

An Analysis of Minority Business in the U.S. Metropolitan Areas

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1. Introduction

John Powell's "Sprawl, Fragmentation and the Persistence of Racial Inequality: Limiting Civil Rights by Fragmenting Space" (2001, mimeo) discusses about the gentrification trends and concentrated poverty in inner-city communities in the U.S. metropolitan areas. He claims that the gentrification on city-scale, or regional-scale has become more evident, and it will become much more harmful to the city and region. Powell investigates a set of cities and classifies them into three categories, rich, middle, and poor, by median per capita income and fiscal capacity/size relative to the surrounding region. Then, he proposes a hypothesis that the gentrification process may be different among rich, middle, and poor cities. And he analyzed the cities he classified and found that his hypothesis is correct--different trends of concentrated poor in different type of cities.

Although Powell's hypothesis and the results seem plausible, his analysis has several drawbacks, including methodological limitations and unclear data set and source. In order to further investigate his hypothesis and the trends of inner-city development, a clearer analysis using the secondary data available from various government data sources is called for. Despite the fact that the statistical analysis is analysis of average tendency and loses particular characteristics found in each inner-city communities, it is still important to perform such an analysis to display the general tendency and trends for one of the aspects of society. However, it is beyond the capability for statistical techniques to deal with qualitative policy, for example, how different public policies are in different types of cities that Powell tries to prove (but not so successful due to the reasons mentioned above). Therefore, only quantitative values are used for the analysis. Furthermore, for practical analysis of inner-city economic activities, the data of minority-owned business, based on 1997 Economic Census, are used. Minority groups in this report are: African American, Hispanic, Asian, and Native American. Since different minority groups have different socio-economic structure and characteristics, analysis of each minority group and comparison among them will provide more comprehensive picture of inner-city, minority, and community development. Of course, minority business is only a part of inner-city minority economic activities. The minority-owned business activities, however, can become a starting point and a trigger of inner-city development. It is crucial to analyze the status quo of minority-owned business so that appropriate public policies for inner-city communities are formulated.

In the following section, the data collected and used are described briefly and basic descriptive analyses of the data are performed. In Section 3, more thorough statistical analyses using correlation coefficient, multiple-regression, and t-test are carried out in order to investigate the socio-economic structure of minority-owned business in the U.S. metropolitan area. In the last section, summary of the analysis and concluding remarks are presented.

2. Data and Descriptive Analysis

Data used in this report are gathered from various secondary data sources. The data for minority businesses are based on 1997 Economic Census, Survey of Minority-Owned Business Enterprises (including Black, Hispanic, Asian, Native American, and Others minorities) by the U.S. Census Bureau. Other demographic data are collected mainly from 1990 Census. The median income of selected race for a metropolitan area is calculated based on 1990 Census data and using the method described in Appendix A.

Metropolitan areas used in this report are the areas that have more than 10% of minority population (all minorities) over the total population, based on 1997 Economic Census. The list of 139 metropolitan area can be found in Appendix B. Table 1 indicates the metropolitan areas that have either significant concentration (more than 40% of total population) or concentration (more than 25% of total population) of minority population. In general, the East and Atlantic regions have more African American population, and the South and South West regions have significant concentration of Hispanic population. Buffalo-Niagara Falls area has 10.25% of African American population, 1.98% of Hispanic population, 0.92% of Asian population, and 0.64% of Native American population over total population in 1990.

Table 1. Metropolitan Areas with Significant Concentration of Minority Population

	African American Proportion	Hispanic Proportion	Asian Proportion	Native American Proportion
Albuquerque, NM (MSA)		>25%		
Atlanta, GA (MSA)	>25%			
Augusta/Aiken, GA/SC (MSA)	>25%			
Bakersfield, CA (MSA)		>25%		
Baltimore, MD (MSA)	>25%			
Baton Rouge, LA (MSA)	>25%			
Birmingham, AL (MSA)	>25%			
Brownsville/Harlingen/San Benito, TX (MSA)		>40%		
Charleston/North Charleston, SC (MSA)	>25%			
Columbia, SC (MSA)	>25%			
Columbus, GA/AL (MSA)	>25%			
Corpus Christi, TX (MSA)		>40%		
El Paso, TX (MSA)		>40%		
Fayetteville, NC (MSA)	>25%			
Fresno, CA (MSA)		>25%		
Honolulu, HI (MSA)			>40%	
Jackson, MS (MSA)	>40%			
Jersey City, NJ (PMSA)		>25%		
Los Angeles/Long Beach, CA (PMSA)		>25%		
Macon, GA (MSA)	>25%			
McAllen/Edinburg/Mission, TX (MSA)		>40%		
Memphis, TN -AR - MS (MSA)	>40%			
Miami, FL (PMSA)		>40%		
Montgomery, AL (MSA)	>25%			
New Orleans, LA (MSA)	>25%			
New York, NY (PMSA)	>25%			
Norfolk/Virginia Beach/Newport News, VA/NC (MSA)	>25%			
Richmond/Petersburg, VA (MSA)	>25%			
Riverside/San Bernardino, CA (PMSA)		>25%		
Salinas, CA (MSA)		>25%		
San Antonio , TX (MSA)		>40%		
Santa Barbara/Santa Maria/Lompoc, CA (MSA)		>25%		
Savannah, GA (MSA)	>25%			
Shreveport/Bossier City, LA (MSA)	>25%			
Tallahassee, FL (MSA)	>25%			
Ventura, CA (PMSA)		>25%		
Visalia/Tulare/Porterville, CA (MSA)		>40%		
Washington DC/MD/VA/WV (PMSA)	>25%			

