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THE EFFECTS OF POPULATION DIVERSITY ON THE ECONOMIC AND HOUSEHOLD WELFARE OF METROPOLITAN AREAS IN THE U.S.

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To: Interim Dean William Hardin
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This dissertation, written by Liria Maria Litano, and entitled The Effects of Population Diversity on the Economic and Household Welfare of Metropolitan Areas in the U.S., having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Florida International University, 2021

DEDICATION

For my wonderful husband, who is relentless in his encouragement. For my parents, whose sacrifice gave me a better life. Finally, to my wolf pack, who ensured we all survived this adventure.

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ABSTRACT OF THE DISSERTATION

THE EFFECTS OF POPULATION DIVERSITY ON THE ECONOMIC AND HOUSEHOLD WELFARE OF METROPOLITAN AREAS IN THE U.S.

by

Liria Maria Litano

Florida International University, 2021

Miami, Florida

Professor George Marakas, Major Professor

The purpose of this paper was to understand the impact of population diversity on household and economic welfare in all the Metropolitan Statistical Area (MSA) in the United States of America (U.S.). I focused on positive views concerning the relationships between population diversity and factors such as human capital, knowledge, and innovation. I established economic growth factors using the Endogenous Growth Theory, which stated that human capital, innovation, and knowledge were significant contributors to economic growth (Romer, 1994). I argued that population diversity affected these contributors; therefore, it helped to create economic growth.

From a human capital perspective, population diversity leads to higher productivity, therefore impacted organizations and the economy (Ager and Bruckner, 2013). From an innovation perspective, population diversity brought diverse workforces and led to new businesses and employment opportunities for workers, especially skilled workers (Rodríguez-Pose and Hardy, 2015). From a knowledge perspective, population diversity brought skills and increased salaries (Ottaviano and Peri, 2006).

Using secondary data from the U.S. Census, Bureau of Economic Analysis data, and Bureau of Labor Statistics, I ran multiple regression analyses to test the research model to understand population diversity's impact on household & economic welfare and unemployment. I focused on MSAs because MSAs tend to have diverse populations and thus the best sample to understand the real implications of diversity in the U.S. I used data from 2006 to 2018. After all, before 2006, there was no Hispanic origin data from the U.S. Census.

The results showed that population diversity harmed household welfare and the unemployment rate. Thus, as population diversity increased, the average household welfare decreased, and at the same time, the unemployment rate fell. The results also showed that population diversity had a positive effect on economic interest, thus that as population diversity increased, the economic welfare increased.

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I. INTRODUCTION

The purpose of this paper is to understand the impact of population diversity on household and economic welfare, along with the unemployment rate, in every Metropolitan Statistical Area (MSA) in the United States of America (U.S.).

Looking at society based on the U.S. Census, the country's workforce, aged 25-64, is undergoing a sweeping demographic transformation. This change can be traced to two primary causes. The first is an increase in minorities, which is projected to double in the workforce from 18% to 37%; the second is the decrease of Caucasians as there is a 7.5% drop in whites, aged 18-44, in the workforce and a 12.4% increase in whites at retirement age (The National Center for Public Policy and Higher Education, 2005). Yet, despite the increasing levels of diversity, 90% of Hispanics/Latinos live in 16 states and 90% of African Americans live in 21 states out of the 50 states in the U.S. (The National Center for Public Policy and Higher Education, 2005). Based on this disproportioned distribution, this study will enable states to understand the future potential of their demography

Negative views of population diversity are popular. A PEW study found that 65% of surveyed Americans believe "it has become more common for people to express racist or racially insensitive views since Trump was elected president (2017-2021), while 45% say this has become more acceptable" (PEW Research, 2019, 7). These shocking statistics imply people do not understand how diversity benefits society. These views have a negative impact on the economy, as discrimination cost 3.8% of the GDP in 1993 according to Andrew Brimmer, the first black governor of the Federal Reserve Board.

(Boston, 1997). It is estimated that closing the racial gap could add an estimated $5 trillion dollars to the economy over the next five years (Peterson and Mann, 2020).

Thus, it is especially meaningful and significant to examine population diversity and its contribution to economic and employment growth. I must understand the contribution of diversity now to help us fully prepare for an inevitable future. According to the Pew Research Center (2015), by 2065 the U.S. population will not have any race or ethnic majorities.

To have a clear understanding of population diversity, in this study, I try to clarify these views by raising the following question: *What are the effects of population diversity on the economic and household welfare of metropolitan areas in the U.S.?*

The U.S. Census officially categorizes the population as "White, Black or African American, Asian, Native American and Alaskan Native, Native Hawaiian and other Pacific Islanders, two or more races, and other races" (U.S. Census, 2020). Additionally, the Census records Hispanic and Latin Americans of any race, two or more races, and other races in a different section. Consequently, no racial category exists for Hispanics. As a result, the Census has eight different classifications. For this paper, I defined population diversity as a combination of race and ethnicity based on the eight recognized U.S. Census classifications.

To understand the impact of population diversity on household and economic welfare, along with unemployment, across the U.S., I reviewed the literature on population diversity and its effects. The literature showed that population diversity was closely related to human capital, knowledge, and innovation. Human capital is the inherent dynamic capabilities of humans (Eide & Showalter, 2010). I refer to knowledge

as the intellectual capital used for consumption and production. I define innovation as a disruptive idea, like a technology, which adds value to an economy. From a human capital perspective, population diversity leads to higher productivity—impacting organizations and the economy (Ager and Bruckner, 2013). From an innovation perspective, population diversity leads to diverse workforces and new businesses and employment opportunities for workers, especially skilled workers (Rodríguez-Pose and Hardy, 2015). From a knowledge perspective, population diversity brings in skills and leads to a rise in salaries (Ottaviano and Peri, 2006).

The Endogenous Growth Theory states that human capital, innovation, and knowledge are significant contributors to economic growth (Romer, 1994). I thus argue that population diversity affects these contributors. Therefore, population diversity helps to create economic growth. I define economic growth as a growth in the goods and services created per head of the populace over some time.

To understand the analysis level, I attempt to find the most meaningful and relevant information to help governments and businesses understand the impact of diversity. Diversity at a country level does not mean that every city and every part of the country is diverse. Analysis at the city level is a bit confusing, as people usually travel between cities for work. MSAs carry more significant amounts of various populations and give the best understanding of an area's diversity and economic growth. This is important because government agencies use these delineations for programmatic applications. Government officials use MSAs MSAs contain "urban and rural territory and populations" (OMB Bulletin 2020, p. 2).

MSAs “have at least one urbanized area, with a population of 50,000 people or more, as well as adjacent territory with a high degree of social and economic integration with the core as measured by commuting ties” (OMB Bulletin 2020, p. 2). MSAs, as a classification, account for about 86.1% of the U.S. Population (OMB Bulletin, 2020). An MSA gives an accurate measure of the relationship between diversity and economic growth, as most inhabitants travel within these boundaries to conduct business. There are 384 MSA in the U.S., and my data was from 2006 to 2018. We will use MSAs to measure the change in the population diversity year over year and its impact on economic and household welfare.

This research will help government officials understand the importance of population diversity in its population's household income. By understanding the impact of population diversity on the economy, officials may promote their cities to new business opportunities. Additionally, this realization may encourage government officials to promote policies that foster diversity.

II. LITERATURE REVIEW

The literature review aims to help the reader understand the impact of population diversity on the economy**.** I selected literature explaining global economic growth drivers, world population diversity and views from scholars of the impact of population diversity on the economy. I first reviewed the literature on population diversity and its effects. I proceeded to understand population diversity and the views of scholars, including both positive and negative opinions. I then focused on positive views concerning the relationships between population diversity and factors such as human capital, knowledge, and innovation. Using the endogenous growth theory as a framework, I reviewed the literature on correlations between economic growth and diversity. I aim to understand the effects of population diversity on the surrounding environment (i.e., economic development and unemployment rate) and their inhabitants (i.e., household welfare).

Population diversity

A country's demographic composition has changed because of global modernization (Crisp, 2012). With the constant change of culture exchange, there has been a transformation of social environments within a country's society (Plaut, 2010). Negative views of population diversity seem to constantly fuel critical world events—for example, the withdrawal of the United Kingdom from the European Union, forced migration from civil wars, and the Covid-19 pandemic.

Race no longer identifies Nationality. Societies have evolved to blend their ethnicity, cultural identity, and even religions identities (Plaut, 2010). However, it is the adaption of this evolution that continues to create debate among the society. While some

argue this evolution of blending the different ethnicities, culture and religious identities inspires intergroup harmony (Plaut, 2010 & Verkuyten, 2005) and positive outcomes (Rudmin, 2003), it seems diversity leads to conflict and unrest, regardless of government policy.

An example of this conflict is the brutal murder of George Floyd—a black man—by a Minneapolis police officer—a white man—which lead to the 2020 Black Lives Matter protests. It was estimated that 15 to 26 million people participated in demonstrations around the U.S., seeking criminal justice reform (Buchanan et al., 2020). Opponents of diversity use these events to support their arguments that diversity creates unrest and social disharmony. Wolsko et al. (2000) argue that while diversity can reduce prejudice, personal bias will still remain, as will support for inequality (Morrison, 2010).

Joppke (2004) observed that although government policies have pushed for diversity, there has been a lack of public support, creating a concept withdrawal. For example, in 2010, German Chancellor Angela Merkel stated that diversification has failed (BBC, 2010). Her comments were supported and reiterated by the United Kingdom's prime minister, David Cameron (BBC, 2011).

Nevertheless, the literature also showed overwhelming evidence of the positive impact of diversity. I reviewed the literature to explain the positive connection between population diversity and human capital, knowledge, innovation, and creative class.

Diversity and Human Capital

Human capital is the inherent dynamic capabilities of humans (Eide & Showalter, 2010). Ager and Bruckner (2013) conclude that a diverse population has various skills that create multiple goods and services. Diversity, therefore, has a higher human work

output per capita. Human capital is a measurement of human work (Eide 2010). Additionally, Ottaviano and Peri (2006) conclude that an increase in cultural fractionalization creates an increase in productivity. Finally, in reviewing the U.S. population, Peri (2012) found that from 1970–2006, immigration resulted in higher productivity in the U.S. Thus, population diversity increases human capital. Based on the research of these scholars, population diversity impacts human capital.

Lucas (1988) observed that people migrate from a lack of human capital to places where human capital was plentiful. He further explained that human capital would not migrate if technological advancements were the same worldwide. His view also showed that there might be a direct link between population diversity and human capital, as population diversity was created by the migration of humans, moving to areas that needed their talent (Lucas, 1988). Thus, human capital is improved by population diversity.

Diversity and Knowledge

Knowledge is "the fact or condition of knowing something with a considerable degree of familiarity through experience, association, or contact" (Bhakkad & Patil, 2014, p.58). I refer to knowledge as the intellectual capital used for consumption and production. Knowledge represents a significant component of economic activities. Examples of knowledge may be intangible assets, such as worker's knowledge or intellectual property.

According to Alesina and La Ferrara (2005), a diverse working population carries various skills that positively impact output growth. Lucas (1988) explained that increased knowledge comes from physical interaction among the educated and skilled. Jacobs (1969) explained that dense cities requiring higher physical interaction are ideal for

human capital accumulation. Therefore, I believe that knowledge accrued by diverse populations learning from each other yield spillover benefits within MSAs.

Diversity and Innovation

Innovation encompasses new or improved solutions that meet market needs (Maranville, 1992). I define innovation as a disruptive idea, like a technology, which adds value to an economy.

Economic growth stems from innovation. Economist Joseph Schumpeter stated "creative destruction is the essential fact about capitalism" (Schumpeter, 1943, pp. 81-84). With customer demand changing, entrepreneurs satisfy this demand with new products, creating new technologies and strategies (Heyne et al., 2010). Cohen et al. (2002) and Mansfield (1991) have looked at how companies access knowledge internally and externally to understand how wisdom sustains an organizations' innovation development.

From an innovation perspective, population diversity brings skilled workers who create new businesses (Rodríguez-Pose and Hardy 2015). Additionally, Mohammadi (2017) found that radical innovation stems from education diversity and workforce diversity. Freeman and Huang (2014) prove that ethnically diverse teams outperformed those of the same ethnicity.

Diversity and 'Creative Class'

A social class is a classification based on a set of hierarchical categories. Usually referred to as a socio-economic class, it represents a group of people with the same social, economic, cultural, or education status. The most common versions are the upper,

middle, and lower classes. For example, if one was in the upper level, they have significantly more wealth and education than someone in a lower grade.

To understand how diversity affects economic growth, Florida (2002, 2012) coined a new social class, the “creative class,” and argued that this social class contributes to economic development through innovation. This new class stems from diverse backgrounds that seek tolerant communities to live. These tolerant environments are the key to innovation and economic growth as the creative class feels accepted and welcomed. Within this class are knowledge workers. These individuals are an ascending financial power, as they represent a significant shift away from manufacturing and farming economies.

