

**Examination of
Private Sector Discrimination**

Metropolitan Government of
Nashville and Davidson County

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Examination of Private Sector Discrimination In the Nashville, Tennessee MSA

I. Introduction

The decision of the United States Court of Appeals for the Tenth Circuit in *Concrete Works Construction Inc. v. City and County of Denver*, 321 F 3d 950 (10th Circuit, 2003), suggests that a disparity study should examine the existence of private sector discrimination. This should be done to determine if there is a pervasive pattern of private sector discrimination in a jurisdiction from which it can be inferred that the government assists in perpetuating the discriminatory conduct of private actors by serving as a passive participant in their discriminatory schemes. Griffin & Strong, P.C. reviewed a number of public documents, periodicals and published court opinions in conducting the research for this report.

The first section of this report provides analyses to assess the effect of ethnicity/race/gender along with other economic and demographic characteristics on individuals' income from self-employment and the likelihood of business formation through analysis of self-employment statistics of individuals in the private sector in the Nashville, TN MSA (Metropolitan Statistical Area) marketplace, by applying two multivariate regression techniques. The linear regression is used in the analysis of individuals' income from self-employment and the binary logistic regression is used in the analysis of the likelihood an individual will be self-employed. The data used in both analyses are derived from the 2000 Census of Population and Housing and extracted from the "Census 2000 Public Use Microdata Sample (PUMS) 5 percent (5%)," and restricted only to self-employment data in the private sector in Nashville, TN MSA. The second section of this report provides threshold analyses using building permits data, and the third section provides lending discrimination analysis using the 1998 Survey of Small

Business Finances (1998 SSBF), conducted by the Federal Reserve Board and the U. S. Small Business Administration.

II. PUMS Analysis

A. Analysis of Ethnicity/Race/Gender Effects on Individuals' Income from Self-employment in the Private Sector in Nashville, TN MSA.

The objective of this section is to determine whether or not ethnicity/race/gender, combined with selected economic and demographic characteristics, have an impact on individuals' income derived from self-employment. The examination is conducted for businesses grouped in three categories (Construction, Professional Services, Goods & Non Professional Services) operating in the private sector in Nashville, TN MSA, applying appropriate statistical technique on Census data.

1. Definition and Application of Multivariate Linear and Binary Logistic Regressions

Multivariate linear and binary logistic regression analyses are a set of statistical techniques that permit one to assess the relationship between a variable to be explained, known as the dependent variable (DV or Y^1) and several explanatory variables known as independent variables (IV or X).

A multivariate linear regression is suitable in assessing the effects of the IV (such as age, level of education, ethnicity/race/gender, etc.) on a DV that can take on a wide range of values (such as the 1999 income from self-employment in the private sector). A variable that can take on a wide range of values is referred to as "*continuous variable*."

A binary logistic regression is suitable in analyses involving a "*non continuous*" DV (or categorical yes or no DV) which takes on only two possible values (self-employment classification such as 1 for self-employed and 0 for not self-employed). When the dependent variable is restricted to a yes or no response, it is referred to as a categorical dependent variable. For instance, the examination of the self-employment status of an Asian American in Nashville, TN MSA will either lead to a yes (being self-employed) or no (not self-employed).

¹ Y is the dependent variable **being** predicted or explained, and y is the predicted or explained dependent variable. In other words (Y) relates to "actual" values, and y (or "y hat") relates to "predicted or explained" values (when the regression equation is calculated from the actual data).

a. Multivariate Linear Regression

The aim is to compare the findings from the multivariate linear regression analysis to the self-employment statistics of non-minority males to determine how much more or how much less they make in the private sector in Nashville, TN MSA.

The multivariate linear regression model is of the mathematical form of:

$$Y = C + B_1 X_1 + B_2 X_2 + B_3 X_3 + \dots + B_n X_n + E$$

Where:

Y = the value of the dependent variable (DV), the variable that is being predicted or explained;

C = the Y intercept, the value of Y when all (IVs or Xs) are zero. It is where the regression line intercepts the Y-axis,

B = the various coefficients of the various IVs. In other words, the Bs represent the weight of the Xs' effect on the DV. They are referred to as slopes, also known as beta coefficients for the independent variables X_i . B_1 is the slope or beta coefficient for the independent variable X_1 , and generally stated, B_n is the slope or beta coefficient for the independent variable X_n .

$X_1 \dots X_n$ = the various independent variables (IV) such as level of education of the firm's owner, ethnicity/race/gender, age, etc.

E = an error term (also known as residual) or variance in the DV unexplained by the IVs

b. The Use of “Gross Revenue/Income²” as Dependent Variable

An extensive review of the literature on economic discrimination reveals that the vast majority of discrimination analyses try to explain the variances in income and earnings (gross receipts for businesses) by selected business and demographic characteristics, when controlling for race and gender. Gary S. Becker, who is one of the pioneers in the field of economic discrimination research, used revenue differences to investigate discrimination against Non-Whites.³ In effect, as Emily P. Hoffman (1991) indicates:

“Almost all modern economic investigation of discrimination follows from the germinal work of Gary S. Becker. In particular, Glen G. Cain examines the current evidence of discrimination in the United States according to Becker’s ideas. Cain tries to answer the question of how much discrimination exists. Both Becker and Cain acknowledge that economists cannot accurately answer the question; not only are there problems in precisely defining discrimination, but there are limitations in the data available from which to try to measure discrimination.”⁴

In “The Use and Limits of Statistical Analysis in Measuring Economic Discrimination,” Cain believes that researchers tend to focus on income and earnings because these variables are relatively easy to quantify.⁵ Economists such as William A. Darity, Marianne A. Ferber and Carole A. Green have used earnings or revenue as the dependent variable in both race and gender discrimination investigations, and economic inequality studies.⁶

² Gross revenue, gross receipts, income, earnings are used interchangeably.

³ Becker, Gary. Second Edition. “The Economics of Discrimination.” The University of Chicago Press, Chicago, p.110.

⁴ Hoffman, Emily. 1991, “Essays on the Economics of Discrimination.” W.E. UPJOHN INSTITUTE for Employment Research, Kalamazoo, Michigan, p. 7.

⁵ Ibid.

⁶ Ibid. pp. 5-7.

2. Statistics, Hypothesis and Variables of Multivariate Linear Regression Analysis

a. Statistics of a Multiple Regression Model

The two types of statistics in a regression⁷ analysis will be presented in the charts of the findings. The statistics for the IVs provide information about how important each individual independent variable is in the model, and the statistics for the regression model summarize the strength of the relationship between the DV and the IVs.⁸

b. Hypothesis of Multiple Regression Model

The hypothesis to be tested using the multivariate linear regression model is that there is no difference in the 1999 private sector self-employment income of M/WOBES compared to that of non-minority male firms in Nashville, TN MSA. The null hypothesis is H0 and the hypothesis of difference is known as the alternate or H1.

