatively owned by nonminority males) could all be properly classified as non-DBEs. Both elements of the survey are described in more detail below.⁵³

b. Survey of Listed DBEs

We selected a stratified random sample of 23,054 listed DBEs to verify the race and gender status of their owner(s). Of these, 4,357 (19%) were excluded as “unable to contact.” Of the remaining 18,697 establishments, we obtained complete interviews from 5,435, for a response rate of 29 percent.

Of the 5,435 establishments interviewed, 1,568 (28.9%) were actually owned by nonminority males. Misclassification varied by putative race and gender, as shown in Table 3.13. Misclassification was highest among putative Native American-owned establishments, followed by putative Asian-owned establishments, then Hispanic-owned establishments, then nonminority female-owned establishments, and finally African American-owned establishments.⁵⁴ Misclassification was also observed in 89 percent of NAICS strata, ranging from a high of 100 percent to a low of 16.7 percent, with a median of 42.5 percent and a mean of 45.3 percent.

⁵¹ A total of 270 separate industry strata were created based on NAICS code. All strata were then split according to listed DBE status to create a total of 540 strata. Generally, listed DBEs were sampled at a higher rate than unclassified establishments.

⁵² Other reasons included changed ownership, duplicate records, and refusals. Putative DBEs were not more likely to be affected by this than putative non-DBEs.

⁵³ By “putative,” we mean the race and gender that we initially assigned to each firm based on the information provided by the State of Maryland, the Maryland DOT, Dun & Bradstreet, our master DBE directory, or from other sources.

⁵⁴ For this Study, “Black” or “African American” refers to an individual having origins in any of the black racial groups of Africa; “Hispanic” refers to an individual of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race; “Asian” refers to an individual having origins in the Far East, Southeast Asia, or the Indian subcontinent; “Native American” or “American Indian” refers to an individual having origins in any of the original peoples of North America but does not include individuals of Eskimo or Aleutian origin.

Table 3.13. Listed DBE Survey—Amount of Misclassification, by Putative DBE Type

Putative Race/Gender	Misclassification (Percentage Nonminority Male)	Misclassification (Percentage Other DBE Type)	Percentage Correctly Classified	Number of Businesses Interviewed
African American (either gender)	17.94	6.53	75.53	1,594
Hispanic (either gender)	33.21	15.69	51.70	530
Asian (either gender)	30.85	18.09	51.06	752
Native American (either gender)	37.21	30.23	32.56	86
Nonminority Female	34.05	13.47	52.49	2,473
All DBE Types	28.85	12.49	58.66	5,435

Source: NERA telephone surveys.

Notes: (1) Figures are rounded. Rounding was performed subsequent to any mathematical calculations.
(2) Similar calculations, not shown here, were performed within each stratum.

The race and gender status of the listed DBEs responding to the survey was changed, if necessary, according to the survey results. For example, if an establishment originally listed as African American-owned was actually nonminority male-owned, then that establishment was counted as nonminority male-owned for purposes of calculating DBE availability.

But what about the remaining putative African American-owned establishments that we did not interview? For these businesses, we estimated the race and gender of their ownership based on the amount of misclassification we observed among the putatively African American-owned establishments that we did interview. In this example, our interviews showed that 75.53 percent of these establishments were indeed actually African American-owned, 17.94 percent were actually nonminority male-owned, 4.27 percent were actually nonminority female-owned, 1.07 percent were actually Hispanic-owned, 0.75 percent were actually Native American-owned, and 0.44 percent were Asian-owned. Therefore, we assigned each of the remaining putative African American-owned establishments a 75.53 percent probability of being African American-owned, a 17.94 percent probability of being nonminority male-owned, a 4.27 percent probability of being nonminority female-owned, a 1.07 percent probability of being Hispanic-owned, a 0.75 percent probability of being Native American-owned, and a 0.44 percent probability of being Asian-owned. We performed this procedure within each sample stratum and for all putative race and gender categories.

4. Verify Putative Non-DBEs

a. Survey of Unclassified Businesses

In the same manner as our survey of listed DBEs, we also examined unclassified businesses, *i.e.*, any business that was not originally identified as a DBE, either in Dun & Bradstreet or in one or more of the other directories, and that would otherwise appear to be a non-DBE.

We selected a stratified random sample of 51,946 unclassified businesses. Of these, 10,518 (20%) were excluded as “unable to contact.” Of the 41,428 remaining establishments, we obtained 12,857 complete interviews, for a response rate of 31 percent.

In Table 3.14, of the 12,857 establishments interviewed, 9,835 (76.50%) were indeed owned by nonminority males. Clearly, a significant majority of unclassified businesses in the Baseline Business Universe are nonminority male-owned. Nevertheless, the survey results indicate that 23.50 percent of these establishments are *not* nonminority male-owned. Among the latter, the largest group was nonminority female-owned (10.55%), followed by African American-owned (6.27%), with descending size shares accounted for by Asian-owned (3.21%), Hispanic-owned (2.64%), and Native American-owned (0.83%). Misclassification was also observed in 91 percent of NAICS strata, ranging from a high of 100 percent to a low of 2.9 percent, with a median of 22.2 percent and a mean of 23.4 percent.

Table 3.14. Unclassified Businesses Survey—By Race and Gender

Verified Race/Gender	Number of Businesses Interviewed	Percentage of Total
Nonminority male	9,835	76.49
Nonminority female	1,356	10.55
African American (either gender)	806	6.27
Hispanic (either gender)	340	2.64
Asian (either gender)	413	3.21
Native American (either gender)	107	0.83
TOTAL	12,857	100.00

Source and Notes: See Table 3.13. Numbers may not add to total due to rounding.

In the same manner as the survey of listed DBEs, the race and gender status of unclassified establishments was changed, if necessary, according to the survey results. For example, if an interviewed establishment that was originally unclassified indicated that it was actually nonminority male-owned, then that establishment was counted as nonminority male-owned for purposes of the DBE availability calculation. If the establishment indicated it was nonminority female-owned, it was counted as nonminority female, and so on. For unclassified establishments that were not interviewed, we assigned probability values (probability actually nonminority male-owned, probability actually nonminority female-owned, probability actually African

American-owned, *etc.*) based on the interview responses. We again carried out the probability assignment procedure within each stratum.

5. Understanding “Capacity”

As noted in the beginning of this chapter, some observers, primarily opponents of efforts to address discrimination in contracting, have argued that, in order to be accurate, availability estimates must be adjusted for “capacity.” These assertions are rarely accompanied by specific suggestions about how such adjustments could be made consistent with professional social science standards. This Study does adjust for certain appropriate characteristics of firms related to capacity (such as industry affiliation, geographic location, owner labor market experience, and educational attainment); however, we are careful to not adjust for capacity factors that are themselves likely to be influenced by discrimination. In our view, all of the “capacity” indicators recommended by program opponents (*e.g.*, firm age, annual individual firm revenues, number of employees, largest contract received, bonding limits) are subject to the impact of discrimination.

Further, the reality is that, since the Supreme Court decisions in *City of Richmond v. J.A. Croson Co.*⁵⁵ and *Adarand Constructors, Inc. v. Peña*,⁵⁶ large, adverse statistical disparities between minority-owned or women-owned businesses and nonminority male-owned businesses have been documented in numerous research studies and reports.⁵⁷ Business outcomes, however, can be influenced by multiple factors, and it is important that disparity studies examine the likelihood of whether discrimination is an important contributing factor to observed disparities.

Moreover, terms such as “capacity,” “qualifications,” and “ability,” are not well defined in any statistical sense. Does “capacity” mean the level of annual individual firm revenues, employment size, bonding limits, or number of contracts bid or awarded? Does “qualified” or “able” mean possession of a business license, certain amounts of training, types of work experience, or the number of contracts a firm can perform at a given moment? What mix of business attributes properly reflects “capacity”? Does the meaning of such terms differ from industry to industry, locality to locality, or through time? Where and how might such data be reliably gathered? Even if capacity is well-defined and adequate data are gathered, when measuring the existence of discrimination, the statistical method used should not improperly limit the availability measure by incorporating factors that are themselves impacted by discrimination, such as firm age, annual individual firm revenues, bonding limits, or number of employees.

Consider an extreme example where discrimination has prevented the emergence of any minority-owned or women-owned firms. Suppose that discrimination was ingrained in a state’s construction market. As a result, few minority or female construction employees are given the opportunity to gain managerial experience in the business; minorities or women who do end up starting construction firms are denied the opportunity to work as subcontractors for nonminority prime contractors; and nonminority prime contractors refuse to work with minority or female

⁵⁵ *City of Richmond v. J.A. Croson Co.*, 488 U.S. 469 (1989).

⁵⁶ *Adarand Constructors, Inc. v. Peña*, 515 U.S. 200 (1995).

⁵⁷ See Enchautegui, *et al.* (1996). More recently, see Wainwright (2012), Wainwright (2010).

firms and put pressure on bonding companies and banks to prevent such firms from securing bonding and capital. In this example, discrimination has prevented the emergence of a minority or female highway construction industry with “capacity.” Those DBEs that exist at all will be smaller and less experienced and have lower annual individual firm revenues, bonding limits, and employees (*i.e.*, “capacity”) because of discrimination than firms that have benefited from the exclusionary system.

Using annual individual firm revenues as the measure of qualifications illustrates the point. If DBEs are subject to market area discrimination, their annual individual firm revenues will be smaller than nonminority, male-owned businesses because they will be less successful at obtaining work. Annual individual firm revenues measure the extent to which a firm has succeeded in the market area, perhaps in spite of discrimination—it does not measure the ability to succeed in the absence of discrimination and should not be used to evaluate the effects of discrimination.

Therefore, focusing on the “capacity” of businesses in terms of employment, annual individual firm revenues, bonding limits, number of trucks, and so forth, is simply wrong as a matter of economics because it can obscure the existence of discrimination. A truly “effective” discriminatory system would lead to a finding of no “capacity,” and under the “capacity” approach, a finding of no discrimination. Excluding firms from an availability measure based on their “capacity” in a discriminatory market merely affirms the results of discrimination rather than ameliorating them.

Further, in dynamic business environments, and especially in the construction sector, such “qualifications” or “capacity” can be obtained relatively easily. It is well known that small construction companies can expand rapidly as needs arise by hiring workers and renting equipment, and many general contractors subcontract the majority of a project. Firms grow quickly when demand increases and shrink quickly when demand decreases. Subcontracting is one important source of this elasticity, as has been noted by several academic studies.⁵⁸ Other industry sectors, especially in this era of Internet commerce and independent contractors, can also quickly grow or shrink in response to demand.

Finally, even where “capacity”-type factors have been controlled for in statistical analyses, results consistent with business discrimination are still typically observed. For example, large and statistically significant differences in commercial loan denial rates between minority and nonminority firms are evident throughout the country, even when detailed balance sheet and creditworthiness measures are held constant.⁵⁹ Similarly, economists using decennial census data have demonstrated that statistically significant disparities in business formation and business owner earnings between DBEs and non-DBEs remain even after controlling for a host of additional relevant factors, including educational achievement, labor market experience, marital status, disability status, veteran status, interest and dividend income, labor market attachment,

⁵⁸ See Bourdon and Levitt (1980); *see also* Eccles (1981); and Gould (1980).

⁵⁹ See Wainwright (2008).

industry, geographic location, and local labor market variables such as the unemployment rate, population growth rate, government employment rate, or per capita income.⁶⁰

To summarize, the statistical analysis of the availability of minority and female firms in disparity studies should not adjust for inappropriate “capacity” factors because:

- “Capacity” has been ill-defined; and reliable data for measurement are generally unavailable;
- Small firms, particularly in the construction industry, are highly elastic with regard to ability to perform;
- Studies have shown that even when “capacity” and “qualifications”-type factors are held constant in statistical analyses, evidence of disparity against DBE firms persists;⁶¹ and
- Most important, identifiable indicators of “capacity” are themselves impacted by discrimination.

C. Estimates of DBE Availability

Overall estimates of DBE availability appear below in Tables 3.15 and 3.16. In each table, two sets of weighted availability measures are provided for each of the six major procurement categories of Construction, AE-CRS, Maintenance, IT, Services and CSE. The first set is weighted by award dollars for all contracts. The second set is weighted by paid dollars for substantially completed contracts. Estimates in Table 3.15 are based on all MDOT contracts, while those in Table 3.16 are based on federally-assisted contracts only.

Table 3.15. Overall Estimated DBE Availability Percentages—All Contracts

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.99	3.39	4.76	1.05	20.18	13.64	33.82	66.18
PAID DOLLARS	11.10	3.50	4.55	1.00	20.15	13.97	34.12	65.88
CONSTRUCTION								
AWARD DOLLARS	13.67	5.17	3.07	0.71	22.62	16.38	39.00	61.00
PAID DOLLARS	13.55	5.33	3.09	0.67	22.64	16.40	39.04	60.96

⁶⁰ Wainwright (2000).

⁶¹ Within the present Study, *see esp.* Chapter V, throughout, and Chapter VII, Tables 7.3-7.6 and the accompanying discussion.

DBE Availability in MDOT's Market Area

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
AE-CRS								
AWARD DOLLARS	8.32	2.22	4.91	1.27	16.72	11.64	28.36	71.64
PAID DOLLARS	8.18	2.20	4.90	1.28	16.57	11.45	28.02	71.98
MAINTENANCE								
AWARD DOLLARS	11.76	3.96	3.37	1.43	20.52	11.31	31.83	68.17
PAID DOLLARS	13.19	4.44	3.46	1.28	22.38	12.05	34.42	65.58
IT								
AWARD DOLLARS	14.34	3.78	14.08	1.29	33.50	12.33	45.82	54.18
PAID DOLLARS	15.52	3.30	12.98	1.24	33.04	12.88	45.92	54.08
SERVICES								
AWARD DOLLARS	16.14	3.21	5.22	0.65	25.21	18.41	43.62	56.38
PAID DOLLARS	15.96	3.13	4.66	0.58	24.32	20.51	44.83	55.17
CSE								
AWARD DOLLARS	11.22	3.79	7.86	1.00	23.88	11.80	35.68	64.32
PAID DOLLARS	11.50	3.83	7.96	1.01	24.31	11.92	36.23	63.77

Sources: Dun & Bradstreet; DBE business directory information compiled by NERA; NERA telephone surveys.

Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Table 3.16. Overall Estimated DBE Availability Percentages, Federally-Assisted Contracts Only

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.39	3.30	4.28	1.04	19.00	13.53	32.54	67.46
PAID DOLLARS	10.48	3.46	4.28	1.02	19.25	13.59	32.84	67.16
CONSTRUCTION								
AWARD DOLLARS	13.86	5.14	3.07	0.65	22.72	16.81	39.54	60.46
PAID DOLLARS	13.76	5.34	3.12	0.62	22.83	16.81	39.64	60.36
AE-CRS								
AWARD DOLLARS	8.28	2.21	4.89	1.27	16.66	11.61	28.27	71.73
PAID DOLLARS	8.20	2.21	4.90	1.28	16.59	11.48	28.07	71.93
MAINTENANCE								
AWARD DOLLARS	8.23	3.07	4.18	1.17	16.65	10.18	26.83	73.17
PAID DOLLARS	8.56	3.03	6.06	0.93	18.58	11.00	29.58	70.42
IT								
AWARD DOLLARS	14.07	2.94	11.02	1.26	29.30	12.48	41.78	58.22
PAID DOLLARS	13.89	2.90	10.82	1.27	28.87	12.39	41.26	58.74
SERVICES								
AWARD DOLLARS	10.50	3.22	5.22	1.22	20.16	12.89	33.05	66.95
PAID DOLLARS	11.39	3.61	5.81	1.30	22.11	12.53	34.64	65.36
CSE								
AWARD DOLLARS	5.29	1.75	2.66	0.40	10.10	8.11	18.22	81.78
PAID DOLLARS	5.49	1.81	3.04	0.30	10.63	8.12	18.75	81.25

Sources: Dun & Bradstreet; DBE business directory information compiled by NERA; NERA telephone surveys.

Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

As indicated in Table 3.15, overall DBE availability in the Construction sector is between 39.00 and 39.04 percent. Non-DBE availability is between 60.96 and 61.00 percent. Among DBEs, availability of African American-owned businesses is between 13.55 and 13.67 percent, availability of Hispanic-owned businesses is between 5.17 and 5.33 percent, availability of Asian-owned businesses is between 3.07 and 3.09 percent, and availability of Native American-owned businesses is between 0.67 and 0.71 percent. Availability of minority-owned businesses as a group is between 22.62 and 22.64 percent. Availability of nonminority female-owned businesses is between 16.38 and 16.40 percent.

Overall DBE availability in the AE-CRS sector is between 28.02 and 28.36 percent. Non-DBE availability is between 71.64 and 71.98 percent. Among DBEs, availability of African American-owned businesses is between 8.18 and 8.32 percent, availability of Hispanic-owned businesses is between 2.20 and 2.22 percent, availability of Asian-owned businesses is between 4.90 and 4.91 percent, and availability of Native American-owned businesses is between 1.27 and 1.28 percent. Availability of minority-owned businesses as a group is between 16.57 and 16.72 percent. Availability of nonminority female-owned businesses is between 11.45 and 11.64 percent.

Overall DBE availability in the Maintenance sector is between 31.83 and 34.42 percent. Non-DBE availability is between 65.58 and 68.17 percent. Among DBEs, availability of African American-owned businesses is between 11.76 and 13.19 percent, availability of Hispanic-owned businesses is between 3.96 and 4.44 percent, availability of Asian-owned businesses is between 3.37 and 3.46 percent, and availability of Native American-owned businesses is between 1.28 and 1.43 percent. Availability of minority-owned businesses as a group is between 20.52 and 22.38 percent. Availability of nonminority female-owned businesses is between 11.31 and 12.05 percent.

Overall DBE availability in the IT sector is between 45.82 and 45.92 percent. Non-DBE availability is between 54.08 and 54.18 percent. Among DBEs, availability of African American-owned businesses is between 14.34 and 15.52 percent, availability of Hispanic-owned businesses is between 3.30 and 3.78 percent, availability of Asian-owned businesses is between 12.98 and 14.08 percent, and availability of Native American-owned businesses is between 1.24 and 1.29 percent. Availability of minority-owned businesses as a group is between 33.04 and 33.50 percent. Availability of nonminority female-owned businesses is between 12.33 and 12.88 percent.

Overall DBE availability in the Services sector is between 43.62 and 44.83 percent. Non-DBE availability is between 55.17 and 56.38 percent. Among DBEs, availability of African American-owned businesses is between 15.96 and 16.14 percent, availability of Hispanic-owned businesses is between 3.13 and 3.21 percent, availability of Asian-owned businesses is between 4.66 and 5.22 percent, and availability of Native American-owned businesses is between 0.58 and 0.65 percent. Availability of minority-owned businesses as a group is between 24.32 and 25.21 percent. Availability of nonminority female-owned businesses is between 18.41 and 20.51 percent.

Overall DBE availability in the CSE sector is between 35.68 and 36.23 percent. Non-DBE availability is between 63.77 and 64.32 percent. Among DBEs, availability of African American-owned businesses is between 11.22 and 11.50 percent, availability of Hispanic-owned businesses

is between 3.79 and 3.83 percent, availability of Asian-owned businesses is between 7.86 and 7.96 percent, and availability of Native American-owned businesses is between 1.00 and 1.01 percent. Availability of minority-owned businesses as a group is between 23.88 and 24.31 percent. Availability of nonminority female-owned businesses is between 11.80 and 11.92 percent.

As indicated in Table 3.16, overall DBE availability for federally-assisted contracts in the Construction sector is between 39.54 and 39.64 percent. Non-DBE availability is between 60.36 and 60.46 percent. Among DBEs, availability of African American-owned businesses is between 13.76 and 13.86 percent, availability of Hispanic-owned businesses is between 5.14 and 5.34 percent, availability of Asian-owned businesses is 3.07 and 3.12 percent, and availability of Native American-owned businesses is between 0.62 and 0.65 percent. Availability of minority-owned businesses as a group is between 22.72 and 22.83 percent. Availability of nonminority female-owned businesses is 16.81 percent.

Overall DBE availability for federally-assisted contracts in the AE-CRS sector is between 28.07 and 28.27 percent. Non-DBE availability is between 71.73 and 71.93 percent. Among DBEs, availability of African American-owned businesses is between 8.20 and 8.28 percent, availability of Hispanic-owned businesses is 2.21 percent, availability of Asian-owned businesses is between 4.89 and 4.90 percent, and availability of Native American-owned businesses is between 1.27 and 1.28 percent. Availability of minority-owned businesses as a group is between 16.59 and 16.66 percent. Availability of nonminority female-owned businesses is between 11.48 and 11.61 percent.

Overall DBE availability for federally-assisted contracts in the Maintenance sector is between 26.83 and 29.58 percent. Non-DBE availability is between 70.42 and 73.17 percent. Among DBEs, availability of African American-owned businesses is between 8.23 and 8.56 percent, availability of Hispanic-owned businesses is between 3.03 and 3.07 percent, availability of Asian-owned businesses is between 4.18 and 6.06 percent, and availability of Native American-owned businesses is between 0.93 and 1.17 percent. Availability of minority-owned businesses as a group is between 16.65 and 18.58 percent. Availability of nonminority female-owned businesses is between 10.18 and 11.00 percent.

Overall DBE availability for federally-assisted contracts in the IT sector is between 41.26 and 41.78 percent. Non-DBE availability is between 58.22 and 58.74 percent. Among DBEs, availability of African American-owned businesses is between 13.89 and 14.07 percent, availability of Hispanic-owned businesses is between 2.90 and 2.94 percent, availability of Asian-owned businesses is between 10.82 and 11.02 percent, and availability of Native American-owned businesses is between 1.26 and 1.27 percent. Availability of minority-owned businesses as a group is between 28.87 and 29.30 percent. Availability of nonminority female-owned businesses is between 12.39 and 12.48 percent.

Overall DBE availability for federally-assisted contracts in the Services sector is between 33.05 and 34.64 percent. Non-DBE availability is between 65.36 and 66.95 percent. Among DBEs, availability of African American-owned businesses is between 10.50 and 11.39 percent, availability of Hispanic-owned businesses is between 3.22 and 3.61 percent, availability of Asian-owned businesses is between 5.22 and 5.81 percent, and availability of Native American-

owned businesses is between 1.22 and 1.30 percent. Availability of minority-owned businesses as a group is between 20.16 and 22.11 percent. Availability of nonminority female-owned businesses is between 12.53 and 12.89 percent.

Overall DBE availability for federally-assisted contracts in the CSE sector is between 18.22 and 18.75 percent. Non-DBE availability is between 81.25 and 81.78 percent. Among DBEs, availability of African American-owned businesses is between 5.29 and 5.49 percent, availability of Hispanic-owned businesses is between 1.75 and 1.81 percent, availability of Asian-owned businesses is between 2.66 and 3.04 percent, and availability of Native American-owned businesses is between 0.30 and 0.40 percent. Availability of minority-owned businesses as a group is between 10.10 and 10.63 percent. Availability of nonminority female-owned businesses is between 8.11 and 8.12 percent.

Tables 3.17 through 3.22 present detailed estimates of DBE availability in MDOT's relevant market area for Construction, AE-CRS, Maintenance, IT, Services, and CSE.⁶²

Table 3.17. Detailed DBE Availability Percentages—Construction (All Contracts) (Dollars Awarded)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Building Equipment Contractors (NAICS 2382)	12.29	6.29	1.66	1.15	12.64	34.03	65.97
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	8.19	8.28	1.55	0.19	7.55	25.77	74.23
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Other Specialty Trade Contractors (NAICS 2389)	7.08	6.77	3.99	2.09	11.90	31.84	68.16
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Building Finishing Contractors (NAICS 2383)	4.88	20.38	3.20	0.08	13.21	41.74	58.26
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.11	2.01	1.12	0.99	9.53	18.75	81.25
Utility System Construction (NAICS 2371)	9.20	1.82	2.39	1.12	10.33	24.86	75.14
Electric Lighting Equipment Manufacturing (NAICS 3351)	5.45	0.10	0.20	3.92	16.63	26.30	73.70

⁶² Similar tables using paid dollar weights were also produced but are not included here for space considerations.

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Architectural, Engineering, and Related Services (NAICS 5413)	6.74	2.07	5.11	1.51	9.55	24.98	75.02
Services to Buildings and Dwellings (NAICS 5617)	16.98	3.05	2.61	2.35	11.39	36.38	63.62
Architectural and Structural Metals Manufacturing (NAICS 3323)	5.67	0.04	0.07	0.22	14.62	20.62	79.38
Cement and Concrete Product Manufacturing (NAICS 3273)	2.84	0.72	0.36	0.05	3.68	7.65	92.35
Investigation and Security Services (NAICS 5616)	19.93	1.49	4.80	1.20	11.71	39.12	60.88
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Other Support Activities for Transportation (NAICS 4889)	30.32	15.93	7.11	0.06	4.93	58.36	41.64
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	1.63	5.51	2.25	2.61	7.25	19.25	80.75
Other Electrical Equipment and Component Manufacturing (NAICS 3359)	12.46	4.15	5.60	0.89	15.77	38.87	61.13
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	0.00	0.00	0.00	0.00	7.14	7.14	92.86
Other Miscellaneous Store Retailers (NAICS 4539)	11.81	3.65	4.95	0.92	17.50	38.83	61.17
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	0.00	0.00	0.00	0.00	20.00	20.00	80.00
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	5.10	3.34	1.40	0.23	9.31	19.37	80.63
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Lawn and Garden Equipment and Supplies Stores (NAICS 4442)	0.19	0.04	0.83	2.27	21.37	24.70	75.30
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Communications Equipment Manufacturing (NAICS 3342)	3.95	11.40	0.00	0.00	20.48	35.83	64.17

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	7.14	0.00	0.00	0.00	35.71	42.86	57.14
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing (NAICS 3252)	6.87	0.04	0.07	0.07	8.03	15.08	84.92
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	0.99	0.01	2.92	0.00	3.83	7.76	92.24
Remediation and Other Waste Management Services (NAICS 5629)	3.77	6.10	6.53	0.03	10.61	27.05	72.95
Other General Purpose Machinery Manufacturing (NAICS 3339)	0.00	0.00	0.00	0.00	22.22	22.22	77.78
Iron and Steel Mills and Ferroalloy Manufacturing (NAICS 3311)	12.67	6.33	6.33	0.00	12.67	38.01	61.99
Computer Systems Design and Related Services (NAICS 5415)	15.03	4.07	15.83	1.34	12.35	48.62	51.38
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing (NAICS 3327)	1.09	2.37	0.01	3.14	6.87	13.48	86.52
Paint, Coating, and Adhesive Manufacturing (NAICS 3255)	10.39	2.67	4.75	0.78	19.87	38.47	61.53
Petroleum and Coal Products Manufacturing (NAICS 3241)	1.71	0.61	0.79	0.12	21.41	24.64	75.36
Waste Treatment and Disposal (NAICS 5622)	8.77	2.81	0.97	0.00	22.25	34.80	65.20
Commercial and Service Industry Machinery Manufacturing (NAICS 3333)	11.19	0.00	1.89	0.00	16.24	29.31	70.69
Other Nonmetallic Mineral Product Manufacturing (NAICS 3279)	11.71	3.88	6.88	0.86	17.30	40.62	59.38
Electrical Equipment Manufacturing (NAICS 3353)	0.00	0.00	0.00	0.00	13.33	13.33	86.67
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	0.93	3.40	2.39	1.14	6.68	14.55	85.45

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Pulp, Paper, and Paperboard Mills (NAICS 3221)	16.29	3.93	5.25	0.75	14.19	40.40	59.60
Management, Scientific, and Technical Consulting Services (NAICS 5416)	5.61	2.14	4.16	2.37	18.55	32.83	67.17

Sources and Notes: *See Table 3.15.*

Table 3.18. Detailed DBE Availability Percentages—AE-CRS (All Contracts) (Dollars Awarded)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Architectural, Engineering, and Related Services (NAICS 5413)	7.16	2.20	4.96	1.37	10.16	25.85	74.15
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Management, Scientific, and Technical Consulting Services (NAICS 5416)	9.14	1.79	4.09	1.51	15.40	31.94	68.06
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	0.34	1.66	0.89	0.04	0.92	3.84	96.16
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Community Food and Housing, and Emergency and Other Relief Services (NAICS 6242)	0.00	0.00	0.00	0.00	9.09	9.09	90.91
Advertising, Public Relations, and Related Services (NAICS 5418)	7.68	4.62	1.70	0.34	26.75	41.08	58.92
Scientific Research and Development Services (NAICS 5417)	4.59	0.01	1.12	0.41	6.95	13.08	86.92
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73

Sources and Notes: See Table 3.15.

Table 3.19. Detailed DBE Availability Percentages—Maintenance (All Contracts) (Dollars Awarded)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Railroad Rolling Stock Manufacturing (NAICS 3365)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Building Equipment Contractors (NAICS 2382)	11.84	3.39	0.87	0.50	13.35	29.95	70.05
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Investigation and Security Services (NAICS 5616)	20.56	1.87	3.34	1.49	11.55	38.81	61.19
Other Specialty Trade Contractors (NAICS 2389)	6.45	1.86	3.30	3.93	11.27	26.80	73.20
Interurban and Rural Bus Transportation (NAICS 4852)	20.62	0.00	0.00	0.00	14.37	35.00	65.00
Services to Buildings and Dwellings (NAICS 5617)	17.40	3.76	2.73	1.96	11.29	37.14	62.86
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Support Activities for Rail Transportation (NAICS 4882)	18.21	12.34	3.80	2.17	13.75	50.27	49.73
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.46	0.28	1.64	1.16	8.28	15.83	84.17
Facilities Support Services (NAICS 5612)	26.39	3.77	2.52	1.15	9.10	42.92	57.08
Architectural, Engineering, and Related Services (NAICS 5413)	6.75	2.06	5.33	1.57	9.40	25.11	74.89
Urban Transit Systems (NAICS 4851)	42.42	4.79	10.65	0.12	5.04	63.02	36.98
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing (NAICS 3327)	1.09	2.37	0.01	3.14	6.87	13.48	86.52
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	8.81	10.61	2.03	0.42	8.60	30.46	69.54
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	1.78	3.65	2.27	1.22	6.99	15.91	84.09
Communications Equipment Manufacturing (NAICS 3342)	6.83	1.51	4.53	0.01	6.29	19.17	80.83
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Comm. and Indust. Machinery and Equipmnt (exc. Automotive and Electronic) Repair and Maintenance (NAICS 8113)	5.95	2.11	0.41	0.01	3.20	11.68	88.32
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Motor Vehicle Parts Manufacturing (NAICS 3363)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Traveler Accommodation (NAICS 7211)	0.13	1.43	10.56	3.60	9.94	25.65	74.35
Waste Collection (NAICS 5621)	23.81	0.00	0.00	3.14	7.25	34.21	65.79
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Employment Services (NAICS 5613)	11.43	2.41	4.22	0.20	13.90	32.16	67.84
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.01	1.55	1.02	1.63	11.28	20.48	79.52
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	2.69	0.16	1.05	0.02	9.95	13.86	86.14
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	7.57	0.19	0.77	0.11	32.42	41.07	58.93
Management, Scientific, and Technical Consulting Services (NAICS 5416)	5.61	2.14	4.16	2.37	18.55	32.83	67.17
Architectural and Structural Metals Manufacturing (NAICS 3323)	3.50	0.04	0.06	0.83	12.79	17.23	82.77
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45
Lawn and Garden Equipment and Supplies Stores (NAICS 4442)	0.19	0.04	0.83	2.27	21.37	24.70	75.30
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	1.29	0.00	2.80	0.00	4.13	8.23	91.77
Chemical and Allied Products Merchant Wholesalers (NAICS 4246)	6.23	4.13	7.07	1.19	6.46	25.08	74.92
Utility System Construction (NAICS 2371)	9.16	1.81	2.38	1.15	10.41	24.90	75.10
Automotive Repair and Maintenance (NAICS 8111)	8.22	3.96	9.00	0.18	11.62	32.98	67.02

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Computer Systems Design and Related Services (NAICS 5415)	15.51	3.85	15.22	1.32	12.60	48.51	51.49
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	6.03	3.42	1.93	0.32	10.31	22.00	78.00
Aerospace Product and Parts Manufacturing (NAICS 3364)	0.00	4.35	0.00	0.00	19.13	23.48	76.52
Building Material and Supplies Dealers (NAICS 4441)	6.65	2.08	2.84	0.52	10.06	22.16	77.84
Support Activities for Air Transportation (NAICS 4881)	18.32	1.91	2.91	0.13	2.42	25.69	74.31
Waste Treatment and Disposal (NAICS 5622)	8.77	2.81	0.97	0.00	22.25	34.80	65.20
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Freight Transportation Arrangement (NAICS 4885)	17.82	4.09	7.34	0.18	11.67	41.11	58.89
Cement and Concrete Product Manufacturing (NAICS 3273)	2.95	0.05	0.07	0.01	0.19	3.27	96.73
Remediation and Other Waste Management Services (NAICS 5629)	5.14	0.05	0.10	0.10	2.22	7.61	92.39
Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing (NAICS 3334)	7.82	0.81	3.77	0.00	13.48	25.88	74.12
Electric Power Generation, Transmission and Distribution (NAICS 2211)	1.22	0.01	1.80	1.11	8.17	12.31	87.69
Nondepository Credit Intermediation (NAICS 5222)	13.11	4.26	4.43	0.76	14.47	37.03	62.97
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35
Activities Related to Real Estate (NAICS 5313)	11.69	4.81	1.66	0.01	20.62	38.79	61.21
Building Finishing Contractors (NAICS 2383)	5.23	22.89	3.19	0.04	13.09	44.45	55.55

Sources and Notes: See Table 3.15.

Table 3.20. Detailed DBE Availability Percentages—IT (All Contracts) (Dollars Awarded)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Computer Systems Design and Related Services (NAICS 5415)	14.99	4.08	15.91	1.34	12.29	48.62	51.38
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.05	4.19	4.58	0.01	10.08	22.92	77.08
Architectural, Engineering, and Related Services (NAICS 5413)	7.29	2.12	5.00	1.35	10.31	26.08	73.92
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	10.23	1.41	5.60	0.81	11.82	29.87	70.13
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Employment Services (NAICS 5613)	10.07	2.43	3.67	0.09	12.91	29.17	70.83
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Management, Scientific, and Technical Consulting Services (NAICS 5416)	13.80	1.17	3.17	0.18	10.03	28.34	71.66
Building Equipment Contractors (NAICS 2382)	13.07	6.81	1.73	1.31	12.66	35.56	64.44
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Computer and Peripheral Equipment Manufacturing (NAICS 3341)	13.70	3.59	6.17	0.95	16.54	40.96	59.04
Data Processing, Hosting, and Related Services (NAICS 5182)	21.33	1.91	5.77	0.14	15.34	44.50	55.50
Electronics and Appliance Stores (NAICS 4431)	10.01	0.31	3.00	0.29	15.37	28.99	71.01
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Other Specialty Trade Contractors (NAICS 2389)	7.40	9.29	4.35	1.15	12.23	34.42	65.58
Utility System Construction (NAICS 2371)	10.23	2.27	2.41	0.51	8.48	23.89	76.11
Electronic and Precision Equipment Repair and Maintenance (NAICS 8112)	17.51	4.11	6.39	0.97	16.15	45.13	54.87

Sources and Notes: See Table 3.15.

Table 3.21. Detailed DBE Availability Percentages—Services (All Contracts) (Dollars Awarded)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Urban Transit Systems (NAICS 4851)	42.42	4.79	10.65	0.12	5.04	63.02	36.98
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Taxi and Limousine Service (NAICS 4853)	22.67	4.26	11.86	1.63	8.66	49.07	50.93
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32
Architectural, Engineering, and Related Services (NAICS 5413)	7.55	2.01	4.86	1.23	11.03	26.68	73.32
Railroad Rolling Stock Manufacturing (NAICS 3365)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Computer Systems Design and Related Services (NAICS 5415)	17.92	2.76	13.92	0.99	11.94	47.53	52.47
Advertising, Public Relations, and Related Services (NAICS 5418)	7.89	4.07	1.74	0.59	26.41	40.69	59.31
Management, Scientific, and Technical Consulting Services (NAICS 5416)	11.65	1.83	3.74	0.88	13.28	31.38	68.62
Travel Arrangement and Reservation Services (NAICS 5615)	8.13	0.00	2.03	2.03	7.10	19.30	80.70
Employment Services (NAICS 5613)	15.77	2.36	5.94	0.53	17.08	41.68	58.32
Agencies, Brokerages, and Other Insurance Related Activities (NAICS 5242)	2.68	0.24	0.42	0.02	13.91	17.27	82.73
Charter Bus Industry (NAICS 4855)	29.84	0.97	0.39	0.18	17.80	49.19	50.81
Building Equipment Contractors (NAICS 2382)	12.76	6.65	1.71	1.26	12.64	35.01	64.99
Interurban and Rural Bus Transportation (NAICS 4852)	20.62	0.00	0.00	0.00	14.37	35.00	65.00
Insurance Carriers (NAICS 5241)	3.26	0.06	0.11	0.00	4.64	8.07	91.93
Electric Power Generation, Transmission and Distribution (NAICS 2211)	1.22	0.01	1.80	1.11	8.17	12.31	87.69
Other Professional, Scientific, and Technical Services (NAICS 5419)	3.02	16.49	4.37	2.62	29.36	55.86	44.14
Services to Buildings and Dwellings (NAICS 5617)	25.63	8.90	3.93	0.77	13.48	52.70	47.30

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Automotive Repair and Maintenance (NAICS 8111)	11.94	7.59	4.57	0.93	8.84	33.86	66.14
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Depository Credit Intermediation (NAICS 5221)	0.19	0.00	0.42	0.00	0.44	1.06	98.94
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	2.69	3.52	2.64	1.09	7.69	17.63	82.37
Activities Related to Real Estate (NAICS 5313)	11.69	4.81	1.66	0.01	20.62	38.79	61.21
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Health and Personal Care Stores (NAICS 4461)	6.28	2.68	2.00	0.01	4.90	15.87	84.13
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.34	1.39	2.47	0.83	8.79	17.83	82.17
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Business, Professional, Labor, Political, and Similar Organizations (NAICS 8139)	11.62	4.08	5.30	0.82	15.09	36.91	63.09
Lessors of Real Estate (NAICS 5311)	2.99	0.15	1.89	0.03	14.43	19.48	80.52
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.37	0.33	0.66	0.49	11.63	16.47	83.53
Natural Gas Distribution (NAICS 2212)	5.63	0.00	4.87	0.00	0.00	10.50	89.50
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	4.09	1.05	2.10	1.06	14.93	23.22	76.78
Utility System Construction (NAICS 2371)	9.60	2.00	2.39	0.88	9.61	24.48	75.52
Automotive Parts, Accessories, and Tire Stores (NAICS 4413)	2.59	3.52	1.66	0.48	4.74	13.00	87.00
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	12.59	0.00	0.00	0.05	0.16	12.81	87.19

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Home Health Care Services (NAICS 6216)	37.69	3.81	0.92	0.04	11.38	53.84	46.16
Support Activities for Road Transportation (NAICS 4884)	12.13	4.00	5.45	0.87	16.22	38.66	61.34
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Data Processing, Hosting, and Related Services (NAICS 5182)	21.33	1.91	5.77	0.14	15.34	44.50	55.50
Other Telecommunications (NAICS 5179)	4.61	2.56	1.77	0.43	3.00	12.38	87.62
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	9.48	2.11	0.10	1.07	15.87	28.62	71.38
Other Specialty Trade Contractors (NAICS 2389)	6.37	1.28	3.21	4.14	11.20	26.21	73.79
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Motor Vehicle Parts Manufacturing (NAICS 3363)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	3.03	3.16	0.22	0.03	7.11	13.56	86.44
Investigation and Security Services (NAICS 5616)	19.05	0.96	6.82	0.79	11.92	39.54	60.46
Rubber Product Manufacturing (NAICS 3262)	11.48	4.10	5.33	0.82	15.16	36.89	63.11
Office Administrative Services (NAICS 5611)	12.78	2.34	2.67	0.81	19.74	38.34	61.66

Sources and Notes: See Table 3.15.

Table 3.22. Detailed DBE Availability Percentages—CSE (All Contracts) (Dollars Awarded)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Motor Vehicle Manufacturing (NAICS 3361)	0.08	0.03	0.06	0.01	0.12	0.31	99.69
Communications Equipment Manufacturing (NAICS 3342)	4.41	9.80	0.73	0.00	18.18	33.13	66.87
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.42	0.51	1.58	0.24	10.16	15.91	84.09
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	2.14	3.75	2.23	1.25	7.12	16.49	83.51
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Computer Systems Design and Related Services (NAICS 5415)	15.67	3.78	15.23	1.29	12.46	48.43	51.57
Building Equipment Contractors (NAICS 2382)	10.52	5.40	1.59	0.87	12.53	30.90	69.10
Other Chemical Product and Preparation Manufacturing (NAICS 3259)	0.16	0.06	11.72	0.01	0.21	12.15	87.85
Railroad Rolling Stock Manufacturing (NAICS 3365)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.18	2.97	3.66	0.37	9.52	20.70	79.30
Natural Gas Distribution (NAICS 2212)	5.63	0.00	4.87	0.00	0.00	10.50	89.50
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	8.99	1.64	6.03	0.59	10.90	28.14	71.86
Engine, Turbine, and Power Transmission Equipment Manufacturing (NAICS 3336)	0.62	0.00	4.32	0.00	0.62	5.56	94.44
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Automotive Repair and Maintenance (NAICS 8111)	11.79	7.37	4.62	1.01	9.20	34.00	66.00
Agriculture, Construction, and Mining Machinery Manufacturing (NAICS 3331)	4.93	1.76	2.29	0.35	9.60	18.94	81.06
Cement and Concrete Product Manufacturing (NAICS 3273)	2.93	0.13	0.07	0.01	0.59	3.73	96.27
Architectural, Engineering, and Related Services (NAICS 5413)	7.29	2.12	5.00	1.36	10.30	26.08	73.92
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.32	2.16	1.40	0.71	12.94	22.54	77.46
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Electrical Equipment Manufacturing (NAICS 3353)	0.08	0.02	0.03	0.01	11.87	12.01	87.99
Electric Lighting Equipment Manufacturing (NAICS 3351)	1.88	0.04	0.07	6.03	12.75	20.77	79.23
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Architectural and Structural Metals Manufacturing (NAICS 3323)	5.51	0.04	0.07	0.39	14.58	20.59	79.41
Motor Vehicle Parts Manufacturing (NAICS 3363)	6.53	2.33	3.03	0.47	8.63	20.99	79.01
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	0.64	0.23	0.30	0.05	7.55	8.76	91.24
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	1.29	0.00	2.80	0.00	4.13	8.23	91.77
Support Activities for Rail Transportation (NAICS 4882)	18.21	12.34	3.80	2.17	13.75	50.27	49.73
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Plastics Product Manufacturing (NAICS 3261)	5.22	1.11	4.56	0.17	9.90	20.96	79.04
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Automotive Parts, Accessories, and Tire Stores (NAICS 4413)	2.33	0.73	1.21	0.72	3.18	8.18	91.82
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35
Investigation and Security Services (NAICS 5616)	19.41	1.17	6.00	0.96	11.84	39.37	60.63
Other Electrical Equipment and Component Manufacturing (NAICS 3359)	25.52	2.54	3.30	1.19	11.44	43.99	56.01
Building Material and Supplies Dealers (NAICS 4441)	6.65	2.08	2.84	0.52	10.06	22.16	77.84
Chemical and Allied Products Merchant Wholesalers (NAICS 4246)	6.23	4.13	7.07	1.19	6.46	25.08	74.92
Automotive Equipment Rental and Leasing (NAICS 5321)	8.45	3.20	4.35	0.87	12.66	29.53	70.47
Other Fabricated Metal Product Manufacturing (NAICS 3329)	0.19	1.51	2.42	4.43	18.69	27.24	72.76
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	2.03	2.84	1.96	0.16	16.34	23.33	76.67

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Offices of Other Health Practitioners (NAICS 6213)	4.99	0.95	2.33	2.25	23.13	33.65	66.35
Iron and Steel Mills and Ferroalloy Manufacturing (NAICS 3311)	12.67	6.33	6.33	0.00	12.67	38.01	61.99
Other Support Activities for Transportation (NAICS 4889)	30.32	15.93	7.11	0.06	4.93	58.36	41.64
Clothing Stores (NAICS 4481)	12.44	3.59	5.89	1.00	18.59	41.51	58.49
Newspaper, Periodical, Book, and Directory Publishers (NAICS 5111)	15.30	1.56	1.63	2.40	19.90	40.80	59.20
Petroleum and Coal Products Manufacturing (NAICS 3241)	5.97	2.13	2.77	0.43	15.48	26.79	73.21
Wired Telecommunications Carriers (NAICS 5171)	14.59	0.20	2.02	0.05	6.34	23.20	76.80
Household and Institutional Furniture and Kitchen Cabinet Manufacturing (NAICS 3371)	13.46	0.00	8.12	0.00	15.81	37.39	62.61
Services to Buildings and Dwellings (NAICS 5617)	16.65	2.83	2.56	2.41	11.31	35.76	64.24
Commercial and Service Industry Machinery Manufacturing (NAICS 3333)	11.19	0.00	1.89	0.00	16.24	29.31	70.69
Glass and Glass Product Manufacturing (NAICS 3272)	12.34	4.39	4.63	0.89	17.86	40.12	59.88
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Miscellaneous Nondurable Goods Merchant Wholesalers (NAICS 4249)	11.99	3.89	5.55	0.94	17.23	39.60	60.40
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing (NAICS 3327)	9.18	3.06	2.56	2.00	11.54	28.34	71.66
Facilities Support Services (NAICS 5612)	26.39	3.77	2.52	1.15	9.10	42.92	57.08
Other General Purpose Machinery Manufacturing (NAICS 3339)	9.78	3.08	7.51	0.75	14.87	35.99	64.01
Metalworking Machinery Manufacturing (NAICS 3335)	11.31	3.48	6.98	1.27	19.01	42.05	57.95
Paper and Paper Product Merchant Wholesalers (NAICS 4241)	13.25	3.47	4.58	0.91	16.14	38.35	61.65
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	6.67	3.47	2.29	0.38	10.99	23.81	76.19
Other Specialty Trade Contractors (NAICS 2389)	7.40	9.29	4.35	1.15	12.23	34.42	65.58

DBE Availability in MDOT's Market Area

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Semiconductor and Other Electronic Component Manufacturing (NAICS 3344)	3.11	0.11	0.15	0.05	7.64	11.06	88.94
Other Telecommunications (NAICS 5179)	4.61	2.56	1.77	0.43	3.00	12.38	87.62
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Computer and Peripheral Equipment Manufacturing (NAICS 3341)	13.54	4.23	4.41	0.77	14.36	37.31	62.69
Other Ambulatory Health Care Services (NAICS 6219)	16.61	3.47	4.64	1.01	17.37	43.10	56.90
Forging and Stamping (NAICS 3321)	0.00	0.00	0.00	0.00	28.89	28.89	71.11
Urban Transit Systems (NAICS 4851)	42.42	4.79	10.65	0.12	5.04	63.02	36.98
Advertising, Public Relations, and Related Services (NAICS 5418)	7.68	4.62	1.70	0.34	26.75	41.08	58.92
Couriers and Express Delivery Services (NAICS 4921)	24.20	3.10	0.10	2.52	1.80	31.73	68.27
Building Finishing Contractors (NAICS 2383)	7.24	8.08	4.53	0.09	10.59	30.53	69.47
Rubber Product Manufacturing (NAICS 3262)	38.74	1.65	3.31	1.09	26.68	71.47	28.53
Other Amusement and Recreation Industries (NAICS 7139)	12.64	3.74	5.20	0.94	17.69	40.20	59.80
Depository Credit Intermediation (NAICS 5221)	0.19	0.00	0.42	0.00	0.44	1.06	98.94
Accounting, Tax Preparation, Bookkeeping, and Payroll Services (NAICS 5412)	4.60	1.87	6.08	0.10	25.08	37.72	62.28
Furniture and Home Furnishing Merchant Wholesalers (NAICS 4232)	13.94	3.66	5.26	0.98	18.45	42.28	57.72
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	2.08	5.23	1.46	2.19	12.74	23.69	76.31
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45
Coating, Engraving, Heat Treating, and Allied Activities (NAICS 3328)	11.31	4.51	4.97	0.90	17.75	39.44	60.56

Sources and Notes: See Table 3.15.

IV. Market-Based Disparities in Business Formation and Business Owner Earnings

A. Introduction

In this chapter, we examine disparities in business formation and earnings in the private sector, where contracting activities are generally *not* subject to DBE or other affirmative action requirements. Statistical examination of disparities in the private sector of the relevant geographic market area is important for at least two reasons. First, to the extent that discriminatory practices by contractors, suppliers, insurers, lenders, customers, and others limit the ability of DBEs to compete, those practices will impact the larger private sector as well as the public sector. Second, examining the utilization of DBEs in the private sector provides an indicator of the extent to which DBEs are used in the absence of race- and gender-conscious efforts, since few firms in the private sector make such efforts.

There is a significant body of research on the economics of entrepreneurship and self-employment,⁶³ and there exists significant agreement on the microeconomic correlates of self-employment.⁶⁴ In the U.S., it is known that self-employment rises with age, is higher among men than women, and higher among non-minorities than minorities. The least educated have the highest probability of being self-employed. However, there is evidence in the U.S. that the most highly educated also have a relatively high probability of self-employment. On average, however, increases in educational attainment are generally found to lead to increases in the probability of being self-employed. A higher number of children in the family increases the likelihood of self-employment, at least for men. Workers in agriculture and construction, by contrast, are also relatively more likely to be self-employed, despite lower average levels of education.

There has been relatively less work on how institutional factors influence self-employment. Such work that has been conducted includes examining the role of minimum wage legislation (Blau, 1987), immigration (Fairlie and Meyer, 1998 and 2003; Olson, Zuiker and Montalto, 2000; Mora

⁶³ Microeconomic work includes Fuchs (1982), Borjas and Bronars (1989), Evans and Jovanovic (1989), Evans and Leighton (1989), Fairlie and Meyer (1996, 1998), Reardon (1998), Fairlie (1999), Wainwright (2000), Blanchflower and Wainwright (2005), and Blanchflower (2009) for the United States; Rees and Shah (1986), Pickles and O'Farrell (1987), Blanchflower and Oswald (1990, 1998), Meager (1992), Taylor (1996), Robson (1998a, 1998b), and Blanchflower and Shadforth (2007) for the UK; DeWit and van Winden (1990) for the Netherlands; Alba-Ramirez (1994) for Spain; Bernhardt (1994), Schuetze (1998), Arai (1997), Lentz and Laband (1990), and Kuhn and Schuetze (1998) for Canada; Laferrere and McEntee (1995) for France; Blanchflower and Meyer (1994) and Kidd (1993) for Australia; and Foti and Vivarelli (1994) for Italy. There are also several theoretical papers including Kihlstrom and Laffonte (1979), Kanbur (1990), Holmes and Schmitz (1990), Coate and Tennyson (1992), and Cagetti and DeNardi (2006), plus a few papers that draw comparisons across countries, *e.g.*, Schuetze (1998) for Canada and the U.S., Blanchflower and Meyer (1994) for Australia and the U.S., Alba-Ramirez (1994) for Spain and the U.S., and Acs and Evans (1994), Blanchflower (2000), Blanchflower, Oswald, and Stutzer (2001), and Blanchflower and Oswald (2008) for many countries.

⁶⁴ Parker (2004) and Aronson (1991) provide good overviews.

and Dávila, 2006; Robles and Cordero-Guzmán, 2007),⁶⁵ immigration policy (Borjas and Bronars, 1989), and retirement policies (Quinn, 1980). Studies by Long (1982), Blau (1987), and Schuetze (2000), have considered the role of taxes.⁶⁶ A number of other studies have also considered the cyclical aspects of self-employment and in particular how movements of self-employment are correlated with movements in unemployment. Meager (1992) provides a useful summary of much of this work.⁶⁷

Blanchflower, Oswald and Stutzer (2001) found that there is a strikingly large latent desire to own a business. There exists frustrated entrepreneurship on a huge scale in the U.S. and other Organization for Economic Co-operation and Development (OECD) countries.⁶⁸ In the U.S., 7 out of 10 people say they would prefer to be self-employed. This compares to an actual proportion of self-employed people in 2001 of 7.3 percent of the civilian labor force, which also shows that the proportion of the labor force that is self-employed has declined steadily since 1990 following a small increase in the rate from 1980 to 1990. This raises an important question. Why do so few individuals in the U.S. and OECD countries manage to translate their preferences into action? Lack of start-up capital is one likely explanation. This factor is commonly cited by small-business managers themselves (Blanchflower and Oswald, 1998). There is also

⁶⁵ Fairlie and Meyer (1998) found that immigration had no statistically significant impact at all on African American self-employment. In a subsequent paper, Fairlie and Meyer (2003) found that self-employed immigrants did displace self-employed native non-African Americans. They found that immigration has a large negative effect on the probability of self-employment among native non-African Americans, although, surprisingly, they found that immigrants increase native self-employment earnings.

⁶⁶ In an interesting study pooling individual level data for the U.S. and Canada from the Current Population Survey and the Survey of Consumer Finances, respectively, Schuetze (1998) finds that increases in income taxes have large and positive effects on the male self-employment rate. He found that a 30 percent increase in taxes generated a rise of 0.9 to 2.0 percentage points in the male self-employment rate in Canada compared with a rise of 0.8 to 1.4 percentage points in the U.S. over 1994 levels.

⁶⁷ Evans and Leighton (1989) found that nonminority men who are unemployed are nearly twice as likely as wage workers to enter self-employment. Bogenhold and Staber (1991) also find evidence that unemployment and self-employment are positively correlated. Blanchflower and Oswald (1990) found a strong negative relationship between regional unemployment and self-employment for the period 1983-1989 in the U.K. using a pooled cross-section time-series data set. Blanchflower and Oswald (1998) confirmed this result, finding that the log of the county unemployment rate entered negatively in a cross-section self-employment model for young people age 23 in 1981 and for the same people aged 33 in 1991. Taylor (1996) confirmed this result using data from the British Household Panel Study of 1991, showing that the probability of being self-employed rises when expected self-employment earnings increase relative to employee earnings, *i.e.*, when unemployment is low. Acs and Evans (1994) found evidence from an analysis of a panel of countries that the unemployment rate entered negatively in a fixed effect and random effects formulation. However, Schuetze (1998) found that for the U.S. and Canada the elasticity of the male self-employment rate with respect to the unemployment rate was considerably smaller than found for the effect from taxes discussed above. The elasticity of self-employment associated with the unemployment rate is about 0.1 in both countries using 1994 figures. A decrease of 5 percentage points in the unemployment rate in the U.S. (about the same decline occurred from 1983-1989) leads to about a 1 percentage point decrease in self-employment. Blanchflower (2000) found that there is generally a negative relationship between the self-employment rate and the unemployment rate. It does seem then that there is some disagreement in the literature on whether high unemployment acts to discourage self-employment because of the lack of available opportunities or encourage it because of the lack of viable alternatives.

⁶⁸ The OECD is an international organization of those developed countries that accept the principles of representative democracy and a free market economy. There are currently 30 full members.

econometric evidence that confirms this barrier. Holding other influences constant, people who inherit cash, who win the lottery, or who have large family assets, are all more likely both to set up and sustain a lasting small business. By contrast, childhood personality test-scores turn out to have almost no predictive power about which persons will be running their own businesses as adults (Blanchflower and Oswald, 1998).

One primary impediment to entrepreneurship among minorities is lack of capital. In work based on U.S. micro data at the level of the individual, Evans and Leighton (1989), and Evans and Jovanovic (1989), have argued formally that entrepreneurs face liquidity constraints. The authors use the National Longitudinal Survey of Young Men for 1966-1981, and the Current Population Surveys for 1968-1987. The key test shows that, all else remaining equal, people with greater family assets are more likely to switch to self-employment from employment. This asset variable enters econometric equations significantly and with a quadratic form. Although Evans and his collaborators draw the conclusion that capital and liquidity constraints bind, this claim is open to the objection that other interpretations of their correlation are feasible. One possibility, for example, is that inherently acquisitive individuals both start their own businesses and forego leisure to build up family assets. In this case, there would be a correlation between family assets and movement into self-employment even if capital constraints did not exist. A second possibility is that the correlation between family assets and the movement to self-employment arises because children tend to inherit family firms. Blanchflower and Oswald (1998), however, find that the probability of self-employment depends positively upon whether the individual ever received an inheritance or gift.⁶⁹ Moreover, when directly questioned in interview surveys, potential entrepreneurs say that raising capital is their principal problem. Work by Holtz-Eakin, Joulfaian and Harvey (1994a, 1994b) drew similar conclusions using different methods on U.S. data, examining flows into and out of self-employment and finding that inheritances both raise entry and slow exit. In contrast, Hurst and Lusardi (2004), citing evidence from the U.S. *Panel Study of Income Dynamics*, claim to show that wealth is not a significant determinant of entry into self-employment. In response, however, Fairlie and Krashinsky (2012) have demonstrated that when the sample is split into two segments—those who enter self-employment after job loss and those who do not—the strong correlation between assets and rate of entry in business formation is evident in both segments.

The work of Black, *et al.* (1996) for the United Kingdom discovers an apparently powerful role for house prices (through its impact on equity withdrawal) in affecting the supply of small new firms. Cowling and Mitchell (1997) find a similar result. Again, these are both suggestive of capital constraints. Finally, Lindh and Ohlsson (1996) adopt the Blanchflower-Oswald procedure and provide complementary evidence for Sweden. Bernhardt (1994), in a study for Canada using data from the 1981 Social Change in Canada Project, also found evidence that capital constraints appear to bind. Using the 1991 French Household Survey of Financial Assets, Laferrere and McEntee (1995) examined the determinants of self-employment using data on intergenerational transfers of wealth, education, informal human capital, and a range of demographic variables.

⁶⁹ This emerges from British data, the National Child Development Study; a birth cohort of children born in March 1958 who have been followed for the whole of their lives.

They also find evidence of the importance played by the family in the decision to enter self-employment. Intergenerational transfers of wealth, familial transfers of human capital, and the structure of the family, were found to be determining factors in the decision to move from wage work into entrepreneurship. Broussard, *et al.* (2013) found that the self-employed have between 0.1 and 0.2 more children compared to the non-self-employed. The authors argue that having more children can increase the likelihood that an inside family member will be a good match at running the business. One might also think that the existence of family businesses, which are particularly prevalent in construction and in agriculture, is a further way to overcome the existence of capital constraints. Transfers of firms within families will help to preserve the status quo and will work against the interests of African Americans, in particular, who do not have as strong a history of business ownership as indigenous non-minorities. Analogously, Hout and Rosen (2000) and Fairlie and Robb (2007a) found that the offspring of self-employed parents are more likely than others to become self-employed and argued that the historically low rates of self-employment among African Americans and Latinos may contribute to their low contemporary rates. Fairlie and Robb (2007b), using data from the U.S. *Characteristics of Business Owners Survey*, and Dunn and Holtz-Eakin (2000), using data from the U.S. *National Longitudinal Surveys*, show that the transmission of positive effects of family on self-employment operates through two channels, intergenerational transmission of entrepreneurial preferences and wealth, and the acquisition of general and specific human capital.

A continuing puzzle in the literature has been why, nationally, the self-employment rate of African American males is one-third of that of nonminority males and has remained roughly constant since 1910. Fairlie and Meyer (2000) rule out a number of explanations for the difference. They found that trends in demographic factors, including the Great Migration and the racial convergence in education levels, “did not have large effects on the trend in the racial gap in self-employment” (p. 662). They also found that an initial lack of business experience “cannot explain the current low levels of black self-employment.” Further, they found that “the lack of traditions in business enterprise among blacks that resulted from slavery cannot explain a substantial part of the current racial gap in self-employment” (p. 664).

Fairlie (1999) and Wainwright (2000) have shown that a considerable part of the explanation of the differences between the African American and nonminority self-employment rate can be attributed to discrimination. Using the 5 percent Public Use Microdata Sample data (“PUMS”) from the 1990 Census, Wainwright (2000) demonstrated that these disparities tend to persist even when factors such as geography, industry, occupation, age, education and assets are held constant.⁷⁰

⁷⁰ In Wainwright (2000), the author conducted a series of regression analyses, similar to those reported in Chapter IV, that examined racial differences among males in business formation rates and business owner earnings while holding a large set of control factors constant. Separate regressions were conducted for each of the nine Census geographic divisions. In addition to race, the following factors were controlled for: educational attainment, age, marital status, non-mover status, number of workers in the family, number of children, immigrant status, years in the U.S., English language proficiency, work-limiting disability, veteran status, years of military services, interest and dividend income, usual weeks worked per year, and usual hours worked per week, industry, and occupation. Additionally, a set of local labor market variables was included for each Census division, including the unemployment rate, population size, population growth rate, the government employment rate, and per capita

Bates (1989) finds strong supporting evidence that racial differences in levels of financial capital have significant effects upon racial patterns in business failure rates. Fairlie (1999, 2006) demonstrates, for example, that the African American exit rate from self-employment is twice as high as that of non-minorities. An example will help to make the point. Two baths are being filled with water. In the first scenario, both have the plug in. Water flows into bath A at the same rate as it does into bath B—that is, the inflow rate is the same. When we return after ten minutes the amount of water (the stock) will be the same in the two baths as the inflow rates were the same. In the second scenario, we take out the plugs and allow for the possibility that the outflow rates from the two baths are different. Bath A (the African American firms) has a much larger drain and hence the water flows out more quickly than it does from bath B (the nonminority firms). When we return after 10 minutes, even though the inflow rates are the same there is much less water in bath A than there is in bath B. A lower exit rate for nonminority-owned firms than is found for minority-owned firms is perfectly consistent with the observed fact that minority-owned firms are younger and smaller than nonminority-owned firms. The extent to which that will be true is a function of the relative sizes of the inflow and the outflow rates.

B. Race and Gender Disparities in Wage and Salary Earnings

In this section, we examine earnings to determine whether minority and female entrepreneurs earn less from their businesses than do their nonminority male counterparts. Other things equal, if minority and female business owners as a group cannot achieve comparable earnings from their businesses as similarly situated nonminorities because of discrimination, then failure rates for DBEs will be higher and DBE formation rates will be lower than would be observed in a race- and gender-neutral market area. Both phenomena would contribute directly to lower levels of minority and female business ownership.

Below, we first examine earnings disparities among wage and salary employees, that is, non-business owners. It is helpful to examine this segment of the labor force since a key source of new entrepreneurs in any given industry is the pool of experienced wage and salary workers in similar or related industries (Blanchflower 2000). Therefore, employment discrimination that adversely impacts the ability of minorities or women to succeed in the labor force directly shrinks the available pool of potential DBEs. In every instance examined, a statistically significant disparity in wage and salary earnings is observed—in the economy at large, and in the Construction, AE-CRS, Maintenance, IT, Services, and CSE sectors.⁷¹

income. The results, in general, showed large and statistically significant disparities in both sets of regressions for all minority groups examined. The findings were strongest for African Americans, followed by Native Americans and Hispanics. Large disparities were documented for Asians as well in many instances.

⁷¹ There is a substantial body of evidence that discriminatory constraints in the capital market prevent minority-owned businesses from obtaining business loans. Furthermore, even when they are able to obtain them, there is evidence that these loans are not obtained on equal terms: minority-owned firms have to pay higher interest rates, other things being equal. This is another form of discrimination with an obvious and direct impact on the ability of racial minorities to form businesses and to expand or grow previously formed businesses. *See* Chapter V, *infra*.

We then turn to an examination of differences in earnings among the self-employed, that is, among business owners. Here too, among the pool of minorities and women who have formed businesses despite discrimination in both employment opportunities and business opportunities, statistically significant disparities are observed in the vast majority of cases in the economy as a whole and in the Construction, AE-CRS, Maintenance, IT, Services, and CSE sectors.

In the remainder of this chapter, we discuss the methods and data we employed and present the specific findings.

1. Methods

We used the statistical technique of linear regression analysis to estimate the effect of each of a set of observable characteristics, such as education and age, on an outcome variable of interest. In this case, the outcome variable of interest is earnings and we used regression to compare earnings among individuals in similar geographic and product markets at similar points in time and with similar years of education and potential labor market experience and see if any adverse race or gender differences remain. In a discrimination free market area, one would not expect to observe significant differences in earnings by race or gender among such similarly situated observations.

Regression also allows us to narrowly tailor our statistical tests to MDOT's relevant geographic market, and assess whether disparities in that market are statistically significantly different from those observed elsewhere in the nation. Starting from an economy-wide data set, we first estimated the basic model of earnings differences just described and also included an indicator variable for MDOT Market Area (MDMA), which is comprised of the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area.⁷² This variable estimates the differential effect of location in the MDMA relevant to the rest of the country. This model appears as Specification 1 in Tables 4.1 through 4.7. Next, we estimated Specification 2, which is the same model as Specification 1 but with the addition of indicator variables that interact race and gender with the MDMA indicator. These variables estimate the differential effect of location in the MDMA *and* membership in the given race or gender group. Specification 3 represents our ultimate specification, which includes all of the variables from the basic model as well as any of the interaction terms from Specification 2 that were statistically significant.⁷³

Any negative and statistically significant differences by race or gender that remain in Specification 3 after holding all of these other factors constant—time, age, education, geography,

⁷² Footnote 26 lists the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area.

⁷³ If none of these terms is significant, then Specification 3 reduces to Specification 1.

and industry—are consistent with what would be observed in a market suffering from business-related discrimination.⁷⁴

2. Data

The analyses undertaken in this Study require individual-level data (*i.e.*, “microdata”) with relevant information on business ownership status and other key socioeconomic characteristics. The data source used is the American Community Survey (ACS) Public Use Microdata Sample (PUMS) for 2010–2014. The Census Bureau’s ACS is an ongoing survey covering the same type of information collected in the decennial census. The ACS is sent to approximately 3.5 million addresses annually, including housing units in all counties in the 50 states and the District of Columbia.⁷⁵ The PUMS file from the ACS contains records for a subsample of the full ACS. The data used here are the multi-year estimates combining the 2010 through 2014 ACS PUMS records. The combined file contains over six million person-level records. The 2010-2014 ACS PUMS provides the full range of population and housing information collected in the annual ACS and in the decennial census. Business ownership status is identified in the ACS PUMS through the “class of worker” variable, which distinguishes the unincorporated and incorporated self-employed from others in the labor force. The presence of the class of worker variable allows us to construct a detailed cross-sectional sample of individual business owners and their associated earnings.

3. Findings: Race and Gender Disparities in Wage and Salary Earnings

Tables 4.1 through 4.7 report results from our regression analyses of annual earnings among wage and salary workers in those industries most relevant to MDOT contracting and procurement. Table 4.1 focuses on the economy as a whole, Table 4.2 on Construction, Table 4.3 on AE-CRS, Table 4.4 on Maintenance, Table 4.5 on IT, Table 4.6 on Services, and Table 4.7 on CSE.⁷⁶ The numbers shown in each table indicate the percentage difference in that sector between the average annual wages of a given race/gender group and comparable nonminority males.

a. Specification 1 - the Basic Model

For example, in Table 4.1 Specification 1, the estimated percentage difference in average annual wages between African Americans (both genders) and nonminority males in 2010–2014 was -38.8 percent. That is, average annual wages among African Americans were 38.8 percent lower than for nonminority males who were otherwise similar in terms of geographic location,

⁷⁴ Typically, a given test statistic is considered to be statistically significant if there is a reasonably low probability that the value of the statistic is due to random chance alone. Unless otherwise indicated, in this and subsequent chapters, we employ three levels of statistical significance, corresponding to 10 percent, 5 percent, and 1 percent probabilities that results were the result of random chance.

⁷⁵ U.S. Census Bureau (2013).

⁷⁶ Procurement categories for Tables 4.2 through 4.7 are based on the top 95 percent of industries relevant to MDOT procurement, as described above in Tables 2.7 through 2.12.

industry, age, and education. The number in parentheses below each percentage difference is the t-statistic, which indicates whether the estimated percentage difference is statistically significant or not. In Tables 4.1 through 4.7, a t-statistic of 2.58 or larger indicates statistical significance at a 99 percent confidence level or better, a t-statistic of 1.96 or larger indicates statistical significance at a 95 percent confidence level or better, and a t-statistic of 1.64 or larger indicates statistical significance at a 90 percent confidence level or better.⁷⁷ In the example just used, the t-statistic of 251.16 indicates that the result is statistically significant at better than a 99 percent level of confidence.

Specification 1 in Table 4.1 shows adverse and statistically significant wage disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories, and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities are large as well, ranging from -19.4 percent for Asians to -38.8 percent for African Americans.

Specification 1 in Table 4.2 shows similar results when the basic analysis is restricted to Construction. In this sector, large, adverse, and statistically significant wage disparities are once again observed for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities in this sector are large as well, ranging from -15.2 percent for Asians to -37.0 percent for Native Americans.

Specification 1 in Table 4.3 shows similar results when the basic analysis is restricted to AE-CRS. In this sector, large, adverse, and statistically significant wage disparities are once again observed for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities in this sector are large as well, ranging from -13.0 percent for Asians to -38.5 percent for African Americans.

Specification 1 in Table 4.4 shows similar results when the basic analysis is restricted to Maintenance. In this sector, large, adverse, and statistically significant wage disparities are once again observed for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities in this sector are large as well, ranging from -13.0 percent for Asians to -35.6 percent for Native Americans.

Specification 1 in Table 4.5 shows similar results when the basic analysis is restricted to IT. In this sector, large, adverse, and statistically significant wage disparities are once again observed for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities in this sector are large as well, ranging from -9.5 percent for Asians to -42.5 percent for African Americans.

⁷⁷ From a two-tailed test.

Specification 1 in Table 4.6 shows similar results when the basic analysis is restricted to Services. In this sector, large, adverse, and statistically significant wage disparities are once again observed for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities in this sector are large as well, ranging from -15.4 percent for Asians to -38.2 percent for Native Americans.

Finally, Specification 1 in Table 4.7 for CSE also shows large, adverse, and statistically significant wage disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting in multiple race categories and nonminority women, consistent with the presence of discrimination in these markets. Observed disparities are large in this sector also, ranging from -15.4 percent for Asians to -36.6 percent for African Americans.

b. Specifications 2 and 3 - the Full Model Including MDOT-Specific Interaction Terms

Next, we turn to Specifications 2 and 3 in Tables 4.1 through 4.7. In each of these Tables, Specification 2 is the basic regression model with a set of interaction terms added, designed to test whether minorities and women in the MDMA differ significantly from those elsewhere in the U.S. economy. Specification 2 in Table 4.1, for example, shows a statistically significant 19.2 percent wage decrement that estimates the direct effect of being Asian in 2010–2014, as well as a statistically significant 5.6 percent wage decrement that captures the indirect effect of residing in the MDMA and being Asian. That is, wages for Asians in the MDMA, on average, were 19.2 percent lower than for Asians in the nation as a whole and 24.8 percent lower (-19.2 percent minus 5.6 percent) than for nonminority males in the MDMA. For African Americans, there is a statistically significant 2.2 percent wage increment (in Specification 2) associated with residing in the MDMA, leading to an overall wage decrement of 36.7 percent (-38.9 percent plus 2.2 percent). For Hispanics, there is a 0.7 percent wage increment (in Specification 2) associated with residing in the MDMA, but this difference is not statistically significant, leading to an overall wage decrement of 29.5 percent. For Native Americans, there is a 0.1 percent wage decrement associated with residing in the MDMA, but this difference is not statistically significant, leading to an overall wage decrement of 36.9 percent. For nonminority women, there is a 0.6 percent wage increment associated with residing in the MDMA, but this difference is also not statistically significant, leading to an overall wage decrement of 32.9 percent.

Specification 3 simply repeats Specification 2, dropping any MDMA interactions that are not statistically significant in Specification 2 at a confidence level of 95 percent or better. In Table 4.1, for example, interaction terms were included in the final specification only for African Americans and Asians. The net result of Specification 3 in Table 4.1 is evidence of large, adverse, and statistically significant wage disparities for all minority groups and for nonminority women consistent with the presence of discrimination in these markets—both nationally and in the MDMA. The same is true for all the other procurement categories as well: Construction (Table 4.2), AE-CRS (Table 4.3), Maintenance (Table 4.4), IT (Table 4.5), Services (Table 4.6), and CSE (Table 4.7).

In Construction, there are two groups with additional statistically significant wage increments associated with living in the MDMA and one with a statistically significant wage decrement.

African Americans have a 14.8 percent wage increment, nonminority females have an 8.0 percent wage increment, and Hispanics have a 5.3 percent wage decrement. The result for African Americans in Construction in the MDMA indicates that, on average, wages were 14.8 percent higher than for African Americans in the nation as a whole but 21.3 percent lower (-36.1 percent plus 14.8 percent) than for nonminority males in the MDMA. The result for nonminority females in Construction in the MDMA indicates that, on average, wages were 8.0 percent higher than for nonminority females in the nation as a whole but 23.1 percent lower (-31.1 percent plus 8.0 percent) than for nonminority males in the MDMA. The result for Hispanics in Construction in the MDMA indicates that, on average, wages were 5.3 percent lower than for Hispanics in the nation as a whole and 29.9 percent lower (-24.6 percent minus 5.3 percent) than for nonminority males in the MDMA. For the remaining groups—Asians, Native Americans, and persons reporting two or more races, the adverse wage disparities observed are no different in the MDMA than in the nation as a whole.

In AE-CRS, there are two groups with additional statistically significant wage increments associated with living in the MDMA and one with a statistically significant wage decrement. African Americans have a 13.4 percent wage increment, nonminority females have a 9.9 percent wage increment, and Hispanics have a 6.4 percent wage decrement. The result for African Americans in AE-CRS in the MDMA indicates that, on average, wages were 13.4 percent higher than for African Americans in the nation as a whole and 26.0 percent lower (-39.4 percent plus 13.4 percent) than for nonminority males in the MDMA. The result for nonminority females in AE-CRS in the MDMA indicates that, on average, wages were 9.9 percent higher than for nonminority females in the nation as a whole and 23.2 percent lower (-33.1 percent plus 9.9 percent) than for nonminority males in the MDMA. The result for Hispanics in AE-CRS in the MDMA indicates that, on average, wages were 6.4 percent lower than for Hispanics in the nation as a whole and 31.4 percent lower (-25.0 percent minus 6.4 percent) than for nonminority males in the MDMA. For the remaining groups—Asians, Native Americans, and persons reporting two or more races, the adverse wage disparities observed are no different in the MDMA than in the nation as a whole.

In Maintenance, there are two groups with additional statistically significant wage increments associated with living in the MDMA. African Americans have a 10.9 percent wage increment and nonminority females have an 8.3 percent wage increment. The result for African Americans in Maintenance in the MDMA indicates that, on average, wages were 10.9 percent higher than for African Americans in the nation as a whole and 24.7 percent lower (-35.6 percent plus 10.9 percent) than for nonminority males in the MDMA. The result for nonminority females in Maintenance in the MDMA indicates that, on average, wages were 8.3 percent higher than for nonminority females in the nation as a whole and 25.0 percent lower (-33.3 percent plus 8.3 percent) than for nonminority males in the MDMA. For the remaining groups—Hispanics, Asians, Native Americans, and persons reporting two or more races, the adverse wage disparities observed are no different in the MDMA than in the nation as a whole.

In IT, there are three groups with additional statistically significant wage increments associated with living in the MDMA and one with a statistically significant wage decrement. African Americans have a 16.9 percent wage increment, nonminority females have a 3.7 percent wage increment, persons reporting two or more races have a 9.6 percent wage increment, and Asians have an 8.0 percent wage decrement. The result for African Americans in IT in the MDMA

indicates that, on average, wages were 16.9 percent higher than for African Americans in the nation as a whole and 26.6 percent lower (-43.5 percent plus 16.9 percent) than for nonminority males in the MDMA. The result for nonminority females in IT in the MDMA indicates that, on average, wages were 3.7 percent higher than for nonminority females in the nation as a whole and 25.4 percent lower (-29.1 percent plus 3.7 percent) than for nonminority males in the MDMA. The result for persons reporting two or more races in IT in the MDMA indicates that, on average, wages were 9.6 percent higher than for persons reporting two or more races in the nation as a whole and 16.9 percent lower (-26.5 percent plus 9.6 percent) than for nonminority males in the MDMA. The result for Asians in IT in the MDMA indicates that, on average, wages were 8.0 percent lower than for Asians in the nation as a whole and 16.9 percent lower (-8.9 percent minus 8.0 percent) than for nonminority males in the MDMA. For the remaining groups—Hispanics, Native Americans, the adverse wage disparities observed are no different in the MDMA than in the nation as a whole.

In Services, there is one group with an additional statistically significant wage increment associated with living in the MDMA and one with a statistically significant wage decrement. African Americans have a 5.8 percent wage increment and Asians have a 7.0 percent wage decrement. The result for African Americans in Services in the MDMA indicates that, on average, wages were 5.8 percent higher than for African Americans in the nation as a whole and 32.4 percent lower (-38.2 percent plus 5.8 percent) than for nonminority males in the MDMA. The result for Asians in Services in the MDMA indicates that, on average, wages were 7.0 percent lower than for Asians in the nation as a whole and 22.0 percent lower (-15.0 percent minus 7.0 percent) than for nonminority males in the MDMA. For the remaining groups—Hispanics, Native Americans, persons reporting two or more races, and nonminority females, the adverse wage disparities observed are no different in the MDMA than in the nation as a whole.

In CSE, there is one group with an additional statistically significant wage decrement associated with living in the MDMA. Asians have a 6.6 percent wage decrement. The result for Asians in CSE in the MDMA indicates that, on average, wages were 6.6 percent lower than for Asians in the nation as a whole and 21.7 percent lower (-15.1 percent minus 6.6 percent) than for nonminority males in the MDMA. For the remaining groups—African Americans, Hispanics, Native Americans, persons reporting two or more races, and nonminority females, the adverse wage disparities observed are no different in the MDMA than in the nation as a whole.

c. Conclusions

Tables 4.1 through 4.7 demonstrate that minorities and women earn substantially and significantly less from their labor than do their similarly situated nonminority male counterparts—in the nation as a whole and in MDOT Market Area in particular. Such disparities are consistent with the presence of discrimination in the labor force that, in addition to its direct effect on workers, reduces the future availability of DBEs by stifling opportunities for minorities and women to progress through precisely those internal labor markets and occupational hierarchies that are most likely to lead to acquiring the skills, experience and contacts necessary to take advantage of entrepreneurial opportunities.⁷⁸ They also demonstrate that discrimination

⁷⁸ See, e.g., Ruetschlin and Asante-Muhammad (2015), Hamilton, *et al.* (2011), Pitts (2007).

results in less opportunity for minorities and women to accumulate and save business start-up capital through their work as employees. These disparities reflect more than just “societal discrimination” because they indicate a nexus between discrimination in the job market and reduced entrepreneurial opportunities for minorities and women. Other things equal, these reduced entrepreneurial opportunities, in turn, lead to lower DBE availability levels than would be expected if the market area were race- and gender-neutral.

Table 4.1. Annual Wage Earnings Regressions, All Industries, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.388 (251.16)	-0.389 (243.81)	-0.389 (244.08)
Hispanic	-0.295 (203.22)	-0.295 (200.89)	-0.295 (203.10)
Asian	-0.194 (96.35)	-0.192 (92.64)	-0.192 (92.71)
Native American	-0.369 (69.20)	-0.369 (68.79)	-0.369 (69.19)
Two or more races	-0.298 (94.41)	-0.298 (92.43)	-0.298 (94.38)
Nonminority Female	-0.328 (338.26)	-0.329 (333.56)	-0.328 (338.27)
Age	0.201 (719.15)	0.201 (719.15)	0.201 (719.15)
Age ²	-0.002 (625.28)	-0.002 (625.28)	-0.002 (625.28)
MDMA	0.405 (60.10)	0.408 (51.75)	0.412 (59.48)
MDMA*African American		0.022 (2.74)	0.019 (2.56)
MDMA*Hispanic		0.007 (0.67)	n/a
MDMA*Asian		-0.056 (5.65)	-0.059 (6.27)
MDMA*Native American		-0.001 (0.02)	n/a
MDMA*Two or more races		-0.007 (0.39)	n/a
MDMA*Nonminority Female		0.006 (1.00)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	3,967,952	3,967,952	3,967,952
Adj. R ²	.3970	.3970	.3970

Source: NERA calculations from the 2010-2014 ACS Public Use Microdata Sample.

Notes: (1) See above, section B.3.(a)-(b) for a description of Specifications 1 through 3; (2) Universe is all private sector wage and salary workers between the ages of 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (3) Reported number is the percentage difference in annual wages between a given group and nonminority men; (4) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level; (5) Geography is defined based on place of residence; (6) “MDMA” is shorthand for “MDOT Market Area,” which includes the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area; (7) “n/a” in Specification 3 means that the category was not included in the regression because it was not statistically significant in Specification 2, as described above in section B.3.b; (8) The “Yes” values next to the “Education,” “Geography” and “Industry” rows indicate that control variables were included in the regression specification for these factors.