Florida (2005a) used creative occupations to measure creative capital instead of the typical education–based human capital measures. Diverse creative professions are vital, especially in research and innovation, according to Florida (2002a, 2002b). These individuals could work in science, research, arts, music, law, finance, and other knowledge-based jobs. These individuals, he estimated, account for almost half of all salaries in the U.S., and he labeled them the Creative Class.

While this class has higher formal education, they also included "people in design, education, arts, music, and entertainment, whose economic function is to create new ideas, technology, and creative content" (Florida, 2002b, p. 8). He argued that creativity is essential in the global economy. I argue that creativity is necessary to create innovation. I define innovation in further detail in the next section.

Additionally, Florida found that cities flourished when they retained a diverse population. Florida (2005a) explained there are three factors required to have diverse

cities. He argued that the cities must possess talent, tolerance, and technology. The city needed an educated population, tolerant policies, and innovative infrastructure. Ideally, Florida (2002) argued, the creative class looks for places that value diversity and inclusion where they live. They choose to live in cities with cultural amenities and favorable environments, including diverse populations.

Diversity and Economic Growth

The literature review of population diversity shows that population diversity brings human capital, knowledge, innovation, and creative class. These are essential factors for economic growth according to the endogenous growth theory. Through empirical studies, the endogenous growth theory explains economic growth's inherent traits (Gordon, 2006). It states that human capital, innovation, and knowledge are significant contributors to economic growth (Romer, 1994). Aghion & Howitt (1998) further explain that the theory looks to correlate society's customs and regulations to economic growth. I argue that human capital, innovation, and knowledge are heavily intertwined and dependent on the other.

Human capital has a significant effect on the endogenous economic growth approach. Human capital can create innovation and education is critical to the development of human capital. For example, Baldaccie et al. (2008) found that an increase in literacy and life expectancy increased GDP growth. The research provides global evidence that human capital is essential for economic growth (Acharya & León-González, 2018; Benhabib & Spiegel, 1994; Li, Loyalka, Rozelle & Wu, 2017; Ogundari & Awokuse, 2018; Tyndorf & Glass, 2017).

Investments in education explain the development of human capital (Lin, 2017; Jorgenson & Fraumeni, 1992). Jorgenson and Fraumeni (1992) further explain that U.S. economic growth, post-war, is attributed to the government strategies for education investment and workforce education. They argue this strategy can be used in other countries to produce economic growth. Additionally, I found that countries benefited from investing in the development of their human capital through building knowledge, skills, and abilities amongst workers (Rehman, Tariq & Khan, 2018). As an investment in human capital, education will increase knowledge and be vital for economic development and sustainability (Eigbiremolen & Anaduaka, 2014; Grant, 2017). Knowledge, therefore, contributes to the improvement of human capital, which contributes to economic growth.

Knowledge leads to innovation. The accumulation of knowledge results in companies investing in research and development. The quality of human capital nurtures innovation. Innovation, acclaimed as the engine of growth, is essential to create technology (Malamud & Zucchi, 2018). Enhanced through innovation incentives, the most significant boost to economic growth is the injection of human capital into an economy's innovative sectors (Kirilenko, Neklyudova-Khairullina, Neklyudov & Tucci, 2018). There must be infrastructure to stimulate innovation and prosper from it (Sredojevićet al., 2016). Economists increasingly believed that innovation is responsible for personal income development (Grossman, Helpman 1991, pp. 46-51).

III. RESEARCH MODEL AND HYPOTHESES

I developed the research model positing that population diversity affects economic welfare, household welfare, and unemployment rates in an MSA. These three factors are critical for economic growth based on the Endogenous Growth Theory. I propose the following research model in which population diversity influences three crucial elements to economic growth—economic welfare, household welfare, and unemployment rates in an MSA. Population diversity represents a robust and diverse investment in human capital, per the literature review

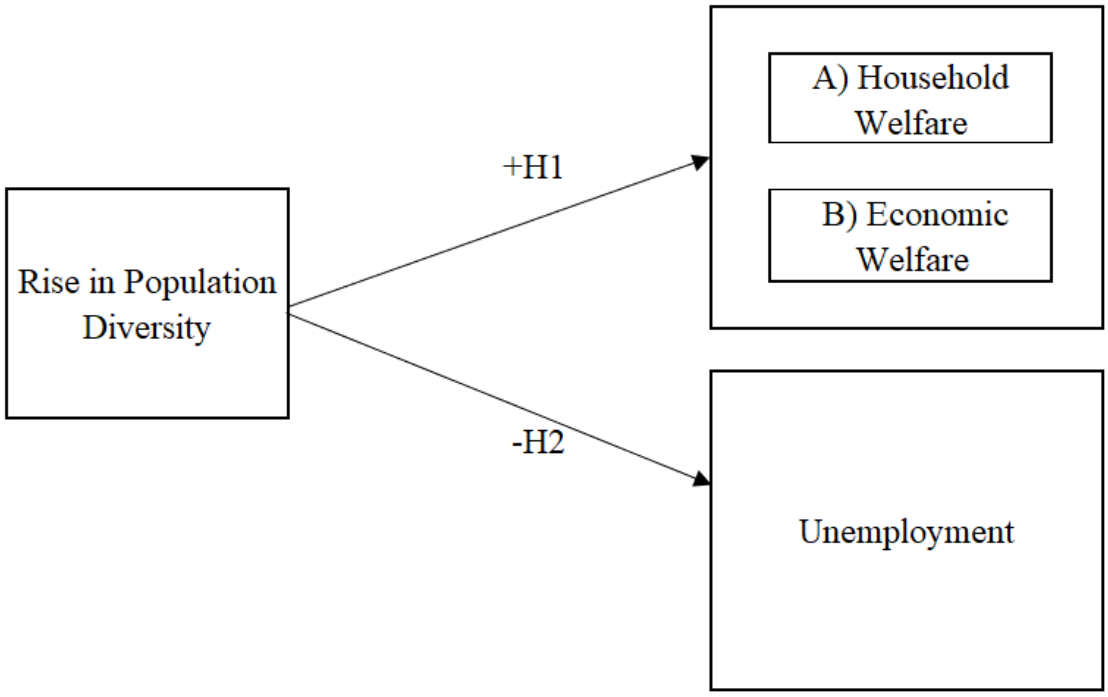


Figure 1. Research Model

Population diversity improved household growth

Ottaviano and Peri (2006) found that population diversity increases wages and rents. There is evidence that in U.S. cities diversity has a positive impact on wages in

high–skilled, complex, problem–solving jobs and no significant impact on wages for low–skilled jobs (Cooke & Kemeny, 2017). Panel data of U.S. states from 1960-2010 shows that highly educated immigrants positively impact economic growth and low–skilled migrants have no effects on such growth (Docquier et al., 2018).

I argue that a diverse population carries different skills and capabilities, and these accumulate as the population concentrates. As the population concentrates, inhabitants can learn from each other and become productive. Lucas (1988) explained that skilled people increase each other's knowledge by interacting in person. Therefore, businesses have a bigger advantage if they are in cities with a higher diversity of human capital. These places, according to Mathur (1999), will grow faster than those with lower levels of human capital.

I argue that population diversity welfare in an MSA can lead to such knowledge transferring and thus improve the household welfare. According to Alesina and La Ferrara (2005), a diverse working population creates various skills that positively impact output growth. Fujita et al. (1999) added to this by concluding that having a variety of goods and services increased its inhabitant's productivity.

The above arguments suggest that population diversity, diverse human capital, innovation, and knowledge, affect household welfare. This view leads to the following hypothesis:

Hypothesis 1a: population diversity has a positive effect on household welfare.

Population diversity improved economic growth

According to the Endogenous Growth Theory, as Romer (1994) explained, investment in human capital, innovation, and knowledge are requirements for financial

growth. Therefore, government policies that embrace openness, competition, change, and innovation promote growth (Fadare, 2010). I argue that government policies improve human capital by welcoming population diversity, which brings innovation and leads to economic growth. Law is crucial to economic growth, as it supports institutions that can develop human capital and regulate infrastructure. (Ramirez, 2006).

The literature review found that population diversity increases productivity output, which increases economic growth. Ager and Bruckner (2013) concluded that a diverse population has various skills that create multiple goods and services. Diversity then sparks a higher output per capita. Additionally, Ottaviano and Peri (2006) concluded that increased cultural fractionalization creates a rise in productivity. Finally, in reviewing the U.S. population, Peri (2012) found that from 1970–2006, immigration resulted in higher productivity in the U.S.

Population diversity also leads to the creation of new businesses among skilled workers (Rodríguez-Pose and Hardy, 2015). Rodriguez-Pose and Hardy (2015) found that the diversity of proficient workers led to intensive start-up businesses as "highly skilled workers, endowed with culture-specific talents and backgrounds, are of special importance for entrepreneurship " (p. 408). Additionally, Mohammadi (2017) found that radical innovation comes from education diversity and workforce diversity. Freeman and Huang (2014) proved that ethnically diverse teams outperformed those of the same ethnicity.

Florida's Creative Class Theory argues that this particular social class contributes to economic growth. Diverse genders, sexual preferences, personal quirks, and races are all part of the creative class. They look for environments where they can thrive, meaning

tolerant and diverse settings, which give them the freedom to create. Once they flourish, they are free to innovate, affecting economic growth. As previously discussed, this class has workers with both formal and informal education. I argue that this creative class creates population diversity. The creative class's nature is diverse and sought more population diversity where they lived as they are from diverse backgrounds and sought tolerant environments. Companies are attracted to these environments due to the creative class' education and innovative workforce (Boarnet, 1994). Therefore, as companies become established in diversified areas, there will be economic growth.

The above arguments suggested that population diversity, diverse human capital, innovation, and knowledge affect economic growth. This view leads to the following hypothesis:

Hypothesis 1b: population diversity has a positive effect on economic welfare.

Population diversity created employment growth

Innovation lowers the unemployment rate. As I have previously discussed, innovation impacts population diversity. Therefore, I argue that population diversity lowers the unemployment rate.

I previously discussed in the literature review the concept of a creative class. This social class contains creative individuals with diverse backgrounds that look for tolerant and diverse environments. Marlet & Woerkens (2007) found that employment growth stems from education and this social class in Dutch cities and towns. Glaeser & Saiz (2003) suggested a correlation between job and population growth.

MSAs have different population diversity levels since they attract different levels of both skilled and unskilled labor. For example, Carlton (1997) showed that skilled labor

created new businesses, and Bates (1990) explained that educated leaders helped businesses survive longer. Additionally, Marlet & Woerkens (2007) found that "creative and highly educated people had higher incomes and participated more in city life, which means that they spend a larger share of their revenues in local bars, restaurants, and theatres, creating amenities and stimulating employment growth in local services and high demands for unskilled labor" (p. 2618). Henderson (1988) showed additional employment opportunities for unskilled labor in towns with high population diversity levels.

Based on these factors, I argue that the concentration of the diverse, educated population creates a more productive prosperous environment. As a result, there is a growth of new businesses, increasing employment opportunities.

These views give rise to the following hypothesis:

Hypothesis 2: population diversity has a negative effect on unemployment.

IV. METHODOLOGY

I conducted a regression analysis using data from the U.S. Census, Bureau of Economic Analysis data, and Bureau of Labor Statistics to test the research model.

When working to understand the analysis level, I tried to find the most meaningful and relevant information to help the government and businesses understand the impact of diversity. Looking at population diversity at a country level was deceiving, as not all parts of the country are diverse. However, looking at population diversity through a city level was confusing, as people usually travel between cities for work. In this study, I choose to focus on MSAs because MSAs are recognized by government offices for planning purposes. For example, Miami–Ft. Lauderdale–Pompano is a specific MSA area, which offers an accurate estimate of the area's diversity as most of its inhabitants travel within these boundaries to conduct business. There are currently 384 MSA in the U.S.

To test the effects between diversity and economic welfare, household welfare, and unemployment rate on MSA, I used data from 2006 to 2018. Before 2006, there was no Hispanic origin data from the U.S. Census. I created the formulas (1)-(3) to explain H1a, H1b, and H2, respectively:

$$\ln(\text{Economic welfare}) = \alpha 1 + \beta 1\ \text{Diversity} + \beta 2\ \text{Diversity*Year} + \beta 3\ X \quad (1)$$

$$\text{Household welfare} = \alpha 2 + \beta 4\ \text{Diversity} + \beta 5\ \text{Diversity*Year} + \beta 6\ X \quad (2)$$

$$\text{Unemployment rate} = \alpha 3 + \beta 7\ \text{Diversity} + \beta 8\ \text{Diversity*Year} + \beta 9\ X \quad (3)$$

In the above formulas, *economic welfare* was the GDP (Gross Domestic Product) growth based on population diversity in any given MSA. For most of the measures, I used secondary data found in the Bureau of Economic Analysis. I used the measure,

labeled “Real GDP” from the Bureau of Economic Analysis to measure *economic welfare*. The log–linear regression model used in *economic welfare* was equivalent to a semi–log elasticity and to avoid losing observations (i.e., log(0) = undefined). *Household welfare* was a dependent variable, measured as income earned per person in an area. I used the measure, labeled “Per capital Personal Income,” from the Bureau of Economic Analysis, for this measure. *Employment growth* was also a dependent variable, measured as the number of available job positions concerning the growth of population diversity in any given MSA. I measured the unemployment rate using the Bureau of Economic Analysis label, “Unemployment Rate.” *Diversity* was measured using the Herfindahl Diversity Index. This index showed the possibility that two randomly selected inhabitants in an MSA are from different population diversities (Churchill, 2019). *Diversity*Year* was the interaction between the *diversity* measurement and years from 2007-2018. α1-3 were the constants of the regressions, and β1-9 were the coefficients of the regressions.