The following definitions are necessary for the formulation of the null and alternate hypotheses. When we represent the 1999 Income from Self-employment (ISE) for M/WOBES by 1999 ISEM/WOBE and the 1999 Income from Self-employment (ISE) of Non-minority male firms by 1999 ISENON-M/WOBE, the null and the alternate hypotheses are generally written as follows:

$$H0: 1999 \text{ ISEM/WOBE} = 1999 \text{ ISENON-M/WOBE}$$

$$H1: 1999 \text{ ISEM/WOBE} \neq 1999 \text{ ISENON-M/WOBE}$$

When the analysis shows that ethnicity/race and gender are found to affect the income, we will reject the null hypothesis and accept the alternate hypothesis, H1. In other words, when the result of the statistical test is significant at a .05 confidence level or 95 percent confidence interval, we reject Ho, and we conclude that the probability of 1999

⁷ For a complete discussion, please see: "Linear Regression and Method of Least Square", M.G. Bulmer, 1967, 1979 "Principles of Statistics, Dover Publication Inc, pp. 209-226

⁸ Both types of statistics should be carefully examined. (1) The statistics for the IVs includes unstandardized/standardized coefficients or beta weights, and results of "t-tests" for the coefficients to determine whether or not they are significantly different from zero. (2)The statistics for the DV includes the coefficient of determination or R-Square (R²) showing the strength of the linear relationship between the DV and the IVs. The F-statistics are used to evaluate the contribution of a subset of IVs (explanatory variables) , as well as the collective statistical significance of all IVs.

ISE of M/WOBES being different from 1999 ISE of NON-M/WOBE is due to chance is less than 5 in 100.

c. Dependent Variable (DV) and Independent Variables (IV)

The DV used in the examination of whether or not ethnicity/race/gender status has an impact on individuals' income is the 1999 income from private sector self-employment in Nashville, TN MSA reported in the PUMS 2000 Five Percent Sample. The variables selected by GSPC as explanatory variables or independent variables believed or hypothesized to predict income included the following business and demographic characteristics:

- Number of years in operation
- Number of full time employees
- Ethnicity, race and gender of the owner: African American, Asian American, Hispanic American, Native American, White Females, and Non-minority Males
- The level of education of the owner: No schooling completed, nursing school to 4th grade, 5th grade to 12th grade, high school graduate, some college, associate degree, bachelor degree, master, professional degree, and doctorate degree.
- Availability of Capital: Interest income, residual income, other income (public assistance not included)
- Age (age is squared to take into account the positive curvilinear relationship between income and each additional year of age)
- Ability to speak English well
- Disability status
- Marital status

3. Results and Findings of the Multivariate Linear Regression Analysis

The results of the multivariate linear regression estimating the effects of each M/WOBE group, when the statistical effects of the other business and demographic characteristics were "controlled for" or "neutralized" are displayed in Table 1⁹. As discussed in the presentation of the multivariate regression model, the number (or coefficient) corresponding to each M/WOBE group is referred to as the "weight" in the variation in the 1999 self-employment income in the private sector. The weight in the variation of the 1999 self-employment income can also be interpreted as percent change in the 1999 self-employment income. The coefficient or percent change for an Asian American when all business categories are combined is -.086, meaning that an Asian American made 8.6 percent less than a non-minority male (in the private sector in Nashville, TN MSA) after controlling for the effects of all other independent variables in the regression model.

a. All Industries

As shown in Table 1, self-employment income for each M/WOBE group was significantly lower than for white males when the three business categories were combined. Income for Asian Americans and African Americans in the private sector was 8.6 percent and 29 percent lower than income for self-employed non-minority males in Nashville, TN MSA. Native Americans and Hispanic Americans made 10.4 percent and 30 percent less than non-minority males. Non-minority females made 18.2 percent less than non-minority males.

b. Construction

In the Construction industry, the variation in income for African Americans and Native American and non-minority males was roughly the same. In effect, African Americans made 29.8 percent less and Native Americans made 30.0 percent less than non minority males. Income for Asian Americans and Hispanic Americans was 11.2 percent and 36.9 percent respectively lower than that of non minority males. Non-minority females made about 20 percent (19.9 percent) lower than non-minority males.

⁹ The results of the full regression are presented in Appendix A.

c. Professional Services

African Americans and Hispanic Americans made about one-third less than self-employed non-minority males in this business category. Income for Native Americans was about 11 percent (10.9 percent) less, and non-minority females made 19.3 percent less than non-minority males.

d. Goods and Non Professional Services

Income for African Americans and Hispanic Americans was 22.1 percent and 30.4 percent respectively less than income of self-employed non-minority males in Goods and Non-Professional Services. Non-minority females made 11.1 percent less than self-employed non-minority males in this business category.

Table 1

Percent Changes of M/WOBE 1999 Self-employment Income Relative to Non-minority males After Controlling for Other Business and Demographic Characteristics by Business Categories

(NASHVILLE, TN MSA)

Industries Ethnicity/Race/Gender	All Industries	Construction	Professional Services¹⁰	Goods/Non Professional Services
Asian American	-0.086	-0.112	0.091	0.151
African American	-0.290	-0.298	-0.302	-0.221
Native American	-0.104	-0.300	-0.109	-0.183
Hispanic American	-0.300	-0.369	-0.309	-0.304
Non minority Females	-0.182	-0.199	-0.193	-0.111

Source: Griffin & Strong, P.C. and Census of Population and Housing (Census 2000 PUMS Five Percent Sample),
 Calculations using SPSS. Bold coefficients (percent changes) are statistically significant (prob- value <= .05)

¹⁰ Professional Services includes Architecture/Engineering

B. Analysis of the Effects of Ethnicity/Race/Gender on the Likelihood of Being Self-employed in the Private Sector in Nashville, TN MSA

The self-employment status of an individual is categorical and binomially distributed (non continuous and only two outcomes: yes or “1” for self-employed and no or “0” for not self-employed). The examination of the effects of ethnicity/race/gender on the likelihood of being self-employed after controlling for the effects of other business and demographic characteristics involves a categorical and binomially distributed dependent variable. Binary logistic regression is suitable for analyses involving a categorical and binomially distributed DV.

1. Binary Logistic Regression Model as a Variation of the Ordinary Regression Model

Ordinary regression such as multivariate linear regression is suitable to regression analyses where the dependent variable can take on a wide range of values (continuous dependent variable).

As described in the linear regression section, the multivariate regression model is of the form:

$$Y = B_0 + B_1 * X_1 + B_2 * X_2 + \dots + B_n * X_n + E$$

In the above model, the dependent variable (Y) is a continuous variable. Binary logistic regression is a variation of ordinary regression such as the above one, useful to examine the relationship between a categorical dependent variable (yes/no or 1/0 dependent variable) and two or more independent variables hypothesized to have explanatory power on the yes/no value of the categorical dependent variable. The binary regression is suitable in assessing the odds that an MWFBE is either self-employed (yes or 1), or the MWFBE is not self-employed (no or 0). An example of application of the binary regression is assessing the odds that a customer in a store will “buy” or will “not buy” an item, hypothesizing some variables influencing the behavior of the customer. Another example of its use is determining the odds that a borrower will default on a loan based on the borrower's income, debt and age.