Table 4.2. Annual Wage Earnings Regressions, Construction, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.354 (75.34)	-0.361 (74.19)	-0.361 (74.19)
Hispanic	-0.247 (68.89)	-0.246 (67.44)	-0.246 (67.48)
Asian	-0.152 (20.39)	-0.151 (19.72)	-0.151 (20.29)
Native American	-0.370 (28.74)	-0.370 (28.44)	-0.371 (28.75)
Two or more races	-0.243 (25.58)	-0.244 (25.27)	-0.243 (25.55)
Nonminority Female	-0.308 (99.43)	-0.311 (98.28)	-0.311 (98.30)
Age	0.155 (196.31)	0.155 (196.32)	0.155 (196.32)
Age ²	-0.001 (171.93)	-0.001 (171.95)	-0.001 (171.95)
MDMA	0.512 (29.27)	0.490 (25.93)	0.491 (26.51)
MDMA*African American		0.149 (6.52)	0.148 (6.53)
MDMA*Hispanic		-0.052 (2.76)	-0.053 (2.83)
MDMA*Asian		-0.004 (0.12)	n/a
MDMA*Native American		-0.089 (0.73)	n/a
MDMA*Two or more races		0.065 (1.13)	n/a
MDMA*Nonminority Female		0.081 (4.19)	0.080 (4.19)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	521,357	521,357	521,357
Adj. R ²	.2496	.2497	.2497

Source and Notes: See Table 4.1.

Table 4.3. Annual Wage Earnings Regressions, AE-CRS, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.385 (56.04)	-0.394 (53.94)	-0.394 (53.96)
Hispanic	-0.253 (54.21)	-0.250 (52.66)	-0.250 (52.75)
Asian	-0.130 (14.97)	-0.126 (13.73)	-0.129 (14.79)
Native American	-0.375 (23.81)	-0.374 (23.51)	-0.375 (23.83)
Two or more races	-0.243 (20.52)	-0.244 (19.95)	-0.243 (20.47)
Nonminority Female	-0.326 (83.17)	-0.330 (81.70)	-0.331 (81.78)
Age	0.157 (152.53)	0.157 (152.54)	0.157 (152.54)
Age ²	-0.002 (134.09)	-0.002 (134.10)	-0.002 (134.10)
MDMA	0.561 (28.78)	0.536 (25.54)	0.530 (25.96)
MDMA*African American		0.131 (4.73)	0.134 (4.88)
MDMA*Hispanic		-0.067 (2.99)	-0.064 (2.89)
MDMA*Asian		-0.036 (1.17)	n/a
MDMA*Native American		-0.074 (0.54)	n/a
MDMA*Two or more races		0.022 (0.37)	n/a
MDMA*Nonminority Female		0.095 (4.93)	0.099 (5.18)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	332,324	332,324	332,324
Adj. R ²	.2296	.2297	.2297

Source and Notes: See Table 4.1.

Table 4.4. Annual Wage Earnings Regressions, Maintenance, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.351 (86.95)	-0.356 (85.13)	-0.356 (85.21)
Hispanic	-0.254 (75.18)	-0.253 (74.00)	-0.254 (75.20)
Asian	-0.130 (22.01)	-0.128 (21.17)	-0.130 (21.96)
Native American	-0.356 (29.30)	-0.355 (28.94)	-0.356 (29.32)
Two or more races	-0.240 (28.59)	-0.240 (28.13)	-0.239 (28.56)
Nonminority Female	-0.331 (123.90)	-0.333 (122.54)	-0.333 (122.71)
Age	0.160 (221.53)	0.160 (221.51)	0.160 (221.50)
Age ²	-0.002 (195.29)	-0.002 (195.26)	-0.002 (195.26)
MDMA	0.485 (29.83)	0.465 (26.51)	0.454 (27.32)
MDMA*African American		0.101 (5.10)	0.109 (5.58)
MDMA*Hispanic		-0.028 (1.37)	n/a
MDMA*Asian		-0.050 (1.63)	n/a
MDMA*Native American		-0.097 (0.89)	n/a
MDMA*Two or more races		0.035 (0.70)	n/a
MDMA*Nonminority Female		0.076 (4.25)	0.083 (4.78)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	607,296	607,296	607,296
Adj. R ²	.2357	.2357	.2357

Source and Notes: See Table 4.1.

Table 4.5. Annual Wage Earnings Regressions, IT, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.425 (91.23)	-0.435 (88.83)	-0.435 (88.88)
Hispanic	-0.282 (73.89)	-0.282 (72.61)	-0.282 (73.91)
Asian	-0.095 (18.45)	-0.089 (16.52)	-0.089 (16.55)
Native American	-0.396 (28.39)	-0.395 (28.07)	-0.396 (28.43)
Two or more races	-0.261 (29.48)	-0.264 (29.07)	-0.265 (29.08)
Nonminority Female	-0.289 (98.09)	-0.291 (95.92)	-0.291 (96.05)
Age	0.170 (202.59)	0.169 (202.55)	0.169 (202.56)
Age ²	-0.002 (179.39)	-0.002 (179.36)	-0.002 (179.36)
MDMA	0.528 (33.66)	0.515 (30.19)	0.514 (30.81)
MDMA*African American		0.168 (8.09)	0.169 (8.25)
MDMA*Hispanic		-0.007 (0.32)	n/a
MDMA*Asian		-0.081 (4.22)	-0.080 (4.21)
MDMA*Native American		-0.057 (0.47)	n/a
MDMA*Two or more races		0.095 (2.11)	0.096 (2.14)
MDMA*Nonminority Female		0.036 (2.41)	0.037 (2.54)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	536,994	536,994	536,994
Adj. R ²	.3052	.3053	.3053

Source and Notes: See Table 4.1.

Table 4.6. Annual Wage Earnings Regressions, Services, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.379 (142.53)	-0.382 (138.44)	-0.382 (138.69)
Hispanic	-0.263 (108.35)	-0.262 (106.57)	-0.263 (108.27)
Asian	-0.154 (44.94)	-0.150 (42.32)	-0.150 (42.43)
Native American	-0.382 (42.52)	-0.382 (42.22)	-0.382 (42.52)
Two or more races	-0.281 (53.00)	-0.282 (52.18)	-0.280 (52.97)
Nonminority Female	-0.304 (178.88)	-0.304 (175.56)	-0.304 (178.89)
Age	0.188 (393.22)	0.188 (393.24)	0.188 (393.23)
Age ²	-0.002 (342.64)	-0.002 (342.66)	-0.002 (342.66)
MDMA	0.449 (42.40)	0.460 (37.98)	0.455 (41.79)
MDMA*African American		0.054 (4.22)	0.058 (4.84)
MDMA*Hispanic		-0.018 (1.24)	n/a
MDMA*Asian		-0.074 (4.98)	-0.070 (4.95)
MDMA*Native American		0.044 (0.48)	n/a
MDMA*Two or more races		0.058 (1.87)	n/a
MDMA*Nonminority Female		-0.009 (0.88)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	1,390,754	1,390,754	1,390,754
Adj. R ²	.4299	.4299	.4299

Source and Notes: See Table 4.1.

Table 4.7. Annual Wage Earnings Regressions, CSE, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.366 (149.19)	-0.367 (144.33)	-0.366 (149.25)
Hispanic	-0.250 (116.83)	-0.250 (115.34)	-0.250 (116.72)
Asian	-0.154 (51.93)	-0.151 (49.44)	-0.151 (49.46)
Native American	-0.356 (43.85)	-0.356 (43.58)	-0.356 (43.84)
Two or more races	-0.259 (53.79)	-0.259 (52.78)	-0.259 (53.78)
Nonminority Female	-0.290 (190.64)	-0.290 (187.57)	-0.290 (190.65)
Age	0.195 (467.92)	0.195 (467.93)	0.195 (467.93)
Age ²	-0.002 (406.12)	-0.002 (406.13)	-0.002 (406.13)
MDMA	0.399 (42.06)	0.406 (38.11)	0.410 (42.27)
MDMA*African American		0.016 (1.37)	n/a
MDMA*Hispanic		0.001 (0.05)	n/a
MDMA*Asian		-0.063 (4.65)	-0.066 (5.07)
MDMA*Native American		0.039 (0.46)	n/a
MDMA*Two or more races		0.019 (0.68)	n/a
MDMA*Nonminority Female		0.002 (0.23)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	1,668,823	1,668,823	1,668,823
Adj. R ²	.4483	.4483	.4483

Source and Notes: See Table 4.1.

4. Findings: Race and Gender Disparities in Business Owner Earnings

The patterns of discrimination that affect minority and female wage earners affect minority and female entrepreneurs as well. We turn next to the analysis of race and gender disparities in business owner earnings. Table 4.8 focuses on the economy as a whole, Table 4.9 on Construction, Table 4.10 on AE-CRS, Table 4.11 on Maintenance, Table 4.12 on IT, Table 4.13 on Services, and Table 4.14 on CSE.⁷⁹ The numbers shown in each table indicate the percentage difference in that sector between the average annual self-employment earnings of a given race/gender group and comparable nonminority males.

a. Specification 1 - the Basic Model⁸⁰

Specification 1 in Table 4.8 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 41.8 percent lower than for comparable nonminority males; for Hispanics, they are 23.4 percent lower; for Asians, they are 8.1 percent lower; for Native Americans, they are 43.8 percent lower; for persons reporting two or more races, they are 37.1 percent lower; and for nonminority women, they are 39.1 percent lower.

Turning to Construction, Specification 1 in Table 4.9 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 41.9 percent lower than for comparable nonminority males; for Hispanics, they are 11.0 percent lower; for Asians, they are 18.9 percent lower; for Native Americans, they are 40.6 percent lower; for persons reporting two or more races, they are 32.2 percent lower; and for nonminority women, they are 39.0 percent lower.

For AE-CRS, Specification 1 in Table 4.10 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 45.5 percent lower than for comparable nonminority males; for Hispanics, they are 14.1 percent lower; for Asians, they are 20.2 percent lower; for Native Americans, they are 34.2 percent lower; for persons reporting two or more races, they are 30.7 percent lower; and for nonminority women, they are 38.1 percent lower.

For Maintenance, Specification 1 in Table 4.11 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Asians, Native

⁷⁹ Procurement categories for Tables 4.9 through 4.14 are based on the top 95 percent of industries relevant to MDOT procurement, as described above in Tables 2.7 through 2.12.

⁸⁰ See above, section B.3.a., for a detailed description of Specification 1.

Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 40.4 percent lower than for comparable nonminority males; for Hispanics, they are 14.0 percent lower; for Asians, they are 15.1 percent lower; for Native Americans, they are 36.7 percent lower; for persons reporting two or more races, they are 28.4 percent lower; and for nonminority women, they are 38.3 percent lower.

For IT, Specification 1 in Table 4.12 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 47.6 percent lower than for comparable nonminority males; for Hispanics, they are 13.2 percent lower; for Asians, they are 16.1 percent lower; for Native Americans, they are 33.9 percent lower; for persons reporting two or more races, they are 31.6 percent lower; and for nonminority women, they are 27.1 percent lower.

For Services, Specification 1 in Table 4.13 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 46.6 percent lower than for comparable nonminority males; for Hispanics, they are 15.2 percent lower; for Asians, they are 5.1 percent lower; for Native Americans, they are 39.9 percent lower; for persons reporting two or more races, they are 33.9 percent lower; and for nonminority women, they are 37.0 percent lower.

For CSE, Specification 1 in Table 4.14 shows large, adverse, and statistically significant business owner earnings disparities for African Americans, Hispanics, Native Americans, persons reporting two or more races and nonminority women, consistent with the presence of discrimination in these markets. Business earnings for African Americans are 42.5 percent lower than for comparable nonminority males; for Hispanics, they are 15.7 percent lower; for Native Americans, they are 37.9 percent lower; for persons reporting two or more races, they are 31.6 percent lower; and for nonminority women, they are 37.9 percent lower.

b. Specifications 2 and 3 - the Full Model Including MDOT-Specific Interaction Terms⁸¹

Next, we turn to Specifications 2 and 3 in Tables 4.8 through 4.14. Specification 2 is the basic regression model enhanced by a set of interaction terms to test whether minorities and women in the MDMA differ significantly from those elsewhere in the U.S. economy. Specification 3 drops any MDMA interaction terms that are not statistically significant.

⁸¹ See above, section B.3.b., for a detailed description of Specifications 2 and 3.

For the economy as a whole in 2010-2014, Table 4.8 shows that none of the MDMA interaction terms is statistically significant at a 95 percent level or better, indicating that disparities are, on average, no better or worse in the MDMA than what is observed for the nation as a whole.

Tables 4.9 through 4.14, for Construction, AE-CRS, Maintenance, IT, Services, and CSE, respectively, show that none of the MDMA interaction terms is statistically significant, indicating that disparities are, on average, no better or worse in the MDMA than what is observed for the nation as a whole.

c. Conclusions

As was the case for wage and salary earners, minority and female entrepreneurs earn substantially and significantly less from their efforts than similarly situated nonminority male entrepreneurs. The situation, in general, differs little in MDOT Market Area from that which is observed for the nation as a whole. These disparities are consistent with the presence of discrimination in commercial markets that adversely affects DBEs. Other things equal, if minorities and women are prevented by discrimination from earning remuneration from their entrepreneurial efforts comparable to that of similarly situated nonminority males, then capital reinvestment and growth rates may slow, business failure rates may increase and, as demonstrated in the next section, business formation rates may decrease. Combined, these phenomena result in lower DBE availability levels than would be observed in a race- and gender-neutral market area, since discrimination depresses business owner earnings for minority and female entrepreneurs. Business owner earnings, however, are often directly related to whether an owner has the capital to reinvest (firm size), how long a firm survives (firm age), and how much money a firm takes in (individual firm revenues). These observations illustrate why employment size, years in business, and individual firm revenues are especially inappropriate factors to consider when attempting to determine if discrimination has diminished opportunities for DBEs.⁸²

⁸² For more on this topic, see “Understanding Capacity,” in Chapter III, section B.5, *supra*.

Table 4.8. Annual Business Owner Earnings Regressions, All Industries, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.418 (38.87)	-0.415 (37.04)	-0.418 (38.87)
Hispanic	-0.234 (25.46)	-0.237 (25.44)	-0.234 (25.46)
Asian	-0.081 (6.18)	-0.086 (6.40)	-0.081 (6.18)
Native American	-0.438 (14.64)	-0.436 (14.48)	-0.438 (14.64)
Two or more races	-0.371 (21.31)	-0.370 (20.87)	-0.371 (21.31)
Nonminority Female	-0.391 (71.56)	-0.390 (70.44)	-0.391 (71.56)
Age	0.185 (102.23)	0.185 (102.23)	0.185 (102.23)
Age ²	-0.002 (88.88)	-0.002 (88.89)	-0.002 (88.88)
MDMA	0.278 (7.28)	0.271 (6.25)	0.278 (7.28)
MDMA*African American		-0.066 (1.29)	n/a
MDMA*Hispanic		0.113 (1.81)	n/a
MDMA*Asian		0.098 (1.53)	n/a
MDMA*Native American		-0.185 (0.59)	n/a
MDMA*Two or more races		-0.041 (0.36)	n/a
MDMA*Nonminority Female		-0.025 (0.73)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	407,509	407,509	407,509
Adj. R ²	.1414	.1414	.1414

Source: NERA calculations from the 2010-2014 ACS Public Use Microdata Sample.

Notes: (1) See above, section B.4.(a)-(b) for a description of specifications 1 through 3; (2) Universe is all persons in the private sector with positive business earnings between the ages of 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (3) Reported number is the percentage difference in annual business earnings between a given group and nonminority men; (4) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level; (5) Geography is defined based on place of residence; (6) “MDMA” is shorthand for “MDOT Market Area,” which includes the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area; (7) “n/a” in Specification 3 means that the category was not included in the regression because it was not statistically significant in Specification 2, as described above in section B.4.b.

Table 4.9. Business Owner Earnings Regressions, Construction, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.419 (19.82)	-0.419 (19.30)	-0.419 (19.82)
Hispanic	-0.110 (6.87)	-0.114 (7.01)	-0.110 (6.87)
Asian	-0.189 (5.54)	-0.202 (5.80)	-0.189 (5.54)
Native American	-0.406 (7.76)	-0.403 (7.65)	-0.406 (7.76)
Two or more races	-0.322 (9.11)	-0.323 (9.04)	-0.322 (9.11)
Nonminority Female	-0.390 (27.27)	-0.389 (26.82)	-0.390 (27.27)
Age	0.180 (51.18)	0.180 (51.18)	0.180 (51.18)
Age ²	-0.002 (46.41)	-0.002 (46.42)	-0.002 (46.41)
MDMA	0.296 (4.02)	0.258 (3.29)	0.296 (4.02)
MDMA*African American		0.028 (0.23)	n/a
MDMA*Hispanic		0.131 (1.34)	n/a
MDMA*Asian		0.362 (1.77)	n/a
MDMA*Native American		-0.351 (0.69)	n/a
MDMA*Two or more races		0.076 (0.28)	n/a
MDMA*Nonminority Female		-0.042 (0.43)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	94,180	94,180	94,180
Adj. R ²	.0842	.0842	.0842

Source and Notes: See Table 4.8.

Table 4.10. Business Owner Earnings Regressions, AE-CRS, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.455 (17.03)	-0.448 (15.92)	-0.455 (17.03)
Hispanic	-0.141 (7.34)	-0.143 (7.34)	-0.141 (7.34)
Asian	-0.202 (5.57)	-0.206 (5.50)	-0.202 (5.57)
Native American	-0.342 (5.27)	-0.338 (5.18)	-0.342 (5.27)
Two or more races	-0.307 (7.31)	-0.308 (7.20)	-0.307 (7.31)
Nonminority Female	-0.381 (22.87)	-0.380 (22.35)	-0.381 (22.87)
Age	0.141 (32.48)	0.141 (32.48)	0.141 (32.48)
Age ²	-0.001 (29.29)	-0.001 (29.29)	-0.001 (29.29)
MDMA	0.308 (3.98)	0.303 (3.68)	0.308 (3.98)
MDMA*African American		-0.142 (1.20)	n/a
MDMA*Hispanic		0.074 (0.65)	n/a
MDMA*Asian		0.067 (0.42)	n/a
MDMA*Native American		-0.380 (0.62)	n/a
MDMA*Two or more races		0.052 (0.20)	n/a
MDMA*Nonminority Female		-0.011 (0.12)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	70,271	70,271	70,271
Adj. R ²	.0504	.0504	.0504

Source and Notes: See Table 4.8.

Table 4.11. Business Owner Earnings Regressions, Maintenance, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.404 (17.03)	-0.408 (16.68)	-0.404 (17.03)
Hispanic	-0.140 (7.88)	-0.143 (7.99)	-0.140 (7.88)
Asian	-0.151 (4.29)	-0.155 (4.31)	-0.151 (4.29)
Native American	-0.367 (6.29)	-0.363 (6.18)	-0.367 (6.29)
Two or more races	-0.284 (7.25)	-0.285 (7.19)	-0.284 (7.25)
Nonminority Female	-0.383 (23.98)	-0.382 (23.65)	-0.383 (23.98)
Age	0.140 (35.15)	0.140 (35.15)	0.140 (35.15)
Age ²	-0.001 (31.93)	-0.001 (31.92)	-0.001 (31.93)
MDMA	0.307 (3.91)	0.275 (3.29)	0.307 (3.91)
MDMA*African American		0.118 (0.92)	n/a
MDMA*Hispanic		0.154 (1.34)	n/a
MDMA*Asian		0.108 (0.58)	n/a
MDMA*Native American		-0.436 (0.82)	n/a
MDMA*Two or more races		0.077 (0.28)	n/a
MDMA*Nonminority Female		-0.029 (0.29)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	85,358	85,358	85,358
Adj. R ²	.0648	.0648	.0648

Source and Notes: See Table 4.8.

Table 4.12. Business Owner Earnings Regressions, IT, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.476 (20.04)	-0.471 (18.78)	-0.476 (20.04)
Hispanic	-0.132 (6.94)	-0.134 (6.94)	-0.132 (6.94)
Asian	-0.161 (5.39)	-0.162 (5.21)	-0.161 (5.39)
Native American	-0.339 (5.24)	-0.336 (5.16)	-0.339 (5.24)
Two or more races	-0.316 (8.27)	-0.322 (8.28)	-0.316 (8.27)
Nonminority Female	-0.271 (17.97)	-0.269 (17.43)	-0.271 (17.97)
Age	0.150 (36.47)	0.150 (36.47)	0.150 (36.47)
Age ²	-0.001 (32.03)	-0.001 (32.02)	-0.001 (32.03)
MDMA	0.252 (3.63)	0.263 (3.49)	0.252 (3.63)
MDMA*African American		-0.105 (1.00)	n/a
MDMA*Hispanic		0.069 (0.62)	n/a
MDMA*Asian		0.003 (0.03)	n/a
MDMA*Native American		-0.254 (0.40)	n/a
MDMA*Two or more races		0.216 (0.89)	n/a
MDMA*Nonminority Female		-0.061 (0.83)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	87,523	87,523	87,523
Adj. R ²	.0526	.0525	.0526

Source and Notes: See Table 4.8.

Table 4.13. Business Owner Earnings Regressions, Services, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.466 (28.88)	-0.467 (27.74)	-0.466 (28.88)
Hispanic	-0.152 (10.82)	-0.154 (10.82)	-0.152 (10.82)
Asian	-0.051 (2.40)	-0.055 (2.51)	-0.051 (2.40)
Native American	-0.399 (8.52)	-0.399 (8.46)	-0.399 (8.52)
Two or more races	-0.339 (12.23)	-0.347 (12.34)	-0.339 (12.23)
Nonminority Female	-0.370 (41.04)	-0.369 (40.32)	-0.370 (41.04)
Age	0.192 (66.00)	0.192 (65.99)	0.192 (66.00)
Age ²	-0.002 (57.31)	-0.002 (57.30)	-0.002 (57.31)
MDMA	0.236 (4.34)	0.220 (3.68)	0.236 (4.34)
MDMA*African American		0.013 (0.16)	n/a
MDMA*Hispanic		0.073 (0.85)	n/a
MDMA*Asian		0.066 (0.73)	n/a
MDMA*Native American		-0.047 (0.09)	n/a
MDMA*Two or more races		0.352 (1.74)	n/a
MDMA*Nonminority Female		-0.025 (0.46)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	166,082	166,082	166,082
Adj. R ²	.1078	.1077	.1078

Source and Notes: See Table 4.8.

Table 4.14. Business Owner Earnings Regressions, CSE, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.425 (22.93)	-0.420 (21.71)	-0.425 (22.93)
Hispanic	-0.157 (10.44)	-0.158 (10.39)	-0.157 (10.44)
Asian	0.052 (2.23)	0.050 (2.06)	0.052 (2.23)
Native American	-0.379 (8.23)	-0.377 (8.13)	-0.379 (8.23)
Two or more races	-0.316 (10.44)	-0.325 (10.61)	-0.316 (10.44)
Nonminority Female	-0.379 (36.93)	-0.380 (36.47)	-0.379 (36.93)
Age	0.169 (55.19)	0.169 (55.18)	0.169 (55.19)
Age ²	-0.002 (47.99)	-0.002 (47.98)	-0.002 (47.99)
MDMA	0.267 (4.46)	0.245 (3.78)	0.267 (4.46)
MDMA*African American		-0.083 (0.96)	n/a
MDMA*Hispanic		0.042 (0.43)	n/a
MDMA*Asian		0.043 (0.44)	n/a
MDMA*Native American		-0.298 (0.62)	n/a
MDMA*Two or more races		0.427 (1.87)	n/a
MDMA*Nonminority Female		0.047 (0.70)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	155,521	155,521	155,521
Adj. R ²	.1015	.1015	.1015

Source and Notes: See Table 4.8.

C. Race and Gender Disparities in Business Formation

As discussed in the two previous sections, discrimination that affects the wages and entrepreneurial earnings of minorities and women will ultimately affect the number of businesses formed by these groups as well. In this section, we turn to an analysis of race and gender disparities in business formation.⁸³ We compare self-employment rates by race and gender to determine whether minorities or women are as likely to become entrepreneurs as are similarly situated nonminority males. We find that in most cases they are not as likely to do so, and that minority and female business formation rates would be substantially and significantly higher if markets operated in a race- and gender-neutral manner.

Discrimination in the labor market, symptoms of which are evidenced in Section B.3 above, might cause wage and salary workers to turn to self-employment in hopes of encountering less discrimination from customers and suppliers than from employers and co-workers. Other things equal, and assuming minority and female workers did not believe that discrimination pervaded commercial markets as well, this would lead minority and female business formation rates to be higher than would otherwise be expected.

On the other hand, discrimination in the labor market prevents minorities and women from acquiring the very skills, experience, and positions that are often observed among those who leave the ranks of the wage and salary earners to start their own businesses. Many construction contracting concerns have been formed by individuals who were once employed as foremen or in related positions for other contractors, fewer by those who were employed instead as laborers. Moreover, discrimination in wages and salaries earned in labor markets inhibits the accumulation of capital necessary for business formation. Similarly, discrimination in commercial capital and credit markets, as well as asset and wealth distribution, prevents minorities and women from acquiring the financial credit and capital that are so often prerequisites to starting or expanding a business. Other things being equal, these phenomena would lead minority and female business formation rates to be lower than otherwise would be expected.

Further, discrimination by commercial customers and suppliers against DBEs, symptoms of which are evidenced in Section B.4 above and elsewhere, operates to increase input prices and lower output prices for DBEs. This discrimination leads to higher rates of failure for some minority- and women-owned firms, lower rates of profitability and growth for others, and prevents some minorities and women from ever starting businesses at all.⁸⁴ All of these phenomena, other things equal, would contribute directly to relatively lower observed rates of minority and female self-employment.

1. Methods and Data

To see if minorities or nonminority women are as likely to be business owners as are comparable nonminority males, we use a statistical technique known as Probit regression. Probit regression is

⁸³ We use the phrases “business formation rates” and “self-employment rates” interchangeably in this Study.

⁸⁴ See also the materials cited at fn. 63 *supra*.

used to determine the relationship between a categorical variable—one that can be characterized in terms of a “yes” or a “no” response as opposed to a continuous number—and a set of characteristics that are related to the outcome of the categorical variable. Probit regression produces estimates of the extent to which each characteristic is positively or negatively related to the likelihood that the categorical variable will be a yes or no. For example, Probit regression is used by statisticians to estimate the likelihood that an individual participates in the labor force, retires this year, or contracts a particular disease—these are all variables that can be categorized by a response of “yes” (for example, she is in the labor force) or “no” (for example, she is not in the labor force)—and the extent to which certain factors are positively or negatively related to the likelihood (for example, the more education she has, the more likely that she is in the labor force). Probit regression is one of several techniques that can be used to examine qualitative outcomes. Generally, other techniques such as Logit regression yield similar results.⁸⁵ In the present case, Probit regression is used to examine the relationship between the choice to own a business (yes or no) and the other demographic and socioeconomic characteristics in our basic model. The underlying data for this section is once again the 2010-2014 ACS PUMS.

2. Findings: Race and Gender Disparities in Business Formation

As a reference point, Tables 4.15 and 4.16 summarize rates of business ownership during 2010-2014 by race and gender. A notable feature of both tables is how much higher, on average, rates are for nonminority males than for all other groups. Table 4.15, for example, shows a 5.98 percentage point difference between the overall self-employment rate of African Americans and nonminority males in the MDMA ($11.55 - 5.57 = 5.98$). As shown in the rightmost column of that table, this 5.98 percentage point gap translates into an African American business formation rate in the MDMA that is 51.8 percent lower than the nonminority male business formation rate (*i.e.*, $5.57 - 11.55 \div 11.55 \approx -51.8\%$). For Hispanics, the business formation rate is 24.8 percent lower. For Asians, it is 6.6 percent lower. For Native Americans, it is 22.9 percent lower. For persons reporting two or more races, it is 36.5 percent lower. For minorities as a group, it is 34.9 percent lower. For nonminority women, it is 28.1 percent lower; and for DBEs overall, it is 32.1 percent lower.

Table 4.16 provides similar information for each of MDOT’s major procurement categories: Construction, AE-CRS, Maintenance, IT, Services and CSE. Large deficits are observed in all six categories and for all groups.

A portion of the group differences documented in Tables 4.15 and 4.16 may be associated with differences in the distribution of individual productivity characteristics and preferences between minorities, women and nonminority males. It is well known, for example, that earnings tend to increase with labor market experience (*i.e.*, age). It is also true that the propensity toward self-employment increases with labor market experience.⁸⁶ Since most minority populations in the United States have a lower median age than the nonminority population, it is important to test

⁸⁵ For a detailed discussion, see G.S. Maddala (1983). Probit analysis is performed here using the “dprobit” command in the statistical program STATA.

⁸⁶ Wainwright (2000), p. 86.

whether the disparities in business ownership evidenced in Tables 4.15 and 4.16 can be fully explained by differences in the age distribution or in other factors such as education, geographic location or the industry preferences of minorities and nonminority women compared to nonminority males.

Table 4.15. Self-Employment Rates in 2010-2014 for Selected Race and Gender Groups: United States and MDOT Market Area, All Procurement Categories

Race/Gender	U.S. (%)	MDMA (%)	Percent Difference from Nonminority Male in Column (2)
	(1)	(2)	(3)
African American	5.21	5.57	-51.8
Hispanic	8.45	8.69	-24.8
Asian	9.74	10.79	-6.6
Native American	8.04	8.91	-22.9
Two or more races	8.42	7.33	-36.5
Minority	7.73	7.52	-34.9
Nonminority Female	8.08	8.30	-28.1
DBE	7.90	7.84	-32.1
Nonminority Male	12.66	11.55	

Source: NERA calculations from the 2010-2014 ACS Public Use Microdata Sample.

Market-Based Disparities in Business Formation and Business Owner Earnings

Table 4.16. Self-Employment Rates in 2010-2014 for Selected Race and Gender Groups: United States and MDOT Market Area, By Procurement Category

Race/Gender	U.S. (%)	MDOT Market Area (%)	Percent Difference from Nonminority Male in Column (2)
	(1)	(2)	(3)
<i>Construction</i>			
African American	12.91	9.58	-46.0
Hispanic	16.61	12.57	-29.1
Asian	14.91	17.38	-2.0
Native American	15.53	13.72	-22.7
Two or more races	17.65	14.40	-18.8
Minority	15.75	11.97	-32.5
Nonminority Female	14.40	10.69	-39.7
DBE	15.39	11.66	-34.3
Nonminority Male	21.44	17.74	
<i>AE-CRS</i>			
African American	17.21	12.50	-33.0
Hispanic	17.21	12.09	-35.2
Asian	16.70	13.22	-29.2
Native American	17.52	13.99	-25.0
Two or more races	20.87	15.37	-17.6
Minority	17.34	12.56	-32.7
Nonminority Female	17.81	13.07	-30.0
DBE	17.48	12.73	-31.8
Nonminority Male	25.57	18.66	
<i>Maintenance</i>			
African American	8.14	7.83	-48.2
Hispanic	13.51	11.64	-23.0
Asian	9.20	12.71	-15.9
Native American	12.68	14.25	-5.7
Two or more races	13.14	11.84	-21.6
Minority	11.64	10.10	-33.2
Nonminority Female	10.34	9.50	-37.1
DBE	11.24	9.95	-34.1
Nonminority Male	17.63	15.11	
<i>IT</i>			
African American	9.89	8.56	-43.2
Hispanic	14.25	11.17	-25.8
Asian	8.18	9.10	-39.6
Native American	14.92	10.50	-30.3
Two or more races	14.70	11.26	-25.2
Minority	12.11	9.70	-35.6
Nonminority Female	13.37	11.01	-26.9
DBE	12.55	10.13	-32.7
Nonminority Male	21.00	15.06	

Market-Based Disparities in Business Formation and Business Owner Earnings

Race/Gender	U.S. (%)	MDOT Market Area (%)	Percent Difference from Nonminority Male in Column (2)
<i>Services</i>			
African American	6.14	6.12	-54.9
Hispanic	10.16	8.54	-37.0
Asian	10.43	11.16	-17.7
Native American	9.77	6.21	-54.2
Two or more races	9.64	7.98	-41.2
Minority	9.11	7.96	-41.3
Nonminority Female	8.65	9.21	-32.1
DBE	8.90	8.41	-38.0
Nonminority Male	16.70	13.56	
<i>CSE</i>			
African American	4.83	5.15	-51.5
Hispanic	7.77	7.05	-33.6
Asian	8.12	8.60	-18.9
Native American	8.94	7.84	-26.1
Two or more races	7.42	7.02	-33.8
Minority	7.10	6.60	-37.8
Nonminority Female	6.11	6.32	-40.4
DBE	6.70	6.50	-38.7
Nonminority Male	12.42	10.61	

Source: NERA calculations from the 2010-2014 ACS Public Use Microdata Sample.

Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

To do this, the remainder of this section presents a series of regression analyses that test whether large, adverse and statistically significant race and gender disparities for minorities and women remain when such other factors are held constant. Table 4.17 focuses on the economy as a whole, Table 4.18 on Construction, Table 4.19 on AE-CRS, Table 4.20 on Maintenance, Table 4.21 on IT, Table 4.22 on Services, and Table 4.23 on CSE.⁸⁷ The numbers shown in each of these tables indicate the percentage point difference between the probability of business ownership for a given race/gender group compared to similarly situated nonminority males.

a. Specification 1 - the Basic Model⁸⁸

Specification 1 in Table 4.17 shows large, adverse, and statistically significant business formation disparities for African Americans, Hispanics, Asians, Native Americans, persons reporting two or more races and nonminority women consistent with the presence of discrimination in these markets. Specification 1 in Tables 4.18 through 4.23 shows large,

⁸⁷ Procurement categories for Tables 4.18 through 4.23 are based on the top 95 percent of industries relevant to MDOT procurement, as described above in Tables 2.7 through 2.12.

⁸⁸ See above, section C.2.a., for a detailed description of Specification 1.

negative, and statistically significant business formation disparities for each of these groups in the Construction, AE-CRS, Maintenance, IT, Services, and CSE sectors, respectively.

b. Specifications 2 and 3 - the Full Model Including MDOT-Specific Interaction Terms⁸⁹

Several of the MDMA interaction terms included in Specification 2 were significant. The final results are shown in Specification 3 for Tables 4.17 through 4.23.

To summarize for the economy-wide results (Table 4.17):

- For African Americans, business formation rates are 2.4 percentage points lower than what would be expected in a race- and gender-neutral market area.⁹⁰
- For Hispanics, business formation rates are 1.4 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Asians, business formation rates are 0.1 percentage points higher than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 2.8 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For persons reporting two or more races, business formation rates are 1.4 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 1.2 percentage points lower than what would be expected in a race- and gender-neutral market area.

To summarize the results for Construction (Table 4.18):

- For African Americans, business formation rates are 8.1 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Hispanics, business formation rates are 4.7 percentage points lower than what would be expected in a race- and gender-neutral market area.

⁸⁹ See above, section C.2.b., for a detailed description of Specifications 2 and 3.

⁹⁰ Recall that the net business formation rate is equal to the value direct coefficient (on the African American indicator variable in this case) plus the value of the statistically significant coefficient on the MDMA*African American interaction term. In this example, the 2.4 percent figure is the net result of the direct coefficient for African Americans, with a value of -3.7 percent, and the coefficient for African Americans interacted with the MDMA indicator, which is positive 1.3 percent.

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- For Asians, business formation rates are 3.3 percentage points higher than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 6.7 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For persons reporting two or more races, business formation rates are 2.2 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 5.2 percentage points lower than what would be expected in a race- and gender-neutral market area.

To summarize the results for AE-CRS (Table 4.19):

- For African Americans, business formation rates are 8.4 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Hispanics, business formation rates are 5.2 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Asians, business formation rates are 7.1 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 8.6 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For persons reporting two or more races, business formation rates are 2.4 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 6.2 percentage points lower than what would be expected in a race- and gender-neutral market area.

To summarize the results for Maintenance (Table 4.20):

- For African Americans, business formation rates are 4.5 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Hispanics, business formation rates are 3.2 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Asians, business formation rates are 1.3 percentage points higher than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 4.9 percentage points lower than what would be expected in a race- and gender-neutral market area.

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- For persons reporting two or more races, business formation rates are 1.7 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 4.0 percentage points lower than what would be expected in a race- and gender-neutral market area.

To summarize the results for IT (Table 4.21):

- For African Americans, business formation rates are 7.0 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Hispanics, business formation rates are 2.6 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Asians, business formation rates are 1.8 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 6.0 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For persons reporting two or more races, business formation rates are 1.9 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 1.8 percentage points lower than what would be expected in a race- and gender-neutral market area.

To summarize the results for Services (Table 4.22):

- For African Americans, business formation rates are 3.6 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Hispanics, business formation rates are 1.9 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Asians, business formation rates are 1.0 percentage points higher than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 3.7 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For persons reporting two or more races, business formation rates are 1.8 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 0.7 percentage points lower than what would be expected in a race- and gender-neutral market area.

To summarize the results for CSE (Table 4.23):

- For African Americans, business formation rates are 2.1 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Hispanics, business formation rates are 1.1 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For Asians, business formation rates are 0.6 percentage points higher than what would be expected in a race- and gender-neutral market area.
- For Native Americans, business formation rates are 2.3 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For persons reporting two or more races, business formation rates are 1.0 percentage points lower than what would be expected in a race- and gender-neutral market area.
- For nonminority women, business formation rates are 1.0 percentage points lower than what would be expected in a race- and gender-neutral market area.

Table 4.17. Business Formation Regressions, All Industries, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.037 (95.00)	-0.037 (92.65)	-0.037 (92.64)
Hispanic	-0.029 (87.55)	-0.029 (87.59)	-0.029 (87.57)
Asian	-0.013 (28.54)	-0.014 (28.99)	-0.014 (28.97)
Native American	-0.028 (23.81)	-0.029 (23.85)	-0.028 (23.9)
Two or more races	-0.014 (17.73)	-0.014 (17.64)	-0.014 (17.71)
Nonminority Female	-0.026 (101.24)	-0.026 (101.38)	-0.026 (101.37)
Age	0.008 (124.51)	0.008 (124.48)	0.008 (124.48)
Age ²	-0.000 (82.14)	-0.000 (82.12)	-0.000 (82.12)
MDMA	-0.006 (4.91)	-0.013 (9.49)	-0.012 (9.36)
MDMA*African American		0.013 (6.07)	0.013 (5.95)
MDMA*Hispanic		0.016 (6.23)	0.015 (6.12)
MDMA*Asian		0.015 (6.27)	0.015 (6.16)
MDMA*Native American		0.014 (0.94)	n/a
MDMA*Two or more races		0.007 (1.37)	n/a
MDMA*Nonminority Female		0.015 (9.59)	0.014 (9.46)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	4,366,874	4,366,874	4,366,874
Pseudo R ²	.2104	.2105	.2105

Source: NERA calculations from the 2010-2014 ACS Public Use Microdata Sample.

Notes: (1) See above, section C.2.(a)-(b) for a description of specifications 1 through 3; (2) Universe is all private sector labor force participants between the ages of 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (3) Reported number represents the percentage point probability difference in business ownership rates between a given group and nonminority men, evaluated at the mean business ownership rate for the estimation sample; (4) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level; (5) Geography is defined based on place of residence; (6) “MDMA” is shorthand for “MDOT Market Area,” which includes the State of Maryland, the State of Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area; (7) “n/a” in Specification 3 indicates that the category was not included in the regression because it was not statistically significant in Specification 2, as described above in section C.2.b.

Table 4.18. Business Formation Regressions, Construction, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.081 (39.65)	-0.081 (38.04)	-0.081 (39.62)
Hispanic	-0.047 (30.98)	-0.048 (30.69)	-0.047 (31.03)
Asian	-0.036 (11.05)	-0.039 (11.68)	-0.039 (11.70)
Native American	-0.067 (12.23)	-0.067 (12.20)	-0.067 (12.23)
Two or more races	-0.022 (5.41)	-0.022 (5.30)	-0.022 (5.44)
Nonminority Female	-0.052 (35.66)	-0.052 (34.75)	-0.052 (35.66)
Age	0.016 (51.21)	0.016 (51.20)	0.016 (51.21)
Age ²	-0.000 (33.01)	-0.000 (33.01)	-0.000 (33.01)
MDMA	-0.034 (6.08)	-0.035 (5.82)	-0.037 (6.56)
MDMA*African American		-0.012 (1.23)	n/a
MDMA*Hispanic		0.004 (0.43)	n/a
MDMA*Asian		0.069 (4.09)	0.072 (4.30)
MDMA*Native American		0.031 (0.54)	n/a
MDMA*Two or more races		-0.009 (0.36)	n/a
MDMA*Nonminority Female		-0.014 (1.72)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	617,717	617,717	617,717
Pseudo R ²	.0970	.0970	.0970

Source and Notes: See Table 4.17.

Table 4.19. Business Formation Regressions, AE-CRS, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.085 (25.38)	-0.085 (24.11)	-0.084 (25.31)
Hispanic	-0.052 (23.67)	-0.053 (23.60)	-0.052 (23.67)
Asian	-0.071 (17.88)	-0.072 (17.62)	-0.071 (17.84)
Native American	-0.086 (11.36)	-0.086 (11.36)	-0.086 (11.36)
Two or more races	-0.024 (4.21)	-0.024 (4.16)	-0.024 (4.21)
Nonminority Female	-0.078 (39.41)	-0.079 (38.90)	-0.079 (38.85)
Age	0.019 (43.19)	0.019 (43.19)	0.019 (43.20)
Age ²	-0.000 (25.70)	-0.000 (25.69)	-0.000 (25.70)
MDMA	-0.062 (9.22)	-0.068 (9.60)	-0.064 (9.41)
MDMA*African American		0.005 (0.39)	n/a
MDMA*Hispanic		0.018 (1.52)	n/a
MDMA*Asian		0.030 (1.82)	n/a
MDMA*Native American		0.046 (0.61)	n/a
MDMA*Two or more races		0.006 (0.20)	n/a
MDMA*Nonminority Female		0.022 (2.31)	0.017 (1.90)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	400,424	400,424	400,424
Pseudo R ²	.0744	.0744	.0744

Source and Notes: See Table 4.17.

Table 4.20. Business Formation Regressions, Maintenance, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.060 (37.73)	-0.061 (36.91)	-0.061 (36.89)
Hispanic	-0.032 (25.53)	-0.032 (25.39)	-0.032 (25.57)
Asian	-0.023 (9.49)	-0.024 (9.90)	-0.024 (9.87)
Native American	-0.049 (11.68)	-0.050 (11.77)	-0.049 (11.69)
Two or more races	-0.017 (5.18)	-0.017 (5.19)	-0.017 (5.20)
Nonminority Female	-0.040 (35.54)	-0.040 (35.14)	-0.040 (35.53)
Age	0.013 (52.40)	0.013 (52.39)	0.013 (52.40)
Age ²	-0.000 (35.46)	-0.000 (35.45)	-0.000 (35.46)
MDMA	-0.019 (4.26)	-0.023 (4.95)	-0.021 (4.74)
MDMA*African American		0.019 (2.38)	0.016 (2.13)
MDMA*Hispanic		0.006 (0.87)	n/a
MDMA*Asian		0.040 (3.11)	0.037 (2.94)
MDMA*Native American		0.064 (1.38)	n/a
MDMA*Two or more races		0.008 (0.43)	n/a
MDMA*Nonminority Female		0.007 (1.11)	n/a
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	696,914	696,914	696,914
Pseudo R ²	.1281	.1281	.1281

Source and Notes: See Table 4.17.

Table 4.21. Business Formation Regressions, IT, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.070 (34.74)	-0.071 (33.34)	-0.070 (34.55)
Hispanic	-0.041 (26.66)	-0.041 (26.71)	-0.041 (26.66)
Asian	-0.065 (31.38)	-0.067 (31.49)	-0.067 (31.46)
Native American	-0.059 (11.18)	-0.060 (11.18)	-0.060 (11.20)
Two or more races	-0.019 (5.26)	-0.020 (5.32)	-0.019 (5.28)
Nonminority Female	-0.033 (25.92)	-0.033 (25.88)	-0.033 (25.83)
Age	0.014 (45.97)	0.014 (45.95)	0.014 (45.96)
Age ²	-0.000 (26.39)	-0.000 (26.37)	-0.000 (26.37)
MDMA	-0.046 (10.59)	-0.054 (11.66)	-0.052 (11.52)
MDMA*African American		0.014 (1.68)	n/a
MDMA*Hispanic		0.018 (2.05)	0.015 (1.81)
MDMA*Asian		0.051 (5.31)	0.049 (5.12)
MDMA*Native American		0.021 (0.38)	n/a
MDMA*Two or more races		0.014 (0.79)	n/a
MDMA*Nonminority Female		0.017 (2.78)	0.015 (2.46)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	622,458	622,458	622,458
Pseudo R ²	.1102	.1103	.1103

Source and Notes: See Table 4.17.

Table 4.22. Business Formation Regressions, Services, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.051 (62.79)	-0.052 (61.02)	-0.052 (61.01)
Hispanic	-0.033 (47.13)	-0.033 (47.18)	-0.033 (47.17)
Asian	-0.016 (16.04)	-0.017 (16.79)	-0.017 (16.77)
Native American	-0.037 (14.40)	-0.037 (14.39)	-0.037 (14.47)
Two or more races	-0.018 (10.96)	-0.019 (11.05)	-0.018 (10.97)
Nonminority Female	-0.031 (58.48)	-0.032 (59.03)	-0.032 (59.01)
Age	0.011 (80.45)	0.011 (80.45)	0.011 (80.45)
Age ²	-0.000 (50.76)	-0.000 (50.75)	-0.000 (50.75)
MDMA	-0.019 (8.36)	-0.028 (11.42)	-0.027 (11.33)
MDMA*African American		0.016 (3.89)	0.016 (3.78)
MDMA*Hispanic		0.015 (3.33)	0.014 (3.23)
MDMA*Asian		0.027 (5.82)	0.027 (5.72)
MDMA*Native American		0.003 (0.12)	n/a
MDMA*Two or more races		0.015 (1.53)	n/a
MDMA*Nonminority Female		0.026 (8.44)	0.025 (8.32)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	1,557,982	1,557,982	1,557,982
Pseudo R ²	.1607	.1608	.1608

Source and Notes: See Table 4.17.

Table 4.23. Business Formation Regressions, CSE, 2010-2014

Independent Variables	Specification		
	(1)	(2)	(3)
African American	-0.032 (48.74)	-0.033 (47.58)	-0.033 (47.57)
Hispanic	-0.021 (39.80)	-0.021 (39.88)	-0.021 (39.86)
Asian	-0.007 (9.26)	-0.008 (9.83)	-0.008 (9.81)
Native American	-0.023 (12.10)	-0.023 (12.19)	-0.023 (12.14)
Two or more races	-0.010 (8.06)	-0.011 (8.16)	-0.010 (8.06)
Nonminority Female	-0.021 (49.61)	-0.021 (49.58)	-0.021 (49.57)
Age	0.009 (84.20)	0.009 (84.19)	0.009 (84.19)
Age ²	-0.000 (55.38)	-0.000 (55.36)	-0.000 (55.36)
MDMA	-0.016 (9.36)	-0.020 (11.01)	-0.020 (10.90)
MDMA*African American		0.012 (3.50)	0.012 (3.40)
MDMA*Hispanic		0.011 (2.99)	0.010 (2.89)
MDMA*Asian		0.014 (3.99)	0.014 (3.89)
MDMA*Native American		0.027 (1.17)	n/a
MDMA*Two or more races		0.010 (1.32)	n/a
MDMA*Nonminority Female		0.011 (4.47)	0.011 (4.34)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	1,835,894	1,835,894	1,835,894
Pseudo R ²	.1945	.1945	.1945

Source and Notes: See Table 4.17.

c. Conclusions

This section has demonstrated that minorities and women in general are substantially and statistically significantly less likely to own their own businesses than would be expected based upon their observable demographic characteristics including age, education, geographic location, industry and trends over time. Moreover, as demonstrated in previous sections, these groups also suffer substantial and significant earnings disadvantages relative to comparable nonminority males whether they work as wage and salary employees or as entrepreneurs.⁹¹ These findings are consistent with results that would be observed in a discriminatory market area.

D. Expected Business Formation Rates—Implications for Current DBE Availability⁹²

In Table 4.24, the Probit regression results for MDOT Market Area from Tables 4.17 through 4.23, for the overall economy, Construction, AE-CRS, Maintenance, IT, Services, and CSE, respectively, are combined with weighted average self-employment rates by race and gender from the 2010-2014 ACS PUMS (Tables 4.15 and 4.16) to determine the disparity between baseline availability and expected availability in a race- and gender-neutral market area. These figures appear in column (3) of each panel in Table 4.24.

In Table 4.24, the business formation rate in the MDMA for African Americans in AE-CRS, for example, is 12.50 percent. According to the regression specification underlying Table 4.19 however, that rate would be 20.90 percent, or 67.2 percent higher, in a race- and gender-neutral market area. Put differently, the disparity ratio of the actual business formation rate to the expected business formation rate for African Americans in AE-CRS in the MDMA is 59.81. Disparity indices are adverse and statistically significant in AE-CRS for African Americans, Asians, Hispanics, Native Americans, persons reporting two or more races, minorities as a group, nonminority women, and minorities and women combined.⁹³

In Construction, the largest disparities observed are for African Americans (54.19), followed in descending order by DBEs as a group (67.17), Native Americans (67.19), nonminority women (67.28), minorities as a group (67.74), Hispanics (72.79), and persons reporting two or more races (86.75).

In AE-CRS, the largest disparities observed are for African Americans (59.81), followed in descending order by Native Americans (61.93), DBEs as a group (63.55), Asians (65.06),

⁹¹ Although business formation disparities were not observed for Asians in the MDOT Market Area, wage and salary earnings disparities and business owner earnings disparities for Asians *were* observed.

⁹² In addition to quantifying how discrimination may have depressed current measured levels of DBE availability, this exercise also addresses the requirements of 49 C.F.R. 26.45 (“Step 2”) for the United States Department of Transportation Disadvantaged Business Enterprise Program.

⁹³ Results are adverse because they are less than 100, and they are statistically significant because the corresponding coefficient(s) from the Probit regression are statistically significant.

minorities as a group (66.60), nonminority women (67.83), Hispanics (69.92), and persons reporting two or more races (86.49).

In Maintenance, the largest disparities observed are for African Americans (56.21), followed in descending order by Asians (67.57), DBEs as a group (70.32), nonminority women (70.37), minorities as a group (71.63), Native Americans (74.41), Hispanics (78.44), and persons reporting two or more races (87.44).

In IT, the largest disparities observed are for African Americans (55.01), followed in descending order by Native Americans (63.64), minorities as a group (70.80), DBEs as a group (75.43), Hispanics (81.12), Asians (83.49), persons reporting two or more races (85.56), and nonminority women (85.95).

In Services, the largest disparities observed are for Native Americans (62.66), followed in descending order by African Americans (62.96), minorities as a group (78.35), DBEs as a group (81.57), persons reporting two or more races (81.60), Hispanics (81.80), and nonminority women (92.94).

In CSE, the largest disparities observed are for African Americans (71.03), followed in descending order by Native Americans (77.32), DBEs as a group (83.33), minorities as a group (85.71), nonminority women (86.34), Hispanics (86.50), and persons reporting two or more races (87.53).

In the economy as a whole, the largest disparities observed are for African Americans (69.89), followed in descending order by Native Americans (76.09), DBEs as a group (80.91), minorities as a group (81.21), persons reporting two or more races (83.96), Hispanics (86.12), and nonminority women (87.37).

Given the disparities observed in the economy for the presumptively disadvantaged groups under 49 CFR Part 26, goal-setters might consider adjusting baseline estimates of DBE availability upward to partly account for the depressing effects of discrimination on current measured levels of availability. The business formation rate disparities documented in Table 4.24 can be combined with the estimates of current DBE availability documented in Table 3.15 and elsewhere to provide estimates of expected availability. Such estimates appear in Table 6.6, below. Expected DBE availability exceeds actual current DBE availability overall and in each major procurement category.

Market-Based Disparities in Business Formation and Business Owner Earnings

Table 4.24. Actual and Potential Business Formation Rates in MDOT Market Area

Race/Gender	Business Formation Rate (%)	Expected Business Formation Rate (%)	Disparity Ratio
<i>All Industries</i>	(1)	(2)	(3)
African American	5.57	7.97	69.89
Hispanic	8.69	10.09	86.12
Asian	10.79	10.69	
Native American	8.91	11.71	76.09
Two or more races	7.33	8.73	83.96
Minority	7.52	9.26	81.21
Nonminority Female	8.30	9.50	87.37
DBE	7.84	9.69	80.91
<i>Construction</i>	(1)	(2)	(3)
African American	9.58	17.68	54.19
Hispanic	12.57	17.27	72.79
Asian	17.38	14.08	
Native American	13.72	20.42	67.19
Two or more races	14.40	16.60	86.75
Minority	11.97	17.67	67.74
Nonminority Female	10.69	15.89	67.28
DBE	11.66	17.36	67.17
<i>AE-CRS</i>	(1)	(2)	(3)
African American	12.50	20.90	59.81
Hispanic	12.09	17.29	69.92
Asian	13.22	20.32	65.06
Native American	13.99	22.59	61.93
Two or more races	15.37	17.77	86.49
Minority	12.56	18.86	66.60
Nonminority Female	13.07	19.27	67.83
DBE	12.73	20.03	63.55
<i>Maintenance</i>	(1)	(2)	(3)
African American	7.83	13.93	56.21
Hispanic	11.64	14.84	78.44
Asian	12.71	18.81	67.57
Native American	14.25	19.15	74.41
Two or more races	11.84	13.54	87.44
Minority	10.10	14.10	71.63
Nonminority Female	9.50	13.50	70.37
DBE	9.95	14.15	70.32

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Race/Gender	Business Formation Rate (%)	Expected Business Formation Rate (%)	Disparity Ratio
<i>IT</i>	(1)	(2)	(3)
African American	8.56	15.56	55.01
Hispanic	11.17	13.77	81.12
Asian	9.10	10.90	83.49
Native American	10.50	16.50	63.64
Two or more races	11.26	13.16	85.56
Minority	9.70	13.70	70.80
Nonminority Female	11.01	12.81	85.95
DBE	10.13	13.43	75.43
<i>Services</i>	(1)	(2)	(3)
African American	6.12	9.72	62.96
Hispanic	8.54	10.44	81.80
Asian	11.16	10.16	
Native American	6.21	9.91	62.66
Two or more races	7.98	9.78	81.60
Minority	7.96	10.16	78.35
Nonminority Female	9.21	9.91	92.94
DBE	8.41	10.31	81.57
<i>CSE</i>	(1)	(2)	(3)
African American	5.15	7.25	71.03
Hispanic	7.05	8.15	86.50
Asian	8.60	8.00	
Native American	7.84	10.14	77.32
Two or more races	7.02	8.02	87.53
Minority	6.60	7.70	85.71
Nonminority Female	6.32	7.32	86.34
DBE	6.50	7.80	83.33

Source: 2010-2014 ACS Public Use Microdata Sample. See Tables 4.15 through 4.22.

Notes: (A) Figures are rounded. Rounding was performed subsequent to any mathematical calculations. (B) Figures in column (1) are average self-employment rates weighted using ACS population-based person weights, as also shown in Tables 4.15 and 4.16. (C) Figures in column (2) are derived by combining the figure in column (1) with the corresponding result from the regression reported in Table 4.17, 4.18, 4.19, 4.20, 4.21 4.22, or 4.23, respectively. Minority and DBE figures were derived from similar regression analyses, not reported separately. (D) Column (3) is the figure in column (1) divided by the figure in column (2), with the result multiplied by 100. (E) An empty cell in the Disparity Ratio column indicates that no adverse disparity was observed for that category.

E. Evidence from the Survey of Business Owners

As a final check on the statistical findings in this chapter, we present evidence from a Census Bureau data collection effort dedicated to DBEs. The Census Bureau's *Survey of Business Owners and Self-Employed Persons* (SBO), formerly known as the *Survey of Minority- and Women-Owned Business Enterprises* (SMWOBE), collects and disseminates data on the number, sales, employment, and payrolls of businesses owned by women and members of racial and ethnic minority groups. This survey has been conducted every five years since 1972 as part of the *Economic Census* program. Data from the 2012 SBO, the most recent available, were released in December 2015.

The SBO estimates are created by matching data collected from income tax returns by the Internal Revenue Service with Social Security Administration data on race and ethnicity, and supplementing this information using statistical sampling methods. The unique field for conducting this matching is the Social Security Number (SSN) or the Employer Identification Number (EIN), as reported on the tax return.

The SBO covers women and five groups of minorities: (1) African Americans, (2) Hispanics, (3) Asians, (4) Native Hawaiians and Pacific Islanders, and (5) American Indians and Alaskan Natives. Comparative information for nonminority male-owned firms is also included.⁹⁴

The SBO provides aggregate estimates of the number of minority-owned and women-owned firms and their annual sales and receipts. The SBO distinguishes employer firms (*i.e.*, firms with one or more paid employees) from nonemployer firms, and for the former also includes estimates of aggregate annual employment and payroll.

Compared to the ACS PUMS, the SBO is more limited in the scope of industrial and geographic detail it provides. Nonetheless, it contains a wealth of information on the character of minority and female business enterprise in the U.S. as a whole as well as in the MDOT Market Area ("MDMA").⁹⁵ In the remainder of this section, we present SBO statistics for the United States as a whole and in the MDMA and calculate disparity indices from them. We observe results in the SBO regarding disparities that are consistent with our findings above using the ACS PUMS.

Tables 4.25 and 4.26 contain data for all industries combined. Table 4.25 is for the U.S. as a whole, Table 4.26 is for the MDMA. Panel A in these two tables summarizes the SBO results for each race and/or gender grouping. For example, Panel A of Table 4.25 shows a total of 27.18 million firms in the U.S. in 2012 (column 1) with overall sales and receipts of \$11.964 trillion (column 2). Of these 27.18 million firms, 5.14 million had one or more employees (column 3)

⁹⁴ In the ACS PUMS data, discussed above, the unit of analysis is the business owner, or self-employed person. In the SBO data, the unit of analysis is the business rather than the business owner. Furthermore, unlike most other business statistics, including the other components of the *Economic Census*, the unit of analysis in the SBO is the firm, rather than the establishment.

⁹⁵ We performed a custom tabulation of SBO data in order to examine the MDOT Market Area, which is defined as the States of Maryland and Delaware, the District of Columbia, and the Virginia and West Virginia portions of the Washington-Arlington-Alexandria DC-VA-MD-WV Metropolitan Statistical Area.

and these 5.14 million firms had overall sales and receipts of \$10.965 trillion (column 4). Column (5) shows a total of 56.059 million employees on the payroll of these 5.14 million firms and a total annual payroll expense of \$2.096 trillion (column 6).

The remaining rows in Panel A provide comparable statistics for nonminority male-owned, women-owned, and minority-owned firms. For example, Table 4.25 shows that there were 2.6 million African American-owned firms counted in the SBO, and that these 2.6 million firms registered \$150.2 billion in sales and receipts. It also shows that 109,137 of these African American-owned firms had one or more employees, and that they employed a total of 975,052 workers with an annual payroll total of \$27.69 billion.

Panel A of Table 4.26 provides comparable information for the MDMA. The SBO counted 918,009 firms in the MDMA, of which 360,045 were female-owned; 178,828 were African American-owned; 77,478 were Hispanic-owned; 91,812 were Asian-owned; 5,924 were Native American-owned; and 952 were Native Hawaiian- or Pacific Islander-owned.

Panel B in each table converts the figures in Panel A to percentage distributions within each column. For example, Column (1) in Panel B of Table 4.26 shows that African American-owned firms were 19.46 percent of all firms in the MDMA and female-owned firms were 39.18 percent. Additionally, 8.43 percent of firms were Hispanic-owned, 9.99 percent were Asian-owned, 0.64 percent were Native American-owned, and 0.10 percent were Native Hawaiian- or Pacific Islander-owned.

Column (2) in Panel B provides the same percentage distribution for overall sales and receipts. Table 4.26, for example, shows that although African American-owned firms were 19.46 percent of all firms in the MDMA, they accounted for only 4.05 percent of all sales and receipts. Although female-owned firms accounted for 39.18 percent, they earned only 13.88 percent of all sales and receipts. For Hispanic-owned firms, the figures are 8.43 percent and 3.03 percent, respectively. For Asian-owned firms, they are 9.99 percent and 8.29 percent, respectively. For Native American-owned firms, they are 0.64 percent and 0.19 percent, respectively; and for Native Hawaiian- or Pacific Islander-owned firms, they are 0.10 percent and 0.02 percent, respectively. In contrast, the figures for nonminority male-owned firms are 26.98 percent and 49.71 percent, respectively.

Similar results are obtained when the survey results are restricted to firms with one or more paid employees. Column (3) in Table 4.26, for example, shows that although nonminority male-owned firms were 38.34 percent of all employer firms, they accounted for 51.01 percent of all employer firm sales and receipts. African American-owned firms, in contrast, were 5.71 percent of all employer firms, but they accounted for only 3.43 percent of all employer firm sales and receipts. Hispanic-owned firms were 4.16 percent of all employer firms, but they accounted for only 2.69 percent of all employer firm sales and receipts. Asian-owned firms were 14.48 percent of all employer firms, but they accounted for only 8.20 percent of all employer firm sales and receipts. Native American-owned firms were 0.32 percent of all employer firms but accounted for only 0.17 percent of all employer firm sales and receipts. Native Hawaiian- and Pacific Islander-owned firms were 0.05 percent of all employer firms but accounted for only 0.02 percent of all employer firm sales and receipts. Finally, women-owned firms accounted for 22.41

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percent of all employer firms, but earned only 12.76 percent of all employer firm sales and receipts.

Table 4.25. Disparity Ratios from the 2012 Survey of Business Owners, United States, All Industries

	Number of Firms	Sales and Receipts (\$000s)	Employer Firms	Sales and Receipts (\$000s)	Employees	Payroll (\$000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	27,179,380	11,964,077,871	5,136,203	10,964,584,749	56,058,563	2,096,442,212
Nonminority Male	12,280,591	8,787,915,377	2,933,198	8,221,010,815	37,750,711	1,531,662,394
Female	9,878,397	1,419,834,295	1,035,655	1,190,586,438	8,431,614	263,720,252
African American	2,584,403	150,203,163	109,137	103,451,510	975,052	27,689,957
Hispanic	3,305,873	473,635,944	287,501	379,994,999	2,329,553	70,855,704
Asian	1,917,902	699,492,422	481,026	627,532,399	3,572,577	110,543,615
Native Hawaiian/Pac. Islander	54,749	8,136,445	4,706	6,469,957	39,001	1,430,591
Am. Indian & Alaska Native	272,919	38,838,125	26,179	31,654,165	208,178	6,994,509
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Nonminority Male	45.18%	73.45%	57.11%	74.98%	67.34%	73.06%
Female	36.35%	11.87%	20.16%	10.86%	15.04%	12.58%
African American	9.51%	1.26%	2.12%	0.94%	1.74%	1.32%
Hispanic	12.16%	3.96%	5.60%	3.47%	4.16%	3.38%
Asian	7.06%	5.85%	9.37%	5.72%	6.37%	5.27%
Native Hawaiian/Pac. Islander	0.20%	0.07%	0.09%	0.06%	0.07%	0.07%
Am. Indian & Alaska Native	1.00%	0.32%	0.51%	0.29%	0.37%	0.33%
Panel C. Disparity Ratios						
		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Nonminority Male		162.56		131.29	117.92	127.93
Female		32.65		53.85	74.59	62.39
African American		13.20		44.40	81.86	62.16
Hispanic		32.55		61.91	74.24	60.38
Asian		82.85		61.11	68.05	56.30
Native Hawaiian/Pac. Islander		33.76		64.40	75.93	74.48
Am. Indian & Alaska Native		32.33		56.64	72.86	65.46

Source: NERA calculations using 2012 SBO. Notes: (A) Figures are rounded. Rounding was performed subsequent to any mathematical calculations. (B) Excludes publicly-owned, foreign-owned, and not-for-profit firms. (C) “n/a” indicates that data were not disclosed due to confidentiality or other publication restrictions.

Disparities between the fraction of firms that are minority- or women-owned and their fraction of sales and receipts in the MDMA are observed for African Americans, Hispanics, Asians, Native Americans, Native Hawaiians and Pacific Islanders, and women, both for employer firms and nonemployer firms. The disparity indices are presented in Panel C of each table. Disparity indices of approximately 80 percent or less are consistent with business discrimination (0 percent being complete disparity and 100 percent being full parity).⁹⁶ In the MDMA (Table 4.26), the sales and receipts disparity indices (in columns 2 and 4) fall at or below the 80 percent threshold

⁹⁶ See Appendix A below, “Constitutional significance or substantive significance.”

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in 11 out of 12 instances for minorities and women. All of the disparity indices in this table are statistically significant within a 95 percent confidence interval.⁹⁷

Table 4.26. Disparity Ratios from the 2012 Survey of Business Owners, MDOT Market Area, All Industries

	Number of Firms	Sales and Receipts (\$000s)	Employer Firms	Sales and Receipts (\$000s)	Employees	Payroll (\$000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	918,909	397,013,822	172,217	362,949,202	1,988,787	88,522,803
Nonminority Male	247,907	197,366,518	66,033	185,135,698	880,015	40,235,729
Female	360,045	55,124,577	38,594	46,310,707	347,590	13,807,496
African American	178,828	16,059,898	9,834	12,434,774	102,995	3,971,763
Hispanic	77,478	12,042,158	7,169	9,753,652	71,276	2,735,040
Asian	91,812	32,925,222	24,945	29,753,839	197,654	7,941,162
Native Hawaiian/Pac. Islander	952	70,098	89	57,807	657	26,348
Am. Indian & Alaska Native	5,924	755,731	551	605,023	4,764	188,921
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Nonminority Male	26.98%	49.71%	38.34%	51.01%	44.25%	45.45%
Female	39.18%	13.88%	22.41%	12.76%	17.48%	15.60%
African American	19.46%	4.05%	5.71%	3.43%	5.18%	4.49%
Hispanic	8.43%	3.03%	4.16%	2.69%	3.58%	3.09%
Asian	9.99%	8.29%	14.48%	8.20%	9.94%	8.97%
Native Hawaiian/Pac. Islander	0.10%	0.02%	0.05%	0.02%	0.03%	0.03%
Am. Indian & Alaska Native	0.64%	0.19%	0.32%	0.17%	0.24%	0.21%
Panel C. Disparity Ratios		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Nonminority Male		184.27		133.03	115.40	118.54
Female		35.44		56.94	77.99	69.60
African American		20.79		60.00	90.69	78.57
Hispanic		35.97		64.56	86.09	74.22
Asian		83.00		56.60	68.61	61.93
Native Hawaiian/Pac. Islander		17.04		30.82	63.92	57.59
Am. Indian & Alaska Native		29.53		52.10	74.87	66.70

Source and Notes: See Table 4.25.

Table 4.27 shows comparable SBO data for the Construction and Construction-related Professional Services (“AE-CRS”) sector in the U.S. as a whole. Here, large and adverse disparities are evident in most instances for African Americans, Hispanics, Asians, Native Americans, Native Hawaiians and Pacific Islanders, and women. For example, although African Americans account for 5.06 percent of all firms in the Construction and AE-CRS sector, they earned only 1.29 percent of all sales and receipts in that sector. Hispanics account for 11.09 percent of firms but only 4.30 percent of sales and receipts. For Asians, the figures are 5.21 percent and 4.00 percent, respectively. For Native Americans, the figures are 0.98 percent and 0.51 percent, respectively. For Native Hawaiians and Pacific Islanders, the figures are 0.17

⁹⁷ This is true for each table in Section E.

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percent and 0.12 percent, respectively. Finally, women account for 23.55 percent of all Construction and AE-CRS firms but earned only 11.15 percent of all sales and receipts.

Among firms with paid employees, adverse disparities are observed for African Americans, Hispanics, Native Americans and women. Overall, disparities in this category are slightly less acute than among firms as a whole. However, they remain far larger than the comparable figure for nonminority male-owned firms. This is evident in that the fraction of employer firms compared to the fraction of all firms is far higher among nonminority males than among other race and gender groups. In Table 4.27, for example, nonminority males represent 60.30 percent of all firms but 67.41 percent of employer firms. For all other groups, the direction of this ratio is reversed. That is, each group's fraction among employer firms is substantially smaller than its fraction among firms as a whole, whereas for nonminority males it is larger.

Table 4.27. Disparity Ratios from the 2012 Survey of Business Owners, United States, Construction and AE-CRS

	Number of Firms	Sales and Receipts (\$000s)	Employer Firms	Sales and Receipts (\$000s)	Employees	Payroll (\$000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	6,796,672	2,077,651,539	1,385,740	1,825,720,151	9,417,271	502,212,138
Nonminority Male	4,098,217	1,588,153,063	934,173	1,418,932,123	6,918,815	380,577,855
Female	1,600,294	231,672,089	219,948	187,668,757	1,210,435	58,325,262
African American	343,671	26,824,886	21,416	19,607,626	121,053	6,165,077
Hispanic	753,538	89,355,188	68,286	64,485,132	393,114	17,294,719
Asian	353,843	83,128,886	61,401	71,585,506	399,780	25,539,672
Native Hawaiian/Pac. Islander	11,843	2,439,922	1,324	2,018,181	8,483	494,869
Am. Indian & Alaska Native	66,935	10,569,706	8,463	8,317,526	47,582	2,116,501
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Nonminority Male	60.30%	76.44%	67.41%	77.72%	73.47%	75.78%
Female	23.55%	11.15%	15.87%	10.28%	12.85%	11.61%
African American	5.06%	1.29%	1.55%	1.07%	1.29%	1.23%
Hispanic	11.09%	4.30%	4.93%	3.53%	4.17%	3.44%
Asian	5.21%	4.00%	4.43%	3.92%	4.25%	5.09%
Native Hawaiian/Pac. Islander	0.17%	0.12%	0.10%	0.11%	0.09%	0.10%
Am. Indian & Alaska Native	0.98%	0.51%	0.61%	0.46%	0.51%	0.42%
Panel C. Disparity Ratios						
		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Nonminority Male		126.77		115.29	108.98	112.41
Female		47.36		64.76	80.98	73.17
African American		25.53		69.49	83.18	79.43
Hispanic		38.79		71.68	84.71	69.88
Asian		76.85		88.49	95.81	114.77
Native Hawaiian/Pac. Islander		67.40		115.70	94.28	103.13
Am. Indian & Alaska Native		51.66		74.60	82.73	69.01

Source and Notes: See Table 4.25.

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Table 4.28 shows results for the Construction and AE-CRS sector in the MDMA. Among all firms in Construction and AE-CRS, large disparities are observed for African Americans, Hispanics, Native Americans, Native Hawaiians and Pacific Islanders, and women. Among firms with paid employees, large disparities are observed for African Americans, Hispanics, Native Americans and women. As in Table 4.26, nonminority males have a much higher ratio of employer firms to firms as a whole than do minorities or women.

Table 4.28. Disparity Ratios from the 2012 Survey of Business Owners, MDOT Market Area, Construction and AE-CRS

	Number of Firms	Sales and Receipts (\$000s)	Employer Firms	Sales and Receipts (\$000s)	Employees	Payroll (\$000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	268,069	129,171,203	58,601	116,799,139	557,979	36,898,322
Nonminority Male	91,833	59,327,931	25,059	54,834,137	239,658	15,286,818
Female	75,608	18,308,510	11,322	15,779,225	91,131	5,859,950
African American	32,470	4,800,474	2,822	3,997,472	27,455	1,545,830
Hispanic	27,880	5,330,311	2,876	4,263,575	22,716	1,279,615
Asian	22,007	11,348,002	5,820	10,615,752	57,245	4,290,200
Native Hawaiian/Pac. Islander	235	56,614	31	55,136	448	26,108
Am. Indian & Alaska Native	1,635	372,014	213	330,081	1,828	106,893
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Nonminority Male	34.26%	45.93%	42.76%	46.95%	42.95%	41.43%
Female	28.20%	14.17%	19.32%	13.51%	16.33%	15.88%
African American	12.11%	3.72%	4.82%	3.42%	4.92%	4.19%
Hispanic	10.40%	4.13%	4.91%	3.65%	4.07%	3.47%
Asian	8.21%	8.79%	9.93%	9.09%	10.26%	11.63%
Native Hawaiian/Pac. Islander	0.09%	0.04%	0.05%	0.05%	0.08%	0.07%
Am. Indian & Alaska Native	0.61%	0.29%	0.36%	0.28%	0.33%	0.29%
Panel C. Disparity Ratios						
		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Nonminority Male		134.07		109.79	100.44	96.88
Female		50.25		69.92	84.53	82.20
African American		30.68		71.07	102.18	87.00
Hispanic		39.68		74.38	82.95	70.66
Asian		107.01		91.52	103.30	117.07
Native Hawaiian/Pac. Islander		50.00		89.24	151.78	133.76
Am. Indian & Alaska Native		47.22		77.75	90.13	79.70

Source and Notes: See Table 4.25.

Table 4.29 shows comparable SBO data for the Goods and Services sector in the U.S. as a whole. Here, adverse disparities are evident for African Americans, Hispanics, Asians, Native Americans, Native Hawaiians and Pacific Islanders and women. African Americans, for example, account for 10.99 percent of all firms in the Goods and Services sector, but they earned only 1.25 percent of all sales and receipts in that sector. Hispanics account for 12.52 percent of firms but only 3.89 percent of sales and receipts. For Asians, the figures are 7.67 percent and 6.23 percent, respectively. For Native Americans, the figures are 1.01 percent and 0.29 percent,

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respectively. For Native Hawaiians and Pacific Islanders, the figures are 0.21 percent and 0.06 percent, respectively. Finally, women account for 40.61 percent of all Goods and Services firms but earned only 12.02 percent of all sales and receipts. Comparable, though slightly smaller, disparities are observed as well among firms with paid employees in the Goods and Services sector.⁹⁸

Table 4.29. Disparity Ratios from the 2012 Survey of Business Owners, United States, Goods and Services

	Number of Firms	Sales and Receipts (\$000s)	Employer Firms	Sales and Receipts (\$000s)	Employees	Payroll (\$000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	20,382,708	9,886,426,332	3,750,463	9,138,864,598	46,641,292	1,594,230,074
Nonminority Male	8,182,374	7,199,762,314	1,999,025	6,802,078,692	30,831,896	1,151,084,539
Female	8,278,103	1,188,162,206	815,707	1,002,917,681	7,221,179	205,394,990
African American	2,240,732	123,378,277	87,721	83,843,884	853,999	21,524,880
Hispanic	2,552,335	384,280,756	219,215	315,509,867	1,936,439	53,560,985
Asian	1,564,059	616,363,536	419,625	555,946,893	3,172,797	85,003,943
Native Hawaiian/Pac. Islander	42,906	5,696,523	3,382	4,451,776	30,518	935,722
Am. Indian & Alaska Native	205,984	28,268,419	17,716	23,336,639	160,596	4,878,008
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Nonminority Male	40.14%	72.82%	53.30%	74.43%	66.10%	72.20%
Female	40.61%	12.02%	21.75%	10.97%	15.48%	12.88%
African American	10.99%	1.25%	2.34%	0.92%	1.83%	1.35%
Hispanic	12.52%	3.89%	5.85%	3.45%	4.15%	3.36%
Asian	7.67%	6.23%	11.19%	6.08%	6.80%	5.33%
Native Hawaiian/Pac. Islander	0.21%	0.06%	0.09%	0.05%	0.07%	0.06%
Am. Indian & Alaska Native	1.01%	0.29%	0.47%	0.26%	0.34%	0.31%
Panel C. Disparity Ratios						
		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Nonminority Male		181.41		139.64	124.02	135.46
Female		29.59		50.46	71.18	59.24
African American		11.35		39.22	78.28	57.73
Hispanic		31.04		59.07	71.03	57.48
Asian		81.25		54.37	60.80	47.66
Native Hawaiian/Pac. Islander		27.37		54.02	72.56	65.09
Am. Indian & Alaska Native		28.29		54.06	72.89	64.78

Source and Notes: See Table 4.25.

⁹⁸ The exception being Asian-owned firms, for which the disparity facing firms with paid employees is substantially more acute than for Asian firms overall.

Market-Based Disparities in Business Formation and Business Owner Earnings

Finally, Table 4.30 shows comparable results for the Goods and Services sector in the MDMA. Among all firms in Goods and Services, adverse disparities are observed for African Americans, Hispanics, Asians, Native Americans, Native Hawaiians and Pacific Islanders, and women. Among firms with paid employees, adverse disparities are observed for African Americans, Hispanics, Asians, Native Americans, Native Hawaiians and Pacific Islanders, and women. As in Table 4.29, nonminority males have a much higher ratio of employer firms to firms as a whole than do minorities or women.⁹⁹ In the MDMA Goods and Services sector, the sales and receipts disparity indices fall at or below the 80 percent threshold in 12 out of 12 cases. All of the disparity indices, throughout this Section, are statistically significant within a 95 percent confidence interval.

Table 4.30. Disparity Ratios from the 2012 Survey of Business Owners, MDOT Market Area, Goods and Services

	Number of Firms	Sales and Receipts (\$000s)	Employer Firms	Sales and Receipts (\$000s)	Employees	Payroll (\$000s)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Levels						
All Firms	650,840	267,842,619	113,616	246,150,063	1,430,808	51,624,481
Nonminority Male	156,074	138,038,587	40,974	130,301,561	640,357	24,948,911
Female	284,437	36,816,067	27,272	30,531,482	256,459	7,947,546
African American	146,358	11,259,424	7,012	8,437,302	75,540	2,425,933
Hispanic	49,598	6,711,847	4,293	5,490,077	48,560	1,455,425
Asian	69,805	21,577,220	19,125	19,138,087	140,409	3,650,962
Native Hawaiian/Pac. Islander	717	13,484	58	2,671	209	240
Am. Indian & Alaska Native	4,289	383,717	338	274,942	2,936	82,028
Panel B. Column Percentages						
All Firms	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Nonminority Male	23.98%	51.54%	36.06%	52.94%	44.75%	48.33%
Female	43.70%	13.75%	24.00%	12.40%	17.92%	15.39%
African American	22.49%	4.20%	6.17%	3.43%	5.28%	4.70%
Hispanic	7.62%	2.51%	3.78%	2.23%	3.39%	2.82%
Asian	10.73%	8.06%	16.83%	7.77%	9.81%	7.07%
Native Hawaiian/Pac. Islander	0.11%	0.01%	0.05%	0.00%	0.01%	0.00%
Am. Indian & Alaska Native	0.66%	0.14%	0.30%	0.11%	0.21%	0.16%
Panel C. Disparity Ratios						
		(2) vs. (1)		(4) vs. (3)	(5) vs. (3)	(6) vs. (3)
Nonminority Male		214.91		146.78	124.10	134.01
Female		31.45		51.67	74.67	64.14
African American		18.69		55.54	85.54	76.14
Hispanic		32.88		59.03	89.82	74.61
Asian		75.11		46.19	58.30	42.01
Native Hawaiian/Pac. Islander		4.57		2.13	28.61	0.91
Am. Indian & Alaska Native		21.74		37.55	68.98	53.41

Source and Notes: See Table 4.25.

⁹⁹ The exception being Asian-owned firms with paid employees.

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V. Statistical Disparities in Capital Markets

A. Introduction

Discrimination occurs whenever the terms of a transaction are affected by personal characteristics of the participants that are not relevant to the transaction. Among such characteristics, the most commonly considered are race, ethnicity and gender. In labor markets, this might translate into equally productive workers in similar jobs being paid different salaries because of their race, ethnicity or gender. In commercial credit markets, it might translate into small business loan approvals differing across racial or gender groups with otherwise similar financial backgrounds.

In this chapter, we examine whether there is evidence consistent with the presence of discrimination against DBEs in the commercial credit market. Discrimination in the credit market against such small businesses can have an important effect on the likelihood that they will succeed. Moreover, discrimination in the credit market can even prevent businesses from opening in the first place, and can negatively impact the size a firm can attain, and/or shorten its longevity in the market.¹⁰⁰

In our analyses in this chapter, we use data from a variety of sources. First and foremost are data from the Federal Reserve Board that allow us to examine whether discrimination exists in the small business credit market for the key years of 1993, 1998 and 2003, as these are the primary years of availability for the most important data source of small business finance by race and gender that has ever been produced. These surveys were based on a large representative sample of firms with fewer than 500 employees and were administered by the Federal Reserve Board and the U.S. Small Business Administration. The 1993 and 1998 surveys deliberately oversampled minority-owned firms, but the 2003 survey did not.¹⁰¹ Unfortunately, the much anticipated continuation of this survey series in 2008 (and presumably in 2013) never materialized due to the Federal Reserve Board's cancellation of this important effort.¹⁰²

Next, in addition to the 1993, 1998 and 2003 Federal Reserve data, this chapter also analyzes similar datasets collected through NERA's own surveys conducted from 1999 through 2007, that mirrored the relevant sections of the earlier Federal Reserve Board surveys. Results from the NERA credit surveys are consistent with the results obtained from the 1993-2003 Federal Reserve Board data.

¹⁰⁰ Again, as noted in Chapter IV, these factors also illustrate why, in a disparity study intended to answer the question of whether discrimination is present in business enterprise, adjusting availability for "capacity" factors such as firm age, firm size or firm revenues, is not a legitimate practice when there is evidence that suggests that these factors themselves are tainted by discrimination. To do so would be to inappropriately introduce one or more endogenous variables into the analysis.

¹⁰¹ The 2003 survey took other steps, however, to increase the likelihood that minority-owned and women-owned firms were captured in the sampling frame. For more details, see National Opinion Research Center (2005), p. 11.

¹⁰² For more on this, see fn. 145 below.

Finally, we review the results of the most recent available research on commercial credit market discrimination, spanning the time period from 2008 forward. Much of this review focuses on the work of Dr. Alicia Robb and her colleagues with data from the Kauffman Firm Survey, the largest and longest longitudinal survey of new businesses in the world. Analyses of the Kauffman data are, as well, consistent with those obtained from the 1993-2003 Federal Reserve Board data and the 1999-2007 NERA credit survey data.