X denotes the control variable, *Education*. I measured the percentage of inhabitants with an education above a bachelor’s degree. As I previously discussed the impact of education on economic growth and employment, I decided to include education as a control variable.

V. DATA COLLECTION

The data was gathered from several U.S. government websites. Because they are government websites, I considered them to be factual and credible. In the paragraphs below there is detailed information about how data was gathered, including the information on the different government agencies. The data gathered was for the years 2006-2018; prior years did not the eight classifications of the population. Appendix 1 has the variable names I used for this paper versus the various government agencies' variable names.

Metropolitan Statistical Area

MSAs, established by The Office of Management and Budget (OMB), are used by government agencies to collect statistical data. The OMB's purpose is to oversee the preparation of the President's policy and budget. (Office of Management and Budget, 2021).

According to OMB Bulletin No. 20-01, there are 384 MSAs in the U.S. The MSA classification provides "nationally consistent delineations for collecting, tabulating, and publishing Federal statistics for a set of geographic areas" (p. 3). As MSAs account for about 86.1% of the population and contain both rural and urban areas, OMB recommends using MSA delineations for the development of and implementation of policies and programs (OMB Bulletin, 2020).

Each MSA has a title name that has principal cities, a code number, and delineations. See Appendix 2 for the name and code of all 384 MSAs. All government agencies follow the MSA's code number—thereby standardizing the data, which are

aligned so that all information is accurate by MSA. All secondary data described below use these Metropolitan codes and names.

Population diversity

I define *population diversity* as a combination of race and ethnicity based on the eight recognized U.S. Census classifications. The U.S. Census website contains databases that collect census information about the population based on city and state. Furthermore, the U.S. Census created *The American Community Survey (ACS)*. The ACS "helps local officials, community leaders, and businesses understand the changes in their communities" and is "the premier source for detailed population and housing information about our nation" (American Community Survey, 2021a).

The ACS is an ongoing survey that provides vital information each year about the nation and its people. The survey's generated data helps to "determine how more than $675 billion in federal and state funds were distributed each year" (American Community Survey, 2021b). I used the report named *DP05 ACS Demographics and Housing Estimates* for this research to categorize the population by demographics by MSA. The report was created in 2005. In 2005, out of the 384 MSAs, 179 (46.6%) did not have any data. As such, I started with the year 2006 thru to 2018. The report used the following eight data measures for races/ethnicities discussed in the introduction. The word "alone" referred to a single race. There were 36 MSAs that had missing data years, all of which are outlined in Appendix 3. Removing these 36 areas, I had 348 MSAs in the final dataset.

Using the Herfindahl–Hirschman Index (HHI) formula, I used these eight races to create a population diversity index. I chose the Herfindahl-type index because there was

an overwhelming amount of researchers who used it to measure fractionalization, diversity, and ethnicity, and prior research has used this measure for diversity (Richard, 2000; Alesina et al., 2003; Alesina & La Ferrara, 2005; Ottaviano & Peri, 2006; Audretsch et al., 2010; Cheng & Li, 2012; Goren, 2014; Rodríguez-Pose & Hardy, 2015; Churchill, 2019).

I measured population diversity using HHI to show the possibility that two randomly selected inhabitants in an MSA were from different population diversities (Churchill, 2019):

$$H = 1 - \sum_{i=1}^{N} S_i^2$$

S_i was the percentage of a race over the total of the MSA population, and *N* was the number of the different races and ethnicities. Index ranges from 0 (homogeneity) to 1 (fully diverse).

As I mentioned prior, the racial classifications follow the U.S. Census, which categorized Americans into eight groups.

Household welfare

I define *household welfare* as the measurement of the income generated in a household concerning the growth of population diversity in any given MSA. I was able to find data for household welfare within the Bureau of Economic Analysis (BEA) website.

The BEA is an agency of the Department of Commerce. BEA produce "economic accounts statistics that enabled government and business decision-makers, researchers, and the American public to follow and understand the performance of the nation's economy" by "collecting source data, conducted research and analysis, developed and

implemented estimation methodologies, and disseminated statistics to the public" (Bureau of Economic Analysis, 2021). The BEA estimates the GDP and individuals' income statistics. For this research, I used the report named *CAINC1 Personal Income Summary: Personal Income, population, Per Capita Personal Income.* This report tracked household welfare using the label 'Per Capita personal income (dollars)' by MSA from 2006-2018. The information had no missing data.

According to the BEA, in 2018, "personal income increased in 3,019 counties, decreased in 91, and was unchanged in three. Personal revenue increased 5.7% in the U.S. metropolitan portion and increased 4.8% in the nonmetropolitan part" (Bureau of Economic Analysis, 2021c). There was no missing data for this measure.

Economic welfare

I define *economic welfare* as the GDP (Gross Domestic Product) measurement concerning the growth of population diversity in any given MSA area. I found data for household welfare within the Bureau of Economic Analysis (BEA) website. Recognized as the Department of Commerce's most outstanding achievement, the GDP was "one of the three most effective steps that affected U.S. financial markets" (Bureau of Economic Analysis, 2021a).

As previously explained, GDP is the value of the goods and services produced in the U.S and is a gauge to measure economic development worldwide.

For this research, I used *CAGDP9 Real GDP by county and MSA.* This report tracked GDP using the label "Real GDP" by MSA from 2006-2018. The information had no missing data.

Unemployment

Unemployment measures the unemployment rate of an MSA by dividing the number of unemployed inhabitants by the employed inhabitants. The Bureau of Labor Statistics for 2006-2018 created the report, *Local Area Unemployment Statistics*. The data in the report provides the unemployment rate by year by MSA. This report gathers monthly estimates of total employment and unemployment by MSA.

Persons were classified as unemployed "if they did not have a job, have actively looked for work in the prior four weeks, and were currently available for work. Persons not working and waiting to be recalled to a previous job were considered unemployed" (Bureau of Labor Statistics, 2020b).

The Bureau of Labor Statistics (BLS) focuses on labor activity from wages to working conditions. They are responsible for gathering state–wide workforce statistics, which are indicators of local economic conditions. They also use "data from several sources, including the CPS, the CES program, State UI systems, and the Census Bureau's American Community Survey (ACS), to create estimates for state–wide employment and unemployment measures" (Bureau of Labor Statistics, 2020c).

There was one MSA that had missing data. The years are outlined in Appendix 3.

Education

Education refers to the percentage of the inhabitants in an MSA with an education above a bachelor's degree. This data was found on the *American Community Survey* website.

Specifically, I used the report named *B15002 Sex by Educational Attainment for the Population 25 Years and Older*. This report divided the total population by education

attained and by gender. Education attainment started from early elementary school to doctorate. I focused the research on higher education from Bachelor's to Doctorate degrees. I added these data measures divided by the total population to create an education attainment percentage.

There were 17 MSAs missing data years in *education.* These are outlined in Appendix 3.

VI. ANALYSIS

The U.S. has defined 384 MSAs. This analysis looked at those MSAs between the years 2006-2018. There were 36 MSAs removed due to missing data, resulting in 348 MSA in the dataset.

Using multiple linear regressions, I tested the research model relationships using formulas (1)-(3). I used education as the control variable. I created interaction terms between population diversity and years. Before running the regression, I first conducted descriptive analyses and then checked regression assumptions such as normality, multicollinearity diagnostics, and independence of error.

Descriptives

Table 1 reported descriptive statistics. Within the MSA, on average, there was a population diversity index of 39.40 (standard deviation 15.61). The least diverse MSA had an index of 6.56, while the most varied MSA had an index of 76.86. The average household income in any MSA was $40.14K (standard deviation 9.41). The lowest household income was $18.73K, while the highest was $122.25K. The economic welfare of an MSA, on average, was $38.14M. The most insufficient economic welfare MSA was $1.6M, while the highest MSA was $1.53T. The MSA's average unemployment rate was 6.42 (standard deviation 2.82), with the lowest rate at 1.70 and the highest rate at 28.90. The MSA, on average, had 26.41% of the population educated above a bachelor's. The lowest educated MSA population had 10.01% of its inhabitant with education above a bachelor's, and the highest had 63.18% of its population educated above a bachelor's.

Table 1: Descriptive Statistics

VARIABLE	MEAN	ST DEV	MIN	MAX	SKEWNESS	KURTOSIS
Population Diversity	39.40	15.61	6.56	76.86	-0.02	-0.98
Household Welfare $K	40.14	9.41	18.73	122.25	2.33	11.62
Economic Welfare $M	38.14	104.92	1.68	1,532.20	7.88	83.27
Unemployment	6.42	2.82	1.70	29.90	1.79	6.80
Education	26.41	8.31	10.01	63.18	0.08	0.77

Regression Diagnostics

I conducted regression diagnostics before I ran the linear regression to test the hypothesis. In detail, I examined normality, independence of error, and multicollinearity.

Normality

I first examined the kurtosis and skewness of the data (see Table 1).

A distribution can be wholly symmetrical but not normal. Therefore, it was also essential to examine the kurtosis, which measures a random variable's probability. As explained by Glass and Stanley (1970), mean and standard deviation were used to compute the kurtosis by converting the measured scores to z-scores.

The value of three is considered a normal distribution of kurtosis. If the value is less than three, it is called platykurtic. Platykurtic produces fewer outliers than a normal distribution, and the central peak is depressed and wider with its trail truncated and narrow. A kurtosis with a value greater than three is called leptokurtic. A kurtosis that is precisely three is called mesokurtic.

Skewness referred to the balance of the distribution, which is determined by "calculating the third-order moment of the score deviations from the mean" (Glass and Stanley,1970, p. 89). If the tail to the right is longer than the left, there is positive

skewness. If the left tail is longer, skewed left means the skewness is negative. Looking at ranges, highly skewed has values less than or greater than one, moderately skewed has values between negative one and negative half (.5) or between positive half (.5) and positive one, and approximately symmetric has values between negative and positive half (.5).

Population diversity has a platykurtic kurtosis (-.98). Additionally, the skewness number of population diversity is negative (-.02) but very close to zero, showing very little skewness. The negative value indicates that only slightly more data points fall at the low end of the distribution than those at the high end. Nevertheless, both skewness and kurtosis values (absolute values) are well below three so the data is not skewed but diametrically distributed. Figure 2a shows the bell–shaped curve that was close to normal distribution.

Household welfare has a leptokurtic kurtosis (11.62). While this number is more significant than 3, it reflects MSA areas' income distributions where income gaps tend to be bigger than rural areas. I further examined the skewness and found the number is positive (2.33), indicating skewed. It is positive because more data points fall at the high end of the distribution. However, Figure 2b shows a bell shape of the distribution, and the skewness value is below 3, indicating a certain level of normal distribution. We, therefore, used the original data for further data analysis.

Economic welfare has high skewness (7.88) and kurtosis (83.27), indicating the data is skewed and has outliers with an immense value. For example, an outlier MSA had made over a trillion U.S. dollars, while the most MSAs were in the million range. Based on this, I used a log transformation to reduce kurtosis and improve skewness. Figures 2e

and 2f show the histograms before and after the log transformation. The histogram in Figure 2f indicates the improvement in a normal distribution.

Unemployment has a leptokurtic kurtosis (1.79). The skewness value of unemployment is positive (6.80), indicating skewed. Considering that MSAs had a wide range of unemployment rates, the histogram in Figure 2c shows a bell shape, and I used the original data for further data analysis.

Education has a platykurtic kurtosis (.82). The skewness and kurtosis are both well below three, so the data was not skewed but diametrically distributed. The histogram in figure 2d shows a bell-shaped curve, indicating normal distribution.