Our objective is to determine how the M/WOBE status of an individual affects the odds of being self-employed or not relative to non minority males controlling for the effects of the other socio-economic and demographic characteristics. Ultimately, we seek

to examine how much the ethnicity/race/gender status of an individual will increase or decrease the odds of being “self-employed” or “not self-employed” thus affecting the rate of business formation in Nashville TN MSA. Logistic regression produces Odds Ratios (O.R.) associated with each independent variable (predictor value). The odd of the event is the probability of the outcome event **occurring (self-employed or yes/1)** divided by the probability of the event **not occurring (not self-employed or no/0)**. The odds ratio (O.R) for a predictor tells the relative amount by which the odds of the outcome increase (O.R. greater than 1.0) or decrease (O.R. less than 1.0) when the value of the predictor is increased by 1.0 unit.

Mathematically, the multivariate logistic regression model is of the form:

$$\ln(p/1-p) = B_0 + B_1 * X_1 + B_2 * X_2 + \dots + B_n * X_n + E$$

Where “**ln**” stands for natural logarithm (natural log) and the ratio (p/1-p) represents the probability of being self-employed

As in a linear model:

B₀ = is a constant value

B₁, B₂, B₃,..., B_n = coefficients corresponding to the independent variables X₁, X₂, X₃..... X_n

X₁, X₂, X₃,..., X_n = selected independent variables or selected economic and demographic characteristics, such as level of education, ethnicity, race and gender, marital status.

E = an error value or residual term to account for the variation in the dependent variable not explained by the independent variables.

2. Binary Logistic Regression Results and Findings

A binary logistic regression was used to determine whether or not minorities and white females were less likely than non-minority males to be self-employed in the private sector. The binary logistic regression was used to assess estimates of the relationship between the likelihood of being self-employed or not, hypothesizing some selected independent variables described below. Each MWFBE member was treated as an independent variable, and the maximum likelihood of an individual being self-employed or not was estimated after transforming the dependent variable into a logit variable (the natural logarithm or natural log of the odds of the dependent variable self-employed (yes/1), or not self-employed (no/0)). The logistic regression estimated the probability (odd) of self-employment using PUMS data restricted to:

- Nashville TN MSA.
- Individuals employed in the private sector
- Individuals 18 years of age or older
- Employment statistics from PUMS in Construction, Professional Services, Goods & Non Professional Services

The variables hypothesized to influence the odds of self-employment included the following:

- Ethnicity/race/gender: African American, Asian American, Hispanic American, Native American, Non-minority (White) Females, Non-minority males,
- Marital Status
- Disability status
- Availability of capital: interest income, residual income, other income (public assistance not included)
- Number of individuals living in a household over the age of 65
- Number of children living in a household under the age of 18
- Ability to speak English well
- Level of education

The estimated odds ratios and odds ratios inverse of MWFBEs relative to non-minority males are presented in Table 2. The odd ratio inverse is one (1) divided by the odd ratio. In an examination of the results in Table 2 for “All Industries”, we found that, holding all other independent variables constant (i.e. controlling for), a non-minority male in the private sector in Nashville, TN MSA is five times as likely to be self-employed as was an Asian American, and more than two times as likely to be self-employed as was an African American (odds ratio inverse of 1/0.199 or 5.025 and 1/0.441 or 2.268

respectively). Additionally, a non-minority male is a little more than one time as likely to be self-employed as were a Hispanic American and a non-minority female respectively.

A detailed analysis by business category revealed the following:

a. Construction

A non-minority male was nearly equally as likely to be self-employed as were African American, Hispanic American and non-minority females (odd ratios inverse of 1.21, 1.03 and 1.23). Non-minority males were more than three times as likely to be self-employed as were Asian Americans and more than one and one-half times as likely to be self-employed as Native Americans.

b. Professional Services

An Asian American was more than one half as likely to be self-employed as a non-minority male (odd ratio inverse of 1/1.352 or 0.73). A non-minority male was more than two and one-half times as likely to self-employed as was an African American and more than three and one-half times as likely to be self-employed as a white female in this business category.

c. Goods and Non Professional Services

A non-minority male was nearly two times as likely to be self-employed as were an African American and a white female. On the other hand, a non-minority male was almost five times as likely to be self-employed as was a Native American in this business category. Asian Americans and Hispanic Americans were nearly one half times as likely to be self-employed as was an Asian American (odd ratio inverse of 0.457 “less than 1”) and a Hispanic American was more than one half times as likely to be self-employed in the Goods and Non Professional Services category.

Table 2

**MWFBE Self-employment Odds Ratios Relative to
 Non-minority males in Nashville TN MSA
 By Business Category**

NASHVILLE TN MSA

Industries Ethnicity/Race/Gender	All Industries	Construction	Professional Services¹¹	Goods/Non Professional Services
Asian American	0.199	0.289	1.352	2.186
African American	0.441	0.826	0.385	0.518
Native American	0.194	0.607	0.992	0.213
Hispanic American	0.815	0.969	0.753	1.132
Non minority Females	0.753	0.812	0.286	0.547

Source: Griffin & Strong, P.C. and Census of Population and Housing (Census 2000 PUMS Five Percent Sample),
 Calculations using SPSS. Bold coefficients (percent changes) are statistically significant (prob- value <= .05)

¹¹ Professional Services includes Architecture/Engineering

III. Building Permit Data Analysis

A. Private Commercial Construction Prime Contractor Overall Utilization by Award Dollars

The dollar amounts of the prime private sector commercial building construction projects for the five year period of Fiscal Year (FY) 1999 to FY 2003, by ethnicity/race/gender, is displayed below in Table 3. As shown in Table 3, the value of the private sector commercial construction permits issued to contractors as primes for the five years examined amounted to \$27.73 billion in the Nashville TN MSA. The private sector prime commercial construction projects executed by M/WOBES amounted to \$13.2 million, or 0.05 percent of total projects awarded during the five years examined. By contrast, non-minority male-owned construction firms executed projects valued at \$27.72 billion, or 99.95 percent of total projects. A detailed analysis of the prime private sector commercial construction showed the following findings:

- African American firms were awarded 1.20 million or 0.004 percent of total project value;
- Asian American and Native American firms did not receive any private sector prime commercial building construction projects during the period examined;
- White Female-owned construction firms received 11.87 million (0.04 percent of total projects) during the five years examined.
- As indicated above, Non minority-owned construction firms received \$27.72 billion or 99.95 percent of total projects during the five year examined in the Nashville TN MSA.

Table 3
Building Permit Data for Private Sector
Overall Utilization Analysis of Commercial Construction
Prime Contractors in Nashville TN MSA by Ethnicity/Race/Gender

(Fiscal Year 1999 to Fiscal Year 2003)

Fiscal Year	Overall \$	MWOBE	African American	Asian American	Hispanic American	Native American	White Female	Non minority males
1999	6,617,651,430	5,960,774	2,000	0	850,000	0	5,108,774	6,611,690,656
2000	5,811,483,933	2,777,093	0	0	0	0	2,777,093	5,808,706,841
2001	4,656,925,152	1,829,160	0	0	0	0	1,829,160	4,655,095,992
2002	5,552,764,461	1,049,154	0	0	0	0	1,049,154	5,551,715,306
2003	5,090,457,960	2,108,751	1,202,306	0	0	0	906,445	5,088,349,209
TOTAL REPORTING PERIOD	27,729,282,936	13,724,932	1,204,306	0	850,000	0	11,670,627	27,715,558,004

(DOLLARS)

Source: Griffin & Strong, P.C.