Various rankings of metropolitan areas regarding minority-owned business are calculated for comparison. Selected rankings for each minority (African American, Hispanic, Asian, and Native American) are found in Appendix C. Those rankings are: 1) Minority Owned Business Sales per Total Population (\$/person); 2) Minority Owned Business Sales per Minority Population (\$/person); 3) Average Dollar Size of Minority Owned Business (\$/firm); and 4) Minority Business with Paid Employees over Total Minority-Owned Business (ratio). Ranking 1) indicates how large the size of minority-owned business per capita is in a metropolitan area, while ranking 2) shows the size of minority-owned business per the specific minority population. Ranking 3) illustrates average size of the specific minority business, whereas ranking 4) indicates the ratio of large business entities (with paid employees) over the total number of specific minority-owned business. Each ranking evaluates a different aspect of minority-owned business operation.

For African American minority, large metropolitan areas in the East and South are ranked high, for example, Washington D.C., Dallas, TX, Detroit, MI, and Fort Worth/Arlington, TX. Buffalo ranked relatively low across the rankings in Table C-1, although Buffalo's rankings for business entities with paid employees are relatively high; for example, ranked 25th for "average employment size of minority firms with paid employees and ranked 48th for "average sales size of minority-owned business with paid employees. This may imply that Buffalo's African American owned business with paid employees are relatively large in terms of employment and sales sizes but majority of African American owned firms are owner-alone-operation (1916 African American owned business and only 183 of them have paid employees).

For Hispanic American minority (Table C-2), large metropolitan areas in the South, the Midwest, and West are ranked relatively high, for example, Miami, FL, South Bend, IN, and Kalamazoo/Battle Creek, MI; however, both South Bend, IN and Kalamazoo/Battle Creek, MI have relatively small number of (but large size) minority-owned business are located there (141 and 236, respectively). Buffalo's rankings for Hispanic American business are also relatively low except "average sales size of minority-owned business." This may be because of the existence of small number (27) of Hispanic Owned business with large employment size (775) in Buffalo; in fact, Buffalo is ranked first in both "average sales size of minority-owned business with paid employees" and "average employment size of minority-owned business with paid employees."

For Asian American minority (Table C-3), the distributions of top 10 ranking are rather dissimilar across the rankings. For "minority-owned business sales per total population", most of top 10 areas are located in the West, where Asian American has usually a larger share of population. On the other hand, for "minority-owned business sales per minority population", "average sales size of minority-owned business" and "minority-owned business with paid employees over total minority business", the top 10 areas are mostly located in the South and the Midwest, where not many Asian population usually reside. This might be explained that these areas have large factory owned by Asians as a result of foreign direct investment. Buffalo is ranked relatively high, except "minority-owned business sales per total population." Also, Buffalo is ranked first in "average employment size of minority-owned business with paid employees" for Asian minority.

For Native American minority (Table C-4), top 10 ranked areas are spread over the entire nation, indicating the population distribution of Native American minority. Buffalo's rankings for Native American minority are relatively low, except ranked 6th in "minority-owned business with paid employees over total minority owned business." About 37% of Native American owned business are with paid employees. Also, "average salary (total payroll/# of employees)" for Buffalo's Native American business is ranked 38th.

Table 2. Top 10 Median Income Areas by Race

Rank	All Population	African American	White (including Hispanic)	Asian	Native American
1	Anchorage, AK (MSA) \$44,234	McAllen/Edinburg/Mission, TX (MSA) \$33,025	Anchorage, AK (MSA) \$46,743	Youngstown/Warren, OH (MSA) \$47,741	Hartford, CT (MSA) \$32,792
2	Hartford, CT (MSA) \$41,819	Anchorage, AK (MSA) \$33,018	Hartford, CT (MSA) \$43,738	Hartford, CT (MSA) \$47,455	Baltimore, MD (MSA) \$31,706
3	Honolulu, HI (MSA) \$41,172	Santa Barbara/Santa Maria/Lompoc, CA (MSA) \$28,610	New Haven/Meriden, CT (MSA) \$41,567	Atlantic/Cape May, NJ (MSA) \$46,497	Honolulu, HI (MSA) \$31,053
4	New Haven/Meriden, CT (MSA) \$39,390	Honolulu, HI (MSA) \$28,184	Atlanta, GA (MSA) \$40,995	Saginaw/Bay City/Midland, MI (MSA) \$46,211	Huntsville, AL (MSA) \$30,855
5	Waterbury, CT (PMSA) \$37,655	Hartford, CT (MSA) \$27,746	Baltimore, MD (MSA) \$40,976	Huntsville, AL (MSA) \$45,079	Atlanta, GA (MSA) \$30,637
6	Baltimore, MD (MSA) \$36,836	Salinas, CA (MSA) \$27,230	Honolulu, HI (MSA) \$39,996	Honolulu, HI (MSA) \$43,382	Fort Wayne, IN (MSA) \$30,443
7	Atlanta, GA (MSA) \$36,291	New Haven/Meriden, CT (MSA) \$26,100	Waterbury, CT (PMSA) \$39,313	Chattanooga, TN/GA (MSA) \$42,002	Salinas, CA (MSA) \$30,380
8	Santa Barbara/Santa Maria/Lompoc, CA (MSA) \$35,867	San Diego, CA (MSA) \$25,149	Richmond/Petersburg, VA (MSA) \$38,163	Dayton/Springfield, OH (MSA) \$41,848	Richmond/Petersburg, VA (MSA) \$29,977
9	San Diego, CA (MSA) \$35,027	Baltimore, MD (MSA) \$24,556	Raleigh/Durham/Chapel Hill, NC (MSA) \$37,996	Baltimore, MD (MSA) \$41,446	Lansing/East Lansing, MI (MSA) \$29,818
10	Rochester, NY (MSA) \$34,327	Atlanta, GA (MSA) \$24,374	Santa Barbara/Santa Maria/Lompoc, CA (MSA) \$37,924	Waterbury, CT (PMSA) \$39,120	Springfield, MA (MSA) \$29,473
Buffalo's Rank	55 \$28,263	87 \$13,965	62 \$30,089	52 \$29,564	83 \$18,355