Figure 2a Population Diversity

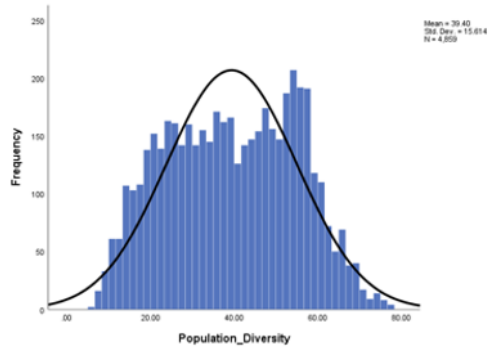


Figure 2b Household Welfare

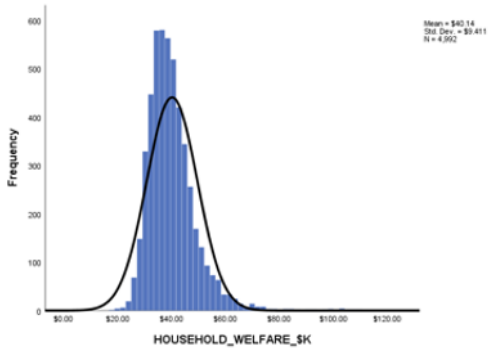


Figure 2c Unemployment

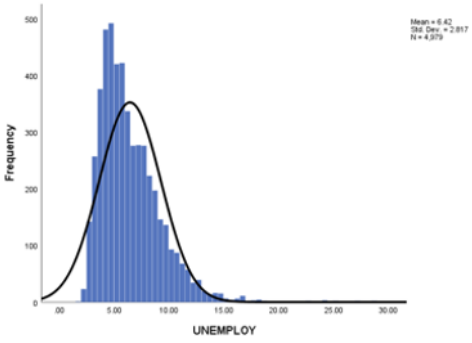
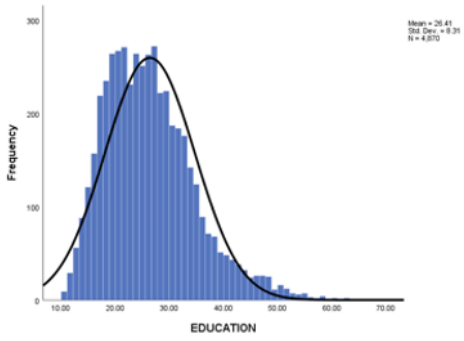


Figure 2d Education



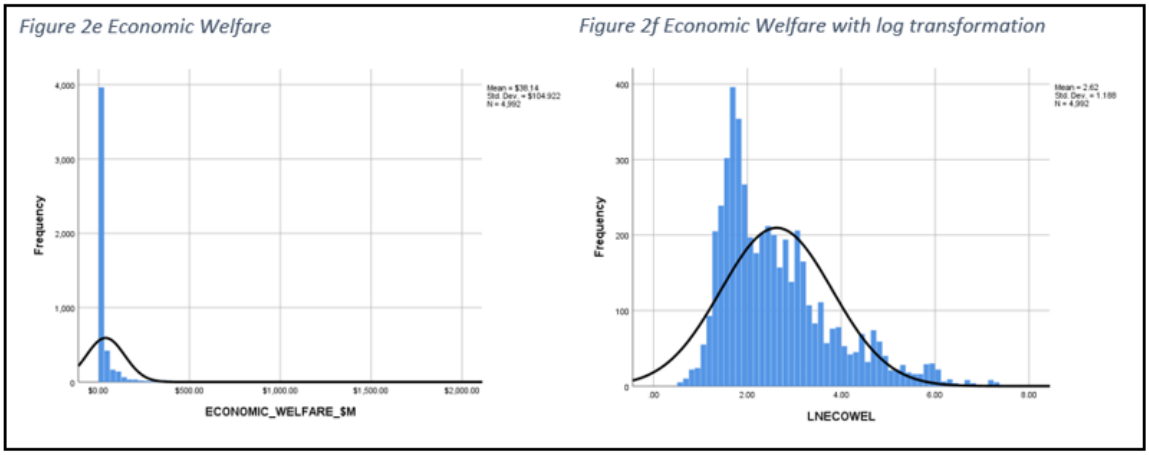


Figure 2. Histograms

I then created QQ plots to check normality further while examining the linearity of the data. Figure 3 below shows the QQ plots by variable. According to Stevens (1996), Q-Q Plot (quantile–versus–quantile) is an accepted form of testing for univariate normality. When the Q-Q Plot resembles a straight line, it shows a normal distribution. The QQ plot confirms the results from skewness and kurtosis. While all variables have tips that fall outside the line, they were mainly within the lines. Economic welfare did not follow the rest, which further proves why log transformation function was necessary. Figure 3f shows the economic welfare with log transformation, which confirms linearity.

Figure 3a Population Diversity

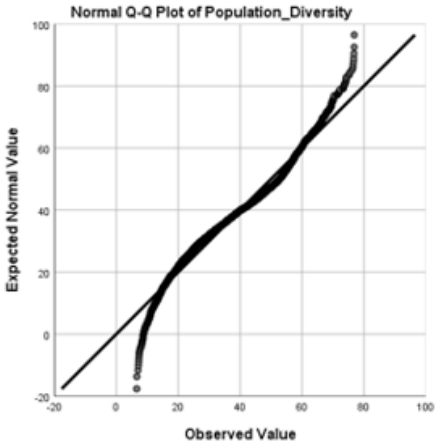


Figure 3b Household Welfare

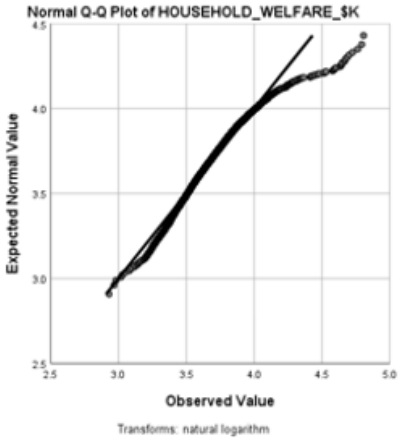


Figure 3c Unemployment

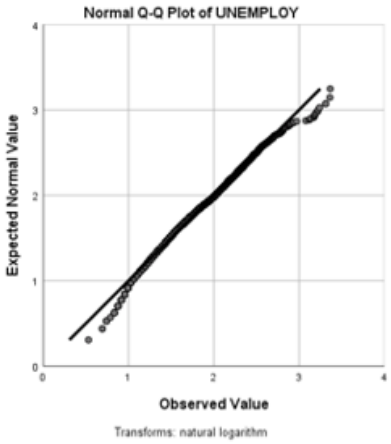
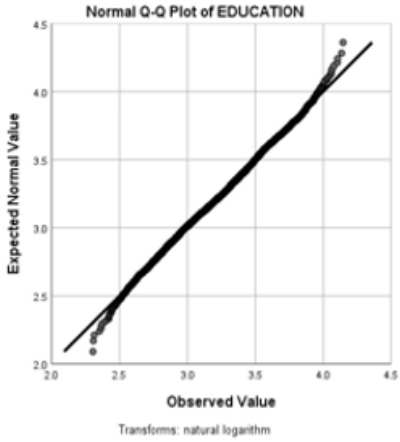


Figure 3d Education



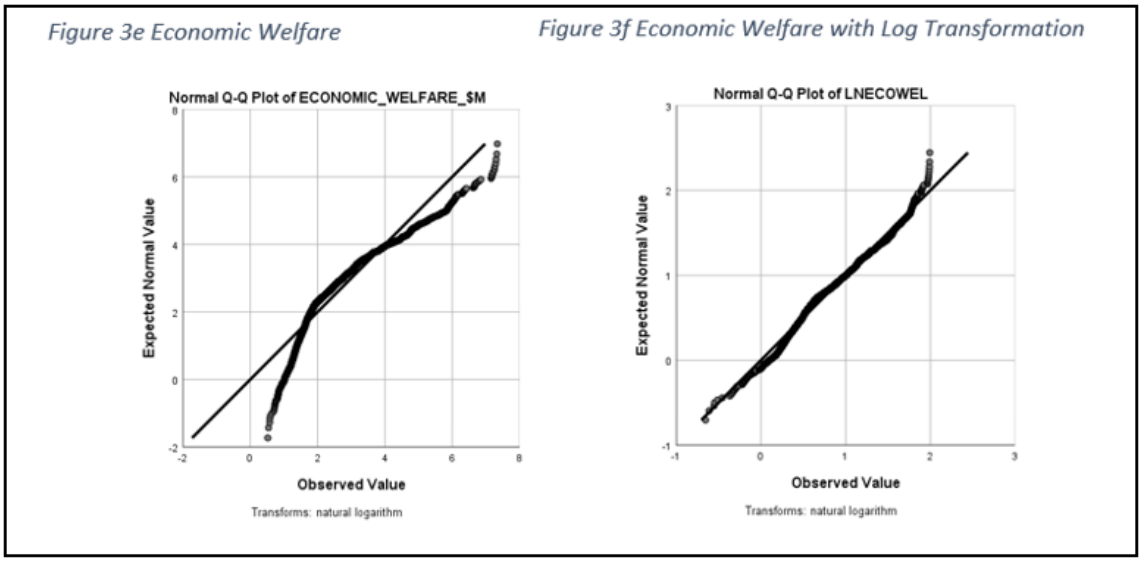


Figure 3. QQ Plots

Independence of Error

I needed to test Independence of Error to see that the distribution of errors was random and not influenced by or correlated to the prior observations' errors.

I created the scatter plots to assess the assumption of independence of error (the standardized residuals against the standardized predicted values). Ideally, I wanted the data points to represent a rectangle and fall in a range between 3 and -3 on the standardized residuals and -3 and 3 on standardized predicted values, as was the case with all household welfare and unemployment (Figures 4a and 4b, respectively). Log transformation was completed for economic welfare so that the variable would be within the range (Figures 4c and 4d).

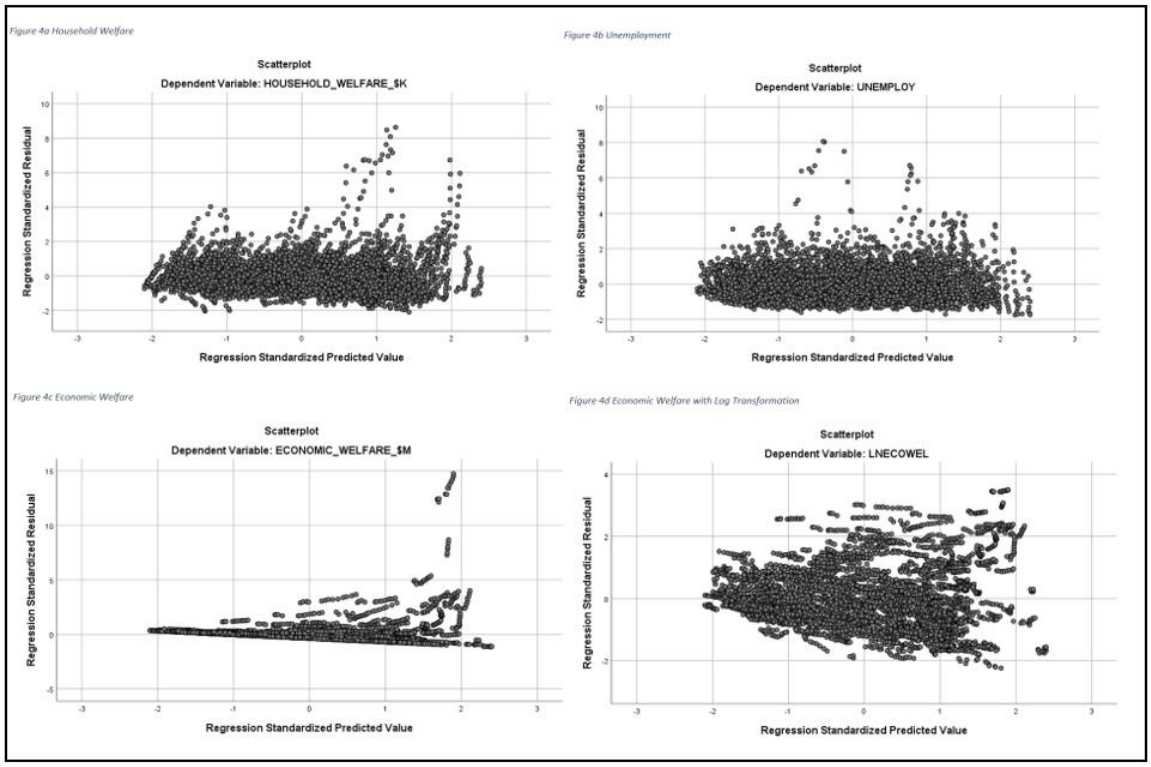


Figure 4. Scatter plots

Multicollinearity

I tested for multicollinearity by running regressions for each dependent variable. Multicollinearity can be detected with tolerance and variance inflation factor (VIF). Table 2 shows that the results were not problematic, as the tolerance results were less than .1 and VIF under the value 10. Significance p values less than .05 are significant. Table 2 (see below) reports the significant p values, which are all less than .05 and are therefore significant. There was no evidence of multicollinearity.