Taken as a whole, these data provide qualitative and quantitative evidence consistent with the presence of discrimination against minorities in the credit market for small businesses. For example, we find that African American-owned firms are much more likely to report being seriously concerned with credit market problems and report being less likely to apply for credit because they fear the loan would be denied. Moreover, after controlling for a large number of characteristics of the firms, we find that African American-owned firms, Hispanic-owned firms, and to a lesser extent other minority-owned firms, are substantially and statistically significantly more likely to be denied credit than are nonminority-owned firms. We find some evidence that women are discriminated against in this market as well. The principal results are as follows:

- Minority-owned firms were more likely to report that they did not apply for a loan over the preceding three years because they feared the loan would be denied (*see* Tables 5.15, 5.22, 5.29);
- When minority-owned firms applied for a loan, their loan requests were substantially more likely to be denied than non-minorities, even after accounting for differences like firm size and credit history (*see* Tables 5.8, 5.9, 5.18, 5.19, 5.25, 5.26);
- When minority-owned firms *did* receive a loan, they were obligated to pay higher interest rates on the loans than comparable nonminority-owned firms (*see* Tables 5.13, 5.14, 5.21, 5.27);
- A larger proportion of minority-owned firms than nonminority-owned firms report that credit market conditions are a serious concern (*see* Tables 5.3, 5.4, 5.5, 5.6, 5.7, 5.17, 5.24);
- A larger share of minority-owned firms than nonminority-owned firms believes that the availability of credit is the most important issue likely to confront them in the upcoming year (*see* Tables 5.5, 5.6);
- There is no evidence that discrimination in the market for credit is significantly different in the South Atlantic census division or in the construction and construction-related professional services industries than it is in the nation or the economy as a whole (various tables);
- There is no evidence that the level of discrimination in the market for credit has diminished between 1993 and 2003 (various tables);

- Evidence from NERA’s own 1999-2007 credit surveys, which contained questions similar to the relevant portions of the SSBF, is fully consistent with the findings drawn from the earlier SSBF data (*see* Tables 5.30, 5.31); and
- Post 2007 evidence from non-SSBF sources, particularly the Kauffman Firm Survey, yield results that are fully consistent with those drawn from the earlier SSBF data (*see* Section L, below).

The structure of this chapter is as follows. First, we outline the main theories of business credit discrimination and discuss how they might be tested. Second, we examine the evidence on the existence of capital/liquidity constraints facing individuals in the mortgage market, households in the non-mortgage loan market, and for small businesses in the commercial credit market. Third, we describe the Federal Reserve Board data files used in the chapter and then examine in more detail problems faced by minority-owned firms in obtaining credit. Fourth, we describe comparable analyses and results using NERA’s own credit surveys conducted between 1999-2007. Fifth, we provide a series of answers to potential criticisms and present our conclusions. Finally, we provide an overview of the results of others’ research, with a focus on the most recent time period from 2008 forward and draw conclusions about its consistency with our own results.

B. Theoretical Framework and Review of the Literature

Most economic studies of discrimination draw on the analyses contained in Gary Becker’s (1957) *The Economics of Discrimination*. Becker’s main contribution was to translate the notion of discrimination into financial terms. Discrimination, in this view, results from the desire of owners, workers, or customers to avoid contact with certain groups. This being the case, transactions with the undesired groups would require more favorable terms than those that occur with a desired group. Assume that the primary objective of a financial institution is to maximize their expected profits. The expected return on a loan will depend on the interest rate charged and the likelihood that a borrower defaults. The financial institution would approve any loan for which the expected return on the loan exceeded the cost of the funds to the institution. Discrimination would then result in either (a) higher interest rates being charged to undesired groups having otherwise similar characteristics to the desired group, or (b) requiring better characteristics (*i.e.*, a lower expected default rate) from the undesired group at any given interest rate. In other words, applicants from the disadvantaged group might either be appraised more rigorously or be given less favorable terms on the loan, or both.

A similar connection between the likelihood of loan approval and the race, ethnicity or gender of the applicant might also be found if lenders employ “statistical discrimination”—a concept first put forth by economists Kenneth Arrow (1973) and Edmund Phelps (1972)—meaning that lenders use personal characteristics such as race, ethnicity or gender to infer the likelihood of default on the loan. If experience has suggested that certain groups of individuals are on average more or less likely to default, then the lender may use this information to economize on the costs of gathering more directly relevant information. Hence, discrimination would not reflect the preferences of the owner but would, rather, reflect an attempt to minimize costs. Empirically, the racial, ethnic or gender characteristics of the applicant could proxy for unobserved characteristics of their creditworthiness.

In the public policy realm, there has been an active debate about whether banks discriminate against minority applicants for mortgages. In particular, banks were often accused of “redlining”—that is, not granting loans for properties located in certain geographic areas. To analyze that issue, the Home Mortgage Disclosure Act was passed by Congress in 1975 to require lenders to disclose information on the geographic location of their home mortgage loans. These data, however, were not sufficient to assess whether or not there was discrimination in the market for mortgage loans.

In 1992, researchers at the Federal Reserve Bank of Boston collected additional information from mortgage lenders (Munnell, *et al.*, 1996). In particular, they tried to collect any information that might be deemed economically relevant to whether a loan would be approved. In the raw data, nonminorities had 10 percent of their loans rejected, whereas rejection rates were 28 percent for both African Americans and Hispanics. Even after the creditworthiness of the borrowers (including the amount of the debt, debt-to-income ratio, credit history, loan characteristics, *etc.*) were controlled for, African Americans were still found to be 7 percentage points less likely to be granted the loan. A variety of criticisms have been launched at this study (*See, e.g.*, Horne, 1994; Day and Liebowitz, 1998; and Harrison, 1998), most alleging various errors in the Munnell, *et al.* (1996) data. Responses to these criticisms are found in Browne and Tootell (1995) and Tootell (1996). Carr and Megbolugbe (1993) and Glennon and Stengle (1994) undertook independent examinations of the Munnell, *et al.* (1996) data that addressed Horne’s (1994) major criticisms and reached similar conclusions as Munnell, *et al.* (1996). As Ardalan (2006, p. 123) notes, “Overall, Munnell *et al.* (1996) paid a great deal of attention to their data and no one has provided credible evidence that the results of the study are influenced by data errors.”

In addition to the type of statistical analysis done in the Munnell, *et al.* (1996) study, two other approaches have been used to measure discrimination in mortgage markets. First, Federal Reserve regulators can examine a lending institution’s files to try to identify any cases where a loan rejection looks suspicious. Second, audit studies have been used with paired “identical” applicants. Such studies have also found evidence of discrimination (*See, e.g.*, Cloud and Galster, 1993; Smith and Cloud, 1996; and Yinger, 1998), although the audit approach is not without its critics (Heckman, 1998, arguing that theoretical tester heterogeneity invalidates the conclusions of paired testing). Subsequent research has shown Heckman’s theoretical critique is not borne out when tested empirically (*See* Ross, *et al.* 2008). Hanson, *et al.* (2016) went a step further and designed a testing experiment that is not subject to Heckman’s critique at all, by using e-mail correspondence with mortgage loan originators, and concludes there is a continuing presence of racial discrimination in mortgage markets.

Another relevant subset of the literature is concerned with the severity of liquidity constraints affecting consumers in non-mortgage credit markets. A consumer is said to be liquidity-constrained when lenders refuse to make the household a loan or offer the household less than they wished to borrow (Ferri and Simon, 1997). Many studies have suggested that roughly 20 percent of U.S. families are liquidity-constrained (*See* Hall and Mishkin, 1982; and Jappelli, 1990). As might be expected, liquidity-constrained households are typically younger, with less wealth and accumulated savings (Hayashi, 1985; and Jappelli, 1990). The research shows minority households to be substantially more likely to be liquidity-constrained even when a variety of financial characteristics of households are controlled for (Jappelli, 1990; and Ferri and

Simon, 1997). Using data from the *Survey of Consumer Finances*, Dogra and Gorbachev (2016) document that despite an increase in household debt between 1983 and 2007, the proportion of liquidity-constrained households did not decline. Using data from the 2010-2013 *Consumer Expenditure Surveys*, Chénier, *et al.* (2015) confirm that liquidity constraints remain significantly more severe for minority households than for similarly-situated nonminority households.

We turn next to the more directly relevant evidence on liquidity constraints facing small businesses. Just like individuals and households, businesses can also face liquidity constraints.¹⁰³ Liquidity constraints can be a problem in starting a business as well as in running it.¹⁰⁴ Discrimination in the credit market against minority- and women-owned small businesses can have a devastating effect on their success, and may even prevent them from opening in the first place.¹⁰⁵ In his report for *Builders Association of Greater Chicago v. the City of Chicago*,¹⁰⁶ Professor Tim Bates (2002) wrote “from its origins, the black-business community has been constrained by limited access to credit, limited opportunities for education and training, and

¹⁰³ Evans and Leighton (1989) and Evans and Jovanovic (1989) have argued formally that entrepreneurs face difficulties borrowing money. As in the discussion above, such individuals are labeled liquidity constrained by economists. Using data from the National Longitudinal Survey of Youth from 1966-1981 and the Current Population Surveys from 1968-1987, these authors found that, all else equal, people with greater family assets are more likely to switch to self-employment from employment. Similar findings with more recent data have been made, in the US and abroad, by numerous researchers, including Meyer (1990), Holtz-Eakin, Joulfaian, and Rosen (1994), Lindh and Ohlsson (1996), Lindh and Ohlsson (1998), Blanchflower and Oswald (1998), Fairlie (1999), Dunn and Holtz-Eakin (2000), Johansson (2000), Taylor (2001), Giannetti and Simonov (2004), Gentry and Hubbard (2005), Holtz-Eakin and Rosen (2005), Nykvist (2005), Cagetti and DeNardi (2006), Zissimopoulos and Karoly (2007), Fairlie and Robb (2008), Zissimopoulos and Karoly (2009), and Lofstrom and Bates (2013). Blanchflower and Oswald (1998) studied the probability that an individual reports him or herself as self-employed. Consistent with the existence of capital constraints on potential entrepreneurs, their econometric estimates imply that the probability of being self-employed depends positively upon whether the individual ever received an inheritance or gift. Holtz-Eakin, *et al.* (1994a, 1994b) examine flows in and out of self-employment and also find that inheritances both raise entry and slow exit. Similarly, Lindh and Ohlsson (1996) suggest that the probability of being self-employed increases when people receive windfall gains in the form of lottery winnings and inheritances. Further confirmation of the positive effect of inheritances on reducing liquidity constraints is found, *e.g.*, in Disney and Gathergood (2009) and Sauer and Wilson (2016). Housing equity also plays an important role in shaping the supply of entrepreneurs (*See, e.g.*, Black, de Meza and Jeffreys (1996), Cavalluzzo and Walken (2005), and Adelino, *et al.* (2015)). Additionally, Blanchflower and Oswald (1998) present evidence that potential entrepreneurs, when directly questioned in interview surveys, say that raising capital is one of their principal problems. The liquidity constraint interpretation has been challenged by Hurst and Lusardi (2004), who argue, using data from 1989 and 1994 waves of the *Panel Study of Income Dynamics*, that business entry rates are essentially flat across the asset distribution except above the 95th percentile. However, Fairlie and Krashinsky (2012) find that when the sample is stratified according to job losers and non-job losers, the data show evidence consistent with the liquidity constraints hypothesis—that of generally increasing rates of entry into self-employment throughout the asset distribution.

¹⁰⁴ *See, e.g.*, Fan and White (2003), Fairlie and Krashinsky (2012), Corradin and Popov (2013), Fort, *et al.* (2013), and Kleiner (2013). Schmalz, *et al.* (2013) found similar results for France, as did Black, *et al.*, (1996) and Kleiner (2013) for the UK.

¹⁰⁵ For further evidence regarding the latter effect, *see* Chapter IV.

¹⁰⁶ 298 F.Supp. 2d 725 (N.D. Ill. 2003).

nonminority stereotypes about suitable roles for minorities in society.”¹⁰⁷ As Bates points out, almost 60 years prior Gunnar Myrdal had observed,

The Negro businessman ... encounters greater difficulties than whites in securing credit. This is partly due to the marginal position of Negro business. It is also partly due to prejudicial opinions among whites concerning business ability and personal reliability of Negroes. In either case a vicious circle is in operation keeping Negro business down.”¹⁰⁸

Available evidence indicates that capital constraints for DBEs are particularly large. A survey conducted by the U.S. Chamber of Commerce (2005, p. 55) found that although 19 percent of nonminority male business owners reported that obtaining credit was the biggest problem for their business, the corresponding figure for nonminority women was 23 percent. For Asian/Pacific Islanders the figure was 34 percent; for Native Americans it was 43 percent; for African Americans it was 46 percent; and for Hispanics it was 52 percent.¹⁰⁹

Bates (1989) finds that racial differences in levels of financial capital have a significant effect upon racial patterns in business failure rates. Fairlie and Meyer (1996) find that racial groups with higher levels of unearned income have higher levels of self-employment. In an important paper, Fairlie (1999) uses data from the 1968-1989 *Panel Study of Income Dynamics* to examine why African American men are one-third as likely to be self-employed as nonminority men. Fairlie finds that the large discrepancy is due to an African American transition rate into self-employment that is approximately one half the nonminority rate and an African American transition rate out of self-employment that is twice the nonminority rate. He finds that capital constraints—measured by interest income and lump-sum cash payments—significantly reduce the flow into self-employment from wage/salary work, with this effect being nearly seven times larger for self-employed African Americans than for nonminority self-employed persons. Fairlie then attempts to decompose the racial gap in the transition rate into self-employment into a part due to differences in the distributions of individual characteristics and a part due to differences in the processes generating the transitions. He finds that differences in the distributions of characteristics between African Americans and non-minorities explain only a part of the racial gap in the transition rate into self-employment. In addition, racial differences in specific variables, such as levels of assets and the likelihood of having a self-employed father, provide important contributions to the gap. He concludes, however, that “the remaining part of the gap is large and is due to racial differences in the coefficients. Unfortunately, we know much less about the causes of these differences. They may be partly caused by lending or consumer discrimination against blacks” (Fairlie, 1999, p. 14).

Using 2002 data from the *Characteristics of Business Owners* survey, Fairlie and Robb (2008) document a strong positive relationship between the availability and amount of startup capital and business outcomes for African American and Hispanic firms. They conclude: “Firms with higher levels of startup capital are less likely to close and are more likely to have higher profits

¹⁰⁷ See also Bates (1991a); Bates (1991b); Bates (1993); Bates (1997); and Fairlie and Robb (2008).

¹⁰⁸ Myrdal (1944), p. 308. See also Bates (1973).

¹⁰⁹ See also Table 5.7 below.

and sales and to hire employees. The estimated positive relationship is consistent with the inability of some entrepreneurs to obtain the optimal level of startup capital because of liquidity constraints” (Fairlie and Robb, 2008, p.11). Further evidence for liquidity constraints affecting the formation of Hispanic-owned businesses has been documented, *e.g.*, by Fairlie and Woodruff (2010) and Lofstrom and Wang (2009).

There is also research on racial differences in access to credit among small businesses—the main subject of this chapter. Cavalluzzo and Cavalluzzo (1998) used data from the 1988-1989 National Survey of Small Business Finances (NSSBF), conducted by the Federal Reserve Board, to analyze differences in application rates, denial rates, and other outcomes by race, ethnicity and gender in a manner similar to the econometric models reported below in this chapter. They documented a large discrepancy in credit access between nonminority- and minority-owned firms that could not be explained by available firm financial characteristics. Unfortunately, this earliest NSSBF data did not over-sample minority-owned firms and contained only limited information on a firm’s credit history and that of its owner, thus reducing the ability to provide a powerful test of the causal impact of race, ethnicity or gender on loan decisions.

Cole (1999) and Cavaluzzo, *et al.* (2002), using data from the 1993 NSSBF, found higher loan application rejection rates for minority-owned businesses than similarly-situated nonminority businesses, and higher loan denial rates for African American-owned and Asian-owned businesses. Blanchflower, Levine and Zimmerman (2003), using data from the 1993 NSSBF and the 1998 Survey of Small Business Finances (SSBF), find that African American-owned small businesses were about twice as likely to be denied credit even after controlling for a wide variety of balance sheet, creditworthiness and other factors. They find similar results for firms owned by Asians, Hispanics, and women, although at smaller magnitudes than for African Americans. They conclude that the racial disparity is likely to be caused by discrimination. Cavaluzzo and Wolken (2005), using data from the 1998 SSBF, find that large disparities exist in denial rates for African American-, Hispanic-, and Asian-owned firms when compared to similarly-situated nonminority-owned firms.

The main analyses in the present chapter take advantage of the three most recent waves of the Survey of Small Business Finances: the 1993 NSSBF data, the 1998 SSBF data, and the 2003 SSBF data. All three datasets have better information on creditworthiness than did the earlier (1988-1989) NSSBF data, and the 1993 and 1998 surveys have a larger sample of minority-owned firms than did the earlier NSSBF data. These datasets are also used to conduct an extensive set of specification checks designed to weigh the possibility that our results are subject to alternative interpretations.

C. Empirical Framework and Description of the Data

1. Introduction

Disputes about discrimination typically originate in differences in the average outcomes for two groups. To determine whether a difference in the loan denial rate for African American-owned firms compared to nonminority-owned firms is consistent with discrimination, it is necessary to compare African American- and nonminority-owned firms that have similar risks of default; that is, the fraction of the African American firms’ loans that would be approved if they had the same

creditworthiness as the nonminority-owned firms. A standard approach to this problem is to statistically control for firms' characteristics relevant to the loan decision. If African American-owned firms with the same likelihood of default as nonminority-owned firms are less likely to be approved, then it is appropriate to attribute such a difference to discrimination.

Following Munnell, *et al.* (1996) we estimated the following loan denial equation:

$$(1) \quad \text{Prob}(D_i = 1) = \Phi(\beta_0 + \beta_1 CW_i + \beta_2 X_i + \beta_3 R_i),$$

where D_i represents an indicator variable for loan denial for firm i (that is, 1 if the loan is denied and 0 if accepted), CW represents measures of creditworthiness, X represents other firm characteristics, R represents the race, ethnicity or gender of the firm's ownership, and Φ is the cumulative normal probability distribution.¹¹⁰ This econometric model can be thought of as a reduced form version of a structural model that incorporates firms' demand for and financial institutions' supply of loan funds as a function of the interest rate and other factors. Within the framework of this model, a positive estimate of β_3 is consistent with the presence of discrimination.¹¹¹

We begin with the 1993 NSSBF dataset and will continue chronologically through the 2003 dataset and then proceed to evidence from NERA's own comparable surveys conducted in various geographies between 1999 and 2007. This chronological progression allows the reader to see the consistency of the main findings over time. This approach serves as well to demonstrate the value of over-sampling minority and female small business owners, as was the case in the 1993 and 1998 surveys, but not the 2003 survey. Unfortunately, the much anticipated 2008 SSBF results never materialized because the Federal Reserve cancelled this important survey effort.¹¹²

2. 1993 NSSBF Data

The 1993 NSSBF data contain substantial information regarding credit availability on a nationally representative target sample of for-profit, non-farm, non-financial business enterprises with fewer than 500 employees. The survey was conducted during 1994 and 1995 for the Board of Governors of the Federal Reserve System and the U.S. Small Business Administration; the data relate to the years 1992 and 1993. The data file used here contains 4,637 firms.¹¹³ In this NSSBF file, minority-owned firms were over-sampled, but sampling weights are provided to generate nationally representative estimates. Of the firms surveyed, 9.5 percent were owned by

¹¹⁰ Additional discussion of Probit regression appears in Chapter IV, Section C.1.

¹¹¹ The Equal Credit Opportunity Act prohibits discrimination in access to credit by race and would apply to both Becker-type and statistical discrimination.

¹¹² For more on this, see fn. 145 below.

¹¹³ The median size of firms in the sample was 5.5 and mean size was 31.6 full-time equivalent employees; 440 firms out of 4,637 had 100 or more full-time equivalent employees.

African Americans, 6.4 percent were owned by Hispanics, and 7.4 percent were owned by individuals of other races (*i.e.*, Asians/Pacific Islanders, Native Americans).¹¹⁴

Table 5.1 presents population-weighted sample means from these data for all firms in the sample that applied for credit. The estimates indicate that African American-owned firms are almost 2.5 times more likely to have a loan application rejected as are nonminority firms (65.9 percent versus 26.9 percent).¹¹⁵ Other minority groups are denied at rates higher than nonminorities as well, but the magnitude of the African American-to-nonminority differential is particularly large.

Minority-owned firms, however, do have characteristics that are different from those of nonminority-owned firms, and such differences may contribute to the gap in loan denial rates. For instance, minority-owned firms were younger, smaller (whether measured in terms of sales or employment), more likely to be located in urban areas, and more likely to have an owner with fewer years of experience than their nonminority counterparts. Minority firms were also less creditworthy, on average, than their nonminority counterparts, as measured by whether (a) the owner had legal judgments against him or her over the previous three years, (b) the firm had been delinquent for more than 60 days on business obligations over the preceding three years, or (c) the owner had been delinquent for more than 60 days on personal obligations over the prior three years. Additionally, compared to nonminority-owned firms, African American-owned firms were also more likely, on average, to have owners who had declared bankruptcy over the preceding seven years.

Minority-owned firms also sought smaller amounts of credit than nonminority-owned firms. This was particularly true for African American-owned firms, who requested loans that were, on average, about 60 percent smaller than those requested by nonminority-owned firms, and Hispanic-owned firms, who requested loans about 42 percent smaller than those requested by nonminority-owned firms.

The NSSBF database does not identify the specific city or state where the firm is located; instead, data are reported for four census regions, nine census divisions, and urban or rural location. Table 5.2 presents evidence for the South Atlantic (SATL) division, which includes MDOT and eight surrounding states.¹¹⁶ This SATL sample includes the owners of 773 firms, of which 342 owners (44.2%) said that they had applied for a loan over the preceding three-year period.

¹¹⁴ There were also two firms in the “Other race” category in 1993 that reported multiple or mixed race.

¹¹⁵ Cavalluzzo and Cavalluzzo (1998) examined these outcomes using the 1987 NSSBF and similarly found that denial rates (weighted) are considerably higher for minorities. Nonminority-owned firms had a denial rate for loans of 22 percent compared with 56 percent for African Americans, 36 percent for Hispanics, and 24 percent for other races, which are broadly similar to the differences reported here. These estimates for minority groups are estimated with less precision, however, because of the smaller number of minority-owned firms in the 1987 sample.

¹¹⁶ In addition to Maryland, the SATL includes Delaware, the District of Columbia, Florida, Georgia, North Carolina, South Carolina, Virginia and West Virginia.

The overall denial rate of 29.2 percent in the SATL is slightly higher than the national rate of 28.8 percent reported in Table 5.1. The difference in the denial rates between African American-owned firms and nonminority-owned firms is also higher in the SATL (43.5 percentage points) than in the nation as a whole (39.0 percentage points). On balance, however, the weighted sample means are not significantly different in the SATL than in the nation as a whole—either overall or by race, ethnicity or gender.

Table 5.1. Selected Population-Weighted Sample Means of Loan Applicants from 1993 NSSBF Data

	All	Non-minority	African American	Hispanic	Other Races
% of Firms Denied in the Last Three Years	28.8	26.9	65.9	35.9	39.9
<i>Credit History of Firm/Owners</i>					
% Owners with Judgments Against Them	4.8	4.1	16.9	5.2	15.2
% Firms Delinquent in Business Obligations	24.2	23.1	49.0	25.1	31.6
% Owners Delinquent on Personal Obligations	14.0	12.6	43.4	14.8	24.5
% Owners Declared Bankruptcy in Past 7yrs	2.4	2.4	5.3	2.0	0.8
<i>Other Firm Characteristics</i>					
% Female-Owned	17.9	18.1	18.2	9.7	23.1
Sales (in 1,000s of 1992 \$)	1795.0	1870.6	588.6	1361.3	1309.1
Profits (in 1,000s of 1992 \$)	86.7	84.5	59.9	189.5	54.0
Assets (in 1,000s of 1992 \$)	889.4	922.5	230.3	745.6	747.3
Liabilities (in 1,000s of 1992 \$)	547.4	572.8	146.2	308.6	486.0
Owner's Years of Experience	18.3	18.7	15.3	15.9	14.9
Owner's Share of Business	77.1	76.5	86.4	83.9	77.1
% ≤ 8 th Grade Education	0.8	0.7	0.0	3.4	1.0
% 9 th -11 th Grade Education	2.2	2.2	3.7	1.8	1.2
% High School Graduate	19.6	19.7	12.8	27.7	14.9
% Some College	28.0	28.3	36.0	20.6	19.8
% College Graduate	29.2	29.2	28.0	24.1	36.5
% Postgraduate Education	20.2	19.9	19.5	22.3	26.6
% Line of credit	48.7	49.1	35.8	52.8	43.7
Total Full-time Employment in 1990	11.4	11.8	6.8	9.3	8.8
Total Full-time Employment in 1992	13.6	13.9	8.3	10.8	12.3
Firm age, in years	13.4	13.6	11.5	13.3	9.3
% New Firm Since 1990	9.4	9.4	13.0	6.4	9.5
% Firms Located in MSA	76.5	75.1	91.2	90.7	85.7
% Sole Proprietorship	32.8	32.3	48.6	38.2	24.2
% Partnership	7.8	7.8	7.7	6.7	7.9
% S Corporation	26.1	27.1	11.7	13.7	27.1
% C Corporation	33.4	32.8	32.1	41.4	40.8
% Existing Relationship with Lender	24.6	24.7	12.8	29.6	25.7
% Firms with Local Sales Market	54.1	54.7	42.9	55.0	47.4
<i>Characteristics of Loan Application</i>					
Amount Requested (in 1,000s of 1992 \$)	300.4	310.8	126.5	179.1	310.5
% Loans to be Used for Working Capital	8.4	8.8	4.9	4.6	5.5
% Loans to be Used for Equipment/Machinery	2.3	2.4	1.7	0.2	0.6
% Loans to be Used for Land/Buildings	0.4	0.4	0.9	0.0	0.0
% Loans to be Backed by Real Estate	28.3	28.6	24.7	26.2	24.7
Sample Size (unweighted)	2,007	1,648	170	96	93

Source: NERA calculations from 1993 NSSBF.

Notes: (1) Sample weights are used to provide statistics that are nationally representative of all small businesses.
(2) Sample restricted to firms that applied for a loan over the preceding three years.

Table 5.2. Selected Sample Means of Loan Applicants—SATL

	All	Non-minority	African American	Hispanic	Other Races
% of Firms Denied in the Last Three Years	29.2	26.3	69.8	50.9	33.4
<i>Credit History of Firm/Owners</i>					
% Owners with Judgments Against Them	4.8	3.9	14.9	0.0	22.5
% Firms Delinquent in Business Obligations	23.3	21.4	49.2	33.4	33.6
% Owners Delinquent on Personal Obligations	11.4	8.5	41.1	16.5	51.3
% Owners Declared Bankruptcy in Past 7yrs	2.3	2.2	6.6	0.0	0.0
<i>Other Firm Characteristics</i>					
% Female-Owned	18.3	17.8	29.9	9.7	28.6
Sales (in 1,000s of 1992 \$)	1727.7	1778.4	776.3	2363.0	635.8
Profits (in 1,000s of 1992 \$)	74.5	62.5	17.5	460.1	6.8
Assets (in 1,000s of 1992 \$)	1022.3	1074.2	277.8	815.9	752.9
Liabilities (in 1,000s of 1992 \$)	645.4	675.5	197.4	650.0	340.3
Owner's Years of Experience	19.1	19.7	15.2	10.9	16.6
Owner's Share of Business	73.8	73.5	84.8	62.3	82.9
% ≤ 8 th Grade Education	0.3	0.4	0.0	0.0	0.0
% 9 th -11 th Grade Education	1.9	1.6	6.7	3.9	0.0
% High School Graduate	16.4	16.2	21.3	27.0	0.0
% Some College	28.2	29.6	25.7	18.6	0.0
% College Graduate	32.5	31.6	31.4	29.5	67.3
% Postgraduate Education	20.7	20.6	14.8	21.0	32.7
% Line of credit	47.4	48.5	32.8	53.0	28.6
Total Full-time Employment in 1990	12.4	12.8	10.9	8.0	8.2
Total Full-time Employment in 1992	14.1	14.5	14.2	9.6	8.2
Firm age, in years	13.2	13.6	10.3	9.3	10.1
% New Firm Since 1990	4.4	3.9	11.2	12.0	0.0
% Firms Located in MSA	80.6	80.0	89.6	92.0	72.4
% Sole Proprietorship	23.1	23.0	45.0	4.5	20.8
% Partnership	6.3	6.7	0.7	3.5	5.1
% S Corporation	29.7	30.3	22.8	23.9	28.6
% C Corporation	40.9	40.0	31.4	68.0	45.5
% Existing Relationship with Lender	24.0	23.8	21.7	15.9	43.6
% Firms with Local Sales Market	49.8	50.3	42.7	30.2	72.5
<i>Characteristics of Loan Application</i>					
Amount Requested (in 1,000s of 1992 \$)	342.9	352.9	183.1	440.0	126.3
% Loans to be Used for Working Capital	6.9	7.4	1.3	3.5	5.3
% Loans to be Used for Equipment/Machinery	3.0	3.4	0.0	0.0	0.0
% Loans to be Used for Land/Buildings	0.4	0.4	0.0	0.0	0.0
% Loans to be Backed by Real Estate	24.6	23.9	38.5	34.4	14.7
Total Sample Size (unweighted)	342	270	45	19	8

Source: See Table 5.1.

Notes: (1) Sample weights are used to provide statistics that are nationally representative of all small businesses. (2) Some variable means are computed from slightly smaller samples because of missing values. (3) "Other Races" are not reported separately due to small sample size.

D. Qualitative Evidence

Before moving on to the results of our multivariate analysis, we first report on what business owners themselves say are their main problems. While this evidence is not conclusive in determining whether discrimination exists, it highlights firms' perceptions regarding discrimination in obtaining credit. That African American-owned firms and other minorities report greater difficulty in obtaining commercial credit than do nonminority-owned firms, but report other types of problems no more frequently, suggests either that discrimination takes place or that perceptions of discrimination exist that are unwarranted. It therefore complements the econometric analysis provided subsequently, which can distinguish between these two hypotheses.

Table 5.3 summarizes, for the U.S. as a whole, responses to specific questions about problems that firms confronted over the 12-month period before the date of response. In the top panel, respondents were asked to what extent credit market conditions had been a problem. African Americans and Hispanics were much more likely to say that it had been a "serious" problem (31.3 percent and 22.9 percent, respectively) than nonminorities (12.7 percent). The bottom panel of the table reports the results for eight other designated problem areas: (1) training costs; (2) worker's compensation costs; (3) health insurance costs; (4) IRS regulation or penalties; (5) environmental regulations; (6) The American with Disabilities Act; (7) the Occupational Safety and Health Act; and (8) The Family and Medical Leave Act. Differences between African American-owned firms and Hispanic-owned firms, on the one hand, and nonminority-owned firms, on the other, are much less pronounced in these eight areas than they are in relation to credit market conditions.¹¹⁷ The finding that minority-owned firms are largely indistinguishable from nonminority-owned firms in reporting a variety of problems, except for the case of credit, indicates that these firms perceive credit availability to be a particular problem for them.

Results are similar in Table 5.4 for the SATL division—with African American, Hispanic and other minority-owned firms being more likely than nonminority-owned firms to say that credit market conditions had been a serious problem in the preceding 12 months.

¹¹⁷ We also estimated a series of ordered Logit equations (not reported) to control for differences across firms in their creditworthiness, location, industry, size, and the like. It is apparent from these regressions that African American-owned firms were more likely to report that credit market conditions were especially serious.

Table 5.3. Problems Firms Experienced During Preceding 12 Months—USA

	All	Non-minority	African American	Hispanic	Other Races
<i>Credit Market Conditions</i>					
Percent reporting not a problem	66.2	67.3	43.1	58.9	65.8
Percent reporting somewhat of a problem	20.1	19.9	25.6	18.2	21.3
Percent reporting serious problem	13.7	12.7	31.3	22.9	12.9
<i>Other Potential Problems (% reporting problem is serious)</i>					
Training costs	6.5	6.6	7.2	6.3	4.3
Worker's compensation costs	21.7	21.0	19.3	30.6	28.7
Health insurance costs	32.5	31.6	38.1	44.3	35.0
IRS regulation or penalties	12.3	11.8	17.1	17.9	13.2
Environmental regulations	8.5	8.5	5.6	7.4	11.0
Americans with Disabilities Act	2.7	2.6	3.6	2.7	3.9
Occupational Safety and Health Act	4.5	4.5	3.9	3.6	6.2
Family and Medical Leave Act	2.7	2.5	4.5	3.1	4.8
Number of observations (unweighted)	2,007	1,648	170	96	93

Source: See Table 5.1.

Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Table 5.4. Problems Firms Experienced During Preceding 12 Months—SATL

	All	Non-minority	African American	Hispanic	Other Races
<i>Credit Market Conditions</i>					
Percent reporting not a problem	65.3	66.8	38.4	58.9	69.2
Percent reporting somewhat of a problem	20.9	20.9	28.8	14.2	18.4
Percent reporting serious problem	13.7	12.3	32.8	26.9	12.4
<i>Other Potential Problems (% reporting problem is serious)</i>					
Training costs	6.5	6.5	5.4	4.8	8.4
Worker's compensation costs	21.5	20.5	25.1	44.0	20.1
Health insurance costs	29.8	27.7	39.4	44.6	50.6
IRS regulation or penalties	12.7	12.3	19.1	24.3	5.0
Environmental regulations	9.3	10.1	6.1	2.9	2.5
Americans with Disabilities Act	2.1	2.0	6.6	0.0	1.2
Occupational Safety and Health Act	3.4	3.2	5.7	5.3	2.7
Family and Medical Leave Act	2.5	2.3	7.8	1.6	1.2
Number of observations (unweighted)	773	573	112	47	41

Source: See Table 5.1.

Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Tables 5.5 and 5.6 report the views of NSSBF respondents for the U.S. as a whole and the SATL division, respectively, on the most important issues businesses expected to face over the following year. Nationally, credit availability and cash flow again appear to be more important issues for African American-owned firms than for nonminority-owned firms. Nonminority-owned firms were especially worried about health care costs. Hispanic and other minority-owned firms were especially worried about general business conditions.

In the SATL, credit availability and cash flow are far more important issues for African American-owned firms than for nonminority-owned firms. Almost four times as many African American-owned firms reported credit availability as the most important issue than nonminority-owned firms. In contrast, in the SATL, health care costs were a large concern for all types of firms.

Table 5.5. Percentage of Firms Reporting Most Important Issues Affecting Them Over the Next 12 Months—USA

	All	Non-minority	African American	Hispanic	Other Races
Credit availability	5.9	5.5	20.5	5.3	4.3
Health care, health insurance	21.1	22.1	12.3	13.7	14.8
Taxes, tax policy	5.7	5.7	2.6	8.7	3.3
General U.S. business conditions	11.8	11.5	8.9	14.4	17.4
High interest rates	5.4	5.7	1.8	3.5	3.4
Costs of conducting business	3.3	3.3	3.8	3.8	3.6
Labor force problems	3.5	3.3	3.9	5.5	3.6
Profits, cash flow, expansion, sales	10.3	9.9	20.3	9.8	11.9
Number of observations (unweighted)	4,388	3,383	424	262	319

Source: See Table 5.1.

Table 5.6. Percentage of Firms Reporting Most Important Issues Affecting Them Over the Next 12 Months—SATL

	All	Non-minority	African American	Hispanic	Other Races
Credit availability	7.1	6.5	25.1	7.2	0.0
Health care, health insurance	19.4	19.6	13.2	17.2	21.6
Taxes, tax policy	6.8	7.2	2.1	9.5	0.0
General U.S. business conditions	10.2	10.1	5.3	15.9	13.3
High interest rates	5.5	5.8	0.7	1.6	6.1
Costs of conducting business	4.0	4.0	5.8	5.3	1.6
Labor force problems	3.9	3.7	4.3	9.3	2.9
Profits, cash flow, expansion, sales	8.5	7.9	14.0	6.1	19.0
Number of observations (unweighted)	729	544	106	41	38

Source: See Table 5.1.

Acute credit availability problems for minorities have been reported in surveys other than the NSSBF. In the Census Bureau's 1992 Characteristics of Business Owners (CBO) Survey, for example, when owners were asked to identify the impact of various issues on their firm's profitability, 27.0 percent of African American-owned firms reporting an answer indicated that lack of financial capital had a strong negative impact—compared to only 17.3 percent among nonminority male-owned firms. Hispanic-owned firms and other minority-owned firms also

reported higher percentages than nonminority male-owned firms—21.3 percent and 19.7 percent, respectively. Further, owners who had recently discontinued their business because it was unsuccessful were asked in the CBO survey to identify the reasons why. African American-owned firms, and to a lesser degree Hispanic-owned firms, other minority-owned firms, and women-owned firms, were much more likely than nonminority male-owned firms to report that the reason was due to lack of access to business or personal loans or credit. For unsuccessful firms that were discontinued, 7.3 percent of firms owned by nonminority males reported it was due to lack of access to business loans or credit compared to 15.5 percent for firms owned by African Americans, 8.8 percent for Hispanics, 6.1 percent for Other minorities, and 9.3 percent for women. Another 2.7 percent of nonminority males said it was due to lack of personal loans or credit compared to 8.4 percent for firms owned by African Americans, 5.8 percent for Hispanics, 6.4 percent for Other minorities, and 3.3 percent for women.¹¹⁸

A later study published by the U.S. Chamber of Commerce (2005) is also consistent with these findings from the 1993 NSSBF and the 1992 CBO.¹¹⁹ The Chamber of Commerce survey was conducted in March and April 2005 and detailed the financing problems experienced by small business owners, 95 percent of whom had less than 100 employees. Over 1,000 business owners were interviewed. This survey showed that minority-owned businesses rely heavily on credit cards to fund their businesses; often do not apply for credit, even though they need it, for fear of being denied; and were especially likely to need working capital. In particular, as shown in Table 5.7, minority-owned firms report that availability of credit is their top problem. The biggest difference in responses between minorities and nonminority men and women was availability of credit: 19 percent of nonminority males report credit as their top problem compared with 54 percent for minority males. There was a 15 percentage point difference between minority women and nonminority women. In no other category is there more than an 11 percentage point difference for men or women.

¹¹⁸ Bureau of the Census (1997), Table 5a, p. 46, Table 1, p. 21.

¹¹⁹ Although the CBO is part of the Economic Census, it was not published in 1997. In 2002, the name was changed to the Survey of Business Owners (SBO). However, questions relating to the importance of access to financial loans and credit to business success were not included in SBO.

Table 5.7. Types of Problems Facing Your Business, by Race and Gender

	Non-minority Male	Non-minority Female	Minority Male	Minority Female	African American	Hispanic	Asian/Pacific Islander	Native American
Availability of credit	19	23	54	38	46	52	34	43
Rising health care costs	60	49	50	41	31	42	66	50
Excessive tax burden	49	46	48	42	46	34	51	50
Lack of qualified workers	37	28	33	17	22	20	34	14
Rising energy costs	37	35	36	35	29	34	44	29
Rising costs of materials	44	47	36	47	53	42	32	43
Legal reform	21	15	15	12	11	10	17	29
Number of firms	415	356	80	81	55	50	41	14

Source: U.S. Chamber of Commerce (2005), p. 55.

Note: Percentages may total to more than 100% because respondents had the option to select multiple choices.

In summary, African American-owned and Hispanic-owned firms in particular reported that they had problems with the availability of credit in the past and expected that such difficulties would continue into the future. Whether or not these perceptions reflect actual discrimination can be tested in the econometric analyses to follow.

E. Differences in Loan Denial Rates by Race, Ethnicity or Gender

Evidence presented to this point indicates that minority-owned firms are more likely to be denied loans and report that their lack of access to credit significantly impairs their business. Can these differences be explained by such things as differences in size, creditworthiness, location, or other factors as some have suggested in the literature on discrimination in mortgage lending (Horne, 1994; Bauer and Cromwell, 1994; and Yezer, Phillips, and Trost, 1994)? To address this question, we turn to an econometric examination of whether the loan requests made by minority-owned firms are more likely to be denied, holding constant important differences among firms.

In Table 5.8 and Table 5.9, we report the results from a series of loan denial Probit regressions of the form specified in Equation (1) using data from the 1993 NSSBF for the U.S. and the SATL division.¹²⁰ As indicated earlier, the 1993-2003 datasets have the particular advantage that they include information that can be used to proxy an applicant's creditworthiness. We report estimates from these models that can be interpreted as changes or differences in loan denial probabilities depending on the type of variables considered. For indicator variables such as race, ethnicity and gender, estimates show differences in loan denial probabilities between the indicated group and the base group.¹²¹ In Column (1) of Table 5.8 (in which the regression model contains only race and gender indicators), the estimated coefficient of 0.443 on the African American indicator indicates that the denial rate for African American-owned businesses is 44.3 percentage points higher than that for nonminority male-owned firms.¹²²

The remainder of Table 5.8 includes additional explanatory variables to hold constant differences in the characteristics of firms that may vary by race, ethnicity or gender.¹²³ In Column (2) a number of controls are included that distinguish the creditworthiness of the firm and the owner. Many are statistically significant on a two-tailed test at conventional levels of significance with the expected signs. For instance, having been bankrupt or had legal judgments against the firm or owner raises the probability of denial; stronger sales lower this probability. Even after controlling for these differences in creditworthiness, however, African American-owned firms remain 28.8 percentage points more likely than nonminority-owned firms to have their loan request denied.

The models reported in Columns (3) through (5) of Table 5.8 control for an array of additional characteristics of firms. Column (3) adds 39 additional characteristics of the firm and the loan application, including such factors as level of employment, change in employment, the size of

¹²⁰ Firms owned 50-50 by minorities and non-minorities are excluded from this and all subsequent analyses, as are nonminority firms owned 50-50 by women and men.

¹²¹ For "continuous" variables, such as profits and sales, estimates can be thought of as changes in loan denial probability when the continuous variable changes by one unit. For example, in Column (2) of Table 5.8, the estimated coefficient of -0.003 on owner's years of experience indicates that one additional year of owner's experience is related to -0.3 percentage point reduction in loan denial rate.

¹²² This estimate largely replicates the raw difference in denial rates between African American-owned and nonminority-owned businesses reported in Table 5.1. The raw differential observed there ($0.659 - 0.269 = 0.39$) differs slightly from the 0.443 differential reported here because this specification also controls for whether the business is owned by a White Female and because the regressions are unweighted whereas the descriptive statistics are weighted using the sample weights. When a full set of explanatory control variables are included, the unweighted estimates are insignificantly different from the weighted estimates, hence in Table 5.8 and subsequent tables we report only unweighted estimates.

¹²³ In preliminary analyses, these models were also estimated separately, focusing specifically on the differences in coefficient estimates between nonminorities and African Americans. The F-Test conducted to determine whether parameter estimates were the same for African Americans and nonminorities rejected this null hypothesis. Next, the estimates obtained by estimating the model separately by race were used to conduct an Oaxaca (1973) decomposition. The results from this analysis were similar to those obtained by restricting the coefficients to be the same between African Americans and nonminorities and using the coefficient on the African Americans indicator variable to measure the gap between groups. In this chapter, all the results are reported in this simpler format for ease of exposition and interpretation.

the loan request, and the use of the loan. Column (4) includes variables to control for differences across regions of the country and major industry groups. Column (5) adds variables indicating the month and year in which the loan was requested and the type of financial institution to which the firm applied.¹²⁴ In total, these three columns add 176 variables to the more parsimonious specification reported in Column (2).¹²⁵ Nevertheless, the estimated disadvantage experienced by African American-owned firms in obtaining credit remains large and statistically significant. The estimate from each of the three additional columns indicates that African American-owned firms are 24 percentage points more likely than nonminority male-owned firms to have their loan application denied even after controlling for the multitude of factors we have taken into consideration.

The results also indicate that Asians/Pacific Islanders had significantly higher denial rates than nonminority males—12 percentage points. There is little evidence in the 1993 national data, however, that denial rates for firms owned by Native Americans or Hispanics were significantly different from the denial rates of firms owned by nonminorities; or that denial rates for firms owned by nonminority women were significantly different from those for firms owned by nonminority men.¹²⁶

In Table 5.9, we see results for the SATL division similar to those reported in Table 5.8 for the nation as a whole. The table shows that the results of our loan denial model in the SATL are not substantially different from the nationwide results reported in Table 5.8. The indicator variable for the SATL division is insignificantly different from zero; as are the interaction terms between race/ethnicity/gender and the SATL region.¹²⁷

¹²⁴ Approximately four out of five (80.5%) of the firms who required a loan applied to a commercial bank. Overall, seventeen different types of financial institutions were tabulated, although only the following accounted for more than 1% of the (weighted) total: Finance Companies (4.9%); Savings Banks (2.5%); Savings & Loans (2.3%); Leasing Companies (2.1%); and Credit Unions (2.0%).

¹²⁵ One piece of information to which we did not have access in the 1993 NSSBF or the 1998 SSBF because of confidentiality concerns was each firm's credit rating. A paper by Cavalluzzo, Cavalluzzo and Wolken (2002) was able to incorporate Dun & Bradstreet credit ratings for each firm because the authors' connection to the Federal Reserve Board enabled them to access the confidential firm identifiers. They added these credit rating variables in a model comparable to that reported here and found the results insensitive to the inclusion. The 2003 SSBF includes Dun & Bradstreet credit ratings for each firm. Below, we discuss the impact of incorporating them into a model similar to that presented in Table 5.8 (see Tables 5.27 and 5.28).

¹²⁶ It would be a mistake to interpret a lack of statistical significance (as opposed to substantive significance) in any of the tables in Chapter V, or elsewhere in this Study, as a lack of adverse disparity. While tests for statistical significance are very useful for assessing whether chance can explain disparities that we observe, they do have important limitations. First, the fact that a disparity is not statistically significant does not mean that it *is* due to chance. It merely means that we cannot rule out chance. Second, there are circumstances under which tests for statistical significance are not helpful for distinguishing disparities due to chance from disparities due to other reasons (*e.g.*, discrimination). In the particular statistical application presented in this chapter, the chance that a test for statistical significance will incorrectly attribute to chance disparities that are due to discrimination becomes greater when relatively small sample sizes are present for an affected group. *See also* Appendix A, "Constitutional Significance," "Statistical Significance," and "Substantive Significance."

¹²⁷ The number of Native Americans in the SATL sample was too small to yield statistical results.

Table 5.8. Determinants of Loan Denial Rates—USA

	(1)	(2)	(3)	(4)	(5)
African American	0.443 (11.21)	0.288 (6.84)	0.237 (5.57)	0.235 (5.22)	0.241 (5.13)
Asian/Pacific Islander	0.225 (4.21)	0.171 (3.18)	0.140 (2.56)	0.121 (2.15)	0.119 (2.07)
Native American	-0.016 (0.11)	-0.141 (1.06)	-0.097 (0.71)	-0.052 (0.35)	-0.083 (0.56)
Hispanic	0.129 (2.62)	0.070 (1.42)	0.067 (1.36)	0.035 (0.70)	0.031 (0.63)
Nonminority female	0.088 (2.65)	0.048 (1.45)	0.047 (1.45)	0.036 (1.06)	0.033 (0.94)
Judgments		0.143 (2.84)	0.129 (2.56)	0.124 (2.40)	0.121 (2.29)
Firm delinquent		0.176 (6.50)	0.178 (6.43)	0.195 (6.77)	0.208 (7.00)
Personally delinquent		0.161 (4.45)	0.128 (3.56)	0.124 (3.38)	0.119 (3.17)
Bankrupt past 7 years		0.208 (3.11)	0.179 (2.68)	0.162 (2.37)	0.167 (2.33)
\$1992 profits (*10 ⁸)		-0.000 (0.89)	-0.000 (1.64)	-0.000 (1.78)	-0.000 (1.83)
\$1992 sales (*10 ⁸)		-0.000 (3.08)	-0.000 (3.38)	-0.000 (3.28)	-0.000 (3.38)
\$1992 assets (*10 ⁸)		0.000 (0.51)	0.000 (0.60)	0.000 (0.40)	0.000 (0.37)
\$1992 liabilities (*10 ⁸)		0.000 (0.61)	0.000 (1.11)	0.000 (1.04)	0.000 (1.17)
Owner years of experience		-0.003 (2.59)	-0.001 (1.30)	-0.002 (1.55)	-0.002 (1.72)
Owner share of business		0.001 (1.91)	0.000 (0.71)	0.000 (0.26)	0.000 (0.30)
Owner Education (5 indicator variables)	No	Yes	Yes	Yes	Yes
Other Firm Characteristics (17 variables)	No	No	Yes	Yes	Yes
Characteristics of the Loan (13 variables)	No	No	Yes	Yes	Yes
Geographic Division (8 indicator variables)	No	No	No	Yes	Yes
Industry (60 indicator variables)	No	No	No	Yes	Yes
Month/Year of Application (51 indicator variables)	No	No	No	No	Yes
Type of Financial Institution (16 indicator vars.)	No	No	No	No	Yes
N	2,007	2,007	2,006	1,985	1,973
Pseudo R ²	.0608	.1412	.2276	.2539	.2725
Chi ²	143.6	333.4	537.3	595.4	635.8
Log likelihood	-1108.8	-1013.8	-911.6	-874.8	-848.7

Source: See Table 5.1.

Notes: (1) Reported estimates are derivatives from Probit models, t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) “Other firm characteristics” include variables indicating whether the firm had a line of credit, 1990 employment, firm age, metropolitan area, a new firm since 1990, legal form of organization (sole proprietorship, partnership, S-corporation, or C-corporation), 1990-1992 employment change, existing long run relation with lender, geographic scope of market (local, regional, national or international), the value of the firm’s inventory, the level of wages and salaries paid to workers, the firm’s cash holdings, and the value of land held by the firm. (3) “Characteristics of the loan” include the size of the loan applied for, a variable indicating whether the loan was backed by real estate, and twelve variables indicating the intended use of the loan.

Table 5.9. Determinants of Loan Denial Rates—SATL Division

	(1)	(2)	(3)	(4)	(5)
African American	0.452 (9.85)	0.289 (5.94)	0.239 (4.88)	0.235 (4.61)	0.252 (4.72)
Asian/Pacific Islander	0.223 (3.98)	0.180 (3.19)	0.142 (2.51)	0.123 (2.11)	0.125 (2.11)
Native American	0.007 (0.05)	-0.132 (0.94)	-0.094 (0.67)	-0.047 (0.31)	-0.079 (0.52)
Hispanic	0.104 (1.91)	0.047 (0.88)	0.051 (0.95)	0.021 (0.40)	0.014 (0.25)
Nonminority female	0.089 (2.45)	0.055 (1.51)	0.060 (1.65)	0.044 (1.18)	0.042 (1.10)
African American*SATL	-0.027 (0.35)	-0.009 (0.11)	-0.013 (0.16)	0.002 (0.02)	-0.030 (0.39)
Asian/Pacific Islander*SATL	0.011 (0.06)	-0.069 (0.44)	-0.011 (0.06)	-0.018 (0.10)	-0.052 (0.31)
Native American*SATL					
Hispanic*SATL	0.114 (0.94)	0.107 (0.85)	0.079 (0.61)	0.073 (0.56)	0.095 (0.71)
Nonminority female*SATL	-0.006 (0.07)	-0.035 (0.43)	-0.062 (0.80)	-0.042 (0.51)	-0.050 (0.61)
SATL division	-0.009 (0.270)	0.012 (0.34)	0.015 (0.43)	0.042 (0.98)	0.046 (1.07)
Creditworthiness Controls (4 variables)	No	Yes	Yes	Yes	Yes
Owner Education (5 indicator variables)	No	Yes	Yes	Yes	Yes
Other Firm Characteristics (17 variables)	No	No	Yes	Yes	Yes
Characteristics of the Loan (13 variables)	No	No	Yes	Yes	Yes
Geographic Division (7 indicator variables)	No	No	No	Yes	Yes
Industry (60 indicator variables)	No	No	No	Yes	Yes
Month/Year of Application (51 indicator variables)	No	No	No	No	Yes
Type of Financial Institution (16 indicator vars.)	No	No	No	No	Yes
N	2,006	2,006	2,005	1,984	1,972
Pseudo R ²	.0612	.1416	.2280	.2540	.2728
Chi ²	144.54	334.27	537.91	595.43	636.45
Log likelihood	-1107.9	-1013.1	-910.9	-874.4	-848.1

Source: See Table 5.1.

Notes: See Table 5.8. Creditworthiness controls are those used in Table 5.8 above.

Although the results provided so far strongly indicate that financial institutions treat African American-owned and nonminority male-owned small businesses differently in lending, other considerations may limit our ability to interpret this finding as discrimination. Of perhaps greatest concern is the possibility that we may not have adequately controlled for differences in the creditworthiness of firms. If African American-owned firms are less creditworthy and we have failed to sufficiently capture those differences, then we would be inadvertently attributing the racial difference in loan denial rates to discrimination. On the other hand, if financial institutions discriminate against African American-owned firms, then the greater likelihood of denial for African Americans in earlier years is likely to hurt the performance of these firms and appear to make them look less creditworthy. Therefore, controlling for creditworthiness will likely understate the presence of discrimination.

As a check on the foregoing results, therefore, our first approach was to identify the types of information that financial institutions collect in order to evaluate a loan application and compare that with the information available to us in the NSSBF. First, a selection of small business loan applications was collected from various banks. An Internet search of web sites that provide general business advice to small firms was also conducted. Such sites typically include descriptions of the loan application process and list the kinds of information typically requested of applicants.¹²⁸

Bank loan applications typically request detailed information about both the firm and its owner(s). Regarding the firm, banks typically request information on: (a) type of business, (b) years in business, (c) number of full-time employees, (d) annual sales, (e) organization type (corporation or proprietorship), (f) owner share(s), (g) assets and liabilities, (h) whether the business is a party to any lawsuit, and (i) whether any back taxes are owed. Regarding the owner's personal finances, banks typically ask for: (a) assets and liabilities, (b) sources and levels of income, and (c) whether the owner has any contingent liabilities. Some applications ask explicitly if the firm qualifies as a minority-owned enterprise for the purposes of certain government loan guarantee programs. The race of the applicant, however, would be readily identifiable even in the absence of such a question since most of these loans would be originated through face-to-face contact with a representative of the financial institution.

These criteria seem to match quite closely the information available in the 1993 NSSBF. The particular strength of the NSSBF is the detail available on the firm, which covers much of the information typically requested on loan application forms. The only shortcoming that we have identified in the 1993 NSSBF data is that less detail is available on the finances of the owner of the firm, as opposed to the firm itself.¹²⁹ Although our creditworthiness measures enable us to identify those owners who have had serious financial problems (like being delinquent on personal obligations), we have no direct information regarding the owner's assets, liabilities, and income (as opposed to those of the firm). These factors would be necessary to identify whether

¹²⁸ An example of a typical application form is presented as Appendix B in Blanchflower, Levine, and Zimmerman (2003).

¹²⁹ This is remedied in the 1998 SSBF and the 2003 SSBF, discussed below, both of which contain information on the owner's home equity, and personal net worth excluding home equity and business equity.

the business owner has sufficient personal resources to draw upon should the business encounter difficulties and to determine the personal collateral available should the firm default on its obligation. We do have measures of the owner's human capital in the form of education and experience, which likely capture at least some of the differential in available personal wealth across firm owners. Nevertheless, our potentially incomplete characterization of the business owner's personal financial condition in the 1993 NSSBF dataset may introduce a bias into our analysis if African American business owners have fewer resources than nonminority business owners. As we will see below, however, and as noted in the previous footnote, this deficiency is rectified in the 1998 and 2003 SSBF datasets, with little change in the main findings.

To assess the potential impact of this problem on our results, we separately examined groups of firms who differ in the degree to which personal finances should influence the loan decision and compare the estimated disadvantage experienced by African American-owned firms in different groups. First, we examine proprietorships and partnerships separately from corporations since owners of incorporated businesses are at least somewhat shielded from incurring the costs of a failed business. Second, we divide firms according to size.¹³⁰ Both larger small businesses and those that have been in existence for some time are more likely to rely on the business's funds, rather than the owner's, to repay its obligations. Third, we consider firms that have applied for loans to obtain working capital separately from those firms that seek funds for other purposes (mainly to purchase vehicles, machinery and equipment, and buildings or land). Loans made for one of these other purposes are at least partially collateralized because the financial institution could sell them, albeit at a potentially somewhat reduced rate, should the small business default.¹³¹

Results from these analyses provide no indication that omitting the owner's personal wealth substantially biases the results presented above in Tables 5.8 and 5.9. Estimates presented in row numbers 1 through 8 of Table 5.10 indicate that African American-owned small businesses are significantly more likely to have their loan applications rejected regardless of the category of firm considered. In particular, when samples are restricted to corporations, larger firms, and firms seeking credit for uses other than working capital, African American-owned firms are 18, 25, and 16 percentage points more likely, respectively, to have their loan application rejected even though personal resources should be less important in these categories. Moreover, in each group where there are two types of firms (large and small, etc.), the estimates for the two types of firms are not significantly different from each other.

¹³⁰ As reported earlier, the mean and median size of firms is 5.5 and 31.6 full-time equivalent workers, respectively. Fourteen percent of firms have one or fewer employees and 27 percent have two or fewer employees. In the SATL, the mean and median size of firms is 6.0 and 34.3 full-time equivalent workers, respectively. Twelve percent of firms have one or fewer employees and 26 percent have two or fewer employees.

¹³¹ As indicated earlier, greater personal wealth may improve a small business's chances of obtaining credit because it provides collateral should the loan go bad and because wealthy owners can use their own resources to weather bad times, improving the likelihood of repayment. Our separate analysis of corporations and proprietorships and of large and small firms does not account for this second reason because corporations and large businesses may still need to draw on the owner's personal wealth to help it survive short-term shocks. Businesses that have been in existence for several years, however, are less likely to experience these shocks, making them less likely to require infusions from the owner's personal wealth. A loan used to purchase equipment that can be sold if the firm defaults similarly insulates the bank from the need to seek repayment directly from the owner.

Another issue is whether the racial differences in loan denial rates among firms with similar characteristics can be attributable to differences in the geographic location of African American- and nonminority-owned firms. If, for example, African American-owned firms are more likely to be located in the central city, and a central city location is negatively correlated with profitability and the ability to repay debt, then financial institutions may be acting optimally in rejecting the loan applications of African American-owned firms at a higher rate. As indicated earlier, this type of behavior is labeled “statistical discrimination.” In the subsequent text and tables, we present a limited analysis to address whether or not this type of behavior takes place.¹³²

To identify whether lenders’ behavior is consistent with this hypothesis, we distinguish those firms that self-classified their sales market as being local rather than regional, national, or international. A central city location should have a greater impact on future profit expectations for those firms that operate on a local level. If minority-owned firms are more likely to locate in the central city, racial differences in loan approval rates should be greater in the firms that sell in the local market area. The results of this test, reported in row numbers 9 and 10 of Table 5.10, reject the hypothesis that differences in loan denial rates are attributable to different propensities to locate in the center of a city. Estimates indicate that African American-owned firms that sell to the local market are 11 percentage points more likely to have their loan applications denied compared to a 20 percent excess denial rate for firms selling primarily to regional, national, or international markets. In the SATL, however, the figures are reversed, indicating that statistical discrimination may in fact be occurring in this region.

¹³² A strong test to distinguish between statistical discrimination and “Becker-Type” discrimination (referring to the standard economic model of discrimination first expounded by University of Chicago economist Gary Becker) would require a tremendous amount of detail about the specific location of the firm, characteristics of its surrounding area, characteristics of neighboring firms, and the like, which were unavailable to us. As indicated earlier, both forms of discrimination are illegal and this chapter applies a definition that incorporates both.

Table 5.10. Alternative Models of Loan Denials

Specification	African American	African American* SATL	Asian/Pacific Islander	Hispanic	Non-minority Female	Sample Size
All	0.222 (4.76)	0.080 (0.85)	0.080 (1.37)	0.055 (0.97)	0.044 (1.25)	2,006
<i>Organization Type</i>						
1) Proprietorships and Partnerships	0.278 (3.03)	0.039 (0.24)	0.177 (1.51)	-0.021 (0.21)	-0.020 (0.29)	536
2) Corporations	0.181 (3.36)	0.175 (1.17)	0.050 (0.73)	0.092 (1.25)	0.069 (1.66)	1,457
<i>Age of Firm</i>						
3) 12 Years or Under	0.243 (3.80)	0.117 (1.02)	0.150 (1.41)	-0.001 (0.01)	0.029 (0.56)	1,074
4) Over 12 Years	0.180 (2.56)	-0.006 (0.54)	0.068 (0.08)	0.114 (1.39)	0.087 (1.69)	926
<i>1993 Firm Size</i>						
5) Fewer than 10 Employees	0.193 (2.97)	0.078 (1.71)	0.251 (0.92)	-0.019 (0.24)	-0.018 (0.34)	868
6) 10 or More Employees	0.245 (3.39)	0.077 (0.65)	-0.082 (0.85)	0.145 (1.61)	0.111 (2.18)	1,132
<i>Intended Use of Loan</i>						
7) Working Capital	0.241 (4.21)	0.176 (1.22)	0.035 (0.47)	0.039 (0.51)	0.041 (0.85)	1,086
8) Other Use	0.158 (1.93)	0.037 (0.27)	0.167 (1.74)	0.081 (0.94)	0.045 (0.87)	917
<i>Scope of Sales Market</i>						
9) Local	0.108 (1.50)	0.348 (2.06)	0.097 (1.26)	0.007 (0.10)	0.041 (0.78)	875
10) Regional, National, or International	0.199 (4.94)	-0.013 (0.24)	0.031 (0.65)	0.071 (1.34)	0.031 (1.19)	1,129
<i>Creditworthiness</i>						
11) No Past Problems	0.244 (4.08)	-0.005 (0.05)	0.113 (1.92)	0.039 (0.71)	0.071 (2.06)	1,386
12) One Past Problem	0.282 (2.53)	-0.072 (0.36)	-0.092 (0.53)	0.181 (1.10)	0.038 (0.37)	376
13) More Than One Problem	0.273 (2.55)	0.080 (0.85)	0.180 (0.67)	0.257 (1.70)	-0.018 (0.09)	231

Source: See Table 5.1.

Notes: (1) Reported estimates are derivatives from Probit models, t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Each line of this table represents a separate regression with the same control variables as Column 3 of Table 5.8. (3) The dependent variable in all specifications represents an indicator for whether or not a loan application was denied. (4) Control for SATL also included.

We also estimate models that address a potential weakness in the specific functional form with which we control for differences in credit history across firms. As shown in Tables 5.1 and 5.2, African American-owned firms are considerably more likely to have had troubles in the past in the form of judgments against them, late payments by the firm or its owner, or past bankruptcies. The model specifications reported in Tables 5.8 and 5.9 implicitly assume that these past problems are additive in their effect on loan denials and one might suspect the marginal impact would rise as past problems rise. Therefore, in the final three rows of Table 5.10, we separated firms by the number of past problems experienced. In Rows 11 through 13, we restricted the sample to those firms that have never had any past credit problems, those firms that reported one problem only, and those firms that reported more than one of these problems, respectively. The results indicate that even African American-owned firms with clean credit histories are at a significant disadvantage in getting their loans approved, holding constant their other characteristics. In fact, the estimated differential in loan approval rates between African American- and nonminority-owned firms is statistically indistinguishable within each of these groups. Asian/Pacific Islander-owned firms and nonminority female-owned firms with clean credit histories are also at a significant disadvantage relative to nonminority-male owned firms.

Finally, we considered whether African American-owned firms are treated differently from nonminority-owned firms when requesting credit from other sources. The source of credit we examined is credit cards. Such an analysis provides a unique advantage because credit card applications are more likely to be filled out and mailed in, so it is more likely that the race of the applicant is unknown to the financial institution, at least in the case of African American-owned firms and Native American-owned firms, where surname is unlikely to provide any signal about minority status. On the other hand, for Asian/Pacific Islander and Hispanic applicants, it is possible that surname does provide such a signal, albeit a somewhat noisy one. The 1993 NSSBF asked respondents whether they used either a business or personal credit card for business purposes. Although our analysis of use of credit cards does not condition on application, a finding that African American- and nonminority-owned small businesses are equally likely to use credit cards may still provide evidence supporting discrimination in small-business lending. In fact, if financial institutions discriminate against African Americans in providing small business loans, we may even expect to see African Americans use credit cards more often than nonminorities since they have fewer alternatives. Even though many institutions may offer both types of credit, they may only be aware of the race of the applicant in a small business loan.¹³³

In Tables 5.11 and 5.12, we examine the probability that a firm uses either a business credit card (Row 1) or a personal credit card (Row 2) to finance business expenses holding constant other

¹³³ It appears that race may also rarely be known to those institutions that issue credit ratings. As we mentioned above, Cavalluzzo, Cavalluzzo and Wolken (2002) show that Dun & Bradstreet Credit Ratings are not helpful in explaining racial disparities in loan denials. Although we are not privy to Dun & Bradstreet's methodology for establishing its credit ratings, we do know from long experience that the good indicators of ownership by race are sometimes lacking in Dun & Bradstreet's master business identifier file. Indeed, this is the reason why NERA's availability estimation methodology requires us to create a master directory of minority- and women-owned businesses for merging with Dun & Bradstreet's data.

differences across firms.¹³⁴ There is no evidence, either for the U.S. as a whole or for the SATL, that African American-owned firms are less likely to access either business or personal credit cards for business expenses. On the other hand, there is evidence in the SATL and in the nation as a whole that Asian- and Pacific Islander-owned firms are less likely to access business credit cards.

Table 5.11. Models of Credit Card Use–USA

Specification	African American	Asian/ Pacific Islander	Native American	Hispanic	Non-minority Female	Sample Size
1) Business Credit Card	0.035 (1.35)	-0.096 (3.23)	0.085 (1.00)	0.024 (0.79)	0.018 (0.83)	4,633
2) Personal Credit Card	0.019 (0.74)	-0.019 (0.63)	0.019 (0.23)	-0.042 (1.40)	0.028 (1.28)	4,633

Source: See Table 5.1.

Notes: (1) Reported estimates are derivatives from Probit models, t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Each line of this table represents a separate regression with the same control variables as Column 3 of Table 5.8 but excluding the loan characteristics. (3) The dependent variable indicates whether the firm used business or personal credit cards to finance business expenses. (4) In all specifications, the sample size is all firms. (5) Other races are excluded due to sample size limitations.

Table 5.12. Models of Credit Card Use–SATL

Specification	African American	Asian/ Pacific Islander	Native American	Hispanic	Non-minority Female	Sample Size
1) Business Credit Card	0.028 (0.96)	-0.087 (2.78)	0.098 (1.07)	0.028 (0.83)	0.009 (0.37)	4,633
2) Personal Credit Card	-0.014 (0.48)	-0.034 (1.08)	0.024 (0.26)	-0.029 (0.87)	0.028 (1.17)	4,633

Source: See Table 5.1.

Notes: See Table 5.11. Control for SATL included.

F. Differences in Interest Rates Charged on Approved Loans

Although most of our analysis has addressed whether minority- and nonminority-owned firms are treated equally in terms of their probability of loan denial, another way that differential treatment may emerge is through the interest rate charged for approved loans. Discrimination may be apparent if banks approve loans to equally creditworthy minority- and nonminority-

¹³⁴ On average, 29 percent of all firms use business credit cards and 41 percent use personal credit cards for business use; these levels vary only modestly by race and ethnicity. In the SATL division, the figures are 29 percent and 36 percent, respectively.

owned firms, but charge the minority-owned firms a higher interest rate. Therefore, we estimated model specifications analogous to those reported previously for loan denials, but now the dependent variable represents the interest rate charged for firms whose loans were approved and the set of explanatory variables includes characteristics of the loan. More formally, the model we estimated takes the form:

$$(2) \quad I_i = \beta_0 + \beta_1 CW_i + \beta_2 X_i + \beta_3 R_i + \beta_4 LC_i + \varepsilon_i,$$

where I represents the interest rate charged on the loan, LC represents characteristics of the loan (See Table 5.8 notes for a full list of the variables included in this set), ε_i is a term capturing random factors, and all other notations are the same as in equation (1).

An important consideration is whether the interest rate may be treated as exogenous, as our reduced form model assumes. In the context of small business loans, in which it is possible that the loan terms may be negotiated in the determination process, this assumption may not be valid. As such, a model that simultaneously estimates the interest rate and the loan decision might be appropriate, except that the interest rate that would be charged to firms whose loans were denied is not available in our data. Alternatively, one could estimate an interest rate model alone for those firms whose loan was approved, adjusting for the potential bias brought about by sample selection. To properly identify such a model, however, a variable is required that is linked to the loan denial decision, but unrelated to the level of interest charged on approved loans; no such variable exists in the data.

Nevertheless, one would expect these considerations to impose a downward bias on the estimated differential in interest rates charged on loans to African American-owned firms. Those firms whose loans were rejected would have been charged higher interest rates than those approved. Since African American-owned businesses were considerably more likely to be rejected holding constant differences in creditworthiness, one would expect any differential in interest rate to be even greater if those firms were included in the sample. We overlook this implication in the results reported below, but its impact should be kept in mind.

The results obtained from estimating equation (2) are reported in Row 1 of Table 5.13, which includes the complete set of control variables comparable to those in Column 5 of Table 5.8. Estimates indicated that African American-owned firms pay rates of interest that are roughly one percent (100 basis points) higher than similarly situated nonminority-owned firms. Row 2 shows that even African American-owned firms with good credit histories are charged higher interest rates relative to nonminority-owned firms.¹³⁵

The remainder of the table presents similar specification checks to those reported in Table 5.10. Recall that most of these models identify firms for which the firm's own history is likely to be a more important contributor to its creditworthiness. The specifications by sales market are designed to distinguish the impact of central city location. Unfortunately, sample sizes are

¹³⁵ Estimates from firms that have had past credit problems are not presented since the higher likelihood of their being denied credit restricts the size of the sample and limits the ability to provide a powerful test of the interest rates charged if they are approved.

smaller in these specifications and reduce the power of the analysis. Nevertheless, we still find that regardless of organization type and firm age, African American-owned firms face statistically significantly higher interest rates. Overall, the evidence presented indicates that African Americans, and to a lesser extent Hispanics and Asians/Pacific Islanders, do face disadvantages in the market for small business credit that does not appear to be attributable to differences in geography or creditworthiness.

Table 5.13. Models of Interest Rate Charged—USA

Specification	African American	Asian/ Pacific Islander	Native American	Hispanic	Non- minority Female	Sample Size
1) All loans (controls as in Column 5, Table 5.8)	1.034 (3.72)	0.413 (1.37)	-0.427 (0.63)	0.517 (1.97)	0.025 (0.14)	1,454
<i>Creditworthiness</i>						
2) No credit problems	1.187 (3.27)	0.485 (1.33)	0.910 (1.07)	0.435 (1.48)	0.129 (0.66)	1,137
<i>Organization Type</i>						
3) Proprietorships and Partnerships	1.735 (2.57)	0.826 (1.03)	2.589 (0.90)	1.008 (1.74)	-0.239 (0.53)	364
4) Corporations	0.660 (2.04)	0.359 (1.07)	-0.585 (0.86)	0.491 (1.53)	0.127 (0.66)	1,090
<i>1993 Firm Size</i>						
5) Fewer than 10 Employees	1.200 (2.58)	-0.247 (0.41)	-0.010 (0.01)	0.783 (1.75)	-0.311 (1.02)	574
6) 10 or More Employees	0.450 (1.15)	0.446 (1.21)	-0.197 (0.25)	0.515 (1.37)	0.164 (0.77)	880
<i>Scope of Sales Market</i>						
7) Local	0.751 (1.55)	-0.073 (0.13)	1.773 (1.12)	0.805 (2.05)	0.324 (1.08)	633
8) Regional, National, or International	1.544 (4.26)	1.185 (2.93)	-1.368 (1.85)	0.392 (0.96)	-0.163 (0.73)	821

Source: See Table 5.1.

Notes: (1) Reported estimates are Ordinary Least Squares (OLS) coefficients, t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Each line of this table represents a separate regression with all of the control variables as Column 5 of Table 5.8 (except where specified) as well as: an indicator variable for whether the loan request was for a fixed interest rate loan, the length of the loan, the size of the loan, whether the loan was guaranteed, whether the loan was secured by collateral, and 7 variables identifying the type of collateral used if the loan was secured. (3) The sample consists of firms that had applied for a loan and had their application approved. (4) “No credit problems” means that neither the firm nor the owner had been delinquent on payments over 60 days, no judgments against the owner for the preceding 3 years, and the owner had not been bankrupt in the preceding 7 years.

Table 5.14 shows results for the SATL. Findings are similar to those observed for the nation as a whole.

Table 5.14. Models of Interest Rate Charged—SATL

Specification	African American	African American * SATL	Asian/Pacific Islander	Native American	Hispanic	Non-minority Female	Sample Size
1) All loans (controls as in Column 5, Table 5.8)	0.974 (3.02)	0.206 (0.35)	0.528 (1.69)	-0.959 (1.32)	0.211 (0.73)	-0.017 (0.09)	1,454
<i>Creditworthiness</i>							
2) No credit problems	0.928 (2.20)	0.927 (1.18)	0.512 (1.39)	0.227 (0.24)	0.008 (0.03)	0.068 (0.32)	1,137
<i>Organization Type</i>							
3) Proprietorships and Partnerships	1.338 (1.93)	6.556 (2.23)	0.772 (0.94)	2.284 (0.80)	0.979 (1.69)	-0.391 (0.83)	364
4) Corporations	0.716 (1.76)	-0.119 (0.19)	0.399 (1.16)	-1.193 (1.63)	0.027 (0.07)	0.107 (0.50)	1,090
<i>1993 Firm Size</i>							
5) Fewer than 10 Employees	1.076 (2.10)	0.746 (0.64)	0.048 (0.08)	-1.371 (0.92)	0.458 (0.97)	-0.488 (1.45)	574
6) 10 or More Employees	0.369 (0.69)	0.152 (0.20)	0.454 (1.23)	-0.200 (0.25)	0.535 (1.23)	0.200 (0.87)	880
<i>Scope of Sales Market</i>							
7) Local	1.154 (2.10)	-1.663 (1.52)	0.189 (0.33)	-1.081 (0.48)	0.541 (1.29)	0.346 (1.06)	633
8) Regional, National, or International	1.227 (2.79)	0.943 (1.27)	1.153 (2.82)	-1.403 (1.90)	0.003 (0.01)	-0.132 (0.54)	821

Source: See Table 5.1.

Notes: See Table 5.13.

G. Loan Approval Rates and Access to Credit

The results presented so far may be biased toward finding too small a disparity between nonminority- and African American-owned firms because those minority-owned firms that actually apply for credit may represent a selected sample of the most creditworthy. More marginal minority-owned firms whose loans may have been accepted had they been owned by nonminorities may not even be among the pool of loan applicants. First, these firms may have gone out of business or may not have had the opportunity to commence operations because of their inability to obtain capital. Second, some existing firms may have chosen not to apply for credit because they were afraid their application would be rejected due to prejudice.

Although we have no direct evidence regarding the first proposition, data from the 1993 NSSBF provide some evidence for the second: African American- and Hispanic-owned firms are much more likely to report that they did not apply for a loan, even though they needed credit, because

they thought they would be rejected. Table 5.15 reports estimates from Probit models in which the dependent variable is an indicator variable representing failure to apply for a loan fearing denial for all firms. The first row presents racial differences without controlling for any other characteristics of firms, and the results indicate that African American- and Hispanic-owned firms are 41 and 24 percentage points more likely than nonminority-owned firms to withhold an application fearing denial.

Of course, some of this difference may be attributable to differences in creditworthiness across firms since firms that are bad credit risks should be afraid that their loan would be denied. To adjust for this, the second row of Table 5.15 reports comparable models that control for differences in creditworthiness and other characteristics of firms. The results from this specification show that the greater fear of rejection among African American- and Hispanic-owned firms can partially be explained by these differences. Nevertheless, a gap of 26, 5, and 16 percentage points still exists for African American-owned, Asian/Pacific Islander-owned and Hispanic-owned firms relative to nonminority-owned firms with similar characteristics. In fact, when asked directly why they were afraid to apply for loans, African American-owned firms and Hispanic-owned firms were far more likely to report prejudice as the reason (19 percent and 8 percent, respectively, compared to less than 3 percent for nonminority-owned firms).¹³⁶ Results obtained in section (b) of Table 5.15 for the SATL division are very similar to those found for the nation as a whole. As section (c) of Table 5.15 shows, African American-owned firms in construction also appear to be fearful of applying because of the possibility of their application being turned down.¹³⁷

If these minority-owned firms had applied for credit and were rejected because of discrimination, estimates of racial disparities based only upon loan applicants (as in Tables 5.8 and 5.9) would be understated. The perception of prejudice among these firms, however, does not necessarily imply that selection bias is present. Those firms that failed to apply because they feared rejection may have had similar loan denial rates as other minority-owned firms with comparable levels of creditworthiness that did apply. If those firms chose to apply for a loan, differences by race in the combined denial rate of the actual and potential applicants would be the same as what we have estimated for the observed sample of applicants.

More formally, suppose that loan denial rates for equally creditworthy nonminority- and minority-owned firms that applied for credit are θ^W and θ^m , respectively; the measure of discrimination employed in the previous analysis is $\theta^m - \theta^W$. Now suppose that firms that are equally creditworthy, but chose not to apply for a loan because they feared rejection, would have been denied at the rates θ^W and ψ^m for nonminority- and minority-owned firms, respectively. Among the nonminority-owned firms, the denial rate is identical regardless of whether the firm chose to apply or not, conditional upon creditworthiness. Among minority-owned firms, however, those who were afraid to apply may have been denied at a higher rate (perhaps because of their greater propensity to locate in the central city or other factors that are related to their

¹³⁶ Other reasons given, including “too little collateral,” “poor credit history,” and “poor balance sheet,” are comparable across groups. Firms could report more than one reason.

¹³⁷ It was not possible to report separate construction results in earlier tables because of small sample sizes.

race, but unrelated to creditworthiness) compared with other minority-owned firms. Then the correct representation of the disadvantage faced by minority-owned firms is $[\eta\theta^m + (1-\eta)\psi^m] - \theta^W$, where η represents the share of minority-owned firms desiring credit that submitted an application. Our earlier findings are biased if θ^m is not equal to ψ^m .

Table 5.15. Racial Differences in Failing to Apply for Loans Fearing Denial

Specification	African American	Asian/Pacific Islander	Native American	Hispanic	Non-minority Female
a) USA					
No Other Control Variables (n=4,637)	0.405 (16.65)	0.099 (3.61)	0.134 (1.72)	0.235 (8.28)	0.031 (1.54)
Full Set of Control Variables (same as Table 5.8, Column 3 except for loan characteristics) (n=4,633)	0.257 (10.02)	0.054 (1.98)	0.019 (0.27)	0.164 (5.69)	-0.008 (0.38)
b) SATL					
No Other Control Variables, except for SATL dummy and race*SATL interactions (n=4,637)	0.405 (14.53)	0.096 (3.27)	0.154 (1.83)	0.241 (7.77)	0.037 (1.67)
Full Set of Control Variables (same as Table 5.8, Column 3 except for loan characteristics) (n=4,633)	0.248 (8.52)	0.054 (1.85)	0.069 (0.85)	0.168 (5.35)	-0.002 (0.07)
c) Construction					
No Other Control Variables (n=781)	0.350 (6.74)	0.109 (1.27)	-0.087 (0.54)	0.150 (2.22)	-0.007 (0.12)
Full Set of Control Variables (same as Table 5.8, Column 3 except for loan characteristics) (n=781)	0.181 (3.67)	0.064 (0.78)	-0.132 (1.00)	0.039 (0.65)	-0.063 (1.32)

Source: See Table 5.1.

Notes: (1) Reported estimates are Probit derivatives, t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Sample consists of all firms. (3) Dependent variable equals one if the firm said they did not apply for a loan fearing denial, zero otherwise.

One approach that is frequently employed to address such a problem is to estimate a “Heckman-correction” that would formally model the application process in conjunction with the loan outcome for those who applied. The difficulty with this methodology in the present context is that it is only correctly implemented when some variable is present that is correlated with a firm’s decision to apply for a loan, but is independent of the financial institution’s decision to approve or deny the request. Unfortunately, the NSSBF data do not appear to contain any variables that would satisfy these conditions, so we are unable to implement this methodology.¹³⁸

As an alternative that answers a different, but related, question, we consider the ability of firms to get credit among those who desired it, regardless of whether or not they applied. This amounts to analyzing access to credit rather than loan approval and includes in the denominator those firms that needed credit but did not apply because they feared rejection. If differences by race in this rate among all firms who needed credit are greater than differences by race in the rate of denial among loan applicants, then this would indicate that African American- and other minority-owned firms have even less access to credit than an analysis of loan applicants would indicate.

To test this proposition, we estimate a regression model comparable to the one reported in Table 5.10 for the sample of firms that applied for a loan, except that this analysis considers all firms seeking credit and treats those who did not apply for fear of rejection as denials. The sample excludes firms that did not need additional credit in the preceding three years. The results, reported in Table 5.16, are consistent with the previous analysis; we find that selection is not much of an issue for African American-owned firms nationally, Asian/Pacific Islander-owned firms nationally, or in the SATL division. Regardless of whether we consider denial rates among applicants or denial rates among firms that desired additional credit, African American-owned firms are 20-30 percentage points less likely to obtain credit once control variables are included and even higher than that when they are not. For Hispanic-owned firms, however, some selection bias is evident. Among the pool of loan applicants, Hispanic-owned firms are not statistically significantly more likely to be denied than other firms with the same characteristics (*See, e.g.,* Table 5.8, Column 5). Among the pool of firms seeking additional credit, however, Hispanic-owned firms are 17 percentage points more likely to be denied access to credit, and 16 percentage points more likely in the SATL, and these differences are statistically significant.