Table 3 (Cont'd)

**Building Permit Data for Private Sector
 Overall Utilization Analysis of Commercial Construction
 Prime Contractors in Nashville TN MSA by Ethnicity/Race/Gender**

(Fiscal Year 1999 to Fiscal Year 2003)

(PERCENTAGES)

Fiscal Year	Overall \$	MWOBE	African American	Asian American	Hispanic American	Native American	White Female	Non minority males
1999	6,617,651,430	0.09	0.00	0.00	0.01	0.00	0.08	99.91
2000	5,811,483,933	0.05	0.00	0.00	0.00	0.00	0.05	99.95
2001	4,656,925,152	0.04	0.00	0.00	0.00	0.00	0.04	99.96
2002	5,552,764,461	0.02	0.00	0.00	0.00	0.00	0.02	99.98
2003	5,090,457,960	0.04	0.02	0.00	0.00	0.00	0.02	99.96
TOTAL REPORTING PERIOD	27,729,282,936	0.05	0.004	0.00	0.003	0.00	0.04	99.95

Source: Griffin & Strong, P.C.

**B. Private Commercial Construction Prime Contractor
 Utilization by Number of Projects**

Table 4 depicts the number of private commercial construction projects awarded to prime contractors in the Nashville TN MSA from FY 1999 to FY 2003 by Ethnicity/Race/Gender. As shown in Table 4, out of a total of 47, 925 private commercial building construction permits issued to contractors as primes, 36 permits were issued to minority and women owned construction firms representing only 0.08 percent of total permits.

A detailed analysis of the distribution of private sector commercial building construction permits indicated the following:

- African American-owned firms were issued 2 permits, or 0.004 percent of total permits;
- Hispanic American-owned construction firms were issued 1 permit, or 0.002 percent of total permits;

- Asian American and Native American-owned construction firms were not successful in receiving private commercial building construction permits in the Nashville TN MSA from FY 1999 to FY 2003;
- Non minority-owned construction firms were issued 47,889 permits, or 99.92 permits of total permits for the time period examined.

Table 4

**Building Permit Data for Private Sector
 Overall Utilization Analysis of Commercial Construction
 Prime Contractors in Nashville TN MSA**

Number of Building Permits Issued by Ethnicity/Race/Gender

(Fiscal Year 1999 to Fiscal Year 2003)

(NUMBER OF PERMITS)

Fiscal Year	Overall # Of Building Permits	MWOBE	African American	Asian American	Hispanic American	Native American	White Female	Non minority males
1999	10,952	13	1	0	1	0	11	10,939
2000	11,470	7	0	0	0	0	7	11,463
2001	8,670	6	0	0	0	0	6	8,664
2002	8,670	5	0	0	0	0	5	8,665
2003	8,163	5	1	0	0	0	4	8,158
TOTAL REPORTING PERIOD	47,925	36	2	0	1	0	33	47,889

Source: Griffin & Strong, P.C.

Table 4 (Cont'd)

**Building Permit Data for Private Sector Overall Utilization Analysis of
 Commercial Construction Prime Contractors in Nashville TN MSA**

Number of Building Permits Issued by Ethnicity/Race/Gender

(Fiscal Year 1999 to Fiscal Year 2003)

(PERCENTAGES)

Fiscal Year	Overall # Of Building Permits	MWOBE	African American	Asian American	Hispanic American	Native American	White Female	Non minority males
1999	10,952	0.12	0.01	0.00	0.01	0.00	0.10	99.88
2000	11,470	0.06	0.00	0.00	0.00	0.00	0.06	99.94
2001	8,670	0.07	0.00	0.00	0.00	0.00	0.07	99.93
2002	8,670	0.06	0.00	0.00	0.00	0.00	0.06	99.94
2003	8,163	0.06	0.01	0.00	0.00	0.00	0.05	99.94
TOTAL REPORTING PERIOD	47,925	0.08	0.00	0.00	0.00	0.00	0.07	99.92

Source: Griffin & Strong, P.C.

**C. Private Commercial Construction Prime Contractor Utilization
 by Number of Unique Vendors**

Griffin & Strong, P.C. developed a unique vendor file by removing duplications from the building permit file. Each vendor is listed one time for each year. The results of the unique vendor analysis are displayed in Table 5 below. As depicted in Table 5, ten (10) unique M/WOBES or 0.19 percent of all unique firms were issued private commercial construction permits as prime contractors. A detailed analysis of the unique vendor file by ethnicity/race/gender showed the following:

- Two unique African American-owned firms were utilized during the period under review, amounting to 0.04 percent of all unique businesses;

- One unique Hispanic American-owned firm was utilized as prime contractor during the study period, accounting for 0.02 percent of all unique firms;
- Seven unique White Female-owned firms were utilized as prime contractors during the period under review, amounting to 0.13 percent of all unique firms.

Table 5

Number of Vendors by Ethnicity/Race/Gender

(Fiscal Year 1999 to Fiscal Year 2003)

Fiscal Year	Overall # Of Vendors	MWOBE	African American	Asian American	Hispanic American	Native American	White Female	Non minority males
1999	1,800	4	1	0	1	0	2	1,796
2000	1,079	2	0	0	0	0	2	1,077
2001	798	1	0	0	0	0	1	797
2002	816	1	0	0	0	0	1	815
2003	864	2	1	0	0	0	1	862
TOTAL REPORTING PERIOD	5,357	10	2	0	1	0	7	5,347

(NUMBERS)

Source: Griffin & Strong, P.C.

Table 5 (Cont'd)
Number of Vendors by Ethnicity/Race/Gender
 (Fiscal Year 1999 to Fiscal Year 2003)

(PERCENTAGES)								
Fiscal Year	Overall # Of Vendors	MWOBE	African American	Asian American	Hispanic American	Native American	White Female	Non minority males
1999	1,800	0.22	0.06	0.00	0.06	0.00	0.11	99.78
2000	1,079	0.19	0.00	0.00	0.00	0.00	0.19	99.81
2001	798	0.13	0.00	0.00	0.00	0.00	0.13	99.87
2002	816	0.12	0.00	0.00	0.00	0.00	0.12	99.88
2003	864	0.23	0.12	0.00	0.00	0.00	0.12	99.77
TOTAL REPORTING PERIOD	5,357	0.19	0.04	0.00	0.02	0.00	0.13	99.81

D. Availability Analyses

Availabilities were estimated only for Construction prime contractors, as data for subcontractors in private sector commercial building construction permits could not be secured from the agency, thus were not analyzed and/or included in this report.