Table 2: Multicollinearity Test for Model Variables

VARIABLE	FIT		COLLINEARITY STATISTICS		
Dependent	Significance P-Value	Results	Tolerance	VIF	Results
Household Welfare	0.043	Significant	0.332	3.013	Not Problematic
Economic Welfare	0.000	Significant	0.332	3.013	Not Problematic
Unemployment	0.000	Significant	0.332	3.013	Not Problematic

Note: Independent Variable Population Diversity

I further examined multicollinearity by creating the correlation matrix of variables (see Table 3).

The correlation was a statistical measure that indicated the extent to which two or more variables move together (Wigmore, 2016). A positive correlation showed "that the variables increased or decreased together. A negative correlation indicated that if one variable increased, the other decreased, and vice versa" (Correa & Goodacre, 2011, p. 2). In general, the correlation coefficient of >0.7 among two or more predictors indicated the presence of multicollinearity.

Population diversity has a significant relationship with household welfare (.216), economic welfare (.319), and unemployment (.120). While the results were positive and significant relationships, as one variable increases, the second variable will also increase in value. The correlation coefficients were less than 0.7, indicating less of a concern for multicollinearity.

Household welfare has a significant relationship with economic welfare (.352) and unemployment (-.304), meaning that economic welfare and household welfare are positively correlated, and that household welfare and unemployment are negatively

correlated. Although significant relationships, the correlation coefficients are less than 0.7, indicating less concern of multicollinearity.

Economic welfare has a significant relationship with unemployment (-.032). The results show that there is an opposite direction between economic welfare and unemployment. Although this is a meaningful relationship, the correlation coefficient is less than 0.7, indicating minimal multicollinearity concern.

Table 3: Correlations

Variable	Population Diversity	Household Welfare	Economic Welfare	Unemployment
Population Diversity	1			
Household Welfare	0.216**	1		
Economic Welfare	0.319**	0.352**	1	
Unemployment	0.120**	-0.304**	-0.032*	1

***Correlation was significant at the 0.01 level (2-tailed)*

** Correlation was significant at the 0.05 level (2-tailed)*

To summarize, the kurtosis and skewness, histograms, and QQ plots all indicate that the data, in general, is normally distributed with linear relationships. The results from the scatter plots also show independence of error. Additionally, the results based on the VIFs, the tolerance values, and the correlation table indicate that multicollinearity is not a concern for this study. In the next section, I report the results of the study.

VII. RESULTS

To examine the hypothesized relationships, I ran multiple regression analyses while controlling for education. I reported the results in Tables 4 and 5. Table 4 shows the model results without the control variable, education. Table 5 shows the control variable model. Both models were significant. Adding education as the control variable does not change the significance of most of the results.

For household welfare, the models with and without the control variable were both significant. The model without control was significant at $p<0.001$ and $F(13,4826)=107.79$. The model with control was significant at $p<0.001$ and $F(14,4839)=300.998$. R^2 changed from 21.7 to 46.6. The R^2 change was 24.9. With both models, the variables of interest remained the same. The full model explained 46.6% of the variance of household welfare.

For economic welfare, the models with and without the control variable were significant. The model without the control was significant at $p<.001$ and $F(13,4826)=42.345$. The model with control was significant at $p<0.001$ and $F(14,4839)=71.035$. R^2 changed from 10.2 to 17.1. The R^2 change was 6.9. With both models, the variables of interest remained the same. The full model explained 17.1% of the variance of economic welfare.

For unemployment, the models with and without the control variable were significant. The model without the control was significant at $p<.001$ and $F(13,4826)=267.61$. The model with control was significant at $p<0.001$ and [$F(14,4839)=390.55$. R^2 changed from 41.9 to 53.0. The R^2 change was 11.2. With both

models, the variables of interest remained the same. The full model explained 53.1% of the variance of unemployment.

Table 4: Model Test Results Without Control

	Dependent Variables					
	Household Welfare		Economic Welfare		Unemployment	
Independent Variable	B	Std. Error	B	Std. Error	B	Std. Error
Population Diversity	-0.27*	0.013	2.121***	0.155	-0.016***	0.003
DIVERSITY * 2007	0.034*	0.016	0.016	0.181	-0.001	-0.004
DIVERSITY * 2008	0.060***	0.016	0.002	0.181	0.026***	0.099
DIVERSITY * 2009	0.034*	0.015	-0.067	0.179	0.102***	0.392
DIVERSITY * 2010	0.059***	0.015	-0.096	0.176	0.111***	0.441
DIVERSITY * 2011	0.100***	0.015	-0.103	0.176	0.097***	0.389
DIVERSITY * 2012	0.131***	0.015	-0.095	0.175	0.077***	0.310
DIVERSITY * 2013	0.138***	0.015	-0.033	0.174	0.061***	0.249
DIVERSITY * 2014	0.179***	0.015	-0.023	0.173	0.035***	0.146
DIVERSITY * 2015	0.210***	0.015	-0.004	0.172	0.018***	0.076
DIVERSITY * 2016	0.223***	0.015	0.006	0.172	0.009**	0.039
DIVERSITY * 2017	0.258***	0.015	0.015	0.171	-0.003	-0.014
DIVERSITY * 2018	0.303***	0.015	0.035	0.170	-0.013***	-0.046
Education						
Observations	4839		4839			
R^2	0.217		0.102		0.419	

** Indicate statistical significance at.05*

*** Indicate statistical significance at .01*

**** Indicate statistical significance at .001*

Table 5: Model Test Results with Control

Independent Variable	Dependent Variables					
	Household Welfare		Economic Welfare		Unemployment	
	B	Std. Error	B	Std. Error	B	Std. Error
Population Diversity	-0.026**	0.011	2.128***	0.149	-0.016***	0.003
DIVERSITY * 2007	0.030*	0.013	-0.006	0.166	0.000	0.004
DIVERSITY * 2008	0.050***	0.013	-0.055	0.174	0.028***	0.004
DIVERSITY * 2009	0.025*	0.013	-0.118	0.172	0.104***	0.004
DIVERSITY * 2010	0.048***	0.013	-0.154	0.170	0.113***	0.004
DIVERSITY * 2011	0.085***	0.012	-0.192	0.169	0.100***	0.003
DIVERSITY * 2012	0.110***	0.012	-0.211	0.168	0.081***	0.003
DIVERSITY * 2013	0.112***	0.012	-0.182	0.167	0.066***	0.003
DIVERSITY * 2014	0.147***	0.012	-0.206	0.166	0.042***	0.003
DIVERSITY * 2015	0.172***	0.012	-0.216	0.166	0.026***	0.003
DIVERSITY * 2016	0.180***	0.012	-0.238	0.166	0.018***	0.003
DIVERSITY * 2017	0.205***	0.012	-0.284	0.165	0.007*	0.003
DIVERSITY * 2018	0.247***	0.012	-0.286	0.165	-0.002	0.003
Education	0.578***	0.012	3.295***	0.165	-0.116***	0.003
Observations	4839		4839		4839	
R^2	0.466		0.171		0.531	
ΔR^2	0.249		0.069		0.112	

** Indicate statistical significance at.05*

*** Indicate statistical significance at .01*

**** Indicate statistical significance at .001*

Population diversity has a negative effect on household welfare

H1a, which posits a positive impact of population diversity on household welfare, is not supported because the unstandardized coefficient for population diversity is -026, t(4825)=-2.346 and p<.01. The result indicates that, while holding education and the interaction between year and population diversity constant, each unit increased in population diversity, leading to a decrease of .026 units ($26) in household welfare, which is negative and significantly different from zero.

The interactions between population diversity and years are all significant ($p<.05$). Year over year, population diversity had a positive effect on the relationship between diversity and household welfare. Such an effect increased, based on the β values of the interaction terms.

For each unit change in education, while keeping population diversity and the interaction between population diversity and year constant, household welfare increased by .578 ($578), and this coefficient is significant with $p<0.001$.

The results found that population diversity harms household welfare, and thus, hypothesis 1a is not supported.

Population diversity has a positive effect on economic welfare

H1b, stating a positive impact of population diversity on economic welfare, is supported because the unstandardized coefficient for population diversity is 2.128, $t(4825)=14.241$, and $p<.01$. The result indicates that, while holding education and the interaction between year and population diversity constant, each unit increased in population diversity, leading to a 2.128% increase in economic welfare, positive and significantly different from zero.

The interactions between population diversity and years were not significant ($p>.05$). There was no differential effect of population diversity on the total economic welfare from 2006 to 2018.

For each unit change in education, while keeping population diversity and the interaction between population diversity and year constant, economic welfare increased by 3.295%, and this coefficient was significant with $p<0.001$.

Based on these results, hypothesis 1b is supported. The results found that population diversity has a positive effect on economic welfare.

Population diversity has a negative effect on unemployment

H2, which posited an adverse impact of population diversity on unemployment, is supported because the unstandardized coefficient for population diversity is -.016, $t(4825)=-5.131$, and $p<.01$. The result indicates that, while holding education and the interaction between year and population diversity constant, each unit increased in population diversity, leading to a decrease of .016 units (.016%) in the unemployment rate, which is negative and significantly different from zero.

The interactions between population diversity and years are not significant ($p>.05$) for 2007. The interactions between population diversity and years are significant ($p<.05$) from 2008-2017. During 2008-2017, population diversity positively affected the relationship between diversity and the unemployment rate.

For each unit change in education, while keeping population diversity and the interaction between population diversity and year constant, unemployment decreased by .116 unit (.116%), and this coefficient was significant with $p<0.001$.

Based on these results, H2 is supported. The results find that Population diversity has a negative effect on unemployment.

Post Hoc Analysis and Results

To examine the impact of diversity on the growth rate of household and economic welfare and understand how diversity changes impact the growth rate, I conducted a post hoc analysis and reported the results in Tables 6 and 7.

Table 6 shows that population diversity had an overall positive impact on the growth rate of household warfare. In 2011, 2014, and 2018, the effect was positive and for the rest of the years, the effect was negative. While the overall effect was significant, it was very marginal (.0027%).

Table 7 indicates that population diversity had an overall positive impact on the growth rate of economic welfare, while half of the years had negative effects: 2010, 2014, 2015, 2017 and 2018. While the overall effect was significant, it was very marginal (.0016%).

Table 6: Model Test Results with Control

	Dependent Variables			
	Household Welfare Growth Rate		Economic Welfare Growth Rate	
Independent Variable	B	Std. Error	B	Std. Error
Population Diversity	0.027***	0.004	0.016**	0.006
DIVERSITY * 2008	-0.025***	0.005	-0.047***	0.007
DIVERSITY * 2009	-0.167***	0.005	-0.102***	0.006
DIVERSITY * 2010	-0.029***	0.005	0.011	0.006
DIVERSITY * 2011	0.013**	0.005	-0.014*	0.006
DIVERSITY * 2012	-0.20***	0.005	-0.019*	0.006
DIVERSITY * 2013	-0.081***	0.005	-0.011	0.006
DIVERSITY * 2014	0.004	0.005	0.005	0.006
DIVERSITY * 2015	-0.018***	0.005	0.011	0.006
DIVERSITY * 2016	-0.063***	0.005	-0.01	0.006
DIVERSITY * 2017	-0.017***	0.005	0.005	0.006
DIVERSITY * 2018	0.004	0.005	0.018**	0.006
Education				
Observations	4476		4476	
R^2	0.365		0.121	

** Indicate statistical significance at .05*
*** Indicate statistical significance at .01*
**** Indicate statistical significance at .001*

Table 7: Model Test Results with Control

Independent Variable	Dependent Variables			
	Household Welfare Growth Rate		Economic Welfare Growth Rate	
	B	Std. Error	B	Std. Error
Population Diversity	0.027***	0.004	0.016**	0.006
DIVERSITY * 2008	-0.025***	0.005	-0.048***	0.007
DIVERSITY * 2009	-0.167***	0.005	-0.103***	0.006
DIVERSITY * 2010	-0.029***	0.005	0.01	0.006
DIVERSITY * 2011	0.013**	0.005	-0.015*	0.006
DIVERSITY * 2012	-0.021***	0.005	-0.02**	0.006
DIVERSITY * 2013	-0.081***	0.005	-0.013*	0.006
DIVERSITY * 2014	0.003	0.005	0.003	0.006
DIVERSITY * 2015	-0.019***	0.005	0.008	0.006
DIVERSITY * 2016	-0.064***	0.005	-0.013*	0.006
DIVERSITY * 2017	-0.019***	0.005	0.001	0.006
DIVERSITY * 2018	0.002	0.005	0.014*	0.006
Education	0.015**	0.005	0.044***	0.006
Observations	4476		4476	
R^2	0.367		0.130	
ΔR^2	0.001		0.009	

* *Indicate statistical significance at .05*

** *Indicate statistical significance at .01*

*** *Indicate statistical significance at .001*

VIII. DISCUSSION

Population diversity has a negative effect on household welfare

I begin the discussion with Hypothesis 1a: population diversity has a positive impact on household welfare. The results found that this claim is not supported. Instead, the results show that as population diversity increased in an MSA, the household welfare decreases, meaning that population diversity caused the average household income to fall. The finding was very alarming, as these results may give anti-diverse groups a reason to limit ethnicity diversification in an MSA.