¹³⁸ The only variable that potentially could meet these conditions in the NSSBF data is the distance between a firm and the nearest financial institution. If greater distance reduced a firm’s information regarding the availability of funds, it might be related to the decision to apply for a loan. On the other hand, the creditworthiness of the firm should be independent of its location and should be unlikely to enter into the approval process. Unfortunately, we did not find a direct relationship between distance to the nearest financial institution and the probability of applying for a loan. This may be due to the fact that few firms are located more than a very short distance from the nearest financial institution.

Table 5.16. Models of Failure to Obtain Credit Among Firms that Desired Additional Credit

Specification	African American	Asian/Pacific Islander	Native American	Hispanic	Non-minority Female
a) USA					
No Other Control Variables (n=2,647)	0.455 (14.84)	0.298 (6.82)	0.188 (1.57)	0.297 (7.76)	0.126 (4.01)
Full Set of Control Variables (same as Table 5.8, Column 3 except for loan characteristics) (n=2,644)	0.276 (6.93)	0.180 (3.42)	-0.008 (0.06)	0.165 (3.51)	0.049 (1.38)
b) SATL					
No Other Control Variables (n=2,647)	0.461 (13.02)	0.288 (6.19)	0.191 (1.49)	0.299 (7.13)	0.142 (4.19)
Full Set of Control Variables (same as Table 5.8, Column 3 except for loan characteristics) (n=2,644)	0.268 (5.85)	0.175 (3.16)	-0.018 (0.12)	0.159 (3.10)	0.083 (2.15)

Source: See Table 5.1.

Notes: (1) Reported estimates are Probit derivatives, t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) The sample consists of all firms that applied for loans along with those who needed credit, but did not apply for fear of refusal. (3) Failure to obtain credit includes those firms that were denied and those that did not apply for fear of refusal. (4) Dependent variable is set to one if the firm failed to obtain credit and to zero if the firm applied for credit and had their loan application approved.

H. Analysis of Credit Market Discrimination in the U.S. in 1998

We turn next to an examination of the extent to which discrimination in the credit market has changed since 1993 using data from the 1998 SSBF conducted by the Board of Governors of the Federal Reserve System.¹³⁹ This section updates the estimates obtained above using the 1993 NSSBF. Two complications are that the overall sample size is smaller and a number of the questions have been changed. However, the result is still clear—African American-owned firms face discrimination in the credit market. In addition, there is evidence of discrimination in the credit market against other minority-owned firms as well. We present four sections of evidence, all of which are consistent with our findings from the 1993 survey.

¹³⁹ The target population of the survey was for-profit businesses with fewer than 500 employees that were either a single establishment or the headquarters of a multiple establishment company, and were not agricultural firms, financial institutions, or government entities. These firms also had to be in business during December 1998. Data were collected for fiscal year-end 1998. Like its 1993 counterpart, the purpose of this survey was to gather information about small business financial behavior and the use of financial services and financial service providers by these firms. The objectives of the survey were to collect information that can inform researchers and policy makers on the availability of credit to small businesses; the location of the sources of financial services; the types of financial services used, including checking accounts, savings accounts, various types of credit, credit cards, trade credit, and equity injections; as well as the firm's recent credit acquisition experiences. The survey also investigated the level of debt held by these firms and their accessibility to credit. Additionally, the survey collected information on firm and owner demographics, as well as the firm's recent income statement and balance sheet.

1. Qualitative Evidence

Consistent with the 1993 survey, African American-owned firms in the 1998 survey report that the biggest problem their firm currently faces is “financing and interest rates.” (Table 5.17). In the 1993 survey, respondents were asked to report problems in the preceding 12 months (Tables 5.3 and 5.4) and over the next 12 months (Tables 5.5 and 5.6). Interestingly, even though credit availability was by far the most important category for African Americans (21 percent in Table 5.5), interest rates were relatively unimportant (2 percent). The 1998 SSBF, however, did not report separate categories.

Table 5.17. What is the Most Important Problem Facing Your Business Today?

	Non-minority Male	African American	Other	Hispanic	Non-minority Female	Total
Financing and interest rates	5.8%	18.2%	10.6%	8.1%	6.2%	6.8%
Taxes	7.7%	1.9%	5.3%	3.1%	6.6%	6.9%
Inflation	0.4%	0.6%	0.0%	1.0%	0.4%	0.4%
Poor sales	7.0%	5.9%	11.6%	7.0%	8.3%	7.5%
Cost/availability of labor	3.9%	3.3%	2.4%	3.5%	4.5%	3.9%
Government regulations/red tape	7.1%	3.0%	4.8%	8.1%	6.5%	6.8%
Competition (from larger firms)	11.1%	10.7%	10.6%	18.4%	10.2%	11.3%
Quality of labor	14.4%	11.0%	9.4%	8.7%	9.1%	12.6%
Cost and availability of insurance	2.6%	1.0%	0.8%	0.0%	2.3%	2.2%
Other	11.4%	10.0%	8.3%	16.0%	12.7%	11.7%
Cash flow	4.6%	10.9%	6.3%	3.5%	3.3%	4.6%
Capital other than working capital	1.1%	1.7%	4.1%	0.8%	1.3%	1.3%
Acquiring and retaining new customers	3.1%	3.9%	5.0%	1.8%	3.3%	3.2%
Growth of firm/industry	0.9%	1.0%	1.2%	0.1%	0.4%	0.8%
Overcapacity of firm/industry	0.1%	0.0%	0.0%	0.3%	0.0%	0.1%
Marketing/advertising	2.1%	3.9%	2.5%	2.8%	3.6%	2.5%
Technology	1.4%	1.2%	1.6%	2.6%	1.3%	1.5%
Costs, other than labor	2.7%	1.8%	2.5%	3.6%	3.8%	2.9%
Seasonal/cyclical issues	1.3%	1.2%	0.7%	0.4%	0.7%	1.1%
Bill collection	2.8%	2.2%	2.4%	2.6%	2.8%	2.8%
Too much work/not enough time	3.6%	2.2%	4.3%	1.4%	5.7%	3.9%
No problems	4.6%	4.3%	5.6%	5.8%	6.4%	5.1%
Not ascertainable	0.4%	0.0%	0.0%	0.0%	0.7%	0.4%

Source: NERA calculations from the 1998 SSBF (n=3,561).

Note: Results are weighted.

2. Differences in Loan Denial Rates by Race/Ethnicity

In 1998 as in 1993, in comparison with firms owned by nonminority males, minority- and female-owned firms were less creditworthy, more likely to have their loan applications turned down, more likely not to apply for a loan for fear of being denied, and consistently smaller and younger. Moreover, their owners had lower amounts of both home and non-home equity. Minority-owned firms in general, and African American-owned firms in particular, were much less likely to be classified as having a “low risk” credit rating by Dun & Bradstreet.¹⁴⁰

In the 1993 survey, respondents were asked: “During the last three years has the firm applied for credit or asked for the renewal of terms on an existing loan?” In 1998, a narrower question limited to new loans was asked: “Did the firm apply for new loans in the last three years?” In 1993, 43 percent answered the question in the affirmative compared with 27 percent in 1998. Despite the fact that in 1993 the question was broader, the pattern of denials by race and gender is similar across the years. As can be seen below, minority-owned firms were especially likely to have their loan applications denied.

Percentage of Loan Applications Denied		
	1993	1998
Nonminority males	26.2%	24.4%
African Americans	65.9%	62.3%
Asians/Pacific Islanders, Native Americans, <i>etc.</i>	39.9%	47.0%
Hispanics	35.9%	49.9%
Nonminority females	30.1%	23.5%
Overall	28.8%	28.6%

Similarly, the proportion of firms reporting that they did not apply for fear of being denied is similar by race, ethnicity, and gender across the two survey years. More than half of African American owners did not apply for a loan for fear of being denied compared with only one out of five nonminority males.

Percentage Not Applying for Fear of Denial		
	1993	1998
Nonminority males	22.5%	20.2%
African Americans	60.7%	53.9%
Asians/Pacific Islanders, Native Americans, <i>etc.</i>	27.5%	23.1%
Hispanics	41.5%	34.3%
Nonminority females	22.7%	24.2%
Overall	24.7%	23.3%

In the 1998 SSBF survey, respondents who were denied loans were asked if they believed there were reasons other than the official ones provided by their financial institution as to why their loan applications were turned down. Among numerous options provided were the following:

¹⁴⁰ Information on home and non-home equity or on the Dun & Bradstreet credit rating was not available in the 1993 survey.

- a) Prejudice on a racial/ethnic basis.
- b) Prejudice against women.
- c) Prejudice against the business location.
- d) Prejudice against the business type.
- e) Prejudice or discrimination (not-specified or other).

Among firm owners who had applied for credit within the last three years and were denied, 34.1 percent believed there were reasons for their denial beyond the official explanation provided by the financial institution. Among nonminorities, 7.7 percent suspected some sort of prejudice. By contrast, the figure among minorities was 25.8 percent. Among owners who needed credit but did not apply for fear of denial, a similar pattern was observed. Only 1.7 percent of nonminorities stated prejudice was the reason, whereas among minorities the figure was 6.8 percent.

In Tables 5.8 and 5.9, the determinants of loan denial rates were estimated using data from the 1993 NSSBF. It was found that African American-owned firms were almost twice as likely to have their loans denied than nonminority male-owned firms, even after controlling for a host of variables included primarily to control for the possibility that minority-owned firms are smaller and less creditworthy than those owned by nonminority men.

A similar exercise is performed below in Tables 5.18 and 5.19 using data from the 1998 SSBF. Column 1 in Table 5.18 shows that African American-owned firms in 1998 had a 42.2 percentage point higher probability of denial than nonminority male-owned firms before taking account of creditworthiness of the firm or any other characteristics. For 1993, the comparable figure was 44.3 percentage points. The addition of a large number of controls reduces the percentage point differential for African Americans to 21.8 in column 5 as the full set of controls is added. For 1993, the comparable figure was 24.1 percentage points.

The main difference between 1993 and 1998 is that now we find evidence that the probability of denial is significantly higher for Hispanic-owned firms as well. In Table 5.18, Column 5, Hispanic-owned firms have a 17.1 percentage point higher probability of being denied than nonminority male-owned firms. In Table 5.8, by contrast, denial probabilities for Hispanic-owned firms were *not* significantly different from those of nonminority male-owned firms. If anything, discrimination in the small business credit market appears to have worsened during the late 1990s.

Table 5.18. Determinants of Loan Denial Rates—USA

	(1)	(2)	(3)	(4)	(5)
African American	0.422 (7.94)	0.254 (5.36)	0.217 (5.05)	0.192 (4.52)	0.218 (4.74)
Asian/Pacific Islander	0.148 (2.54)	0.129 (2.52)	0.049 (1.25)	0.023 (0.65)	0.028 (0.77)
Hispanic	0.353 (6.44)	0.269 (5.37)	0.211 (4.69)	0.183 (4.21)	0.171 (4.00)
Nonminority female	0.087 (2.22)	0.049 (1.55)	0.024 (0.96)	0.016 (0.66)	0.011 (0.44)
Judgments		0.272 (4.28)	0.249 (4.32)	0.272 (4.47)	0.262 (4.20)
Firm delinquent		0.081 (2.88)	0.115 (4.20)	0.103 (3.88)	0.111 (4.01)
Personally delinquent		0.092 (2.85)	0.039 (1.59)	0.042 (1.69)	0.045 (1.76)
Bankrupt past 7 years		0.504 (4.48)	0.406 (3.83)	0.392 (3.67)	0.395 (3.64)
\$1998 sales (*10 ⁸)		-0.000 (2.47)	-0.000 (0.26)	0.000 (0.02)	0.000 (0.03)
\$1998 firm equity (*10 ⁸)		0.000 (1.40)	0.000 (0.46)	0.000 (0.20)	0.000 (0.06)
Owner home equity (*10 ⁸)		0.000 (0.52)	0.000 (1.47)	0.000 (0.96)	0.000 (0.90)
Owner net worth (*10 ⁸)		-0.000 (1.25)	-0.000 (1.28)	-0.000 (1.19)	-0.000 (1.24)
Owner years of experience		-0.002 (1.42)	-0.001 (0.49)	-0.000 (0.34)	-0.000 (0.21)
Owner share of business		0.000 (0.75)	-0.000 (0.12)	0.000 (0.03)	-0.000 (0.33)
Dun & Bradstreet credit ratings (4 variables)	No	Yes	Yes	Yes	Yes
Owner Education (6 indicator variables)	No	Yes	Yes	Yes	Yes
Other Firm Characteristics (17 variables)	No	No	Yes	Yes	Yes
Characteristics of the Loan (1 variable)	No	No	Yes	Yes	Yes
Geographic Division (8 indicator variables)	No	No	No	Yes	Yes
Industry (8 indicator variables)	No	No	No	Yes	Yes
Year of Application (5 indicator variables)	No	No	No	No	Yes
Type of Financial Institution (11 indicator vars.)	No	No	No	No	Yes
N	924	924	924	924	905
Pseudo R ²	.1061	.2842	.3714	.3910	.4015
Chi ²	90.0	241.1	315.1	331.8	337.8
Log likelihood	-379.3	-303.7	-266.7	-258.3	-251.7

Source: See Table 5.17.

Notes: (1) Reported estimates are derivatives from Probit models, t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) “Other firm characteristics” include variables indicating whether the firm had a line of credit, 1998 full time equivalent employment, firm age, metropolitan area, legal form of organization (sole proprietorship, partnership, LLP, S-corporation, C-corporation, or LLC), existing long run relation with lender, geographic scope of market (regional, national, foreign or international), the value of the firm’s inventory, the firm’s cash holdings, and the value of land held by the firm. (3) “Characteristics of the loan” includes the size of the loan applied for.

Table 5.19. Determinants of Loan Denial Rates—SATL

	(1)	(2)	(3)	(4)	(5)
African American	0.471 (7.46)	0.318 (5.38)	0.236 (4.59)	0.217 (4.16)	0.243 (4.35)
Asian/Pacific Islander	0.189 (3.00)	0.162 (2.89)	0.072 (1.65)	0.041 (1.05)	0.048 (1.17)
Hispanic	0.381 (6.27)	0.309 (5.46)	0.251 (4.79)	0.223 (4.32)	0.209 (4.13)
Nonminority Female	0.074 (1.69)	0.049 (1.39)	0.021 (0.75)	0.012 (0.45)	0.004 (0.16)
African American*SATL	-0.092 (1.42)	-0.072 (1.65)	-0.029 (0.63)	-0.028 (0.64)	-0.027 (0.60)
Asian/Pacific Islander*SATL					
Hispanic*SATL	-0.080 (0.96)	-0.070 (1.32)	-0.051 (1.28)	-0.047 (1.20)	-0.046 (1.20)
Nonminority female*SATL	0.050 (0.53)	-0.011 (0.18)	0.001 (0.02)	0.006 (0.11)	0.017 (0.29)
SATL division	0.043 (0.94)	0.041 (1.05)	0.040 (1.19)	0.006 (0.13)	0.011 (0.22)
Creditworthiness Controls (8 variables)	No	Yes	Yes	Yes	Yes
Owner's Education (6 indicator variables)	No	Yes	Yes	Yes	Yes
Other Firm Characteristics (17 variables)	No	No	Yes	Yes	Yes
Characteristics of the Loan (1 variable)	No	No	Yes	Yes	Yes
Geographic Division (7 indicator variables)	No	No	No	Yes	Yes
Industry (8 indicator variables)	No	No	No	Yes	Yes
Year of Application (5 indicator variables)	No	No	No	No	Yes
Type of Financial Institution (11 indicator vars.)	No	No	No	No	Yes
N	918	918	918	918	899
Pseudo R ²	0.1119	0.2893	0.3750	0.3941	0.4052
Chi ²	94.67	244.85	317.33	333.51	339.91
Log likelihood	-375.8	-300.7	-264.5	-256.4	-249.5

Source: See Table 5.17.

Notes: (1) t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Other creditworthiness controls are the four other variables included in Column 2 of Table 5.18.

Table 5.19 focusing on the SATL division yields similar results—showing significantly larger denial probabilities for African American- and Hispanic-owned firms (24.3 percent and 20.9 percent, respectively) than for nonminority male-owned firms. The SATL indicator was not significant in Table 5.19. None of the interaction terms between SATL and race, ethnicity or gender were significant either, indicating that the loan denial results for the SATL are not significantly different than for the nation as a whole.

Although tempered by the smaller sample size available, the quality of the experiment is somewhat better using the 1998 data than it was using the 1993 data due to the availability of an

improved set of controls for the creditworthiness of the firm and its owner. In 1998, three new variables are included regarding the financial viability of the firm:

- a) The value of the equity, if any, in the owner's home.
- b) The owner's net worth excluding home equity and equity in the firm.
- c) The firm's Dun & Bradstreet credit rating in five categories (low, moderate, average, significant and high) indicating the likelihood of loan default.¹⁴¹

Despite the fact that these new variables do help to predict loan denials,¹⁴² the estimated race differences including these variables are unchanged from those reported above.¹⁴³ This suggests that the large estimated differences in the denial probabilities that were estimated in 1993 were not biased significantly upwards by the fact that these variables were unavailable.

3. Effect of 1998 Survey Design Changes on Differences in Loan Denial Rates

The question we used to examine the 1998 data was somewhat narrower than the question used in the 1993 survey because it was changed by the survey designers. The 1998 question asked about new loans over the preceding three years, whereas the 1993 question covered all loans, including renewals. Responses in 1998 were as follows:

Applied for New Loans Last Three Years	Number	Percent
Did not apply	2,599	73.0%
Always approved	713	20.0%
Always denied	166	4.7%
Sometimes approved/sometimes denied	83	2.3%
Total	3,561	100.0%

The dependent variable used in Tables 5.18 and 5.19 was set to one if the loan application was always denied and was set to zero if the application was always approved or sometimes approved/sometimes denied. An alternative dependent variable—*DenyAlt*—is set to one if the application is always denied, set to zero if always approved. Those responding “sometimes approved/sometimes denied” are excluded from the analysis. Column (1) of Table 5.20 replicates Column 1 of Table 5.18 using *DenyAlt* as the dependent variable with the smaller sub-sample. African Americans, Hispanics, Asians/Pacific Islanders, and nonminority females are all

¹⁴¹ The D&B Commercial Credit Score Report predicts the likelihood of a company paying in a delinquent manner (90+ days past terms) during the next 12 months based on the information in D&B's file. The score is intended to help firms decide quickly whether to accept or reject accounts, adjust terms or credit limits, or conduct a more extensive review based on the report D&B provides. Firms can also determine the company's relative ranking among other businesses in the D&B database.

¹⁴² The coefficients and t-statistics on the credit score variables when they were included alone in a U.S. loan denial model was as follows: moderate risk = .228 (2.45); average risk = .295 (3.25); significant risk = .319 (3.28); high risk = .391 (3.53); n =924; pseudo r^2 =.0253. Excluded category “low risk.” Results were essentially the same when a control for SATL was also included.

¹⁴³ This confirms the findings of Cavalluzzo, Cavalluzzo and Wolken (2002) who performed a similar exercise with the 1993 data.

confirmed to face higher denial rates than nonminority males using this specification. For African Americans and Hispanics, the difference is 46 and 36 percentage points, respectively. For Asians/Pacific Islanders, the difference is 19 percentage points, and for nonminority females, 8 percentage points.

Table 5.20. More Loan Denial Probabilities

	(1)	(2)	(3)	(4)
	<i>DenyAlt</i>	<i>DenyAlt</i>	<i>DenyAlt</i>	<i>DenyAlt</i>
African American	0.457 (8.00)	0.246 (4.76)	0.499 (7.42)	0.271 (4.32)
Asian/Pacific Islander	0.185 (2.81)	0.027 (0.65)	0.231 (3.25)	0.043 (0.93)
Hispanic	0.360 (6.28)	0.171 (3.67)	0.385 (6.07)	0.206 (3.79)
Nonminority female	0.083 (2.00)	0.005 (0.20)	0.068 (1.48)	0.001 (0.04)
African American*SATL			-0.091 (1.21)	-0.028 (0.53)
Asian/Pacific Islander*SATL				
Hispanic*SATL			-0.078 (0.82)	-0.051 (1.06)
Nonminority female*SATL			0.058 (0.57)	0.011 (0.16)
SATL			0.043 (0.87)	0.025 (0.43)
Creditworthiness Controls	No	Yes	No	Yes
Owner's Education	No	Yes	No	Yes
Other Firm Characteristics	No	Yes	No	Yes
Characteristics of the Loan	No	Yes	No	Yes
Geographic Division	No	Yes	No	Yes
Industry	No	Yes	No	Yes
N	846	846	841	841
Pseudo R ²	0.1112	0.4265	0.1168	0.4284
Chi ²	90.94	348.71	95.23	349.41
Log likelihood	-363.3	-234.5	-360.1	-233.1

Source: See Table 5.18.

Results consistent with discrimination are confirmed for African American-owned firms and Hispanic-owned firms in Column (2) of Table 5.20 when a host of demographic and financial characteristics and geographic and industry indicators are included. When interaction terms for the SATL division are added to the model as in Columns (3) and (4), results for African Americans and Hispanics remain statistically significant throughout. The SATL indicator is not significant in any of the specifications, nor are the interaction terms between SATL and race, ethnicity, or gender.

4. Differences in Interest Rates, Credit Card Use, and Failure to Apply for Fear of Denial

Tables 5.21 through 5.23 provide confirmation from the 1998 survey of a number of other results from the 1993 survey reported above.

Table 5.21, which is similar to Tables 5.13 and 5.14, finds that conditional on obtaining a loan, African American-owned firms are charged a higher price for their credit—on average 1.06 percentage points nationally and 1.18 percentage points in the SATL.

Table 5.22, which is similar to Table 5.15, shows that African American-owned firms are much more likely not to apply for a loan for fear that they will be denied. Based on all of the foregoing evidence, this is perhaps a sensible decision—if and when they do apply they are almost twice as likely as nonminority male-owned firms to have their application rejected. This is evident in the SATL as well and also in the construction sector. There is some evidence of this phenomenon for Hispanic-owned firms nationally as well.

Finally, Table 5.23, which is comparable to Tables 5.11 and 5.12, suggests that when the financial institution does not know the race or ethnicity of the applicant—as is often the case in an application for a credit card—there are no differences by race or ethnicity in the usage for business purposes of either business or personal credit cards. There was also no evidence of any race effects in the use of business credit cards in the SATL region (row 3) or in construction (results not reported here).

The strength of the findings from the 1993 NSSBF survey is elevated by these findings from the 1998 SSBF survey, which strongly confirm the earlier results. Unfortunately, African Americans continue to be discriminated against in the market for small business credit throughout this time period. By 1998, this discrimination was on the increase for African Americans and expanding to impact other minority groups, such as Hispanics and Asians/Pacific Islanders, as well.

Table 5.21. Models of Interest Rate Charged

Specification	African American	African American* SATL	Asian/Pacific Islander	Hispanic	Non-minority Female
1a) All Loans (as in Column 5 of Table 5.18) n=765	1.064 (2.66)	—	0.559 (1.49)	-0.088 (0.23)	-0.501 (1.93)
1b) All Loans (as in Column 5 of Table 5.19) n=765	1.177 (2.22)	-0.408 (0.49)	0.639 (1.50)	-0.152 (0.30)	-0.271 (0.92)

Source: See Table 5.18.

Notes: (1) Each line of this table represents a separate OLS regression with all of the control variables. (2) t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (3) The sample consists of firms that had applied for a loan and had their application approved.

Table 5.22. Racial Differences in Failing to Apply for Loans Fearing Denial

Specification	African American	Asian/Pacific Islander	Hispanic	Non-minority Female
a) U.S.				
No Other Control Variables (n=3,448)	0.353 (11.90)	0.046 (1.48)	0.173 (5.77)	0.051 (2.55)
Full Set of Control Variables (n=3,448)	0.208 (7.04)	-0.012 (0.43)	0.052 (1.87)	0.011 (0.59)
b) SATL division				
No Other Control Variables (n=565)	0.389 (7.00)	-0.001 (0.01)	0.122 (1.71)	0.080 (1.58)
Full Set of Control Variables (n=560)	0.218 (4.21)	-0.024 (0.35)	0.023 (0.40)	0.023 (0.57)
c) Construction				
No Other Control Variables (n=613)	0.371 (5.06)	0.117 (1.43)	0.020 (0.26)	0.122 (2.08)
Full Set of Control Variables (n=609)	0.273 (3.69)	0.099 (1.32)	-0.062 (1.13)	0.038 (0.74)

Source: See Table 5.18.

Notes: (1) Reported estimates are Probit derivatives with t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Full set of control variables as in Column 5 of Table 5.18, except for loan amount, year of application, and type of lender.

Table 5.23. Models of Credit Card Use

Specification	African American	Asian/ Pacific Islander	Hispanic	Nonminority Female	Sample Size
1) Business Credit Card	-0.001 (0.02)	-0.038 (1.00)	-0.014 (0.38)	-0.018 (0.72)	3,561
2) Personal Credit Card	-0.018 (0.54)	0.016 (0.44)	-0.050 (1.42)	0.012 (0.52)	3,561
3) Business Credit Card SATL	0.034 (0.49)	-0.198 (1.73)	-0.063 (0.7)	-0.108 (1.71)	641
4) Personal Credit Card SATL	-0.031 (0.47)	0.018 (0.16)	-0.028 (0.32)	0.091 (1.54)	641
3) Business Credit Card Construction & related	0.056 (0.62)	-0.074 (0.70)	0.087 (0.86)	-0.025 (0.35)	624
4) Personal Credit Card Construction & related	0.003 (0.04)	0.047 (0.46)	-0.092 (1.01)	-0.073 (0.99)	624

Source: See Table 5.18.

Notes: (1) Each line of this table represents a separate regression with the same control variables as Column 5 of Table 5.18, except for loan amount, year of application, and type of lender. (2) The dependent variable indicates whether the firm used business or personal credit cards to finance business expenses. (3) In all specifications, the sample size includes all firms. (4) Reported estimates are Probit derivatives with t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level.

I. Analysis of Credit Market Discrimination in the U.S. in 2003

The most recent wave of the Survey of Small Business Finances was made available by the Board of Governors of the Federal Reserve System in 2007.¹⁴⁴ This is the fourth and final survey of U.S. small businesses conducted by the Board of Governors since 1987.¹⁴⁵ The survey gathered data from 4,072 firms selected to be representative of small businesses operating in the U.S. at the end of 2003. The survey covered a nationally representative sample of U.S. for profit, non-financial, non-subsidary, nonagricultural, and nongovernmental businesses with fewer than 500 employees that were in operation at year-end 2003 and at the time of interview. Most interviews took place between June 2004 and January 2005. The sample was drawn from the

¹⁴⁴ See www.federalreserve.gov/pubs/oss/oss3/ssbf03/ssbf03home.html.

¹⁴⁵ The Federal Reserve Board cancelled the SSBF subsequent to the completion of the 2003 wave, ostensibly for financial reasons. See Robb (2010).

Dun & Bradstreet Market Identifier file. The number of employees varied from zero to 486 with a weighted median of 3.0 and weighted mean of 8.6.

Unfortunately, the 2003 SSBF did not over-sample minority-owned firms, as in the first three survey waves. According to survey staff, this was due to concerns that doing so would delay the survey timeline and reduce the overall response rate.¹⁴⁶

In 1998, almost 8 percent of survey respondents were African American, compared to slightly more than 3 percent in 2003. Hispanics were almost 7 percent in 1998 but less than 4 percent in 2003. Other minorities were 6.5 percent in 1998 but only 5.4 percent in 2003.¹⁴⁷ Although the population weights were adjusted to accommodate these changes, even these weighted percentages are significantly smaller for minorities in 2003 than in 1998.¹⁴⁸

Mach and Wolken (2006) reported using these data that 13.1 percent of firms were owned by nonminority or Hispanic individuals; the share is statistically lower than in 1998 (14.6 percent). The shares for African Americans and Asians/Pacific Islanders each held roughly constant at 4 percent; the share of American Indians and Alaska natives held at roughly 1 percent. However, the share of Hispanics fell a statistically significant amount from 5.6 percent to 4.2 percent. The percentage of firms owned by females also declined from 72.0 percent to 64.8 percent. Despite these drawbacks, our analysis of the 2003 SSBF yields results that are strongly consistent with those obtained from the 1993 and 1998 survey waves. The remainder of this section presents our findings from this analysis.¹⁴⁹

1. Qualitative Evidence

Table 5.24 reports the results of asking business owners for the most important problem currently facing their firm. Consistent with the surveys in earlier years, firms owned by minority and women-owned firms were more likely to say that their most important problem was “financing and interest rates.” Once again, the African American-nonminority difference was most pronounced—only slightly more than 5 percent of nonminority male business owners reported this as their major problem compared to almost 21 percent of African American business owners.

¹⁴⁶ See fn. 101, above.

¹⁴⁷ The impact on women was not as pronounced. Females were 23.3 percent in 1998 and 20.9 percent in 2003. For nonminority females, the figures are 17.8 percent in 1998 and 18.2 percent in 2003.

¹⁴⁸ Mach and Wolken (2006, Table 2) report that weighted figures for Blacks were 4.1 percent in 1998 and 3.7 percent in 2003. Hispanics were 5.6 and 4.2 percent, respectively; Asians and Pacific Islanders were 4.4 and 4.2 percent, respectively; Native Americans were 0.8 and 1.3 percent, respectively; and women were 24.3 and 22.4 percent, respectively.

¹⁴⁹ The data file provided by the Board of Governors includes five separate observations per firm. That is to say, there are $4240 \times 5 = 21,200$ observations. These so-called multiple imputations are done via a randomized regression model, and are included because where there are missing observations several alternative estimates are provided. Where values are not missing the values for each of the five imputations are identical. We make use of the data from the first imputation: the results presented here are essentially identical whichever imputation is used. Overall, only 1.8 percent of observations in the data file were missing.

Table 5.24. What is the Most Important Problem Facing Your Business Today?

	Non-minority Male	African American	Other	Hispanic	Non-minority Female	Total
Financing and interest rates	5.4%	20.7%	9.1%	5.7%	5.8%	6.3%
Taxes	6.3%	2.4%	4.9%	7.7%	4.3%	5.7%
Inflation	2.7%	1.0%	2.3%	0.5%	1.4%	2.3%
Poor sales or profitability	17.8%	38.5%	28.9%	30.0%	22.5%	20.6%
Cost/availability of labor	1.5%	0.0%	0.6%	1.5%	1.5%	1.4%
Government regulations/red tape	4.7%	1.0%	5.4%	9.6%	2.5%	4.5%
Competition from larger firms	4.0%	2.7%	2.7%	3.6%	3.6%	3.8%
Quality of labor	7.9%	6.9%	5.0%	3.8%	6.5%	7.2%
Cost and availability of insurances	10.3%	1.8%	3.1%	5.2%	6.4%	8.6%
Other	2.6%	1.9%	4.0%	2.8%	1.6%	2.5%
None	5.3%	3.4%	9.4%	4.1%	8.6%	6.0%
Cash flow	6.2%	5.1%	4.6%	7.1%	6.8%	6.3%
Growth	0.9%	2.7%	0.4%	1.1%	0.8%	1.0%
Foreign competition	1.3%	0.0%	1.0%	0.1%	0.7%	1.0%
Competition - other	1.6%	0.8%	1.8%	0.1%	1.1%	1.4%
Availability of materials/resources	0.8%	0.8%	0.6%	1.6%	1.2%	0.9%
Labor problems other than cost or quality	1.2%	2.2%	0.2%	0.0%	1.3%	1.1%
Internal management/administrative problems	4.2%	2.5%	4.3%	1.0%	6.1%	4.4%
Environmental constraints	1.4%	0.7%	1.6%	2.3%	2.0%	1.6%
Advertising and public awareness	2.2%	1.8%	2.4%	1.8%	3.3%	2.4%
Market/economic/industry factors	4.9%	1.9%	4.0%	2.3%	6.2%	4.8%
Health care cost and availability	1.5%	0.0%	0.7%	0.8%	1.4%	1.4%
Energy costs	1.5%	0.0%	0.7%	3.7%	1.2%	1.4%
Costs other than health care and energy	2.2%	1.0%	0.1%	3.6%	1.0%	1.9%
Owner's personal problems	0.3%	0.0%	0.0%	0.0%	0.8%	0.4%
Technology	0.4%	0.0%	0.7%	0.0%	0.5%	0.4%
Dealing with insurance companies	0.3%	0.4%	0.0%	0.0%	0.4%	0.3%
War and September 11th	0.2%	0.0%	1.3%	0.0%	0.5%	0.3%

Source: NERA calculations from the 2003 SSBF (n=4,072).

Note: Results are weighted.

2. Differences in Loan Denial Rates by Race/Ethnicity

Tables 5.25 and 5.26 present estimates of loan denial probabilities for the nation as a whole and for the SATL division using a regression model comparable to that used with the 1993 and 1998 survey waves.¹⁵⁰

Column (1) in Table 5.25 (comparable to Table 5.8 for 1993 and 5.18 for 1998) shows that African American-owned firms in 2003 had a 45.9 percentage point higher probability of denial than nonminority male-owned firms before taking into account the creditworthiness of the firm or any other characteristics. The addition of a large number of controls reduces the percentage point differential for African Americans to 9.4 in Column (5) as the full set of controls is added. The coefficients in Column (5) for nonminority females and for Native American and Other minority groups are not significant, however.

Table 5.26 (comparable to Table 5.9 for 1993 and 5.19 for 1998) focuses on the SATL division and yields similar results—showing significantly larger denial probabilities for African American-owned firms than for nonminority male-owned firms, persisting even after the addition of all of the control variables. The SATL indicator as well as the race and gender interaction terms with the SATL are also insignificant when the control variables are added.

¹⁵⁰ In 2003, the credit application question was changed from 1998 to once again include requests for renewals as well as new loans, making it comparable to the 1993 version.

Table 5.25. Determinants of Loan Denial Rates—USA

	(1)	(2)	(3)	(4)	(5)
African American	0.459 (8.38)	0.136 (5.47)	0.105 (4.80)	0.091 (5.04)	0.094 (4.95)
Asian/Pacific Islander	0.055 (1.51)	0.020 (1.59)	0.009 (1.01)	0.002 (0.49)	0.001 (0.18)
Hispanic	0.067 (1.74)	0.008 (0.83)	0.004 (0.58)	0.001 (0.30)	0.001 (0.25)
Native American and Other	0.184 (2.22)	0.061 (1.95)	0.032 (1.47)	0.021 (1.43)	0.021 (1.49)
Nonminority female	0.043 (2.17)	0.003 (0.70)	0.002 (0.49)	0.001 (0.57)	0.002 (0.76)
Judgments against owner		0.007 (0.66)	0.003 (0.35)	0.003 (0.54)	0.006 (0.90)
Judgments against firm		0.005 (1.16)	0.005 (1.42)	0.001 (0.54)	0.001 (0.64)
Firm delinquent		0.032 (3.78)	0.021 (3.23)	0.019 (3.89)	0.021 (4.08)
Personally delinquent		-0.007 (0.69)	-0.006 (1.02)	-0.003 (0.82)	-0.002 (0.58)
Owner Bankrupt past 7 years		0.046 (1.36)	0.041 (1.35)	0.052 (1.81)	0.044 (1.66)
Firm Bankrupt past 7 years		0.000 (0.03)	0.003 (0.37)	0.001 (0.17)	-0.001 (0.38)
\$1998 sales (*10 ⁸)		-0.000 (1.68)	0.000 (0.04)	0.000 (0.29)	0.000 (0.51)
\$1998 firm equity (*10 ⁸)		-0.000 (2.23)	-0.000 (1.03)	-0.000 (1.62)	-0.000 (1.63)
Owner home equity (*10 ⁸)		0.000 (0.28)	0.000 (0.02)	-0.000 (0.45)	-0.000 (0.26)
Owner net worth (*10 ⁸)		-0.000 (2.97)	-0.000 (2.92)	-0.000 (3.06)	-0.000 (3.26)
Owner years of experience		0.000 (0.31)	0.000 (1.00)	0.000 (0.82)	0.000 (0.62)
Owner share of business		0.000 (0.08)	0.000 (0.61)	0.000 (0.38)	0.000 (0.47)
Dun & Bradstreet credit ratings (4 variables)	No	Yes	Yes	Yes	Yes
Owner Education (6 indicator variables)	No	Yes	Yes	Yes	Yes
Other Firm Characteristics (17 variables)	No	No	Yes	Yes	Yes
Characteristics of the Loan (1 variable)	No	No	Yes	Yes	Yes
Geographic Division (8 indicator variables)	No	No	No	Yes	Yes
Industry (8 indicator variables)	No	No	No	Yes	Yes
Year of Application (5 indicator variables)	No	No	No	No	Yes
Type of Financial Institution (11 indicator vars.)	No	No	No	No	Yes
N	1,664	1,655	1,655	1,655	1,605
Pseudo R ²	.0850	.2267	.2901	.3336	.3681
Chi ²	74.1	192.9	246.8	283.8	310.3
Log likelihood	-399.1	-328.9	-301.9	-283.4	-266.4

Source: See Table 5.26. Notes: (1) Reported estimates are Probit derivatives with t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) "Other firm characteristics" include variables indicating whether the firm had a line of credit, 2003 total employment, firm age, metropolitan area, legal form of organization (sole proprietorship, partnership, LLP, S-corporation, C-corporation, or LLC), existing long-run relation with lender, geographic scope of market (local, regional, national, foreign or international), the value of the firm's inventory, the firm's cash holdings, the value of land held by the firm, and total salaries and wages paid. (3) "Characteristics of the loan" includes the size of the loan applied for.

Table 5.26. Determinants of Loan Denial Rates—SATL

	(1)	(2)	(3)	(4)	(5)
African American	0.412 (6.44)	0.111 (4.18)	0.088 (3.74)	0.082 (4.05)	0.083 (4.05)
Asian/Pacific Islander	0.051 (1.31)	0.016 (1.24)	0.007 (0.80)	0.001 (0.26)	-0.000 (0.00)
Hispanic	0.030 (0.70)	-0.002 (0.22)	-0.002 (0.23)	-0.002 (0.59)	-0.002 (0.63)
Native and Other	0.206 (2.34)	0.062 (1.94)	0.035 (1.50)	0.022 (1.43)	0.022 (1.50)
Nonminority female	0.054 (2.39)	0.004 (0.70)	0.002 (0.55)	0.002 (0.63)	0.002 (0.96)
African American*SATL	0.053 (0.78)	0.018 (0.81)	0.011 (0.61)	0.003 (0.34)	0.003 (0.35)
Asian/Pacific Islander*SATL	0.025 (0.27)	0.018 (0.55)	0.010 (0.38)	0.009 (0.49)	0.009 (0.50)
Hispanic-Other*SATL	0.093 (1.04)	0.067 (1.55)	0.032 (1.16)	0.032 (1.39)	0.034 (1.40)
Native-Other*SATL					
Nonminority female*SATL	0.054 (2.39)	0.004 (0.70)	-0.002 (0.19)	-0.001 (0.25)	-0.002 (0.57)
SATL division	0.010 (0.51)	-0.002 (0.35)	-0.001 (0.32)	-0.001 (0.32)	-0.001 (0.38)
Creditworthiness (4 variables)	No	Yes	Yes	Yes	Yes
Dun & Bradstreet credit ratings (4 variables)	No	Yes	Yes	Yes	Yes
Balance Sheet (4 indicator variables)	No	Yes	Yes	Yes	Yes
Owner Experience (1 indicator variable)	No	Yes	Yes	Yes	Yes
Owner's Share of Business (1 indicator variable)	No	Yes	Yes	Yes	Yes
Owner's Education (6 indicator variables)	No	Yes	Yes	Yes	Yes
Other Firm Characteristics (17 variables)	No	No	Yes	Yes	Yes
Characteristics of the Loan (1 variable)	No	No	Yes	Yes	Yes
Geographic Division (7 indicator variables)	No	No	No	Yes	Yes
Industry (8 indicator variables)	No	No	No	Yes	Yes
Year of Application (5 indicator variables)	No	No	No	No	Yes
Type of Financial Institution (11 indicator vars.)	No	No	No	No	Yes
N	1,663	1,654	1,654	1,654	1,604
Pseudo R ²	0.0897	0.2307	0.2926	0.3367	0.3719
Chi ²	78.25	196.16	248.84	286.32	313.48
Log likelihood	-397.0	-327.2	-300.8	-282.1	-264.7

Source: See Table 5.24.

Notes: (1) t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Creditworthiness controls include presence of legal judgments against the firm during the previous 3 years, more than 60 days delinquent on any personal obligations of the firm's owner during the previous 3 years, more than 60 days delinquent on any business obligations of the firm during the previous 3 years, and declaration of owner of firm bankruptcy during the previous 7 years. (3) Balance sheet variables include firm sales in 1998, firm equity in 1998, owner's home equity in 1998, and owner's personal net worth (exclusive of firm equity and home equity) in 1998. (4) For other variables, see notes for Table 5.25.

3. Differences in Interest Rates, Credit Card Use, and Failure to Apply for Fear of Denial

Table 5.27 models the interest rate charged for those minority-owned and nonminority female-owned firms that were able to successfully obtain a loan (comparable to Tables 5.13 and 5.14 for 1993 and Table 5.21 for 1998). As was found in earlier surveys, African American business owners are hurt here as well since they have to pay, on average, 1.04 percentage points more for their loans than nonminority male business owners with identical characteristics. Hispanic business owners, as well, pay 1.01 percentage points more than their nonminority male counterparts.

Table 5.27 shows that the loan price differential is present for African American and Hispanic business owners in the SATL as well. For African American-owned firms, the differential is 1.1 percentage points. For Hispanics, the differential is 1.04 percentage points.

Table 5.28 reports the results of estimating a model where the dependent variable is whether a business or personal credit card is used to pay business expenses (comparable to Tables 5.11 and 5.12 for 1993 and Table 5.23 for 1998). As noted above, the application procedure for business and personal credit cards is usually automated and not conducted face-to-face. If there were missing variables such as creditworthiness or some such characteristic unobserved to the econometrician, then the race and ethnicity indicator variables should enter significantly in these equations. There is some evidence nationally and in the SATL in 2003 that African Americans and Hispanics are less likely to use personal credit cards for business expenses. However, this result is not observed for business credit cards.

Table 5.27. Models of Interest Rate Charged

Specification	African American	African American * SATL	Asian/Pacific Islander	Asian/Pacific Islander * SATL	Hispanic	Hispanic * SATL	Native and Other	Non-minority Female
1a) All Loans (as in Column 5 of Table 5.25) n=1,537	1.043 (2.01)		0.445 (1.24)		1.01 (2.76)		0.260 (0.35)	-0.142 (0.72)
1b) All Loans (as in Column 5 of Table 5.26) n=1,537	1.101 (1.72)	-0.187 (0.16)	0.486 (1.16)	-0.436 (0.40)	1.044 (2.22)	1.00 (1.18)	0.480 (0.51)	-0.185 (0.77)

Source: See Table 5.24.

Notes: (1) Each line of this table represents a separate regression with all of the control variables as indicated. (2) t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (3) Additionally, controls were included for whether the loan required a co-signer or guarantor, whether collateral was required and, if so, the type of collateral required. (4) The sample consists of firms that had applied for a loan and had their application approved.

Table 5.28. Models of Credit Card Use

Specification	African American	Asian/ Pacific Islander	Hispanic	Native American and Other	Non- minority Female	Sample Size
1) Business Credit Card	-0.060 (1.13)	0.040 (0.91)	0.004 (0.08)	-0.001 (0.01)	0.002 (0.07)	3,676
2) Personal Credit Card	-0.132 (2.68)	0.036 (0.84)	-0.080 (1.77)	-0.040 (0.48)	0.036 (1.56)	3,676
3) Business Credit Card, SATL	-0.057 (0.57)	0.096 (0.94)	-0.013 (0.13)	–	-0.011 (0.20)	655
4) Personal Credit Card, SATL	-0.185 (2.04)	-0.149 (1.52)	-0.271 (2.86)	–	0.056 (1.00)	646

Source: See Table 5.24.

Notes: (1) Each line of this table represents a separate regression with the same control variables as Column 5 of Table 5.27, except for loan amount, year of application, and type of lender. (2) The dependent variable indicates whether the firm used business or personal credit cards to finance business expenses. (3) In all specifications, the sample size is all firms. (4) Reported estimates are Probit derivatives with t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level.

Finally, consistent with earlier results, Table 5.29 (comparable to Tables 5.15 for 1993 and 5.22 for 1998) shows that African American owners are much more likely not to apply for a loan fearing they will be denied. Even after controlling for a host of demographic, financial, geographic and industry factors, African American business owners are still almost 17 percentage points more likely to fail to apply for loans for fear of denial—even though they need the credit. In the SATL, the phenomenon is evident as well—African American business owners are 15 percentage points more likely to fail to apply for fear of denial. In the construction sector, the trend is even more pronounced at 30 percentage points. Nationally, and in the SATL, there is evidence of this phenomenon for nonminority female business owners as well.

Table 5.29. Racial Differences in Failing to Apply for Loans Fearing Denial

Specification	African American	Asian/Pacific Islander	Hispanic	Native American and Other	Non-minority Female
a) USA					
No Other Control Variables (n=3,704)	0.385 (9.48)	0.059 (1.95)	0.138 (4.01)	0.138 (2.14)	0.072 (4.47)
Full Set of Control Variables (n=3,676)	0.166 (4.73)	0.038 (1.40)	0.050 (1.82)	0.052 (1.01)	0.035 (2.46)
b) SATL division					
No Other Control Variables (n=3,694)	0.357 (7.22)	0.060 (1.80)	0.115 (2.98)	0.126 (1.91)	0.088 (4.93)
Full Set of Control Variables (n=3,666)	0.152 (3.59)	0.036 (1.19)	0.033 (1.06)	0.046 (0.88)	0.046 (2.90)
c) Construction					
No Other Control Variables (n=705)	0.492 (4.34)	-0.022 (0.29)	0.090 (1.22)	0.258 (2.17)	0.026 (0.64)
Full Set of Control Variables (n=695)	0.303 (3.16)	0.002 (0.04)	-0.009 (0.34)	0.137 (1.65)	-0.002 (0.11)

Source: See Table 5.24.

Notes: (1) Reported estimates are Probit derivatives with t-statistics in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Full set of control variables as in Column 5 of Table 5.27, except for loan amount, year of application, and type of lender. (3) In Panel (b), interaction terms between race, gender, and SATL were all insignificant.

J. Further Analysis of Credit Market Discrimination: NERA Surveys 1999-2007

NERA has conducted local credit market surveys at nine other times and places since 1999. These include the Chicago metropolitan area in 1999, MDOT in 2000 (Maryland I), the Jacksonville, Florida metropolitan area in 2002, the Baltimore-Washington, DC metropolitan area in 2003, the St. Louis metropolitan area in 2004, the Denver metropolitan area in 2005, MDOT (again) in 2005 (Maryland II), the State of Massachusetts in 2005, and the Memphis, TN-MS-AR metropolitan area in 2007. The Chicago, Jacksonville, Baltimore, St. Louis, and Denver surveys focused on construction and construction-related industries, while the two Maryland surveys, the Massachusetts surveys, and the Memphis surveys, included other goods and services as well.

Our Chicago, Maryland I, and Jacksonville survey questionnaires followed the format of the 1993 NSSBF, while our Baltimore, St. Louis, Denver, Maryland II, Massachusetts, and Memphis surveys followed the format of the 1998 SSBF questionnaire.

As a final check on our findings in this chapter, we combined the results of these nine NERA surveys together in a consistent format and re-estimated the basic loan denial model on this larger file. These results appear below in Table 5.30, and are remarkably similar to results seen in Tables 5.8-5.9, 5.18-5.19, and 5.25-5.26. Denial probabilities for African American-owned firms compared to nonminority male-owned firms are 29 percentage points higher—even when creditworthiness controls, other firm and owner characteristics, and interaction terms are included.

Moreover, the NERA surveys found statistically significant loan denial disparities for Hispanic-owned firms and nonminority female-owned firms as well. Denial rates were 18-24 percentage points higher for Hispanic-owned firms and 5-9 percentage points higher for nonminority female-owned firms than for their nonminority male-owned counterparts. Significant loan denial disparities were also observed for Native American-owned firms (9-19 percentage points higher).

Finally, as shown in Table 5.31, we modeled the rate of interest charged, conditional upon receiving loan approval, using our nine-jurisdiction dataset. Results are very similar to that observed in Tables 5.13-5.14, 5.21 and 5.27. African Americans pay almost 1.7 percentage points more, on average, for their business credit than do nonminority males, declining to 1.5 percentage points when creditworthiness and other firm and owner controls are accounted for.

On the basis of the foregoing, we conclude that the evidence of credit discrimination from NERA's nine local credit market surveys conducted throughout the nation between 1999-2007 is entirely consistent with the results obtained using data from the 1993 NSSBF, the 1998 SSBF and the 2003 SSBF.

Table 5.30. Determinants of Loan Denial Rates—Nine Jurisdictions

	(1)	(2)
	<i>Most Recent Application</i>	<i>Last Three Years</i>
African American	0.289 (8.20)	0.293 (7.60)
Hispanic	0.178 (3.86)	0.244 (4.59)
Native American	0.087 (1.69)	0.188 (3.29)
Asian/Pacific Islander	0.042 (0.72)	0.003 (0.05)
Other race	0.313 (3.07)	0.364 (3.15)
Nonminority female	0.046 (1.83)	0.086 (2.96)
Judgments	0.051 (1.23)	0.119 (2.24)
Firm delinquent	0.022 (2.7)	0.057 (5.90)
Personally delinquent	0.076 (7.38)	0.077 (6.03)
Bankrupt past 3 years	0.228 (3.99)	0.328 (4.74)
N	1,855	1,855
Pseudo R ²	.1905	.1721
Chi ²	336.0	363.3

Source: NERA Credit Market Surveys, 1999-2007.

Notes: (1) Reported estimates are derivatives from Probit models, t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Indicator variables are also included for the various jurisdictions.

Table 5.31. Determinants of Interest Rates—Nine Jurisdictions

	(1)	(2)
African American	1.683 (3.44)	1.491 (2.98)
Asian/Pacific Islander	1.221 (2.16)	0.789 (1.34)
Hispanic	0.820 (1.48)	0.895 (1.56)
Native American	1.241 (1.52)	1.008 (1.24)
Other race	-1.115 (0.63)	-1.072 (0.61)
Nonminority female	0.046 (0.16)	0.018 (0.06)
Judgments		0.537 (0.85)
Firm delinquent		-0.041 (0.36)
Personally delinquent		0.644 (3.65)
Bankrupt past 3 years		1.184 (1.13)
Creditworthiness, Firm, and Owner Characteristics	No	Yes
Loan Characteristics	Yes	Yes
N	1,490	1,463
Adjusted R ²	.0831	.1046
F	11.4	11.05

Source: See Table 5.30.

Notes: (1) Reported estimates are OLS regression models, t-statistics are in parentheses. Using a two-tailed test, t-statistics greater than 1.64 (1.96) (2.58) are statistically significant at a 90 (95) (99) percent confidence level. (2) Five indicators for primary owner's education level, four indicators for legal form of organization, loan amount applied for, loan amount granted, and month and year of loan application were included. (3) Seven additional indicators for jurisdiction were also included.

K. Conclusions from the 1993, 1998 and 2003 SSBF Analyses

The results presented in this chapter indicate that African American-owned firms face serious obstacles in obtaining credit that are unrelated to their creditworthiness, industry, or geographic location. In a number of cases this is true as well for Hispanic-owned firms, Asian/Pacific Islander-owned firms, Native American-owned firms, and nonminority female-owned firms.

Many of the criticisms levied against the home mortgage loan discrimination study of Munnell, *et al.* (1996) could perhaps be applied to the analyses in this Chapter. Yet, these criticisms have been effectively countered by, *e.g.*, Browne and Tootell (1995) and Tootell (1996). What is important to keep in mind in reference to the analyses in the present Chapter compared with Munnell, *et al.* (1996), is the magnitude of the estimated racial disparities. The absolute size of the raw racial differences found in the mortgage study are considerably smaller than those observed in this study regarding small business credit.¹⁵¹

The magnitude of the racial difference in small business loan approval rates is substantial, even after controlling for observed differences in creditworthiness, and considerably larger than that found in the analysis of discrimination in mortgage markets. Why do the results for small business loans differ so markedly from those obtained from mortgage loans? First, many mortgages are sold in the secondary market and a substantial fraction of mortgage lenders have little intention of keeping the loans they make. This added “distance” in the transaction might reduce the likelihood of discrimination. As Day and Liebowitz (1998, p. 6) point out, “economic self-interest, therefore, should reduce racial discrimination in this market more completely than in many others.” A highly sophisticated secondary market for loans to small firms does not exist. Second, the presence of special programs and regulatory incentives to encourage banks and others to increase their mortgage lending to minorities gives these groups some advantages in obtaining a mortgage.

Clearly, a portion of the difference in denial rates between nonminority males and other groups in both types of studies appears to be due to differences in the characteristics of the applicants. Even after controlling for these differences, however, the gap in denial rates in the small business credit market is considerably larger than that found in the mortgage market.¹⁵²

Our analysis finds significant evidence that African American-owned businesses face impediments to obtaining credit that go beyond observable differences in their creditworthiness. These firms are more likely to report that credit availability was a problem in the past and expect it to be a problem in the future. In fact, these concerns prevented more African American-owned firms from applying for loans because they feared being turned down due to prejudice or discrimination. We also found that loan denial rates are significantly higher for African American-owned firms than for nonminority male-owned firms even after taking into account differences in an extensive array of measures of creditworthiness and other characteristics. This result appears to be largely insensitive to geographic location or to changes in econometric specification. Comparable findings are observed for other minority business owners and for nonminority women as well, although not with as much consistency as the findings for African Americans.

¹⁵¹ In the Boston Fed study, 10 percent of White mortgage applications were rejected compared with 28 percent for African Americans. Loan denial rates (weighted) for business credit in this study ranged from 8.3 to 26.2 percent for White males and between 50.0 and 65.9 percent for African American-owned firms (depending on which NSSBF or SSBF survey is used).

¹⁵² The gap in denial rates between African Americans and nonminorities with similar characteristics is between 34-46 percentage points in the small business credit market compared with 7 percentage points in the mortgage market.

Overall, the evidence is consistent that African American-owned firms and other DBE firms face large and statistically significant disadvantages in the market for small business credit. The larger size and significance of the effects found in our analyses (compared to mortgage market analyses) significantly reduces the possibility that the observed differences can be explained away by some quirk of the econometric estimation procedure and, instead, strongly suggests that the observed differences are consistent with the presence of discrimination.

L. Evidence of Credit Market Discrimination from 2008 and Beyond

As noted above, the Federal Reserve abolished the SSBF prior to releasing results from 2008, and the most recent NERA survey on credit access was conducted in 2007. Economist Alicia Robb, in her article “Beyond the late, lamented Survey of Small Business Finance,” notes:

A few years ago, the [SSBF], the main source of data on small business financing, was cancelled by the Federal Reserve Board. The SSBF had provided detailed information on the use of credit and other financial services by small businesses every five years beginning in 1987. There are no data available after 2003. The Federal Reserve stated the survey was cancelled for financial reasons and the survey had been conducted four times in varying economic conditions. Yet, less than a year after the cancellation, the worst financial crisis hit the United States since the Great Depression. Unfortunately, the nation now has no demand-side data to investigate the impact of this financial crisis on small business financing or firm performance. . . . It is ironic that a survey that could shed light on the impact of a financial crisis on the state of small business financing was cancelled due to budgetary concerns when the government has spent hundreds of billions of dollars on other matters arising from the crisis. The survey cost about \$6 million dollars over a five-year survey period, more of a rounding error to the Fed than a significant investment. What a pity that we have no data for 2008—a year of great interest for policy purposes.¹⁵³

Given this, what can we say about evidence of DBE disparities in access to capital and credit during the period subsequent to 2007? Although the negative impact of the loss of the SSBF cannot be overstated, Dr. Robb and others have worked to fill the void using analyses on a unique data set known as the Kauffman Firm Survey (“KFS”). As mentioned above, the KFS is the largest and longest longitudinal survey of new businesses in the world, and followed a large sample of small businesses for eight years, from their inception in 2004 through 2011.

Robb (2013) uses data from the 2004-2010 cohort of KFS firms to examine the financing patterns of firms during their first years of operation. Key findings from this study include:

- Differences in asset levels are the largest single factor explaining racial disparities in business creation rates. Half of all Hispanic families in 2004 had less than \$13,375 in wealth and half of all African American families in 2004 had less than \$8,650 in wealth. These figures were 12 percent and 8 percent, respectively, of nonminority wealth levels (Robb, 2013, pp. 5-6).

¹⁵³ Robb (2010).

- There is evidence that during times of financial distress, bank lending is curtailed, especially to firms that appear inherently more risky, such as minority-owned and women-owned firms (*Ibid.* at 7, citing Caballero and Krishnamurthy, 2008; Ivashina and Scharfstein, 2010).
- During 2007-2010, young firms owned by African Americans, Hispanics, and women were statistically significantly less likely than similarly situated nonminority firms to apply for credit when they needed it for fear of denial. Robb (2013, p. 23) notes: “This is perhaps the clearest recent evidence of continued borrowing constraints for Black and Hispanic business owners in the United States. Women were also more likely than men to have this fear during the economic crisis.”
- During 2007-2010, when they did apply for credit, young African American- and Hispanic-owned firms were statistically significantly more likely to have their loans denied than nonminority-owned firms with comparable levels of creditworthiness (*Ibid.* at 25).
- Moreover, the magnitude of minority denials “increased dramatically” during the 2007-2010 period and through the financial crisis (*Ibid.*).
- Women-owned firms were also more likely to be denied than nonminority male firms with comparable creditworthiness levels although the differences were not always statistically significant (*Ibid.*).

Robb (2013) concludes:

The analysis...suggests minority owners who did not apply for new loans were significantly more likely than their White counterparts to avoid applying for loans when needed because they were afraid that their loan applications would be declined by lenders. This is even after controlling for credit quality and a host of owner and firm characteristics. Women were also more likely than similar men not to apply for credit when it was needed for fear of having their loan application denied during the years of the economic crisis. The analysis showed that women and minority business owners’ fears of being declined for a loan were not necessarily unwarranted. In particular, in terms of loan application outcomes, even after controlling for such factors as industry, credit score, legal form, and human capital, minority owners of young firms were significantly less likely to have their loan applications approved than were similar White business owners. Similarly, in 2008, women owners of new businesses were significantly less likely than men with similar credit profiles and legal forms of organization to be approved for loans. More generally, the results suggest that in the initial year of startup, Black- and Hispanic-owned businesses faced greater credit constraints than did their White and Asian counterparts. Similarly, women-owned businesses faced greater credit constraints than did similar startups owned by men during the years of the financial crisis (*Ibid.* at 31-32).

Robb, *et al.* (2010) use data from the 2004-2008 KFS cohort to examine differences in external financing among African American- and nonminority-owned firms to determine if African

Americans received smaller loans after starting up. Controlling for both firm and owner characteristics, including credit scores and owner wealth, they found that adverse disparities in the amounts of financing persisted, with race being the strongest single determinant of loan size.

Bates and Robb (2013) provide an overview of the major issues and debates that continue to the present day regarding discrimination in commercial credit access. They conclude:

Limited access to financing restricts the ability of [MBEs] to achieve viability, to generate new jobs, and, generally, to reach their full potential to contribute to the economic development of the communities and regions in which they operate. Although MBEs rely more heavily on financial institutions for loans than all other borrowing sources combined, they experience higher costs than White firms when they borrow, receive smaller loans, and have their loan applications rejected more often. ... The federal government needs to prosecute financial institutions that discriminate against MBEs on the basis of borrower race. Local governments can assist by weighing bank-lending activity in local minority communities when choosing the local banks with which they do business. Prompt payment of MBE vendor invoices by public-sector clients is needed (Bates and Robb, 2013, p. 1).

Noting that urban minority-owned businesses are heavily concentrated in relatively segregated neighborhoods, Bates and Robb (2016) examined whether loan denial disparities were attributable to race, to location, or to both. Using the 2004-2011 cohort from the KFS data to disentangle the interaction of race and location, they conclude that:

[Our] findings suggest that banks engage in discriminatory practices limiting credit availability to MBEs. Controlling for risk factors, however, firm location in a minority or inner-city neighborhood has no apparent impact on loan availability or size. Owner race/ethnicity, in contrast, is important. Subtle processes discourage MBEs from seeking bank loans. Owner race and wealth both powerfully shape loan access: high wealth opens doors, minority ownership closes them (Bates and Robb, 2016, p. 159).

Post-2007 evidence is also provided by sources other than the KFS. In addition to their own findings, Bates and Robb (2016) also report on the findings of Bone, *et al.* (2014) who conducted a paired testing, or audit, study of small business credit access and race. Bates and Robb (2016) summarize:

A common initial objective of firm owners seeking business loans is to identify bank-lending criteria. In their audit study of small business owners seeking bank loans, Bone, [*et al.* (2014)] focused directly on this inquiry stage and found that Black and Latino owners were treated differently than matched Whites. Typifying audit studies, the White and minority testers were matched regarding age, gender, credit history, personal net worth, characteristics of the loans being sought, and other traits, and their differential treatment was strongly consistent with minority owners being treated worse than Whites. ... In comparison to White testers, minorities were more often asked to provide business financial statements (83% vs. 50%), income tax returns (86% vs. 52%), bank account information (25% vs. 0%), personal financial asset details (60% vs. 22%), and credit card debt (42% vs. 13%). Additionally, minorities were offered less frequent assistance than

Whites in completing loan applications (18% vs. 59%), and loan officers offered business cards to minority testers less often (43% vs. 82%). Overall, minorities were consistently offered less assistance and subjected to greater scrutiny, in comparison with the White testers (Bates and Robb, 2016, p. 160, referencing Bone, *et al.*, 2014).

[These audit] study findings ... indicate that starkly differential treatment [by race] is real in the experiences of minorities investigating small-business financing sources. By themselves, these findings provide no direct evidence of racial reservation price differentials regarding loan terms. What they do provide is audit study evidence of minorities being treated badly, compared with Whites. In this sense, they confirm, with control-group precision, past findings that banks treat MBEs badly, relative to equally creditworthy Whites. Studies using regression analysis to demonstrate disproportionate bank rejection of minority loan applicants, their unfavorable loan terms, and high discouraged-borrower incidence are all subject to omitted variable-bias criticisms No such criticisms apply to the [Bone *et al.* 2014] audit study findings (Bates and Robb, 2016, p. 162, referencing Bone, *et al.*, 2014).

The findings of Robb (2013), Robb, *et al.* (2010), Bates and Robb (2013), Bates and Robb (2016), and Bone, *et al.* (2014) are consistent with the findings reported above in this chapter from the SSBF and from NERA's own surveys. There is no evidence to suggest that credit discrimination has lessened in the years since 2007. Indeed, the available evidence suggests that credit discrimination has continued and, if anything, worsened during and subsequent to the recent financial crisis.

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VI. DBE Utilization and Disparity in MDOT Contracting Activity

A. Introduction

Chapters IV and V documented several specific disparities facing minority- and women-owned firms in the private sector of MDOT's market area, where contracting and procurement activity is generally *not* subject to such requirements. In this chapter, we combined the evidence from Chapter III, which estimates DBE availability in the MDOT Market Area, with the Master Contract/Subcontract Database described in Chapter II, in order to examine whether there is statistical evidence of disparities in the MDOT's own contracting activity.

The statistical evidence reported in Chapter II has already established from which specific industries MDOT procures goods and services as well as from which geographic areas it draws the majority of its prime contractors and subcontractors. In addition, the statistical evidence reported in Chapter III has established what percentage of all firms in MDOT's geographic and product markets are DBEs.

MDOT, through both the State of Maryland MBE Program and the USDOT DBE Program, has a long and well established policy of setting goals on many of its contracting activities, especially in the areas of Construction and AE-CRS.¹⁵⁴ Given this, the data for MDOT contracts with subcontracting goals may not show evidence of underutilization, even if such underutilization exists in the private sector of MDOT's relevant market area. Instead, the data on such contracts is most informative for examining the effectiveness of MDOT's efforts during the study time period to encourage DBE utilization. If MDOT DBE utilization is still significantly less than DBE availability, then that data would be consistent with the persistence of discrimination, in conjunction with the private sector data examined in Chapters IV, V and VII.

This chapter, therefore, will document:

- To what extent have DBEs been utilized in the contracting and subcontracting activities of MDOT during the study period.
- To what extent does a disparity exist, if any, between DBE utilization and DBE availability in the relevant market area.

The DBE utilization results below are reported using two different, but related, measures—dollars awarded and dollars paid. We report this information for Construction, AE-CRS, Maintenance, IT, Services, CSE, and for all six categories combined. Results for DBEs are reported by race and gender as well as for minorities as a group and for all minorities and women combined.

¹⁵⁴ To determine whether minorities and women have been underutilized on public contracting, we should ideally examine expenditures that were *not* subject to goals. *See, e.g.*, NERA Economic Consulting (2017), pp. 240-243.

B. DBE Utilization for All Contracting Dollars

For this Study, we examined 3,322 prime contracts or purchase orders and 14,851 associated subcontracts active during State fiscal years 2010-2014. These contracts and purchases had a total award value of \$7.45 billion and a total paid value of \$4.03 billion.¹⁵⁵ NAICS codes, DBE status, and detailed race and gender status for the prime contractors and subcontractors included in the Master Contract/Subcontract Database were established through extensive computer-assisted cross-referencing of firms in our database with firms in the: (a) MDOT Directory of Certified Firms; (b) the master directory of DBEs assembled for this study;¹⁵⁶ (c) Dun & Bradstreet; (d) company profiles drawn from American Business Information, Standard & Poor's, and other sources; and (e) the results of our race/gender misclassification/non-classification surveys.¹⁵⁷

1. Utilization Across All Contracts

From Tables 6.1 and 6.2 we see that, as a group during the study period, DBEs were awarded 24.56 percent and paid 23.83 percent of all contract and subcontract dollars in Construction; awarded 29.57 percent and paid 30.63 percent of all contract and subcontract dollars in AE-CRS; awarded 17.12 percent and paid 22.04 percent of all contract and subcontract dollars in Maintenance; awarded 43.87 percent and paid 33.82 percent of all contract and subcontract dollars in IT; awarded 19.05 percent and paid 25.52 percent of all contract and subcontract dollars in Services; and awarded 5.91 percent and paid 5.04 percent of all contract and subcontract dollars in CSE. Altogether, DBEs were awarded 23.37 percent and paid 24.00 percent of all contract and subcontract dollars during the study period. Among DBEs, firms owned by nonminority females were awarded the largest fraction overall of contracting and subcontracting dollars (both awarded and paid), followed in descending order by firms owned by Asians, African Americans, Hispanics, and Native Americans.

¹⁵⁵ Payments on contracts that were not substantially complete at the time of the Study data collection were excluded from the paid dollar totals. *See also* footnote 21.

¹⁵⁶ *See* Chapter III, Section B.2, for more information on how NERA's master directory was compiled.

¹⁵⁷ *See* Chapter III, Section B, for more information on the misclassification/non-classification surveys.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.1. DBE Utilization at MDOT–All Contracts (Dollars Awarded)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	4.59	3.81	4.96	4.64	11.26	1.96	5.36
Hispanic	8.12	1.09	1.91	4.72	1.86	0.31	4.24
Asian	2.30	17.39	0.86	25.67	1.38	0.87	5.99
Native American	0.81	0.06	0.07	0.00	0.01	0.00	0.36
Minority Total	15.82	22.35	7.81	35.03	14.52	3.14	15.95
Nonminority female	8.74	7.23	9.32	8.84	4.54	2.77	7.42
DBE Total	24.56	29.57	17.12	43.87	19.05	5.91	23.37
Non-DBE Total	75.44	70.43	82.88	56.13	80.95	94.09	76.63
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	3,083,346,877	1,770,472,644	811,264,376	158,961,034	1,189,264,351	440,585,034	7,453,894,316
Prime Contracts	887	234	227	166	287	1,521	3,322
Subcontracts	11,154	1,174	1,233	134	1,021	135	14,851

Source: NERA Master Contract/Subcontract Database. Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Table 6.2. DBE Utilization at MDOT –All Contracts (Dollars Paid)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	4.63	3.56	5.01	9.50	18.39	1.38	5.50
Hispanic	6.79	0.87	3.94	4.63	3.66	0.36	4.25
Asian	1.66	19.02	1.76	13.11	0.13	0.96	5.96
Native American	0.81	0.05	0.00	0.00	0.04	0.00	0.43
Minority Total	13.89	23.50	10.71	27.25	22.22	2.70	16.14
Nonminority female	9.97	7.13	11.33	6.57	3.30	2.34	7.87
DBE Total	23.86	30.63	22.04	33.82	25.52	5.04	24.00
Non-DBE Total	76.14	69.37	77.96	66.18	74.48	94.96	76.00
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	2,033,386,289	1,006,656,259	141,150,664	61,993,592	398,014,575	385,706,032	4,026,907,409
Prime Contracts	698	234	151	144	241	1,519	2,987
Subcontracts	9,051	1,172	442	57	817	114	11,653

Source and Notes: See Table 6.1.

Non-DBEs were awarded 75.44 percent and paid 76.14 percent of all contract and subcontract dollars in Construction; awarded 70.43 percent and paid 69.37 percent of all contract and subcontract dollars in AE-CRS; awarded 82.88 percent and paid 77.96 percent of all contract and subcontract dollars in Maintenance; awarded 56.13 percent and paid 66.18 percent of all contract and subcontract dollars in IT; awarded 80.95 percent and paid 74.48 percent of all contract and subcontract dollars in Services; and awarded 94.09 percent and paid 94.96 percent of all contract and subcontract dollars in CSE. Altogether, Non-DBEs were awarded 76.63 percent and paid 76.00 percent of all contract and subcontract dollars during the study period.

For federally-assisted contracts, we see in Tables 6.3 and 6.4 that, as a group during the study period, DBEs were awarded 24.95 percent and paid 23.54 percent of all contract and subcontract dollars in Construction; awarded 30.26 percent and paid 31.21 percent of all contract and subcontract dollars in AE-CRS; awarded 10.82 percent and paid 6.42 percent of all contract and subcontract dollars in Maintenance; awarded 38.13 percent and paid 38.48 percent of all contract and subcontract dollars in IT; awarded 17.98 percent and paid 35.82 percent of all contract and subcontract dollars in Services; and awarded 4.65 percent and paid 1.50 percent of all contract and subcontract dollars in CSE. Altogether, DBEs were awarded 25.15 percent and paid 24.88 percent of all contract and subcontract dollars during the study period. Among DBEs, firms owned by nonminority females were awarded the largest fraction overall of contracting and subcontracting dollars (both awarded and paid), followed in descending order by firms owned by Asians, Hispanics, African Americans, and Native Americans.

Non-DBEs, on federally-assisted contracts, were awarded 75.05 percent and paid 76.46 percent of all contract and subcontract dollars in Construction; awarded 69.74 percent and paid 68.79 percent of all contract and subcontract dollars in AE-CRS; awarded 89.18 percent and paid 93.58 percent of all contract and subcontract dollars in Maintenance; awarded 61.87 percent and paid 61.52 percent of all contract and subcontract dollars in IT; awarded 82.02 percent and paid 64.18 percent of all contract and subcontract dollars in Services; and awarded 95.35 percent and paid 98.50 percent of all contract and subcontract dollars in CSE. Altogether, Non-DBEs were awarded 74.85 percent and paid 75.12 percent of all federally-assisted contract and subcontract dollars during the study period.

Table 6.3. DBE Utilization at MDOT–Federally-Assisted Contracts (Dollars Awarded)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	3.97	3.54	0.17	8.61	1.86	1.47	3.50
Hispanic	8.85	1.16	1.80	15.02	4.29	0.02	5.53
Asian	2.32	18.09	0.00	0.76	0.07	0.57	7.25
Native American	0.82	0.06	0.00	0.00	0.00	0.00	0.47
Minority Total	15.96	22.85	1.98	24.39	6.22	2.06	16.76
Nonminority female	8.99	7.40	8.84	13.75	11.76	2.59	8.40
DBE Total	24.95	30.26	10.82	38.13	17.98	4.65	25.15
Non-DBE Total	75.05	69.74	89.18	61.87	82.02	95.35	74.85
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	2,757,270,003	1,663,703,079	190,438,399	9,877,013	258,612,340	169,308,682	5,049,209,517
Prime Contracts	816	221	12	6	28	44	1,127
Subcontracts	10,185	1,084	88	22	212	53	11,644

Source and Notes: See Table 6.1.

Table 6.4. DBE Utilization at MDOT –Federally-Assisted Contracts (Dollars Paid)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	3.78	3.28	0.03	8.59	9.04	0.02	3.49
Hispanic	7.26	0.92	6.39	13.18	11.99	0.02	4.96
Asian	1.51	19.67	0.00	0.92	0.40	0.58	7.14
Native American	0.89	0.05	0.00	0.00	0.00	0.00	0.56
Minority Total	13.44	23.91	6.42	22.69	21.42	0.62	16.14
Nonminority female	10.10	7.29	0.00	15.79	14.40	0.88	8.74
DBE Total	23.54	31.21	6.42	38.48	35.82	1.50	24.88
Non-DBE Total	76.46	68.79	93.58	61.52	64.18	98.50	75.12
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	1,836,144,797	947,994,813	19,513,022	7,901,720	44,094,212	161,426,453	3,017,075,017
Prime Contracts	643	221	6	5	13	42	930
Subcontracts	8,400	1,082	22	13	90	32	9,639

Source and Notes: See Table 6.1.

C. DBE Disparity Analysis for All Contracting Dollars

1. Results by Major Procurement Category

In this section, we compare our estimates of DBE utilization in MDOT's contracting and subcontracting activities to our estimates of DBE availability in the relevant geographic and product market area. Tables 6.5 and 6.6 present the results of this comparison for all prime contracts and purchase orders examined during the study period, using dollars awarded and dollars paid, respectively, as the metric of utilization. Tables 6.7 and 6.8 present corresponding results for federally-assisted contracts.

In each of these tables, the figures in the utilization column include both prime contract and subcontract dollars and were derived as described above in this chapter. The figures in the availability column were derived as described in Chapter III. The disparity ratio, which appears in the final column of each table, is derived by dividing utilization by availability and then multiplying the result by 100. A disparity ratio below 100 indicates that DBEs did not participate in MDOT contracting and subcontracting at a level that is consistent with their estimated availability in the relevant market area. A disparity ratio is said to be substantively significant, or large, if its value is approximately 80 or less. A disparity ratio is said to be statistically significant if it is unlikely to be caused by chance alone.¹⁵⁸ In the tables below, statistical significance is indicated by one or more asterisks to the right of the disparity ratio.

When all procurement categories are combined, Tables 6.5 and 6.6 show that adverse disparities are observed for firms owned by African Americans, Native Americans, minorities as a group, nonminority females, and DBEs as a group. These disparities are large for African Americans, Native Americans, minorities as a group, nonminority females, and DBEs as a group; and they are statistically significant for African Americans, Native Americans, minorities as a group, nonminority females, and DBEs as a group.

In Construction, adverse disparities are observed for firms owned by African Americans, Asians, minorities as a group, nonminority females, and DBEs as a group. These disparities are large for African Americans, Asians, minorities as a group, nonminority females, and DBEs as a group; and they are statistically significant for African Americans, Asians (paid dollars only), minorities as a group, nonminority females, and DBEs as a group.

In AE-CRS, adverse disparities are observed for firms owned by African Americans, Hispanics, Native Americans, and nonminority females. These disparities are large for African Americans, Hispanics, Native Americans, and nonminority females; and they are statistically significant for African Americans, Hispanics, Native Americans, and nonminority females.

In Maintenance, adverse disparities are observed for firms owned by African Americans, Hispanics, Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group. Large disparities were observed for firms owned by African Americans, Hispanics (award

¹⁵⁸ See Appendix A below, "Constitutional significance or substantive significance."

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dollars only), Asians, Native Americans, minorities as a group, and DBEs as a group. These disparities are statistically significant for African Americans, Hispanics (award dollars only), Asians, Native Americans, minorities as a group, and DBEs as a group.

In IT, adverse disparities are observed for firms owned by African Americans, Native Americans, minorities as a group (paid dollars only), nonminority females, and DBEs as a group. Large disparities are observed for firms owned by African Americans, Native Americans, nonminority females, and DBEs as a group (paid dollars only). These disparities are statistically significant for African Americans, Native Americans, minorities as a group (paid dollars only), nonminority females, and DBEs as a group (paid dollars only).

In Services, adverse disparities are observed for firms owned by African Americans (award dollars only), Hispanics (award dollars only), Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group. Large disparities are observed for firms owned by African Americans (award dollars only), Hispanics (award dollars only), Asians, Native Americans, minorities as a group (award dollars only), nonminority females, and DBEs as a group. These disparities are statistically significant for African Americans (award dollars only), Hispanics (award dollars only), Asians, Native Americans, minorities as a group (award dollars only), nonminority females, and DBEs as a group.

In CSE, adverse and large disparities are observed for firms owned by African Americans, Hispanics, Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group. These disparities are statistically significant for African Americans, Hispanics, Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group.

Table 6.5. Utilization, Availability, and Disparity Results for MDOT Contracting, Overall and by Contracting Category—All Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	5.36	10.99	48.76 ****
Hispanic	4.24	3.39	
Asian	5.99	4.76	
Native American	0.36	1.05	34.47 ****
Minority-owned	15.95	20.18	79.05 ***
Nonminority female	7.42	13.64	54.39 ****
DBE total	23.37	33.82	69.11 ****
CONSTRUCTION			
African American	4.59	13.67	33.61 ****
Hispanic	8.12	5.17	
Asian	2.30	3.07	74.81
Native American	0.81	0.71	
Minority-owned	15.82	22.62	69.94 ****
Nonminority female	8.74	16.38	53.33 ****
DBE total	24.56	39.00	62.96 ****

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Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
AE-CRS			
African American	3.81	8.32	45.78 ****
Hispanic	1.09	2.22	49.26 ***
Asian	17.39	4.91	
Native American	0.06	1.27	4.77 ****
Minority-owned	22.35	16.72	
Nonminority female	7.23	11.64	62.06 ****
DBE total	29.57	28.36	
MAINTENANCE			
African American	4.96	11.76	42.19 ****
Hispanic	1.91	3.96	48.38 ****
Asian	0.86	3.37	25.41 ****
Native American	0.07	1.43	5.12 ****
Minority-owned	7.81	20.52	38.05 ****
Nonminority female	9.32	11.31	82.40
DBE total	17.12	31.83	53.8 ****
IT			
African American	4.64	14.34	32.33 ****
Hispanic	4.72	3.78	
Asian	25.67	14.08	
Native American	0.00	1.29	0.00 ****
Minority-owned	35.03	33.50	
Nonminority female	8.84	12.33	71.7 ****
DBE total	43.87	45.82	95.72
SERVICES			
African American	11.26	16.14	69.78 ****
Hispanic	1.86	3.21	57.94 ***
Asian	1.38	5.22	26.49 ****
Native American	0.01	0.65	2.05 ****
Minority-owned	14.52	25.21	57.58 ****
Nonminority female	4.54	18.41	24.64 ****
DBE total	19.05	43.62	43.68 ****
CSE			
African American	1.96	11.22	17.48 ****
Hispanic	0.31	3.79	8.25 ****
Asian	0.87	7.86	11.08 ****
Native American	0.00	1.00	0.00 ****
Minority-owned	3.14	23.88	13.17 ****
Nonminority female	2.77	11.8	23.43 ****
DBE total	5.91	35.68	16.56 ****

Source: Calculations from NERA Master Contract/Subcontract Database and NERA Baseline Business Universe.

Notes: (1) “*” indicates an adverse disparity that is statistically significant at the 15% level or better (85% confidence). “**” indicates the disparity is significant at a 10% level or better (90% confidence). “***” indicates significance at a 5% level or better (95% confidence). “****” indicates significance at a 1% level or better (99% confidence). (2) An empty cell in the Disparity Ratio column indicates that no adverse disparity was observed for that category.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.6. Utilization, Availability, and Disparity Results for MDOT Contracting, Overall and by Contracting Category–All Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	5.50	11.10	49.56 ****
Hispanic	4.25	3.50	
Asian	5.96	4.55	
Native American	0.43	1.00	42.64 ***
Minority-owned	16.14	20.15	80.09 ***
Nonminority female	7.87	13.97	56.31 ****
DBE total	24.00	34.12	70.36 ****
CONSTRUCTION			
African American	4.63	13.55	34.16 ****
Hispanic	6.79	5.33	
Asian	1.66	3.09	53.67 ****
Native American	0.81	0.67	
Minority-owned	13.89	22.64	61.35 ****
Nonminority female	9.97	16.40	60.79 ****
DBE total	23.86	39.04	61.12 ****
AE-CRS			
African American	3.56	8.18	43.54 ****
Hispanic	0.87	2.20	39.54 ****
Asian	19.02	4.90	
Native American	0.05	1.28	3.65 ****
Minority-owned	23.50	16.57	
Nonminority female	7.13	11.45	62.28 ****
DBE total	30.63	28.02	
MAINTENANCE			
African American	5.01	13.19	37.96 ****
Hispanic	3.94	4.44	88.72
Asian	1.76	3.46	50.69 ****
Native American	0.00	1.28	0.00 ****
Minority-owned	10.71	22.38	47.85 ****
Nonminority female	11.33	12.05	94.07
DBE total	22.04	34.42	64.03 ****
IT			
African American	9.50	15.52	61.24 ****
Hispanic	4.63	3.30	
Asian	13.11	12.98	
Native American	0.00	1.24	0.00 ****
Minority-owned	27.25	33.04	82.48 ****
Nonminority female	6.57	12.88	51.02 ****
DBE total	33.82	45.92	73.66 ****

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	18.39	15.96	
Hispanic	3.66	3.13	
Asian	0.13	4.66	2.82 ****
Native American	0.04	0.58	6.82 ****
Minority-owned	22.22	24.32	91.38
Nonminority female	3.30	20.51	16.07 ****
DBE total	25.52	44.83	56.92 ****
CSE			
African American	1.38	11.50	12.00 ****
Hispanic	0.36	3.83	9.33 ****
Asian	0.96	7.96	12.08 ****
Native American	0.00	1.01	0.00 ****
Minority-owned	2.70	24.31	11.11 ****
Nonminority female	2.34	11.92	19.64 ****
DBE total	5.04	36.23	13.91 ****

Source and Notes: See Table 6.5.