Using 1990 Census data, the median income for each race of 93 out of 139 cities are calculated (see Appendix A for the method). Due to the race classification in 1990 Census, Hispanic population is included in White. Top 10 areas with highest median income by race are shown in Table 2. With exception of Anchorage, AK and Honolulu, HI, isolated locations with high locational compensation, some common areas are found across races, such as Hartford, CT, Baltimore, MD, New Haven, CT, and Santa Barbara, CA, where relatively wealthy population reside within the metropolitan area. More significant difference is found the median income levels across races. Asian minority has relatively higher median income throughout top 10 areas, while African American and Native American minorities have lower median income. This tendency continues throughout rankings to lower rank, indicating significant difference in income distribution by race.

Buffalo's median income is ranked 55th for all population, 87th for African American population, 62nd for White (including Hispanic), 52nd for Asian, and 83rd for Native American populations. The value of median income for each race is also significantly different from one another, ranging from the highest for White (including Hispanic), \$30,089, and to the lowest for African American, \$13,965.

3. Statistical Analysis

In this section, statistical analyses of data described in the previous section are carried out in order to grasp the structure of minority-owned business.

3-1. Relationship between Minority Population and Minority-Owned Business

First analysis investigated here is whether or not larger minority population in a metropolitan area attracts minority-owned business. Although there is no clear evidence, larger minority population in a metropolitan area may provide incentives for minority business owner to start business and some political power in the area, which, in turn, further attract minority-owned business. In order to investigate relationship between population characteristics and minority business patterns, correlation coefficients are calculated between following variables: All Population (All POP), Minority Population (Minority POP), Number of Minority Firms (Minority Firms), Number of Minority Firms with Paid Employees (Employees), Sales of

Minority-Owned Business (Minority Sales), and Sales of Minority-Owned Business with Paid Employees (Employees Sales).

Table 3 indicates the correlation coefficients between the variables for African American minority. Here, minority population and all population in a metropolitan area shows a relatively strong positive correlation (0.8830), indicating that in larger cities more African Americans reside. Throughout the correlation coefficients between population variables and minority business variables, strong positive correlations are observed. These imply that the larger the African American population (in large cities), the more minority-owned businesses exist and the larger the minority-owned businesses are. This, however, does not imply any way the causality of relationship.

Table 3. Correlation Coefficient Table for African American Minority

	All POP	Minority POP	Minority Firms	Employees	Minority Sales	Employees Sales
All POP	1					
Minority POP	0.8830	1				
Minority Firms	0.8632	0.9550	1			
Employees	0.8568	0.9567	0.9834	1		
Minority Sales	0.8293	0.8914	0.9277	0.9300	1	
Employees Sales	0.7908	0.8520	0.8828	0.8920	0.9938	1

Table 4. Correlation Coefficient Table for Hispanic Minority

	All POP	Minority POP	Minority Firms	Employees	Minority Sales	Employees Sales
All POP	1					
Minority POP	0.7775	1				
Minority Firms	0.6948	0.9181	1			
Employees	0.5740	0.7849	0.9586	1		
Minority Sales	0.5471	0.7475	0.9232	0.9642	1	
Employees Sales	0.5166	0.7118	0.9023	0.9570	0.9984	1

Table 4 exhibits the correlation coefficients for Hispanic minority. The correlations between population variable and minority business variable are rather weaker (ranging from 0.5166 to 0.7775), comparing to the correlations for African Americans, except the correlation between minority population and number of minority firms (0.9181). Although the correlations are weak, positive correlations between population and minority business are observed. A large gap between the correlation coefficients of number of minority firms and of number of minority firms with paid employees with population variables (0.6948 and 0.5740 with All POP and

0.9181 and 0.7849 with Minority POP) may indicate that a large part of Hispanic owned businesses are operated by owner-alone.

Asian minority's correlation coefficients are relatively large indicating strong positive relationship between variables (Table 5). The tendency is similar to African American ones, but the values are somewhat weaker, especially with all population. On the other hand, the correlations between minority business variables and minority population (Minority POP) are larger than African American ones. These may generally imply that Asian businesses are concentrated on the metropolitan area with large Asian population, regardless of total population of area.

Native American minority has a quite different pattern of correlation coefficients (Table 5). By and large, the values of coefficient are smaller than other minorities, especially the coefficient between All POP and Minority POP (0.4800). This might be due to the trend that most Native Americans reside in specific locations (ancestral land) rather than large cities. On the other hand, Native American's businesses are found in large cities. Another evidence is that the relatively smaller coefficients between minority business variables and minority population (Minority POP) shows that some of Native American's businesses are located in areas with smaller Native American population.

