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Unionization and Income Inequality: The Impact of Labor Union Participation on Income Inequality in the United States

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by

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Abstract

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Using Current Population Survey data in the period from 1996 -2011, this paper analyzes the relationship between labor union participation and income inequality in each of the 50 U.S. states. Since the 1970s the income gap in the United States has grown steadily and today the United States is the most unequal of all OECD countries (with the exception of Mexico and Turkey). In the past ten years alone, the disposable income for middle class families in the United States has shrank by a figure of 4 percent.

In addition to rising income inequality, labor union participation has been on a downward spiral since the early 1980s as well. Today, union participation in the United States is one of the lowest of any developed country. Many past studies have explored a multitude of different factors to explain this phenomenon. The main lesson of the existing literature on this topic is that there is no single "story" or "factor" that can explain the bulk of this extraordinary trend. This paper does in fact reinforce the literature of past studies. My findings indicate that there is indeed no single "story" or factor that can explain income inequality in the United States of America. For the most part, the findings were insignificant in explaining the trend in rising income disparity in the period from 1996-2011.

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Chapter One

Introduction

The Economist (2013) notes that for the first time in five years the typical American household's income has finally stopped falling and the rate of poverty in the United States has stopped rising. It seems like the American Economy is finally starting to pick up steam and move away from the shadow of the past couple years. However, *The Economist* (2013) goes on to describe that since the U.S. Economic Recovery begun, nearly 95 percent of the gains from the recovery have gone to the richest 1 percent of Americans. The other 99 percent of our population has received only 5 percent of this recovery. According to the article, the richest 1 percent's share of overall income is the highest it has been in a century. The main question I plan on pursuing for this empirical thesis is to study the effect that decreased labor union participation has had on the growing income gap in the United States of America.

Other economists should care about this question because of the fact that this is not a new phenomenon. Since the 1970s the income gap in the United States has grown steadily and today our country is the most unequal of all OECD countries (with the exception of Mexico and Turkey). According to *The Economist* (2013) middle income Australians, Germans, Dutch, French, Danes, Norwegians and even Mexicans had higher growth. In a country that once cultivated the largest and most powerful middle class the world has ever seen, these figures should be troubling. In addition, the question of income inequality in the United States is now at the forefront of U.S. politics. In recent years it has become a major issue with nearly

every popular news network highlighting its importance. Probably the largest single event that brought the issue to mainstream politics and media was the recent Occupy Wall Street Movement, which occurred in 2011 in New York City's Financial District. Also, other economists should care about this question because of the fact that many view inequality as a representation of inefficiency and believe that it causes more broad problems for the overall economy. According to *The Economist* (2013) even though inequality to a certain degree can be beneficial for an economy, the recent concentration of income gains among the most affluent is both politically dangerous and economically damaging. In the end, the study can help contribute to our understanding of how the U.S income gap has grown unequally in the past twenty years. By looking specifically at U.S unionization and the effect it has had on income inequality I can possibly contribute to our understanding of the forces behind this trend.

Saez (2012), Chintrakarn, Herzer, and Nunnenkamp (2011), Atif et al. (2012), and Gregorio and Lee (2002) have focused on the evolution of top incomes in the U.S and the effect that factors such as Foreign Direct Investment, education, outsourcing, and globalization in general have had on income inequality. A number of studies including Freeman (1991) and Dinardo, Fortin, and Lemieux (1996) have explored the effect that unionization has had as well. Freeman (2012) found that falling labor union participation rates did indeed contribute to increases in wage inequality, while Dinardo, Fortin, and Lemieux (1996) found that rising unionization and the real value of the minimum wage actually decreases inequality. The new aspect about my question that I analyze in this empirical thesis is the effect that

labor union participation has had on income inequality across each of the 50 states in the period from 1996 to 2011. Despite the fact that labor union participation has been in decline since the early 1980s, possible correlation between unionization in recent years and U.S. income inequality has received hardly any attention. My findings indicate that in the period from 1996-2011, decreased labor union participation had no effect on income disparity in the United States. However, the empirical analysis did find that the percentage of people living inside a metropolitan area, the amount of people with just a high school diploma, and the amount of people with just some college experience are all both positively and significantly related to income inequality. In addition, the results indicate that rises in the state minimum wage, the amount of people with a college degree or higher, and increases in the Hispanic population or those of other race or ethnicity decreases income inequality.