The availability estimates for prime contractors in Construction restricted to Nashville TN MSA are displayed in Table 6 below. These estimates show that the vast majority of Construction firms (78.81 percent) were owned by non minority males in Nashville TN MSA. A detailed analysis of M/WOBE Construction availability in Nashville TN MSA by ethnicity/race/gender indicated the following:

- African American and Native American firms represented 2.6 percent and 1.91 percent of the pool of Construction firms in Nashville TN MSA,
- Asian American firms made up 0.44 percent of the pool of Construction firms,

- Hispanic American firms represented 2.01 percent of the pool of firms,
- Construction firms owned by Females of any race were 8.20 percent of the pool of firms,
- White Female firms were 7.52 percent of the total firms, and

Table 6

**Census Availability of Prime Contractors by
 Ethnicity/Race/Gender**

Construction at two-digit NAICS level (code 23)

Nashville TN MSA

Ethnicity/Race/Gender	Number Of Firms	Percent
African American	467	2.60
Asian American	79	0.44
Females (of any race)	1,474	8.20
White Females	1,351	7.52
Hispanic American	361	2.01
Native American	343	1.91
Non-Minority Males ¹	14,124	78.61
Total Firms in Construction (Nashville TN MSA)	17,967	100.00

Source: Griffin & Strong, P.C.

E. Disparity Analysis and Statistical Tests

1. Disparity Analysis

As in the report analyzing public contracting by Metro Government of Nashville and Davidson County, the disparity analysis

¹ The number of firms for Non-minority males and White Females derived from special tabulations by the Economic Census Branch of the U.S. Census Bureau. A straight subtraction of minority and female figures from the total to get non minority male figure will not be accurate due largely to double counting and survey methodology. Likewise, please do not add MWOBE firms and Non-MWOBE firms to get the "Total Number of Firms" in Nashville TN MSA (they will not add up).

addresses the crucial question of whether, and to what extent, there is disparity between the utilization of Minority and Women-Owned Businesses (M/WOBs) as measured against their availability in the private sector in the Nashville TN MSA, using the building permit data from FY 1999 to FY 2003.

One approach to answering this question is to assess the existence and extent of disparity by comparing the M/WOB utilization percentages to the percentage of the total number of firms in the relevant geographic area. The actual disparity derived as a result of employing this approach is measured by use of a Disparity Index (**DI**).

The Disparity Index is defined as the ratio of the percentage of Minority and Women¹² Owned firms utilized (**U**) divided by the percentage of such firms available in the marketplace, (**A**):

Let: **U** =Utilization percentage for the M/WOB group
A =Availability percentage for the M/WOB group
DI =Disparity Index for the M/WOB group

$$\boxed{DI = U/A \text{ or Utilization Percent divided by Availability Percent}}$$

When the **DI** is one, which indicates that the utilization percentage equals the availability percentage, there is parity or an absence of disparity. In situations where there is availability, but no utilization, the corresponding disparity index will be zero, indicating disparity. In cases where there is utilization, but no availability, the resulting disparity index is designated by the infinity (∞) symbol. Finally, in cases where there is neither utilization nor availability, the corresponding disparity index is undefined and designated by a dash (-) symbol.

¹² Throughout this report, Women refers to White Female firms. All other women are included in their ethnic group (for instance, Asian American women are included in the group Asian American).

Disparity index analyses are presented in this report to reflect the history of prime contracting in the private commercial building construction in Nashville TN MSA, by M/WOB group, and fiscal year.

2. Statistical “t-test”

These disparity indices were tested for their statistical significance. A statistical test suitable for small samples known as “t-test” was used to determine whether or not the disparity indices associated with each MWOBE group for the fiscal year was statistically significant. The “t-test” is used because the number of permits issued to MWOBE group is too small to warrant the use of a “Z-test” derived from a “Normal Probability Distribution” applied to large samples (at least more than thirty (30) data items in the sample is considered large). The statistical decision rule for the “t-test” is that, after mathematical derivations and calculations, a “t-test value” below “-2” or more than “+2” indicates statistical significant of the disparity index being examined/tested. The “t-test” results for the building permit data analyzed in this report are presented in Table 6 below.

As shown in the Table 7 below, the disparity analysis and statistical tests results indicated the followings:

- Overall, M/WOBs were significantly under-utilized across the board during the period under review with a disparity index of 0.003.
- African American firms were significantly under-utilized during the study period with disparity index of 0.02,
- Asian American, Hispanic American firms were significantly under-utilized as prime contractors during the period under review,

- White Female firms were significantly under-utilized during the period under review with disparity index of 0.005,
- Native American firms experienced an absolute under-utilization as these firms were not utilized when they were available yielding a disparity index of zero (0.00), and
- Non-minority males were over-utilized but not at a statistical significant level during the period under review.

Table 7

Disparity Analysis and Statistical Tests of Private Sector Prime Contractors in Commercial Building Construction in Nashville TN MSA

Based on Building Permit Data and Census Data

(Fiscal Year 1999 to Fiscal Year 2003)

MWOBE Group	Utilization Percent (U)	Availability Percent (A)	Disparity Index (U/A)	Disparate Impact of Utilization	Statistical Significance
African American	0.004	2.6	0.002	Under utilization	Significant
Asian American	0.00	0.44	0.00	Under utilization	Significant
Hispanic American	0.003	2.01	0.001	Under utilization	Significant
Native American	0.00	1.91	0.00	Under utilization	Significant
White Female	0.04	7.52	0.005	Under utilization	Significant
MWOBE	0.05	14.48	0.003	Under utilization	Significant
Non-MWOBE	99.95	78.61	1.27	Over utilization	Not Significant

Source: Griffin & Strong, P.C.

F. Comparison of Metro Purchasing Utilization of M/WOBE Contractors with M/WOBE Utilization in the Private Sector

The utilization percentages for the public sector were derived from combining the utilization of all the six (6) agencies included in the Metropolitan Government of Nashville and Davidson County Disparity Study. These agencies were:

- Metro Purchasing
- Metropolitan Nashville Public Schools (MNPS)

- Nashville Electric Service (NES)
- Metropolitan Development and Housing Authority
- Metropolitan Nashville Airport Authority (MNAA)
- Metropolitan Transit Authority (MTA).

The utilization percentages for the private construction prime contractors were derived from the building permit data provided by Metro Purchasing. These percentages for both public and private sector are based on analyses of utilization dollars and presented in Table 8.

Table 8 shows that M/WOBE utilization as prime contractors in public sector construction was 5.93 percent, compared with 0.05 percent for their utilization in the private sector (using commercial building permits data). Overall, M/WOBE experienced low utilization both in the public sector and the private sector. In effect, the detailed comparative analysis showed the following:

- African American firms' utilization in the public sector was 2.03 percent compared with 0.004 percent in the private sector;
- Asian American and Hispanic American firms' utilization was 0.87 percent each in the public sector, compared with no utilization for the former and 0.003 percent for the latter in the private sector;
- Native American and White Female-owned firms received 0.12 percent and 2.02 percent of the prime construction dollars in the public sector, respectively, during the period under review compared with 0.00 percent and 0.04 percent respectively of the prime private sector commercial construction dollars; and

- Non-minority male-owned firms were more successful as construction primes both in the public and the private sectors during the period under review (94.07 percent in the public sector and 99.95 percent in the private sector).