Table 5. Correlation Coefficient Table for Asian Minority

	All POP	Minority POP	Minority Firms	Employees	Minority Sales	Employees Sales
All POP	1					
Minority POP	0.7501	1				
Minority Firms	0.8383	0.9569	1			
Employees	0.8554	0.9536	0.9903	1		
Minority Sales	0.7933	0.9531	0.9569	0.9801	1	
Employees Sales	0.7921	0.9530	0.9550	0.9789	0.9998	1

Table 6. Correlation Coefficient Table for Native American Minority

	All POP	Minority POP	Minority Firms	Employees	Minority Sales	Employees Sales
All POP	1					
Minority POP	0.4800	1				
Minority Firms	0.7656	0.7968	1			
Employees	0.7145	0.7207	0.9330	1		
Minority Sales	0.6521	0.6863	0.8872	0.9360	1	
Employees Sales	0.6331	0.6690	0.8659	0.9275	0.9985	1

3-2. Relationship between Minority Population Proportion and Minority-Owned Business

In Section 3-1, the relationships between population (total and minority) and minority business variables were analyzed. Population values used there are the size of population. It is important to know the correlation between the size of population and minority business activities. On the other hand, it is also crucial to investigate the relationship between the proportion of minority population over total population (POP Ratio) and the ratio of minority business activities over total population (Firms Ratio = Number of Minority Firms / Total Population; Sales Ratio = Sales of Minority Firms / Total Population). The below are the result.

Although African American minority has strong positive correlations between All POP and Minority POP and between population variables and minority-owned business variables, the correlations between the share of minority population and the ratio of minority-owned business are rather not so strong, ranging from 0.6231 to 0.8419 (Table 7). These values are, in fact, the lowest among the minority groups (see Tables 8, 9, and 10). It is difficult, however, to speculate the mechanism of this results, without having further data. For Hispanic minority, the correlations between POP Ratio and the ratio of minority business variables are higher than the ones for African Americans. This might imply that the concentration of Hispanic population (share-wise) has a positive influence in the concentration of minority business.

Table 7. Correlation Coefficient Table for African American Minority-2

	POP Ratio	Firms Ratio	Sales Ratio
POP Ratio	1		
Firms Ratio	0.8419	1	
Sales Ratio	0.6231	0.7732	1

Table 8. Correlation Coefficient Table for Hispanic Minority-2

	POP Ratio	Firms Ratio	Sales Ratio
POP Ratio	1		
Firms Ratio	0.9015	1	
Sales Ratio	0.7457	0.9118	1

Asian minority has the largest values of correlation coefficient throughout the table, ranging from 0.8693 to 0.9505. These are very strong positive correlations. This might be an evidence of agglomeration effects discussed in Economics--a concentration created further concentrations. Table 10 indicates the correlation coefficients for Native American minority. The values are relatively smaller than Hispanic's and Asian's, but larger than African American's,

except the correlation between the ratio of number of minority business over total population and the ratio of sales of minority business over total population. 0.6927. The results in this and previous sections indicate that the tendency and structure of minority business seem to be different across minority groups.

Table 9. Correlation Coefficient Table for Asian Minority-2

	POP Ratio	Firms Ratio	Sales Ratio
POP Ratio	1		
Firms Ratio	0.9417	1	
Sales Ratio	0.8693	0.9505	1

Table 10. Correlation Coefficient Table for Native American Minority-2

	POP Ratio	Firms Ratio	Sales Ratio
POP Ratio	1		
Firms Ratio	0.8799	1	
Sales Ratio	0.7499	0.6927	1

3-3. Relationship between Wealth of the Area and Minority-Owned Business

So far, the results are based on correlation coefficients--one-sided relationship. In order to understand the structure of minority-owned business in a comprehensive fashion, multiple-regression analysis is called for. In this section, minority business activities (Sales of Minority-Owned Business: Minority Business) is regressed by total population (All POP), minority population (Minority POP), minority median income (Minority M-Income), and total median income (All M-Income). Since the median income data were collected from 1990 Census, Hispanic population is included in White race. Therefore, in this section, the analysis for Hispanic-owned business is not conducted in order to make comparison among minority groups consistent.

Table 11 indicates the summary results of regression analysis for African American Minority. The dependent variable is the sales of minority-owned business. The summary statistics show the relatively high R-square value (0.818) and significant F value (78.81). With regard to independent variables, only the intercept and Minority POP variables are statistically significant, and other independent variables, All POP, Minority M-Income, and All M-Income, are statistically not significant, indicating no statistical relationship between the sales size of minority-owned business and them. This might indicate that the African American businesses,

in general, depend on the own minority group; however, further investigation is necessary to conclude.

Table 11. Regression Summary for African American Minority

<i>Regression Statistics</i>	
Multiple R	0.904592088
R Square	0.818286846
Adjusted R Square	0.807903237
Standard Error	175152.2306
Observations	75

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4	9.67049E+12	2.41762E+12	78.80563112	3.55142E-25
Residual	70	2.14748E+12	30678303889		
Total	74	1.1818E+13			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-296027.4520	154690.6439	-1.9137	0.0598
All POP	0.0235	0.0527	0.4456	0.6572
Minority POP	2.6026	0.2285	11.3915	0.0000
Minority M-Income	4.9886	9.6431	0.5173	0.6066
All M-Income	4.6439	9.1640	0.5068	0.6139

: significant with 10% level

For Asian American minority, the regression results are somewhat different (Table 12). The summary statistics indicate the stronger evidence of relationship (high R-square, 0.8838; and large F-value, 159.75) than African American's. In the regression model, All POP and Minority POP are statistically significant (even at 5% significance level), but Minority M-Income and All M-Income are statistically insignificant. Again, wealth (median income) of the metropolitan area seems to have no influence on the size of minority business. On the other hand, Asian-owned business is strongly influenced by the size of metropolitan area and of minority community within it.