In chapter two, a review of the existing literature surrounding the topic is provided. Chapter three contains the empirical model and a description of the data that is used. A description of the variables used in the study is included in this chapter as well. In chapter four the descriptive statistics and empirical results for the three regressions that I ran are provided. Finally, chapter five contains the conclusions of the empirical study.

Chapter 2

Literature Review

In this chapter I focus on the existing literature surrounding income disparity. A number of past studies on U.S. Income Inequality have studied the trends and the evolution of the phenomenon. In addition, a number look specifically at factors such as Foreign Direct Investment, Outsourcing, Globalization and Unionization in general to see their effect on income inequality. In Saez (2012) the evolution of this trend is explored using updated estimates from 2009 and 2010. This article, which is an extension of an earlier study, looks at the income share of the Top decile from 1917 to 2010, with a large emphasis on the period from 1993-2010. According to his results, the incomes of the richest 1 percent of Americans grew at a tremendous rate of 98.7 percent during the Clinton expansion, and 61.8 percent during the Bush Administration. When these results are compared to the 20.3 percent and 6.8 percent growth rates for the bottom 99 percent in the same two time periods it is obvious that the richest 1 percent of Americans captured a strikingly disproportionate amount of the overall income growth. In addition, Emmanual Saez's analysis of the recent recovery from the Great Recession is a strong asset of the article as well. Saez's results indicated that in the first year of the economic recovery the top 1 percent attained 93 percent of the income gains. The one limitation of this study is that Saez only lists a number of possible factors that may explain this trend, rather than actually finding the factors themselves. However, despite the small limitation, this article contributes a great insight into the evolution

of income inequality in the United States. It especially paints an accurate picture of the recent acceleration of inequality that has occurred during the past 25 years as well.

A number of studies have looked at specific factors in order to see their direct effect on income inequality as well. They look at factors such as foreign direct investment, outsourcing, education and globalization in general. One such study that employs this approach is the article by Chintrakarn, Herzer, and Nunnenkamp (2012). Like Saez (2012), this study uses panel data from 1977 to 2001 of 48 U.S. States in order to see the effect that inward foreign direct investment has had on income inequality. The results of the study indicate that in the long run, inward FDI has a negative effect on income inequality in the United States. Also, the panel approach that this study takes helps mitigate the possibility of cross state heterogeneity that may occur when using national level data sets.

Gregorio and Lee (2002) explore the relationship between education and income inequality in the period from 1960-1990. In this study, a panel data set is employed in order to analyze this relationship in a multitude of countries including the United States. The results of this study find that educational factors including higher educational attainment and more equal distribution of education play an important role in making income distribution more equal. However, it is worth noting that a significant proportion of the variation in income inequality across countries over time was still unexplained at the conclusion of their study.

In addition, a recent study looks directly at a specific factor and its effect on income inequality as well. This article by Atif, Srivastav, Sauytbekova, and Arachchige (2012) uses a panel data set from 1990 to 2010 of 68 developing countries in order to see the effect that globalization has had on income inequality in these nations. The results of the study do in fact suggest that an increase in globalization in developing countries causes the level of income inequality in those countries to rise. However, there are a number of limitations associated with this analysis including missing values in the data that is used in the analysis. Also, the study makes no distinction between countries in the Northern Hemisphere and Southern Hemisphere. Overall, like the article on inward FDI and income inequality, this study provides an example of how a specific factor like globalization can affect income disparity.