Table 8
Comparison of Public Sector with Private Sector M/WOBE
Construction Prime Contractors' Utilization
(Fiscal Year 1999 to Fiscal Year 2003)
(Nashville TN MSA)

Prime Contractors/Public & Private Sector	African American (%)	Asian American (%)	Hispanic American (%)	Native American (%)	White Female (%)	M/WOBE (%)	Non-M/WOBE (%)
Public (*) Construction Prime Contractors (Actual Payments)	2.03	0.87	0.87	0.12	2.02	5.93	94.07
Private Construction Prime Contractors (Building Permits)	0.004	0.00	0.003	0.00	0.04	0.05	99.95

Source: Griffin & Strong, P.C.

Note: Percentages are derived from analysis of utilization of dollar amounts both for Public Sector and Private Sector

(*) The public sector utilization includes all agencies examined in the Metropolitan Government of Nashville and Davidson County Disparity Study.

IV. Examination of Lending Discrimination in the Nashville Tennessee MSA

There is a direct causal connection between access to capital and the ability to obtain and perform government contracts. During this research process an extensive amount of research was reviewed which indicates that commercial lending disparities continue to be a problem in Tennessee.

Dr. Timothy Bates, as early as 1993, reported that commercial banks have pronounced racial disparities in business lending. According to Dr. Bates' analysis of the commercial lending data from 28 metropolitan areas, discriminatory treatment by commercial banks of black and white business borrowers resulted in the average white loan recipient being awarded \$1.79 debt capital for every dollar of equity, while black borrowers receive, on average \$0.89, all other things being equal.¹³ Dr. Bates found that the problem is compounded for minority owned businesses, which are located in minority neighborhoods. After controlling for demographic traits, education, skills, experience, and owner equity investment, black businesses located in minority neighborhoods received \$39.564 less than black businesses located in non-minority areas.¹⁴

A recent study conducted for the Maryland Department of Transportation¹⁵ by Dr. David Blanchflower, former chair of the Department of Economics at Dartmouth College, on behalf of National Economic Research Associates suggests that Maryland follows the pattern Dr. Bates outlines.¹⁶ Dr. Blanchflower's work used data from the 1993 National Survey of Small Business Finances (NSSBF). This

¹³ Bates, T., (1993), "Banking on Black Enterprise".

¹⁴ Ibid.

¹⁵ Dr. Blanchflower's inferences statistics were based on data covering the South Atlantic Region of the 1993 National Survey of Small Business Finances (NSSBF), which includes North Carolina.

¹⁶ National Economic Research Associates, (2001), "Utilization of Minority Business Enterprises by the State of Maryland".

survey is conducted by the Federal Reserve Board and the U. S. Small Business Administration every five years and is now called Survey of Small Business Finances (SSBF). Dr. Blanchflower, after isolating the South Atlantic region, where Maryland is located, analyzed the data. Dr. Blanchflower concluded that loan denial rates for minority owned firms, and particularly for African American owned firms, are much higher, even when firm size and credit history are taken into consideration.

Similar to Dr. Blanchflower's analysis using the 1993 survey data, Griffin and Strong, P.C. (GSPC) analyzed the 2003 Survey of Small Business Finances data (2003 SSBF)¹⁷, after isolating the East South Central Region where Tennessee is located. The results of GSPC's analyses led to the same conclusions as the 1993 NSSBF data analyzed by Dr. Blanchflower, which is that loan denial rates for minority owned firms, and particularly African American-owned firms are much higher, even when firm size and credit history are taken into account. Our review of the relevant literature leads to the conclusion that commercial lending discrimination remains a problem in Tennessee in general, and in Nashville, TN MSA in particular.

Some statistics regarding lending practices, credit history and other characteristics of firm/owners, and loan applicants are displayed in Table 8 for the East South Central Region including Tennessee, thus Nashville, TN MSA.

A. General Characteristics

Table 9 shows that firms owned by African Americans were more likely to be denied credit than their non-minority counterparts.

¹⁷ These Survey of Small Business Finances (SSBF) data are collected by Census Region only (not by individual States or MSAs, or counties/cities), and the East South Central Region includes Kentucky, Tennessee, Mississippi, and Alabama.

During the last three years, all African American firm owners who participated in the survey were denied credit. Also thirty percent of Female owned firms who participated in the survey were denied credit during the last three years. It is worth noting that the preceding analysis did not include loan applications for renewal of existing lines of credit.

Table 9 shows that interest rates charged to minority and female owners were all higher than those charged to non-minority (White) owners, except for Asian Americans. In effect, Asian Americans were able to get the same interest rate as Whites (6.7 percent) on loans approved. The data also show that, when a loan was approved, the interest rate for African American, Hispanic American, and Native American owners was higher compared to that of Asian Americans and Females. A detailed analysis of interest rates of loans approved by ethnicity/race and gender was as follows:

- Interest rate charged to African Americans: 8.0 percent,
- Interest rate charged to Native Americans: 8.0 percent,
- Interest rate charged to Females: 7.8 percent,
- Interest rate charged to Asian Americans: 6.7 percent.

B. Credit History of Firms/Owners

When all M/WOBE firms/owners, except Female had no judgment against them, the percentage of firms/owners with delinquent personal obligations was higher for African Americans (32.3 percent) compared to Whites (10.1 percent). The delinquency rate for African Americans was also higher than any other M/WOBE group member. Among M/WOBEs, firm owners with delinquent personal obligations were as follow:

- African Americans: 32.3 percent

- Asian Americans: 0.00 percent
- Hispanic Americans: 26.4 percent
- Native Americans: 16.2 percent
- Females: 16.4 percent

C. Other Firm Characteristics

On average, when the number of workers was used to measure the size of firms, M/WOBE firms were smaller, except firms owned by Asian Americans and Hispanic Americans, compared to their non-minority counterparts. In effect, the distribution of firm size by ethnicity/race and gender was as follows:

- Firms owned by African Americans: 3.8 employees
- Firms owned by Asian Americans: 9.7 employees
- Firms owned by Hispanic Americans: 15.9 employees
- Firms owned by Native Americans: 4.7 employees, and
- Firms owned by Females: 4.8 workers.

A closer look at Table 9 also shows that firms owned by M/WOBEs had less sales and made less profit, except firms owned by Hispanic Americans, compared to their non-minority counterparts. Additionally, M/WOBEs had less experience, except for Asian American firms, compared to their non-minority counterparts who had 21.2 years of experience. The distribution of firm/owners years of experience was as follows:

- African Americans: 12.0 years,
- Asian Americans: 24.8 years,
- Hispanic Americans: 20.1 years,
- Native Americans: 18.8 years, and
- Females: 17.7 years.