Table 12. Regression Summary for Asian Minority

<i>Regression Statistics</i>	
Multiple R	0.94011601
R Square	0.883818111
Adjusted R Square	0.878285641
Standard Error	486357.1127
Observations	89

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4	1.51152E+14	3.7788E+13	159.7510643	2.07478E-38
Residual	84	1.98696E+13	2.36543E+11		
Total	88	1.71022E+14			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-393999.8954	360440.6511	-1.0931	0.2775
All POP	0.4312	0.0985	4.3780	0.0000
Minority POP	20.0694	0.9441	21.2577	0.0000
Minority M-Income	6.7171	7.8104	0.8600	0.3922
All M-Income	3.2889	14.2120	0.2314	0.8176

: significant with 10% level

Native American-owned business has slightly different tendency with other two minority groups (Table 13). The summary results indicate that the regression model has moderate explanation power (R-Square, 0.621) and moderate F-value (25.38). Although three independent variables, intercept, Minority POP, and All M-Income, one of them (All M-Income) is barely significant at 10 % level, indicating a weak influence. However, Native American-owned business is the only one having statistically significant relationship between the size of business and median income of the area. This might be resulted from the types of business this particular minority group engages; however, again, further investigation is necessary to conclude.

Table 13. Regression Summary for Native American Minority

<i>Regression Statistics</i>	
Multiple R	0.787955294
R Square	0.620873546
Adjusted R Square	0.596413774
Standard Error	111088.7034
Observations	67

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4	1.253E+12	3.1325E+11	25.38345674	1.77284E-12
Residual	62	7.65123E+11	12340700022		
Total	66	2.01812E+12			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-221811.5804	96579.6252	-2.2967	0.0250
All POP	-0.0298	0.0250	-1.1922	0.2377
Minority POP	14.3820	1.5364	9.3609	0.0000
Minority M- Income	3.2410	4.4083	0.7352	0.4650
All M-Income	7.1269	4.2469	1.6781	0.0984

: significant with 10% level

3-4. Wealthy Cities and Poor Cities

John Powell's main claim is that the situation of concentrated poor is different among rich, middle, and poor cities. Although the activities of minority business do not directly reflect the concentrated poor in cities, they may be a key indicator for inner-city development policies. In order to investigate how minority business is different among metropolitan areas, difference of means between two groups tests (t-test) are performed assuming unequal variance (the results are the same with the assumption of equal variance). Metropolitan areas are sorted by two ways: 1) by total median income; and 2) by minority median income. Richest 30 and poorest 30 metropolitan areas are selected for comparison. The value of Minority Sales per Population (total population) are used for comparison, assuming that it indicates the performance level of minority business over the near-by market.

Table 14 indicates the test results for African American minority. The null hypothesis is set to be no difference in means between rich cities and poor cities. The results from both groups

included in Powell's study, are not included in the data set in this section. The addition of those data might slightly change the results, but it is expected that it will not change the results significantly. Third and lastly, this is the test for difference in means. Mean, sometime called average, is a statistics indicating general tendencies. Perhaps, what the results truly reveal is that the particular socio-economic characteristics and structure of locality are much more important than the comparison with other cities, since the use of numbers tends to lose unique feature of a metropolitan area.

4. Conclusions

It is difficult to argue against a plausible hypothesis posed by Powell. However, the results in this report indicated to some extent that, with regard to minority-owned business, it is not the case that the U.S. metropolitan areas are easily classified into to some *a priori* categories. It is also not the case that the results of this report deny the Powell's hypothesis. His argument still stands, but needs to be proven using more widely available data and clearer methods, such as used in this report. This is just a starting point of thorough investigation of how the socio-economic structure and characteristics of minorities, or inner city communities, are, and this type of analysis needs to be carried out in more comprehensive fashion, including demographic data and other socio-economic variables.

One of the policy implications derived from this report is that wealthy region does not necessarily mean the good place to do business. Under the current advanced suburbanization and mass-commuting, the place of residence and the place of work may not be the same. In this study, the metropolitan statistical area is used; however, it has become that more people are commuting from or to the outside of metropolitan area. Also, higher median income does not necessarily mean the higher tax base; income level is different from taxable income level. It is necessary to employ other items, such as community asset level and/or actual government revenue level (and debt level), to classify cities/metropolitan areas to categories.

Throughout this report, Buffalo has been ranked quite low, in terms of minority business rankings and in terms of median income levels. As found in the previous section, this does not mean that because Buffalo is a relatively poor city, minority-owned businesses do not flourish in Buffalo. The results reveal that there is no difference in minority-owned business between rich

and poor cities. There are other poor cities where minority-owned businesses are relatively successful. In addition to learn from such cities, there are other factors that may influence the minority-owned business, such as economic structure, employment structure, demographic structure, and political climate. In order to explain fully about the low rankings of Buffalo's economic activities, further and more detailed analyses are necessary.