With respect to federally-assisted contracts, when all procurement categories are combined, Tables 6.7 and 6.8 show that adverse disparities are observed for firms owned by African Americans, Native Americans, minorities as a group, nonminority females, and DBEs as a group. These disparities are large for African Americans, Native Americans, nonminority females, and DBEs as a group; and they are statistically significant for African Americans, Native Americans (award dollars only), minorities as a group (paid dollars only), nonminority females, and DBEs as a group.

In Construction, adverse disparities are observed for firms owned by African Americans, Asians, minorities as a group, nonminority females, and DBEs as a group. These disparities are large for African Americans, Asians, minorities as a group, nonminority females, and DBEs as a group; and they are statistically significant for African Americans, Asians (paid dollars only), minorities as a group, nonminority females, and DBEs as a group.

In AE-CRS, adverse disparities are observed for firms owned by African Americans, Hispanics, Native Americans, and nonminority females. These disparities are large for African Americans, Hispanics, Native Americans, and nonminority females; and they are statistically significant for African Americans, Hispanics, Native Americans, and nonminority females.

In Maintenance, adverse disparities are observed for firms owned by African Americans, Hispanics (award dollars only), Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group. These disparities are large for African Americans, Hispanics (award dollars only), Asians, Native Americans, minorities as a group, nonminority females (paid dollars only), and DBEs as a group. These disparities are statistically significant for African Americans, Hispanics (award dollars only), Asians, Native Americans, minorities as a group, nonminority females (paid dollars only), and DBEs as a group.

DBE Utilization and Disparity in MDOT Contracting Activity

In IT, adverse disparities are observed for firms owned by African Americans, Asians, Native Americans, minorities as a group, and DBEs as a group. Large disparities are observed for firms owned by African Americans, Asians, Native Americans, and minorities as a group (paid dollars only). These disparities are statistically significant for African Americans, Asians, Native Americans, and minorities as a group.

In Services, adverse disparities are observed for firms owned by African Americans, Asians, Native Americans, minorities as a group, nonminority females (award dollars only), and DBEs as a group (award dollars only). Large disparities are observed for firms owned by African Americans, Asians, Native Americans, minorities as a group (award dollars only), and DBEs as a group (award dollars only). These disparities are statistically significant for African Americans, Asians, Native Americans, minorities as a group (award dollars only), and DBEs as a group (award dollars only).

In CSE, adverse and large disparities are observed for firms owned by African Americans, Hispanics, Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group. These disparities are statistically significant for African Americans, Hispanics, Asians, Native Americans, minorities as a group, nonminority females, and DBEs as a group.

Table 6.7. Utilization, Availability, and Disparity Results for MDOT Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.50	10.39	33.71 ****
Hispanic	5.53	3.30	
Asian	7.25	4.28	
Native American	0.47	1.04	45.05 **
Minority-owned	16.76	19.00	88.18
Nonminority female	8.40	13.53	62.04 ****
DBE total	25.15	32.54	77.31 ****
CONSTRUCTION			
African American	3.97	13.86	28.63 ****
Hispanic	8.85	5.14	
Asian	2.32	3.07	75.57
Native American	0.82	0.65	
Minority-owned	15.96	22.72	70.25 ****
Nonminority female	8.99	16.81	53.44 ****
DBE total	24.95	39.54	63.10 ****
AE-CRS			
African American	3.54	8.28	42.72 ****
Hispanic	1.16	2.21	52.26 ***
Asian	18.09	4.89	
Native American	0.06	1.27	5.07 ****
Minority-owned	22.85	16.66	
Nonminority female	7.40	11.61	63.75 ****
DBE total	30.26	28.27	

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
MAINTENANCE			
African American	0.17	8.23	2.11 ****
Hispanic	1.80	3.07	58.76 ***
Asian	0.00	4.18	0.04 ****
Native American	0.00	1.17	0.00 ****
Minority-owned	1.98	16.65	11.88 ****
Nonminority female	8.84	10.18	86.85
DBE total	10.82	26.83	40.33 ****
IT			
African American	8.61	14.07	61.15 ****
Hispanic	15.02	2.94	
Asian	0.76	11.02	6.91 ****
Native American	0.00	1.26	0.00 ****
Minority-owned	24.39	29.30	83.25 ***
Nonminority female	13.75	12.48	
DBE total	38.13	41.78	91.28
SERVICES			
African American	1.86	10.50	17.70 ****
Hispanic	4.29	3.22	
Asian	0.07	5.22	1.34 ****
Native American	0.00	1.22	0.00 ****
Minority-owned	6.22	20.16	30.86 ****
Nonminority female	11.76	12.89	91.23
DBE total	17.98	33.05	54.40 ****
CSE			
African American	1.47	5.29	27.73 ****
Hispanic	0.02	1.75	0.97 ****
Asian	0.57	2.66	21.55 ****
Native American	0.00	0.40	0.00 ****
Minority-owned	2.06	10.10	20.37 ****
Nonminority female	2.59	8.11	31.91 ****
DBE total	4.65	18.22	25.51 ****

Source and Notes: See Table 6.5.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.8. Utilization, Availability, and Disparity Results for MDOT Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.49	10.48	33.29 ****
Hispanic	4.96	3.46	
Asian	7.14	4.28	
Native American	0.56	1.02	54.96
Minority-owned	16.14	19.25	83.87 *
Nonminority female	8.74	13.59	64.30 ****
DBE total	24.88	32.84	75.77 ****
CONSTRUCTION			
African American	3.78	13.76	27.50 ****
Hispanic	7.26	5.34	
Asian	1.51	3.12	48.26 ****
Native American	0.89	0.62	
Minority-owned	13.44	22.83	58.88 ****
Nonminority female	10.10	16.81	60.09 ****
DBE total	23.54	39.64	59.39 ****
AE-CRS			
African American	3.28	8.20	40.02 ****
Hispanic	0.92	2.21	41.50 ****
Asian	19.67	4.90	
Native American	0.05	1.28	3.88 ****
Minority-owned	23.91	16.59	
Nonminority female	7.29	11.48	63.55 ****
DBE total	31.21	28.07	
MAINTENANCE			
African American	0.03	8.56	0.39 ****
Hispanic	6.39	3.03	
Asian	0.00	6.06	0.00 ****
Native American	0.00	0.93	0.00 ****
Minority-owned	6.42	18.58	34.58 ****
Nonminority female	0.00	11.00	0.00 ****
DBE total	6.42	29.58	21.72 ****
IT			
African American	8.59	13.89	61.90 ****
Hispanic	13.18	2.90	
Asian	0.92	10.82	8.46 ****
Native American	0.00	1.27	0.00 ****
Minority-owned	22.69	28.87	78.58 ****
Nonminority female	15.79	12.39	
DBE total	38.48	41.26	93.25

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	9.04	11.39	79.30 *
Hispanic	11.99	3.61	
Asian	0.40	5.81	6.92 ****
Native American	0.00	1.30	0.00 ****
Minority-owned	21.42	22.11	96.89
Nonminority female	14.40	12.53	
DBE total	35.82	34.64	
CSE			
African American	0.02	5.49	0.39 ****
Hispanic	0.02	1.81	0.99 ****
Asian	0.58	3.04	19.21 ****
Native American	0.00	0.30	0.00 ****
Minority-owned	0.62	10.63	5.86 ****
Nonminority female	0.88	8.12	10.84 ****
DBE total	1.50	18.75	8.01 ****

Source and Notes: See Table 6.5.

2. SHA Results By Major Procurement Category

Tables 6.9 through 6.12 below document utilization, availability, and disparity results for SHA comparable to those presented above in Tables 6.5 through 6.8.

Table 6.9. Utilization, Availability, and Disparity Results for SHA Contracting, Overall and by Contracting Category—All Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.05	11.59	26.34 ****
Hispanic	7.18	3.56	
Asian	6.81	4.67	
Native American	0.69	0.94	73.34
Minority-owned	17.73	20.77	85.39 ***
Nonminority female	10.20	14.61	69.84 ****
DBE total	27.94	35.38	78.97 ****
CONSTRUCTION			
African American	2.98	14.30	20.82 ****
Hispanic	9.70	4.93	
Asian	1.41	3.10	45.59 ****
Native American	1.04	0.54	
Minority-owned	15.14	22.87	66.18 ****
Nonminority female	9.52	17.69	53.83 ****
DBE total	24.66	40.56	60.79 ****

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
AE-CRS			
African American	3.20	8.54	37.43 ****
Hispanic	1.60	2.22	71.85
Asian	20.97	4.79	
Native American	0.01	1.24	1.15 ****
Minority-owned	25.78	16.80	
Nonminority female	8.86	12.20	72.66 ****
DBE total	34.64	29.00	
MAINTENANCE			
African American	3.33	12.36	26.94 ****
Hispanic	4.97	4.68	
Asian	1.72	2.80	61.29 ***
Native American	0.00	1.29	0.00 ****
Minority-owned	10.02	21.13	47.41 ****
Nonminority female	21.35	12.22	
DBE total	31.37	33.35	94.06
IT			
African American	6.14	15.15	40.52 ****
Hispanic	5.35	3.76	
Asian	29.49	14.44	
Native American	0.00	1.29	0.00 ****
Minority-owned	40.98	34.63	
Nonminority female	11.56	12.63	91.49
DBE total	52.54	47.26	
SERVICES			
African American	0.21	12.78	1.64 ****
Hispanic	0.00	2.71	0.00 ****
Asian	0.12	4.75	2.42 ****
Native American	0.00	1.02	0.00 ****
Minority-owned	0.33	21.26	1.53 ****
Nonminority female	32.79	14.52	
DBE total	33.11	35.78	92.55 *
CSE			
African American	0.02	14.07	0.14 ****
Hispanic	0.00	4.36	0.00 ****
Asian	1.00	8.56	11.65 ****
Native American	0.00	1.07	0.00 ****
Minority-owned	1.02	28.06	3.62 ****
Nonminority female	6.88	13.23	52.01 ****
DBE total	7.90	41.30	19.13 ****

Source: Calculations from NERA Master Contract/Subcontract Database and NERA Baseline Business Universe.

Notes: (1) “*” indicates an adverse disparity that is statistically significant at the 15% level or better (85% confidence). “**” indicates the disparity is significant at a 10% level or better (90% confidence). “***” indicates significance at a 5% level or better (95% confidence). “****” indicates significance at a 1% level or better (99% confidence). (2) An empty cell in the Disparity Ratio column indicates that no adverse disparity was observed for that category.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.10. Utilization, Availability, and Disparity Results for SHA Contracting, Overall and by Contracting Category–All Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	2.97	11.88	25.01 ****
Hispanic	6.05	3.91	
Asian	5.31	4.38	
Native American	0.74	0.89	82.83
Minority-owned	15.07	21.06	71.54 ****
Nonminority female	9.99	14.91	67.01 ****
DBE total	25.06	35.98	69.66 ****
CONSTRUCTION			
African American	2.98	14.08	21.15 ****
Hispanic	7.63	5.26	
Asian	0.95	3.19	29.83 ****
Native American	1.02	0.55	
Minority-owned	12.58	23.08	54.49 ****
Nonminority female	10.47	17.45	59.97 ****
DBE total	23.04	40.53	56.85 ****
AE-CRS			
African American	2.75	8.43	32.63 ****
Hispanic	1.43	2.20	65.00 **
Asian	24.70	4.77	
Native American	0.00	1.25	0.04 ****
Minority-owned	28.88	16.65	
Nonminority female	9.15	12.09	75.66 ***
DBE total	38.02	28.74	
MAINTENANCE			
African American	1.77	12.28	14.45 ****
Hispanic	4.73	4.81	98.46
Asian	0.12	2.94	4.16 ****
Native American	0.00	1.32	0.00 ****
Minority-owned	6.63	21.33	31.08 ****
Nonminority female	13.39	12.35	
DBE total	20.02	33.68	59.44 ****
IT			
African American	11.92	16.06	74.22 ****
Hispanic	3.88	3.24	
Asian	8.50	13.16	64.59 ****
Native American	0.00	1.24	0.00 ****
Minority-owned	24.30	33.70	72.10 ****
Nonminority female	6.48	13.09	49.48 ****
DBE total	30.78	46.79	65.77 ****

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	0.14	12.90	1.09 ****
Hispanic	0.00	3.02	0.00 ****
Asian	0.17	3.60	4.66 ****
Native American	0.00	0.91	0.00 ****
Minority-owned	0.31	20.42	1.51 ****
Nonminority female	3.71	15.43	24.07 ****
DBE total	4.02	35.86	11.22 ****
CSE			
African American	0.02	14.23	0.14 ****
Hispanic	0.00	4.39	0.00 ****
Asian	1.04	8.70	11.90 ****
Native American	0.00	1.08	0.00 ****
Minority-owned	1.06	28.40	3.72 ****
Nonminority female	2.66	13.24	20.12 ****
DBE total	3.72	41.64	8.93 ****

Source and Notes: See Table 6.5.

Table 6.11. Utilization, Availability, and Disparity Results for SHA Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.04	11.30	26.92 ****
Hispanic	7.66	3.54	
Asian	6.56	4.02	
Native American	0.71	0.91	78.18
Minority-owned	17.97	19.77	90.87
Nonminority female	9.35	14.79	63.18 ****
DBE total	27.31	34.57	79.02 ****
CONSTRUCTION			
African American	3.00	14.28	21.03 ****
Hispanic	9.87	4.97	
Asian	1.46	3.10	46.89 ****
Native American	0.97	0.54	
Minority-owned	15.30	22.89	66.81 ****
Nonminority female	9.32	17.69	52.67 ****
DBE total	24.61	40.58	60.65 ****
AE-CRS			
African American	3.15	8.52	37.00 ****
Hispanic	1.63	2.22	73.22
Asian	21.21	4.80	
Native American	0.01	1.24	1.18 ****
Minority-owned	26.01	16.79	
Nonminority female	8.86	12.17	72.84 ****
DBE total	34.88	28.96	
MAINTENANCE			
African American	0.00	12.61	0.00 ****
Hispanic	3.25	6.49	50.08 ****
Asian	0.04	1.78	2.20 ****
Native American	0.00	1.29	0.00 ****
Minority-owned	3.29	22.17	14.84 ****
Nonminority female	1.52	12.84	11.86 ****
DBE total	4.81	35.01	13.75 ****
IT			
African American	10.56	14.87	71.03 ****
Hispanic	0.00	3.02	0.00 ****
Asian	0.93	11.74	7.96 ****
Native American	0.00	1.25	0.00 ****
Minority-owned	11.49	30.87	37.23 ****
Nonminority female	16.56	12.74	
DBE total	28.05	43.61	64.32 ****

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	0.67	10.98	6.15 ****
Hispanic	0.00	2.70	0.00 ****
Asian	0.00	4.69	0.00 ****
Native American	0.00	1.44	0.00 ****
Minority-owned	0.67	19.82	3.41 ****
Nonminority female	27.54	12.32	
DBE total	28.22	32.13	87.81 ***
CSE			
African American	0.16	4.34	3.65 ****
Hispanic	0.00	0.79	0.00 ****
Asian	7.96	0.93	
Native American	0.00	0.38	0.00 ****
Minority-owned	8.12	6.44	
Nonminority female	53.26	10.37	
DBE total	61.38	16.81	

Source and Notes: See Table 6.5.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.12. Utilization, Availability, and Disparity Results for SHA Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	2.95	11.63	25.36 ****
Hispanic	6.38	3.94	
Asian	5.69	3.95	
Native American	0.82	0.86	96.35
Minority-owned	15.85	20.39	77.74 ****
Nonminority female	9.97	15.08	66.11 ****
DBE total	25.82	35.46	72.80 ****
CONSTRUCTION			
African American	3.02	14.06	21.48 ****
Hispanic	7.65	5.31	
Asian	0.97	3.19	30.44 ****
Native American	1.03	0.54	
Minority-owned	12.67	23.10	54.87 ****
Nonminority female	10.08	17.44	57.80 ****
DBE total	22.76	40.54	56.13 ****
AE-CRS			
African American	2.61	8.42	31.01 ****
Hispanic	1.46	2.20	66.23
Asian	25.10	4.77	
Native American	0.00	1.25	0.04 ****
Minority-owned	29.16	16.64	
Nonminority female	9.15	12.06	75.87 ***
DBE total	38.31	28.70	
MAINTENANCE			
African American	0.00	7.24	0.00 ****
Hispanic	0.00	1.64	0.00 ****
Asian	0.00	2.34	0.00 ****
Native American	0.00	1.28	0.00 ****
Minority-owned	0.00	12.49	0.00 ****
Nonminority female	0.00	16.37	0.00 ****
DBE total	0.00	28.87	0.00 ****
IT			
African American	9.90	14.75	67.12 ****
Hispanic	0.00	2.99	0.00 ****
Asian	1.05	11.57	9.11 ****
Native American	0.00	1.25	0.00 ****
Minority-owned	10.95	30.56	35.85 ****
Nonminority female	18.19	12.70	
DBE total	29.14	43.25	67.37 ****

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	0.00	16.13	0.00 ****
Hispanic	0.00	2.75	0.00 ****
Asian	0.00	2.70	0.00 ****
Native American	0.00	2.29	0.00 ****
Minority-owned	0.00	23.87	0.00 ****
Nonminority female	34.11	11.01	
DBE total	34.11	34.88	97.79
CSE			
African American	0.24	4.51	5.35 ****
Hispanic	0.00	1.12	0.00 ****
Asian	11.70	1.09	
Native American	0.00	0.39	0.00 ****
Minority-owned	11.94	7.11	
Nonminority female	25.26	11.85	
DBE total	37.20	18.96	

Source and Notes: See Table 6.5.

3. MTA Results By Major Procurement Category

Tables 6.13 through 6.16 below document utilization, availability, and disparity results for MTA comparable to those presented above in Tables 6.5 through 6.8.

Table 6.13. Utilization, Availability, and Disparity Results for MTA Contracting, Overall and by Contracting Category—All Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	6.93	10.05	68.93
Hispanic	1.58	2.92	54.17
Asian	5.48	4.97	
Native American	0.06	1.17	5.40 ****
Minority-owned	14.05	19.11	73.54
Nonminority female	4.86	12.61	38.50 ****
DBE total	18.91	31.72	59.61 ****
CONSTRUCTION			
African American	10.08	11.18	90.21
Hispanic	3.85	6.29	61.26
Asian	8.83	3.05	
Native American	0.06	1.27	4.68 ****
Minority-owned	22.82	21.78	
Nonminority female	7.98	12.49	63.89
DBE total	30.81	34.27	89.88

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
AE-CRS			
African American	2.89	8.11	35.64 ****
Hispanic	0.77	2.23	34.62
Asian	15.81	5.01	
Native American	0.12	1.29	9.53 ****
Minority-owned	19.60	16.63	
Nonminority female	6.27	11.12	56.40 *
DBE total	25.87	27.76	93.21
MAINTENANCE			
African American	3.29	10.39	31.63 ****
Hispanic	1.12	3.14	35.49
Asian	0.54	4.13	13.08 ****
Native American	0.12	1.42	8.36 ****
Minority-owned	5.06	19.08	26.52 ****
Nonminority female	6.35	10.55	60.19
DBE total	11.41	29.62	38.51 ****
IT			
African American	0.00	12.29	0.00 ****
Hispanic	8.90	4.06	
Asian	25.50	14.15	
Native American	0.00	1.26	0.00 ****
Minority-owned	34.41	31.76	
Nonminority female	0.30	11.46	2.61 ****
DBE total	34.70	43.22	80.29 *
SERVICES			
African American	12.47	16.19	77.05
Hispanic	2.03	3.21	63.43
Asian	0.55	5.17	10.66 ****
Native American	0.01	0.61	2.41 ****
Minority-owned	15.07	25.18	59.88 ***
Nonminority female	3.52	18.80	18.74 ****
DBE total	18.60	43.97	42.29 ****
CSE			
African American	1.57	10.63	14.79 ****
Hispanic	0.42	3.49	11.98 ****
Asian	0.73	9.35	7.78 ****
Native American	0.00	1.05	0.00 ****
Minority-owned	2.72	24.52	11.08 ****
Nonminority female	1.08	11.05	9.76 ****
DBE total	3.79	35.57	10.67 ****

Source: Calculations from NERA Master Contract/Subcontract Database and NERA Baseline Business Universe.

Notes: (1) “*” indicates an adverse disparity that is statistically significant at the 15% level or better (85% confidence). “**” indicates the disparity is significant at a 10% level or better (90% confidence). “***” indicates significance at a 5% level or better (95% confidence). “****” indicates significance at a 1% level or better (99% confidence). (2) An empty cell in the Disparity Ratio column indicates that no adverse disparity was observed for that category.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.14. Utilization, Availability, and Disparity Results for MTA Contracting, Overall and by Contracting Category–All Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	7.85	10.23	76.69
Hispanic	2.29	2.78	82.31
Asian	7.40	4.95	
Native American	0.06	1.12	5.32 ****
Minority-owned	17.59	19.07	92.22
Nonminority female	5.09	13.29	38.29 ****
DBE total	22.68	32.36	70.08 **
CONSTRUCTION			
African American	9.69	11.17	86.78
Hispanic	5.83	5.80	
Asian	4.31	2.80	
Native American	0.10	1.09	9.58 ****
Minority-owned	19.94	20.86	95.57
Nonminority female	12.28	13.14	93.41
DBE total	32.21	34.00	94.74
AE-CRS			
African American	2.77	8.09	34.20 ***
Hispanic	0.62	2.22	27.77 *
Asian	16.89	5.00	
Native American	0.09	1.29	7.17 ****
Minority-owned	20.37	16.60	
Nonminority female	6.49	11.07	58.59
DBE total	26.86	27.67	97.06
MAINTENANCE			
African American	3.40	13.24	25.71 ****
Hispanic	5.13	4.38	
Asian	9.74	5.72	
Native American	0.00	1.00	0.00 ****
Minority-owned	18.28	24.34	75.12
Nonminority female	0.00	11.46	0.00 ****
DBE total	18.28	35.80	51.07 ****
IT			
African American	0.00	12.52	0.00 ****
Hispanic	31.72	2.74	
Asian	35.13	9.70	
Native American	0.00	1.30	0.00 ****
Minority-owned	66.85	26.26	
Nonminority female	0.75	11.84	6.35 ****
DBE total	67.60	38.11	

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	20.37	16.10	
Hispanic	4.08	3.14	
Asian	0.14	4.67	2.91 ****
Native American	0.04	0.57	7.68 ***
Minority-owned	24.63	24.49	
Nonminority female	3.46	20.70	16.70 ****
DBE total	28.09	45.19	62.16 ****
CSE			
African American	0.61	10.98	5.51 ****
Hispanic	0.47	3.49	13.47 ****
Asian	0.80	9.60	8.31 ****
Native American	0.00	1.06	0.00 ****
Minority-owned	1.87	25.14	7.45 ****
Nonminority female	1.16	11.18	10.42 ****
DBE total	3.04	36.32	8.37 ****

Source and Notes: See Table 6.5.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.15. Utilization, Availability, and Disparity Results for MTA Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.51	8.63	40.66 **
Hispanic	1.96	2.83	69.24
Asian	8.94	4.75	
Native American	0.07	1.28	5.29 ****
Minority-owned	14.47	17.49	82.76
Nonminority female	7.02	11.36	61.79
DBE total	21.50	28.85	74.50
CONSTRUCTION			
African American	10.10	11.18	90.35
Hispanic	3.87	6.29	61.51
Asian	8.88	3.05	
Native American	0.06	1.26	4.72 ****
Minority-owned	22.91	21.79	
Nonminority female	7.81	12.50	62.48
DBE total	30.72	34.29	89.60
AE-CRS			
African American	2.89	8.11	35.64 ***
Hispanic	0.77	2.23	34.63
Asian	15.81	5.01	
Native American	0.12	1.29	9.53 ***
Minority-owned	19.60	16.63	
Nonminority female	6.27	11.12	56.40
DBE total	25.87	27.76	93.21
MAINTENANCE			
African American	0.18	7.15	2.54 ****
Hispanic	1.64	2.22	73.93
Asian	0.00	4.74	0.00 ****
Native American	0.00	1.14	0.00 ****
Minority-owned	1.82	15.26	11.95 ****
Nonminority female	9.19	9.51	96.61
DBE total	11.02	24.77	44.46 ****
IT			
African American	0.00	7.42	0.00 ****
Hispanic	81.21	2.25	
Asian	0.00	5.03	0.00 ****
Native American	0.00	1.37	0.00 ****
Minority-owned	81.21	16.06	
Nonminority female	1.36	10.31	13.22 ****
DBE total	82.57	26.37	

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	1.89	10.39	18.16 ****
Hispanic	4.40	3.27	
Asian	0.07	5.30	1.35 ****
Native American	0.00	1.15	0.00 ****
Minority-owned	6.35	20.11	31.59 ****
Nonminority female	11.38	12.94	87.97
DBE total	17.74	33.05	53.67 ****
CSE			
African American	1.53	5.46	28.08 ***
Hispanic	0.02	1.96	0.91 ****
Asian	0.20	3.04	6.66 ****
Native American	0.00	0.40	0.00 ****
Minority-owned	1.75	10.87	16.14 ****
Nonminority female	0.04	7.75	0.57 ****
DBE total	1.80	18.61	9.66 ****

Source and Notes: See Table 6.5.

Table 6.16. Utilization, Availability, and Disparity Results for MTA Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	3.78	8.64	43.74
Hispanic	2.26	2.68	84.42
Asian	10.56	4.86	
Native American	0.07	1.27	5.68 ****
Minority-owned	16.67	17.44	95.56
Nonminority female	6.55	11.37	57.60
DBE total	23.22	28.82	80.58
CONSTRUCTION			
African American	9.75	11.18	87.19
Hispanic	5.89	5.82	
Asian	4.34	2.80	
Native American	0.11	1.08	9.73 **
Minority-owned	20.09	20.88	96.21
Nonminority female	11.98	13.15	91.12
DBE total	32.07	34.03	94.24
AE-CRS			
African American	2.77	8.09	34.20 ***
Hispanic	0.62	2.22	27.77
Asian	16.90	5.00	
Native American	0.09	1.29	7.17 ****
Minority-owned	20.37	16.60	
Nonminority female	6.49	11.07	58.59
DBE total	26.86	27.67	97.07
MAINTENANCE			
African American	0.04	8.63	0.45 ****
Hispanic	7.45	3.10	
Asian	0.00	6.25	0.00 ****
Native American	0.00	0.91	0.00 ****
Minority-owned	7.49	18.89	39.63 ****
Nonminority female	0.00	10.73	0.00 ****
DBE total	7.49	29.62	25.28 ****
IT			
African American	0.00	7.18	0.00 ****
Hispanic	100.00	2.17	
Asian	0.00	5.06	0.00 ****
Native American	0.00	1.41	0.00 ****
Minority-owned	100.00	15.82	
Nonminority female	0.00	10.00	0.00 ****
DBE total	100.00	25.82	

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	9.25	11.35	81.51
Hispanic	12.27	3.62	
Asian	0.41	5.84	7.04 ****
Native American	0.00	1.29	0.00 ****
Minority-owned	21.93	22.09	99.27
Nonminority female	13.93	12.54	
DBE total	35.86	34.63	
CSE			
African American	0.01	5.63	0.25 ****
Hispanic	0.02	1.90	0.97 ****
Asian	0.21	3.38	6.09 ****
Native American	0.00	0.30	0.00 ****
Minority-owned	0.24	11.21	2.13 ****
Nonminority female	0.05	7.40	0.69 ****
DBE total	0.29	18.60	1.56 ****

Source and Notes: See Table 6.5.

4. MAA Results By Major Procurement Category

Tables 6.17 through 6.20 below document utilization, availability, and disparity results for MAA comparable to those presented above in Tables 6.5 through 6.8.

Table 6.17. Utilization, Availability, and Disparity Results for MAA Contracting, Overall and by Contracting Category—All Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	9.51	10.39	91.49
Hispanic	1.14	3.84	29.66 **
Asian	4.35	4.55	95.59
Native American	0.01	1.28	0.76 ****
Minority-owned	15.00	20.06	74.80
Nonminority female	4.63	11.40	40.59 ****
DBE total	19.63	31.46	62.40 ****
CONSTRUCTION			
African American	10.20	12.01	84.94
Hispanic	1.87	5.69	32.92 **
Asian	3.01	2.92	
Native American	0.02	1.24	1.67 ****
Minority-owned	15.10	21.85	69.12 **
Nonminority female	4.74	11.76	40.32 ****
DBE total	19.84	33.60	59.04 ****

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
AE-CRS			
African American	11.46	7.90	
Hispanic	0.00	2.19	0.00 ****
Asian	6.23	5.13	
Native American	0.00	1.33	0.00 ****
Minority-owned	17.69	16.55	
Nonminority female	3.25	10.65	30.55 ****
DBE total	20.94	27.20	77.00
MAINTENANCE			
African American	12.49	12.74	98.03
Hispanic	1.22	3.56	34.29 *
Asian	0.98	3.31	29.65 **
Native American	0.00	1.62	0.00 ****
Minority-owned	14.69	21.23	69.19 **
Nonminority female	5.98	11.50	52.03 **
DBE total	20.67	32.73	63.16 ****
IT			
African American	1.59	10.50	15.16 ****
Hispanic	0.00	3.84	0.00 ****
Asian	11.32	11.93	94.90
Native American	0.00	1.33	0.00 ****
Minority-owned	12.91	27.60	46.79 ****
Nonminority female	3.39	10.91	31.09 ****
DBE total	16.30	38.50	42.34 ****
SERVICES			
African American	1.54	19.08	8.07 ****
Hispanic	0.59	3.93	15.04 ****
Asian	12.66	6.45	
Native American	0.00	0.76	0.00 ****
Minority-owned	14.79	30.21	48.95 ****
Nonminority female	2.75	16.93	16.22 ****
DBE total	17.53	47.14	37.19 ****
CSE			
African American	6.82	9.02	75.56
Hispanic	0.08	3.75	2.02 ****
Asian	1.58	3.86	41.03
Native American	0.00	0.81	0.00 ****
Minority-owned	8.47	17.44	48.59 ****
Nonminority female	7.77	11.72	66.30
DBE total	16.24	29.16	55.71 ****

Source: Calculations from NERA Master Contract/Subcontract Database and NERA Baseline Business Universe.

Notes: (1) “*” indicates an adverse disparity that is statistically significant at the 15% level or better (85% confidence). “**” indicates the disparity is significant at a 10% level or better (90% confidence). “***” indicates significance at a 5% level or better (95% confidence). “****” indicates significance at a 1% level or better (99% confidence). (2) An empty cell in the Disparity Ratio column indicates that no adverse disparity was observed for that category.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.18. Utilization, Availability, and Disparity Results for MAA Contracting, Overall and by Contracting Category–All Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	10.65	9.84	
Hispanic	1.42	3.77	37.62
Asian	4.95	4.13	
Native American	0.02	1.22	1.47 ****
Minority-owned	17.04	18.96	89.86
Nonminority female	5.75	11.26	51.11 **
DBE total	22.80	30.22	75.42
CONSTRUCTION			
African American	11.34	11.82	95.96
Hispanic	2.45	5.52	44.45
Asian	4.25	2.73	
Native American	0.03	1.13	2.77 ****
Minority-owned	18.08	21.20	85.30
Nonminority female	5.77	12.00	48.04 ***
DBE total	23.85	33.20	71.83 **
AE-CRS			
African American	10.46	7.40	
Hispanic	0.00	2.16	0.00 ****
Asian	7.87	5.05	
Native American	0.00	1.37	0.00 ****
Minority-owned	18.33	15.98	
Nonminority female	2.62	10.34	25.33 ****
DBE total	20.95	26.32	79.59
MAINTENANCE			
African American	18.01	19.11	94.25
Hispanic	0.00	2.19	0.00 ****
Asian	0.00	2.58	0.00 ****
Native American	0.00	1.55	0.00 ****
Minority-owned	18.01	25.43	70.84 *
Nonminority female	14.75	11.22	
DBE total	32.77	36.65	89.41
IT			
African American	2.56	11.93	21.48 ****
Hispanic	0.00	4.04	0.00 ****
Asian	25.28	12.40	
Native American	0.00	1.18	0.00 ****
Minority-owned	27.85	29.55	94.24
Nonminority female	8.58	11.56	74.25
DBE total	36.43	41.11	88.62

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	1.61	10.58	15.22 ****
Hispanic	0.00	2.05	0.00 ****
Asian	0.03	5.66	0.50 ****
Native American	0.00	0.42	0.00 ****
Minority-owned	1.64	18.71	8.76 ****
Nonminority female	0.52	16.20	3.20 ****
DBE total	2.16	34.90	6.18 ****
CSE			
African American	9.29	9.26	
Hispanic	0.10	3.78	2.74 ****
Asian	2.05	3.87	53.10
Native American	0.00	0.81	0.00 ****
Minority-owned	11.45	17.72	64.60 *
Nonminority female	10.49	11.82	88.76
DBE total	21.94	29.54	74.27

Source and Notes: See Table 6.5.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.19. Utilization, Availability, and Disparity Results for MAA Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Awarded)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	9.57	10.13	94.48
Hispanic	1.99	3.29	60.38
Asian	4.83	4.22	
Native American	0.03	1.24	2.68
Minority-owned	16.42	18.88	86.94
Nonminority female	5.27	11.38	46.32
DBE total	21.68	30.26	71.67
CONSTRUCTION			
African American	7.37	13.39	55.01
Hispanic	2.81	5.20	54.07
Asian	3.50	2.48	
Native American	0.05	1.14	4.27
Minority-owned	13.72	22.21	61.79
Nonminority female	6.24	12.01	51.92
DBE total	19.96	34.23	58.32 *
AE-CRS			
African American	14.32	8.27	
Hispanic	0.00	2.21	0.00 ****
Asian	7.69	5.20	
Native American	0.00	1.30	0.00 ****
Minority-owned	22.01	16.98	
Nonminority female	3.20	11.02	29.03 *
DBE total	25.20	28.00	90.01
MAINTENANCE			
African American	0.00	12.12	0.00 ****
Hispanic	95.56	6.71	
Asian	0.00	4.44	0.00 ****
Native American	0.00	2.08	0.00 ****
Minority-owned	95.56	25.34	
Nonminority female	1.94	10.03	19.38 **
DBE total	97.50	35.37	
IT			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total	n/a	n/a	n/a

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total	n/a	n/a	n/a
CSE			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total	n/a	n/a	n/a

Source and Notes: *See Table 6.5.*

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.20. Utilization, Availability, and Disparity Results for MAA Contracting, Overall and by Contracting Category–Federally-Assisted Contracts (Dollars Paid)

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
OVERALL			
African American	8.10	9.39	86.22
Hispanic	2.50	3.13	80.01
Asian	6.14	4.22	
Native American	0.05	1.30	3.50
Minority-owned	16.78	18.04	93.06
Nonminority female	5.94	10.90	54.44
DBE total	22.72	28.94	78.51
CONSTRUCTION			
African American	6.10	13.23	46.13
Hispanic	3.81	5.04	75.55
Asian	4.93	2.55	
Native American	0.07	1.15	5.98
Minority-owned	14.90	21.97	67.84
Nonminority female	7.84	11.89	65.91
DBE total	22.74	33.86	67.16
AE-CRS			
African American	11.92	7.47	
Hispanic	0.00	2.17	0.00 ****
Asian	8.48	5.06	
Native American	0.00	1.37	0.00 ****
Minority-owned	20.40	16.07	
Nonminority female	2.29	10.41	21.99 **
DBE total	22.68	26.47	85.68
MAINTENANCE			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total	n/a	n/a	n/a
IT			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total	n/a	n/a	n/a

Contracting Category & DBE Type	Utilization	Availability	Disparity Ratio
SERVICES			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total	n/a	n/a	n/a
CSE			
African American	n/a	n/a	n/a
Hispanic	n/a	n/a	n/a
Asian	n/a	n/a	n/a
Native American	n/a	n/a	n/a
Minority-owned	n/a	n/a	n/a
Nonminority female	n/a	n/a	n/a
DBE total			

Source and Notes: See Table 6.5.

5. Detailed Industry Level Results

Utilization, availability and disparity results comparable to those presented above in Tables 6.5 through 6.20 have also been produced according to detailed Industry Groups. In the interest of space, these tables are presented in Appendix D.

D. Current Availability versus Expected Availability

Finally, Table 6.21 provides a comparison between current levels of DBE availability for MDOT and levels that we would expect to observe in a race- and gender-neutral market area. The latter, referred to as “expected availability,” is derived by dividing the current availability figures, as documented in Table 3.15, by the disparity ratios documented in column (3) of Table 4.24. If no business formation disparity is present in the relevant market area, the disparity ratio will be equal to 100 and expected availability will be equivalent to current availability. In cases where adverse business formation disparities are present in the relevant market area, the disparity ratio will be less than 100 and, consequently, expected availability will exceed current availability.

Expected availability in MDOT’s market area exceeds current availability by substantial margins in 90 of 98 cases, or 92 percent.

DBE Utilization and Disparity in MDOT Contracting Activity

Table 6.21. Current Availability and Expected Availability for MDOT Contracting

Contracting Category & DBE Type	Award Dollar Weights		Paid Dollar Weights	
	Current Availability (%)	Expected Availability (%)	Current Availability (%)	Expected Availability (%)
OVERALL				
African American	10.99	15.72	11.10	15.88
Hispanic	3.39	3.94	3.50	4.06
Asian	4.76	4.72	4.55	4.51
Native American	1.05	1.38	1.00	1.31
Minority-owned	20.18	24.85	20.15	24.81
Nonminority female	13.64	15.61	13.97	15.99
DBE total	33.82	41.80	34.12	42.17
CONSTRUCTION				
African American	13.67	25.23	13.55	25.00
Hispanic	5.17	7.10	5.33	7.32
Asian	3.07	2.49	3.09	2.50
Native American	0.71	1.06	0.67	1.00
Minority-owned	22.62	33.39	22.64	33.42
Nonminority female	16.38	24.35	16.40	24.38
DBE total	39.00	58.06	39.04	58.12
AE-CRS				
African American	8.32	13.91	8.18	13.68
Hispanic	2.22	3.18	2.20	3.15
Asian	4.91	7.55	4.90	7.53
Native American	1.27	2.05	1.28	2.07
Minority-owned	16.72	25.11	16.57	24.88
Nonminority female	11.64	17.16	11.45	16.88
DBE total	28.36	44.63	28.02	44.09
MAINTENANCE				
African American	11.76	20.92	13.19	23.47
Hispanic	3.96	5.05	4.44	5.66
Asian	3.37	4.99	3.46	5.12
Native American	1.43	1.92	1.28	1.72
Minority-owned	20.52	28.65	22.38	31.24
Nonminority female	11.31	16.07	12.05	17.12
DBE total	31.83	45.26	34.42	48.95
IT				
African American	14.34	26.07	15.52	28.21
Hispanic	3.78	4.66	3.30	4.07
Asian	14.08	16.86	12.98	15.55
Native American	1.29	2.03	1.24	1.95
Minority-owned	33.50	47.32	33.04	46.67
Nonminority female	12.33	14.35	12.88	14.99
DBE total	45.82	60.75	45.92	60.88

DBE Utilization and Disparity in MDOT Contracting Activity

Contracting Category & DBE Type	Award Dollar Weights		Paid Dollar Weights	
	Current Availability (%)	Expected Availability (%)	Current Availability (%)	Expected Availability (%)
SERVICES				
African American	16.14	25.64	15.96	25.35
Hispanic	3.21	3.92	3.13	3.83
Asian	5.22	4.75	4.66	4.24
Native American	0.65	1.04	0.58	0.93
Minority-owned	25.21	32.18	24.32	31.04
Nonminority female	18.41	19.81	20.51	22.07
DBE total	43.62	53.48	44.83	54.96
CSE				
African American	11.22	15.80	11.50	16.19
Hispanic	3.79	4.38	3.83	4.43
Asian	7.86	7.31	7.96	7.40
Native American	1.00	1.29	1.01	1.31
Minority-owned	23.88	27.86	24.31	28.36
Nonminority female	11.80	13.67	11.92	13.81
DBE total	35.68	42.82	36.23	43.48

Source: See Tables 3.15 and 4.24.

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VII. Anecdotal Evidence of Disparities in MDOT Market Area

A. Introduction

We have presented a variety of economic and statistical findings above that are consistent with, and indicative of, the presence of business discrimination against minorities and women in the geographic and product markets that are relevant to MDOT's contracting and procurement activities. Chapters IV and V, in particular, have documented large and statistically significant disparities in MDOT's relevant markets adversely impacting the competitiveness and utilization of minority and female entrepreneurs. In most cases, commercial loan denial rates were higher, the cost of credit was higher, business formation rates are lower, and business owner earnings are lower—even when comparisons are restricted to similarly situated businesses and business owners.

As a complement to these quantitative findings, we gathered anecdotal evidence regarding disparities, perceived barriers, and differences in treatment of business owners on the basis of race and/or gender in MDOT's market area. First, we conducted a large scale survey of business establishments in the market area—both DBE and non-DBE—and asked owners directly about their experiences, if any, with contemporary business-related acts of discrimination. We find that DBEs in MDOT's markets report suffering business-related discrimination in substantial numbers and often with statistically significantly greater frequency than non-DBEs (*See* Tables 7.3 and 7.4). These differences tend to remain substantial when firm size and owner characteristics are held constant (*See* Tables 7.5 and 7.6). Additionally, we find that DBE firms that have been hired in the past by non-DBE prime contractors to work on public sector contracts with DBE goals often are not hired—or even solicited—by these prime contractors to work on projects without DBE goals (*See* Tables 7.9 and 7.10). The relative lack of DBE hiring and, even more significantly, the relative lack of solicitation of DBEs in the absence of affirmative efforts by MDOT and other public entities in the relevant market area, shows that business discrimination continues to fetter DBE business opportunities. We conclude that the statistical evidence presented in this Study is consistent with these anecdotal accounts of contemporary business discrimination.

The remainder of this chapter is organized as follows. We first discuss the mail survey results in Section B. In Section B.1, we discuss the survey questionnaire, sample frame, and response rate. Section B.2 presents evidence on willingness of firms to do business with the public sector. Section B.3 presents the key findings from the DBE and non-DBE respondents concerning disparate treatment. Section B.4 presents the key findings concerning the impact of the current business environment on DBEs' ability to conduct their businesses. Section B.5 presents key findings to our questions concerning whether prime contractors solicit or hire DBEs for work on public or private contracts without DBE goals. Section B.6 then examines whether DBEs and non-DBEs that responded to the mail surveys are representative of all DBEs and non-DBEs in the relevant markets. To do so, we surveyed a random sample of DBEs and non-DBEs that did not respond to our mail survey, and then compared their responses to key questions with those of our survey respondents.

Finally, Section C describes the results of the business experience group interviews. Responses are grouped under the headings of the most common cited barriers and issues facing businesses in MDOT's market area.

B. Business Experience Surveys

1. Survey Questionnaire, Sample, and Responses

The survey questionnaire asked whether and with what frequency firms had experienced discrimination in a wide variety of likely business dealings in the previous five years. The survey also inquired about the influence of specific aspects of the everyday business environment, such as bonding and insurance requirements, on each firm's ability to do business in MDOT's relevant markets. We also asked about the relative frequency with which firms that have been used as subcontractors, subconsultants, or suppliers by prime contractors on contracts *with* DBE goals have been hired to work, or even solicited to bid, on similar contracts *without* DBE goals. Finally, we posed questions about the characteristics of the firm, including firm age, owner's education, employment size and revenue size, to facilitate comparisons of similarly situated firms.

The mail survey sample was stratified by industry and drawn directly from the Master DBE Directory and the Baseline Business Universe compiled for this Study using the custom census methodology outlined in Chapter IV.¹⁵⁹ Firms were sampled randomly within strata. DBE firms were oversampled to facilitate statistical comparisons with non-DBEs. Of 18,362 businesses that received the questionnaire,¹⁶⁰ 1,706 (9.3%) provided usable responses.¹⁶¹ The distribution of total responses according to the race and gender of the business owner, by major contracting category, appears in Table 7.1.

¹⁵⁹ See Chapter II for a discussion of how the product and geographic markets were defined. See Chapter III for a discussion of how the Master DBE Directory and the Baseline Business Universe were assembled.

¹⁶⁰ These figures exclude surveys that were returned undelivered or were otherwise undeliverable.

¹⁶¹ The total number of valid responses to any particular survey question, however, was sometimes lower than this due to item non-response.

Table 7.1. Race, Gender and Contracting Category of Mail Survey Respondents

Group	Construction	Architecture & Engineering	Professional & Other Services	Goods & Supplies	Total
African American	89	28	226	20	363
Hispanic	59	9	36	3	107
Asian	23	41	88	10	162
Native American	2	2	9	1	14
Minorities with unknown Race/Ethnicity	-	-	-	-	-
Nonminority Women	138	63	320	40	561
DBE Total	311	143	679	74	1,207
Nonminority Men	221	73	173	32	499
Total	532	216	852	106	1,706

Source: NERA mail survey.

2. Willingness of Firms to Contract with the Public Sector

The probative value of anecdotal evidence of discrimination increases when it comes from active businesses in the relevant geographic and procurement markets. The value of such evidence increases further when it comes from firms that have actually worked or attempted to work for the public sector within those markets. Such is the present case.

As shown below in Table 7.2, there is an observable link between the firms responding to our mail survey and the public sector of the Maryland area economy. All respondents operate establishments in the relevant geographic and product markets. Moreover, significant numbers of survey respondents have worked or attempted to do work for MDOT or other public entities in the market area in the last five years. This is observed for virtually all types of DBEs and non-DBEs in all procurement categories, and the importance of the public sector is even more significant for DBEs than it is for non-DBEs. Overall, 43 percent of non-DBEs and 54 percent of DBEs have worked or attempted to work for MDOT or some other public entity in the market area in the previous five years. For DBEs in Construction and A&E, the figures are significantly higher than this, at 65 percent and 62 percent, respectively.

Anecdotal Evidence of Disparities in MDOT Market Area

Table 7.2. Survey Respondents Indicating They Had Worked or Attempted to Work for Public Sector Agencies in the Last Five Years

Worked or Attempted to Work, Last 5 Years	African American	Hispanic	Asian	Native American	Minority Total	Non-minority Female	DBE Total	Non-minority Male
ALL INDUSTRIES								
With State of Maryland	51.0%	47.7%	48.8%	28.6%	49.4%	32.0%	41.3%	29.7%
	(363)	(107)	(162)	(14)	(646)	(557)	(1203)	(495)
With Other Public Entity in Market Area	54.4%	48.1%	54.0%	21.4%	52.6%	40.3%	46.9%	36.2%
	(360)	(106)	(161)	(14)	(641)	(553)	(1194)	(489)
With any Public Entity in Market Area	62.6%	58.5%	61.1%	35.7%	61.0%	46.4%	54.2%	43.4%
	(361)	(106)	(162)	(14)	(643)	(554)	(1197)	(491)
CONSTRUCTION								
With State of Maryland	57.3%	55.9%	69.6%	100.0%	59.0%	42.3%	51.6%	35.3%
	(89)	(59)	(23)	(2)	(173)	(137)	(310)	(221)
With Other Public Entity in Market Area	63.6%	53.4%	78.3%	100.0%	62.6%	54.4%	59.0%	37.9%
	(88)	(58)	(23)	(2)	(171)	(136)	(307)	(219)
With any Public Entity in Market Area	67.0%	65.5%	82.6%	100.0%	69.0%	59.1%	64.6%	46.6%
	(88)	(58)	(23)	(2)	(171)	(137)	(308)	(219)
ARCHITECTURE & ENGINEERING								
With State of Maryland	57.1%	44.4%	63.4%	50.0%	58.8%	33.9%	47.9%	31.5%
	(28)	(9)	(41)	(2)	(80)	(62)	(142)	(73)
With Other Public Entity in Market Area	71.4%	44.4%	62.5%	50.0%	63.3%	48.3%	56.8%	47.2%
	(28)	(9)	(40)	(2)	(79)	(60)	(139)	(72)
With any Public Entity in Market Area	71.4%	55.6%	68.3%	100.0%	68.8%	54.1%	62.4%	52.8%
	(28)	(9)	(41)	(2)	(80)	(61)	(141)	(72)
PROFESSIONAL & OTHER SERVICES								
With State of Maryland	48.2%	36.1%	38.6%	11.1%	43.7%	27.4%	36.0%	22.9%
	(226)	(36)	(88)	(9)	(359)	(318)	(677)	(170)
With Other Public Entity in Market Area	49.6%	38.9%	44.3%	0.0%	45.9%	33.1%	39.9%	31.5%
	(224)	(36)	(88)	(9)	(357)	(317)	(674)	(168)
With any Public Entity in Market Area	60.4%	47.2%	53.4%	11.1%	56.1%	39.9%	48.5%	37.9%
	(225)	(36)	(88)	(9)	(358)	(316)	(674)	(169)
GOODS & SUPPLIES								
With State of Maryland	45.0%	33.3%	30.0%	0.0%	38.2%	30.0%	33.8%	22.6%
	(20)	(3)	(10)	(1)	(34)	(40)	(74)	(31)
With Other Public Entity in Market Area	45.0%	66.7%	50.0%	0.0%	47.1%	37.5%	41.9%	23.3%
	(20)	(3)	(10)	(1)	(34)	(40)	(74)	(30)
With any Public Entity in Market Area	55.0%	66.7%	50.0%	0.0%	52.9%	42.5%	47.3%	29.0%
	(20)	(3)	(10)	(1)	(34)	(40)	(74)	(31)

Source: NERA mail survey.

Note: Total number of valid responses in parentheses.

3. Experiences of Disparate Treatment in Business Dealings

The survey included questions about instances of disparate treatment based on race and/or gender experienced in various business dealings during the past five years. As shown in the two rightmost columns of Table 7.3, in every one of the 14 categories on which they were polled, substantially more DBEs than non-DBEs reported experiencing disparate treatment, casting doubt on claims of widespread “reverse discrimination.” In each case, these differences were statistically significant as well.

On average, reports were highest among African Americans, with an overall rate of 49.7 percent, followed in descending order by Asians (47.7%), Hispanics (44.0%), nonminority women (34.5%), and Native Americans (23.1%). By comparison, the reported rate for nonminority males was 19.8 percent. The balance of Table 7.3 shows results for each of 14 distinct types of disparate treatment that we asked about in the survey.

In all 14 categories, the ratio of the reported amount of disparate treatment between DBEs and non-DBEs is large—more than 150 percent of the reported rate for non-DBEs. In all 14 categories, this difference is statistically significant as well. In most categories, the reported incidence of disparate treatment is far more severe than even this. Specifically:

- In applying for surety bonds the incidence of disparate treatment was almost 2300% higher than the reported rate for non-DBEs;
- In applying for commercial loans and in obtaining price quotes from suppliers or subcontractors the incidence of disparate treatment was approximately 700% higher than the reported rate for non-DBEs;
- In hiring workers from union hiring halls and in having to do inappropriate or extra work not required of comparable non-DBEs the incidence of disparate treatment was approximately 600% higher than the reported rate for non-DBEs;
- In having to meet quality, inspection, or performance standards not required of comparable non-DBEs the incidence of disparate treatment was over 500% higher than the reported rate for non-DBEs;
- In applying for commercial or professional insurance and in working or attempting to work on private sector prime contracts the incidence of disparate treatment was approximately 450% higher than the reported rate for non-DBEs;
- In working or attempting to work on private sector subcontracts and in functioning without hindrance or harassment on the work site the incidence of disparate treatment was over 400% higher than the reported rate for non-DBEs;
- In joining or dealing with trade associations the incidence of disparate treatment was almost 300% higher than the reported rate for non-DBEs;

- In working or attempting to work on public sector subcontracts and in receiving timely payment for work performed the incidence of disparate treatment was over 200% higher than the reported rate for non-DBEs;
- In working or attempting to work on public sector prime contracts the incidence of disparate treatment was just under 200% higher than the reported rate for non-DBEs.

Table 7.3 also provides evidence of the positive impact of public sector DBE programs in the Maryland economy. Three of the categories with the smallest relative differences between DBEs and non-DBEs—by far—were working or attempting to work on public sector prime contracts, working or attempting to work on public sector subcontracts, and receiving timely payment for work performed. In these categories, reports of disparate treatment were 1.87, 2.38 times, and 2.29 times more frequent, respectively.

Table 7.3. Firms Indicating They Had Been Treated Less Favorably Due to Race and/or Gender While Participating in Business Dealings

Business Dealings	African American	Hispanic	Asian	Native American	Minority Total	Non-minority Female	DBE Total	Non-minority Male
Applying for commercial loans	36.5%	23.2%	20.3%	14.3%	29.7%	11.8%	21.9%	3.0%
	(189)	(69)	(79)	(7)	(344)	(262)	(606)	(231)
Applying for surety bonds	17.9%	12.3%	10.5%	16.7%	15.0%	7.5%	11.7%	0.5%
	(134)	(57)	(57)	(6)	(254)	(200)	(454)	(195)
Applying for commercial or professional insurance	18.5%	7.8%	6.9%	20.0%	13.6%	3.8%	9.2%	2.0%
	(222)	(77)	(102)	(10)	(411)	(343)	(754)	(294)
Hiring workers from union hiring halls	8.7%	4.9%	0.0%	14.3%	6.3%	3.7%	5.4%	0.9%
	(104)	(41)	(37)	(7)	(189)	(109)	(298)	(113)
Obtaining price quotes from suppliers or subcontractors	24.5%	19.2%	18.8%	0.0%	21.6%	13.2%	17.8%	2.5%
	(200)	(73)	(80)	(8)	(361)	(302)	(663)	(275)
Working or attempting to obtain work on public sector prime contracts	35.0%	21.2%	30.8%	11.1%	30.9%	17.2%	25.2%	13.5%
	(197)	(66)	(91)	(9)	(363)	(261)	(624)	(223)
Working or attempting to obtain work on public sector subcontracts	39.6%	27.8%	29.3%	10.0%	34.0%	16.3%	26.7%	11.2%
	(202)	(72)	(92)	(10)	(376)	(264)	(640)	(223)
Working or attempting to obtain work on private sector prime contracts	36.8%	19.4%	26.6%	9.1%	30.3%	16.2%	24.2%	5.2%
	(209)	(72)	(94)	(11)	(386)	(297)	(683)	(250)
Working or attempting to obtain work on private sector subcontracts	37.2%	28.4%	26.1%	9.1%	32.2%	14.9%	24.8%	6.0%
	(215)	(74)	(88)	(11)	(388)	(289)	(677)	(248)
Receiving timely payment for work performed	30.6%	32.5%	29.7%	27.3%	30.6%	23.0%	27.0%	11.8%
	(219)	(80)	(111)	(11)	(421)	(378)	(799)	(313)
Functioning without hindrance or harassment on the work site	20.1%	21.4%	18.6%	25.0%	20.1%	14.5%	17.4%	4.1%
	(194)	(70)	(97)	(8)	(369)	(331)	(700)	(292)
Joining or dealing with construction trade associations	16.4%	11.1%	8.6%	12.5%	13.3%	5.7%	9.8%	3.3%
	(134)	(63)	(58)	(8)	(263)	(228)	(491)	(212)
Having to do inappropriate or extra work not required of comparable non-DBEs	26.6%	20.0%	27.2%	25.0%	25.4%	14.7%	20.4%	3.4%
	(184)	(70)	(92)	(8)	(354)	(313)	(667)	(266)
Double standards not required of comparable non-DBEs	24.0%	16.7%	19.0%	22.2%	21.3%	12.9%	17.5%	3.2%
	(204)	(72)	(100)	(9)	(385)	(318)	(703)	(279)
In any one of the business dealings listed above	49.7%	44.0%	47.7%	23.1%	47.5%	34.5%	41.5%	19.8%
	(286)	(91)	(130)	(13)	(520)	(446)	(966)	(354)

Source: NERA mail survey.

Notes: Total number of valid responses in parentheses. Figures in **boldface** type are statistically significantly different from non-DBEs using a conventional two-tailed Fisher's Exact Test and within a 95% or better confidence interval. Figures in **boldface italicized** type are significant within a 90% confidence interval.

Table 7.4 represents the same disparate treatment information as in Table 7.3, but with the frequency percentages replaced by relative rankings. That is, the 14 kinds of disparate treatment are ranked by each group according to the frequency with which disparate treatment was reported, with “1” representing the most frequent and “14” representing the least frequent.¹⁶² The most frequently reported problem overall for DBEs—as opposed to the one with the most relative difference from non-DBEs—was receiving timely payment for work performed. The next five most frequently reported, in descending order of frequency, were working or attempting to work on public sector subcontracts,¹⁶³ working or attempting to work on public sector prime contracts, working or attempting to work on private sector subcontracts,¹⁶⁴ and working or attempting to work on private sector prime contracts.

Some courts and other observers have asserted that findings such as those in Tables 7.3 and 7.4 tell us nothing about discrimination against DBEs since, even though they are current and come directly from the businesses reporting disparate treatment, even though they are restricted to the relevant geographic and product markets, even though they are disaggregated by contracting category and by race and gender, they still do not compare firms of similar size, qualifications, or experience. We have argued elsewhere against such flawed logic (and economics) since size, qualifications, and experience are *precisely* the factors that are adversely impacted by discrimination.¹⁶⁵ Nevertheless, if disparities are still observed even when such “capacity” factors are held constant, the case becomes even more compelling.

The results reported next in Table 7.5 show that even when levels of size, qualifications, and experience are held constant across firms, measures of disparate treatment of DBEs are still large, adverse, and statistically significant.

¹⁶² In the case of ties, not all 14 ranks will be present.

¹⁶³ In these two survey questions, “public sector” refers to public sector entities in general and not the State of Maryland or MDOT specifically.

¹⁶⁴ *Ibid.*

¹⁶⁵ Wainwright and Holt (2010), pp. 65-67; Wainwright (2000), pp. 86-87.

Table 7.4. Firms Indicating They Had Been Treated Less Favorably Due to Race and/or Gender While Participating in Business Dealings (Rankings)

Business Dealings	African American	Hispanic	Asian	Native American	Minority Total	Non-minority Female	DBE Total
Applying for commercial loans	4	4	7	6	6	10	6
Applying for surety bonds	12	11	11	5	11	11	11
Applying for commercial or professional insurance	11	13	13	4	12	13	13
Hiring workers from union hiring halls	14	14	14	6	14	14	14
Obtaining price quotes from suppliers or subs	8	9	9	11	8	8	8
Working or attempting to obtain work on public sector prime contracts	5	6	1	8	3	2	3
Working or attempting to obtain work on public sector subcontracts	1	3	3	9	1	3	2
Working or attempting to obtain work on private sector prime contracts	3	8	5	10	5	4	5
Working or attempting to obtain work on private sector subcontracts	2	2	6	10	2	5	4
Receiving timely payment for work performed	6	1	2	1	4	1	1
Functioning without hindrance or harassment on the work site	10	5	10	2	10	7	10
Joining or dealing with trade associations	13	12	12	7	13	12	12
Having to do inappropriate or extra work not required of comparable non-DBEs	7	7	4	2	7	6	7
Having to meet quality or performance standards not required of comparable non-DBEs	9	10	8	3	9	9	9

Source: See Table 7.1.

In Table 7.5, we report the results from a series of Probit regressions using the mail survey data on disparate treatment.¹⁶⁶ As indicated earlier, the survey questionnaire collected data related to each firm's size, qualifications, and experience. The reported estimates from these models can be interpreted as changes or differences in the probability of disparate treatment conditional on the control variables. The estimates in the table show large differences in disparate treatment probabilities between DBEs and non-DBEs. In column (1) of Table 7.5 (in which the regression model contains only DBE status and contracting category indicators), the estimated coefficient of 0.241 on the DBE variable indicates that the likelihood of experiencing disparate treatment for DBE firms is 24.1 percentage points higher than that for non-DBE firms.¹⁶⁷ This difference is statistically significant. Column (2) of Table 7.5 includes additional explanatory variables to hold constant differences in the characteristics of firms that may vary by race or gender, including the owner's education, the age of the firm, and the size of the firm measured by employment and by sales. Even after controlling for these differences, however, DBE firms remain 22.3 percentage points more likely than non-DBE firms to experience disparate treatment. These differences are statistically significant. Firm size and other "capacity"-type characteristics account for only a small portion of the disparate treatment reported by DBEs in MDOT's market area.

The exercise is repeated in columns (3) and (4). The only difference in these columns from the earlier regressions is that the DBE variable is now separated into two components—one for minority-owned firms and one for nonminority-female owned firms. The results in column (3) indicate that minority-owned firms in MDOT's market area are 31.9 percentage points more likely to experience disparate treatment than non-DBE firms. When controls are added in column (4), this difference falls only slightly to 29.3 percentage points, indicating that controlling for other "capacity"-type factors makes only a limited difference in the incidence of disparate treatment. These differences are statistically significant. The differences for nonminority female-owned firms are similar, showing a 20.1 percentage point difference with only the industry controls and an only slightly smaller 19.4 percentage point difference when the full set of capacity-type controls is added. These differences are statistically significant.

The exercise is repeated a final time in columns (5) and (6) with separate indicators for each type of DBE. The results for nonminority females are nearly identical to those in columns (3) and (4). For African American-owned firms, the differential is 36.1 percentage points in column (5), falling slightly to 34.4 percentage points after the full set of controls is added. These differences are statistically significant. For Hispanic-owned firms, the differential is 26.9 percentage points in column (5), falling just slightly to 24.1 percentage points after the full set of controls is added. These differences are statistically significant. For Asian-owned firms, the differential is 33.3 percentage points in column (5), falling just slightly to 31.6 percentage points after the full set of controls is added. These differences are statistically significant. For Native American-owned firms, the differential is 9.2 percentage points in column (5), falling to -1.8 percentage points

¹⁶⁶ See Chapter IV for a description of Probit regression.

¹⁶⁷ This estimate largely replicates the raw difference in disparate treatment rates between DBE and non-DBE firms reported in the last row of Table 7.3. The raw differential observed there ($41.5\% - 19.8\% = 21.7\%$) differs slightly from the 24.1% differential reported here since the regression specification also controls for industry category.

after the full set of controls is added. The differences for Native Americans, however, are not statistically significant.

Table 7.5. Prevalence of Disparate Treatment Facing DBEs

	(1)	(2)	(3)	(4)	(5)	(6)
DBE	0.241 (8.05)	0.223 (5.82)				
Minority			0.319 (8.95)	0.293 (6.38)		
Nonminority Female			0.201 (5.34)	0.194 (4.13)	0.203 (5.38)	0.197 (4.17)
African American					0.361 (8.64)	0.344 (6.34)
Hispanic					0.269 (4.51)	0.241 (3.24)
Asian					0.333 (6.26)	0.316 (4.60)
Native American					0.092 (0.62)	-0.018 (-0.11)
Owner's Education (3 indicator variables)	No	Yes	No	Yes	No	Yes
Firm Age (4 indicators)	No	Yes	No	Yes	No	Yes
Employment size bracket (6 indicators)	No	Yes	No	Yes	No	Yes
Sales/revenue size bracket (4 indicators)	No	Yes	No	Yes	No	Yes
Industry category (3 indicators)	Yes	Yes	Yes	Yes	Yes	Yes
N	1320.00	897.00	1320.00	897.00	1320.00	897.00
Pseudo R ²	0.05	0.07	0.06	0.07	0.06	0.08
Chi ²	79.47	78.50	95.03	85.23	100.76	91.49
Log likelihood						

Source: See Table 7.1.

Note: Reported estimates are derivatives from Probit models, t-statistics are in parentheses. A t-statistic of 1.96 (1.64) or larger indicates that the result is significant within a 95 (90) percent confidence interval.

Table 7.6. Prevalence of Disparate Treatment Facing DBEs, by Type of Business Dealing

Business Dealings	African American	Hispanic	Asian	Native American	Minority Total	Non-minority Female	DBE Total
Applying for commercial loans	44.1% <i>(5.57)</i>	42.6% <i>(4.19)</i>	32.8% <i>(3.27)</i>	0.0% (0.00)	32.0% <i>(5.24)</i>	19.0% <i>(3.04)</i>	16.9% <i>(4.51)</i>
Applying for surety bonds	37.6% <i>(3.97)</i>	29.3% <i>(2.76)</i>	26.8% <i>(2.37)</i>	0.0% (0.00)	22.6% <i>(3.63)</i>	18.9% <i>(2.87)</i>	9.8% <i>(3.43)</i>
Applying for commercial or professional insurance	18.3% <i>(4.05)</i>	2.8% (0.57)	11.6% <i>(2.09)</i>	27.4% <i>(1.80)</i>	11.5% <i>(3.49)</i>	3.7% (1.21)	5.8% <i>(2.70)</i>
Hiring workers from union hiring halls	1.3% <i>(2.07)</i>	2.0% (1.48)	0.0% (0.00)	0.0% (0.00)	0.6% <i>(1.69)</i>	0.3% (0.76)	0.2% (1.48)
Obtaining price quotes from suppliers or subcontractors	31.8% <i>(4.72)</i>	33.7% <i>(3.84)</i>	38.4% <i>(4.20)</i>	0.0% (0.00)	25.5% <i>(4.96)</i>	18.9% <i>(3.65)</i>	14.2% <i>(4.57)</i>
Working or attempting to obtain work on public sector prime contracts	26.3% <i>(3.97)</i>	18.0% <i>(1.99)</i>	24.3% <i>(2.99)</i>	0.0% (0.00)	20.3% <i>(3.81)</i>	11.1% <i>(1.96)</i>	13.9% <i>(3.26)</i>
Working or attempting to obtain work on public sector subcontracts	42.1% <i>(5.75)</i>	39.9% <i>(4.23)</i>	32.8% <i>(3.72)</i>	0.0% (0.00)	32.0% <i>(5.55)</i>	16.7% <i>(2.67)</i>	20.3% <i>(4.65)</i>
Working or attempting to obtain work on private sector prime contracts	43.9% <i>(6.11)</i>	28.5% <i>(3.05)</i>	39.9% <i>(4.55)</i>	0.0% (0.00)	31.6% <i>(5.70)</i>	19.5% <i>(3.30)</i>	19.2% <i>(4.95)</i>
Working or attempting to obtain work on private sector subcontracts	39.0% <i>(5.60)</i>	39.3% <i>(4.27)</i>	35.5% <i>(4.06)</i>	0.0% (0.00)	30.6% <i>(5.61)</i>	18.8% <i>(3.16)</i>	19.2% <i>(4.88)</i>
Receiving timely payment for work performed	21.6% <i>(3.85)</i>	20.9% <i>(2.76)</i>	18.8% <i>(2.67)</i>	12.1% (0.78)	18.7% <i>(4.14)</i>	14.2% <i>(3.10)</i>	14.2% <i>(4.01)</i>
Functioning without hindrance or harassment on the work site	25.0% <i>(4.41)</i>	18.8% <i>(2.45)</i>	33.3% <i>(4.29)</i>	22.1% <i>(1.69)</i>	20.8% <i>(4.72)</i>	16.5% <i>(3.75)</i>	12.8% <i>(4.54)</i>
Joining or dealing with construction trade associations	15.1% <i>(2.96)</i>	8.1% (1.44)	6.4% (1.04)	25.3% <i>(1.64)</i>	9.9% <i>(2.66)</i>	3.1% (0.88)	5.4% <i>(2.05)</i>
Having to do inappropriate or extra work not required of comparable non-DBEs	36.7% <i>(5.08)</i>	37.3% <i>(3.98)</i>	47.5% <i>(4.96)</i>	32.3% <i>(1.64)</i>	31.2% <i>(5.52)</i>	23.2% <i>(4.19)</i>	17.3% <i>(5.16)</i>
Having to meet quality, inspection, or performance standards not required of comparable non-DBEs	25.1% <i>(4.31)</i>	18.1% <i>(2.35)</i>	31.0% <i>(4.03)</i>	22.9% <i>(1.66)</i>	20.3% <i>(4.53)</i>	14.6% <i>(3.19)</i>	12.5% <i>(4.17)</i>
In any one of the business dealings listed above	34.4% <i>(6.34)</i>	24.1% <i>(3.24)</i>	31.6% <i>(4.60)</i>	-1.8% (-0.11)	29.3% <i>(6.38)</i>	19.4% <i>(4.13)</i>	22.3% <i>(5.82)</i>

Source: See Table 7.1.

Notes: (1) Reported estimates are derivatives from Probit models, t-statistics are in parentheses. A t-statistic of 1.96 (1.64) or larger indicates that the result is significant within a 95 (90) percent confidence interval; (2) Figures in **boldface** type are statistically significantly different from non-DBEs using a conventional two-tailed Fisher's Exact Test and within a 95% or better confidence interval. Figures in **boldface italicized** type are significant within a 90% confidence interval.

The regression models reported in Table 7.5 used as their dependent variable an indicator of whether or not a survey respondent reported having been treated less favorably in *any* of the 14 different types of business dealings described in the first column of Table 7.3. We re-estimated the regression model reported in Column (2) of Table 7.5 separately using as the dependent variable, in turn, each of the 14 types of business dealings and report those results in Table 7.6. As Table 7.6 shows:

- In 14 of 14 categories, the differences for African American-owned firms are large, adverse and statistically significant.
- In 11 of 14 categories, the differences for Hispanic-owned firms are large, adverse and statistically significant.
- In 12 of 14 categories, the differences for Asian-owned firms are large, adverse and statistically significant.
- In 5 of 14 categories, the differences for Native American-owned firms are large, adverse and statistically significant.
- In 14 of 14 categories, the differences for minority-owned firms as a group are large, adverse and statistically significant.
- In 11 of 14 categories, the differences for nonminority female-owned firms as a group are large, adverse and statistically significant.
- In 13 of 14 categories, the differences for minority- and women-owned firms as a group are large, adverse and statistically significant.

4. Impact of Current Business Environment on Ability to Win Contracts

The survey also asked questions about some common features of the business environment to determine which factors were perceived by DBEs as serious impediments to obtaining contracts. As Table 7.7 indicates, substantial percentages of both DBEs and non-DBEs report that certain factors, such as “Late Notice of Bid/Proposal Deadlines,” “Large project sizes,” “Cost of bidding and proposing,” “Obtaining working capital,” “Price of supplies or materials,” and “Bonding requirements” make it harder or impossible for their firms to obtain contracts. Among non-DBEs, for example, 42 percent reported that late notice of bid/proposal deadlines made it harder or impossible for them to win contracts, 32 percent reported that the large project sizes had this effect, 28 percent reported that the cost of bidding or proposing had this effect, 25 percent reported that obtaining working capital had this effect, 25 percent reported that the price of supplies or materials had this effect, and 23 percent reported that bonding requirements had this effect. The figures for DBEs in these six categories, however, at 57 percent, 54 percent, 43 percent, 45 percent, 34 percent, and 44 percent, respectively, are substantially and statistically significantly higher than those for non-DBEs. Indeed, as Table 7.7 shows, DBEs reported statistically significantly more difficulty than non-DBEs on all nine factors about which they were surveyed. The rates at which DBEs reported difficulty with these factors ranged from 130 percent to 230 percent higher than the rates reported by non-DBEs.

Table 7.7. Firms Indicating that Specific Factors in the Business Environment Make It Harder or Impossible to Obtain Contracts—Sample Differences

Business Environment	African American	Hispanic	Asian	Native American	Minority Total	Non-minority Female	DBE Total	Non-DBEs
Bonding Requirements	48.9% (135)	37.5% (56)	46.7% (60)	100.0% (2)	46.2% (253)	41.3% (179)	44.2% (432)	23.3% (159)
Insurance Requirements	27.4% (215)	18.9% (74)	14.6% (89)	28.6% (7)	22.9% (385)	17.5% (263)	20.7% (648)	9.8% (256)
Previous Experience Requirements	38.5% (218)	23.0% (74)	25.0% (100)	16.7% (6)	31.9% (398)	17.7% (288)	25.9% (686)	11.3% (256)
Cost of Bidding or Proposing	53.5% (213)	40.8% (71)	42.7% (96)	60.0% (5)	48.6% (385)	35.2% (264)	43.1% (649)	27.8% (241)
Large Project Sizes	66.0% (194)	48.5% (68)	54.2% (96)	40.0% (5)	59.2% (363)	47.1% (242)	54.4% (605)	32.1% (215)
Price of Supplies or Materials	42.7% (192)	43.1% (65)	23.3% (73)	20.0% (5)	38.2% (335)	29.0% (238)	34.4% (573)	25.0% (228)
Obtaining Working Capital	62.0% (208)	49.2% (65)	38.4% (86)	25.0% (4)	53.7% (363)	31.3% (227)	45.1% (590)	25.4% (205)
Late Notice of Bid/Proposal Deadlines	60.6% (198)	58.1% (62)	57.8% (90)	33.3% (3)	59.2% (353)	52.7% (224)	56.7% (577)	42.0% (212)
Prior Dealings with Public Agency or Private Owner	24.9% (201)	23.7% (59)	18.3% (93)	0.0% (5)	22.6% (358)	11.4% (255)	17.9% (613)	10.0% (241)

Source and Notes: See Table 7.3.

To control for firm and owner characteristics, we used a regression technique known as ordered Probit.¹⁶⁸ Ordered Probit regression is used when the dependent variable is discrete and ordinal (and hence can be ranked). We use ordered Probit to model the ordinal ranking—(1) “helps me,” (2) “has no effect,” (3) “makes it harder,” or (4) “makes it impossible”—of the aspect of procurement under consideration. The firm characteristics used as control variables consist of the age of the firm, the number of employees, the size of revenues, the education level of the primary owner of the firm and the major industry group. To report results from ordered Probit analysis, we use a “+” to indicate that DBEs had more difficulty than non-DBEs with similar firm characteristics, and a “-” to indicate that DBEs had less difficulty than non-DBEs with similar firm characteristics.

¹⁶⁸ For a textbook discussion of ordered Probit, see, for example, Greene (2011).

Table 7.8 reports the sign and statistical significance from the ordered Probit analysis. We find that when observable firm characteristics are controlled for, all nine of the factors we inquired about prove to be greater difficulties for DBEs than for non-DBEs (as indicated by the “+” sign), even when “capacity”-type factors such as employment size, revenue size, years in business, and owner education are held constant. The disparities observed regarding previous experience requirements, the cost of bidding or proposing, large project sizes, and prior dealings with the owner, in particular, were statistically significant with respect to non-DBEs.

Table 7.8. Firms Indicating that Specific Factors in the Business Environment Make It Harder or Impossible for DBEs to Obtain Contracts, Regression Results

Business Environment	DBEs
Bonding Requirements	+*
Insurance Requirements	+*
Previous Experience Requirements	+*
Cost of Bidding or Proposing	+*
Large Project Sizes	+*
Price of Supplies or Materials	+*
Obtaining Working Capital	+*
Late Notice of Bid/Proposal Deadlines	+*
Prior Dealings with Public Agency or Private Owner	+†

Source: See Table 7.1.

Notes: A plus (+) indicates that a group is more likely than non-DBEs to report difficulty with business environment factors. A minus (–) indicates that a group is less likely than non-DBEs to experience difficulty. An asterisk (*) indicates that the disparity is statistically significant within a 95% or better confidence interval. A dagger (†) indicates that the disparity is statistically significant within a 90% or better confidence interval.

5. Solicitation and Use of DBEs on Public and Private Projects Without Affirmative Action Goals

Our second to last survey question asked, “How often do prime contractors who use your firm as a subcontractor on public-sector projects with requirements for minority, women and/or disadvantaged businesses also *hire* your firm on projects (public or private) *without* such goals or requirements?” As Table 7.9 shows, 74 percent of African American-owned firms, 52 percent of Hispanic-owned firms, 62 percent of Asian-owned firms, 70 percent of Native American-owned firms, and 53 percent of nonminority female-owned firms responded that this seldom or never occurs. For minorities as a group the figure was 67 percent and for DBEs as a group the figure was 64 percent.

Table 7.9. Percent of DBEs Indicating that Prime Contractors Who Use Them as Subcontractors on Projects with Goals Seldom or Never Hire Them on Projects without Such Goals

DBE Group	All Industries	Construction	Maintenance	AE-CRS	IT	Services	CSE
African American	74.4% (219)	50.8% (63)		69.6% (23)		86.2% (123)	90.0% (10)
Hispanic	52.2% (69)	45.5% (44)		42.9% (7)		70.6% (17)	100.0% (1)
Asian	61.5% (104)	47.1% (17)		65.6% (32)		63.3% (49)	66.7% (6)
Native American	70.0% (10)	50.0% (2)		50.0% (2)		83.3% (6)	- (0)
Minority Total	67.2% (402)	48.4% (126)		64.1% (64)		79.0% (195)	82.4% (17)
Nonminority Female	52.8% (123)	48.1% (27)		50.0% (16)		56.5% (62)	50.0% (18)
DBE Total	63.8% (525)	48.4% (153)		61.3% (80)		73.5% (257)	65.7% (35)

Source and Note: See Table 7.2.

At least one court has held that the failure of prime contractors to even *solicit* qualified minority- and women-owned firms is a “market failure” and is important evidence in helping to establish a government’s compelling interest in remedying such failures.¹⁶⁹ Among the evidence relied upon for this holding was a NERA survey similar to the current one in which approximately 50 percent of the respondents reported that they were seldom or never solicited for non-goals work.¹⁷⁰

Our final survey question therefore asked “How often do prime contractors who use your firm as a subcontractor on public-sector projects with requirements for minority, women and/or disadvantaged businesses *solicit* your firm on projects (public or private) *without* such goals or requirements?” Responses to this question are tabulated in Table 7.10, which shows the same pattern as in Table 7.9. In Table 7.10, 69 percent of African American-owned firms, 47 percent of Hispanic-owned firms, 57 percent of Asian-owned firms, 82 percent of Native American-owned firms, and 54 percent of nonminority female-owned firms responded that this seldom or never occurs. For minorities as a group the figure was 62 percent and for DBEs as a group the figure was 60 percent. Similar results were observed in each major contracting category as well.

¹⁶⁹ *Builders Association of Greater Chicago v. City of Chicago*, 298 F.Supp. 2d 725, 737 (N.D. Ill. 2003).

¹⁷⁰ *Id.* See also *Concrete Works of Colorado v. City and County of Denver*, 321 F.3d 950 at 987-988.

Table 7.10. Percent of DBEs Indicating that Prime Contractors Who Use Them as Subcontractors on Projects with Goals Seldom or Never *Solicit* Them on Projects without Such Goals

DBE Group	All Industries	Construction	Maintenance	AE-CRS	IT	Services	CSE
African American	68.9% (225)	47.8% (67)		63.6% (22)		79.4% (126)	90.0% (10)
Hispanic	47.1% (68)	46.7% (45)		16.7% (6)		62.5% (16)	0.0% (1)
Asian	56.5% (108)	36.8% (19)		62.5% (32)		58.0% (50)	71.4% (7)
Native American	81.8% (11)	100.0% (2)		50.0% (2)		85.7% (7)	- (0)
Minority Total	62.4% (412)	46.6% (133)		58.1% (62)		72.9% (199)	77.8% (18)
Nonminority Female	53.7% (134)	54.8% (31)		47.4% (19)		53.8% (65)	57.9% (19)
DBE Total	60.3% (546)	48.2% (164)		55.6% (81)		68.2% (264)	67.6% (37)

Source and Note: See Table 7.2.

6. Impact of Survey Non-Response

Since the mail survey was voluntary, it is important to account for the fact that many recipients did not respond. As a check on the usefulness of the information obtained from our mail survey respondents, we conducted telephone surveys of 11,000 randomly selected DBEs and non-DBEs that did not respond to our mail survey. The purpose of this “non-response” survey is to test whether their answers to key survey questions were different from the answers of respondents in ways that would impact the relevance of the information obtained from our mail survey respondents.

We obtained complete responses from 2,261 firms, for a raw response rate of 21 percent. After removing duplicate records, records where the firm was no longer in business, and records where the telephone number was disconnected or the listing was otherwise unreachable, the effective response rate increased to 33 percent.

For the non-respondent survey, we selected three questions from the mail survey to pose to non-respondents. The first question asked whether large project sizes helped or harmed the firm’s ability to obtain public or private sector contracts. The second question asked whether and how frequently the firm had experienced discrimination in attempting to apply for commercial loans. The final question asked whether and how frequently the firm had experienced discrimination in working or attempting to work on private sector prime contracts.

Not surprisingly, one difference that we observed between respondents and non-respondents was that respondents had a greater general interest in the questions being asked. Among survey respondents, only 31.0 percent indicated that the question about large project sizes was “not applicable.” Among non-respondents, the figure was 46.2 percent. Among survey respondents, 43.3 percent indicated that discrimination in applying for commercial loans never occurred, compared to 84.0 percent among non-respondents. Among survey respondents, 42.0 percent indicated that discrimination in working or attempting to work on private sector prime contracts never occurred, compared to 82.5 percent among non-respondents. This phenomenon was apparent regardless of whether the firm was minority-owned, women-owned, or nonminority male-owned.