Table 9

SELECTED MEANS OF LOAN APPLICATIONS FROM 2003
 SSBF

	All	White	African American	Asian American	Hispanic American	Native American	Female
% of Applications by firms always denied (in the last 3 years)	4.3	4.4	100	0	0	0	30
% of Applications by firms never denied (in the last 3 years)	73.4	75	0	3	0	0	70
% of Applications by firms sometimes denied (in the last 3 years)	22.3	20.6	0	0	100	100	0
Sample Size (# of applications excl. renewals of existing Lines of Credit)	188	160	1	3	4	5	10
Sample Size	106	92	3	3	1	3	16
Interest rate on Approved Loans (%)	6.9	6.7	8.0	6.7	20.9	8.0	7.8
Sample Size	100	88	1	3	1	3	14
1. Credit History of Firms/Owners							
% Owners with Judgments against them	0.6	0.7	0.0	0.0	0.0	0.0	1.5
% Firms with Delinquent Business Obligations	12.5	13.1	7.5	0.0	0.0	23.6	14.6
% Owners with Delinquent Personal Obligations	11.7	10.1	32.3	0.0	26.4	16.2	16.4
% Owners declared Bankruptcy in last 7 years	6.8	4.5	45.4	0.0	0.0	0.0	9.6
Sample Size	231	195	11	6	5	9	48
2. Other Firm Characteristics							
% Female Owned	31.3	31.9	40.3	0.0	24.9	32.0	100.0
Sales (in 1,000's of 2003 \$)	\$1,148.7	\$1,209.4	\$75.2	\$1,052.2	\$1,682.6	\$468.6	\$374.9
Profits (in 1,000's of 2003 \$)	\$201.6	\$205.5	-\$7.1	\$411.6	\$105.5	\$30.9	\$36.6
Assets (in 1,000's of 2003 \$)	\$432.2	\$455.4	\$38.6	\$606.2	\$319.9	\$149.5	\$253.4
Liabilities (in 1,000's of 2003 \$)	\$225.3	\$238.0	\$2.5	\$295.2	\$233.8	\$150.2	\$79.1
Owners years of Experience	20.6	21.2	12.0	24.8	20.1	18.8	17.7
% Owners share of Business	82.5	82.1	86.1	89.6	62.8	85.5	79.8
% Less than High School	2.0	3.7	0.0	0.0	0.0	7.4	5.0
% High School Diploma	16.5	26.4	26.5	0.0	60.6	31.0	29.1
% Some College but no degree	17.0	17.4	51.6	0.0	0.0	15.3	20.9
% Associates Degree Occupational/Academic	5.9	5.4	6.6	0.0	5.7	10.3	9.2
% Trade School Vocational Program	2.1	2.4	0.0	0.0	0.0	0.0	4.4
% College Degree	33.1	29.7	14.8	0.0	26.4	11.9	18.7
% Post Graduate Degree	23.5	14.9	0.4	100.0	7.3	24.2	12.7
% Sole Proprietorship	53.3	55.2	57.4	10.6	24.9	54.5	68.1
% Partnership	12.3	11.3	26.4	12.8	0.0	11.4	11.1
% S Corporation	20.1	21.6	0.4	0.6	26.4	34.1	11.5
% C Corporation	14.3	11.9	15.8	76.0	48.8	0.0	9.3
Total Number of Workers	8.9	9.1	3.8	9.7	15.9	4.7	4.8

Source: Griffin & Strong, P.C. (Generated from 2003 SSBF)

Table 9 (cont'd)

SELECTED MEANS OF LOAN APPLICATIONS FROM 2003 SSBF

	All	White	African American	Asian American	Hispanic	Native American	Female
2. Other Firm Characteristics (cont'd)							
Firm age (in years)	14.1	14.4	8.9	20.2	14.0	11.3	14.8
% New Firms (less than 5 years in operation)	21.3	21.7	12.7	12.8	35.8	31.0	19.1
% Firms Located in MSA	58.7	55.0	82.7	57.5	94.3	83.8	45.3
Sample Size	231	195	11	6	5	9	48
3. Characteristics of Loan Application							
MRL Amount Approved (in 1,000's of 2003 \$)	\$268.6	\$273.6	\$27.0	\$650.8	\$6.0	\$63.1	\$63.9
Sample Size	100	88	1	3	1	3	14
MRL Amount Denied (in 1,000's of 2003 \$)	\$185.6	\$211.5	\$3.7	\$0.0	\$10.0	\$500.0	\$36.2
Sample Size	16	12	2	0	1	1	2
% New Line of Credit	40.0	41.1	100.0	0.0	0.0	0.0	63.8
% Capital Lease	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Mortgage for Business Purposes	17.2	21.7	0.0	0.0	0.0	0.0	0.0
% Vehicle Loan for Business Purposes	8.6	10.9	0.0	0.0	0.0	0.0	36.2
% Equipment Loan	5.9	0.0	0.0	0.0	100.0	0.0	0.0
% Other Loan	28.2	26.3	0.0	0.0	0.0	100.0	0.0
Sample Size	15	12	1	0	1	1	2

Source: Griffin & Strong, P.C. (Generated from 2003 SSBF)

D. Estimated Probit Model of Loan Denial Probability

In this section, estimates for five probit models¹⁸ were developed for loan denial rates and eighteen independent variables were properly identified in the East South Central census Division including Tennessee where Nashville, TN MSA is located. As pioneered by Blanchflower et al., loan denial probabilities were estimated using the statistical package SPSS. The estimates are interpreted as the effect of a marginal change in the variable on the probability of having a loan denial.

It is worth noting that some of the independent variables were collapsed to be in line with some of the key properties of multivariate regression. One of the properties is that the sample size should be at least 10 to 20 times the number of independent variables. As the sample size is $n = 102$, after collapsing some of the independent variables, we ended up with ten (10) independent variables. Additionally, loan denial probabilities were not estimated for Hispanic Americans and Asian Americans in the models presented in Table 10.¹⁹ Twenty iterations were done for each model. In model (1), only the ethnicity/race/gender variable is taken into account. In Model (2) through model (5), additional variables are added to assess in detail the effects of these variables on the loan denial probabilities. From the first model to model (5), eighteen (18) variables have been introduced. The results of the regressions are presented in Table 10 on page 38.

¹⁸ Probit regression is an alternative approach to dealing with categorical and binary dependent variable. In practice, probit models come to the same conclusions as logistic regression presented in this private sector analysis in the self-employment analysis section. Probit regression is suitable in response variable and is widely used in medical studies “biostatistics” to analyze dose-response data. In this particular case, the categorical dependent variable to be explained is whether or not the application of the firm-owner for a loan was denied.

¹⁹ There was only one Hispanic American who responded to the survey question, and this Hispanic American firm owner was sometime approved and sometime denied over the last three years. Also, all three Asian Americans who submitted loan applications over the last three years were all approved.

The estimates in Tables 10 and 11 are marginal effects of a change in the variable on the probability of loan denial. In model (1), the estimated likelihood of applying for a loan and been denied increased by 26.6 percent for African American owned-firms, 24.1 percent for Native American owned firms, and by 2.5 percent for Female owned firms in the East South Central Census Division. The increase of the probability of loan denial was statistically significant for African American even when credit worthiness and educational attainment variables were taken into account. In model (3), (4), and (5), the increase of the probability of loan denial for African American was also statistically significant. The estimate in the increase of the probability of loan denial for Native American owned firms might have been different if the sample size was a bit larger. The status of a firm owned by a Female seemed to have little effect on the loan denial probability.