Appendix A: Calculation of Median Income using Categorized Data

1990 Census provides the income distribution of selected race using income cohort (9 categories) as follows:

<\$5,000
 \$5,000-9,999
 \$10,000-14,999
 \$15,000-24,999
 \$25,000-34,999
 \$35,000-49,999
 \$50,000-74,999
 \$75,000-99,999
 >\$100,000

In order to calculate the median income value from the categorized data, the upper value of each category are used as the category value to represent a category as below:

Income Category	Category Value
<\$5,000	\$5,000
\$5,000-9,999	\$9,999
\$10,000-14,999	\$14,999
\$15,000-24,999	\$24,999
\$25,000-34,999	\$34,999
\$35,000-49,999	\$49,999
\$50,000-74,999	\$74,999
\$75,000-99,999	\$99,999
>\$100,000	\$999,999

Set the notation of variable as follows:

N : Total sample number

$N/2$: Median sample point

First, using the Category Value, CV , the category including the median sample point was found based on the following condition:

$$CF_{i-1} < N/2 \text{ and } CF_i > N/2$$

where CF_i is the cumulative frequency of category i . Once the category that include the median sample point, median income is calculated as follows:

$$MI = (CV_m - CV_{m-1}) \cdot (N/2 - CF_{m-1}) / (CF_m - CF_{m-1}) + CV_{m-1}$$

where:

MI : Median income

CV_m : Category value of the category that includes the median sample point

CF_m : Cumulative frequency of the category that includes the median sample point

This method is intended to provide an approximation of the median income for an income distribution. Depending on the shape of the distribution, the derived value can be over- or under-estimation of true median value. Also, it should be noted that because of use of upper value the derived median income may have a tendency of overestimation.

Appendix B: List of Metropolitan Areas Used in This Report

1	Akron, OH (PMSA)	71	Macon, GA (MSA)
2	Albuquerque, NM (MSA)	72	McAllen/Edinburg/Mission, TX (MSA)
3	Anchorage, AK (MSA)	73	Melbourne/Titusville/Palm Bay, FL (MSA)
4	Ann Arbor, MI (PMSA)	74	Memphis, TN -AR - MS (MSA)
5	Atlanta, GA (MSA)	75	Miami, FL (PMSA)
6	Atlantic/Cape May, NJ (MSA)	76	Middlesex/Somerset/Hunterdon, NJ (PMSA)
7	Augusta/Aiken, GA/SC (MSA)	77	Milwaukee/Waukesha, WI (PMSA)
8	Austin/San Marcos, TX (MSA)	78	Mobile, AL (MSA)
9	Bakersfield, CA (MSA)	79	Modesto, CA (MSA)
10	Baltimore, MD (MSA)	80	Monmouth/Ocean, NJ (PMSA)
11	Baton Rouge, LA (MSA)	81	Montgomery, AL (MSA)
12	Beaumont/Port Arthur, TX (MSA)	82	Nashville, TN (MSA)
13	Bergen/Passaic, NJ (PMSA)	83	Nassau/Suffolk, NY (PMSA)
14	Birmingham, AL (MSA)	84	New Haven/Meriden, CT (MSA)
15	Boston, MA/NH (PMSA)	85	New Orleans, LA (MSA)
16	Boulder/Longmont, CO (PMSA)	86	New York, NY (PMSA)
17	Bridgeport, CT (PMSA)	87	Newark, NJ (PMSA)
18	Brownsville/Harlingen/San Benito, TX (MSA)	88	Newburgh, NY/PA (PMSA)
19	Buffalo-Niagara Falls, NY (MSA)	89	Norfolk/Virginia Beach/Newport News, VA/NC (MSA)
20	Charleston/North Charleston, SC (MSA)	90	Oakland, CA (PMSA)
21	Charlotte/Gastonia/Rock Hill, NC/SC (MSA)	91	Oklahoma, City, OK (MSA)
22	Chattanooga, TN/GA (MSA)	92	Omaha, NE/IA (MSA)
23	Chicago, IL (PMSA)	93	Orange County, CA (PMSA)
24	Cincinnati, OH/KY/IN (PMSA)	94	Orlando, FL (MSA)
25	Cleveland/Lorain/Elyria, OH (PMSA)	95	Pensacola, FL (MSA)
26	Colorado Springs, CO (MSA)	96	Philadelphia, PA/NJ (PMSA)
27	Columbia, SC (MSA)	97	Phoenix/Mesa, AZ (MSA)
28	Columbus, GA/AL (MSA)	98	Raleigh/Durham/Chapel Hill, NC (MSA)
29	Columbus, OH (MSA)	99	Reno, NV (MSA)
30	Corpus Christi, TX (MSA)	100	Richmond/Petersburg, VA (MSA)
31	Dallas, TX (PMSA)	101	Riverside/San Bernardino, CA (PMSA)
32	Dayton/Springfield, OH (MSA)	102	Roanoke, VA (MSA)
33	Daytona Beach, FL (MSA)	103	Rochester, NY (MSA)
34	Denver, CO (PMSA)	104	Rockford, IL (MSA)
35	Detroit, MI (PMSA)	105	Sacramento, CA (PMSA)
36	Dutchess County, NY (PMSA)	106	Saginaw/Bay City/Midland, MI (MSA)
37	El Paso, TX (MSA)	107	St Louis, MO -IL (MSA)
38	Fayetteville, NC (MSA)	108	Salem, OR (PMSA)
39	Flint, MI (PMSA)	109	Salinas, CA (MSA)
40	Fort Lauderdale, FL (PMSA)	110	San Antonio, TX (MSA)
41	Fort Myers/Cape Coral, FL (MSA)	111	San Diego, CA (MSA)
42	Fort Pierce/Port St. Lucie, FL (MSA)	112	San Francisco, CA (PMSA)
43	Fort Wayne, IN (MSA)	113	San Jose, CA (PMSA)
44	Fort Worth/Arlington, TX (PMSA)	114	Santa Barbara/Santa Maria/Lompoc, CA (MSA)
45	Fresno, CA (MSA)	115	Santa Cruz/Watsonville, CA (PMSA)
46	Gainesville, FL (MSA)	116	Santa Rosa, CA (PMSA)
47	Gary, IN (PMSA)	117	Savannah, GA (MSA)