Among those firms to which the question was applicable, 31.2 percent of minority-owned firms that did not respond to the mail survey indicated that large project sizes made it harder or impossible for them to obtain contract awards. Among those that did respond to the survey, the figure was 59.2 percent. This difference is statistically significant. Among female-owned firms that did not respond to the mail survey, 22.8 percent indicated that large project sizes made it harder or impossible for them to obtain contract awards. Among those that did respond to the survey, the figure was 50.4 percent. This difference is statistically significant.¹⁷¹ Among nonminority male-owned firms that did not respond to the mail survey, 12.4 percent indicated that large project sizes made it harder or impossible for them to obtain contract awards. Among

¹⁷¹ The percentages reported in this section may differ slightly from comparable figures reported elsewhere in Chapter VII, since minorities of unknown race or ethnicity were excluded from the tallies in the mail survey.

those that did respond to the survey, the figure was 32.1 percent. This difference is also statistically significant.

These results demonstrate two key findings. First, reports that large project sizes make it harder or impossible for firms to obtain contracts are greater among mail survey respondents than among non-respondents, regardless of DBE status. Second, substantially more DBEs than non-DBEs report that large project sizes make it harder or impossible for them to obtain contracts, regardless of whether they responded to the mail survey or not. Moreover, the ratio of DBEs to non-DBEs reporting difficulty in this regard is actually greater among non-respondents, than among respondents, implying that the estimate of adverse disparity for DBE firms with regard to large project sizes that was reported from the mail survey (*See* Tables 7.7 and 7.8) may be somewhat understated relative to the universe of firms as a whole.

Among those firms to which the question was applicable, 10.4 percent of minority-owned firms that did not respond to the mail survey indicated that they had experienced one or more instances of discrimination during the previous five years in applying for commercial loans. Among those that did respond to the survey, the figure was 29.7 percent. This difference is statistically significant. For female-owned firms, 5.4 percent of those that did not respond to the mail survey indicated that they had experienced one or more instances of discrimination during the previous five years in applying for commercial loans. Among those that did respond to the survey, the figure was 16.8 percent. This difference is statistically significant. Among nonminority male-owned firms that did not respond to the mail survey, 4.2 percent indicated that they had experienced one or more instances of discrimination during the previous five years in applying for commercial loans. Among those that did respond to the survey, the figure was 3.0 percent. This difference is not statistically significant.

Once again we see that substantially more DBEs than non-DBEs report experiencing discrimination in applying for commercial loans during the previous five years, regardless of whether they responded to the mail survey or not. The ratio of DBEs to non-DBEs reporting discrimination is greater among respondents than non-respondents, indicating that the estimate of adverse disparity for DBE firms with regard to discrimination in applying for commercial loans reported from the mail survey (*See* Tables 7.3, 7.4 and 7.6) may be somewhat larger than in the universe of firms as a whole.

Among those firms to which the question was applicable, 9.7 percent of minority-owned firms that did not respond to the mail survey indicated that they had experienced one or more instances of discrimination during the previous five years in working or attempting to work on private sector prime contracts. Among those that did respond to the survey, the figure was 30.3 percent. For female-owned firms, 7.1 percent of those that did not respond to the mail survey indicated that they had experienced one or more instances of discrimination during the previous five years in working or attempting to work on private sector prime contracts. Among those that did respond to the survey, the figure was 22.5 percent. Both of these differences are statistically significant. Among nonminority male-owned firms that did not respond to the mail survey, 5.0 percent indicated that they had experienced one or more instances of discrimination during the previous five years in working or attempting to work on private sector prime contracts. Among those that did respond to the survey, the figure was 5.2 percent. This difference is not statistically significant.

We see from these results that reports of discrimination in working or attempting to work on private sector prime contracts are greater among mail survey respondents than among non-respondents, regardless of DBE status, although the difference with respect to non-DBEs in this instance is not statistically significant. As observed with the other questions, more DBEs than non-DBEs reported experiencing discrimination in working or attempting to work on private sector prime contracts, regardless of whether they responded to the mail survey or not. However, the ratio of DBEs to non-DBEs reporting this type of discrimination is somewhat larger among respondents than non-respondents, indicating that the estimate of adverse disparity for DBE firms with regard to discrimination in working or attempting to work on private sector prime contracts shown above (*See* Tables 7.3, 7.4 and 7.6) may be somewhat larger than in the universe of firms as a whole.

In conclusion, the results of our non-respondent survey indicate that both DBEs and non-DBEs are more likely to have responded to the mail survey if they had experienced the difficulties identified in the mail survey and also that DBEs reported greater difficulties than non-DBEs whether or not they responded to the mail survey. For all three of the questions we examined, this means the actual disparities facing DBEs in MDOT's market area are not dissimilar to those that we estimated based on our mail survey results. For all three questions examined, the basic qualitative finding of more problems and greater disparities being observed among DBEs than among non-DBEs is unchanged.

C. Business Owner Interviews

To explore additional anecdotal evidence of possible discrimination against minorities and women (collectively, DBEs) in MDOT's market area, we conducted 30 focus group sessions, including a stakeholder meeting with minority- and women-owned business leaders. We also conducted four group interviews with MDOT and other State staff including senior procurement officers, MBE liaisons and Governor's Office of Small, Minority and Women Business Affairs personnel. The focus group sessions were held in every region of the State: Western, Eastern, Central and Southern Maryland and included minority and nonminority firms doing business with MDOT. Combined, we met with 183 business owners or representatives, and received written comments as well, from a cross section of the industries from which the State, including MDOT, procures goods and services. Firms ranged in size from large national businesses to much smaller and newer firms in all major industry categories (*i.e.*, construction, A/E-CRS, maintenance, IT, services and CSE). Owners' backgrounds included individuals with decades of experience in their fields as well as entrepreneurs at the start of their business careers. We sought to explore their experiences in seeking and performing public and private sector contracting opportunities, and with the State's and MDOT's contracting and purchasing policies.

This effort gathered individual perspectives to augment the statistical information in the study, including that from the business experience surveys. In general, interviewees' individual experiences echoed the responses to the business experience surveys.

The following are summaries of the issues discussed. Quotations are indented, and are intended to represent the views expressed by several participants.

1. Perceptions of Competence and Qualifications and Higher Performance Standards

Many firms, both minority and nonminority, indicated that there had been significant progress in providing opportunities for minorities and women in MDOT's public and private sector contracting activities. There was also a belief that many barriers remained in the State's and MDOT's contracting processes. Although not quantifiable, one theme in the interviews was the continuing influence of subtle and sometimes not so subtle negative perceptions and stereotypes. These stereotypes of a lack of competence and qualifications infect all aspects of M/WBEs' and DBEs' attempts to obtain contracts and to be treated equally in performing contract work. Minorities and women repeatedly discussed their struggles with negative perceptions and attitudes of their capabilities in the business world.

So, I mean I'm sure you all are doing the same thing, go in, shake hands, introduce yourself to the people, show that you have this experience, you have great experience in the private sector...[but M/WBE or DBE] equals "not qualified"....

The people who are doing the contracts, they don't outwardly express [discrimination] like they would if we were interacting on a job site or at a bar or something like that. But there is—how can you prove that? How can you say that when a person—you know, I've heard things said about contracts after the contract's out. Not directly from the person, but a White friend of mine told me what another [non-DBE] said after I left the room [He said], "I'm going to ask him a question, I'm going to see if he even knows how to respond." Or something like that. I wonder what he was saying as if my intelligence level would not have warranted the proper response to the question. Just some things like that.

We found access, especially in heavy civil jobs, to supply fuel, simple and short. I would say that it's not rocket science. I say that because, trust me, you are...saying that you are a PE, a professional engineer certified, but you are Black. They are looking at you and saying, "Can he really do the work?"

[Y]ou tell a gentleman, say, "Look, I'm going to give you 4 percent less than what the manufacturer is charging you or your rep." ...And they say, "I went with loyalty." Well that's code for "I am going with the gentleman that I've been working with all along that's most likely a Caucasian male."

There is a reputation that it's hard to find a good company, a good engineer who is [M/WBE or DBE], qualified, that we get the jobs because of this requirement, it's not because we are worthy of it.

I do all environmental landscaping. I have a Masters in natural resource management, my B.S. and Masters in natural resources and yet, I'm still constantly—I get all the certifications I can.... I'm a tree expert, I'm a fertilizer expert...but it's still not fair.... I should have to do that simply because I want to [so] I'm not having to constantly prove myself as a female in the construction industry.

There are meetings that I go to and I put on a hardhat and steel toed boots just so people [know] because they're already going to discount me because I am a woman....

I go up to this fella who was with one of the big national companies and I introduce myself. I told him that I do high performance coating...And he said to me... "Well you know, I really don't have the time to answer the phone if you have questions about the drawings."

When I [a female construction business owner] go on a construction site and one of my [male] employees is [there]...we're 60 percent women, my firm is. The questions, to this day, if someone doesn't know us, they walk up to the two of us and they ask [the man the technical questions]....They ask [the man]. So that happens all the time.

Several majority prime contractors expressed their negative views of the competency of minority contractors as follows:

I've seen firms surviving because of it. Yeah, I guess some of them have flourished, but most of them—I shouldn't say it, but a lot of them wouldn't exist without that crutch...In other words, if they didn't have that certification, they couldn't even exist in the business world.

[T]here's also a lot of firms out there that they're not growing. They're not learning to market themselves. They're not learning to do what it takes to be a standalone business. They are living off the program.

We're forced to deal with those invoicing issues where they can't prepare a proper invoice. We're forced to deal with quality issues where they turn in substandard work, and we have to fix it for them at our cost. We're forced to deal with schedule issues when they can't deliver or we call them up and say, "We have some work for you," and they say, "We're too busy." We have to deal with, okay, where do we get that [M/WBE or DBE] participation that we need for this task?

This view is not unique to the prime contracting community. Some M/WBEs and DBEs expressed the view that it is also reflected in the decision-making process of some State agency employees who are reluctant to award prime contracts to M/WBEs and DBEs.

They [State personnel] depend on the primes to manage and be accountable for the work of the [M/WBEs and DBEs]. And I think they are scared about turning prime responsibilities over to a [M/WBE or DBE] firm because of their capability to deliver.

M/WBE and DBE firms also complained that they are held to higher standards than their nonminority counterparts.

I've been on jobs where I walked through and I look at [the] work, and I say, "Wow, they accepted this?" Meaning that we know, when we work on it, it's never accepted like that. You got to make it better. And we're talking, [private agencies like ---] and [public agencies like ---]. And it's like they actually accepted this work by this guy, and we know if we were doing that work, we would've had to have a higher standard.

Where we've seen situations where a majority contractor or a White firm would do the same thing, and a lot of times what happens, it's an accident. With a minority firm, it happens, it happened because you didn't manage it properly, you didn't look far enough ahead, you didn't anticipate.

And as a woman in construction, you have to have a thicker skin and be able to deal with this, and you have to know...your stuff 200 percent better than whoever any other person. Like, you just have to know your job, you have to know everything, because they're always going to test you.

M/WBE and DBE firms also complained that they were often paid less for the same work than the nonminority counterparts.

I remember the initial conversation was like, "You have to reduce that, because you're new, and we're trying to help get you in, which, you know, the industry is dominated by, you know, others. ...but you can't charge what they charge. I was selected to sit on the interagency rates committee [and] had the privilege to see everybody's rates and to see the minority vendor's rates are down here and everybody else's is up here, and we're providing some of the same services.

A significant number of M/WBE and DBE firms have the perception that the nonminority contracting community continues to engage in discrimination that is more subtle than blatant.

But as far as racism, we deal with that, like he said, it's not blatant now as it been years ago, but it's difficult.

I'm 100 percent in agreement that racism and discrimination is alive and well in just about every industry. It's gotten to be extremely subtle in how it's executed these days, and so if you are not savvy enough to pick up the nuances that you're hearing, the code words, the code phrases that are being used, then you're going to miss it, and you might feel it and not be able to put your finger on it that it is actually discrimination...but you know that it is.

My business card had my picture on it, and so someone said to me, "Oh, whatever you do, don't put your picture on your card." And I said, "Why?" ...They said, "Because you'll never get hired because you're Black."

On a job, the guy didn't like our [Black] driver, a four-year job. He was trying to explain to the driver that it will be over in four months.... We actually hired a White guy.... We sent him there. The problems totally disappeared. Where have you been? That was what the supervisor said.

We do work through a prime for [one MDOT modal]. We've done other projects, that we were just ignored on and their DBE requirements on it.

Although discrimination is considered to be subtle, M/WBE and DBE firms reported that they continue to experience some forms of blatant discrimination. Some owners reported that nonminority prime contractors intentionally undermine the performance of M/WBE and DBE firms on public contracts.

I developed and earned the trust of the people in positions of authority. But I still have employees who work for those clients and who have literally tried to sabotage my work so that I can get out of there so they can get back to business as usual.

I had a gentleman reach out to me. He was a sub...And what he did was he sent me a lengthy email about how they're using the N word towards him and his staff, and he had already reached out to the director of [public agency] and expressed his concerns to them

and how they were treating him and his staff and they really didn't give him too much of any assistance.

I'm senior management on most projects I'm on. I'm like the top... When they come in, if me or you are standing here, you could be my assistant, they will go to you first. Literally, they would walk up to you and ask you.... I've had come into—I'm at a trailer in a file cabinet getting some files out when the office person, girl wasn't there, they're like. "Yeah, hon, can you tell... I'm here to see him and can you get me a cup of coffee?"

I'm just surprised to hear the same things that I heard about 15 years ago I'm hearing today, and it gives me some concern... sounds like deja vu to me right now.

The experiences of some women-owned firms illustrate the impact of the glass ceiling and negative perceptions on their efforts to develop and grow professionally in the industry.

I have gone on interviews where I am in ...the running, three people, final cut. And I have spoken to this person about the job and they were questioning me about my skill, my everything, why I bid the job. I'm looking at this person as, "What do you mean why, I bid this job?... I'm in the business of making money... And he said to me, "Well, you know, women just simply shouldn't be here."

She started this company, like I said, in 1996, and she started it because her ideas weren't taken seriously in the engineering circles of the time. Her ideas about doing environmental compliance and environmental mitigation work in the face of engineering often resulted in being second thought or afterthought in the whole process... engineers in her firms were offered training, were offered an ability to go for ...certified engineer training... She, as an environmental scientist, had to pay for it herself... had to do self-improvement on her own nickel. And finally, as a woman, she was often the brunt of sexual innuendos... Those three things caused her to... put her shingle out... But those reasons, many of them still exist today. And you go into a ...design meeting of engineer firms, and you're going to see a lot of men sitting around the table and one or two women... So there is a disparity.

Several nonminority owners articulated a contrary position that the issue of race and gender should not be considered in the procurement process and that discrimination was no longer an issue.

First of all, do I think there is any discrimination? Is there some out there? Yes. Is it prevalent? I don't think so.

But I don't think it's race as it once was.

We've got some real issues and we have some real perception issues.... I know what the other side says. I don't share their opinion.... Ninety percent of what is going on in business has nothing to do with race or gender; it has to do with the color green, to be honest with you.

2. Workplace/Jobsite Harassment

Although less overt, there was little disagreement that racism and gender discrimination continue to persist in public and private sector contracting.

I actually sent one of my employees...a young lady...and she cried the whole way back...And I promised her I'd never send her back again.

I mean they discriminate not just in construction but in all facets of life. Whatever industry you're in, you're going to have discrimination if you're African American, Hispanic, especially in an industry which is...male dominated.

3. Payment

There was uniform agreement across ethnic and gender groups that one of the most important issues was payment, by both the government and the prime contractor. [M/WBE and DBE] firms considered delays in payment an issue that created strains in the prime-subcontractor relationship.

How do I know it's animosity? Because when I'm sitting with a prime contractor who knows he has to pay me in 30 days and is trying to wiggle out of that and structure 45, 50, 60 day payment terms and I literally have to have a knockdown, drag out, and kind of school him on the situation, it creates animosity.

Nonminority construction firms reported that certain agencies in Maryland had significant delays in processing payments.

I think recently...everyone experienced delay in pay from [one MDOT modal]...and I think it has to do with the changes in the organizations, a lot personnel change, shortage...We have noticed it's really causing some cash flow problems. Some of the invoices...routinely, six to eight months. We have invoices from [seven months ago] we haven't got paid, quite a few of them.

[O]nce you're in and you're working for them, payment's a problem, I mean 180 to 200-day DSO, day sales outstanding, is common.

It takes a year to get your final payment...I have jobs that are two years old that I've not gotten final payment.

M/WBE and DBE firms also considered payment an issue and were particularly sensitive to the negative impact delays in payment have upon their ability to succeed.

I'm talking about I under-billed, so I would have been cheating myself out of two pennies because that's the way my software extended out the decimal points and it came back two pennies shorter than the way they did it, which was using two decimal points and mine took it out to four...but they kicked it back for two pennies... Started all over again.

[I]t makes it hard to grow to do more State work. You literally have to become financially capable as a tiny company first. ... It's also something that the primes don't get.

With the State, you know you're going to get paid, it's just a question of when, and what is that money worth...." Every day that you don't get paid in that 30 days, that dollar is depreciating. And by the time you get it, it's probably only worth two thirds of what you actually had because you[ve] been fronting it so long.

Some M/WBE and DBE companies also expressed frustration in dealing with the prime contractors and the State on the handling of their payment issues.

So we had a contract where we had to move money. I sent a reallocation request to the prime who proceeded to just not do anything with it for three months. So, I couldn't bill for four months. Finally, after I bugged him repeatedly, nicely, because I didn't want to get my prime upset, he finally said, "Oh, my mistake. That was approved...two and half months ago."

My primary issue with getting paid is that as a subcontractor working for a State agency through a general contractor or a prime, when they don't pay you although you've got to guarantee you are paying all your subs. The State agencies don't assist because you don't have a contract with them.

You might be told particularly why there's a delay and sometimes they're legit. Sometimes the State may be holding up the money. It may be a short fall with the State or may be something going on with the government where they haven't gotten paid so they're not able to pay the sub. But the sub needs to be paid. When you take on as a prime, you take that responsibility on and I found that a real challenge.

This is not to imply or suggest that all M/WBEs' and DBEs' experiences with the State on payment issues are negative.

[B]ut if you go through the MBE office, they will advocate for you to get paid and, in fact, to the point where my prime wasn't getting paid and because I told them I was making the call because they haven't gotten paid either. So I called and they got all of us paid. But every agency doesn't have that. This was through [one MDOT modal].

4. Exclusion from Industry Networks

The perspective of many M/WBE and DBE firms was that the close-knit nature of the construction industry intentionally or unintentionally contributes to the exclusion of minority firms from informal networks.

I still have faith that sooner or later I will get in. I'm in a totally different field with construction, not based upon color, it is still the good old boy club and I don't fit. And just a note, I belong to some very big professional organizations for construction. I have been approached to run payroll through my company so that the person can get the bid. I refused.

I've worked for a lot of different counties like for consultants and I've seen the different agencies throughout the State.... And honestly, to me [the good old boy network]...it's alive and well.

In construction it's about the team. Everybody has a team. And they don't want to break that team. They're forced to break it with the [MBE and DBE] laws. They're forced to break it. But if they don't have to do it, they don't...if they don't have to use the women, they won't. And the same thing, they don't have to use the minority, they don't.

We've run into the good old boy network, but it sort of is in reverse where the government employees now working with the prime contractors or subcontractors and they have previous relationships with the government employees, and they're the ones that are getting awarded the contracts because of their past history.

Master concessionaires come with their pre-existing relationships. That's their pool that they go to first.

[T]hese primes out here already know who they're using. It doesn't matter what your number is. When it comes in, it doesn't matter...they already have proven and established relationships with their subs that they're using.

But we closed it down in Baltimore because...there came a point where we just didn't have the relationships necessary to get work. We felt that we did not have those relationships because we are African American....

We see a lot of opportunity out there. A lot of it is relationship based.

In an effort to avoid the negative impact of the "good old boy network" on the M/WBEs and DBEs ability to conduct business, some firms have hired nonminority employees to interact with the State.

So we've been women owned for almost 15 years now...We saw a lot of our State business go away...I asked one of my senior salesmen if they would start developing a relationship with three of our top suppliers...And I will tell you, in those, in just within about a year, all of our support turned back around. They related better to him than they related to me. And to this day, still, one of our suppliers can only deal with my White salesman.

I've actually gone to do walkthroughs and stuff like that, and obviously it [does] exist, because there's women owned businesses... showing up with two guys. And we've been there where we've been doing the walkthrough and...it's like the good old boys club.

It got so bad, my margins were hit so hard, I went ahead and hired a middle aged White man to be president of my company so I could get a seat at the table. And guess what? My margins went up 6 percent last year as a result of doing that. We shouldn't have to do that.

Now, here is what we've done in a couple different situations. We've actually had some non-minorities go to the table for us so that we were not there, and we got much better response in that situation [than] when it was just us presenting ourselves in the room.

I actually hired a Caucasian guy on purpose. Sat down and explained to him what I wanted to do. I said, "Look, I'm going to give you the same call list. I want you to call all of these folks and introduce the company, ask them can we meet with them." Every one of them on the list invited him to meet with the buyer.

5. Applying for Commercial Loans

Many M/WBE and DBE business owners stated that they found it difficult to obtain working capital. While perhaps not the direct result of discrimination by the lender, the exclusion of minorities from construction and other industries hampers their access to family wealth and networks that support growing businesses, making access to commercial credit all the more critical.

Several M/WBEs and DBEs commented on the difficulty of getting financing with commercial banks.

Getting a line of credit that covers that kind of cash when you're outstanding and you've got a number of employees is a huge challenge.

We wanted to get financing. We went to --- [bank] and --- [bank]. We had our accounts there. They said bring your account to us, we will take care of you and get you the loans. We asked for \$5,000 loan one time, we got denied.

I went into a local bank and I was denied and I tried different [banks], with the relationship building and everybody was denying me. I finally went to another local bank and they looked at my credit. I had a house, I had good credit, my score was over 700, but it didn't have the history...so they wouldn't give me a loan. I had had it. I sat in the bank and I said, "This is bull, because I am a woman" and I usually don't say that, but I'd had it. I said, "Because I'm a woman business owner, you're not giving me a loan. I am not leaving here until you do."

Some of the primes say, "You can borrow from me." If I were to get it from a bank, it might be 6 percent. Borrowing from them, it's 9 or 10 percent. And then if you look at the P&L, you don't make any profit if you're on a seven-year lease until the last year.

I can't get money from a bank. I have to self-finance. I started this with a dollar, literally. I mean I had \$1.50.

I had to secure my personal home which is how I have been funding everything with an equity loan from my real estate.

However, we went to the African-American newspaper, had a big meeting there, and this organization said, "Okay, let's hear your story. We won't look at what your revenue is. Tell me what your story is, where you're going to go. If it makes sense to us, we'll give you the loan." So we had to go in front of them and pitch our speech to them and it worked and they got us the loan. But it was a little different criteria. It was not straight "let me see your numbers." They wanted to know, "Do you have a vision to go to a certain area? Are you going to make it?" And they took a chance on us.

Access to capital in highway construction is especially important, and the lack of capital is a barrier because the field is relatively capital intensive.

At least in highway construction it really is a capital intensive program...I've got 50 trucks, I probably got 150 pieces of equipment. That's a lot of capital.... [A] lot of these companies that I compete against [are] old companies like mine. They are second and third and fourth generation. [There are] very few first generation contractors in this business.

[T]he nuclear gauge and that's what you use to measure the density and moisture in asphalt and different materials....It is a unique challenge because it can be thousands of dollars just to have the license for that equipment because it has nuclear—it has radiation in it.

6. Applying for Surety Bonds

Many firms reported difficulty obtaining surety bonds. The underwriting standards were so strict and required that the firm post so much cash or have sufficient assets to secure the bond that they could not qualify. They saw bonding as a barrier to growing and taking advantage of opportunities.

And now, a lot of prime contractors, small contractors, they got the capacity...but the issue is bonding.

I ran into problems with getting adequate bonding. Normally, in the course when you bid on a contract, they require you to have a minimum amount of bonding in place and I found that...I couldn't afford it....

So when the contract came up for rebid, what they did was they said, "You got to bid on the contract." I said, "Okay, I'll bid the contract."...what they came up with...this last bid session? You need a \$5 million bond in order for you to come down there and work at the stadium...So I couldn't do it.

I guess I should say it's a big challenge...the bonding issue, I think, is a big deal for [M/WBE and DBE] companies. Surety is based on financial strength, and the normal surety companies aren't going to look seriously at a lot of small companies.

We've had people practically signing their houses away to get bonded, because we don't have the past work experience, but you can't get the experience unless you get the job, but they won't bond you unless you had a job that was \$1 million.

Why do I, as a small business owner—again, I'm not talking about \$10 million dollars, I'm talking about a couple thousand dollars or less or whatever, why do I have to kick out so much money for a bond for a contract that I might not get or I won't know if I get for 6 months to 12 months later?

Some minority firms stated that although difficult they were able to obtain bonding for their construction projects.

I have a good relationship with [surety agency], but they come out once or twice a year and we go through things, and I do have the bonding. If I am going to bid a big job, a really big job, I call them first and talk about it. But I'm afraid to say it, but I haven't had too much of a problem getting bonding.

Some nonminority firms stated that it is difficult to find M/WBE and DBE subcontractors with bonding or do not require bonding at all.

What we've done, because most of them can't get bonding, most of the [M/WBE and DBE] subs that we use can't get bonding, we kind of just roll the dice with them. One, we don't have giant contracts with them. If a contract gets over a couple hundred thousand and I don't know the sub, I ask him for bonding, or if I am nervous about him.

We typically don't, because the size of our tasks aren't big enough that I'm comfortable with the risk that you know, I'm not doing 420 million jobs at the airport, you know, we're doing smaller jobs there, so I'll take that risk and haven't been burned.

7. Insurance

Several minority- and nonminority-owned firms were concerned about the insurance requirements and the high costs, particularly for professional liability insurance.

I've notice[d] in Maryland; I believe in the last couple of years...the tendency to raise professional liability [insurance] limits in contracts that we are involved in. ...If you are asking \$5 million worth of special liability insurance on a \$2 million fee, it's disproportionate. What I am just saying is...I understand why you want professional liability insurance, and I agree with it...but the amount of insurance should be commensurate with the amount of work that you've done, not some figure that somebody came up with.

One of the unique challenges sometimes that small businesses face is getting professional liability insurance.

Well...the cost to do business with the State...I'm paying a crap load of money for insurance, and I haven't even got a bid yet, it's for the professional liability.

8. Obtaining Work on Public Sector Projects

a. Prime Contracts

Most M/WBE and DBE firms expressed a desire to grow their firms and move from subcontractor to prime on public sector contracts.

[I] want to be a prime. But I also want to be able to handle that. If you go out and fall on your face that's it. Nobody wants to do that. But we certainly want the opportunity to do that. Part of it should be the requirement that we are measured by what we do and get more as a result of that.

I absolutely would love to be a prime, yes...I don't mind expanding or growing a bit.

We are 18 years old in May and we have been prime on everything we've done except maybe two or three contracts and those were for reasons of political jockeying and strategy to maybe get into something we hadn't done before so we could get that past performance, so we could then do it in the future. But, it's a huge challenge, as we all know, being entrepreneurs.

My issues are I just wish that there were better ways that I can become prime...in terms of development of staff and more long-term contracts, in terms of really becoming a bigger organization.

We don't want to be subcontractors for our entire career, but because [there are] no teeth in this program, and you're only looking at percentages and percentages for each contract.

Several minority and female business owners agreed that the DBE Program opened doors and created opportunities for firms.

We have survived in business because of the DBE program.

Maryland has actually the most generous DBE program in the entire country. The DBE percent is 25 to 30 percent, That's unheard of. You have worked for [Virginia DOT]. It's what 5 to 10 percent.

I mean, if it wasn't for MDOT, I wouldn't be working. It's just plain and simple as that.

M/WBE and DBE firms explained that nonminority contractor violations and complaints about the program often go unreported because of fear of retaliation.

To file a complaint, no. But has it happened, yes, on all the others. But to file a complaint, to me would be kind of putting up a red flag...Basically you'll never work again.

I went up to one of the buyers who I've dealt with in the past, and I said, "Do you have anything coming up?" She said, "Not for you." That was her answer to me because she knew that I would complain about the quality of the merchandise that she purchases.

I ...complained about an inspector yelling and screaming at me on a jobsite. I told the DBE officer this...We complained, it was a retaliation after we complained that we didn't get paid and they had been paid. It was clear discrimination and the State DBE officer had no idea what to do....

Several DBEs commented that delays in the administration of MDOT contracts was problematic.

It doesn't take [Virginia] DOT, [Delaware] DOT or Penn DOT or South Carolina DOT two and half years to award a contract. It's absolutely ridiculous.

b. Subcontracts

Although M/WBEs and DBEs reported that it is easier to obtain subcontracts than prime contracts on public projects, the firm also expressed frustration with their prime-subcontractor relationships and the business practices of the primes.

So, you have to diversify into the public sector as well, but it's very time consuming to be in the government sector. I mean you you're going to have to have 50 people just to do the paperwork. It's crazy. So, it's like a tail chasing situation, if you will. ...We are looking to other avenues...I just don't want to struggle any more paying the fees that I pay to keep my minority business and not win anything.

What I have found is smaller primes, whether it be another DBE firm or just a smaller business, or even medium sized firms, they have been very good at giving tasks, working collaboratively, and moving forward. But with the mega-firms now, the big conglomerates, that has not been my experience...I found that the bigger A&E firms, they will only do the right thing if told to do the right thing.

M/WBE and DBE firms uniformly complained that the minority firms are not solicited in good faith or not used as listed in the contractor's schedule of subcontractors.

I get a lot of requests for me to bid on proposal...It seems to me that a lot of these bigger companies when they are sending out these RFPs and they are requesting for your bid, they are not really looking at who the DBE companies are, they are just looking for a DBE company because they have to check off a checkbox...

[T]hey send you a file with 700 pages and you only need two pages, but they send a file with 700, your computer takes a while to download everything. So, it's very difficult.

[Two of the] biggest bus companies in the United States...used our name on contracts for the State of Maryland. We were not aware of this. But because I attend a lot of events, somebody...said, "Congratulations, you have a contract." I said, "With who?" ...Both companies for the next month were busy trying to get rid of us. ...To the credit of [MDOT modal], they told them that you guys must be speaking Japanese or something. ... When you have a contract [in place with the minority-owned firm], come and give us a copy and then [you can] start. Wow, [the bus companies] couldn't believe it.

[T]he majority owned firms will do whatever they can to not employ the [M/WBE or DBE] contractor...I have very extensive conversations with them, with my larger point being I will not tolerate being looked at as inconvenience or that you are doing me a favor.

I've had an experience...where the contractor bid it, put our name in, and what we were told was that the State did a random compliance check and came across the document that had our name as being a part of the award and they alerted us to the fact that we were on that award.... they ended up buying the product from another competitor....

There are times when the prime will use us and our expertise and our past performance to win the contract, and once the contract is won, many times, we're not part of that or we don't get the dollars we were initially promised.

But the [letters of intent] don't get enforced... They always come back with, can you do it for less? Well, I already signed a letter of intent. Where's the number on the letter of intent? And they tell us, don't fill in the number, we'll fill that in later. This is my number, why wouldn't I fill it in now?

M/WBE and DBE firms uniformly complained that the nonminority prime contractors' efforts to include such firms were pro forma and that their efforts were not designed to achieve the participation goals.

They call you on the phone like the day of and I'll tell them, "Don't ask me for a waiver because I am going to write a letter or an email to the MBE office that you have called me up an hour before the bid."

Same thing as I keep saying, two or three days before the bid is due. So I called the office...and said, "listen I would really like to bid on this but I need more than three

days....” And the women on the phone said, “Don’t worry about it, we’ve already picked a person. We just need to send that out as part of the requirements.”

I just got a gentleman for my company now who just called me and wanted me to bid on painting at ---. He sent me the request, but would not send me the access to get into the files. So for two weeks I called the office, I sent him emails, I tried to get in touch with him. So he finally calls me and says, “Sorry, I was away for two weeks. Here I can give you the access now, but it’s due tomorrow.”

The problem is, they don’t give us the chance to bid in a timely fashion. If a prime contractor says, “I really want to bid on this,” they should start that day looking for us, not wait.

Some DBE firms also complained that the type of work subcontracted by nonminority primes in professional services was not substantive and calculated only to reach their participation toward the goal.

The engineering firms don’t particularly want to give away their drawings. They keep that close to their chest.... They will ask minority businesses to do certain tasks that are less favorable, perhaps landscape, simple things....

I mean, some of the projects I’ve done, it’s like, I can’t believe I’m a PE and this is what you want me to do—I’m essentially a secretary—so that I can have this opportunity.

They don’t want to give away their core work.

I had [one of our] senior environmental scientist[s] go on site visits at --- facilities to [just] take photos and notes. And he and I were in the office and he’s like, “I can’t believe it.” I said, “Listen [just] do the best job taking notes and photos that you possibly can.”

So I had a 30 percent goal... So the only other thing I could think of to do at the time was to go out and hire another architect... Now this is [minority-owned] firm... But the problem was, we had trouble figuring out exactly what he was going to do... I said, “We don’t have anything for design. We’re going to pay you a fee. You’re going to get a fee no matter what. ... We’ll probably end up sending you to meetings during construction so

that you can earn your part of the fee.” We got into construction, that made no sense... We’re just going to pay your fee.

This is not to imply or suggest that all M/WBEs’ and DBEs’ experience with prime contractors is negative.

So, I don’t think primes are the enemies here. So, we all get work from someone else. It’s your choice to be a DBE or MBE. Nobody asks you to become a DBE. Once you have done that, there are pros and cons you have to follow.

I work primarily as a subcontractor, but working with ---, --- and ---, the actual quality of the work and the exposure to those larger contracts that we get as being a subcontractor of the work, it’s always been great.

Some nonminority firms complained that there is limited capacity and that higher goals were making it difficult to meet program requirements.

It is getting harder and harder because of the DBE requirements. DBE requirements keep going up. The program has gotten bigger. There [are] more projects being put out, and a lot of the subconsultants are busy. It’s tough...there can be one firm who will be on five contracts. Then you call them up, try to get them to do something, some work and you can’t get them.

They don’t have the experience and they don’t have the capital.

As far as the pool of MDOT certified subcontractors...there is not sufficient capacity.

We won’t invite you for something that is so far above your capacity. Much like we are monitored by being bonded, particularly with all this work coming out, you can put a company out of business by giving them too much work just as quickly as you can by not giving them business.

9. Obtaining Work on Private Sector or “Non-Goals” Projects

M/WBEs and DBEs providing construction services uniformly continue to find private sector prime contractor work (other than small residential and commercial projects) very difficult to obtain. Most firms, particularly those owned by African Americans and Hispanics, are often limited to public sector projects. Minority firms in particular reported that general contractors

who use them successfully and repeatedly on public sector projects with participation goals rarely or never contact them to bid private work.

[W]hy is it the only time that they contact me is when there's a participation required? Never am I contacted just for the private work or the negotiated work, but I am only good enough when there's participation required.

[O]ne of the big issues for minority contractors are contractors have certain lists. Our problem is, we've got to get off the minority contractor list, because as long as you're on that list, needless to say...they call when they need a minority contractor.

You've got to build the relationships. That's true regardless. It took a while just to build the relationships to get the MBE piece. ...So it is a long process to get there, but the bottom line is they bid every day on all kinds of projects that if indeed we could be a part of, we'd be billionaires, I suspect. But when they don't have to include you, they don't. They just don't.

When there's no goal for women on these contracts, GC's don't hire them. It's real simple. It is not rocket science.

[T]he big contractors, they call me for [contracts with goals]...they don't call me on private jobs.

The private sector work I get is primarily from customers that look like me. There are very few of my private sector customers that don't look like me.

Yeah, there are firms that we work with currently as a [woman-owned firm] who also do private sector work and they don't call us on those projects.

A nonminority construction company indicated he does not use M/WBE or DBE firms on private sector work, and stated the following:

No. Can't. We could, but it's too fast, it's too — private sector work is very competitive, price based, very quick. It's not a long, drawn out public process. Schedule time is

everything. If we don't have to use a DBE, if we don't have to use a subconsultant on anything, we won't use them....

The paucity of private sector opportunities means that M/WBEs and DBEs, despite having the capacity to take on more projects, have to cut staff when public jobs are finished because they receive no or very limited private sector work. This negatively affects their capacity to do future projects.

D. Conclusion

Consistent with other evidence reported in this Study, our interview information strongly suggests that M/WBEs and DBEs continue to face discriminatory barriers to full and fair participation in both public and private sector contracts in the MDOT Market Area. This evidence includes negative perceptions of M/WBE and DBE competence and qualifications; being held to higher performance standards than for nonminority firms; harassment at the workplace/jobsite; abuses by primes of the payment process, and in the compliance process; exclusion from industry networks; discrimination in access to commercial loans, surety bonds, and commercial or professional insurance; difficulties in obtaining work on public sector projects; and difficulties obtaining work on private sector or “non-goals” projects. The results of these surveys and personal interviews have yielded the types of evidence that the courts have found to be highly probative in deciding whether an entity such as MDOT has been and/or continues to be a passive participant in a discriminatory market area, particularly when considered in conjunction with the numerous pieces of statistical evidence assembled and presented throughout this Study.

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Appendix A. Glossary

ACS: *The American Community Survey.* The Census Bureau’s ACS is an ongoing survey covering the same type of information collected in the decennial census. The ACS is sent to more than 3.5 million addresses annually, including housing units in all counties in the 50 states and the District of Columbia.

African American: African American or “Black” refers to an individual having origins in any of the black racial groups of Africa.

American Indian: *See* Native American.

Anecdotal evidence: Qualitative data regarding business owners’ accounts of experiences with disparate treatment and other barriers to business success.

Asian: Refers to an individual having origins in the Far East, Southeast Asia or the Indian subcontinent.

Availability: A term of art in disparity studies that refers to the percentage of a given population of businesses owned by one or more groups of interest. *See also* “Utilization,” “Disparity Ratio.”

Baseline Business Universe: The underlying population of business establishments that is used in an availability analysis. It is used as the denominator in a DBE availability measure.

Black: Or “African American” refers to an individual having origins in any of the Black racial groups of Africa.

Capacity: This term has no single definition. *See* Chapter III for discussion of this concept and its role in disparity studies.

Constitutional significance or substantive significance: An indication of how large or small a given disparity is. Under the Equal Employment Opportunity Commission’s (“EEOC”) “four-fifths” rule, a disparity ratio is constitutionally (or substantively) significant if it is 0.8 or less on a scale of 0 to 1 or 80 or less on a scale of 1 to 100.

DBE: Disadvantaged Business Enterprise. A for-profit small business concern that is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

Decennial: Refers to the census conducted every decade by the U.S. Census Bureau. The last decennial census was conducted in 2010.

Dependent variable: In a regression analysis, a variable whose value is postulated to be influenced by one or more other “independent” or “exogenous” or “explanatory” variables. For example, in business owner earnings regressions, business owner earnings is the dependent

variable, and other variables, such as industry, geographic location, or age, are the explanatory variables. *See also* “Independent variable,” “Exogenous variable.”

Disaggregation, disaggregated: Refers to the practice of splitting larger groups into smaller groups. In the present context, this term is typically used in reference to the presentation of utilization, availability, or related statistics according to industry. For example, statistics presented for “Building Construction,” “Heavy Construction,” and “Special Trades Construction” industries are more disaggregated than statistics for the “Construction” sector as a whole.

Disparity ratio (or Disparity index): A measure derived from dividing utilization by availability and multiplying the result by 100. A disparity ratio of less than 100 indicates that utilization is less than availability. A statistically significant disparity ratio of 80 or less can be taken as evidence of disparate impact, *see* “Availability,” “Constitutional significance,” “Utilization.”

Distribution: A set of numbers and their frequency of occurrence collected from measurements over a statistical population.

Econometrics, econometrically: Econometrics is the field of economics that concerns itself with the application of statistical inference to the empirical measurement of relationships postulated by economic theory. *See also* “Regression.”

Endogenous variable: A variable that is correlated with the residual in a regression analysis or equation. Endogenous variables should not be used in statistical tests for the presence of disparities. *See also* “Exogenous variable.”

Exogenous variable: A variable that is uncorrelated with the residual in a regression analysis or equation. Exogenous variables are appropriate for use in statistical tests for the presence of disparities. *See also* “Endogenous variable,” “Independent variable,” “Dependent variable.”

First tier subcontractors: Subcontractors or suppliers hired directly by the prime contractor.

Hispanic: Refers to an individual of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

Independent variable: In a regression analysis, one or more variables that are postulated to influence or explain the value of another, “dependent” variable. For example, in business owner earnings regressions, business owner earnings is the dependent variable, and other variables, such as industry, geographic location, or age, are the independent or explanatory variables. *See also* “Dependent variable,” “Exogenous variable.”

MBE: Minority-Owned Business Enterprise. A business establishment that is 51 percent or more owned and controlled by racial or ethnic minorities (*i.e.*, African Americans, Hispanics, Asians or Native Americans).

Mean: A term of art in statistics, synonymous in this context with the arithmetic average. For example, the mean value of the series 1, 1, 2, 2, 2, 4, 5 is 2.43. This is derived by calculating the sum of all the values in the series (*i.e.*, 17) and dividing that sum by the number of elements in the series (*i.e.*, 7).

Median: A term of art in statistics, meaning the middle value of a series of numbers. For example, the median value of the series 1, 1, 2, 2, 2, 4, 5 is 2.

Microdata or micro-level data: Quantitative data rendered at the level of the individual person or business, as opposed to data rendered for groups or aggregates of individuals or businesses. For example, Dun and Bradstreet provides micro-level data on business establishments. The Census Bureau's *Survey of Business Owners*, provides grouped or aggregated data on businesses.

Misclassification: In the present context, this term refers to a situation when a listing or directory of minority-owned or women-owned firms has incorrectly classified a firm's race or gender status. For example, when a firm listed as Hispanic-owned is actually African American-owned, or when a firm listed as nonminority female-owned is actually nonminority male-owned.

MSA: Metropolitan Statistical Area. As defined by the Federal Office of Management and Budget, contains at least one urbanized area that has a total population of 50,000 or more, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.

M/WBE: Minority and/or Women-Owned Business Enterprise. A business establishment that is 51 percent or more owned and controlled by racial or ethnic minorities (*i.e.*, African Americans, Hispanics, Asians or Native Americans) or women.

NAICS: North American Industry Classification System. The standard system for classifying industry-based data in the U.S. Superseded the Standard Industrial Classification (SIC) System in 1997. *See also* "SIC."

NSSBF or SSBF: The *Survey of Small Business Finances*, formerly the *National Survey of Small Business Finances*, was produced jointly by the Federal Reserve Board and the U.S. Small Business Administration to provide a periodic statistical picture of small business finances. The SSBF was discontinued after 2003.

Native American: Refers to an individual having origins in any of the original peoples of North America, but not including individuals of Eskimo or Aleutian origin.

Nonminority: Firms that are not DBEs, *i.e.*, not owned by African Americans, Hispanics, Asians, Native Americans or nonminority females.

PUMS: Public Use Microdata Sample. Both the decennial census and the American Community Survey publish PUMS products.

Regression, multiple regression, multivariate regression: A type of statistical analysis which examines the correlation between two variables (“regression”) or three or more variables (“multiple regression” or “multivariate regression”) in a mathematical model by determining the line of best fit through a series of data points. Econometric research typically employs regression analysis. *See also* “Econometrics.”

SATL: Refers to the South Atlantic census division in the NSSBF and SSBF data sets. The SATL includes the states of Maryland, Delaware, Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia and the District of Columbia.

SBO: The Census Bureau’s *Survey of Business Owners* statistical data series is devoted to capturing statistical information on the nation’s minority-owned and women-owned business enterprises. Part of the five-year *Economic Census* series.

Setaside, setasides: A contracting practice where certain contracts or classes of contracts are reserved for competitive bidding exclusively among a given subset of contractors, for example minority-owned and women-owned contractors.

SIC: Standard Industrial Classification system. Prior to 1997, the standard system for classifying industry-based data in the U.S. Superseded by the North American Industry Classification System (NAICS). *See also* “NAICS.”

Statistical significance: A statistical outcome or result that is unlikely to have occurred as the result of random chance alone. The greater the statistical significance, the smaller the probability that it resulted from random chance alone.

SSBF: *See* NSSBF.

Stratified: In the present context, this refers to a statistical practice where random samples are drawn within different categories or “strata” such as time period, industry sector, or DBE status.

Substantive significance or constitutional significance: An indication of how large or small a given disparity is. Under the EEOC’s “four-fifths” rule, a disparity ratio is substantively (or constitutionally) significant if it is 0.8 or less on a scale of 0 to 1.

t-test, t-statistic, t-distribution: Often employed in disparity studies to determine the statistical significance of a particular disparity statistic. A t-test is a statistical hypothesis test based on a test statistic whose sampling distribution is a t-distribution. Various t-tests, strictly speaking, are aimed at testing hypotheses about populations with normal probability distributions. However, statistical research has shown that t-tests often provide quite adequate results for non-normally distributed populations as well.

Two-tailed (or two-sided) statistical test: A “two-tailed” test means that one is testing the hypothesis that two values, say u (utilization) and a (availability), are equal against the alternate hypothesis that u is not equal to a . In contrast, a one-sided test means that you are testing the hypothesis that u and a are equal against the alternate hypothesis u is not equal to a in only one direction. That is, that it is either larger than a or smaller than a .

Utilization: A term of art in disparity studies that refers to the percentage of a given amount of contracting and/or procurement dollars that is awarded or paid to businesses owned by one or more groups of interest. *See also* “Availability,” “Disparity Ratio.”

WBE: Women-Owned Business Enterprise: A business establishment that is 51 percent or more owned and controlled by nonminority women. In this Study, unless otherwise indicated, WBE refers to nonminority women-owned firms.

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Appendix B. Federal-Aid Subrecipients Included in the Study

MTA Subrecipients

ALLEGANY COUNTY

CALVERT COUNTY

CARROLL COUNTY

CCTM OAKLAND

CECIL COUNTY

CHARLES COUNTY

CENTRAL MARYLAND REGIONAL TRANSIT (CMRT)

DELMARVA COMMUNITY

FREDERICK COUNTY

GARRETT COUNTY

HOWARD COUNTY

OCEAN CITY

SHORE TRANSIT/TRI-COUNTY COUNCIL

ST. MARY'S COUNTY

TOWN OF OCEAN CITY

TRI-COUNTY LOWER EASTERN SHORE

WASHINGTON COUNTY

SHA Subrecipients

ANNE ARUNDEL COUNTY

BALTIMORE CITY

CAROLINE COUNTY

Appendix B. Federal-Aid Subrecipients Included in the Study

CARROLL COUNTY

CECIL COUNTY

CHARLES COUNTY

CITY OF CHESTERTOWN

CITY OF CRISFIELD

CITY OF CUMBERLAND

CITY OF DISTRICT HGTS

CITY OF GAITHERSBURG

CITY OF GREENBELT

CITY OF HAGERSTOWN

CITY OF ROCKVILLE

DORCHESTER COUNTY

FREDERICK CITY

FREDERICK COUNTY

GARRETT COUNTY

HOWARD COUNTY

MONTGOMERY COUNTY

PRINCE GEORGES COUNTY

QUEEN ANNE'S COUNTY

SOMERSET COUNTY

ST. MARY'S COUNTY

WASHINGTON COUNTY

WICOMICO COUNTY

WORCESTER COUNTY

Appendix C. Master DBE Directory Sources

A. Entities with lists of DBE firms that were duplicative of previously collected lists

African American Chamber of Commerce of Montgomery County
Anne Arundel County Economic Development Corporation
Baltimore City Public School System
Baltimore County
Baltimore County Office of Fair Practices and Community Affairs
Baltimore County Public Schools
Bowie State University
Carroll County
Charles County Economic Development Commission
City of Annapolis, Small and Minority Business Enterprise Development
Department of State Police
Dulles International Airport
eVA – Virginia’s eProcurement Portal
Frederick County Business Development and Retention
Frostburg State University
Governor's Commission on Asian Pacific American Affairs
Harford County
Maryland Aviation Administration
Maryland Department of Budget and Management
Maryland Department of Commerce
Maryland Department of Education
Maryland Department of General Services
Maryland Department of Human Resources
Maryland Department of Information Technology
Maryland Department of Juvenile Services
Maryland Department of Labor, Licensing & Regulation
Maryland Department of Mental Health and Hygiene
Maryland Department of Public Safety and Correctional Services
Maryland Environmental Service
Maryland Governor's Office of Minority Affairs
Maryland Interagency Commission for Public School Construction
Maryland Mass Transit Administration-Baltimore
Maryland Port Authority
Maryland Stadium Authority
Maryland State Highway
Maryland State Lottery Agency
Maryland Transit Administration
Maryland Transportation Authority
Maryland Vehicle Administration
MDOT-The Secretary's Office
Metropolitan Washington Airports Authority

Appendix C. Master DBE Directory Sources

Montgomery County Procurement
Morgan State University
National Association of Women in Construction (Delaware Chapter)
National Association of Women in Construction (Roanoke, VA Chapter)
Prince George's County
Queen Anne's County
Richmond International Airport
Salisbury State University
Southern Maryland Black Chamber of Commerce
St. Mary's County
Talbot County
Towson University
University of Baltimore
University of Maryland Baltimore
University of Maryland Baltimore County
University of Maryland College Park
University of Maryland Eastern Shore
University of Maryland University College
Upper Shore Workforce Investment Board
Virginia Department of Transportation
Washington County
West Virginia Small Business Development Center
Worcester County

B. Entities that had no directory, or their directory did not identify race and sex

Airport Minority Advisory Council
Baltimore County Dept. of Economic Development
Baltimore Orioles
Calvert County Minority Business Alliance
Central Vendor Registration of Montgomery County
City of Falls Church
City of Hagerstown
City of Richmond
Dorchester County
Downtown Partnership of Baltimore
Frederick County Department of Human Relations
Garrett County
Hagerstown/Washington Economic Development Commission
Jefferson County Development Authority
Maryland Minority Contractors Association, Inc.
Maryland R*STARS Database
Maryland Small Business Development Center (Western Region)
Minority Business Network
National Association of Women in Construction (National Chapter)

Naval Air Systems Command
Tri-County Council of Southern Maryland
Virginia Department of Minority Business Enterprise

C. Entities that were non-responsive to repeated contacts

American Minority Contractors & Business Association
Arlington County
Baltimore County Chamber of Commerce
Capital Region Minority Supplier Development Council
Cecil County
Charles County Minority Business Advocacy Council
DC Minority Business Enterprise Center
District of Columbia Department of Small and Local Business Development
Governor's Commission on Hispanic Affairs
Greater Baltimore Black Chamber of Commerce
Greater Baltimore Committee
Maryland Small Business Development Center (Northern Region)
Maryland-National Capital Park & Planning Commission
National Association of Women in Construction (Maryland Chapter)
National Association of Women in Construction (Greater Tidewater, VA Chapter)
National Association of Women in Construction (Washington DC Chapter)
Prince George's County Minority Business Opportunity Commission
Queen Anne's County
Somerset County
Washington Suburban Sanitary Commission
Women Construction Owners and Executives
Women Presidents' Educational Organization

D. Entities that refused to provide the requested information

Black Chamber of Commerce of Anne Arundel County
Maryland Small Business Development Center (Corridor Region)
National Association of Minority Contractors
National Center for American Indian Enterprise Development
Women's Business Enterprise National Council

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Appendix D. Individual Modal Administration Tables

Table 2.1.A. Summary of Master Contract/Subcontract Database: SHA Prime Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED	DOLLARS PAID
<i>CONSTRUCTION</i>			2,388,356,651	1,600,939,998
<i>Prime Contracts</i>	799	628	1,558,668,733	997,016,162
<i>Subcontracts</i>	9,429	7,649	829,687,918	603,923,836
<i>AE-CRS</i>			837,870,539	395,619,995
<i>Prime Contracts</i>	180	180	547,232,067	251,150,376
<i>Subcontracts</i>	731	729	290,638,472	144,469,619
<i>MAINTENANCE</i>			164,110,977	91,186,401
<i>Prime Contracts</i>	156	117	134,099,648	70,873,808
<i>Subcontracts</i>	763	409	30,011,329	20,312,594
<i>IT</i>			112,389,606	46,911,446
<i>Prime Contracts</i>	99	87	88,858,047	35,333,184
<i>Subcontracts</i>	54	22	23,531,559	11,578,262
<i>SERVICES</i>			43,445,594	17,545,046
<i>Prime Contracts</i>	107	92	34,819,103	10,948,001
<i>Subcontracts</i>	120	96	8,626,492	6,597,046
<i>CSE</i>			67,362,083	62,563,655
<i>Prime Contracts</i>	387	387	62,307,071	60,502,691
<i>Subcontracts</i>	42	23	5,055,012	2,060,963
<i>GRAND TOTAL</i>			3,613,535,450	2,214,766,542
<i>Prime Contracts</i>	1,728	1,491	2,425,984,669	1,425,824,222
<i>Subcontracts</i>	11,139	8,928	1,187,550,781	788,942,320

Source: NERA calculations from Master Contract/Subcontract Database. Note: Prime Contract dollar amounts are net of subcontract amounts.

Appendix D. Individual Modal Administration Tables

Table 2.1.B. Summary of Master Contract/Subcontract Database: MTA Prime Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED	DOLLARS PAID
<i>CONSTRUCTION</i>			276,730,357	157,232,671
<i>Prime Contracts</i>	62	52	160,755,720	70,050,241
<i>Subcontracts</i>	976	842	115,974,637	87,182,430
<i>AE-CRS</i>			772,302,105	506,194,374
<i>Prime Contracts</i>	40	40	333,522,100	202,077,054
<i>Subcontracts</i>	319	319	438,780,005	304,117,320
<i>MAINTENANCE</i>			500,165,936	24,286,355
<i>Prime Contracts</i>	43	30	349,844,276	9,302,430
<i>Subcontracts</i>	259	28	150,321,659	14,983,925
<i>IT</i>			16,794,066	3,319,898
<i>Prime Contracts</i>	21	14	15,017,331	3,164,450
<i>Subcontracts</i>	16	1	1,776,735	155,448
<i>SERVICES</i>			1,062,609,167	357,267,212
<i>Prime Contracts</i>	148	120	852,211,001	227,803,342
<i>Subcontracts</i>	865	707	210,398,166	129,463,870
<i>CSE</i>			320,577,433	284,532,036
<i>Prime Contracts</i>	979	977	312,262,427	278,663,540
<i>Subcontracts</i>	19	17	8,315,006	5,868,496
<i>GRAND TOTAL</i>			2,949,179,063	1,332,832,545
<i>Prime Contracts</i>	1,293	1,233	2,023,612,855	791,061,057
<i>Subcontracts</i>	2,454	1,914	925,566,208	541,771,488

Source: NERA calculations from Master Contract/Subcontract Database. Note: Prime Contract dollar amounts are net of subcontract amounts.

Appendix D. Individual Modal Administration Tables

Table 2.1.C. Summary of Master Contract/Subcontract Database: MAA Prime Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED	DOLLARS PAID
<i>CONSTRUCTION</i>			418,259,869	275,213,620
<i>Prime Contracts</i>	26	18	177,758,600	81,124,093
<i>Subcontracts</i>	749	560	240,501,269	194,089,527
<i>AE-CRS</i>			160,300,000	104,841,889
<i>Prime Contracts</i>	14	14	113,825,761	72,788,415
<i>Subcontracts</i>	124	124	46,474,239	32,053,475
<i>MAINTENANCE</i>			146,987,464	25,677,908
<i>Prime Contracts</i>	28	4	120,468,143	18,048,273
<i>Subcontracts</i>	211	5	26,519,320	7,629,635
<i>IT</i>			29,777,363	11,762,248
<i>Prime Contracts</i>	46	43	24,561,754	8,479,547
<i>Subcontracts</i>	64	34	5,215,608	3,282,701
<i>SERVICES</i>			83,209,589	23,202,317
<i>Prime Contracts</i>	32	29	69,231,463	22,497,372
<i>Subcontracts</i>	36	14	13,978,127	704,944
<i>CSE</i>			52,645,519	38,610,341
<i>Prime Contracts</i>	155	155	37,635,594	23,600,417
<i>Subcontracts</i>	74	74	15,009,925	15,009,925
<i>GRAND TOTAL</i>			891,179,803	479,308,323
<i>Prime Contracts</i>	301	263	543,481,316	226,538,116
<i>Subcontracts</i>	1,258	811	347,698,487	252,770,207

Source: NERA calculations from Master Contract/Subcontract Database. Note: Prime Contract dollar amounts are net of subcontract amounts.

Appendix D. Individual Modal Administration Tables

Table 2.2.A. Summary of Master Contract/Subcontract Database: SHA Federally-Assisted Prime Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED	DOLLARS PAID
<i>CONSTRUCTION</i>			2,319,514,030	1,565,306,038
<i>Prime Contracts</i>	751	589	1,508,975,431	973,664,925
<i>Subcontracts</i>	9,012	7,374	810,538,599	591,641,114
<i>AE-CRS</i>			815,732,734	381,854,652
<i>Prime Contracts</i>	176	176	535,171,731	244,844,255
<i>Subcontracts</i>	710	708	280,561,003	137,010,397
<i>MAINTENANCE</i>			8,479,294	2,769,080
<i>Prime Contracts</i>	6	3	7,396,034	2,769,080
<i>Subcontracts</i>	45	0	1,083,260	0
<i>IT</i>			8,050,099	6,860,436
<i>Prime Contracts</i>	4	4	4,423,873	3,681,416
<i>Subcontracts</i>	13	13	3,626,225	3,179,021
<i>SERVICES</i>			6,007,901	1,018,700
<i>Prime Contracts</i>	6	2	4,297,250	662,423
<i>Subcontracts</i>	26	17	1,710,650	356,277
<i>CSE</i>			8,092,608	5,304,323
<i>Prime Contracts</i>	4	4	3,337,973	3,543,737
<i>Subcontracts</i>	39	20	4,754,635	1,760,587
<i>GRAND TOTAL</i>			3,165,876,666	1,963,113,231
<i>Prime Contracts</i>	947	778	2,063,602,293	1,229,165,836
<i>Subcontracts</i>	9,845	8,132	1,102,274,374	733,947,395

Source: NERA calculations from Master Contract/Subcontract Database. Note: Prime Contract dollar amounts are net of subcontract amounts.

Appendix D. Individual Modal Administration Tables

Table 2.2.B. Summary of Master Contract/Subcontract Database: MTA Federally-Assisted Prime Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED	DOLLARS PAID
<i>CONSTRUCTION</i>			275,243,220	155,745,534
<i>Prime Contracts</i>	60	50	159,512,907	68,765,689
<i>Subcontracts</i>	969	835	115,730,313	86,979,846
<i>AE-CRS</i>			772,270,345	506,162,614
<i>Prime Contracts</i>	39	39	333,490,340	202,045,294
<i>Subcontracts</i>	319	319	438,780,005	304,117,320
<i>MAINTENANCE</i>			181,779,104	16,743,942
<i>Prime Contracts</i>	5	3	105,885,827	2,580,364
<i>Subcontracts</i>	41	22	75,893,278	14,163,579
<i>IT</i>			1,826,914	1,041,284
<i>Prime Contracts</i>	2	1	1,248,127	1,041,284
<i>Subcontracts</i>	9	0	578,787	0
<i>SERVICES</i>			252,604,440	43,075,511
<i>Prime Contracts</i>	22	11	218,360,313	23,660,744
<i>Subcontracts</i>	186	73	34,244,127	19,414,767
<i>CSE</i>			161,216,074	156,122,129
<i>Prime Contracts</i>	40	38	158,208,740	155,561,305
<i>Subcontracts</i>	14	12	3,007,334	560,824
<i>GRAND TOTAL</i>			1,644,940,098	878,891,015
<i>Prime Contracts</i>	168	142	976,706,254	453,654,680
<i>Subcontracts</i>	1,538	1,261	668,233,843	425,236,335

Source: NERA calculations from Master Contract/Subcontract Database. Note: Prime Contract dollar amounts are net of subcontract amounts.

Appendix D. Individual Modal Administration Tables

Table 2.2.C. Summary of Master Contract/Subcontract Database: MAA Federally-Assisted Prime Contracts and Subcontracts by Procurement Category, 2010-2014

CONTRACT CATEGORY	NUMBER OF AWARDED CONTRACTS	NUMBER OF PAID CONTRACTS	DOLLARS AWARDED	DOLLARS PAID
<i>CONSTRUCTION</i>			162,512,753	115,093,224
<i>Prime Contracts</i>	5	4	55,285,739	29,790,506
<i>Subcontracts</i>	204	191	107,227,014	85,302,719
<i>AE-CRS</i>			75,700,000	59,977,547
<i>Prime Contracts</i>	6	6	52,132,732	42,291,611
<i>Subcontracts</i>	55	55	23,567,268	17,685,936
<i>MAINTENANCE</i>			180,000	0
<i>Prime Contracts</i>	1	0	172,000	0
<i>Subcontracts</i>	2	0	8,000	0
<i>IT</i>			0	0
<i>Prime Contracts</i>	0	0	0	0
<i>Subcontracts</i>	0	0	0	0
<i>SERVICES</i>			0	0
<i>Prime Contracts</i>	0	0	0	0
<i>Subcontracts</i>	0	0	0	0
<i>CSE</i>			0	0
<i>Prime Contracts</i>	0	0	0	0
<i>Subcontracts</i>	0	0	0	0
<i>GRAND TOTAL</i>			238,392,752	175,070,771
<i>Prime Contracts</i>	12	10	107,590,471	72,082,116
<i>Subcontracts</i>	261	246	130,802,282	102,988,654

Source: NERA calculations from Master Contract/Subcontract Database. Note: Prime Contract dollar amounts are net of subcontract amounts.

Appendix D. Individual Modal Administration Tables

Table 2.3.A. Distribution of SHA Contracting Dollars by Geographic Location, 2010-2014

Location	Con- struction (%)	AE- CRS (%)	Main- tenance (%)	IT (%)	Services (%)	CSE (%)	Total (%)
<i>Dollars Awarded</i>							
Inside State of MD Market Area	88.5	93.4	86.4	97.8	91.2	77.8	89.6
Outside State of MD Market Area	11.5	6.6	13.6	2.2	8.8	22.2	10.4
<i>Dollars Paid</i>							
Inside State of MD Market Area	88.2	93.6	88.5	95.6	83.1	76.0	88.9
Outside State of MD Market Area	11.8	6.4	11.5	4.4	16.9	24.0	11.1
<i>Dollars Awarded</i>							
Inside Maryland	79.7	91.4	82.2	89.9	90.5	71.6	82.8
Outside Maryland	20.3	8.6	17.8	10.1	9.5	28.4	17.2
<i>Dollars Paid</i>							
Inside Maryland	80.3	91.8	82.5	87.5	81.7	76.0	82.3
Outside Maryland	19.7	8.2	17.5	12.5	18.3	24.0	17.7

Source and Note: See Table 2.3.

Appendix D. Individual Modal Administration Tables

Table 2.3.B. Distribution of MTA Contracting Dollars by Geographic Location, 2010-2014

Location	Con- struction (%)	AE- CRS (%)	Main- tenance (%)	IT (%)	Services (%)	CSE (%)	Total (%)
<i>Dollars Awarded</i>							
Inside State of MD Market Area	92.2	95.8	89.1	70.6	94.7	77.5	91.8
Outside State of MD Market Area	7.8	4.2	10.9	29.4	5.3	22.5	8.2
<i>Dollars Paid</i>							
Inside State of MD Market Area	89.0	97.5	76.1	94.4	90.4	78.8	90.2
Outside State of MD Market Area	11.0	2.5	23.9	5.6	9.6	21.2	9.8
<i>Dollars Awarded</i>							
Inside Maryland	85.6	92.3	65.5	51.0	92.5	76.4	85.2
Outside Maryland	14.4	7.7	34.5	49.0	7.5	23.6	14.8
<i>Dollars Paid</i>							
Inside Maryland	78.8	94.6	70.0	70.8	89.3	78.8	87.3
Outside Maryland	21.2	5.4	30.0	29.2	10.7	21.2	12.7

Source and Note: See Table 2.3.

Appendix D. Individual Modal Administration Tables

Table 2.3.C. Distribution of MAA Contracting Dollars by Geographic Location, 2010-2014

Location	Con- struction (%)	AE- CRS (%)	Main- tenance (%)	IT (%)	Services (%)	CSE (%)	Total (%)
<i>Dollars Awarded</i>							
Inside State of MD Market Area	79.7	92.4	97.4	69.4	73.8	54.7	82.5
Outside State of MD Market Area	20.3	7.6	2.6	30.6	26.2	45.3	17.5
<i>Dollars Paid</i>							
Inside State of MD Market Area	73.4	92.7	100.0	74.2	13.6	59.8	75.1
Outside State of MD Market Area	26.6	7.3	0.0	25.8	86.4	40.2	24.9
<i>Dollars Awarded</i>							
Inside Maryland	68.2	86.0	80.9	58.0	60.6	41.4	70.9
Outside Maryland	31.8	14.0	19.1	42.0	39.4	58.6	29.1
<i>Dollars Paid</i>							
Inside Maryland	56.9	89.8	37.7	48.5	13.3	59.8	60.2
Outside Maryland	43.1	10.2	62.3	51.5	86.7	40.2	39.8

Source and Note: See Table 2.3.

Appendix D. Individual Modal Administration Tables

Table 2.4.A. Distribution of SHA Contract Award Dollars by State and County, Inside the Market Area, 2010-2014

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
MD	BALTIMORE	686,478,924	21.19	21.19
MD	BALTIMORE CITY	401,003,244	12.38	33.57
MD	MONTGOMERY	376,256,360	11.61	45.18
MD	ANNE ARUNDEL	320,085,421	9.88	55.07
MD	HOWARD	305,597,154	9.43	64.50
MD	PRINCE GEORGES	301,304,173	9.30	73.80
MD	HARFORD	216,362,174	6.68	80.48
MD	CARROLL	90,133,069	2.78	83.26
MD	KENT	79,819,499	2.46	85.72
VA	FAIRFAX	64,378,266	1.99	87.71
MD	FREDERICK	62,728,111	1.94	89.65
DC	DISTRICT OF COLUMBIA	58,923,053	1.82	91.47
DE	NEW CASTLE	56,172,246	1.73	93.20
MD	WASHINGTON	36,814,922	1.14	94.34
MD	CHARLES	31,999,043	0.99	95.33
MD	ALLEGANY	30,679,172	0.95	96.27
VA	LOUDOUN	20,804,481	0.64	96.91
MD	GARRETT	19,834,472	0.61	97.53
DE	KENT	13,886,785	0.43	97.96
VA	FALLS CHURCH CITY	8,801,343	0.27	98.23
MD	QUEEN ANNES	8,148,855	0.25	98.48
MD	WICOMICO	8,101,642	0.25	98.73
MD	TALBOT	6,131,205	0.19	98.92
VA	PRINCE WILLIAM	5,588,037	0.17	99.09
VA	STAFFORD	4,727,656	0.15	99.24
DE	SUSSEX	4,026,525	0.12	99.36
MD	WORCESTER	3,962,454	0.12	99.48
MD	CAROLINE	3,077,819	0.10	99.58
VA	FAUQUIER	2,370,061	0.07	99.65
VA	CLARKE	1,990,668	0.06	99.71
MD	DORCHESTER	1,977,400	0.06	99.77

Appendix D. Individual Modal Administration Tables

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
VA	MANASSAS CITY	1,696,366	0.05	99.83
VA	WARREN	1,058,755	0.03	99.86
MD	SAINT MARYS	1,016,900	0.03	99.89
MD	CECIL	935,973	0.03	99.92
MD	CALVERT	710,056	0.02	99.94
MD	SOMERSET	516,217	0.02	99.96
VA	ALEXANDRIA CITY	442,142	0.01	99.97
WV	JEFFERSON	358,303	0.01	99.98
VA	ARLINGTON	293,177	0.01	99.99
VA	CULPEPER	244,450	0.01	100.00
VA	MANASSAS PARK CITY	39,079	0.00	100.00
VA	FAIRFAX CITY	5,554	0.00	100.00
VA	SPOTSYLVANIA	1,530	0.00	100.00

Source: See Table 2.4.

Appendix D. Individual Modal Administration Tables

Table 2.4.B. Distribution of MTA Contract Award Dollars by State and County, Inside the Market Area, 2010-2014

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
MD	BALTIMORE CITY	966,832,700	35.70	35.70
MD	BALTIMORE	497,122,613	18.36	54.06
MD	ANNE ARUNDEL	314,108,554	11.60	65.66
MD	ALLEGANY	238,666,157	8.81	74.47
MD	PRINCE GEORGES	140,579,093	5.19	79.67
DC	DISTRICT OF COLUMBIA	134,223,733	4.96	84.62
MD	HOWARD	115,438,597	4.26	88.88
MD	MONTGOMERY	97,416,363	3.60	92.48
MD	CHARLES	48,006,522	1.77	94.26
MD	HARFORD	29,582,273	1.09	95.35
VA	FAIRFAX	19,578,823	0.72	96.07
VA	ARLINGTON	19,363,603	0.72	96.79
MD	WICOMICO	18,560,061	0.69	97.47
MD	WASHINGTON	17,891,655	0.66	98.13
MD	CARROLL	17,246,227	0.64	98.77
DE	NEW CASTLE	8,151,755	0.30	99.07
VA	LOUDOUN	6,858,402	0.25	99.32
MD	TALBOT	3,213,453	0.12	99.44
MD	QUEEN ANNES	2,785,951	0.10	99.54
MD	FREDERICK	2,385,644	0.09	99.63
VA	WARREN	1,940,822	0.07	99.70
VA	FAUQUIER	1,732,813	0.06	99.77
VA	FREDERICKSBURG CITY	1,247,371	0.05	99.81
MD	CALVERT	1,111,347	0.04	99.86
MD	SAINT MARYS	1,026,050	0.04	99.89
MD	CAROLINE	,937,377	0.03	99.93
VA	PRINCE WILLIAM	427,992	0.02	99.94
VA	STAFFORD	310,000	0.01	99.95
VA	ALEXANDRIA CITY	292,353	0.01	99.97
DE	SUSSEX	239,710	0.01	99.97
MD	CECIL	204,016	0.01	99.98

Appendix D. Individual Modal Administration Tables

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
MD	DORCHESTER	143,268	0.01	99.99
VA	CULPEPER	123,416	0.00	99.99
VA	MANASSAS CITY	107,781	0.00	100.00
MD	KENT	67,805	0.00	100.00
MD	SOMERSET	20,118	0.00	100.00
VA	FREDERICK	9,000	0.00	100.00
WV	HARRISON	7,508	0.00	100.00
MD	WORCESTER	2,927	0.00	100.00
DE	KENT	1,348	0.00	100.00
VA	SPOTSYLVANIA	697	0.00	100.00

Source: See Table 2.4.

Appendix D. Individual Modal Administration Tables

Table 2.4.C. Distribution of MAA Contract Award Dollars by State and County, Inside the Market Area, 2010-2014

STATE	COUNTY	AMOUNT (\$)	PERCENT	CUMULATIVE PERCENT
MD	ANNE ARUNDEL	180,023,180	24.47	24.47
MD	BALTIMORE CITY	138,769,348	18.86	43.34
MD	BALTIMORE	138,585,938	18.84	62.18
MD	PRINCE GEORGES	55,953,364	7.61	69.78
MD	HOWARD	51,830,006	7.05	76.83
MD	HARFORD	37,855,000	5.15	81.97
VA	STAFFORD	33,908,560	4.61	86.58
VA	FAIRFAX	23,695,031	3.22	89.80
MD	MONTGOMERY	19,025,630	2.59	92.39
VA	LOUDOUN	13,576,054	1.85	94.24
DC	DISTRICT OF COLUMBIA	10,860,430	1.48	95.71
VA	ARLINGTON	10,128,758	1.38	97.09
DE	SUSSEX	5,702,776	0.78	97.86
MD	FREDERICK	3,697,876	0.50	98.37
VA	PRINCE WILLIAM	3,279,149	0.45	98.81
MD	CARROLL	1,951,305	0.27	99.08
MD	DORCHESTER	1,277,958	0.17	99.25
VA	MANASSAS CITY	1,119,597	0.15	99.40
MD	CALVERT	1,087,238	0.15	99.55
VA	ALEXANDRIA CITY	952,666	0.13	99.68
MD	TALBOT	872,917	0.12	99.80
DE	NEW CASTLE	558,422	0.08	99.88
MD	WASHINGTON	264,645	0.04	99.91
VA	FAUQUIER	233,650	0.03	99.94
MD	CHARLES	159,465	0.02	99.97
MD	QUEEN ANNES	100,579	0.01	99.98
MD	CECIL	37,031	0.01	99.98
MD	ALLEGANY	35,956	0.00	99.99
DE	KENT	31,697	0.00	99.99
VA	SPOTSYLVANIA	27,535	0.00	100.00
MD	WICOMICO	23,949	0.00	100.00

Source: See Table 2.4.

Appendix D. Individual Modal Administration Tables

Table 2.5.A. Distribution of SHA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Construction

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
2373	Highway, Street, and Bridge Construction	52.80	52.80
2381	Foundation, Structure, and Building Exterior Contractors	9.07	61.87
4247	Petroleum and Petroleum Products Merchant Wholesalers	5.92	67.79
2382	Building Equipment Contractors	5.56	73.35
2389	Other Specialty Trade Contractors	4.05	77.41
4842	Specialized Freight Trucking	2.95	80.36
2383	Building Finishing Contractors	2.20	82.56
2379	Other Heavy and Civil Engineering Construction	1.82	84.38
4233	Lumber and Other Construction Materials Merchant Wholesalers	1.48	85.86
3351	Electric Lighting Equipment Manufacturing	1.37	87.23
2362	Nonresidential Building Construction	1.36	88.59
5413	Architectural, Engineering, and Related Services	1.24	89.82
5617	Services to Buildings and Dwellings	1.18	91.01
2371	Utility System Construction	1.09	92.10
5619	Other Support Services	0.95	93.05
3273	Cement and Concrete Product Manufacturing	0.93	93.97
3323	Architectural and Structural Metals Manufacturing	0.78	94.75
4889	Other Support Activities for Transportation	0.75	95.50
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	0.60	96.10
3359	Other Electrical Equipment and Component Manufacturing	0.39	96.48
2123	Nonmetallic Mineral Mining and Quarrying	0.34	96.82
4539	Other Miscellaneous Store Retailers	0.31	97.13
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.20	97.34
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.20	97.54
4821	Rail Transportation	0.20	97.74
4442	Lawn and Garden Equipment and Supplies Stores	0.20	97.95
3342	Communications Equipment Manufacturing	0.18	98.13
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	0.15	98.28
3399	Other Miscellaneous Manufacturing	0.15	98.43

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NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4543	Direct Selling Establishments	0.14	98.57
5613	Employment Services	0.14	98.71
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.13	98.84
3311	Iron and Steel Mills and Ferroalloy Manufacturing	0.11	98.94
4884	Support Activities for Road Transportation	0.10	99.04
	Balance of industries (96 industry groups)	0.96	100.00
	<i>TOTAL - \$2,388,356,651</i>		

Source: See Table 2.5.

Appendix D. Individual Modal Administration Tables

Table 2.5.B. Distribution of MTA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Construction

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
2362	Nonresidential Building Construction	24.98	24.98
2382	Building Equipment Contractors	21.45	46.43
2373	Highway, Street, and Bridge Construction	9.49	55.93
2381	Foundation, Structure, and Building Exterior Contractors	8.35	64.28
2389	Other Specialty Trade Contractors	8.23	72.51
2379	Other Heavy and Civil Engineering Construction	3.94	76.45
4247	Petroleum and Petroleum Products Merchant Wholesalers	2.85	79.30
4842	Specialized Freight Trucking	2.61	81.91
2383	Building Finishing Contractors	2.31	84.22
2371	Utility System Construction	2.20	86.42
4233	Lumber and Other Construction Materials Merchant Wholesalers	1.45	87.87
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1.21	89.08
3273	Cement and Concrete Product Manufacturing	1.13	90.21
3323	Architectural and Structural Metals Manufacturing	1.04	91.25
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.96	92.21
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	0.96	93.17
5413	Architectural, Engineering, and Related Services	0.73	93.90
5617	Services to Buildings and Dwellings	0.58	94.47
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	0.38	94.86
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.38	95.24
3333	Commercial and Service Industry Machinery Manufacturing	0.37	95.61
3353	Electrical Equipment Manufacturing	0.36	95.97
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.33	96.30
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.31	96.61
3351	Electric Lighting Equipment Manufacturing	0.25	96.86
4232	Furniture and Home Furnishing Merchant Wholesalers	0.24	97.10
3359	Other Electrical Equipment and Component Manufacturing	0.24	97.34
3133	Textile and Fabric Finishing and Fabric Coating Mills	0.16	97.49

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NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5619	Other Support Services	0.16	97.65
5416	Management, Scientific, and Technical Consulting Services	0.15	97.80
5612	Facilities Support Services	0.14	97.94
3399	Other Miscellaneous Manufacturing	0.14	98.08
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.13	98.20
3339	Other General Purpose Machinery Manufacturing	0.12	98.32
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	0.12	98.45
5415	Computer Systems Design and Related Services	0.11	98.56
5321	Automotive Equipment Rental and Leasing	0.10	98.66
5616	Investigation and Security Services	0.10	98.76
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.10	98.86
4882	Support Activities for Rail Transportation	0.08	98.94
5629	Remediation and Other Waste Management Services	0.08	99.01
	Balance of industries (67 industry groups)	0.99	100.00
	<i>TOTAL - \$276,730,357</i>		

Source: See Table 2.5.

Appendix D. Individual Modal Administration Tables

Table 2.5.C. Distribution of MAA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Construction

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
2373	Highway, Street, and Bridge Construction	26.44	26.44
2382	Building Equipment Contractors	22.82	49.27
2362	Nonresidential Building Construction	15.39	64.66
5616	Investigation and Security Services	6.49	71.15
4842	Specialized Freight Trucking	4.02	75.17
2381	Foundation, Structure, and Building Exterior Contractors	2.94	78.11
2383	Building Finishing Contractors	2.71	80.82
3323	Architectural and Structural Metals Manufacturing	1.92	82.74
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1.91	84.65
4233	Lumber and Other Construction Materials Merchant Wholesalers	1.70	86.34
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	1.66	88.00
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1.52	89.52
2371	Utility System Construction	1.28	90.79
2389	Other Specialty Trade Contractors	0.87	91.66
5617	Services to Buildings and Dwellings	0.80	92.46
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.70	93.16
3359	Other Electrical Equipment and Component Manufacturing	0.67	93.83
3339	Other General Purpose Machinery Manufacturing	0.65	94.48
5413	Architectural, Engineering, and Related Services	0.56	95.05
3273	Cement and Concrete Product Manufacturing	0.55	95.59
3351	Electric Lighting Equipment Manufacturing	0.52	96.11
5629	Remediation and Other Waste Management Services	0.50	96.61
4884	Support Activities for Road Transportation	0.47	97.08
2123	Nonmetallic Mineral Mining and Quarrying	0.46	97.54
5613	Employment Services	0.38	97.92
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.34	98.27
2379	Other Heavy and Civil Engineering Construction	0.33	98.60
5415	Computer Systems Design and Related Services	0.22	98.81
3399	Other Miscellaneous Manufacturing	0.18	98.99

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NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4247	Petroleum and Petroleum Products Merchant Wholesalers	0.18	99.17
	Balance of industries (44 industry groups)	0.83	100.00
	<i>TOTAL - \$418,259,869</i>		

Source: See Table 2.5.

Appendix D. Individual Modal Administration Tables

Table 2.6.A. Distribution of SHA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: AE-CRS

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5413	Architectural, Engineering, and Related Services	93.03	93.03
5416	Management, Scientific, and Technical Consulting Services	3.87	96.90
5619	Other Support Services	0.94	97.84
5417	Scientific Research and Development Services	0.45	98.29
5415	Computer Systems Design and Related Services	0.39	98.68
5613	Employment Services	0.38	99.06
	Balance of industries (23 industry groups)	0.94	100.00
	<i>TOTAL - \$837,084,884</i>		

Source: See Table 2.6.

Appendix D. Individual Modal Administration Tables

Table 2.6.B. Distribution of MTA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: AE-CRS

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5413	Architectural, Engineering, and Related Services	78.59	78.59
2379	Other Heavy and Civil Engineering Construction	11.89	90.48
5416	Management, Scientific, and Technical Consulting Services	3.83	94.31
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1.65	95.96
6242	Community Food and Housing, and Emergency and Other Relief Services	1.29	97.25
5418	Advertising, Public Relations, and Related Services	0.85	98.10
2373	Highway, Street, and Bridge Construction	0.42	98.52
5417	Scientific Research and Development Services	0.42	98.93
5619	Other Support Services	0.31	99.24
	Balance of industries (12 industry groups)	0.76	100.00
	<i>TOTAL - \$772,302,105</i>		

Source: See Table 2.6.

Appendix D. Individual Modal Administration Tables

Table 2.6.C. Distribution of MAA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: AE-CRS

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5413	Architectural, Engineering, and Related Services	91.04	91.04
5416	Management, Scientific, and Technical Consulting Services	7.33	98.37
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.46	98.82
3231	Printing and Related Support Activities	0.39	99.22
	Balance of industries (7 industry groups)	0.78	100.00
	<i>TOTAL - \$160,300,000</i>		

Source: See Table 2.6.