To explain this phenomenon, I looked to relate the findings in the literature. Churchill (2019) previously studied the impact of ethnic diversity on income and found "trust and social network were associated with higher income while an increase in discrimination lowers income" (p. 31). Discrimination stems from the categorization of ethnic groups. According to Churchill, "ethnic diversity was characterized by an inherently hierarchical system, which projects one ethnic group as superior to the other, and thus places such labels as ethnic minorities and majorities" (p. 23). Becker (1957) also explained that discrimination could lead to business closures. Discrimination and inequality may explain the decrease in household welfare as population diversity rises.

Another explanation for the findings is related to social capital's impact on an individual's move or arrival to a new MSA. Social capital refers to the network of helpful information about market opportunities. Individuals with an extensive network are more likely to find jobs or opportunities and pursue better industries or high–income opportunities (Kranton, 1996; Fafchamps, 1998). Additionally, literature shows the value of social networks for job opportunities (Lin and Dumin 1986; Boxman et al. 1991). A

diverse population tends to consist of many new residents who likely do not have such a network. As a result, individuals tend to take jobs with lower incomes.

A final explanation considers this outcome as one of the consequences of racism. According to the Economic Policy Institute, there is currently a significantly higher wage gap, compared to 40 years ago (1970-2019), between white and black workers. In comparison to a white worker with the same education, age, gender, and geography, the gap in wages is 14.9% (EPI, 2020). This matter was also discussed in a conference held by The National Federal Reserve. The conference addressed racism in the economy and explained "occupational segregation," which is the exclusion of Blacks and Hispanics from professional roles. These races are over-represented in lower-wage occupations such as janitorial services, food preparation, etc. (Federal Reserve of Minneapolis, 2021). These jobs offer limited opportunities and few benefits. The disparity between race and wage seems to be an outcome of racism. It seems that diversity, while welcomed, would invite wage gaps, thereby lowering the household welfare of an MSA.

To recap, similar studies have explained that population diversity drives lower household welfare because of a rise in discrimination. Discrimination may be resolved with adequate education of the community such as showing them the benefits of diversity like lower unemployment rate and higher economic welfare. Based on the findings, I suggest MSAs help ethnical minority groups increase social capital. For instance, cities may hold monthly events or training to improve their social capital and expand their network. Businesses may also join the force by providing employees, especially potential hires, with social network support to develop their new networks.

Population diversity has a positive effect on economic welfare

I found that the results supported the Hypothesis 1B: population diversity positively impacts economic welfare. The findings were in line with the argument that population diversity brought in human capital, innovation, and knowledge, and created a creative class. According to the endogenous growth theory, these factors were substantial contributors to economic growth (Romer, 1994). Additionally, the results confirm the findings from the literature review. For example, research from the World Bank points out that education is an investment for economic growth (Patrinos, 2016). Depending on the government's economic policy and agents, technology knowledge varies (Beg et al., 2010). The results also confirm the endogenous growth models that "justify an active policy of the state in promoting growth through direct and indirect investment in the improvement of human capital and the support of foreign investors to invest in the development of the information and communication sector and the software industry" (Todaro, Smith, 2011, p. 134).

Based on the findings, MSAs can benefit from diverse populations to grow their economy. This research suggests if MSAs spend their efforts in welcoming diversity, such as creating minority institutions and building community partnerships, they may be able to increase GDP. To attract diverse population, MSAs may offer tax incentives for minority business owners or start-up incentives for minority entrepreneurs. Lastly, MSAs can work with their local colleges to target the outside population by providing grants to attract a young, diverse population which may have a higher chance of living in the area after graduation. These efforts may create a more tolerant environment that welcomes population diversity.

Population diversity has a negative effect on unemployment

The results support Hypothesis 2: population diversity has a negative impact on unemployment. This finding was supported by previous literature from Marlet and van Woerkens, (2007), which investigated employment generation from diversity, the importance of adequate human capital in a diversified environment (Glaeser and Mare, 2001; Glaeser and Saiz, 2003;Simon, 1998), and the relationships between population diversity, skilled workers, and creation of new businesses (Rodríguez-Pose and Hardy 2015).

Understanding that population diversity improves economic growth and lowers the unemployment rate has significant implications in society. Country officials should recognize the importance of diversity in society and government jobs, as diversity needs to be popularized as a positive action to improve the overall economic growth in an area. The endogenous growth theory suggests that innovation is a key contributor to economic growth and job creation. The findings imply that diverse populations create knowledge transferring and innovation, leading to economic growth and a low unemployment rate.

Social interaction between diverse populations is key for creating job opportunities. Since there may be awkwardness to opening communication between strangers, MSAs may address such challenges by promoting community events. These events not only bring the community together, but also can educate the community and build tolerance. These events also provide ways for new members of society to interact and meet with locals and share ideas. Community events can be festivals or education–based seminars and may encourage interested parties to come together, share their thoughts, and create opportunities.

The post hoc analysis shows that while the population diversity has a positive effect on the growth rate of household welfare and economic welfare, the magnitude is very small. While it has an overall positive effect, the effects varied across household welfare and economic welfare over many years. I argue that additional years of data are necessary to understand the growth rate relevance.

IX. CONTRIBUTION

This study contributes to the Endogenous Growth theory by reviewing the relationship between population diversity and factors such as human capital, knowledge, and innovation, which are key factors to economic growth. This paper provides an analysis of the direct impacts of population diversity on household and economic growth, along with the unemployment rate.

This study contributes to the literature on population diversity and its impact on economic growth. Previous research mainly focused on how business performance may be improved by population diversity. I argue that population diversity leads to overall economic prosperity for MSAs. This paper also adds to the research by demonstrating that population diversity lowers unemployment.

Government leaders should promote lower unemployment rates by attracting a diverse workforce that could bring new opportunities or availabilities. Suppose government leaders offer education programs to educate the community on the benefits of population diversity, such as increase economic welfare and lower unemployment. In that case, discrimination and ignorance would decrease, maximizing the positive effects of population diversity. This research could be academic evidence for governments to promote population diversity. Governments may also provide tax incentives for businesses that put effort into creating a diverse workforce. The goal is to contribute to the ongoing dialogue of population diversity by promotion the positive effects to the society.

X. LIMITATIONS & FURTHER RESEARCH

The study does have limitations. For instance, this study only examines 12 years of data. Future research could expand the timeline by looking for additional data year sources and seeking a further understanding of population diversity's effect on the economy. Also, due to limitations in the data, this study is limited in that it only provides a correlation instead of causation between population diversity and the variables of interest. Future research may further explore such causation, for example, in some areas with ongoing prosperity or a big increase in prosperity (e.g., areas of oil extraction or a new business headquarters). These areas attract migration and thus change population diversity. In this scenario, I would compare the data before and after the prosperity to find causation between diversity and economic growth.

A surprising finding—population diversity negatively affects household welfare—indicates a future research direction in which the social impact of population diversity, such as discrimination and its effect on income, can be explored. Perhaps a discrimination index to enhance the diversity index can provide a more in-depth understanding of the relationships among population diversity, discrimination, and household welfare. Additionally, there were no surveys that studied diversity, racism and social capital levels by MSA. A future study focusing on all these three factors might better understand population diversity's impacts on the economy.

The 2020 pandemic has become a game changer for the workplace environment, which has affected unemployment, household, and economic welfare. Most importantly, the pandemic has changed the definition of population diversity in a geographic area (e.g., MSA), as millions work remotely. It is unknown whether the shift to remote work

changes population diversity in MSAs. As a talent pool in each geographic area, population diversity may become irrelevant as remote work starts to rise, creating global talent availability.

Nevertheless, McKinsey Global Institute (2020) found the potential for remote work is "concentrated among highly-skilled, educated workers in specific industries, occupations, and geographies" and "more than 20% of the workforce could work remotely three to five days a week as effectively as possible if working from an office" (p.1). Based on this, permanent remote work could increase, creating a profound impact on population diversity in an MSA and its overall economy if skilled workforces leave MSAs and move to areas with better life quality. This would be an exciting topic for future research to examine how remote work impacts population diversity and economy in MSAs. Another interesting future research discussion would be to examine the effects of knowledge transfer in remote environments instead of the traditional face–to–face interactions in diversified populations.

XI. CONCLUSION

This paper examines the effects of population diversity on household welfare, economic welfare, and unemployment. Based on the US Census's secondary data, I constructed a population diversity index measured using the Herfindahl index. I found that population diversity harmed household welfare and had a positive effect on economic welfare, meaning that as the MSA population diversified over time, the MSA's economic welfare grows, but household income decreases. Lastly, I found that population diversity has a negative effect on unemployment, meaning that as an MSA population becomes more diverse over time, the unemployment rate decreased.

The results showcase the immediate necessity for policies that can reduce prejudice for population diversity. In diversified populations, policymakers can focus on policies that build human and social capital, as they were the key to economic growth. Examining population diversity and economic development in MSAs in the U.S., this paper should serve as evidence that the overall economy can benefit from population diversity. Businesses should aim to look for areas that are diversified when looking for their business expansion or headquarters.

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APPENDIX 1. Data names versus Government Agency Data Names

NAME FOR DISSERTATION	GOVERNMENT DATA NAME
DIVERSITY	Population Diversity Index
HOUSEHOLD WELFARE	GNI Per capita personal income (dollars)
ECONOMIC WELFARE	GDP Real GDP: All industry total
UNEMPLOY	Unemployment Rate
EDUCATION	Percent of the population with bachelor's degree or higher

APPENDIX 2. List of Metropolitan Statistical Area Names & Codes

Code	Metropolitan Statistical Area Title
10180	Abilene, TX Metropolitan Statistical Area
10420	Akron, OH Metropolitan Statistical Area
10500	Albany, GA Metropolitan Statistical Area
10540	Albany-Lebanon, OR Metropolitan Statistical Area
10580	Albany-Schenectady-Troy, NY Metropolitan Statistical Area
10740	Albuquerque, NM Metropolitan Statistical Area
10780	Alexandria, LA Metropolitan Statistical Area
10900	Allentown-Bethlehem-Easton, PA-NJ Metropolitan Statistical Area
11020	Altoona, PA Metropolitan Statistical Area
11100	Amarillo, TX Metropolitan Statistical Area
11180	Ames, IA Metropolitan Statistical Area
11260	Anchorage, AK Metropolitan Statistical Area
11460	Ann Arbor, MI Metropolitan Statistical Area
11500	Anniston-Oxford, AL Metropolitan Statistical Area
11540	Appleton, WI Metropolitan Statistical Area 11580
11700	Asheville, NC Metropolitan Statistical Area
12020	Athens-Clarke County, GA Metropolitan Statistical Area
12060	Atlanta-Sandy Springs-Alpharetta, GA Metropolitan Statistical Area
12100	Atlantic City-Hammonton, NJ Metropolitan Statistical Area
12220	Auburn-Opelika, AL Metropolitan Statistical Area
12260	Augusta-Richmond County, GA-SC Metropolitan Statistical Area
12420	Austin-Round Rock-Georgetown, TX Metropolitan Statistical Area
12540	Bakersfield, CA Metropolitan Statistical Area
12580	Baltimore-Columbia-Towson, MD Metropolitan Statistical Area
12620	Bangor, ME Metropolitan Statistical Area
12700	Barnstable Town, MA Metropolitan Statistical Area
12940	Baton Rouge, LA Metropolitan Statistical Area
12980	Battle Creek, MI Metropolitan Statistical Area
13020	Bay City, MI Metropolitan Statistical Area
13140	Beaumont-Port Arthur, TX Metropolitan Statistical Area
13220	Beckley, WV Metropolitan Statistical Area
13380	Bellingham, WA Metropolitan Statistical Area
13460	Bend, OR Metropolitan Statistical Area
13740	Billings, MT Metropolitan Statistical Area
13780	Binghamton, NY Metropolitan Statistical Area
13820	Birmingham-Hoover, AL Metropolitan Statistical Area
13900	Bismarck, ND Metropolitan Statistical Area
13980	Blacksburg-Christiansburg, VA Metropolitan Statistical Area
14010	Bloomington, IL Metropolitan Statistical Area