48	Grand Rapids/Muskegon/Holland, MI (MSA)	118	Seattle/Bellevue/Everett, WA (PMSA)
49	Greensboro/Winston-Salem/High Point, NC (MSA)	119	Shreveport/Bossier City, LA (MSA)
50	Greenville/Spartanburg/Anderson, SC (MSA)	120	South Bend, IN (MSA)
51	Hartford, CT (MSA)	121	Springfield, MA (MSA)
52	Honolulu, HI (MSA)	122	Stamford/Norwalk, CT (PMSA)
53	Houston, TX (PMSA)	123	Stockton/Lodi, CA (MSA)
54	Huntsville, AL (MSA)	124	Tacoma, WA (PMSA)
55	Indianapolis, IN (MSA)	125	Tallahassee, FL (MSA)
56	Jackson, MS (MSA)	126	Tampa/St. Petersburg/Clearwater, FL (MSA)
57	Jacksonville, FL (MSA)	127	Toledo, OH (MSA)
58	Jersey City, NJ (PMSA)	128	Trenton, NJ (PMSA)
59	Kalamazoo/Battle Creek, MI (MSA)	129	Tucson, AZ (MSA)
60	Kansas City, MO/KS (MSA)	130	Tulsa, OK (MSA)
61	Killeen/Temple, TX (MSA)	131	Vallejo/Fairfield/Napa, CA (PMSA)
62	Lafayette, LA (MSA)	132	Ventura, CA (PMSA)
63	Lakeland/Winter Haven, FL (MSA)	133	Visalia/Tulare/Porterville, CA (MSA)
64	Lansing/East Lansing, MI (MSA)	134	Washington DC/MD/VA/WV (PMSA)
65	Las Vegas, NV/AZ (MSA)	135	Waterbury, CT (PMSA)
66	Lexington, KY (MSA)	136	West Palm Beach FL/Boca Raton, FL (MSA)
67	Little Rock/North Little Rock, AR (MSA)	137	Wichita, KS (MSA)
68	Los Angeles/Long Beach, CA (PMSA)	138	Wilmington/Newark, DE/MD (PMSA)
69	Louisville, KY-IN, (MSA)	139	Youngstown/Warren, OH (MSA)
70	Lubbock, TX (MSA)		

Appendix C: Rankings of Metropolitan Areas for Minority Owned Business

Table C-1. Rankings for African American Owned Business

Rank	Minority-Owned Business Sales per Total Population	Minority-Owned Business Sales per Minority Population	Average \$ Size of Minority-Owned Business	Minority-Owned Business with Paid Employees over Total Minority-Owned Business (# of firms)
1	Washington DC/MD/VA/WV (PMSA)	Albuquerque, NM (MSA)	Fort Worth/Arlington, TX (PMSA)	Reno, NV (MSA)
2	Atlanta, GA (MSA)	Fort Worth/Arlington, TX (PMSA)	Detroit, MI (PMSA)	Honolulu, HI (MSA)
3	Huntsville, AL (MSA)	Orange County, CA (PMSA)	Lansing/East Lansing, MI (MSA)	Gainesville, FL (MSA)
4	Dallas, TX (PMSA)	San Francisco, CA (PMSA)	Saginaw/Bay City/Midland, MI (MSA)	Jersey City, NJ (PMSA)
5	Fort Lauderdale, FL (PMSA)	Fort Lauderdale, FL (PMSA)	San Francisco, CA (PMSA)	Kansas City, MO/KS (MSA)
6	Detroit, MI (PMSA)	Ann Arbor, MI (PMSA)	Flint, MI (PMSA)	Orange County, CA (PMSA)
7	Lafayette, LA (MSA)	Dallas, TX (PMSA)	Orange County, CA (PMSA)	Chattanooga, TN/GA (MSA)
8	Columbia, SC (MSA)	Lansing/East Lansing, MI (MSA)	Columbus, OH (MSA)	Trenton, NJ (PMSA)
9	Fort Worth/Arlington, TX (PMSA)	Washington DC/MD/VA/WV (PMSA)	Dallas, TX (PMSA)	Lafayette, LA (MSA)
10	Raleigh/Durham/Capel Hill, NC (MSA)	Stamford/Norwalk, CT (PMSA)	Youngstown/Warren, OH (MSA)	Nashville, TN (MSA)
Buffalo's Rank				
	108	111	79	94