Appendix D. Individual Modal Administration Tables

Table 2.7.A. Distribution of SHA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Maintenance

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
2373	Highway, Street, and Bridge Construction	29.89	29.89
2382	Building Equipment Contractors	11.68	41.56
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	8.43	49.99
2389	Other Specialty Trade Contractors	6.33	56.32
5617	Services to Buildings and Dwellings	6.20	62.53
2362	Nonresidential Building Construction	5.43	67.96
2379	Other Heavy and Civil Engineering Construction	4.97	72.93
5616	Investigation and Security Services	4.91	77.84
2381	Foundation, Structure, and Building Exterior Contractors	4.43	82.27
4884	Support Activities for Road Transportation	3.43	85.70
4233	Lumber and Other Construction Materials Merchant Wholesalers	2.10	87.80
5613	Employment Services	1.80	89.60
3323	Architectural and Structural Metals Manufacturing	1.31	90.91
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	1.20	92.11
4442	Lawn and Garden Equipment and Supplies Stores	1.19	93.30
5413	Architectural, Engineering, and Related Services	0.72	94.02
4441	Building Material and Supplies Dealers	0.69	94.71
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.63	95.34
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.48	95.82
3273	Cement and Concrete Product Manufacturing	0.40	96.22
4821	Rail Transportation	0.33	96.55
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.32	96.87
2383	Building Finishing Contractors	0.31	97.18
2211	Electric Power Generation, Transmission and Distribution	0.28	97.46
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	0.25	97.70
3342	Communications Equipment Manufacturing	0.18	97.89
4247	Petroleum and Petroleum Products Merchant Wholesalers	0.15	98.03
2371	Utility System Construction	0.13	98.17

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NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.13	98.30
3272	Glass and Glass Product Manufacturing	0.12	98.42
3351	Electric Lighting Equipment Manufacturing	0.10	98.51
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	0.09	98.61
4842	Specialized Freight Trucking	0.09	98.70
5622	Waste Treatment and Disposal	0.08	98.78
3324	Boiler, Tank, and Shipping Container Manufacturing	0.08	98.86
5621	Waste Collection	0.08	98.94
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.08	99.01
	Balance of industries (56 industry groups)	0.99	100.00
	<i>TOTAL - \$164,110,977</i>		

Source: See Table 2.7.

Appendix D. Individual Modal Administration Tables

Table 2.7.B. Distribution of MTA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Maintenance

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3365	Railroad Rolling Stock Manufacturing	62.23	62.23
2382	Building Equipment Contractors	6.12	68.35
4852	Interurban and Rural Bus Transportation	5.51	73.86
4882	Support Activities for Rail Transportation	3.73	77.59
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	2.94	80.53
4851	Urban Transit Systems	2.82	83.35
5617	Services to Buildings and Dwellings	2.18	85.53
5413	Architectural, Engineering, and Related Services	1.83	87.35
2379	Other Heavy and Civil Engineering Construction	1.69	89.05
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	1.68	90.73
4543	Direct Selling Establishments	1.12	91.85
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	1.10	92.95
4411	Automobile Dealers	1.06	94.00
3363	Motor Vehicle Parts Manufacturing	0.96	94.96
7211	Traveler Accommodation	0.78	95.75
2389	Other Specialty Trade Contractors	0.57	96.31
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	0.55	96.86
5416	Management, Scientific, and Technical Consulting Services	0.49	97.35
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.43	97.78
8111	Automotive Repair and Maintenance	0.33	98.11
5616	Investigation and Security Services	0.26	98.37
5415	Computer Systems Design and Related Services	0.22	98.60
2373	Highway, Street, and Bridge Construction	0.14	98.73
5622	Waste Treatment and Disposal	0.13	98.86
4885	Freight Transportation Arrangement	0.12	98.98
5629	Remediation and Other Waste Management Services	0.10	99.08
	Balance of industries (51 industry groups)	0.92	100.00
	<i>TOTAL - \$500,165,936</i>		

Source: See Table 2.7.

Appendix D. Individual Modal Administration Tables

Table 2.7.C. Distribution of MAA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Maintenance

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5616	Investigation and Security Services	22.15	22.15
2389	Other Specialty Trade Contractors	13.03	35.18
4884	Support Activities for Road Transportation	11.46	46.64
5612	Facilities Support Services	10.38	57.02
2382	Building Equipment Contractors	10.21	67.23
2373	Highway, Street, and Bridge Construction	5.61	72.84
3342	Communications Equipment Manufacturing	4.45	77.28
5413	Architectural, Engineering, and Related Services	2.69	79.98
5617	Services to Buildings and Dwellings	2.67	82.65
2362	Nonresidential Building Construction	2.49	85.14
5621	Waste Collection	2.47	87.61
4842	Specialized Freight Trucking	2.33	89.94
4239	Miscellaneous Durable Goods Merchant Wholesalers	1.79	91.73
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	1.39	93.12
4246	Chemical and Allied Products Merchant Wholesalers	1.22	94.34
2381	Foundation, Structure, and Building Exterior Contractors	1.16	95.50
2371	Utility System Construction	0.98	96.48
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.73	97.21
3351	Electric Lighting Equipment Manufacturing	0.63	97.83
3364	Aerospace Product and Parts Manufacturing	0.52	98.35
4881	Support Activities for Air Transportation	0.51	98.86
5415	Computer Systems Design and Related Services	0.37	99.24
	Balance of industries (35 industry groups)	0.76	100.00
<i>TOTAL - \$146,987,464</i>			

Source: See Table 2.7.

Appendix D. Individual Modal Administration Tables

Table 2.8.A. Distribution of SHA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: IT

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5415	Computer Systems Design and Related Services	66.21	66.21
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	12.45	78.66
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	5.79	84.45
3342	Communications Equipment Manufacturing	3.97	88.41
5413	Architectural, Engineering, and Related Services	3.36	91.77
5613	Employment Services	2.35	94.12
3231	Printing and Related Support Activities	2.08	96.20
5416	Management, Scientific, and Technical Consulting Services	1.62	97.83
2382	Building Equipment Contractors	0.71	98.54
5112	Software Publishers	0.33	98.87
5182	Data Processing, Hosting, and Related Services	0.23	99.10
	Balance of industries (14 industry groups)	0.90	100.00
	<i>TOTAL - \$112,389,606</i>		

Source: See Table 2.8.

Appendix D. Individual Modal Administration Tables

Table 2.8.B. Distribution of MTA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: IT

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5415	Computer Systems Design and Related Services	27.18	27.18
3342	Communications Equipment Manufacturing	25.70	52.88
5112	Software Publishers	25.36	78.24
5413	Architectural, Engineering, and Related Services	8.04	86.29
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	7.83	94.12
2379	Other Heavy and Civil Engineering Construction	2.63	96.75
2371	Utility System Construction	1.23	97.98
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.93	98.91
1119	Other Crop Farming	0.54	99.44
	Balance of industries (10 industry groups)	0.56	100.00
	<i>TOTAL - \$16,794,066</i>		

Source: See Table 2.8.

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Table 2.8.C. Distribution of MAA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: IT

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5415	Computer Systems Design and Related Services	27.15	27.15
5112	Software Publishers	25.26	52.41
5413	Architectural, Engineering, and Related Services	25.23	77.64
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	10.67	88.31
2382	Building Equipment Contractors	2.78	91.09
3342	Communications Equipment Manufacturing	1.27	92.37
5172	Wireless Telecommunications Carriers (except Satellite)	1.09	93.45
5613	Employment Services	1.05	94.51
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.81	95.32
3341	Computer and Peripheral Equipment Manufacturing	0.72	96.04
3399	Other Miscellaneous Manufacturing	0.72	96.76
3351	Electric Lighting Equipment Manufacturing	0.72	97.49
8112	Electronic and Precision Equipment Repair and Maintenance	0.72	98.20
4431	Electronics and Appliance Stores	0.55	98.75
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	0.44	99.19
	Balance of industries (8 industry groups)	0.81	100.00
	<i>TOTAL - \$29,777,363</i>		

Source: See Table 2.8.

Appendix D. Individual Modal Administration Tables

Table 2.9.A. Distribution of SHA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Services

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
5613	Employment Services	27.83	27.83
2211	Electric Power Generation, Transmission and Distribution	21.71	49.54
5172	Wireless Telecommunications Carriers (except Satellite)	15.99	65.53
5413	Architectural, Engineering, and Related Services	6.44	71.97
2379	Other Heavy and Civil Engineering Construction	4.40	76.37
5617	Services to Buildings and Dwellings	3.36	79.74
2373	Highway, Street, and Bridge Construction	3.07	82.81
2212	Natural Gas Distribution	3.02	85.83
2382	Building Equipment Contractors	2.80	88.63
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	2.76	91.40
2371	Utility System Construction	2.53	93.92
5419	Other Professional, Scientific, and Technical Services	1.22	95.14
5416	Management, Scientific, and Technical Consulting Services	0.69	95.84
5418	Advertising, Public Relations, and Related Services	0.61	96.45
5111	Newspaper, Periodical, Book, and Directory Publishers	0.50	96.95
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.48	97.43
7211	Traveler Accommodation	0.31	97.74
2389	Other Specialty Trade Contractors	0.30	98.04
5152	Cable and Other Subscription Programming	0.20	98.24
5313	Activities Related to Real Estate	0.19	98.44
5619	Other Support Services	0.15	98.59
6244	Child Day Care Services	0.12	98.71
5112	Software Publishers	0.12	98.82
4884	Support Activities for Road Transportation	0.11	98.93
5615	Travel Arrangement and Reservation Services	0.11	99.04
	Balance of industries (15 industry groups)	1.00	100.00
<i>TOTAL - \$43,445,594</i>			

Source: See Table 2.9.

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Table 2.9.B. Distribution of MTA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Services

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4851	Urban Transit Systems	28.06	28.06
4821	Rail Transportation	22.39	50.45
4859	Other Transit and Ground Passenger Transportation	16.21	66.66
4543	Direct Selling Establishments	3.02	69.68
4247	Petroleum and Petroleum Products Merchant Wholesalers	2.73	72.41
3365	Railroad Rolling Stock Manufacturing	2.63	75.04
4853	Taxi and Limousine Service	2.49	77.53
5413	Architectural, Engineering, and Related Services	2.47	80.00
5415	Computer Systems Design and Related Services	2.35	82.35
5418	Advertising, Public Relations, and Related Services	1.89	84.24
5615	Travel Arrangement and Reservation Services	1.72	85.96
5242	Agencies, Brokerages, and Other Insurance Related Activities	1.36	87.33
4855	Charter Bus Industry	1.20	88.53
5416	Management, Scientific, and Technical Consulting Services	1.18	89.71
4852	Interurban and Rural Bus Transportation	1.06	90.77
2382	Building Equipment Contractors	1.04	91.81
5241	Insurance Carriers	1.03	92.84
5419	Other Professional, Scientific, and Technical Services	0.91	93.75
8111	Automotive Repair and Maintenance	0.63	94.39
5617	Services to Buildings and Dwellings	0.60	94.99
5619	Other Support Services	0.53	95.51
3342	Communications Equipment Manufacturing	0.51	96.03
5221	Depository Credit Intermediation	0.46	96.48
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	0.42	96.90
5613	Employment Services	0.28	97.18
5313	Activities Related to Real Estate	0.24	97.43
4461	Health and Personal Care Stores	0.17	97.59
4411	Automobile Dealers	0.16	97.75
2211	Electric Power Generation, Transmission and Distribution	0.14	97.89
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	0.14	98.03

Appendix D. Individual Modal Administration Tables

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
8139	Business, Professional, Labor, Political, and Similar Organizations	0.13	98.16
5311	Lessors of Real Estate	0.12	98.29
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.11	98.40
4413	Automotive Parts, Accessories, and Tire Stores	0.10	98.50
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.10	98.60
2362	Nonresidential Building Construction	0.09	98.69
9999	Services of public entities	0.07	98.76
6216	Home Health Care Services	0.07	98.83
3353	Electrical Equipment Manufacturing	0.06	98.88
4884	Support Activities for Road Transportation	0.05	98.94
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	0.05	98.98
2381	Foundation, Structure, and Building Exterior Contractors	0.05	99.03
	Balance of industries (100 industry groups)	0.97	100.00
	<i>TOTAL - \$1,062,609,167</i>		

Source: See Table 2.9.

Appendix D. Individual Modal Administration Tables

Table 2.9.C. Distribution of MAA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: Services

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
4859	Other Transit and Ground Passenger Transportation	46.63	46.63
4247	Petroleum and Petroleum Products Merchant Wholesalers	23.64	70.26
4853	Taxi and Limousine Service	12.35	82.62
5416	Management, Scientific, and Technical Consulting Services	9.90	92.52
5418	Advertising, Public Relations, and Related Services	3.88	96.40
5415	Computer Systems Design and Related Services	0.65	97.05
5617	Services to Buildings and Dwellings	0.59	97.64
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	0.40	98.04
5413	Architectural, Engineering, and Related Services	0.31	98.35
5613	Employment Services	0.30	98.65
7223	Special Food Services	0.20	98.85
5414	Specialized Design Services	0.18	99.03
	Balance of industries (21 industry groups)	0.97	100.00
	<i>TOTAL - \$83,209,589</i>		

Source: See Table 2.9.

Appendix D. Individual Modal Administration Tables

Table 2.10.A. Distribution of SHA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: CSE

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3342	Communications Equipment Manufacturing	43.94	43.94
5415	Computer Systems Design and Related Services	6.86	50.80
3273	Cement and Concrete Product Manufacturing	5.62	56.41
2382	Building Equipment Contractors	4.81	61.23
3399	Other Miscellaneous Manufacturing	4.50	65.73
4411	Automobile Dealers	3.90	69.63
2123	Nonmetallic Mineral Mining and Quarrying	2.93	72.56
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	2.90	75.46
5172	Wireless Telecommunications Carriers (except Satellite)	1.85	77.31
4233	Lumber and Other Construction Materials Merchant Wholesalers	1.85	79.16
3323	Architectural and Structural Metals Manufacturing	1.75	80.91
4441	Building Material and Supplies Dealers	1.72	82.63
6213	Offices of Other Health Practitioners	1.46	84.09
4889	Other Support Activities for Transportation	1.29	85.39
5111	Newspaper, Periodical, Book, and Directory Publishers	1.20	86.59
3331	Agriculture, Construction, and Mining Machinery Manufacturing	1.12	87.71
8111	Automotive Repair and Maintenance	1.07	88.78
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	1.05	89.83
5171	Wired Telecommunications Carriers	0.87	90.70
3333	Commercial and Service Industry Machinery Manufacturing	0.74	91.44
3272	Glass and Glass Product Manufacturing	0.74	92.18
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.73	92.91
3351	Electric Lighting Equipment Manufacturing	0.70	93.61
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	0.67	94.28
5612	Facilities Support Services	0.56	94.84
4246	Chemical and Allied Products Merchant Wholesalers	0.55	95.40
3339	Other General Purpose Machinery Manufacturing	0.55	95.95
3231	Printing and Related Support Activities	0.50	96.44
5321	Automotive Equipment Rental and Leasing	0.48	96.93

Appendix D. Individual Modal Administration Tables

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3329	Other Fabricated Metal Product Manufacturing	0.44	97.37
3241	Petroleum and Coal Products Manufacturing	0.41	97.78
2373	Highway, Street, and Bridge Construction	0.30	98.07
2212	Natural Gas Distribution	0.19	98.27
3219	Other Wood Product Manufacturing	0.17	98.44
8112	Electronic and Precision Equipment Repair and Maintenance	0.16	98.60
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	0.15	98.75
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.15	98.90
5112	Software Publishers	0.13	99.03
	Balance of industries (14 industry groups)	0.97	100.00
	<i>TOTAL - \$67,362,083</i>		

Source: See Table 2.10.

Appendix D. Individual Modal Administration Tables

Table 2.10.B. Distribution of MTA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: CSE

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3361	Motor Vehicle Manufacturing	55.17	55.17
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	7.24	62.40
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	6.76	69.16
4247	Petroleum and Petroleum Products Merchant Wholesalers	5.86	75.02
3365	Railroad Rolling Stock Manufacturing	2.92	77.94
5415	Computer Systems Design and Related Services	2.43	80.38
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	1.73	82.10
3342	Communications Equipment Manufacturing	1.53	83.64
5112	Software Publishers	1.38	85.02
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	1.35	86.37
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1.13	87.51
8111	Automotive Repair and Maintenance	1.05	88.56
3353	Electrical Equipment Manufacturing	0.89	89.45
3363	Motor Vehicle Parts Manufacturing	0.75	90.20
5413	Architectural, Engineering, and Related Services	0.56	90.76
4882	Support Activities for Rail Transportation	0.56	91.32
3331	Agriculture, Construction, and Mining Machinery Manufacturing	0.53	91.85
3261	Plastics Product Manufacturing	0.48	92.33
2373	Highway, Street, and Bridge Construction	0.47	92.80
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	0.44	93.24
5616	Investigation and Security Services	0.41	93.65
4859	Other Transit and Ground Passenger Transportation	0.41	94.06
3359	Other Electrical Equipment and Component Manufacturing	0.38	94.44
2382	Building Equipment Contractors	0.38	94.82
3231	Printing and Related Support Activities	0.36	95.18
4413	Automotive Parts, Accessories, and Tire Stores	0.35	95.54
3323	Architectural and Structural Metals Manufacturing	0.34	95.87
2212	Natural Gas Distribution	0.31	96.18
3329	Other Fabricated Metal Product Manufacturing	0.28	96.46

Appendix D. Individual Modal Administration Tables

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3311	Iron and Steel Mills and Ferroalloy Manufacturing	0.27	96.73
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.25	96.98
5617	Services to Buildings and Dwellings	0.18	97.15
4481	Clothing Stores	0.17	97.33
4884	Support Activities for Road Transportation	0.16	97.49
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	0.14	97.62
3241	Petroleum and Coal Products Manufacturing	0.13	97.76
4246	Chemical and Allied Products Merchant Wholesalers	0.13	97.89
4241	Paper and Paper Product Merchant Wholesalers	0.12	98.01
5172	Wireless Telecommunications Carriers (except Satellite)	0.11	98.12
2362	Nonresidential Building Construction	0.10	98.22
3335	Metalworking Machinery Manufacturing	0.10	98.32
3351	Electric Lighting Equipment Manufacturing	0.09	98.41
4233	Lumber and Other Construction Materials Merchant Wholesalers	0.08	98.49
3344	Semiconductor and Other Electronic Component Manufacturing	0.08	98.57
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	0.08	98.65
5179	Other Telecommunications	0.07	98.72
2389	Other Specialty Trade Contractors	0.07	98.79
4239	Miscellaneous Durable Goods Merchant Wholesalers	0.06	98.85
3321	Forging and Stamping	0.06	98.91
4851	Urban Transit Systems	0.06	98.97
3399	Other Miscellaneous Manufacturing	0.06	99.03
	Balance of industries (43 industry groups)	0.96	100.00
<i>TOTAL - \$320,577,433</i>			

Source: See Table 2.10.

Appendix D. Individual Modal Administration Tables

Table 2.10.C. Distribution of MAA Contract and Subcontract Dollars Awarded by Industry Group, State Fiscal Years 2010-2014: CSE

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
3259	Other Chemical Product and Preparation Manufacturing	20.07	20.07
2382	Building Equipment Contractors	14.36	34.42
2212	Natural Gas Distribution	8.90	43.32
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	7.71	51.02
3361	Motor Vehicle Manufacturing	4.87	55.90
3351	Electric Lighting Equipment Manufacturing	4.12	60.02
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	3.82	63.84
4233	Lumber and Other Construction Materials Merchant Wholesalers	3.81	67.65
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	3.64	71.28
5413	Architectural, Engineering, and Related Services	3.50	74.79
5172	Wireless Telecommunications Carriers (except Satellite)	3.17	77.96
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	3.15	81.11
3331	Agriculture, Construction, and Mining Machinery Manufacturing	2.98	84.09
5415	Computer Systems Design and Related Services	1.84	85.93
5321	Automotive Equipment Rental and Leasing	1.54	87.47
4239	Miscellaneous Durable Goods Merchant Wholesalers	1.37	88.84
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	1.08	89.92
3342	Communications Equipment Manufacturing	0.91	90.83
4247	Petroleum and Petroleum Products Merchant Wholesalers	0.81	91.65
4246	Chemical and Allied Products Merchant Wholesalers	0.79	92.43
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	0.61	93.04
4413	Automotive Parts, Accessories, and Tire Stores	0.58	93.63
4411	Automobile Dealers	0.49	94.11
4481	Clothing Stores	0.44	94.55
6219	Other Ambulatory Health Care Services	0.39	94.94
2362	Nonresidential Building Construction	0.33	95.28
2383	Building Finishing Contractors	0.31	95.59
3262	Rubber Product Manufacturing	0.30	95.89

Appendix D. Individual Modal Administration Tables

NAICS Industry Group	NAICS Description	Percentage	Cumulative Percentage
2381	Foundation, Structure, and Building Exterior Contractors	0.29	96.18
5221	Depository Credit Intermediation	0.26	96.44
8111	Automotive Repair and Maintenance	0.25	96.69
3341	Computer and Peripheral Equipment Manufacturing	0.23	96.92
3353	Electrical Equipment Manufacturing	0.23	97.15
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	0.21	97.35
3323	Architectural and Structural Metals Manufacturing	0.20	97.56
4232	Furniture and Home Furnishing Merchant Wholesalers	0.20	97.75
2123	Nonmetallic Mineral Mining and Quarrying	0.19	97.94
4881	Support Activities for Air Transportation	0.17	98.11
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	0.16	98.27
5613	Employment Services	0.15	98.42
5242	Agencies, Brokerages, and Other Insurance Related Activities	0.13	98.55
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	0.12	98.67
5112	Software Publishers	0.11	98.78
2389	Other Specialty Trade Contractors	0.11	98.88
5615	Travel Arrangement and Reservation Services	0.09	98.97
4422	Home Furnishings Stores	0.09	99.06
	Balance of industries (23 industry groups)	0.94	100.00
	<i>TOTAL - \$52,645,519</i>		

Source: See Table 2.10.

Appendix D. Individual Modal Administration Tables

Table 3.1.A. Construction—Number of Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	819	53.33	53.33
2381	Foundation, Structure, and Building Exterior Contractors	1,779	9.12	62.45
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	5.98	68.43
2382	Building Equipment Contractors	9,283	5.61	74.05
2389	Other Specialty Trade Contractors	5,579	4.09	78.14
4842	Specialized Freight Trucking	255	2.98	81.12
2383	Building Finishing Contractors	3,886	2.21	83.33
2379	Other Heavy and Civil Engineering Construction	230	1.84	85.17
4233	Lumber and Other Construction Materials Merchant Wholesalers	946	1.50	86.67
3351	Electric Lighting Equipment Manufacturing	57	1.38	88.05
2362	Nonresidential Building Construction	2,462	1.37	89.42
5413	Architectural, Engineering, and Related Services	5,696	1.20	90.62
5617	Services to Buildings and Dwellings	4,050	1.19	91.81
2371	Utility System Construction	424	1.10	92.91
5619	Other Support Services	66,060	0.96	93.88
3273	Cement and Concrete Product Manufacturing	216	0.93	94.81
3323	Architectural and Structural Metals Manufacturing	206	0.76	95.57
4889	Other Support Activities for Transportation	2,373	0.75	96.33
4235	Metal and Mineral (except Petroleum) Merchant Whlse	209	0.60	96.93
3359	Other Electrical Equipment and Component Manufacturing	195	0.39	97.32
4539	Other Miscellaneous Store Retailers	3,412	0.31	97.63
2123	Nonmetallic Mineral Mining and Quarrying	14	0.31	97.94
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	986	0.21	98.14
4821	Rail Transportation	38	0.21	98.35
4442	Lawn and Garden Equipment and Supplies Stores	320	0.21	98.56
3342	Communications Equipment Manufacturing	76	0.18	98.74
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	855	0.18	98.92
4543	Direct Selling Establishments	249	0.14	99.07
3399	Other Miscellaneous Manufacturing	482	0.14	99.21
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	31	0.14	99.35
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	0.13	99.47
5613	Employment Services	820	0.12	99.60
3311	Iron and Steel Mills and Ferroalloy Manufacturing	34	0.11	99.70
4884	Support Activities for Road Transportation	181	0.09	99.80
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	195	0.05	99.85
3255	Paint, Coating, and Adhesive Manufacturing	43	0.05	99.90
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	272	0.05	99.95
5415	Computer Systems Design and Related Services	8,755	0.05	100.00

Source and Notes: See Table 3.1.

Appendix D. Individual Modal Administration Tables

Table 3.1.B. Construction—Number of Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2362	Nonresidential Building Construction	2,462	25.23	25.23
2382	Building Equipment Contractors	9,358	21.66	46.89
2373	Highway, Street, and Bridge Construction	819	9.59	56.48
2381	Foundation, Structure, and Building Exterior Contractors	1,991	8.42	64.89
2389	Other Specialty Trade Contractors	5,579	8.31	73.20
2379	Other Heavy and Civil Engineering Construction	230	3.98	77.18
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	2.88	80.06
4842	Specialized Freight Trucking	255	2.64	82.70
2383	Building Finishing Contractors	4,080	2.26	84.96
2371	Utility System Construction	341	2.22	87.18
4233	Lumber and Other Construction Materials Merchant Wholesalers	946	1.47	88.64
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	600	1.18	89.82
3273	Cement and Concrete Product Manufacturing	171	1.14	90.96
3323	Architectural and Structural Metals Manufacturing	152	1.01	91.97
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,452	0.97	92.93
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	209	0.97	93.90
5413	Architectural, Engineering, and Related Services	5,696	0.67	94.57
5617	Services to Buildings and Dwellings	7,805	0.58	95.15
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	611	0.39	95.54
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.39	95.92
3333	Commercial and Service Industry Machinery Manufacturing	106	0.38	96.30
3353	Electrical Equipment Manufacturing	15	0.36	96.66
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	123	0.33	96.99
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	0.29	97.28
3351	Electric Lighting Equipment Manufacturing	57	0.25	97.53
3359	Other Electrical Equipment and Component Manufacturing	213	0.24	97.77
4232	Furniture and Home Furnishing Merchant Wholesalers	431	0.23	98.00
3133	Textile and Fabric Finishing and Fabric Coating Mills	12	0.16	98.16
5619	Other Support Services	66,060	0.16	98.32
5416	Management, Scientific, and Technical Consulting Services	16,376	0.15	98.47
5612	Facilities Support Services	333	0.14	98.61
3399	Other Miscellaneous Manufacturing	482	0.14	98.75
3339	Other General Purpose Machinery Manufacturing	23	0.12	98.87
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	149	0.12	98.99
5415	Computer Systems Design and Related Services	9,212	0.11	99.11
5321	Automotive Equipment Rental and Leasing	436	0.10	99.21
5616	Investigation and Security Services	1,282	0.10	99.31

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	272	0.09	99.40
4882	Support Activities for Rail Transportation	311	0.08	99.48
3391	Medical Equipment and Supplies Manufacturing	125	0.07	99.55
5242	Agencies, Brokerages, and Other Insurance Related Activities	4,733	0.07	99.63
4441	Building Material and Supplies Dealers	385	0.06	99.69
4821	Rail Transportation	38	0.06	99.75
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	139	0.06	99.81
5222	Nondepository Credit Intermediation	322	0.05	99.86
3363	Motor Vehicle Parts Manufacturing	43	0.05	99.91
2361	Residential Building Construction	10,603	0.05	99.96
2123	Nonmetallic Mineral Mining and Quarrying	14	0.04	100.00

Source and Notes: *See* Table 3.1.

Appendix D. Individual Modal Administration Tables

Table 3.1.C. Construction—Number of Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	819	26.70	26.70
2382	Building Equipment Contractors	9,358	23.04	49.74
2362	Nonresidential Building Construction	2,462	15.54	65.28
5616	Investigation and Security Services	1,632	6.55	71.83
4842	Specialized Freight Trucking	255	4.05	75.88
2381	Foundation, Structure, and Building Exterior Contractors	3,843	2.95	78.84
2383	Building Finishing Contractors	5,051	2.68	81.51
3323	Architectural and Structural Metals Manufacturing	127	1.90	83.41
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	271	1.87	85.29
4233	Lumber and Other Construction Materials Merchant Wholesalers	946	1.71	87.00
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	629	1.66	88.66
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	5	1.53	90.19
2371	Utility System Construction	341	1.29	91.48
2389	Other Specialty Trade Contractors	5,579	0.88	92.36
5617	Services to Buildings and Dwellings	4,050	0.78	93.14
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.70	93.84
3359	Other Electrical Equipment and Component Manufacturing	195	0.67	94.51
3339	Other General Purpose Machinery Manufacturing	9	0.66	95.17
5413	Architectural, Engineering, and Related Services	5,696	0.56	95.72
3273	Cement and Concrete Product Manufacturing	106	0.52	96.24
3351	Electric Lighting Equipment Manufacturing	28	0.51	96.75
4884	Support Activities for Road Transportation	181	0.48	97.23
5629	Remediation and Other Waste Management Services	65	0.47	97.70
2123	Nonmetallic Mineral Mining and Quarrying	14	0.47	98.17
5613	Employment Services	820	0.38	98.55
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	199	0.34	98.89
2379	Other Heavy and Civil Engineering Construction	230	0.33	99.23
5415	Computer Systems Design and Related Services	6,650	0.22	99.44
3399	Other Miscellaneous Manufacturing	482	0.18	99.63
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	0.18	99.80
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	14	0.10	99.91
4543	Direct Selling Establishments	249	0.09	100.00

Source and Notes: See Table 3.1.

Appendix D. Individual Modal Administration Tables

Table 3.2.A. AE-CRS—Number of Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	10,060	93.85	93.85
5416	Management, Scientific, and Technical Consulting Services	877	3.74	97.59
5619	Other Support Services	66,060	0.95	98.54
5417	Scientific Research and Development Services	1,421	0.45	98.99
5613	Employment Services	820	0.38	99.37
5415	Computer Systems Design and Related Services	8,755	0.34	99.71
2373	Highway, Street, and Bridge Construction	819	0.29	100.00

Source and Notes: *See* Table 3.2.

Appendix D. Individual Modal Administration Tables

Table 3.2.B. AE-CRS—Number of Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	9,482	79.06	79.06
2379	Other Heavy and Civil Engineering Construction	230	12.01	91.06
5416	Management, Scientific, and Technical Consulting Services	38,995	3.75	94.82
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	61	1.66	96.48
6242	Community Food and Housing, and Emergency and Other Relief Services	11	1.31	97.78
5418	Advertising, Public Relations, and Related Services	653	0.83	98.61
2373	Highway, Street, and Bridge Construction	819	0.42	99.04
5417	Scientific Research and Development Services	1,421	0.42	99.46
5619	Other Support Services	66,060	0.32	99.77
5415	Computer Systems Design and Related Services	8,755	0.23	100.00

Source and Notes: See Table 3.2.

Appendix D. Individual Modal Administration Tables

Table 3.2.C. AE-CRS—Number of Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	7,357	91.89	91.89
5416	Management, Scientific, and Technical Consulting Services	36,537	6.88	98.78
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	0.46	99.24
3231	Printing and Related Support Activities	1,359	0.40	99.64
2382	Building Equipment Contractors	3,845	0.36	100.00

Source and Notes: *See* Table 3.2.

Appendix D. Individual Modal Administration Tables

Table 3.3.A. Maintenance—Number of Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	819	30.18	30.18
2382	Building Equipment Contractors	9,358	11.79	41.97
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	195	8.49	50.46
2389	Other Specialty Trade Contractors	5,579	6.39	56.84
5617	Services to Buildings and Dwellings	7,805	6.27	63.11
2362	Nonresidential Building Construction	2,613	5.48	68.59
2379	Other Heavy and Civil Engineering Construction	230	5.02	73.61
5616	Investigation and Security Services	1,632	4.95	78.57
2381	Foundation, Structure, and Building Exterior Contractors	2,565	4.44	83.01
4884	Support Activities for Road Transportation	181	3.46	86.47
4233	Lumber and Other Construction Materials Merchant Wholesalers	946	2.12	88.59
5613	Employment Services	2,016	1.82	90.41
3323	Architectural and Structural Metals Manufacturing	206	1.31	91.72
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	209	1.21	92.93
4442	Lawn and Garden Equipment and Supplies Stores	320	1.20	94.13
5413	Architectural, Engineering, and Related Services	5,415	0.69	94.82
4441	Building Material and Supplies Dealers	1,503	0.68	95.51
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	584	0.62	96.12
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	986	0.49	96.61
3273	Cement and Concrete Product Manufacturing	97	0.35	96.96
4821	Rail Transportation	38	0.33	97.29
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	0.30	97.59
2383	Building Finishing Contractors	3,886	0.30	97.89
2211	Electric Power Generation, Transmission and Distribution	311	0.27	98.15
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	53	0.25	98.40
3342	Communications Equipment Manufacturing	76	0.19	98.59
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	0.15	98.74
2371	Utility System Construction	341	0.13	98.87
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	471	0.13	99.00
3272	Glass and Glass Product Manufacturing	47	0.12	99.12
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	858	0.10	99.22
4842	Specialized Freight Trucking	255	0.09	99.31
3324	Boiler, Tank, and Shipping Container Manufacturing	4	0.08	99.39
5621	Waste Collection	77	0.08	99.47
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.08	99.55
5619	Other Support Services	66,060	0.07	99.62
5241	Insurance Carriers	305	0.07	99.69
5311	Lessors of Real Estate	798	0.06	99.75

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3351	Electric Lighting Equipment Manufacturing	29	0.06	99.81
3311	Iron and Steel Mills and Ferroalloy Manufacturing	34	0.05	99.86
3261	Plastics Product Manufacturing	129	0.05	99.91
5622	Waste Treatment and Disposal	103	0.05	99.95
8123	Drycleaning and Laundry Services	329	0.05	100.00

Source and Notes: *See* Table 3.3.

Appendix D. Individual Modal Administration Tables

Table 3.3.B. Maintenance—Number of Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3365	Railroad Rolling Stock Manufacturing	13	62.84	62.84
2382	Building Equipment Contractors	9,358	6.18	69.02
4852	Interurban and Rural Bus Transportation	32	5.57	74.59
4882	Support Activities for Rail Transportation	311	3.77	78.36
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	2.95	81.31
4851	Urban Transit Systems	44	2.85	84.16
5617	Services to Buildings and Dwellings	7,805	2.19	86.35
5413	Architectural, Engineering, and Related Services	5,415	1.82	88.17
2379	Other Heavy and Civil Engineering Construction	230	1.71	89.88
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	710	1.70	91.58
4543	Direct Selling Establishments	249	1.13	92.71
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	858	1.11	93.82
4411	Automobile Dealers	1,352	1.07	94.88
3363	Motor Vehicle Parts Manufacturing	43	0.96	95.84
7211	Traveler Accommodation	2,275	0.79	96.63
2389	Other Specialty Trade Contractors	956	0.57	97.20
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	600	0.55	97.75
5416	Management, Scientific, and Technical Consulting Services	700	0.45	98.20
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,015	0.38	98.59
8111	Automotive Repair and Maintenance	1,984	0.32	98.90
5616	Investigation and Security Services	831	0.24	99.15
5415	Computer Systems Design and Related Services	8,755	0.16	99.31
2373	Highway, Street, and Bridge Construction	819	0.14	99.45
5622	Waste Treatment and Disposal	103	0.13	99.58
4885	Freight Transportation Arrangement	648	0.12	99.70
5629	Remediation and Other Waste Management Services	22	0.10	99.80
2381	Foundation, Structure, and Building Exterior Contractors	840	0.07	99.87
5613	Employment Services	820	0.06	99.94
4859	Other Transit and Ground Passenger Transportation	290	0.06	100.00

Source and Notes: See Table 3.3.

Appendix D. Individual Modal Administration Tables

Table 3.3.C. Maintenance—Number of Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5616	Investigation and Security Services	1632	22.35	22.35
2389	Other Specialty Trade Contractors	956	13.06	35.41
4884	Support Activities for Road Transportation	181	11.56	46.97
5612	Facilities Support Services	333	10.47	57.44
2382	Building Equipment Contractors	9,358	10.30	67.74
2373	Highway, Street, and Bridge Construction	819	5.66	73.40
3342	Communications Equipment Manufacturing	195	4.47	77.88
5413	Architectural, Engineering, and Related Services	5,696	2.71	80.58
5617	Services to Buildings and Dwellings	4,901	2.61	83.19
2362	Nonresidential Building Construction	2,462	2.52	85.71
5621	Waste Collection	77	2.49	88.20
4842	Specialized Freight Trucking	255	2.35	90.55
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	1.81	92.36
4246	Chemical and Allied Products Merchant Wholesalers	201	1.23	93.59
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	199	1.22	94.81
2381	Foundation, Structure, and Building Exterior Contractors	1,702	1.17	95.98
2371	Utility System Construction	341	0.98	96.97
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	369	0.64	97.61
3351	Electric Lighting Equipment Manufacturing	29	0.63	98.24
3364	Aerospace Product and Parts Manufacturing	46	0.52	98.76
4881	Support Activities for Air Transportation	79	0.52	99.28
5415	Computer Systems Design and Related Services	15,405	0.38	99.66
5222	Nondepository Credit Intermediation	79	0.21	99.87
8111	Automotive Repair and Maintenance	3,937	0.13	100.00

Source and Notes: See Table 3.3.

Appendix D. Individual Modal Administration Tables

Table 3.4.A. IT—Number of Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	15,405	66.72	66.72
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	369	12.50	79.23
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	586	5.84	85.07
3342	Communications Equipment Manufacturing	195	3.95	89.02
5413	Architectural, Engineering, and Related Services	7,060	3.39	92.40
5613	Employment Services	820	2.37	94.78
3231	Printing and Related Support Activities	1,359	2.10	96.88
5416	Management, Scientific, and Technical Consulting Services	15,853	1.64	98.52
2382	Building Equipment Contractors	3,845	0.63	99.15
5112	Software Publishers	1,145	0.33	99.48
5182	Data Processing, Hosting, and Related Services	1,171	0.23	99.71
2389	Other Specialty Trade Contractors	4,623	0.19	99.89
3351	Electric Lighting Equipment Manufacturing	29	0.11	100.00
5415	Computer Systems Design and Related Services	15,405	66.72	66.72
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	369	12.50	79.23
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	586	5.84	85.07
3342	Communications Equipment Manufacturing	195	3.95	89.02
5413	Architectural, Engineering, and Related Services	7,060	3.39	92.40
5613	Employment Services	820	2.37	94.78
3231	Printing and Related Support Activities	1,359	2.10	96.88
5416	Management, Scientific, and Technical Consulting Services	15,853	1.64	98.52
2382	Building Equipment Contractors	3,845	0.63	99.15
5112	Software Publishers	1,145	0.33	99.48
5182	Data Processing, Hosting, and Related Services	1,171	0.23	99.71
2389	Other Specialty Trade Contractors	4,623	0.19	99.89
3351	Electric Lighting Equipment Manufacturing	29	0.11	100.00

Source and Notes: See Table 3.4.

Appendix D. Individual Modal Administration Tables

Table 3.4.B. IT—Number of Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	15,405	27.33	27.33
3342	Communications Equipment Manufacturing	195	25.84	53.18
5112	Software Publishers	1,145	25.51	78.68
5413	Architectural, Engineering, and Related Services	5,415	8.09	86.77
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	600	7.87	94.64
2379	Other Heavy and Civil Engineering Construction	230	2.65	97.29
2371	Utility System Construction	83	1.24	98.53
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	584	0.93	99.46
1119	Other Crop Farming	3,182	0.54	100.00

Source and Notes: *See Table 3.4.*

Appendix D. Individual Modal Administration Tables

Table 3.4.C. IT—Number of Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	15,862	27.40	27.40
5112	Software Publishers	1,145	25.50	52.90
5413	Architectural, Engineering, and Related Services	5,415	25.47	78.37
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	586	10.77	89.14
2382	Building Equipment Contractors	3,845	2.81	91.94
3342	Communications Equipment Manufacturing	195	1.28	93.23
5172	Wireless Telecommunications Carriers (except Satellite)	668	1.10	94.32
5613	Employment Services	1,196	1.06	95.38
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	369	0.82	96.20
3399	Other Miscellaneous Manufacturing	482	0.73	96.93
3351	Electric Lighting Equipment Manufacturing	29	0.73	97.66
8112	Electronic and Precision Equipment Repair and Maintenance	631	0.68	98.34
3341	Computer and Peripheral Equipment Manufacturing	141	0.66	99.00
4431	Electronics and Appliance Stores	2,498	0.55	99.55
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	52	0.45	100.00

Source and Notes: See Table 3.4.

Appendix D. Individual Modal Administration Tables

Table 3.5.A. Services—Number of Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5613	Employment Services	2,016	28.09	28.09
2211	Electric Power Generation, Transmission and Distribution	351	21.92	50.01
5172	Wireless Telecommunications Carriers (except Satellite)	668	16.14	66.15
5413	Architectural, Engineering, and Related Services	5,415	6.50	72.65
2379	Other Heavy and Civil Engineering Construction	230	4.45	77.10
5617	Services to Buildings and Dwellings	4,050	3.40	80.50
2373	Highway, Street, and Bridge Construction	819	3.10	83.60
2212	Natural Gas Distribution	71	3.05	86.65
2382	Building Equipment Contractors	3,845	2.83	89.47
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	309	2.79	92.27
2371	Utility System Construction	424	2.55	94.82
5419	Other Professional, Scientific, and Technical Services	15,188	1.23	96.05
5418	Advertising, Public Relations, and Related Services	197	0.62	96.67
5416	Management, Scientific, and Technical Consulting Services	20,684	0.62	97.29
5111	Newspaper, Periodical, Book, and Directory Publishers	391	0.50	97.79
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	139	0.49	98.28
7211	Traveler Accommodation	2,275	0.31	98.59
2389	Other Specialty Trade Contractors	956	0.30	98.89
5152	Cable and Other Subscription Programming	220	0.20	99.10
5313	Activities Related to Real Estate	670	0.20	99.29
5619	Other Support Services	66,060	0.15	99.45
5112	Software Publishers	1,145	0.12	99.56
6244	Child Day Care Services	5,914	0.12	99.68
5615	Travel Arrangement and Reservation Services	2,156	0.11	99.79

Source and Notes: See Table 3.4.

Appendix D. Individual Modal Administration Tables

Table 3.5.B. Services—Number of Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4851	Urban Transit Systems	44	28.34	28.34
4821	Rail Transportation	38	22.61	50.95
4859	Other Transit and Ground Passenger Transportation	290	16.37	67.32
4543	Direct Selling Establishments	249	3.04	70.37
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	2.75	73.12
3365	Railroad Rolling Stock Manufacturing	13	2.66	75.78
4853	Taxi and Limousine Service	1,031	2.51	78.29
5413	Architectural, Engineering, and Related Services	7,060	2.49	80.79
5415	Computer Systems Design and Related Services	15,862	2.37	83.16
5418	Advertising, Public Relations, and Related Services	850	1.86	85.02
5615	Travel Arrangement and Reservation Services	110	1.74	86.76
5242	Agencies, Brokerages, and Other Insurance Related Activities	4,793	1.38	88.14
4855	Charter Bus Industry	104	1.21	89.35
5416	Management, Scientific, and Technical Consulting Services	18,704	1.18	90.53
4852	Interurban and Rural Bus Transportation	32	1.07	91.59
2382	Building Equipment Contractors	9,283	1.05	92.64
5241	Insurance Carriers	173	1.04	93.69
5419	Other Professional, Scientific, and Technical Services	16,085	0.92	94.61
5617	Services to Buildings and Dwellings	7,805	0.61	95.21
8111	Automotive Repair and Maintenance	4,708	0.59	95.81
5619	Other Support Services	66,060	0.53	96.34
3342	Communications Equipment Manufacturing	195	0.51	96.84
5221	Depository Credit Intermediation	2,759	0.46	97.31
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	559	0.42	97.72
5613	Employment Services	2,016	0.29	98.01
5313	Activities Related to Real Estate	3,606	0.24	98.25
4461	Health and Personal Care Stores	1,714	0.17	98.42
4411	Automobile Dealers	1,352	0.16	98.58
2211	Electric Power Generation, Transmission and Distribution	311	0.15	98.73
8139	Business, Professional, Labor, Political, and Similar Organizations	667	0.13	98.85
5311	Lessors of Real Estate	798	0.13	98.98
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,181	0.12	99.10
4413	Automotive Parts, Accessories, and Tire Stores	1,437	0.10	99.21
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	52	0.10	99.30
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	0.09	99.40
2362	Nonresidential Building Construction	2,462	0.09	99.49
6216	Home Health Care Services	1,253	0.07	99.55
4884	Support Activities for Road Transportation	1,051	0.05	99.61
3231	Printing and Related Support Activities	1,359	0.05	99.65
5182	Data Processing, Hosting, and Related Services	1,171	0.04	99.70
5179	Other Telecommunications	542	0.04	99.74

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2381	Foundation, Structure, and Building Exterior Contractors	175	0.04	99.78
3363	Motor Vehicle Parts Manufacturing	43	0.03	99.81
3262	Rubber Product Manufacturing	11	0.03	99.84
3351	Electric Lighting Equipment Manufacturing	29	0.03	99.87
5616	Investigation and Security Services	801	0.03	99.90
5611	Office Administrative Services	5,740	0.03	99.93

Source and Notes: *See* Table 3.4.

Appendix D. Individual Modal Administration Tables

Table 3.5.C. Services—Number of Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
4859	Other Transit and Ground Passenger Transportation	290	47.06	47.06
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	23.86	70.92
4853	Taxi and Limousine Service	692	12.47	83.39
5416	Management, Scientific, and Technical Consulting Services	18,134	9.99	93.38
5418	Advertising, Public Relations, and Related Services	921	3.92	97.30
5415	Computer Systems Design and Related Services	8,755	0.65	97.96
5617	Services to Buildings and Dwellings	3,755	0.60	98.55
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	369	0.34	98.89
5613	Employment Services	820	0.30	99.20
5413	Architectural, Engineering, and Related Services	281	0.25	99.44
7223	Special Food Services	1,303	0.20	99.64
5414	Specialized Design Services	1,999	0.18	99.82
5242	Agencies, Brokerages, and Other Insurance Related Activities	4,733	0.18	100.00

Source and Notes: See Table 3.5.

Appendix D. Individual Modal Administration Tables

Table 3.6.A. CSE—Number of Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3342	Communications Equipment Manufacturing	76	44.35	44.35
5415	Computer Systems Design and Related Services	8,755	6.92	51.28
3273	Cement and Concrete Product Manufacturing	79	5.65	56.93
2382	Building Equipment Contractors	9,283	4.86	61.79
3399	Other Miscellaneous Manufacturing	482	4.55	66.33
4411	Automobile Dealers	1,352	3.94	70.27
2123	Nonmetallic Mineral Mining and Quarrying	24	2.96	73.23
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	994	2.87	76.10
5172	Wireless Telecommunications Carriers (except Satellite)	668	1.87	77.97
4233	Lumber and Other Construction Materials Merchant Wholesalers	869	1.86	79.83
3323	Architectural and Structural Metals Manufacturing	106	1.77	81.60
4441	Building Material and Supplies Dealers	362	1.73	83.33
6213	Offices of Other Health Practitioners	1,206	1.47	84.81
4889	Other Support Activities for Transportation	2,373	1.31	86.11
5111	Newspaper, Periodical, Book, and Directory Publishers	648	1.21	87.33
3331	Agriculture, Construction, and Mining Machinery Manufacturing	81	1.13	88.46
8111	Automotive Repair and Maintenance	3,937	1.08	89.54
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	480	1.06	90.60
5171	Wired Telecommunications Carriers	615	0.88	91.48
3333	Commercial and Service Industry Machinery Mfg	106	0.75	92.23
3272	Glass and Glass Product Manufacturing	47	0.74	92.97
3351	Electric Lighting Equipment Manufacturing	29	0.71	93.68
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,781	0.63	94.31
5612	Facilities Support Services	333	0.57	94.88
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	73	0.57	95.45
4246	Chemical and Allied Products Merchant Wholesalers	201	0.56	96.01
3339	Other General Purpose Machinery Manufacturing	15	0.51	96.52
3231	Printing and Related Support Activities	1,359	0.50	97.02
5321	Automotive Equipment Rental and Leasing	436	0.49	97.51
3329	Other Fabricated Metal Product Manufacturing	77	0.44	97.95
3241	Petroleum and Coal Products Manufacturing	47	0.41	98.37
2373	Highway, Street, and Bridge Construction	819	0.30	98.67
2212	Natural Gas Distribution	71	0.19	98.86
3219	Other Wood Product Manufacturing	7	0.17	99.04
8112	Electronic and Precision Equipment Repair and Maintenance	631	0.16	99.20
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	128	0.15	99.35
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.15	99.50
5112	Software Publishers	1,145	0.13	99.64
5417	Scientific Research and Development Services	1,747	0.10	99.74

Source and Notes: See Table 3.6.

Appendix D. Individual Modal Administration Tables

Table 3.6.B. CSE—Number of Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3361	Motor Vehicle Manufacturing	8	55.72	55.72
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	710	7.31	63.03
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,958	6.83	69.86
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	5.92	75.77
3365	Railroad Rolling Stock Manufacturing	13	2.95	78.72
5415	Computer Systems Design and Related Services	15,405	2.43	81.16
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	12	1.75	82.90
3342	Communications Equipment Manufacturing	195	1.55	84.45
5112	Software Publishers	1,145	1.40	85.85
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	849	1.37	87.21
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1,143	1.14	88.36
8111	Automotive Repair and Maintenance	5,556	1.04	89.39
3353	Electrical Equipment Manufacturing	34	0.89	90.29
3363	Motor Vehicle Parts Manufacturing	51	0.73	91.02
4882	Support Activities for Rail Transportation	311	0.56	91.58
5413	Architectural, Engineering, and Related Services	7,060	0.55	92.14
3331	Agriculture, Construction, and Mining Machinery Manufacturing	5	0.54	92.67
3261	Plastics Product Manufacturing	138	0.49	93.16
2373	Highway, Street, and Bridge Construction	819	0.47	93.63
4859	Other Transit and Ground Passenger Transportation	290	0.41	94.04
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	199	0.41	94.45
5616	Investigation and Security Services	1,632	0.39	94.84
3359	Other Electrical Equipment and Component Manufacturing	5	0.38	95.23
2382	Building Equipment Contractors	9,283	0.38	95.61
3231	Printing and Related Support Activities	1,359	0.37	95.98
4413	Automotive Parts, Accessories, and Tire Stores	836	0.36	96.34
3323	Architectural and Structural Metals Manufacturing	206	0.34	96.67
2212	Natural Gas Distribution	71	0.31	96.99
3329	Other Fabricated Metal Product Manufacturing	67	0.28	97.27
3311	Iron and Steel Mills and Ferroalloy Manufacturing	34	0.28	97.54
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	67	0.24	97.78
4481	Clothing Stores	886	0.17	97.95
4884	Support Activities for Road Transportation	181	0.16	98.11
5617	Services to Buildings and Dwellings	4,050	0.16	98.27
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	218	0.14	98.41
3241	Petroleum and Coal Products Manufacturing	17	0.13	98.54
4246	Chemical and Allied Products Merchant Wholesalers	201	0.12	98.66
5172	Wireless Telecommunications Carriers (except Satellite)	668	0.11	98.77

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
2362	Nonresidential Building Construction	2,462	0.10	98.87
3335	Metalworking Machinery Manufacturing	33	0.10	98.97
4241	Paper and Paper Product Merchant Wholesalers	102	0.09	99.07
3351	Electric Lighting Equipment Manufacturing	29	0.09	99.16
3344	Semiconductor and Other Electronic Component Manufacturing	84	0.08	99.24
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	52	0.08	99.32
5179	Other Telecommunications	542	0.07	99.39
2389	Other Specialty Trade Contractors	4,623	0.07	99.46
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	0.07	99.52
3321	Forging and Stamping	18	0.06	99.58
4233	Lumber and Other Construction Materials Merchant Wholesalers	503	0.06	99.64
4851	Urban Transit Systems	44	0.06	99.70
3399	Other Miscellaneous Manufacturing	482	0.06	99.76
5418	Advertising, Public Relations, and Related Services	653	0.06	99.81
4921	Couriers and Express Delivery Services	211	0.05	99.87
2379	Other Heavy and Civil Engineering Construction	230	0.05	99.91
7139	Other Amusement and Recreation Industries	557	0.04	99.96
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	2,331	0.04	100.00

Source and Notes: See Table 3.6.

Appendix D. Individual Modal Administration Tables

Table 3.6.C. CSE—Number of Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
3259	Other Chemical Product and Preparation Manufacturing	73	20.27	20.27
2382	Building Equipment Contractors	9,358	14.50	34.77
2212	Natural Gas Distribution	71	8.98	43.75
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	849	7.78	51.54
3361	Motor Vehicle Manufacturing	36	4.92	56.46
3351	Electric Lighting Equipment Manufacturing	57	4.16	60.62
4233	Lumber and Other Construction Materials Merchant Wholesalers	790	3.83	64.45
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	223	3.80	68.25
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1271	3.67	71.92
5413	Architectural, Engineering, and Related Services	5,415	3.47	75.39
5172	Wireless Telecommunications Carriers (except Satellite)	668	3.21	78.60
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	1,826	3.18	81.78
3331	Agriculture, Construction, and Mining Machinery Manufacturing	53	3.01	84.79
5415	Computer Systems Design and Related Services	9,212	1.85	86.65
5321	Automotive Equipment Rental and Leasing	43	1.55	88.20
4239	Miscellaneous Durable Goods Merchant Wholesalers	1,018	1.38	89.59
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	199	1.09	90.68
3342	Communications Equipment Manufacturing	195	0.92	91.60
4247	Petroleum and Petroleum Products Merchant Wholesalers	212	0.82	92.42
4246	Chemical and Allied Products Merchant Wholesalers	201	0.80	93.22
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	52	0.62	93.83
4413	Automotive Parts, Accessories, and Tire Stores	836	0.59	94.42
4411	Automobile Dealers	1,352	0.49	94.91
4481	Clothing Stores	886	0.45	95.36
6219	Other Ambulatory Health Care Services	117	0.39	95.75
2362	Nonresidential Building Construction	2,462	0.34	96.09
2383	Building Finishing Contractors	584	0.31	96.40
3262	Rubber Product Manufacturing	2	0.30	96.71
5221	Depository Credit Intermediation	2,759	0.27	96.97
2381	Foundation, Structure, and Building Exterior Contractors	862	0.25	97.22
3341	Computer and Peripheral Equipment Manufacturing	102	0.23	97.45
3353	Electrical Equipment Manufacturing	36	0.23	97.68
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	107	0.21	97.89
4232	Furniture and Home Furnishing Merchant Wholesalers	431	0.20	98.08
2123	Nonmetallic Mineral Mining and Quarrying	47	0.19	98.28
8111	Automotive Repair and Maintenance	771	0.19	98.47
3323	Architectural and Structural Metals Manufacturing	106	0.18	98.65
5613	Employment Services	1,196	0.15	98.80

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Establishments	Industry Weight	Cumulative Industry Weight
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	139	0.15	98.95
5242	Agencies, Brokerages, and Other Insurance Related Activities	4,733	0.13	99.08
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	1,781	0.12	99.20
4881	Support Activities for Air Transportation	283	0.11	99.31
5112	Software Publishers	1,145	0.11	99.42
2389	Other Specialty Trade Contractors	4,623	0.11	99.53
5615	Travel Arrangement and Reservation Services	2,156	0.09	99.62
4422	Home Furnishings Stores	1,333	0.09	99.71
4539	Other Miscellaneous Store Retailers	3,412	0.08	99.79
3339	Other General Purpose Machinery Manufacturing	12	0.07	99.86
3325	Hardware Manufacturing	36	0.07	99.93
3261	Plastics Product Manufacturing	129	0.07	100.00

Source and Notes: See Table 3.6.

Appendix D. Individual Modal Administration Tables

Table 3.7.A. Construction—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	164	53.33	53.33
2381	Foundation, Structure, and Building Exterior Contractors	253	9.12	62.45
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	5.98	68.43
2382	Building Equipment Contractors	984	5.61	74.05
2389	Other Specialty Trade Contractors	516	4.09	78.14
4842	Specialized Freight Trucking	67	2.98	81.12
2383	Building Finishing Contractors	414	2.21	83.33
2379	Other Heavy and Civil Engineering Construction	41	1.84	85.17
4233	Lumber & Other Construction Materials Merchant Whlse	95	1.50	86.67
3351	Electric Lighting Equipment Manufacturing	19	1.38	88.05
2362	Nonresidential Building Construction	766	1.37	89.42
5413	Architectural, Engineering, and Related Services	1,350	1.20	90.62
5617	Services to Buildings and Dwellings	275	1.19	91.81
2371	Utility System Construction	85	1.10	92.91
5619	Other Support Services	3,242	0.96	93.88
3273	Cement and Concrete Product Manufacturing	15	0.93	94.81
3323	Architectural and Structural Metals Manufacturing	35	0.76	95.57
4889	Other Support Activities for Transportation	119	0.75	96.33
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	0.60	96.93
3359	Other Electrical Equipment and Component Mfg	29	0.39	97.32
4539	Other Miscellaneous Store Retailers	382	0.31	97.63
2123	Nonmetallic Mineral Mining and Quarrying	1	0.31	97.94
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	64	0.21	98.14
4821	Rail Transportation	1	0.21	98.35
4442	Lawn and Garden Equipment and Supplies Stores	40	0.21	98.56
3342	Communications Equipment Manufacturing	16	0.18	98.74
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	97	0.18	98.92
4543	Direct Selling Establishments	22	0.14	99.07
3399	Other Miscellaneous Manufacturing	104	0.14	99.21
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	2	0.14	99.35
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.13	99.47
5613	Employment Services	209	0.12	99.60
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	0.11	99.70
4884	Support Activities for Road Transportation	27	0.09	99.80
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	28	0.05	99.85
3255	Paint, Coating, and Adhesive Manufacturing	9	0.05	99.90
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	19	0.05	99.95
5415	Computer Systems Design and Related Services	3,661	0.05	100.00

Source and Notes: See Table 3.7.

Appendix D. Individual Modal Administration Tables

Table 3.7.B. Construction—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
2362	Nonresidential Building Construction	766	25.23	25.23
2382	Building Equipment Contractors	1,003	21.66	46.89
2373	Highway, Street, and Bridge Construction	164	9.59	56.48
2381	Foundation, Structure, and Building Exterior Contractors	311	8.42	64.89
2389	Other Specialty Trade Contractors	516	8.31	73.20
2379	Other Heavy and Civil Engineering Construction	41	3.98	77.18
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	2.88	80.06
4842	Specialized Freight Trucking	67	2.64	82.70
2383	Building Finishing Contractors	429	2.26	84.96
2371	Utility System Construction	55	2.22	87.18
4233	Lumber and Other Construction Materials Merchant Wholesalers	95	1.47	88.64
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	179	1.18	89.82
3273	Cement and Concrete Product Manufacturing	11	1.14	90.96
3323	Architectural and Structural Metals Manufacturing	22	1.01	91.97
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	169	0.97	92.93
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	0.97	93.90
5413	Architectural, Engineering, and Related Services	1,350	0.67	94.57
5617	Services to Buildings and Dwellings	1,575	0.58	95.15
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	39	0.39	95.54
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.39	95.92
3333	Commercial and Service Industry Machinery Manufacturing	20	0.38	96.30
3353	Electrical Equipment Manufacturing	3	0.36	96.66
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	23	0.33	96.99
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.29	97.28
3351	Electric Lighting Equipment Manufacturing	19	0.25	97.53
3359	Other Electrical Equipment and Component Manufacturing	31	0.24	97.77
4232	Furniture and Home Furnishing Merchant Wholesalers	80	0.23	98.00
3133	Textile and Fabric Finishing and Fabric Coating Mills	1	0.16	98.16
5619	Other Support Services	3,242	0.16	98.32
5416	Management, Scientific, and Technical Consulting Services	5,554	0.15	98.47
5612	Facilities Support Services	145	0.14	98.61
3399	Other Miscellaneous Manufacturing	104	0.14	98.75
3339	Other General Purpose Machinery Manufacturing	0	0.12	98.87
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	10	0.12	98.99
5415	Computer Systems Design and Related Services	3,873	0.11	99.11
5321	Automotive Equipment Rental and Leasing	10	0.10	99.21
5616	Investigation and Security Services	257	0.10	99.31

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	19	0.09	99.40
4882	Support Activities for Rail Transportation	37	0.08	99.48
3391	Medical Equipment and Supplies Manufacturing	23	0.07	99.55
5242	Agencies, Brokerages, and Other Insurance Related Activities	423	0.07	99.63
4441	Building Material and Supplies Dealers	31	0.06	99.69
4821	Rail Transportation	1	0.06	99.75
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	12	0.06	99.81
5222	Nondepository Credit Intermediation	7	0.05	99.86
3363	Motor Vehicle Parts Manufacturing	3	0.05	99.91
2361	Residential Building Construction	619	0.05	99.96
2123	Nonmetallic Mineral Mining and Quarrying	1	0.04	100.00

Source and Notes: *See* Table 3.7.

Appendix D. Individual Modal Administration Tables

Table 3.7.C. Construction—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	164	26.70	26.70
2382	Building Equipment Contractors	1,003	23.04	49.74
2362	Nonresidential Building Construction	766	15.54	65.28
5616	Investigation and Security Services	406	6.55	71.83
4842	Specialized Freight Trucking	67	4.05	75.88
2381	Foundation, Structure, and Building Exterior Contractors	455	2.95	78.84
2383	Building Finishing Contractors	546	2.68	81.51
3323	Architectural and Structural Metals Manufacturing	23	1.90	83.41
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	31	1.87	85.29
4233	Lumber and Other Construction Materials Merchant Wholesalers	95	1.71	87.00
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	82	1.66	88.66
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	1	1.53	90.19
2371	Utility System Construction	55	1.29	91.48
2389	Other Specialty Trade Contractors	516	0.88	92.36
5617	Services to Buildings and Dwellings	275	0.78	93.14
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.70	93.84
3359	Other Electrical Equipment and Component Manufacturing	29	0.67	94.51
3339	Other General Purpose Machinery Manufacturing	1	0.66	95.17
5413	Architectural, Engineering, and Related Services	1,350	0.56	95.72
3273	Cement and Concrete Product Manufacturing	4	0.52	96.24
3351	Electric Lighting Equipment Manufacturing	12	0.51	96.75
4884	Support Activities for Road Transportation	27	0.48	97.23
5629	Remediation and Other Waste Management Services	22	0.47	97.70
2123	Nonmetallic Mineral Mining and Quarrying	1	0.47	98.17
5613	Employment Services	209	0.38	98.55
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	16	0.34	98.89
2379	Other Heavy and Civil Engineering Construction	41	0.33	99.23
5415	Computer Systems Design and Related Services	2,214	0.22	99.44
3399	Other Miscellaneous Manufacturing	104	0.18	99.63
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	0.18	99.80
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	4	0.10	99.91
4543	Direct Selling Establishments	22	0.09	100.00

Source and Notes: See Table 3.7.

Appendix D. Individual Modal Administration Tables

Table 3.8.A. AE-CRS—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	1,840	79.06	79.06
2379	Other Heavy and Civil Engineering Construction	41	12.01	91.06
5416	Management, Scientific, and Technical Consulting Services	10,118	3.75	94.82
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	14	1.66	96.48
6242	Community Food and Housing, and Emergency and Other Relief Services	1	1.31	97.78
5418	Advertising, Public Relations, and Related Services	160	0.83	98.61
2373	Highway, Street, and Bridge Construction	164	0.42	99.04

Source and Notes: See Table 3.8.

Appendix D. Individual Modal Administration Tables

Table 3.8.B. AE-CRS—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	1,840	79.06	79.06
2379	Other Heavy and Civil Engineering Construction	41	12.01	91.06
5416	Management, Scientific, and Technical Consulting Services	10,118	3.75	94.82
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	14	1.66	96.48
6242	Community Food and Housing, and Emergency and Other Relief Services	1	1.31	97.78
5418	Advertising, Public Relations, and Related Services	160	0.83	98.61
2373	Highway, Street, and Bridge Construction	164	0.42	99.04
5417	Scientific Research and Development Services	269	0.42	99.46
5619	Other Support Services	3,242	0.32	99.77
5415	Computer Systems Design and Related Services	3,661	0.23	100.00

Source and Notes: See Table 3.8.

Appendix D. Individual Modal Administration Tables

Table 3.8.C. AE-CRS—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5413	Architectural, Engineering, and Related Services	1,660	91.89	91.89
5416	Management, Scientific, and Technical Consulting Services	9,545	6.88	98.78
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.46	99.24
3231	Printing and Related Support Activities	265	0.40	99.64
2382	Building Equipment Contractors	544	0.36	100.00

Source and Notes: *See* Table 3.8.

Appendix D. Individual Modal Administration Tables

Table 3.9.A. Maintenance—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
2373	Highway, Street, and Bridge Construction	164	30.18	30.18
2382	Building Equipment Contractors	1,003	11.79	41.97
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	28	8.49	50.46
2389	Other Specialty Trade Contractors	516	6.39	56.84
5617	Services to Buildings and Dwellings	1,575	6.27	63.11
2362	Nonresidential Building Construction	813	5.48	68.59
2379	Other Heavy and Civil Engineering Construction	41	5.02	73.61
5616	Investigation and Security Services	406	4.95	78.57
2381	Foundation, Structure, and Building Exterior Contractors	340	4.44	83.01
4884	Support Activities for Road Transportation	27	3.46	86.47
4233	Lumber and Other Construction Materials Merchant Wholesalers	95	2.12	88.59
5613	Employment Services	613	1.82	90.41
3323	Architectural and Structural Metals Manufacturing	35	1.31	91.72
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	1.21	92.93
4442	Lawn and Garden Equipment and Supplies Stores	40	1.20	94.13
5413	Architectural, Engineering, and Related Services	1,302	0.69	94.82
4441	Building Material and Supplies Dealers	127	0.68	95.51
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	66	0.62	96.12
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	64	0.49	96.61
3273	Cement and Concrete Product Manufacturing	4	0.35	96.96
4821	Rail Transportation	1	0.33	97.29
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.30	97.59
2383	Building Finishing Contractors	414	0.30	97.89
2211	Electric Power Generation, Transmission and Distribution	27	0.27	98.15
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	10	0.25	98.40
3342	Communications Equipment Manufacturing	16	0.19	98.59
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	0.15	98.74
2371	Utility System Construction	55	0.13	98.87
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	35	0.13	99.00
3272	Glass and Glass Product Manufacturing	7	0.12	99.12
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	40	0.10	99.22
4842	Specialized Freight Trucking	67	0.09	99.31
3324	Boiler, Tank, and Shipping Container Manufacturing	0	0.08	99.39
5621	Waste Collection	20	0.08	99.47
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.08	99.55
5619	Other Support Services	3,242	0.07	99.62
5241	Insurance Carriers	20	0.07	99.69

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5311	Lessors of Real Estate	34	0.06	99.75
3351	Electric Lighting Equipment Manufacturing	7	0.06	99.81
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	0.05	99.86
3261	Plastics Product Manufacturing	22	0.05	99.91
5622	Waste Treatment and Disposal	21	0.05	99.95
8123	Drycleaning and Laundry Services	50	0.05	100.00
2373	Highway, Street, and Bridge Construction	164	30.18	30.18
2382	Building Equipment Contractors	1,003	11.79	41.97
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	28	8.49	50.46
2389	Other Specialty Trade Contractors	516	6.39	56.84
5617	Services to Buildings and Dwellings	1,575	6.27	63.11
2362	Nonresidential Building Construction	813	5.48	68.59
2379	Other Heavy and Civil Engineering Construction	41	5.02	73.61
5616	Investigation and Security Services	406	4.95	78.57
2381	Foundation, Structure, and Building Exterior Contractors	340	4.44	83.01
4884	Support Activities for Road Transportation	27	3.46	86.47
4233	Lumber and Other Construction Materials Merchant Wholesalers	95	2.12	88.59
5613	Employment Services	613	1.82	90.41
3323	Architectural and Structural Metals Manufacturing	35	1.31	91.72
4235	Metal and Mineral (except Petroleum) Merchant Wholesalers	17	1.21	92.93
4442	Lawn and Garden Equipment and Supplies Stores	40	1.20	94.13
5413	Architectural, Engineering, and Related Services	1,302	0.69	94.82
4441	Building Material and Supplies Dealers	127	0.68	95.51
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	66	0.62	96.12
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	64	0.49	96.61
3273	Cement and Concrete Product Manufacturing	4	0.35	96.96
4821	Rail Transportation	1	0.33	97.29
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.30	97.59
2383	Building Finishing Contractors	414	0.30	97.89
2211	Electric Power Generation, Transmission and Distribution	27	0.27	98.15
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	10	0.25	98.40
3342	Communications Equipment Manufacturing	16	0.19	98.59
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	0.15	98.74
2371	Utility System Construction	55	0.13	98.87
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	35	0.13	99.00
3272	Glass and Glass Product Manufacturing	7	0.12	99.12
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	40	0.10	99.22
4842	Specialized Freight Trucking	67	0.09	99.31
3324	Boiler, Tank, and Shipping Container Manufacturing	0	0.08	99.39

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5621	Waste Collection	20	0.08	99.47
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.08	99.55
5619	Other Support Services	3,242	0.07	99.62
5241	Insurance Carriers	20	0.07	99.69
5311	Lessors of Real Estate	34	0.06	99.75
3351	Electric Lighting Equipment Manufacturing	7	0.06	99.81
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	0.05	99.86
3261	Plastics Product Manufacturing	22	0.05	99.91

Source and Notes: *See* Table 3.9.

Appendix D. Individual Modal Administration Tables

Table 3.9.B. Maintenance—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3365	Railroad Rolling Stock Manufacturing	2	62.84	62.84
2382	Building Equipment Contractors	1,003	6.18	69.02
4852	Interurban and Rural Bus Transportation	5	5.57	74.59
4882	Support Activities for Rail Transportation	37	3.77	78.36
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	2.95	81.31
4851	Urban Transit Systems	16	2.85	84.16
5617	Services to Buildings and Dwellings	1,575	2.19	86.35
5413	Architectural, Engineering, and Related Services	1,302	1.82	88.17
2379	Other Heavy and Civil Engineering Construction	41	1.71	89.88
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	43	1.70	91.58
4543	Direct Selling Establishments	22	1.13	92.71
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	40	1.11	93.82
4411	Automobile Dealers	51	1.07	94.88
3363	Motor Vehicle Parts Manufacturing	3	0.96	95.84
7211	Traveler Accommodation	183	0.79	96.63
2389	Other Specialty Trade Contractors	125	0.57	97.20
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	179	0.55	97.75
5416	Management, Scientific, and Technical Consulting Services	188	0.45	98.20
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	112	0.38	98.59
8111	Automotive Repair and Maintenance	174	0.32	98.90
5616	Investigation and Security Services	181	0.24	99.15
5415	Computer Systems Design and Related Services	3,661	0.16	99.31
2373	Highway, Street, and Bridge Construction	164	0.14	99.45
5622	Waste Treatment and Disposal	21	0.13	99.58
4885	Freight Transportation Arrangement	141	0.12	99.70
5629	Remediation and Other Waste Management Services	8	0.10	99.80
2381	Foundation, Structure, and Building Exterior Contractors	144	0.07	99.87
5613	Employment Services	209	0.06	99.94
4859	Other Transit and Ground Passenger Transportation	109	0.06	100.00

Source and Notes: See Table 3.9.

Appendix D. Individual Modal Administration Tables

Table 3.9.C. Maintenance—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5616	Investigation and Security Services	406	22.35	22.35
2389	Other Specialty Trade Contractors	125	13.06	35.41
4884	Support Activities for Road Transportation	27	11.56	46.97
5612	Facilities Support Services	145	10.47	57.44
2382	Building Equipment Contractors	1,003	10.30	67.74
2373	Highway, Street, and Bridge Construction	164	5.66	73.40
3342	Communications Equipment Manufacturing	28	4.47	77.88
5413	Architectural, Engineering, and Related Services	1,350	2.71	80.58
5617	Services to Buildings and Dwellings	351	2.61	83.19
2362	Nonresidential Building Construction	766	2.52	85.71
5621	Waste Collection	20	2.49	88.20
4842	Specialized Freight Trucking	67	2.35	90.55
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	1.81	92.36
4246	Chemical and Allied Products Merchant Wholesalers	43	1.23	93.59
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	16	1.22	94.81
2381	Foundation, Structure, and Building Exterior Contractors	248	1.17	95.98
2371	Utility System Construction	55	0.98	96.97
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	55	0.64	97.61
3351	Electric Lighting Equipment Manufacturing	7	0.63	98.24
3364	Aerospace Product and Parts Manufacturing	8	0.52	98.76
4881	Support Activities for Air Transportation	21	0.52	99.28
5415	Computer Systems Design and Related Services	5,875	0.38	99.66
5222	Nondepository Credit Intermediation	9	0.21	99.87
8111	Automotive Repair and Maintenance	169	0.13	100.00

Source and Notes: See Table 3.9.

Appendix D. Individual Modal Administration Tables

Table 3.10.A. IT—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	5,875	66.72	66.72
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	55	12.50	79.23
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	175	5.84	85.07
3342	Communications Equipment Manufacturing	28	3.95	89.02
5413	Architectural, Engineering, and Related Services	1,623	3.39	92.40
5613	Employment Services	209	2.37	94.78
3231	Printing and Related Support Activities	265	2.10	96.88
5416	Management, Scientific, and Technical Consulting Services	5,413	1.64	98.52
2382	Building Equipment Contractors	544	0.63	99.15
5112	Software Publishers	195	0.33	99.48
5182	Data Processing, Hosting, and Related Services	357	0.23	99.71
2389	Other Specialty Trade Contractors	391	0.19	99.89
3351	Electric Lighting Equipment Manufacturing	7	0.11	100.00

Source and Notes: See Table 3.9.

Appendix D. Individual Modal Administration Tables

Table 3.10.B. IT—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	5,875	27.33	27.33
3342	Communications Equipment Manufacturing	28	25.84	53.18
5112	Software Publishers	195	25.51	78.68
5413	Architectural, Engineering, and Related Services	1,302	8.09	86.77
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	179	7.87	94.64
2379	Other Heavy and Civil Engineering Construction	41	2.65	97.29
2371	Utility System Construction	30	1.24	98.53
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	66	0.93	99.46
1119	Other Crop Farming	157	0.54	100.00

Source and Notes: *See* Table 3.10.

Appendix D. Individual Modal Administration Tables

Table 3.10.C. IT—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5415	Computer Systems Design and Related Services	6,087	27.40	27.40
5112	Software Publishers	195	25.50	52.90
5413	Architectural, Engineering, and Related Services	1,302	25.47	78.37
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	175	10.77	89.14
2382	Building Equipment Contractors	544	2.81	91.94
3342	Communications Equipment Manufacturing	28	1.28	93.23
5172	Wireless Telecommunications Carriers (except Satellite)	39	1.10	94.32
5613	Employment Services	404	1.06	95.38
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	55	0.82	96.20
3399	Other Miscellaneous Manufacturing	104	0.73	96.93
3351	Electric Lighting Equipment Manufacturing	7	0.73	97.66
8112	Electronic and Precision Equipment Repair and Maintenance	167	0.68	98.34
3341	Computer and Peripheral Equipment Manufacturing	35	0.66	99.00
4431	Electronics and Appliance Stores	265	0.55	99.55
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	11	0.45	100.00

Source and Notes: See Table 3.10.

Appendix D. Individual Modal Administration Tables

Table 3.11.A. Services—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5613	Employment Services	613	28.09	28.09
2211	Electric Power Generation, Transmission and Distribution	32	21.92	50.01
5172	Wireless Telecommunications Carriers (except Satellite)	39	16.14	66.15
5413	Architectural, Engineering, and Related Services	1,302	6.50	72.65
2379	Other Heavy and Civil Engineering Construction	41	4.45	77.10
5617	Services to Buildings and Dwellings	275	3.40	80.50
2373	Highway, Street, and Bridge Construction	164	3.10	83.60
2212	Natural Gas Distribution	5	3.05	86.65
2382	Building Equipment Contractors	544	2.83	89.47
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	32	2.79	92.27
2371	Utility System Construction	85	2.55	94.82
5419	Other Professional, Scientific, and Technical Services	2,025	1.23	96.05
5418	Advertising, Public Relations, and Related Services	48	0.62	96.67
5416	Management, Scientific, and Technical Consulting Services	4,132	0.62	97.29
5111	Newspaper, Periodical, Book, and Directory Publishers	42	0.50	97.79
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	12	0.49	98.28
7211	Traveler Accommodation	183	0.31	98.59
2389	Other Specialty Trade Contractors	125	0.30	98.89
5152	Cable and Other Subscription Programming	16	0.20	99.10
5313	Activities Related to Real Estate	88	0.20	99.29
5619	Other Support Services	3,242	0.15	99.45
5112	Software Publishers	195	0.12	99.56
6244	Child Day Care Services	1,469	0.12	99.68
5615	Travel Arrangement and Reservation Services	356	0.11	99.79

Source and Notes: See Table 3.11.

Appendix D. Individual Modal Administration Tables

Table 3.11.B. Services—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
4851	Urban Transit Systems	16	28.34	28.34
4821	Rail Transportation	1	22.61	50.95
4859	Other Transit and Ground Passenger Transportation	109	16.37	67.32
4543	Direct Selling Establishments	22	3.04	70.37
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	2.75	73.12
3365	Railroad Rolling Stock Manufacturing	2	2.66	75.78
4853	Taxi and Limousine Service	109	2.51	78.29
5413	Architectural, Engineering, and Related Services	1,623	2.49	80.79
5415	Computer Systems Design and Related Services	6,087	2.37	83.16
5418	Advertising, Public Relations, and Related Services	208	1.86	85.02
5615	Travel Arrangement and Reservation Services	17	1.74	86.76
5242	Agencies, Brokerages, and Other Insurance Related Activities	425	1.38	88.14
4855	Charter Bus Industry	35	1.21	89.35
5416	Management, Scientific, and Technical Consulting Services	6,310	1.18	90.53
4852	Interurban and Rural Bus Transportation	5	1.07	91.59
2382	Building Equipment Contractors	984	1.05	92.64
5241	Insurance Carriers	15	1.04	93.69
5419	Other Professional, Scientific, and Technical Services	2,585	0.92	94.61
5617	Services to Buildings and Dwellings	1,575	0.61	95.21
8111	Automotive Repair and Maintenance	225	0.59	95.81
5619	Other Support Services	3,242	0.53	96.34
3342	Communications Equipment Manufacturing	28	0.51	96.84
5221	Depository Credit Intermediation	29	0.46	97.31
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	39	0.42	97.72
5613	Employment Services	613	0.29	98.01
5313	Activities Related to Real Estate	120	0.24	98.25
4461	Health and Personal Care Stores	47	0.17	98.42
4411	Automobile Dealers	51	0.16	98.58
2211	Electric Power Generation, Transmission and Distribution	27	0.15	98.73
8139	Business, Professional, Labor, Political, and Similar Organizations	2	0.13	98.85
5311	Lessors of Real Estate	34	0.13	98.98
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	138	0.12	99.10
4413	Automotive Parts, Accessories, and Tire Stores	50	0.10	99.21
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	9	0.10	99.30
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	0.09	99.40
2362	Nonresidential Building Construction	766	0.09	99.49
6216	Home Health Care Services	266	0.07	99.55
4884	Support Activities for Road Transportation	61	0.05	99.61
3231	Printing and Related Support Activities	265	0.05	99.65
5182	Data Processing, Hosting, and Related Services	357	0.04	99.70

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5179	Other Telecommunications	66	0.04	99.74
2381	Foundation, Structure, and Building Exterior Contractors	38	0.04	99.78
3363	Motor Vehicle Parts Manufacturing	3	0.03	99.81
3262	Rubber Product Manufacturing	0	0.03	99.84
3351	Electric Lighting Equipment Manufacturing	7	0.03	99.87
5616	Investigation and Security Services	225	0.03	99.90
5611	Office Administrative Services	939	0.03	99.93

Source and Notes: *See* Table 3.11.

Appendix D. Individual Modal Administration Tables

Table 3.11.C. Services—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
4859	Other Transit and Ground Passenger Transportation	109	47.06	47.06
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	23.86	70.92
4853	Taxi and Limousine Service	86	12.47	83.39
5416	Management, Scientific, and Technical Consulting Services	5,939	9.99	93.38
5418	Advertising, Public Relations, and Related Services	221	3.92	97.30
5415	Computer Systems Design and Related Services	3,661	0.65	97.96
5617	Services to Buildings and Dwellings	1,300	0.60	98.55
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	55	0.34	98.89
5613	Employment Services	209	0.30	99.20
5413	Architectural, Engineering, and Related Services	48	0.25	99.44
7223	Special Food Services	236	0.20	99.64
5414	Specialized Design Services	811	0.18	99.82
5242	Agencies, Brokerages, and Other Insurance Related Activities	423	0.18	100.00

Source and Notes: See Table 3.11.