14020	Bloomington, IN Metropolitan Statistical Area
14100	Bloomsburg-Berwick, PA Metropolitan Statistical Area
14260	Boise City, ID Metropolitan Statistical Area
14460	Boston-Cambridge-Newton, MA-NH Metropolitan Statistical Area
14500	Boulder, CO Metropolitan Statistical Area
14540	Bowling Green, KY Metropolitan Statistical Area
14740	Bremerton-Silverdale-Port Orchard, WA Metropolitan Statistical Area
14860	Bridgeport-Stamford-Norwalk, CT Metropolitan Statistical Area
15180	Brownsville-Harlingen, TX Metropolitan Statistical Area
15260	Brunswick, GA Metropolitan Statistical Area
15380	Buffalo-Cheektowaga, NY Metropolitan Statistical Area
15500	Burlington, NC Metropolitan Statistical Area
15540	Burlington-South Burlington, VT Metropolitan Statistical Area
15680	California-Lexington Park, MD Metropolitan Statistical Area
15940	Canton-Massillon, OH Metropolitan Statistical Area
15980	Cape Coral-Fort Myers, FL Metropolitan Statistical Area
16020	Cape Girardeau, MO-IL Metropolitan Statistical Area
16060	Carbondale-Marion, IL Metropolitan Statistical Area
16180	Carson City, NV Metropolitan Statistical Area
16220	Casper, WY Metropolitan Statistical Area
16300	Cedar Rapids, IA Metropolitan Statistical Area
16540	Chambersburg-Waynesboro, PA Metropolitan Statistical Area
16580	Champaign-Urbana, IL Metropolitan Statistical Area
16620	Charleston, WV Metropolitan Statistical Area
16700	Charleston-North Charleston, SC Metropolitan Statistical Area
16740	Charlotte-Concord-Gastonia, NC-SC Metropolitan Statistical Area
16820	Charlottesville, VA Metropolitan Statistical Area
16860	Chattanooga, TN-GA Metropolitan Statistical Area
16940	Cheyenne, WY Metropolitan Statistical Area
16980	Chicago-Naperville-Elgin, IL-IN-WI Metropolitan Statistical Area
17020	Chico, CA Metropolitan Statistical Area
17140	Cincinnati, OH-KY-IN Metropolitan Statistical Area
17300	Clarksville, TN-KY Metropolitan Statistical Area
17420	Cleveland, TN Metropolitan Statistical Area
17460	Cleveland-Elyria, OH Metropolitan Statistical Area
17660	Coeur d'Alene, ID Metropolitan Statistical Area
17780	College Station-Bryan, TX Metropolitan Statistical Area
17820	Colorado Springs, CO Metropolitan Statistical Area
17860	Columbia, MO Metropolitan Statistical Area
17900	Columbia, SC Metropolitan Statistical Area
17980	Columbus, GA-AL Metropolitan Statistical Area
18020	Columbus, IN Metropolitan Statistical Area

18140	Columbus, OH Metropolitan Statistical Area
18580	Corpus Christi, TX Metropolitan Statistical Area
18700	Corvallis, OR Metropolitan Statistical Area
18880	Crestview-Fort Walton Beach-Destin, FL Metropolitan Statistical Area
19060	Cumberland, MD-WV Metropolitan Statistical Area
19100	Dallas-Fort Worth-Arlington, TX Metropolitan Statistical Area
19140	Dalton, GA Metropolitan Statistical Area
19180	Danville, IL Metropolitan Statistical Area
19300	Daphne-Fairhope-Foley, AL Metropolitan Statistical Area
19340	Davenport-Moline-Rock Island, IA-IL Metropolitan Statistical Area
19430	Dayton-Kettering, OH Metropolitan Statistical Area
19460	Decatur, AL Metropolitan Statistical Area
19500	Decatur, IL Metropolitan Statistical Area
19660	Deltona-Daytona Beach-Ormond Beach, FL Metropolitan Statistical Area
19740	Denver-Aurora-Lakewood, CO Metropolitan Statistical Area
19780	Des Moines-West Des Moines, IA Metropolitan Statistical Area
19820	Detroit-Warren-Dearborn, MI Metropolitan Statistical Area
20020	Dothan, AL Metropolitan Statistical Area
20100	Dover, DE Metropolitan Statistical Area
20220	Dubuque, IA Metropolitan Statistical Area
20260	Duluth, MN-WI Metropolitan Statistical Area
20500	Durham-Chapel Hill, NC Metropolitan Statistical Area
20700	East Stroudsburg, PA Metropolitan Statistical Area
20740	Eau Claire, WI Metropolitan Statistical Area
20940	El Centro, CA Metropolitan Statistical Area
21060	Elizabethtown-Fort Knox, KY Metropolitan Statistical Area
21140	Elkhart-Goshen, IN Metropolitan Statistical Area
21300	Elmira, NY Metropolitan Statistical Area
21340	El Paso, TX Metropolitan Statistical Area
21420	Enid, OK Metropolitan Statistical Area
21500	Erie, PA Metropolitan Statistical Area
21660	Eugene-Springfield, OR Metropolitan Statistical Area
21780	Evansville, IN-KY Metropolitan Statistical Area
21820	Fairbanks, AK Metropolitan Statistical Area
22020	Fargo, ND-MN Metropolitan Statistical Area
22140	Farmington, NM Metropolitan Statistical Area
22180	Fayetteville, NC Metropolitan Statistical Area
22220	Fayetteville-Springdale-Rogers, AR Metropolitan Statistical Area
22380	Flagstaff, AZ Metropolitan Statistical Area
22420	Flint, MI Metropolitan Statistical Area
22500	Florence, SC Metropolitan Statistical Area

22520	Florence-Muscle Shoals, AL Metropolitan Statistical Area
22540	Fond du Lac, WI Metropolitan Statistical Area
22660	Fort Collins, CO Metropolitan Statistical Area
22900	Fort Smith, AR-OK Metropolitan Statistical Area
23060	Fort Wayne, IN Metropolitan Statistical Area
23420	Fresno, CA Metropolitan Statistical Area
23460	Gadsden, AL Metropolitan Statistical Area
23540	Gainesville, FL Metropolitan Statistical Area
23580	Gainesville, GA Metropolitan Statistical Area
23900	Gettysburg, PA Metropolitan Statistical Area
24020	Glens Falls, NY Metropolitan Statistical Area
24140	Goldsboro, NC Metropolitan Statistical Area
24220	Grand Forks, ND-MN Metropolitan Statistical Area
24260	Grand Island, NE Metropolitan Statistical Area
24300	Grand Junction, CO Metropolitan Statistical Area
24340	Grand Rapids-Kentwood, MI Metropolitan Statistical Area
24420	Grants Pass, OR Metropolitan Statistical Area
24500	Great Falls, MT Metropolitan Statistical Area
24540	Greeley, CO Metropolitan Statistical Area
24580	Green Bay, WI Metropolitan Statistical Area
24660	Greensboro-High Point, NC Metropolitan Statistical Area
24780	Greenville, NC Metropolitan Statistical Area
24860	Greenville-Anderson, SC Metropolitan Statistical Area
25060	Gulfport-Biloxi, MS Metropolitan Statistical Area
25180	Hagerstown-Martinsburg, MD-WV Metropolitan Statistical Area
25220	Hammond, LA Metropolitan Statistical Area
25260	Hanford-Corcoran, CA Metropolitan Statistical Area
25420	Harrisburg-Carlisle, PA Metropolitan Statistical Area
25500	Harrisonburg, VA Metropolitan Statistical Area
25540	Hartford-East Hartford-Middletown, CT Metropolitan Statistical Area
25620	Hattiesburg, MS Metropolitan Statistical Area
25860	Hickory-Lenoir-Morganton, NC Metropolitan Statistical Area
25940	Hilton Head Island-Bluffton, SC Metropolitan Statistical Area
25980	Hinesville, GA Metropolitan Statistical Area
26140	Homosassa Springs, FL Metropolitan Statistical Area
26300	Hot Springs, AR Metropolitan Statistical Area
26380	Houma-Thibodaux, LA Metropolitan Statistical Area
26420	Houston-The Woodlands-Sugar Land, TX Metropolitan Statistical Area
26580	Huntington-Ashland, WV-KY-OH Metropolitan Statistical Area
26620	Huntsville, AL Metropolitan Statistical Area
26820	Idaho Falls, ID Metropolitan Statistical Area
26900	Indianapolis-Carmel-Anderson, IN Metropolitan Statistical Area

26980	Iowa City, IA Metropolitan Statistical Area
27060	Ithaca, NY Metropolitan Statistical Area
27100	Jackson, MI Metropolitan Statistical Area
27140	Jackson, MS Metropolitan Statistical Area
27180	Jackson, TN Metropolitan Statistical Area
27260	Jacksonville, FL Metropolitan Statistical Area
27340	Jacksonville, NC Metropolitan Statistical Area
27500	Janesville-Beloit, WI Metropolitan Statistical Area
27620	Jefferson City, MO Metropolitan Statistical Area
27740	Johnson City, TN Metropolitan Statistical Area
27780	Johnstown, PA Metropolitan Statistical Area
27860	Jonesboro, AR Metropolitan Statistical Area
27900	Joplin, MO Metropolitan Statistical Area
27980	Kahului-Wailuku-Lahaina, HI Metropolitan Statistical Area
28020	Kalamazoo-Portage, MI Metropolitan Statistical Area
28100	Kankakee, IL Metropolitan Statistical Area
28140	Kansas City, MO-KS Metropolitan Statistical Area
28420	Kennewick-Richland, WA Metropolitan Statistical Area
28660	Killeen-Temple, TX Metropolitan Statistical Area
28700	Kingsport-Bristol, TN-VA Metropolitan Statistical Area
28740	Kingston, NY Metropolitan Statistical Area
28940	Knoxville, TN Metropolitan Statistical Area
29020	Kokomo, IN Metropolitan Statistical Area
29100	La Crosse-Onalaska, WI-MN Metropolitan Statistical Area
29180	Lafayette, LA Metropolitan Statistical Area
29200	Lafayette-West Lafayette, IN Metropolitan Statistical Area
29340	Lake Charles, LA Metropolitan Statistical Area
29420	Lake Havasu City-Kingman, AZ Metropolitan Statistical Area
29460	Lakeland-Winter Haven, FL Metropolitan Statistical Area
29540	Lancaster, PA Metropolitan Statistical Area
29620	Lansing-East Lansing, MI Metropolitan Statistical Area
29700	Laredo, TX Metropolitan Statistical Area
29740	Las Cruces, NM Metropolitan Statistical Area
29820	Las Vegas-Henderson-Paradise, NV Metropolitan Statistical Area
29940	Lawrence, KS Metropolitan Statistical Area
30020	Lawton, OK Metropolitan Statistical Area
30140	Lebanon, PA Metropolitan Statistical Area
30300	Lewiston, ID-WA Metropolitan Statistical Area
30340	Lewiston-Auburn, ME Metropolitan Statistical Area
30460	Lexington-Fayette, KY Metropolitan Statistical Area
30620	Lima, OH Metropolitan Statistical Area
30700	Lincoln, NE Metropolitan Statistical Area

30780	Little Rock-North Little Rock-Conway, AR Metropolitan Statistical Area
30860	Logan, UT-ID Metropolitan Statistical Area
30980	Longview, TX Metropolitan Statistical Area
31020	Longview, WA Metropolitan Statistical Area
31080	Los Angeles-Long Beach-Anaheim, CA Metropolitan Statistical Area
31140	Louisville/Jefferson County, KY-IN Metropolitan Statistical Area
31180	Lubbock, TX Metropolitan Statistical Area
31340	Lynchburg, VA Metropolitan Statistical Area
31420	Macon-Bibb County, GA Metropolitan Statistical Area
31460	Madera, CA Metropolitan Statistical Area
31540	Madison, WI Metropolitan Statistical Area
31700	Manchester-Nashua, NH Metropolitan Statistical Area
31740	Manhattan, KS Metropolitan Statistical Area
31860	Mankato, MN Metropolitan Statistical Area
31900	Mansfield, OH Metropolitan Statistical Area
32580	McAllen-Edinburg-Mission, TX Metropolitan Statistical Area
32780	Medford, OR Metropolitan Statistical Area
32820	Memphis, TN-MS-AR Metropolitan Statistical Area
32900	Merced, CA Metropolitan Statistical Area
33100	Miami-Fort Lauderdale-Pompano Beach, FL Metropolitan Statistical Area
33140	Michigan City-La Porte, IN Metropolitan Statistical Area
33220	Midland, MI Metropolitan Statistical Area
33260	Midland, TX Metropolitan Statistical Area
33340	Milwaukee-Waukesha, WI Metropolitan Statistical Area
33460	Minneapolis-St. Paul-Bloomington, MN-WI Metropolitan Statistical Area
33540	Missoula, MT Metropolitan Statistical Area
33660	Mobile, AL Metropolitan Statistical Area
33700	Modesto, CA Metropolitan Statistical Area
33740	Monroe, LA Metropolitan Statistical Area
33780	Monroe, MI Metropolitan Statistical Area
33860	Montgomery, AL Metropolitan Statistical Area
34060	Morgantown, WV Metropolitan Statistical Area
34100	Morristown, TN Metropolitan Statistical Area
34580	Mount Vernon-Anacortes, WA Metropolitan Statistical Area
34620	Muncie, IN Metropolitan Statistical Area
34740	Muskegon, MI Metropolitan Statistical Area
34820	Myrtle Beach-Conway-North Myrtle Beach, SC-NC Metropolitan Statistical Area
34900	Napa, CA Metropolitan Statistical Area