Table 10

ESTIMATED PROBIT MODEL OF LOAN DENIAL PROBABILITY

Models: New Variables Included When running Each New Model	African American	Native American	Females	Sample Size
(1) Ethnicity/race/gender variable	0.266 (1.12)	0.241 (1.65)	0.025 (0.107)	118
(2) Model (1) plus creditworthiness measures and education attainment variables	0.335 (1.98)	0.104 (0.29)	0.0002 (0.001)	118
(3) Model (2) plus Dun and Bradstreet credit rating variables	0.483 (2.30)	0.392 (2.90)	0.011 (0.07)	118
(4) Model (3) plus other firm characteristic and loan characteristics variables	0.372 (2.09)	0.148 (0.63)	0.002 (0.02)	118
(5) Model (4) plus housing and non-housing wealth variables	0.394 (2.35)	0.126 (0.75)	0.034 (0.41)	118

Source: Griffin & Strong, P.C.

Sample size: White (92), African American (3), Hispanic American (1), Native American (3), Asian American (3), Females (16).

Note: In model (2), the t-statistic is almost equal to 2.00 and the estimate for African American is assumed statistically significant (we are approximating 1.98 to 2.00).

In Table 11, all ethnic groups and Females are collapsed to address the concern of the small sample sizes. In effect, we are mindful of the fact that larger samples would have been ideal, but in response variable analyses, researchers have little impact on the survey response rates and often times deal with small samples. These data fall in that case.

Table 11

ESTIMATED PROBIT MODEL OF LOAN DENIAL PROBABILITY

(All ethnicity/race/gender categories are collapsed in one IV referred to as MWOB)

Models: New Variables Included When running Each New Model	MWOB	Sample Size
(1) Ethnicity/race/gender variable	0.193 (1.190)	118
(2) Model (1) plus creditworthiness measures and education attainment variables	0.0018 (0.010)	118
(3) Model (2) plus Dun and Bradstreet credit rating variables	0.322 (3.402)	118
(4) Model (3) plus other firm characteristic and loan characteristics variables	0.173 (1.563)	118
(5) Model (4) plus housing and non-housing wealth variables	0.174 (1.330)	118

Source: Griffin & Strong, P.C.

V. Conclusion

The PUMS data show that M/WOBES earn less than their White male counterparts. Additionally, minority individuals are less likely to be self-employed in the Nashville MSA. Building permit data show that M/WOBES are less utilized in the private sector than in the public sector, which is an indication that unless there is action on the part of the public sector, majority primes tend not to utilize minority-owned firms. Census data show that minority firm size tends to be smaller compared to the size of non-minority firms. Additionally, the loan denial rates for minority-owned firms are much higher than for non-minority firms.

APPENDIX

Full Results of the Multivariate Linear Regression Analyses

(The Dependent Variable was the 1999 Self-Employment
 Income in Nashville TN MSA)

Table 1

ALL INDUSTRIES

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.787	0.583		11.647	0.000
Disability	0.064	0.029	0.021	2.168	0.030
Level of Education ²⁰	0.003	0.008	0.004	0.366	0.714
Ability to Speak English Well	0.017	0.058	0.003	0.285	0.775
Availability of Capital	0.031	0.006	0.049	4.947	0.000
Marital Status	0.038	0.008	0.049	4.968	0.000
Asian American	-0.086	0.171	-0.005	-2.506	0.013
African American	-0.290	0.056	-0.052	-5.207	0.000
Native American	-0.104	0.192	-0.005	-2.541	0.030
Hispanic American	-0.296	0.098	-0.030	-3.032	0.002
White Females	-0.182	0.023	-0.078	-7.801	0.000

Source: Griffin & Strong, P.C. and Census of Population and Housing (Census 2000 PUMS
 Five Percent Sample), Calculations using SPSS. Bold coefficients are statistically significant
 (prob- value <= .05)

²⁰ The level of education of the owner is coded as follows: 1 = no Schooling completed, 2 =
 nursing school to 4th grade, 3 = 5th grade to 12th grade, 4 = high school graduate, 5 = some
 college, 6 = Associate degree, 7 = bachelor degree, 8 = master's degree, 9 = professional degree
 and 10 = doctorate degree.

Table 2

CONSTRUCTION

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	7.259	0.610		11.892	0.000
Disability	0.070	0.030	0.023	2.298	0.022
Level of Education	0.014	0.008	0.017	1.638	0.101
Ability to Speak English Well	0.018	0.059	0.003	0.304	0.761
Availability of Capital	0.031	0.006	0.049	4.804	0.000
Marital Status	0.038	0.008	0.049	4.785	0.000
Asian American	-0.112	0.175	-0.006	-2.636	0.025
African American	-0.298	0.057	-0.054	-5.271	0.000
Native American	-0.300	0.205	-0.015	-2.460	0.044
Hispanic American	-0.369	0.100	-0.038	-3.678	0.000
White Females	-0.199	0.024	-0.085	-8.185	0.000

Source: Griffin & Strong, P.C. and Census of Population and Housing (Census 2000 PUMS Five Percent Sample), Calculations using SPSS. Bold coefficients are statistically significant (prob- value <= .05)

Table 3

PROFESSIONAL SERVICES

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.832	0.596		11.466	0.000
Disability	0.057*	0.030	0.019*	1.891	0.059
Level of Education	0.005	0.008	0.007	0.673	0.501
Ability to Speak English Well	0.013	0.059	0.002	0.220	0.826
Availability of Capital	0.031	0.006	0.050	4.971	0.000
Marital Status	0.038	0.008	0.048	4.830	0.000
Asian American	0.091	0.174	0.005	0.525	0.599
African American	-0.302	0.057	-0.053	-5.299	0.000
Native American	-0.109	0.196	-0.005	-0.553	0.580
Hispanic American	-0.309	0.100	-0.031	-3.096	0.002
White Females	-0.193	0.024	-0.082	-8.079	0.000

Source: Griffin & Strong, P.C. and Census of Population and Housing (Census 2000 PUMS Five Percent Sample), Calculations using SPSS. Bold coefficients are statistically significant (prob- value <= .05)

Note: (*) The statistical significance of being disabled in professional services is *marginal* (the significance of coefficients with a “Sig (prob- value)” between 0.05 and 0.10 is *marginal*. The “Sig” for this coefficient is 0.059 getting closer to 0.06 (a little more than 0.05) (please see the value of t “1.891 or less than 2”, t should be more than or equal to +/- 2 to indicate statistical significance.

Table 4

GOODS AND NON PROFESSIONAL SERVICES

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.668	0.594		11.234	0.000
Disability	0.093	0.030	0.033	3.076	0.002
Level of Education	0.002	0.008	0.003	0.250	0.803
Ability to Speak English Well	0.046	0.059	0.009	0.790	0.430
Availability of Capital	0.033	0.006	0.057	5.247	0.000
Marital Status	0.030	0.008	0.042	3.898	0.000
Asian American	0.151	0.165	0.010	0.918	0.359
African American	-0.221	0.055	-0.044	-4.008	0.000
Native American	-0.183	0.202	-0.010	-0.906	0.365
Hispanic American	-0.304	0.099	-0.034	-3.067	0.002
White Females	-0.111	0.024	-0.051	-4.610	0.000

Source: Griffin & Strong, P.C. and Census of Population and Housing (Census 2000 PUMS Five Percent Sample), Calculations using SPSS. Bold coefficients are statistically significant (prob- value <= .05)