Appendix D. Individual Modal Administration Tables

Table 3.12.A. CSE—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (SHA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3342	Communications Equipment Manufacturing	16	44.35	44.35
5415	Computer Systems Design and Related Services	3,661	6.92	51.28
3273	Cement and Concrete Product Manufacturing	2	5.65	56.93
2382	Building Equipment Contractors	984	4.86	61.79
3399	Other Miscellaneous Manufacturing	104	4.55	66.33
4411	Automobile Dealers	51	3.94	70.27
2123	Nonmetallic Mineral Mining and Quarrying	1	2.96	73.23
4238	Machinery, Equipment, and Supplies Merchant Whlse	105	2.87	76.10
5172	Wireless Telecommunications Carriers (except Satellite)	39	1.87	77.97
4233	Lumber and Other Construction Materials Merchant Wholesalers	88	1.86	79.83
3323	Architectural and Structural Metals Manufacturing	21	1.77	81.60
4441	Building Material and Supplies Dealers	20	1.73	83.33
6213	Offices of Other Health Practitioners	196	1.47	84.81
4889	Other Support Activities for Transportation	119	1.31	86.11
5111	Newspaper, Periodical, Book, and Directory Publishers	95	1.21	87.33
3331	Agriculture, Construction, and Mining Machinery Manufacturing	7	1.13	88.46
8111	Automotive Repair and Maintenance	169	1.08	89.54
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	65	1.06	90.60
5171	Wired Telecommunications Carriers	92	0.88	91.48
3333	Commercial and Service Industry Machinery Manufacturing	20	0.75	92.23
3272	Glass and Glass Product Manufacturing	7	0.74	92.97
3351	Electric Lighting Equipment Manufacturing	7	0.71	93.68
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	174	0.63	94.31
5612	Facilities Support Services	145	0.57	94.88
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	16	0.57	95.45
4246	Chemical and Allied Products Merchant Wholesalers	43	0.56	96.01
3339	Other General Purpose Machinery Manufacturing	2	0.51	96.52
3231	Printing and Related Support Activities	265	0.50	97.02
5321	Automotive Equipment Rental and Leasing	10	0.49	97.51
3329	Other Fabricated Metal Product Manufacturing	18	0.44	97.95
3241	Petroleum and Coal Products Manufacturing	7	0.41	98.37
2373	Highway, Street, and Bridge Construction	164	0.30	98.67
2212	Natural Gas Distribution	5	0.19	98.86
3219	Other Wood Product Manufacturing	0	0.17	99.04
8112	Electronic and Precision Equipment Repair and Maintenance	167	0.16	99.20
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	23	0.15	99.35
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.15	99.50
5112	Software Publishers	195	0.13	99.64
5417	Scientific Research and Development Services	381	0.10	99.74

Source and Notes: See Table 3.12.

Appendix D. Individual Modal Administration Tables

Table 3.12.B. CSE—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MTA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3361	Motor Vehicle Manufacturing	0	55.72	55.72
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	43	7.31	63.03
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	253	6.83	69.86
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	5.92	75.77
3365	Railroad Rolling Stock Manufacturing	2	2.95	78.72
5415	Computer Systems Design and Related Services	5,875	2.43	81.16
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	3	1.75	82.90
3342	Communications Equipment Manufacturing	28	1.55	84.45
5112	Software Publishers	195	1.40	85.85
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	120	1.37	87.21
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	327	1.14	88.36
8111	Automotive Repair and Maintenance	284	1.04	89.39
3353	Electrical Equipment Manufacturing	6	0.89	90.29
3363	Motor Vehicle Parts Manufacturing	3	0.73	91.02
4882	Support Activities for Rail Transportation	37	0.56	91.58
5413	Architectural, Engineering, and Related Services	1,623	0.55	92.14
3331	Agriculture, Construction, and Mining Machinery Manufacturing	0	0.54	92.67
3261	Plastics Product Manufacturing	24	0.49	93.16
2373	Highway, Street, and Bridge Construction	164	0.47	93.63
4859	Other Transit and Ground Passenger Transportation	109	0.41	94.04
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	16	0.41	94.45
5616	Investigation and Security Services	406	0.39	94.84
3359	Other Electrical Equipment and Component Manufacturing	1	0.38	95.23
2382	Building Equipment Contractors	984	0.38	95.61
3231	Printing and Related Support Activities	265	0.37	95.98
4413	Automotive Parts, Accessories, and Tire Stores	34	0.36	96.34
3323	Architectural and Structural Metals Manufacturing	35	0.34	96.67
2212	Natural Gas Distribution	5	0.31	96.99
3329	Other Fabricated Metal Product Manufacturing	14	0.28	97.27
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	0.28	97.54
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	10	0.24	97.78
4481	Clothing Stores	166	0.17	97.95
4884	Support Activities for Road Transportation	27	0.16	98.11
5617	Services to Buildings and Dwellings	275	0.16	98.27
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	31	0.14	98.41
3241	Petroleum and Coal Products Manufacturing	0	0.13	98.54
4246	Chemical and Allied Products Merchant Wholesalers	43	0.12	98.66
5172	Wireless Telecommunications Carriers (except Satellite)	39	0.11	98.77

Appendix D. Individual Modal Administration Tables

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
2362	Nonresidential Building Construction	766	0.10	98.87
3335	Metalworking Machinery Manufacturing	6	0.10	98.97
4241	Paper and Paper Product Merchant Wholesalers	11	0.09	99.07
3351	Electric Lighting Equipment Manufacturing	7	0.09	99.16
3344	Semiconductor and Other Electronic Component Manufacturing	13	0.08	99.24
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	11	0.08	99.32
5179	Other Telecommunications	66	0.07	99.39
2389	Other Specialty Trade Contractors	391	0.07	99.46
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	0.07	99.52
3321	Forging and Stamping	5	0.06	99.58
4233	Lumber and Other Construction Materials Merchant Wholesalers	45	0.06	99.64
4851	Urban Transit Systems	16	0.06	99.70
3399	Other Miscellaneous Manufacturing	104	0.06	99.76
5418	Advertising, Public Relations, and Related Services	160	0.06	99.81
4921	Couriers and Express Delivery Services	42	0.05	99.87
2379	Other Heavy and Civil Engineering Construction	41	0.05	99.91
7139	Other Amusement and Recreation Industries	62	0.04	99.96
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	263	0.04	100.00

Source and Notes: See Table 3.12.

Appendix D. Individual Modal Administration Tables

Table 3.12.C. CSE—Number of Listed DBE Establishments and Industry Weight, by NAICS Code (MAA)

NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
3259	Other Chemical Product and Preparation Manufacturing	12	20.27	20.27
2382	Building Equipment Contractors	1,003	14.50	34.77
2212	Natural Gas Distribution	5	8.98	43.75
4236	Household Appliances and Electrical and Electronic Goods Merchant Wholesalers	120	7.78	51.54
3361	Motor Vehicle Manufacturing	3	4.92	56.46
3351	Electric Lighting Equipment Manufacturing	19	4.16	60.62
4233	Lumber and Other Construction Materials Merchant Wholesalers	77	3.83	64.45
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	13	3.80	68.25
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	349	3.67	71.92
5413	Architectural, Engineering, and Related Services	1,302	3.47	75.39
5172	Wireless Telecommunications Carriers (except Satellite)	39	3.21	78.60
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	230	3.18	81.78
3331	Agriculture, Construction, and Mining Machinery Manufacturing	6	3.01	84.79
5415	Computer Systems Design and Related Services	3,873	1.85	86.65
5321	Automotive Equipment Rental and Leasing	3	1.55	88.20
4239	Miscellaneous Durable Goods Merchant Wholesalers	86	1.38	89.59
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	16	1.09	90.68
3342	Communications Equipment Manufacturing	28	0.92	91.60
4247	Petroleum and Petroleum Products Merchant Wholesalers	17	0.82	92.42
4246	Chemical and Allied Products Merchant Wholesalers	43	0.80	93.22
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	11	0.62	93.83
4413	Automotive Parts, Accessories, and Tire Stores	34	0.59	94.42
4411	Automobile Dealers	51	0.49	94.91
4481	Clothing Stores	166	0.45	95.36
6219	Other Ambulatory Health Care Services	21	0.39	95.75
2362	Nonresidential Building Construction	766	0.34	96.09
2383	Building Finishing Contractors	93	0.31	96.40
3262	Rubber Product Manufacturing	2	0.30	96.71
5221	Depository Credit Intermediation	29	0.27	96.97
2381	Foundation, Structure, and Building Exterior Contractors	104	0.25	97.22
3341	Computer and Peripheral Equipment Manufacturing	18	0.23	97.45
3353	Electrical Equipment Manufacturing	3	0.23	97.68
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing	20	0.21	97.89
4232	Furniture and Home Furnishing Merchant Wholesalers	80	0.20	98.08
2123	Nonmetallic Mineral Mining and Quarrying	3	0.19	98.28
8111	Automotive Repair and Maintenance	56	0.19	98.47
3323	Architectural and Structural Metals Manufacturing	21	0.18	98.65
5613	Employment Services	404	0.15	98.80

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NAICS Code	NAICS Description	Number of Listed DBEs	Industry Weight	Cumulative Industry Weight
5324	Commercial and Industrial Machinery and Equipment Rental and Leasing	12	0.15	98.95
5242	Agencies, Brokerages, and Other Insurance Related Activities	423	0.13	99.08
4249	Miscellaneous Nondurable Goods Merchant Wholesalers	174	0.12	99.20
4881	Support Activities for Air Transportation	10	0.11	99.31
5112	Software Publishers	195	0.11	99.42
2389	Other Specialty Trade Contractors	391	0.11	99.53
5615	Travel Arrangement and Reservation Services	356	0.09	99.62
4422	Home Furnishings Stores	93	0.09	99.71
4539	Other Miscellaneous Store Retailers	382	0.08	99.79
3339	Other General Purpose Machinery Manufacturing	2	0.07	99.86
3325	Hardware Manufacturing	4	0.07	99.93
3261	Plastics Product Manufacturing	22	0.07	100.00

Source and Notes: See Table 3.12.

Appendix D. Individual Modal Administration Tables

Table 3.15.A Overall Estimated DBE Availability Percentages (SHA)

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	11.59	3.56	4.67	0.94	20.77	14.61	35.38	64.62
PAID DOLLARS	11.88	3.91	4.38	0.89	21.06	14.91	35.98	64.02
CONSTRUCTION								
AWARD DOLLARS	14.30	4.93	3.10	0.54	22.87	17.69	40.56	59.44
PAID DOLLARS	14.08	5.26	3.19	0.55	23.08	17.45	40.53	59.47
AE-CRS								
AWARD DOLLARS	8.54	2.22	4.79	1.24	16.80	12.20	29.00	71.00
PAID DOLLARS	8.43	2.20	4.77	1.25	16.65	12.09	28.74	71.26
MAINTENANCE								
AWARD DOLLARS	12.36	4.68	2.80	1.29	21.13	12.22	33.35	66.65
PAID DOLLARS	12.28	4.81	2.94	1.32	21.33	12.35	33.68	66.32
IT								
AWARD DOLLARS	15.15	3.76	14.44	1.29	34.63	12.63	47.26	52.74
PAID DOLLARS	16.06	3.24	13.16	1.24	33.70	13.09	46.79	53.21
SERVICES								
AWARD DOLLARS	12.78	2.71	4.75	1.02	21.26	14.52	35.78	64.22
PAID DOLLARS	12.90	3.02	3.60	0.91	20.42	15.43	35.86	64.14
CSE								
AWARD DOLLARS	14.07	4.36	8.56	1.07	28.06	13.23	41.30	58.70
PAID DOLLARS	14.23	4.39	8.70	1.08	28.40	13.24	41.64	58.36

Source and Notes: See Table 3.15.

Appendix D. Individual Modal Administration Tables

Table 3.15.B Overall Estimated DBE Availability Percentages (MTA)

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.05	2.92	4.97	1.17	19.11	12.61	31.72	68.28
PAID DOLLARS	10.23	2.78	4.95	1.12	19.07	13.29	32.36	67.64
CONSTRUCTION								
AWARD DOLLARS	11.18	6.29	3.05	1.27	21.78	12.49	34.27	65.73
PAID DOLLARS	11.17	5.80	2.80	1.09	20.86	13.14	34.00	66.00
AE-CRS								
AWARD DOLLARS	8.11	2.23	5.01	1.29	16.63	11.12	27.76	72.24
PAID DOLLARS	8.09	2.22	5.00	1.29	16.60	11.07	27.67	72.33
MAINTENANCE								
AWARD DOLLARS	10.39	3.14	4.13	1.42	19.08	10.55	29.62	70.38
PAID DOLLARS	13.24	4.38	5.72	1.00	24.34	11.46	35.80	64.20
IT								
AWARD DOLLARS	12.29	4.06	14.15	1.26	31.76	11.46	43.22	56.78
PAID DOLLARS	12.52	2.74	9.70	1.30	26.26	11.84	38.11	61.89
SERVICES								
AWARD DOLLARS	16.19	3.21	5.17	0.61	25.18	18.80	43.97	56.03
PAID DOLLARS	16.10	3.14	4.67	0.57	24.49	20.70	45.19	54.81
CSE								
AWARD DOLLARS	10.63	3.49	9.35	1.05	24.52	11.05	35.57	64.43
PAID DOLLARS	10.98	3.49	9.60	1.06	25.14	11.18	36.32	63.68

Source and Notes: See Table 3.15.

Appendix D. Individual Modal Administration Tables

Table 3.15.C Overall Estimated DBE Availability Percentages (MAA)

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.39	3.84	4.55	1.28	20.06	11.40	31.46	68.54
PAID DOLLARS	9.84	3.77	4.13	1.22	18.96	11.26	30.22	69.78
CONSTRUCTION								
AWARD DOLLARS	12.01	5.69	2.92	1.24	21.85	11.76	33.60	66.40
PAID DOLLARS	11.82	5.52	2.73	1.13	21.20	12.00	33.20	66.80
AE-CRS								
AWARD DOLLARS	7.90	2.19	5.13	1.33	16.55	10.65	27.20	72.80
PAID DOLLARS	7.40	2.16	5.05	1.37	15.98	10.34	26.32	73.68
MAINTENANCE								
AWARD DOLLARS	12.74	3.56	3.31	1.62	21.23	11.50	32.73	67.27
PAID DOLLARS	19.11	2.19	2.58	1.55	25.43	11.22	36.65	63.35
IT								
AWARD DOLLARS	10.50	3.84	11.93	1.33	27.60	10.91	38.50	61.50
PAID DOLLARS	11.93	4.04	12.40	1.18	29.55	11.56	41.11	58.89
SERVICES								
AWARD DOLLARS	19.08	3.93	6.45	0.76	30.21	16.93	47.14	52.86
PAID DOLLARS	10.58	2.05	5.66	0.42	18.71	16.20	34.90	65.10
CSE								
AWARD DOLLARS	9.02	3.75	3.86	0.81	17.44	11.72	29.16	70.84
PAID DOLLARS	9.26	3.78	3.87	0.81	17.72	11.82	29.54	70.46

Source and Notes: See Table 3.15.

Appendix D. Individual Modal Administration Tables

Table 3.16.A Overall Estimated DBE Availability Percentages, Federally-Assisted Contracts Only (SHA)

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	11.30	3.54	4.02	0.91	19.77	14.79	34.57	65.43
PAID DOLLARS	11.63	3.94	3.95	0.86	20.39	15.08	35.46	64.54
CONSTRUCTION								
AWARD DOLLARS	14.28	4.97	3.10	0.54	22.89	17.69	40.58	59.42
PAID DOLLARS	14.06	5.31	3.19	0.54	23.10	17.44	40.54	59.46
AE-CRS								
AWARD DOLLARS	8.52	2.22	4.80	1.24	16.79	12.17	28.96	71.04
PAID DOLLARS	8.42	2.20	4.77	1.25	16.64	12.06	28.70	71.30
MAINTENANCE								
AWARD DOLLARS	12.61	6.49	1.78	1.29	22.17	12.84	35.01	64.99
PAID DOLLARS	7.24	1.64	2.34	1.28	12.49	16.37	28.87	71.13
IT								
AWARD DOLLARS	14.87	3.02	11.74	1.25	30.87	12.74	43.61	56.39
PAID DOLLARS	14.75	2.99	11.57	1.25	30.56	12.70	43.25	56.75
SERVICES								
AWARD DOLLARS	10.98	2.70	4.69	1.44	19.82	12.32	32.13	67.87
PAID DOLLARS	16.13	2.75	2.70	2.29	23.87	11.01	34.88	65.12
CSE								
AWARD DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PAID DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source and Notes: See Table 3.16.

Appendix D. Individual Modal Administration Tables

Table 3.16.B Overall Estimated DBE Availability Percentages, Federally-Assisted Contracts Only (MTA)

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	8.63	2.83	4.75	1.28	17.49	11.36	28.85	71.15
PAID DOLLARS	8.64	2.68	4.86	1.27	17.44	11.37	28.82	71.18
CONSTRUCTION								
AWARD DOLLARS	11.18	6.29	3.05	1.26	21.79	12.50	34.29	65.71
PAID DOLLARS	11.18	5.82	2.80	1.08	20.88	13.15	34.03	65.97
AE-CRS								
AWARD DOLLARS	8.11	2.23	5.01	1.29	16.63	11.12	27.76	72.24
PAID DOLLARS	8.09	2.22	5.00	1.29	16.60	11.07	27.67	72.33
MAINTENANCE								
AWARD DOLLARS	7.15	2.22	4.74	1.14	15.26	9.51	24.77	75.23
PAID DOLLARS	8.63	3.10	6.25	0.91	18.89	10.73	29.62	70.38
IT								
AWARD DOLLARS	7.42	2.25	5.03	1.37	16.06	10.31	26.37	73.63
PAID DOLLARS	7.18	2.17	5.06	1.41	15.82	10.00	25.82	74.18
SERVICES								
AWARD DOLLARS	10.39	3.27	5.30	1.15	20.11	12.94	33.05	66.95
PAID DOLLARS	11.35	3.62	5.84	1.29	22.09	12.54	34.63	65.37
CSE								
AWARD DOLLARS	5.46	1.96	3.04	0.40	10.87	7.75	18.61	81.39
PAID DOLLARS	5.63	1.90	3.38	0.30	11.21	7.40	18.60	81.40

Source and Notes: See Table 3.16.

Appendix D. Individual Modal Administration Tables

Table 3.16.C Overall Estimated DBE Availability Percentages, Federally-Assisted Contracts Only (MAA)

	African American	Hispanic	Asian	Native American	Minority	Non-minority Female	DBE	Non-DBE
OVERALL								
AWARD DOLLARS	10.13	3.29	4.22	1.24	18.88	11.38	30.26	69.74
PAID DOLLARS	9.39	3.13	4.22	1.30	18.04	10.90	28.94	71.06
CONSTRUCTION								
AWARD DOLLARS	13.39	5.20	2.48	1.14	22.21	12.01	34.23	65.77
PAID DOLLARS	13.23	5.04	2.55	1.15	21.97	11.89	33.86	66.14
AE-CRS								
AWARD DOLLARS	8.27	2.21	5.20	1.30	16.98	11.02	28.00	72.00
PAID DOLLARS	7.47	2.17	5.06	1.37	16.07	10.41	26.47	73.53
MAINTENANCE								
AWARD DOLLARS	12.12	6.71	4.44	2.08	25.34	10.03	35.37	64.63
PAID DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
IT								
AWARD DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PAID DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SERVICES								
AWARD DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PAID DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CSE								
AWARD DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PAID DOLLARS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source and Notes: See Table 3.16.

Appendix D. Individual Modal Administration Tables

Table 3.17.A Detailed DBE Availability Percentages—Construction (All Contracts) (Dollars Awarded) (SHA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	8.60	8.63	1.59	0.07	7.22	26.11	73.89
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Building Equipment Contractors (NAICS 2382)	12.86	6.70	1.72	1.27	12.64	35.20	64.80
Other Specialty Trade Contractors (NAICS 2389)	7.12	7.12	4.04	1.96	11.95	32.20	67.80
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Building Finishing Contractors (NAICS 2383)	5.17	22.46	3.15	0.04	13.13	43.96	56.04
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.06	2.03	1.11	0.97	9.31	18.48	81.52
Electric Lighting Equipment Manufacturing (NAICS 3351)	5.88	0.11	0.22	3.66	17.10	26.97	73.03
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Architectural, Engineering, and Related Services (NAICS 5413)	6.89	2.10	5.24	1.52	9.59	25.34	74.66
Services to Buildings and Dwellings (NAICS 5617)	16.65	2.83	2.56	2.41	11.31	35.76	64.24
Utility System Construction (NAICS 2371)	9.22	1.83	2.39	1.11	10.30	24.84	75.16
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Cement and Concrete Product Manufacturing (NAICS 3273)	3.01	0.60	0.43	0.06	3.09	7.19	92.81
Architectural and Structural Metals Manufacturing (NAICS 3323)	5.82	0.04	0.07	0.32	14.85	21.11	78.89
Other Support Activities for Transportation (NAICS 4889)	30.32	15.93	7.11	0.06	4.93	58.36	41.64
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45
Other Electrical Equipment and Component Manufacturing (NAICS 3359)	12.46	4.15	5.60	0.89	15.77	38.87	61.13
Other Miscellaneous Store Retailers (NAICS 4539)	11.81	3.65	4.95	0.92	17.50	38.83	61.17

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	0.00	0.00	0.00	0.00	7.14	7.14	92.86
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	4.88	3.32	1.28	0.21	9.08	18.77	81.23
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Lawn and Garden Equipment and Supplies Stores (NAICS 4442)	0.19	0.04	0.83	2.27	21.37	24.70	75.30
Communications Equipment Manufacturing (NAICS 3342)	3.95	11.40	0.00	0.00	20.48	35.83	64.17
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	2.46	2.20	1.70	1.03	8.35	15.74	84.26
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing (NAICS 3252)	6.87	0.04	0.07	0.07	8.03	15.08	84.92
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Iron and Steel Mills and Ferroalloy Manufacturing (NAICS 3311)	12.67	6.33	6.33	0.00	12.67	38.01	61.99
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing (NAICS 3327)	1.09	2.37	0.01	3.14	6.87	13.48	86.52
Paint, Coating, and Adhesive Manufacturing (NAICS 3255)	10.39	2.67	4.75	0.78	19.87	38.47	61.53
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	0.67	0.03	3.05	0.01	3.52	7.27	92.73
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85

Sources and Notes: See Table 3.17.

Appendix D. Individual Modal Administration Tables

Table 3.17.B Detailed DBE Availability Percentages—Construction (All Contracts) (Dollars Awarded) (MTA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Building Equipment Contractors (NAICS 2382)	11.42	5.89	1.63	1.02	12.58	32.54	67.46
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	5.31	5.67	1.27	0.83	9.14	22.22	77.78
Other Specialty Trade Contractors (NAICS 2389)	6.94	5.70	3.84	2.49	11.76	30.74	69.26
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Building Finishing Contractors (NAICS 2383)	4.44	19.04	4.31	0.04	13.48	41.32	58.68
Utility System Construction (NAICS 2371)	9.16	1.81	2.38	1.15	10.41	24.90	75.10
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.08	2.09	1.43	0.76	13.50	22.85	77.15
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	7.49	0.16	0.63	0.09	33.04	41.40	58.60
Cement and Concrete Product Manufacturing (NAICS 3273)	2.22	2.07	0.01	0.00	10.36	14.67	85.33
Architectural and Structural Metals Manufacturing (NAICS 3323)	0.42	0.00	0.00	0.00	6.91	7.34	92.66
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.69	0.86	1.01	0.87	10.77	17.19	82.81
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45
Architectural, Engineering, and Related Services (NAICS 5413)	6.56	2.02	5.45	1.64	9.13	24.80	75.20
Services to Buildings and Dwellings (NAICS 5617)	22.74	6.94	3.49	1.30	12.78	47.25	52.75
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	2.42	3.49	2.86	1.10	8.10	17.97	82.03

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Commercial and Service Industry Machinery Manufacturing (NAICS 3333)	11.19	0.00	1.89	0.00	16.24	29.31	70.69
Electrical Equipment Manufacturing (NAICS 3353)	0.00	0.00	0.00	0.00	13.33	13.33	86.67
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	0.27	2.29	0.73	0.03	3.72	7.04	92.96
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Electric Lighting Equipment Manufacturing (NAICS 3351)	1.77	0.03	0.07	6.10	12.63	20.60	79.40
Other Electrical Equipment and Component Manufacturing (NAICS 3359)	13.08	3.52	4.73	0.78	14.96	37.07	62.93
Furniture and Home Furnishing Merchant Wholesalers (NAICS 4232)	13.94	3.66	5.26	0.98	18.45	42.28	57.72
Textile and Fabric Finishing and Fabric Coating Mills (NAICS 3133)	10.65	3.51	4.62	0.86	16.71	36.35	63.65
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Management, Scientific, and Technical Consulting Services (NAICS 5416)	13.41	2.93	5.75	1.26	19.96	43.30	56.70
Facilities Support Services (NAICS 5612)	26.39	3.77	2.52	1.15	9.10	42.92	57.08
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Other General Purpose Machinery Manufacturing (NAICS 3339)	10.48	3.74	4.86	0.75	13.85	33.68	66.32
Miscellaneous Nondurable Goods Merchant Wholesalers (NAICS 4249)	4.26	2.46	0.71	1.76	8.69	17.88	82.12
Computer Systems Design and Related Services (NAICS 5415)	20.38	1.61	14.19	0.49	9.50	46.16	53.84
Automotive Equipment Rental and Leasing (NAICS 5321)	2.08	0.07	2.88	0.95	3.13	9.11	90.89
Investigation and Security Services (NAICS 5616)	15.53	2.76	6.02	0.82	14.11	39.24	60.76
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	0.67	0.03	3.05	0.01	3.52	7.27	92.73

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Support Activities for Rail Transportation (NAICS 4882)	18.21	12.34	3.80	2.17	13.75	50.27	49.73
Medical Equipment and Supplies Manufacturing (NAICS 3391)	12.09	3.92	5.45	0.82	15.24	37.52	62.48
Agencies, Brokerages, and Other Insurance Related Activities (NAICS 5242)	8.56	0.75	1.35	0.07	14.61	25.34	74.66
Building Material and Supplies Dealers (NAICS 4441)	1.31	0.03	0.05	0.01	12.75	14.15	85.85
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	3.03	3.16	0.22	0.03	7.11	13.56	86.44
Nondepository Credit Intermediation (NAICS 5222)	8.16	2.68	3.51	0.57	10.62	25.53	74.47
Motor Vehicle Parts Manufacturing (NAICS 3363)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Residential Building Construction (NAICS 2361)	12.32	4.20	5.31	0.84	15.69	38.36	61.64
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	0.00	0.00	0.00	0.00	7.14	7.14	92.86

Sources and Notes: *See Table 3.17.*

Appendix D. Individual Modal Administration Tables

Table 3.17.C. Detailed DBE Availability Percentages—Construction (All Contracts) (Dollars Awarded) (MAA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Building Equipment Contractors (NAICS 2382)	12.03	5.97	1.59	1.07	12.68	33.33	66.67
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Investigation and Security Services (NAICS 5616)	19.93	1.49	4.79	1.20	11.71	39.12	60.88
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	6.49	7.51	1.56	1.04	10.48	27.08	72.92
Building Finishing Contractors (NAICS 2383)	3.75	11.51	2.81	0.23	13.42	31.72	68.28
Architectural and Structural Metals Manufacturing (NAICS 3323)	6.58	0.04	0.08	0.04	16.37	23.10	76.90
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	0.90	8.40	2.73	3.98	6.30	22.30	77.70
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.34	1.91	0.96	1.24	8.37	17.82	82.18
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	5.04	0.26	1.70	1.21	8.67	16.87	83.13
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	0.00	0.00	0.00	0.00	20.00	20.00	80.00
Utility System Construction (NAICS 2371)	9.16	1.81	2.38	1.15	10.41	24.90	75.10
Other Specialty Trade Contractors (NAICS 2389)	6.73	4.06	3.61	3.10	11.55	29.06	70.94
Services to Buildings and Dwellings (NAICS 5617)	16.65	2.83	2.56	2.41	11.31	35.76	64.24
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Other Electrical Equipment and Component Manufacturing (NAICS 3359)	12.46	4.15	5.60	0.89	15.77	38.87	61.13
Other General Purpose Machinery Manufacturing (NAICS 3339)	0.00	0.00	0.00	0.00	22.22	22.22	77.78
Architectural, Engineering, and Related Services (NAICS 5413)	6.89	2.10	5.24	1.52	9.60	25.35	74.65

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Cement and Concrete Product Manufacturing (NAICS 3273)	1.77	0.03	0.04	0.01	0.12	1.97	98.03
Electric Lighting Equipment Manufacturing (NAICS 3351)	0.00	0.00	0.00	7.14	10.71	17.86	82.14
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Remediation and Other Waste Management Services (NAICS 5629)	3.19	8.67	9.26	0.00	14.17	35.29	64.71
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	0.00	0.00	0.00	0.00	7.14	7.14	92.86
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	1.29	0.00	2.80	0.00	4.13	8.23	91.77
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Computer Systems Design and Related Services (NAICS 5415)	12.44	5.22	19.12	1.48	10.98	49.24	50.76
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	7.14	0.00	0.00	0.00	35.71	42.86	57.14
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32

Sources and Notes: See Table 3.17.

Appendix D. Individual Modal Administration Tables

Table 3.18.A Detailed DBE Availability Percentages—AE-CRS (All Contracts) (Dollars Awarded) (SHA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Architectural, Engineering, and Related Services (NAICS 5413)	7.12	2.19	4.93	1.38	10.13	25.75	74.25
Management, Scientific, and Technical Consulting Services (NAICS 5416)	6.79	1.88	3.85	1.99	16.70	31.22	68.78
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Scientific Research and Development Services (NAICS 5417)	4.59	0.01	1.12	0.41	6.95	13.08	86.92
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Architectural, Engineering, and Related Services (NAICS 5413)	7.12	2.19	4.93	1.38	10.13	25.75	74.25
Management, Scientific, and Technical Consulting Services (NAICS 5416)	6.79	1.88	3.85	1.99	16.70	31.22	68.78
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Scientific Research and Development Services (NAICS 5417)	4.59	0.01	1.12	0.41	6.95	13.08	86.92

Sources and Notes: See Table 3.18.

Appendix D. Individual Modal Administration Tables

Table 3.18.B Detailed DBE Availability Percentages—AE-CRS (All Contracts) (Dollars Awarded) (MTA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Architectural, Engineering, and Related Services (NAICS 5413)	7.20	2.25	5.00	1.38	10.15	25.97	74.03
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Management, Scientific, and Technical Consulting Services (NAICS 5416)	10.53	2.77	4.80	1.31	16.02	35.43	64.57
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	0.34	1.66	0.89	0.04	0.92	3.84	96.16
Community Food and Housing, and Emergency and Other Relief Services (NAICS 6242)	0.00	0.00	0.00	0.00	9.09	9.09	90.91
Advertising, Public Relations, and Related Services (NAICS 5418)	7.68	4.62	1.70	0.34	26.75	41.08	58.92
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Scientific Research and Development Services (NAICS 5417)	4.59	0.01	1.12	0.41	6.95	13.08	86.92
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85

Sources and Notes: See Table 3.18.

Appendix D. Individual Modal Administration Tables

Table 3.18.C Detailed DBE Availability Percentages—AE-CRS (All Contracts) (Dollars Awarded) (MAA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Architectural, Engineering, and Related Services (NAICS 5413)	7.28	2.09	4.92	1.33	10.42	26.04	73.96
Management, Scientific, and Technical Consulting Services (NAICS 5416)	14.06	1.17	3.45	0.17	10.04	28.89	71.11
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Building Equipment Contractors (NAICS 2382)	13.07	6.81	1.73	1.31	12.66	35.56	64.44

Sources and Notes: *See* Table 3.18.

Appendix D. Individual Modal Administration Tables

Table 3.19.A Detailed DBE Availability Percentages—Maintenance (All Contracts) (Dollars Awarded) (SHA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Building Equipment Contractors (NAICS 2382)	11.42	5.95	1.65	1.04	12.56	32.62	67.38
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing (NAICS 3327)	1.09	2.37	0.01	3.14	6.87	13.48	86.52
Other Specialty Trade Contractors (NAICS 2389)	6.59	2.98	3.45	3.51	11.41	27.94	72.06
Services to Buildings and Dwellings (NAICS 5617)	17.21	3.20	2.65	2.31	11.44	36.81	63.19
Nonresidential Building Construction (NAICS 2362)	12.19	6.71	4.41	2.06	10.03	35.42	64.58
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Investigation and Security Services (NAICS 5616)	20.27	1.70	4.00	1.36	11.62	38.95	61.05
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	9.99	11.45	2.09	0.09	7.81	31.44	68.56
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	4.82	1.57	1.07	1.54	11.59	20.59	79.41
Employment Services (NAICS 5613)	11.59	2.41	4.28	0.21	14.02	32.52	67.48
Architectural and Structural Metals Manufacturing (NAICS 3323)	3.52	0.04	0.06	0.83	12.81	17.27	82.73
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45
Lawn and Garden Equipment and Supplies Stores (NAICS 4442)	0.19	0.04	0.83	2.27	21.37	24.70	75.30
Architectural, Engineering, and Related Services (NAICS 5413)	7.18	2.17	5.06	1.41	10.00	25.82	74.18
Building Material and Supplies Dealers (NAICS 4441)	5.50	1.63	2.23	0.41	11.07	20.84	79.16
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.01	0.05	1.34	0.02	9.06	13.47	86.53
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	5.38	3.36	1.56	0.26	9.61	20.17	79.83

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Cement and Concrete Product Manufacturing (NAICS 3273)	3.66	0.04	0.58	0.08	0.30	4.66	95.34
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Building Finishing Contractors (NAICS 2383)	4.46	17.24	2.67	0.05	13.61	38.03	61.97
Electric Power Generation, Transmission and Distribution (NAICS 2211)	1.22	0.01	1.80	1.11	8.17	12.31	87.69
Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing (NAICS 3334)	7.82	0.81	3.77	0.00	13.48	25.88	74.12
Communications Equipment Manufacturing (NAICS 3342)	3.95	11.40	0.00	0.00	20.48	35.83	64.17
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Utility System Construction (NAICS 2371)	9.16	1.81	2.38	1.15	10.41	24.90	75.10
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	0.88	0.02	2.96	0.00	3.73	7.60	92.40
Glass and Glass Product Manufacturing (NAICS 3272)	12.34	4.39	4.63	0.89	17.86	40.12	59.88
Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance (NAICS 8113)	5.95	2.11	0.41	0.01	3.20	11.68	88.32
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Boiler, Tank, and Shipping Container Manufacturing (NAICS 3324)	8.61	3.07	4.00	0.61	11.37	27.66	72.34
Waste Collection (NAICS 5621)	23.81	0.00	0.00	3.14	7.25	34.21	65.79
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Insurance Carriers (NAICS 5241)	10.53	3.64	4.65	0.80	15.08	34.69	65.31
Lessors of Real Estate (NAICS 5311)	2.99	0.15	1.89	0.03	14.43	19.48	80.52

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Iron and Steel Mills and Ferroalloy Manufacturing (NAICS 3311)	12.67	6.33	6.33	0.00	12.67	38.01	61.99
Plastics Product Manufacturing (NAICS 3261)	4.34	0.78	3.74	0.06	8.69	17.62	82.38
Waste Treatment and Disposal (NAICS 5622)	8.77	2.81	0.97	0.00	22.25	34.80	65.20
Drycleaning and Laundry Services (NAICS 8123)	12.33	3.86	6.67	0.95	17.59	41.40	58.60

Sources and Notes: *See Table 3.19.*

Appendix D. Individual Modal Administration Tables

Table 3.19.B Detailed DBE Availability Percentages—Maintenance (All Contracts) (Dollars Awarded) (MTA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Railroad Rolling Stock Manufacturing (NAICS 3365)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Building Equipment Contractors (NAICS 2382)	12.27	1.69	0.34	0.15	13.90	28.35	71.65
Interurban and Rural Bus Transportation (NAICS 4852)	20.62	0.00	0.00	0.00	14.37	35.00	65.00
Support Activities for Rail Transportation (NAICS 4882)	18.21	12.34	3.80	2.17	13.75	50.27	49.73
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Urban Transit Systems (NAICS 4851)	42.42	4.79	10.65	0.12	5.04	63.02	36.98
Services to Buildings and Dwellings (NAICS 5617)	19.39	4.68	2.98	1.91	11.97	40.92	59.08
Architectural, Engineering, and Related Services (NAICS 5413)	7.18	2.17	5.06	1.41	10.00	25.82	74.18
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	1.76	3.64	2.28	1.22	6.99	15.88	84.12
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32
Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance (NAICS 8113)	5.95	2.11	0.41	0.01	3.20	11.68	88.32
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Motor Vehicle Parts Manufacturing (NAICS 3363)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Traveler Accommodation (NAICS 7211)	0.13	1.43	10.56	3.60	9.94	25.65	74.35
Other Specialty Trade Contractors (NAICS 2389)	6.37	1.28	3.21	4.14	11.20	26.21	73.79
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	7.57	0.19	0.77	0.11	32.42	41.07	58.93
Management, Scientific, and Technical Consulting Services (NAICS 5416)	5.61	2.14	4.16	2.37	18.55	32.83	67.17
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	2.54	0.21	0.90	0.02	10.39	14.06	85.94

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Automotive Repair and Maintenance (NAICS 8111)	8.22	3.96	9.00	0.18	11.62	32.98	67.02
Investigation and Security Services (NAICS 5616)	20.84	2.04	2.69	1.62	11.48	38.68	61.32
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Waste Treatment and Disposal (NAICS 5622)	8.77	2.81	0.97	0.00	22.25	34.80	65.20
Freight Transportation Arrangement (NAICS 4885)	17.82	4.09	7.34	0.18	11.67	41.11	58.89
Remediation and Other Waste Management Services (NAICS 5629)	5.14	0.05	0.10	0.10	2.22	7.61	92.39
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	10.17	11.71	2.14	0.06	7.75	31.84	68.16
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35

Sources and Notes: *See Table 3.19.*

Appendix D. Individual Modal Administration Tables

Table 3.19.C Detailed DBE Availability Percentages—Maintenance (All Contracts) (Dollars Awarded) (MAA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Investigation and Security Services (NAICS 5616)	20.63	1.91	3.19	1.52	11.54	38.78	61.22
Other Specialty Trade Contractors (NAICS 2389)	6.37	1.28	3.21	4.14	11.20	26.21	73.79
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Facilities Support Services (NAICS 5612)	26.39	3.77	2.52	1.15	9.10	42.92	57.08
Building Equipment Contractors (NAICS 2382)	11.52	3.57	0.95	0.52	13.23	29.79	70.21
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Architectural, Engineering, and Related Services (NAICS 5413)	5.65	1.80	6.01	1.98	7.89	23.32	76.68
Services to Buildings and Dwellings (NAICS 5617)	12.00	2.44	2.20	1.25	8.88	26.78	73.22
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Waste Collection (NAICS 5621)	23.81	0.00	0.00	3.14	7.25	34.21	65.79
Specialized Freight Trucking (NAICS 4842)	24.84	7.48	1.87	0.12	11.65	45.97	54.03
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Chemical and Allied Products Merchant Wholesalers (NAICS 4246)	6.23	4.13	7.07	1.19	6.46	25.08	74.92
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	1.29	0.00	2.80	0.00	4.13	8.23	91.77
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	3.50	6.36	1.58	1.82	11.86	25.12	74.88
Utility System Construction (NAICS 2371)	9.16	1.81	2.38	1.15	10.41	24.90	75.10
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.05	4.19	4.58	0.01	10.08	22.92	77.08
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Aerospace Product and Parts Manufacturing (NAICS 3364)	0.00	4.35	0.00	0.00	19.13	23.48	76.52
Support Activities for Air Transportation (NAICS 4881)	18.32	1.91	2.91	0.13	2.42	25.69	74.31

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Computer Systems Design and Related Services (NAICS 5415)	14.09	4.49	17.03	1.40	11.85	48.85	51.15
Nondepository Credit Intermediation (NAICS 5222)	13.11	4.26	4.43	0.76	14.47	37.03	62.97
Automotive Repair and Maintenance (NAICS 8111)	10.12	7.10	4.65	1.69	9.32	32.87	67.13

Sources and Notes: *See Table 3.19.*

Appendix D. Individual Modal Administration Tables

Table 3.20.A Detailed DBE Availability Percentages—IT (All Contracts) (Dollars Awarded) (SHA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Computer Systems Design and Related Services (NAICS 5415)	15.31	3.94	15.48	1.33	12.49	48.56	51.44
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.05	4.19	4.58	0.01	10.08	22.92	77.08
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	10.62	1.59	6.32	0.91	8.78	28.22	71.78
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Architectural, Engineering, and Related Services (NAICS 5413)	7.55	2.01	4.86	1.23	11.04	26.69	73.31
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Management, Scientific, and Technical Consulting Services (NAICS 5416)	13.80	1.17	3.17	0.18	10.04	28.36	71.64
Building Equipment Contractors (NAICS 2382)	13.07	6.81	1.73	1.31	12.66	35.56	64.44
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Data Processing, Hosting, and Related Services (NAICS 5182)	21.33	1.91	5.77	0.14	15.34	44.50	55.50
Other Specialty Trade Contractors (NAICS 2389)	7.40	9.29	4.35	1.15	12.23	34.42	65.58
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66

Sources and Notes: See Table 3.20.

Appendix D. Individual Modal Administration Tables

Table 3.20.B Detailed DBE Availability Percentages—IT (All Contracts) (Dollars Awarded) (MTA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Computer Systems Design and Related Services (NAICS 5415)	13.45	4.77	17.83	1.43	11.51	49.00	51.00
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Architectural, Engineering, and Related Services (NAICS 5413)	7.18	2.17	5.06	1.41	10.00	25.82	74.18
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	7.35	0.09	0.37	0.05	34.13	42.00	58.00
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Utility System Construction (NAICS 2371)	10.23	2.27	2.41	0.51	8.48	23.89	76.11
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.01	0.05	1.34	0.02	9.06	13.47	86.53
Other Crop Farming (NAICS 1119)	11.61	3.94	5.16	0.88	16.74	38.33	61.67

Sources and Notes: *See Table 3.20.*

Appendix D. Individual Modal Administration Tables

Table 3.20.C Detailed DBE Availability Percentages—IT (All Contracts) (Dollars Awarded) (MAA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Computer Systems Design and Related Services (NAICS 5415)	12.87	5.02	18.81	1.43	10.93	49.08	50.92
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Architectural, Engineering, and Related Services (NAICS 5413)	7.18	2.17	5.06	1.41	10.00	25.82	74.18
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	10.62	1.59	6.32	0.91	8.78	28.22	71.78
Building Equipment Contractors (NAICS 2382)	13.07	6.81	1.73	1.31	12.66	35.56	64.44
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Employment Services (NAICS 5613)	17.40	2.34	6.60	0.66	18.27	45.27	54.73
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.05	4.19	4.58	0.01	10.08	22.92	77.08
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Electronic and Precision Equipment Repair and Maintenance (NAICS 8112)	17.51	4.11	6.39	0.97	16.15	45.13	54.87
Computer and Peripheral Equipment Manufacturing (NAICS 3341)	13.70	3.59	6.17	0.95	16.54	40.96	59.04
Electronics and Appliance Stores (NAICS 4431)	10.01	0.31	3.00	0.29	15.37	28.99	71.01
Household and Institutional Furniture and Kitchen Cabinet Manufacturing (NAICS 3371)	13.46	0.00	8.12	0.00	15.81	37.39	62.61

Sources and Notes: See Table 3.20.

Appendix D. Individual Modal Administration Tables

Table 3.21.A Detailed DBE Availability Percentages—Services (All Contracts) (Dollars Awarded) (SHA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Employment Services (NAICS 5613)	17.34	2.34	6.57	0.66	18.23	45.14	54.86
Electric Power Generation, Transmission and Distribution (NAICS 2211)	1.22	0.01	1.78	1.10	8.15	12.27	87.73
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Architectural, Engineering, and Related Services (NAICS 5413)	7.18	2.17	5.06	1.41	10.00	25.82	74.18
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Services to Buildings and Dwellings (NAICS 5617)	16.65	2.83	2.56	2.41	11.31	35.76	64.24
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Natural Gas Distribution (NAICS 2212)	5.63	0.00	4.87	0.00	0.00	10.50	89.50
Building Equipment Contractors (NAICS 2382)	13.07	6.81	1.73	1.31	12.66	35.56	64.44
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	4.09	1.05	2.10	1.06	14.93	23.22	76.78
Utility System Construction (NAICS 2371)	9.60	2.00	2.39	0.88	9.61	24.48	75.52
Other Professional, Scientific, and Technical Services (NAICS 5419)	13.29	3.86	5.21	0.96	17.94	41.27	58.73
Advertising, Public Relations, and Related Services (NAICS 5418)	8.99	0.04	2.60	3.21	22.48	37.32	62.68
Management, Scientific, and Technical Consulting Services (NAICS 5416)	17.70	1.80	7.36	0.29	13.29	40.44	59.56
Newspaper, Periodical, Book, and Directory Publishers (NAICS 5111)	1.47	0.84	1.41	1.01	12.81	17.54	82.46
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	3.03	3.16	0.22	0.03	7.11	13.56	86.44
Traveler Accommodation (NAICS 7211)	0.13	1.43	10.56	3.60	9.94	25.65	74.35
Other Specialty Trade Contractors (NAICS 2389)	6.37	1.28	3.21	4.14	11.20	26.21	73.79
Cable and Other Subscription Programming (NAICS 5152)	5.49	3.55	4.00	0.06	3.25	16.35	83.65

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Activities Related to Real Estate (NAICS 5313)	4.29	1.69	1.66	0.05	20.64	28.32	71.68
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Child Day Care Services (NAICS 6244)	13.25	3.49	4.58	1.16	22.28	44.77	55.23
Travel Arrangement and Reservation Services (NAICS 5615)	12.80	3.83	5.23	1.02	18.97	41.86	58.14
Accounting, Tax Preparation, Bookkeeping, and Payroll Services (NAICS 5412)	14.80	0.85	0.83	2.15	24.82	43.44	56.56
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66

Sources and Notes: *See Table 3.21.*

Appendix D. Individual Modal Administration Tables

Table 3.21.B Detailed DBE Availability Percentages—Services (All Contracts) (Dollars Awarded) (MTA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Urban Transit Systems (NAICS 4851)	42.42	4.79	10.65	0.12	5.04	63.02	36.98
Rail Transportation (NAICS 4821)	0.65	0.14	0.20	0.08	1.69	2.74	97.26
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35
Direct Selling Establishments (NAICS 4543)	2.43	0.82	0.83	0.01	8.60	12.68	87.32
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Railroad Rolling Stock Manufacturing (NAICS 3365)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Taxi and Limousine Service (NAICS 4853)	20.41	3.19	12.24	2.26	6.76	44.86	55.14
Architectural, Engineering, and Related Services (NAICS 5413)	7.59	1.99	4.84	1.21	11.15	26.78	73.22
Computer Systems Design and Related Services (NAICS 5415)	17.94	2.75	13.93	0.99	11.91	47.52	52.48
Advertising, Public Relations, and Related Services (NAICS 5418)	7.90	4.04	1.73	0.59	26.41	40.68	59.32
Travel Arrangement and Reservation Services (NAICS 5615)	8.13	0.00	2.03	2.03	7.10	19.30	80.70
Agencies, Brokerages, and Other Insurance Related Activities (NAICS 5242)	2.62	0.23	0.41	0.02	13.90	17.19	82.81
Charter Bus Industry (NAICS 4855)	29.84	0.97	0.39	0.18	17.80	49.19	50.81
Management, Scientific, and Technical Consulting Services (NAICS 5416)	13.92	1.32	3.02	0.15	9.61	28.02	71.98
Interurban and Rural Bus Transportation (NAICS 4852)	20.62	0.00	0.00	0.00	14.37	35.00	65.00
Building Equipment Contractors (NAICS 2382)	12.72	6.63	1.71	1.25	12.64	34.95	65.05
Insurance Carriers (NAICS 5241)	3.26	0.06	0.11	0.00	4.64	8.07	91.93
Other Professional, Scientific, and Technical Services (NAICS 5419)	2.54	17.16	4.33	2.71	29.95	56.68	43.32
Services to Buildings and Dwellings (NAICS 5617)	27.49	10.16	4.21	0.43	13.93	56.22	43.78
Automotive Repair and Maintenance (NAICS 8111)	11.94	7.59	4.57	0.93	8.84	33.86	66.14
Other Support Services (NAICS 5619)	18.71	2.45	2.57	0.02	28.54	52.30	47.70

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Depository Credit Intermediation (NAICS 5221)	0.19	0.00	0.42	0.00	0.44	1.06	98.94
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	2.69	3.52	2.64	1.09	7.69	17.63	82.37
Employment Services (NAICS 5613)	10.00	2.43	3.65	0.09	12.86	29.03	70.97
Activities Related to Real Estate (NAICS 5313)	11.69	4.81	1.66	0.01	20.62	38.79	61.21
Health and Personal Care Stores (NAICS 4461)	6.28	2.68	2.00	0.01	4.90	15.87	84.13
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Electric Power Generation, Transmission and Distribution (NAICS 2211)	1.22	0.01	1.80	1.11	8.17	12.31	87.69
Business, Professional, Labor, Political, and Similar Organizations (NAICS 8139)	11.62	4.08	5.30	0.82	15.09	36.91	63.09
Lessors of Real Estate (NAICS 5311)	2.99	0.15	1.89	0.03	14.43	19.48	80.52
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.41	0.32	0.67	0.50	11.59	16.50	83.50
Automotive Parts, Accessories, and Tire Stores (NAICS 4413)	2.59	3.52	1.66	0.48	4.74	13.00	87.00
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	12.59	0.00	0.00	0.05	0.16	12.81	87.19
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Home Health Care Services (NAICS 6216)	37.69	3.81	0.92	0.04	11.38	53.84	46.16
Support Activities for Road Transportation (NAICS 4884)	12.13	4.00	5.45	0.87	16.22	38.66	61.34
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Data Processing, Hosting, and Related Services (NAICS 5182)	21.33	1.91	5.77	0.14	15.34	44.50	55.50
Other Telecommunications (NAICS 5179)	4.61	2.56	1.77	0.43	3.00	12.38	87.62
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	9.48	2.11	0.10	1.07	15.87	28.62	71.38

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Motor Vehicle Parts Manufacturing (NAICS 3363)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Rubber Product Manufacturing (NAICS 3262)	11.48	4.10	5.33	0.82	15.16	36.89	63.11
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Investigation and Security Services (NAICS 5616)	19.05	0.96	6.82	0.79	11.92	39.54	60.46
Office Administrative Services (NAICS 5611)	12.78	2.34	2.67	0.81	19.74	38.34	61.66

Sources and Notes: *See Table 3.21.*

Appendix D. Individual Modal Administration Tables

Table 3.21.C Detailed DBE Availability Percentages—Services (All Contracts) (Dollars Awarded) (MAA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Taxi and Limousine Service (NAICS 4853)	28.47	7.02	10.87	0.01	13.56	59.92	40.08
Management, Scientific, and Technical Consulting Services (NAICS 5416)	7.89	2.60	4.62	2.00	18.75	35.86	64.14
Advertising, Public Relations, and Related Services (NAICS 5418)	7.98	4.58	1.90	0.38	26.36	41.19	58.81
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85
Services to Buildings and Dwellings (NAICS 5617)	28.14	10.60	4.31	0.31	14.08	57.44	42.56
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.05	4.19	4.58	0.01	10.08	22.92	77.08
Employment Services (NAICS 5613)	9.20	2.44	3.33	0.03	12.27	27.27	72.73
Architectural, Engineering, and Related Services (NAICS 5413)	4.77	1.59	6.55	2.30	6.68	21.90	78.10
Special Food Services (NAICS 7223)	24.97	4.73	1.38	0.01	24.09	55.17	44.83
Specialized Design Services (NAICS 5414)	15.06	3.76	4.93	1.27	24.71	49.73	50.27
Agencies, Brokerages, and Other Insurance Related Activities (NAICS 5242)	8.56	0.75	1.35	0.07	14.61	25.34	74.66

Sources and Notes: See Table 3.21.

Appendix D. Individual Modal Administration Tables

Table 3.22.A Detailed DBE Availability Percentages—CSE (All Contracts) (Dollars Awarded) (SHA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Communications Equipment Manufacturing (NAICS 3342)	3.95	11.40	0.00	0.00	20.48	35.83	64.17
Computer Systems Design and Related Services (NAICS 5415)	17.01	3.19	13.33	1.24	13.39	48.15	51.85
Cement and Concrete Product Manufacturing (NAICS 3273)	2.95	0.05	0.07	0.01	0.19	3.27	96.73
Building Equipment Contractors (NAICS 2382)	12.87	6.70	1.72	1.27	12.64	35.21	64.79
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	0.64	0.23	0.30	0.05	7.55	8.76	91.24
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.21	1.37	1.73	0.59	9.11	16.01	83.99
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.46	2.10	1.22	0.89	10.87	20.54	79.46
Architectural and Structural Metals Manufacturing (NAICS 3323)	7.09	0.04	0.08	0.04	15.98	23.23	76.77
Building Material and Supplies Dealers (NAICS 4441)	6.65	2.08	2.84	0.52	10.06	22.16	77.84
Offices of Other Health Practitioners (NAICS 6213)	4.99	0.95	2.33	2.25	23.13	33.65	66.35
Other Support Activities for Transportation (NAICS 4889)	30.32	15.93	7.11	0.06	4.93	58.36	41.64
Newspaper, Periodical, Book, and Directory Publishers (NAICS 5111)	13.68	1.48	1.60	2.24	19.07	38.07	61.93
Agriculture, Construction, and Mining Machinery Manufacturing (NAICS 3331)	0.00	1.16	0.00	0.00	6.06	7.22	92.78
Automotive Repair and Maintenance (NAICS 8111)	10.12	7.10	4.65	1.69	9.32	32.87	67.13
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.49	0.02	1.44	1.24	8.16	15.35	84.65
Wired Telecommunications Carriers (NAICS 5171)	14.59	0.20	2.02	0.05	6.34	23.20	76.80
Commercial and Service Industry Machinery Manufacturing (NAICS 3333)	11.19	0.00	1.89	0.00	16.24	29.31	70.69

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Glass and Glass Product Manufacturing (NAICS 3272)	12.34	4.39	4.63	0.89	17.86	40.12	59.88
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66
Miscellaneous Nondurable Goods Merchant Wholesalers (NAICS 4249)	11.99	3.89	5.55	0.94	17.23	39.60	60.40
Facilities Support Services (NAICS 5612)	26.39	3.77	2.52	1.15	9.10	42.92	57.08
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	5.97	2.04	5.87	0.48	9.93	24.29	75.71
Chemical and Allied Products Merchant Wholesalers (NAICS 4246)	6.23	4.13	7.07	1.19	6.46	25.08	74.92
Other General Purpose Machinery Manufacturing (NAICS 3339)	9.78	3.08	7.51	0.75	14.87	35.99	64.01
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Automotive Equipment Rental and Leasing (NAICS 5321)	2.08	0.07	2.88	0.95	3.13	9.11	90.89
Other Fabricated Metal Product Manufacturing (NAICS 3329)	4.77	1.83	2.78	3.68	20.17	33.22	66.78
Petroleum and Coal Products Manufacturing (NAICS 3241)	1.71	0.61	0.79	0.12	21.41	24.64	75.36
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Natural Gas Distribution (NAICS 2212)	5.63	0.00	4.87	0.00	0.00	10.50	89.50
Other Wood Product Manufacturing (NAICS 3219)	9.84	3.51	4.57	0.70	13.00	31.62	68.38
Electronic and Precision Equipment Repair and Maintenance (NAICS 8112)	17.51	4.11	6.39	0.97	16.15	45.13	54.87
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	5.37	0.07	4.64	0.05	14.49	24.62	75.38
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Scientific Research and Development Services (NAICS 5417)	4.78	0.89	5.29	2.80	5.71	19.48	80.52
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11

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Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Metal and Mineral (except Petroleum) Merchant Wholesalers (NAICS 4235)	10.28	0.06	7.17	0.04	18.00	35.55	64.45

Sources and Notes: *See Table 3.22.*

Appendix D. Individual Modal Administration Tables

Table 3.22.B Detailed DBE Availability Percentages—CSE (All Contracts) (Dollars Awarded) (MTA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Motor Vehicle Manufacturing (NAICS 3361)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	1.80	3.65	2.27	1.22	7.00	15.94	84.06
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	3.03	0.28	1.37	0.16	9.89	14.73	85.27
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Railroad Rolling Stock Manufacturing (NAICS 3365)	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Computer Systems Design and Related Services (NAICS 5415)	14.45	4.32	16.56	1.38	12.04	48.76	51.24
Engine, Turbine, and Power Transmission Equipment Manufacturing (NAICS 3336)	0.62	0.00	4.32	0.00	0.62	5.56	94.44
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.10	3.66	4.18	0.17	9.84	21.95	78.05
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	11.20	1.59	5.41	0.73	11.03	29.95	70.05
Automotive Repair and Maintenance (NAICS 8111)	12.13	7.41	4.62	0.88	9.20	34.23	65.77
Electrical Equipment Manufacturing (NAICS 3353)	0.04	0.02	0.02	0.00	12.42	12.50	87.50
Motor Vehicle Parts Manufacturing (NAICS 3363)	6.53	2.33	3.03	0.47	8.63	20.99	79.01
Support Activities for Rail Transportation (NAICS 4882)	18.21	12.34	3.80	2.17	13.75	50.27	49.73
Architectural, Engineering, and Related Services (NAICS 5413)	7.38	2.09	4.96	1.31	10.54	26.28	73.72
Agriculture, Construction, and Mining Machinery Manufacturing (NAICS 3331)	11.48	4.10	5.33	0.82	15.16	36.89	63.11
Plastics Product Manufacturing (NAICS 3261)	5.24	1.12	4.58	0.17	9.92	21.03	78.97
Highway, Street, and Bridge Construction (NAICS 2373)	13.59	3.09	3.70	0.38	11.87	32.62	67.38
Other Transit and Ground Passenger Transportation (NAICS 4859)	29.55	4.35	3.85	0.80	14.10	52.65	47.35

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	1.29	0.00	2.80	0.00	4.13	8.23	91.77
Investigation and Security Services (NAICS 5616)	19.41	1.17	6.00	0.96	11.84	39.37	60.63
Other Electrical Equipment and Component Manufacturing (NAICS 3359)	25.52	2.54	3.30	1.19	11.44	43.99	56.01
Building Equipment Contractors (NAICS 2382)	10.23	5.38	1.61	0.85	12.47	30.54	69.46
Printing and Related Support Activities (NAICS 3231)	4.82	1.60	5.27	0.98	17.92	30.59	69.41
Automotive Parts, Accessories, and Tire Stores (NAICS 4413)	2.33	0.73	1.21	0.72	3.18	8.18	91.82
Architectural and Structural Metals Manufacturing (NAICS 3323)	3.68	0.04	0.06	0.79	12.95	17.52	82.48
Natural Gas Distribution (NAICS 2212)	5.63	0.00	4.87	0.00	0.00	10.50	89.50
Other Fabricated Metal Product Manufacturing (NAICS 3329)	0.19	1.51	2.42	4.43	18.69	27.24	72.76
Iron and Steel Mills and Ferroalloy Manufacturing (NAICS 3311)	12.67	6.33	6.33	0.00	12.67	38.01	61.99
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	0.00	2.97	0.00	0.00	17.96	20.93	79.07
Clothing Stores (NAICS 4481)	12.44	3.59	5.89	1.00	18.59	41.51	58.49
Support Activities for Road Transportation (NAICS 4884)	6.71	9.01	0.15	1.78	16.46	34.11	65.89
Services to Buildings and Dwellings (NAICS 5617)	16.65	2.83	2.56	2.41	11.31	35.76	64.24
Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing (NAICS 3327)	9.18	3.06	2.56	2.00	11.54	28.34	71.66
Petroleum and Coal Products Manufacturing (NAICS 3241)	8.78	3.13	4.07	0.63	11.60	28.21	71.79
Chemical and Allied Products Merchant Wholesalers (NAICS 4246)	6.23	4.13	7.07	1.19	6.46	25.08	74.92
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Metalworking Machinery Manufacturing (NAICS 3335)	11.31	3.48	6.98	1.27	19.01	42.05	57.95
Paper and Paper Product Merchant Wholesalers (NAICS 4241)	13.25	3.47	4.58	0.91	16.14	38.35	61.65
Electric Lighting Equipment Manufacturing (NAICS 3351)	6.12	0.11	0.23	3.52	17.36	27.34	72.66

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Semiconductor and Other Electronic Component Manufacturing (NAICS 3344)	3.11	0.11	0.15	0.05	7.64	11.06	88.94
Household and Institutional Furniture and Kitchen Cabinet Manufacturing (NAICS 3371)	13.46	0.00	8.12	0.00	15.81	37.39	62.61
Other Telecommunications (NAICS 5179)	4.61	2.56	1.77	0.43	3.00	12.38	87.62
Other Specialty Trade Contractors (NAICS 2389)	7.40	9.29	4.35	1.15	12.23	34.42	65.58
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Forging and Stamping (NAICS 3321)	0.00	0.00	0.00	0.00	28.89	28.89	71.11
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.03	2.19	1.70	0.49	16.57	25.98	74.02
Urban Transit Systems (NAICS 4851)	42.42	4.79	10.65	0.12	5.04	63.02	36.98
Other Miscellaneous Manufacturing (NAICS 3399)	2.36	2.09	1.03	0.05	29.31	34.84	65.16
Advertising, Public Relations, and Related Services (NAICS 5418)	7.68	4.62	1.70	0.34	26.75	41.08	58.92
Couriers and Express Delivery Services (NAICS 4921)	24.20	3.10	0.10	2.52	1.80	31.73	68.27
Other Heavy and Civil Engineering Construction (NAICS 2379)	8.76	1.99	3.41	0.45	10.28	24.89	75.11
Other Amusement and Recreation Industries (NAICS 7139)	12.64	3.74	5.20	0.94	17.69	40.20	59.80
Accounting, Tax Preparation, Bookkeeping, and Payroll Services (NAICS 5412)	4.60	1.87	6.08	0.10	25.08	37.72	62.28

Sources and Notes: *See Table 3.22.*

Appendix D. Individual Modal Administration Tables

Table 3.22.C Detailed DBE Availability Percentages—CSE (All Contracts) (Dollars Awarded) (MAA)

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Other Chemical Product and Preparation Manufacturing (NAICS 3259)	0.16	0.06	11.72	0.01	0.21	12.15	87.85
Building Equipment Contractors (NAICS 2382)	9.57	4.84	1.52	0.70	12.49	29.11	70.89
Natural Gas Distribution (NAICS 2212)	5.63	0.00	4.87	0.00	0.00	10.50	89.50
Household Appliances and Electrical and Electronic Goods Merchant Wholesalers (NAICS 4236)	4.20	2.74	3.49	0.44	9.42	20.29	79.71
Motor Vehicle Manufacturing (NAICS 3361)	5.93	1.95	4.40	0.54	8.51	21.33	78.67
Electric Lighting Equipment Manufacturing (NAICS 3351)	0.39	0.01	0.01	6.91	11.14	18.46	81.54
Lumber and Other Construction Materials Merchant Wholesalers (NAICS 4233)	5.27	2.23	1.53	0.55	14.19	23.78	76.22
Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers (NAICS 4231)	6.16	4.92	1.68	1.64	8.59	22.99	77.01
Professional and Commercial Equipment and Supplies Merchant Wholesalers (NAICS 4234)	4.83	1.75	7.20	0.32	10.65	24.74	75.26
Architectural, Engineering, and Related Services (NAICS 5413)	7.18	2.17	5.06	1.41	10.00	25.82	74.18
Wireless Telecommunications Carriers (except Satellite) (NAICS 5172)	9.50	3.00	4.55	0.68	12.18	29.92	70.08
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS 4238)	8.62	2.48	4.29	0.87	14.80	31.05	68.95
Agriculture, Construction, and Mining Machinery Manufacturing (NAICS 3331)	0.00	0.00	0.00	0.00	5.41	5.41	94.59
Computer Systems Design and Related Services (NAICS 5415)	18.38	2.55	13.68	0.93	11.81	47.34	52.66
Automotive Equipment Rental and Leasing (NAICS 5321)	11.01	4.47	4.93	0.84	16.49	37.75	62.25
Miscellaneous Durable Goods Merchant Wholesalers (NAICS 4239)	10.59	3.98	5.58	0.11	17.56	37.82	62.18
Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers (NAICS 4237)	1.29	0.00	2.80	0.00	4.13	8.23	91.77
Communications Equipment Manufacturing (NAICS 3342)	6.97	1.03	4.75	0.01	5.59	18.36	81.64

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Petroleum and Petroleum Products Merchant Wholesalers (NAICS 4247)	8.55	0.23	5.55	0.12	11.32	25.76	74.24
Chemical and Allied Products Merchant Wholesalers (NAICS 4246)	6.23	4.13	7.07	1.19	6.46	25.08	74.92
Household and Institutional Furniture and Kitchen Cabinet Manufacturing (NAICS 3371)	13.46	0.00	8.12	0.00	15.81	37.39	62.61
Automotive Parts, Accessories, and Tire Stores (NAICS 4413)	2.33	0.73	1.21	0.72	3.18	8.18	91.82
Automobile Dealers (NAICS 4411)	4.17	2.71	2.96	0.05	10.16	20.05	79.95
Clothing Stores (NAICS 4481)	12.44	3.59	5.89	1.00	18.59	41.51	58.49
Other Ambulatory Health Care Services (NAICS 6219)	16.61	3.47	4.64	1.01	17.37	43.10	56.90
Nonresidential Building Construction (NAICS 2362)	12.17	6.74	4.46	2.09	10.01	35.47	64.53
Building Finishing Contractors (NAICS 2383)	7.24	8.08	4.53	0.09	10.59	30.53	69.47
Rubber Product Manufacturing (NAICS 3262)	38.74	1.65	3.31	1.09	26.68	71.47	28.53
Depository Credit Intermediation (NAICS 5221)	0.19	0.00	0.42	0.00	0.44	1.06	98.94
Foundation, Structure, and Building Exterior Contractors (NAICS 2381)	2.08	5.23	1.46	2.19	12.74	23.69	76.31
Computer and Peripheral Equipment Manufacturing (NAICS 3341)	13.54	4.23	4.41	0.77	14.36	37.31	62.69
Electrical Equipment Manufacturing (NAICS 3353)	0.68	0.14	0.21	0.08	1.78	2.90	97.10
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (NAICS 3345)	4.10	0.00	0.64	0.02	6.59	11.35	88.65
Furniture and Home Furnishing Merchant Wholesalers (NAICS 4232)	13.94	3.66	5.26	0.98	18.45	42.28	57.72
Nonmetallic Mineral Mining and Quarrying (NAICS 2123)	10.11	3.04	5.10	0.64	12.26	31.14	68.86
Automotive Repair and Maintenance (NAICS 8111)	13.21	7.93	4.52	0.40	8.50	34.56	65.44
Architectural and Structural Metals Manufacturing (NAICS 3323)	7.09	0.04	0.08	0.04	15.98	23.23	76.77
Employment Services (NAICS 5613)	17.40	2.34	6.60	0.66	18.27	45.27	54.73
Commercial and Industrial Machinery and Equipment Rental and Leasing (NAICS 5324)	3.03	3.16	0.22	0.03	7.11	13.56	86.44

Appendix D. Individual Modal Administration Tables

Detailed Industry Group	African American	Hispanic	Asian	Native American	Non-minority Female	DBE	Non-DBE
Agencies, Brokerages, and Other Insurance Related Activities (NAICS 5242)	8.56	0.75	1.35	0.07	14.61	25.34	74.66
Miscellaneous Nondurable Goods Merchant Wholesalers (NAICS 4249)	11.99	3.89	5.55	0.94	17.23	39.60	60.40
Support Activities for Air Transportation (NAICS 4881)	11.33	3.89	4.95	0.81	15.20	36.18	63.82
Software Publishers (NAICS 5112)	11.92	3.54	8.00	0.28	13.22	36.96	63.04
Other Specialty Trade Contractors (NAICS 2389)	7.40	9.29	4.35	1.15	12.23	34.42	65.58
Travel Arrangement and Reservation Services (NAICS 5615)	12.80	3.83	5.23	1.02	18.97	41.86	58.14
Home Furnishings Stores (NAICS 4422)	0.94	9.73	7.22	0.01	10.14	28.04	71.96
Other Miscellaneous Store Retailers (NAICS 4539)	11.81	3.65	4.95	0.92	17.50	38.83	61.17
Other General Purpose Machinery Manufacturing (NAICS 3339)	7.41	0.62	1.00	0.25	5.71	14.99	85.01
Hardware Manufacturing (NAICS 3325)	10.65	4.34	4.62	0.86	17.27	37.74	62.26
Plastics Product Manufacturing (NAICS 3261)	4.34	0.78	3.74	0.06	8.69	17.62	82.38

Sources and Notes: *See Table 3.22.*

Appendix D. Individual Modal Administration Tables

Table 6.1.A. DBE Utilization at MDOT–All Contracts (Dollars Awarded) (SHA)

DBE Type	Procurement Category						Overall (%)
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	
African American	2.98	3.20	3.33	6.14	0.21	0.02	3.05
Hispanic	9.70	1.60	4.97	5.35	0.00	0.00	7.18
Asian	1.41	20.97	1.72	29.49	0.12	1.00	6.81
Native American	1.04	0.01	0.00	0.00	0.00	0.00	0.69
Minority Total	15.14	25.78	10.02	40.98	0.33	1.02	17.73
Nonminority female	9.52	8.86	21.35	11.56	32.79	6.88	10.20
DBE Total	24.66	34.64	31.37	52.54	33.11	7.90	27.94
Non-DBE Total	75.34	65.36	68.63	47.46	66.89	92.10	72.06
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	2,388,356,651	837,870,539	164,110,977	112,389,606	43,445,594	67,362,083	3,613,535,450
Prime Contracts	799	180	156	99	107	383	1,728
Subcontracts	9,429	731	763	54	120	42	11,139

Source: NERA Master Contract/Subcontract Database. Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Appendix D. Individual Modal Administration Tables

Table 6.1.B. DBE Utilization at MDOT–All Contracts (Dollars Awarded) (MTA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	10.08	2.89	3.29	0.00	12.47	1.57	6.93
Hispanic	3.85	0.77	1.12	8.90	2.03	0.42	1.58
Asian	8.83	15.81	0.54	25.50	0.55	0.73	5.48
Native American	0.06	0.12	0.12	0.00	0.01	0.00	0.06
Minority Total	22.82	19.60	5.06	34.41	15.07	2.72	14.05
Nonminority female	7.98	6.27	6.35	0.30	3.52	1.08	4.86
DBE Total	30.81	25.87	11.41	34.70	18.60	3.79	18.91
Non-DBE Total	69.19	74.13	88.59	65.30	81.40	96.21	81.09
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	276,730,357	772,302,105	500,165,936	16,794,066	1,062,609,167	320,577,433	2,949,179,063
Prime Contracts	62	40	43	21	148	979	1,293
Subcontracts	976	319	259	16	865	19	2,454

Source: NERA Master Contract/Subcontract Database. Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Appendix D. Individual Modal Administration Tables

Table 6.1.C. DBE Utilization at MDOT–All Contracts (Dollars Awarded) (MAA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	10.20	11.46	12.49	1.59	1.54	6.82	9.51
Hispanic	1.87	0.00	1.22	0.00	0.59	0.08	1.14
Asian	3.01	6.23	0.98	11.32	12.66	1.58	4.35
Native American	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Minority Total	15.10	17.69	14.69	12.91	14.79	8.47	15.00
Nonminority female	4.74	3.25	5.98	3.39	2.75	7.77	4.63
DBE Total	19.84	20.94	20.67	16.30	17.53	16.24	19.63
Non-DBE Total	80.16	79.06	79.33	83.70	82.47	83.76	80.37
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	418,259,869	160,300,000	146,987,464	29,777,363	83,209,589	52,645,519	891,179,803
Prime Contracts	26	14	28	46	32	155	301
Subcontracts	749	124	211	64	36	74	1,258

Source: NERA Master Contract/Subcontract Database. Note: Figures are rounded. Rounding was performed subsequent to any mathematical calculations.

Appendix D. Individual Modal Administration Tables

Table 6.2.A. DBE Utilization at MDOT –All Contracts (Dollars Paid) (SHA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	2.98	2.75	1.77	11.92	0.14	0.02	2.97
Hispanic	7.63	1.43	4.73	3.88	0.00	0.00	6.05
Asian	0.95	24.70	0.12	8.50	0.17	1.04	5.31
Native American	1.02	0.00	0.00	0.00	0.00	0.00	0.74
Minority Total	12.58	28.88	6.63	24.30	0.31	1.06	15.07
Nonminority female	10.47	9.15	13.39	6.48	3.71	2.66	9.99
DBE Total	23.04	38.02	20.02	30.78	4.02	3.72	25.06
Non-DBE Total	76.96	61.98	79.98	69.22	95.98	96.28	74.94
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	1,600,939,998	395,619,995	91,186,401	46,911,446	17,545,046	62,563,655	2,214,766,542
Prime Contracts	628	180	117	87	92	387	1,491
Subcontracts	7,649	729	409	22	96	23	8,928

Source and Notes: See Table 6.2.

Appendix D. Individual Modal Administration Tables

Table 6.2.B. DBE Utilization at MDOT –All Contracts (Dollars Paid) (MTA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	9.69	2.77	3.40	0.00	20.37	0.61	7.85
Hispanic	5.83	0.62	5.13	31.72	4.08	0.47	2.29
Asian	4.31	16.89	9.74	35.13	0.14	0.80	7.40
Native American	0.10	0.09	0.00	0.00	0.04	0.00	0.06
Minority Total	19.94	20.37	18.28	66.85	24.63	1.87	17.59
Nonminority female	12.28	6.49	0.00	0.75	3.46	1.16	5.09
DBE Total	32.21	26.86	18.28	67.60	28.09	3.04	22.68
Non-DBE Total	67.79	73.14	81.72	32.40	71.91	96.96	77.32
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	157,232,671	506,194,374	24,286,355	3,319,898	357,267,212	284,532,036	1,332,832,545
Prime Contracts	52	40	30	14	120	977	1,233
Subcontracts	842	319	28	1	707	17	1,914

Source and Notes: See Table 6.2.

Appendix D. Individual Modal Administration Tables

Table 6.2.C. DBE Utilization at MDOT –All Contracts (Dollars Paid) (MAA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	11.34	10.46	18.01	2.56	1.61	9.29	10.65
Hispanic	2.45	0.00	0.00	0.00	0.00	0.10	1.42
Asian	4.25	7.87	0.00	25.28	0.03	2.05	4.95
Native American	0.03	0.00	0.00	0.00	0.00	0.00	0.02
Minority Total	18.08	18.33	18.01	27.85	1.64	11.45	17.04
Nonminority female	5.77	2.62	14.75	8.58	0.52	10.49	5.75
DBE Total	23.85	20.95	32.77	36.43	2.16	21.94	22.80
Non-DBE Total	76.15	79.05	67.23	63.57	97.84	78.06	77.20
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	275,213,620	104,841,889	25,677,908	11,762,248	23,202,317	38,610,341	479,308,323
Prime Contracts	18	14	4	43	29	155	263
Subcontracts	560	124	5	34	14	74	811

Source and Notes: See Table 6.2.

Appendix D. Individual Modal Administration Tables

Table 6.3.A DBE Utilization at MDOT–Federally-Assisted Contracts (Dollars Awarded) (SHA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	3.00	3.15	0.00	10.56	0.67	0.16	3.04
Hispanic	9.87	1.63	3.25	0.00	0.00	0.00	7.66
Asian	1.46	21.21	0.04	0.93	0.00	7.96	6.56
Native American	0.97	0.01	0.00	0.00	0.00	0.00	0.71
Minority Total	15.30	26.01	3.29	11.49	0.67	8.12	17.97
Nonminority female	9.32	8.86	1.52	16.56	27.54	53.26	9.35
DBE Total	24.61	34.88	4.81	28.05	28.22	61.38	27.31
Non-DBE Total	75.39	65.12	95.19	71.95	71.78	38.62	72.69
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	2,319,514,030	815,732,734	8,479,294	8,050,099	6,007,901	8,092,608	3,165,876,666
Prime Contracts	751	176	6	4	6	4	947
Subcontracts	9,012	710	45	13	26	39	9,845

Source and Notes: See Table 6.3.

Appendix D. Individual Modal Administration Tables

Table 6.3.B DBE Utilization at MDOT–Federally-Assisted Contracts (Dollars Awarded) (MTA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	10.10	2.89	0.18	0.00	1.89	1.53	3.51
Hispanic	3.87	0.77	1.64	81.21	4.40	0.02	1.96
Asian	8.88	15.81	0.00	0.00	0.07	0.20	8.94
Native American	0.06	0.12	0.00	0.00	0.00	0.00	0.07
Minority Total	22.91	19.60	1.82	81.21	6.35	1.75	14.47
Nonminority female	7.81	6.27	9.19	1.36	11.38	0.04	7.02
DBE Total	30.72	25.87	11.02	82.57	17.74	1.80	21.50
Non-DBE Total	69.28	74.13	88.98	17.43	82.26	98.20	78.50
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	275,243,220	772,270,345	181,779,105	1,826,914	252,604,440	161,216,074	1,644,940,098
Prime Contracts	60	39	5	2	22	40	168
Subcontracts	969	319	41	9	186	14	1,538

Source and Notes: See Table 6.3.

Appendix D. Individual Modal Administration Tables

Table 6.3.C DBE Utilization at MDOT–Federally-Assisted Contracts (Dollars Awarded) (MAA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	7.37	14.32	0.00	n/a	n/a	n/a	9.57
Hispanic	2.81	0.00	95.56	n/a	n/a	n/a	1.99
Asian	3.50	7.69	0.00	n/a	n/a	n/a	4.83
Native American	0.05	0.00	0.00	n/a	n/a	n/a	0.03
Minority Total	13.72	22.01	95.56	n/a	n/a	n/a	16.42
Nonminority female	6.24	3.20	1.94	n/a	n/a	n/a	5.27
DBE Total	19.96	25.20	97.50	n/a	n/a	n/a	21.68
Non-DBE Total	80.04	74.80	2.50	n/a	n/a	n/a	78.32
Total (%)	100.00	100.00	100.00	n/a	n/a	n/a	100.00
Total (\$)	162,512,753	75,700,000	180,000	n/a	n/a	n/a	238,392,752
Prime Contracts	5	6	1	0	0	0	12
Subcontracts	204	55	2	0	0	0	261

Source and Notes: See Table 6.3.

Appendix D. Individual Modal Administration Tables

Table 6.4.A DBE Utilization at MDOT –Federally-Assisted Contracts (Dollars Paid) (SHA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	3.02	2.61	0.00	9.90	0.00	0.24	2.95
Hispanic	7.65	1.46	0.00	0.00	0.00	0.00	6.38
Asian	0.97	25.10	0.00	1.05	0.00	11.70	5.69
Native American	1.03	0.00	0.00	0.00	0.00	0.00	0.82
Minority Total	12.67	29.16	0.00	10.95	0.00	11.94	15.85
Nonminority female	10.08	9.15	0.00	18.19	34.11	25.26	9.97
DBE Total	22.76	38.31	0.00	29.14	34.11	37.20	25.82
Non-DBE Total	77.24	61.69	100.00	70.86	65.89	62.80	74.18
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	1,565,306,038	381,854,652	2,769,080	6,860,436	1,018,700	5,304,323	1,963,113,231
Prime Contracts	589	176	3	4	2	4	778
Subcontracts	7,374	708	0	13	17	20	8,132

Source and Notes: See Table 6.4.

Appendix D. Individual Modal Administration Tables

Table 6.4.B DBE Utilization at MDOT –Federally-Assisted Contracts (Dollars Paid) (MTA)

DBE Type	Procurement Category						
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	Overall (%)
African American	9.75	2.77	0.04	0.00	9.25	0.01	3.78
Hispanic	5.89	0.62	7.45	100.00	12.27	0.02	2.26
Asian	4.34	16.90	0.00	0.00	0.41	0.21	10.56
Native American	0.11	0.09	0.00	0.00	0.00	0.00	0.07
Minority Total	20.09	20.37	7.49	100.00	21.93	0.24	16.67
Nonminority female	11.98	6.49	0.00	0.00	13.93	0.05	6.55
DBE Total	32.07	26.86	7.49	100.00	35.86	0.29	23.22
Non-DBE Total	67.93	73.14	92.51	0.00	64.14	99.71	76.78
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total (\$)	155,745,534	506,162,614	16,743,942	1,041,284	43,075,511	156,122,129	878,891,015
Prime Contracts	505	39	3	1	11	38	142
Subcontracts	835	319	22	0	73	12	1,261

Source and Notes: See Table 6.4.

Appendix D. Individual Modal Administration Tables

Table 6.4.C DBE Utilization at MDOT –Federally-Assisted Contracts (Dollars Paid) (MAA)

DBE Type	Procurement Category						Overall (%)
	Construction (%)	AE-CRS (%)	Maintenance (%)	IT (%)	Services (%)	CSE (%)	
African American	6.10	11.92	n/a	n/a	n/a	n/a	8.10
Hispanic	3.81	0.00	n/a	n/a	n/a	n/a	2.50
Asian	4.93	8.48	n/a	n/a	n/a	n/a	6.14
Native American	0.07	0.00	n/a	n/a	n/a	n/a	0.05
Minority Total	14.90	20.40	n/a	n/a	n/a	n/a	16.78
Nonminority female	7.84	2.29	n/a	n/a	n/a	n/a	5.94
DBE Total	22.74	22.68	n/a	n/a	n/a	n/a	22.72
Non-DBE Total	77.26	77.32	n/a	n/a	n/a	n/a	77.28
Total (%)	100.00	100.00	n/a	n/a	n/a	n/a	100.00
Total (\$)	143,857,958	59,977,547	n/a	n/a	n/a	n/a	203,956,077
Prime Contracts	4	6	0	0	0	0	10
Subcontracts	191	55	0	0	0	0	246

Source and Notes: See Table 6.4.

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