34940	Naples-Marco Island, FL Metropolitan Statistical Area
34980	Nashville-Davidson--Murfreesboro--Franklin, TN Metropolitan Statistical Area
35100	New Bern, NC Metropolitan Statistical Area
35300	New Haven-Milford, CT Metropolitan Statistical Area
35380	New Orleans-Metairie, LA Metropolitan Statistical Area
35620	New York-Newark-Jersey City, NY-NJ-PA Metropolitan Statistical Area
35660	Niles, MI Metropolitan Statistical Area
35840	North Port-Sarasota-Bradenton, FL Metropolitan Statistical Area
35980	Norwich-New London, CT Metropolitan Statistical Area
36100	Ocala, FL Metropolitan Statistical Area
36140	Ocean City, NJ Metropolitan Statistical Area
36220	Odessa, TX Metropolitan Statistical Area
36260	Ogden-Clearfield, UT Metropolitan Statistical Area
36420	Oklahoma City, OK Metropolitan Statistical Area
36500	Olympia-Lacey-Tumwater, WA Metropolitan Statistical Area
36540	Omaha-Council Bluffs, NE-IA Metropolitan Statistical Area
36740	Orlando-Kissimmee-Sanford, FL Metropolitan Statistical Area
36780	Oshkosh-Neenah, WI Metropolitan Statistical Area
36980	Owensboro, KY Metropolitan Statistical Area
37100	Oxnard-Thousand Oaks-Ventura, CA Metropolitan Statistical Area
37340	Palm Bay-Melbourne-Titusville, FL Metropolitan Statistical Area
37460	Panama City, FL Metropolitan Statistical Area
37620	Parkersburg-Vienna, WV Metropolitan Statistical Area
37860	Pensacola-Ferry Pass-Brent, FL Metropolitan Statistical Area
37900	Peoria, IL Metropolitan Statistical Area
37980	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area
38060	Phoenix-Mesa-Chandler, AZ Metropolitan Statistical Area
38220	Pine Bluff, AR Metropolitan Statistical Area
38300	Pittsburgh, PA Metropolitan Statistical Area
38340	Pittsfield, MA Metropolitan Statistical Area
38540	Pocatello, ID Metropolitan Statistical Area
38860	Portland-South Portland, ME Metropolitan Statistical Area
38900	Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area
38940	Port St. Lucie, FL Metropolitan Statistical Area
39100	Poughkeepsie-Newburgh-Middletown, NY Metropolitan Statistical Area
39150	Prescott Valley-Prescott, AZ Metropolitan Statistical Area
39300	Providence-Warwick, RI-MA Metropolitan Statistical Area
39340	Provo-Orem, UT Metropolitan Statistical Area

39380	Pueblo, CO Metropolitan Statistical Area
39460	Punta Gorda, FL Metropolitan Statistical Area
39540	Racine, WI Metropolitan Statistical Area
39580	Raleigh-Cary, NC Metropolitan Statistical Area
39660	Rapid City, SD Metropolitan Statistical Area
39740	Reading, PA Metropolitan Statistical Area
39820	Redding, CA Metropolitan Statistical Area
39900	Reno, NV Metropolitan Statistical Area
40060	Richmond, VA Metropolitan Statistical Area
40140	Riverside-San Bernardino-Ontario, CA Metropolitan Statistical Area
40220	Roanoke, VA Metropolitan Statistical Area
40340	Rochester, MN Metropolitan Statistical Area
40380	Rochester, NY Metropolitan Statistical Area
40420	Rockford, IL Metropolitan Statistical Area
40580	Rocky Mount, NC Metropolitan Statistical Area
40660	Rome, GA Metropolitan Statistical Area
40900	Sacramento-Roseville-Folsom, CA Metropolitan Statistical Area
40980	Saginaw, MI Metropolitan Statistical Area
41060	St. Cloud, MN Metropolitan Statistical Area
41100	St. George, UT Metropolitan Statistical Area
41140	St. Joseph, MO-KS Metropolitan Statistical Area
41180	St. Louis, MO-IL Metropolitan Statistical Area
41420	Salem, OR Metropolitan Statistical Area
41500	Salinas, CA Metropolitan Statistical Area
41540	Salisbury, MD-DE Metropolitan Statistical Area
41620	Salt Lake City, UT Metropolitan Statistical Area
41660	San Angelo, TX Metropolitan Statistical Area
41700	San Antonio-New Braunfels, TX Metropolitan Statistical Area
41740	San Diego-Chula Vista-Carlsbad, CA Metropolitan Statistical Area
41860	San Francisco-Oakland-Berkeley, CA Metropolitan Statistical Area
41940	San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area
42020	San Luis Obispo-Paso Robles, CA Metropolitan Statistical Area
42100	Santa Cruz-Watsonville, CA Metropolitan Statistical Area
42140	Santa Fe, NM Metropolitan Statistical Area
42200	Santa Maria-Santa Barbara, CA Metropolitan Statistical Area
42220	Santa Rosa-Petaluma, CA Metropolitan Statistical Area
42340	Savannah, GA Metropolitan Statistical Area 42380
42540	Scranton--Wilkes-Barre, PA Metropolitan Statistical Area
42660	Seattle-Tacoma-Bellevue, WA Metropolitan Statistical Area
42680	Sebastian-Vero Beach, FL Metropolitan Statistical Area
42700	Sebring-Avon Park, FL Metropolitan Statistical Area
43100	Sheboygan, WI Metropolitan Statistical Area

43300	Sherman-Denison, TX Metropolitan Statistical Area
43340	Shreveport-Bossier City, LA Metropolitan Statistical Area
43420	Sierra Vista-Douglas, AZ Metropolitan Statistical Area
43580	Sioux City, IA-NE-SD Metropolitan Statistical Area
43620	Sioux Falls, SD Metropolitan Statistical Area
43780	South Bend-Mishawaka, IN-MI Metropolitan Statistical Area
43900	Spartanburg, SC Metropolitan Statistical Area
44060	Spokane-Spokane Valley, WA Metropolitan Statistical Area
44100	Springfield, IL Metropolitan Statistical Area
44140	Springfield, MA Metropolitan Statistical Area
44180	Springfield, MO Metropolitan Statistical Area
44220	Springfield, OH Metropolitan Statistical Area
44300	State College, PA Metropolitan Statistical Area
44420	Staunton, VA Metropolitan Statistical Area
44700	Stockton, CA Metropolitan Statistical Area
44940	Sumter, SC Metropolitan Statistical Area
45060	Syracuse, NY Metropolitan Statistical Area
45220	Tallahassee, FL Metropolitan Statistical Area
45300	Tampa-St. Petersburg-Clearwater, FL Metropolitan Statistical Area
45460	Terre Haute, IN Metropolitan Statistical Area
45500	Texarkana, TX-AR Metropolitan Statistical Area
45540	The Villages, FL Metropolitan Statistical Area
45780	Toledo, OH Metropolitan Statistical Area
45820	Topeka, KS Metropolitan Statistical Area
45940	Trenton-Princeton, NJ Metropolitan Statistical Area
46060	Tucson, AZ Metropolitan Statistical Area
46140	Tulsa, OK Metropolitan Statistical Area
46220	Tuscaloosa, AL Metropolitan Statistical Area
46300	Twin Falls, ID Metropolitan Statistical Area
46340	Tyler, TX Metropolitan Statistical Area
46520	Urban Honolulu, HI Metropolitan Statistical Area
46540	Utica-Rome, NY Metropolitan Statistical Area
46660	Valdosta, GA Metropolitan Statistical Area
46700	Vallejo, CA Metropolitan Statistical Area
47020	Victoria, TX Metropolitan Statistical Area
47220	Vineland-Bridgeton, NJ Metropolitan Statistical Area
47260	Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area
47300	Visalia, CA Metropolitan Statistical Area
47380	Waco, TX Metropolitan Statistical Area
47460	Walla Walla, WA Metropolitan Statistical Area
47580	Warner Robins, GA Metropolitan Statistical Area

47900	Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area
47940	Waterloo-Cedar Falls, IA Metropolitan Statistical Area
48060	Watertown-Fort Drum, NY Metropolitan Statistical Area
48140	Wausau-Weston, WI Metropolitan Statistical Area
48260	Weirton-Steubenville, WV-OH Metropolitan Statistical Area
48300	Wenatchee, WA Metropolitan Statistical Area
48540	Wheeling, WV-OH Metropolitan Statistical Area
48620	Wichita, KS Metropolitan Statistical Area
48660	Wichita Falls, TX Metropolitan Statistical Area
48700	Williamsport, PA Metropolitan Statistical Area
48900	Wilmington, NC Metropolitan Statistical Area
49020	Winchester, VA-WV Metropolitan Statistical Area
49180	Winston-Salem, NC Metropolitan Statistical Area
49340	Worcester, MA-CT Metropolitan Statistical Area
49420	Yakima, WA Metropolitan Statistical Area
49620	York-Hanover, PA Metropolitan Statistical Area
49660	Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area
49700	Yuba City, CA Metropolitan Statistical Area
49740	Yuma, AZ Metropolitan Statistical Area

APPENDIX 3. MSAs and Years of Data for Key Variables of Study

Code	Metropolitan Statistical Area Title	Diversity	Unemployment	Education
13220	Beckley, WV Metropolitan Statistical Area	2008		
13900	Bismarck, ND Metropolitan Statistical Area	2008		
14010	Bloomington, IL Metropolitan Statistical Area	2006-2012		2006-2012
14100	Bloomsburg-Berwick, PA Metropolitan Statistical Area	2008		
15180	Brownsville-Harlingen, TX Metropolitan Statistical Area	2008		
15680	California-Lexington Park, MD Metropolitan Statistical Area	2006-2012		2006-2012
16060	Carbondale-Marion, IL Metropolitan Statistical Area	2006-2009		2006-2012
16180	Carson City, NV Metropolitan Statistical Area	2006-2008		2006-2008
18880	Crestview-Fort Walton Beach-Destin, FL Metropolitan Statistical Area	2006-2009		2006-2009
19060	Cumberland, MD-WV Metropolitan Statistical Area	2007		
19430	Dayton-Kettering, OH Metropolitan Statistical Area	2006-2018		2006-2018
20220	Dubuque, IA Metropolitan Statistical Area	2006, 2008		
21420	Enid, OK Metropolitan Statistical Area	2006-2009		2006-2015
24260	Grand Island, NE Metropolitan Statistical Area	2006-2008		
29200	Lafayette-West Lafayette, IN Metropolitan Statistical Area	2006-2012		2006-2012
29700	Laredo, TX Metropolitan Statistical Area	2006, 2008		
30300	Lewiston, ID-WA Metropolitan Statistical Area	2006-2008		2006-2008
30620	Lima, OH Metropolitan Statistical Area	2008		
30860	Logan, UT-ID Metropolitan Statistical Area	2006		
31080	Los Angeles-Long Beach-Anaheim, CA Metropolitan Statistical Area	2006-2012		2006-2012

33140	Michigan City-La Porte, IN Metropolitan Statistical Area	2008		
33260	Midland, TX Metropolitan Statistical Area	2008		
33780	Monroe, MI Metropolitan Statistical Area	2008		
34100	Morristown, TN Metropolitan Statistical Area	2006		
35840	North Port-Sarasota-Bradenton, FL Metropolitan Statistical Area	2006-2009		2006-2009
36220	Odessa, TX Metropolitan Statistical Area	2008		
39100	Poughkeepsie-Newburgh-Middletown, NY Metropolitan Statistical Area	2013-2018	2006-2018	2006-2018
39150	Prescott Valley-Prescott, AZ Metropolitan Statistical Area	2006-2018		2006-2018
42200	Santa Maria-Santa Barbara, CA Metropolitan Statistical Area	2006-2012		2006-2012
45540	The Villages, FL Metropolitan Statistical Area	2008		
46300	Twin Falls, ID Metropolitan Statistical Area	2007		
46520	Urban Honolulu, HI Metropolitan Statistical Area	2006-2012		2006-2012
47020	Victoria, TX Metropolitan Statistical Area	2008		
47460	Walla Walla, WA Metropolitan Statistical Area	2006-2009		2006-2012
48260	Weirton-Steubenville, WV-OH Metropolitan Statistical Area	2010-2012		2010-2012
48300	Wenatchee, WA Metropolitan Statistical Area	2008		

VITA

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2012-2016	Manager of Retail Planning Perry Ellis International Miami, Florida
2016-2018	Consultant/Strategic Planning Cool J's Miami, FL
2018-2020	Solutions Consultant Enterprise Applications Aptos Miami, FL
2020-Present	Director, Pre-Sales Tecsys Miami, FL

INVITED TO PRESENT

Diaz, W., Diz, M., Litano, L., & Phillips, S. (2020). *Global Effects of Blockchain Utilization on Nation and Household Welfare.* Invited to present at the Academy of International Business - LAC