Table C-2. Rankings for Hispanic Owned Business

Rank	Minority-Owned Business Sales per Total Population	Minority-Owned Business Sales per Minority Population	Average \$ Size of Minority-Owned Business	Minority-Owned Business with Paid Employees over Total Minority-Owned Business (# of firms)
1	Miami, FL (PMSA)	Pensacola, FL (MSA)	Kalamazoo/Battle Creek, MI (MSA)	Columbus, GA/AL (MSA)
2	McAllen/Edinburg/Mission, TX (MSA)	Kalamazoo/Battle Creek, MI (MSA)	Dayton/Springfield, OH (MSA)	Louisville, KY-IN, (MSA)
3	El Paso, TX (MSA)	Dayton/Springfield, OH (MSA)	South Bend, IN (MSA)	Killeen/Temple, TX (MSA)
4	San Antonio, TX (MSA)	Greensboro/Winston-Salem/High Point, NC (MSA)	Youngstown/Warren, OH (MSA)	South Bend, IN (MSA)
5	Brownsville/Harlingen/San Benito, TX (MSA)	Lafayette, LA (MSA)	Huntsville, AL (MSA)	Kalamazoo/Battle Creek, MI (MSA)
6	Albuquerque, NM (MSA)	Huntsville, AL (MSA)	Savannah, GA (MSA)	Modesto, CA (MSA)
7	Houston, TX (PMSA)	Macon, GA (MSA)	Milwaukee/Waukesha, WI (PMSA)	Gainesville, FL (MSA)
8	Orange County, CA (PMSA)	Miami, FL (PMSA)	San Jose, CA (PMSA)	Savannah, GA (MSA)
9	San Jose, CA (PMSA)	Atlanta, GA (MSA)	Orange County, CA (PMSA)	Huntsville, AL (MSA)
10	Jersey City, NJ (PMSA)	Charlotte/Gastonia/Rock Hill, NC/SC (MSA)	Lafayette, LA (MSA)	Toledo, OH (MSA)
Buffalo's Rank				
	106	72	25	138

Table C-3. Rankings for Asian Owned Business

Rank	Minority-Owned Business Sales per Total Population	Minority-Owned Business Sales per Minority Population	Average \$ Size of Minority-Owned Business	Minority-Owned Business with Paid Employees over Total Minority-Owned Business (# of firms)
1	Honolulu, HI (MSA)	Columbus, GA/AL (MSA)	Columbus, GA/AL (MSA)	Corpus Christi, TX (MSA)
2	San Francisco, CA (PMSA)	Lakeland/Winter Haven, FL (MSA)	Bakersfield, CA (MSA)	Lubbock, TX (MSA)
3	San Jose, CA (PMSA)	Cleveland/Lorain/Elyria, OH (PMSA)	Bridgeport, CT (PMSA)	Vallejo/Fairfield/Napa, CA (PMSA)
4	Los Angeles/Long Beach, CA (PMSA)	Miami, FL (PMSA)	Huntsville, AL (MSA)	Dayton/Springfield, OH (MSA)
5	Orange County, CA (PMSA)	Youngstown/Warren, OH (MSA)	Lansing/East Lansing, MI (MSA)	Columbus, GA/AL (MSA)
6	Oakland, CA (PMSA)	Jackson, MS (MSA)	Dayton/Springfield, OH (MSA)	El Paso, TX (MSA)
7	Middlesex/Somerset/Hunterdon, NJ (PMSA)	Huntsville, AL (MSA)	Miami, FL (PMSA)	Lakeland/Winter Haven, FL (MSA)
8	Bergen/Passaic, NJ (PMSA)	Atlanta, GA (MSA)	Middlesex/Somerset/Hunterdon, NJ (PMSA)	Jacksonville, FL (MSA)
9	Jersey City, NJ (PMSA)	Fort Pierce/Port St. Lucie, FL (MSA)	Jackson, MS (MSA)	Montgomery, AL (MSA)
10	Seattle/Bellevue/Everett, WA (PMSA)	Stamford/Norwalk, CT (PMSA)	Detroit, MI (PMSA)	Roanoke, VA (MSA)
Buffalo's Rank				
	81	46	22	12

Table C-4. Rankings for Native American Owned Business

Rank	Minority-Owned Business Sales per Total Population	Minority-Owned Business Sales per Minority Population	Average \$ Size of Minority-Owned Business	Minority-Owned Business with Paid Employees over Total Minority-Owned Business (# of firms)
1	Anchorage, AK (MSA)	Baton Rouge, LA (MSA)	Anchorage, AK (MSA)	Vallejo/Fairfield/Napa, CA (PMSA)
2	Tulsa, OK (MSA)	Cleveland/Lorain/Elyria, OH (PMSA)	Tacoma, WA (PMSA)	Stockton/Lodi, CA (MSA)
3	El Paso, TX (MSA)	El Paso, TX (MSA)	Wichita, KS (MSA)	Modesto, CA (MSA)
4	Pensacola, FL (MSA)	Lafayette, LA (MSA)	Baton Rouge, LA (MSA)	Wichita, KS (MSA)
5	Oklahoma, City, OK (MSA)	Columbus, OH (MSA)	Cleveland/Lorain/Elyria, OH (PMSA)	Corpus Christi, TX (MSA)
6	Tacoma, WA (PMSA)	Miami, FL (PMSA)	El Paso, TX (MSA)	Buffalo-Niagara Falls, NY (MSA)
7	Baton Rouge, LA (MSA)	Augusta/Aiken, GA/SC (MSA)	Shreveport/Bossier City, LA (MSA)	Augusta/Aiken, GA/SC (MSA)
8	Wichita, KS (MSA)	West Palm Beach FL/Boca Raton, FL (MSA)	Columbus, OH (MSA)	Visalia/Tulare/Porterville, CA (MSA)
9	Albuquerque, NM (MSA)	Pensacola, FL (MSA)	Pensacola, FL (MSA)	Hartford, CT (MSA)
10	Colorado Springs, CO (MSA)	Hartford, CT (MSA)	Gary, IN (PMSA)	Milwaukee/Waukesha, WI (PMSA)
Buffalo's Rank				
	105	114	78	6