Many existing articles have explored long run trends of income inequality using entire countries as samples. The problem with this approach is it is often times too broad and fails to explain which areas of a country have the most problems associated with income inequality. Another way to approach this topic, rather than using say the United States as a whole, is to analyze the income inequality trends across each of the 50 states. This approach was adopted by Partridge, Rickman, and Levernier (1996). In the article, panel data for 48 U.S. States (excluding Alaska and Hawaii) from 1960 to 1990 is used in order to find which factors most explain U.S income inequality. The OLS results of the study indicated that international immigration, the percent of a state's population that is black, the percent of the population that lives in a metropolitan area, the percent of the

population engaged in farm activities, and the percent of families headed by a female were all significant in explaining family income inequality. However, these same empirical results from the study revealed that unionization was insignificant in explaining U.S. income inequality. This variable had very little effect in this empirical study. However, it is worth noting that this study looked at panel data from 1960-1990. In the period from 1960-1980, the unionization rate in the United States was relatively stable. It was not until the beginning of the 1980s that the union share of nonagricultural workers began to plummet.

Despite the findings of Partridge, Rickman, and Levernier (1996), there have indeed been a number of studies that have found that de-unionization has contributed to the rise in U.S. Income Inequality. Dinardo, Fortin, and Lemiuex (1996) have shown that de-unionization and supply and demand shocks were significant factors in explaining the rise in wage inequality during the period from 1979 to 1988. Their main findings show that the apparent rise in wage inequality from 1979-1988 can be substantially explained by a decline in the real value of the minimum wage during the same period. Additionally the study discovered that changes in the level of unionization had a substantial effect on the distribution of men's wages in particular. They conclude that the decline in unionization from 1979-1988 did indeed contributed to the decline of wages for men in the middle of the wage distribution. Their conclusions lead us to believe that labor market institutions like unions are as important as supply and demand factors in explaining U.S. wage inequality.

Freeman (1991) looks directly at the effect that de-unionization had on increasing wage inequality during the 1980s. The study estimates the effect that this factor has had on male earnings differentials and inequality in not only the United States, but in a number of other OECD countries as well. In order to specifically estimate the magnitude of unionization on skill differentials and the distribution of earnings in the U.S, Freeman employs data on usual hourly earnings on men in both the 1988 Annual Merged CPS file and in the 1978 May CPS file. In the end, Freeman concluded that union density absolutely contributed to the rise in U.S earnings inequality in the 1980s. However, his results indicated that inequality still would have risen substantially even if union density had been stable throughout the decade. Despite this finding, Freeman did discover that inequality increased much more substantially among OECD countries with low union density. Inequality in general was much lower in OECD countries that had strong union participation. This fact in itself provides ample evidence that declines in unionization contributes to increased wage inequality.

Like Freeman (1991) and a number of other previous studies, the question associated with this topic is the effect that labor union participation has had on the growing income gap in the United States during the period from the late 1990s up until 2011. The the Gini Coefficent of family income inequality for each U.S state, the Top decile income share, and the Top 1% income share is used in order to measure income inequality. In the concluding sentences Freeman (1991) suggests that continued declines in unionization in the United States would place added pressure to middle class Americans and make it even more difficult for the nation to reverse

this problematic trend. By specifically looking at the period from 1996 to 2011, the study provides an answer to Freeman's statement.

Chapter 3

Models and Description of Data

This analysis examines the effect that labor union participation has on income inequality. The econometric model that is used in this empirical study is a panel data regression model in order to examine the relationship between labor union participation and income inequality in each of the 50 U.S. states. By using this model in particular the study measures the different state fixed effects throughout the period. An intercept dummy variable for each state will be included in the model. The data used in this analysis is from the March Current Population Survey (CPS) data from 1996-2011. In addition, the data that measures union density is from unionstats.com and the data that measures fluctuations in the state minimum wage is taken from the U.S. Department of Labor website. The data that measures the Gini coefficient, Top decile income share, and Top 1% income share is taken from data compiled by Professor Mark W. Frank from the Sam Houston State University economics department website.

The U.S. Current Population Survey is the main source for labor force statistics and characteristics for the U.S. population. The monthly survey of about 50,000 households is carried out by the Bureau of the Census for the Bureau of Labor Statistics. It provides data for a wide range of economic statistics including the unemployment rate and provides a snapshot of the current U.S. labor force and its demographics. Additionally, it gives statistics regarding both national and state

level labor market conditions. It is the main source of labor force characteristics for the population of the United States.

The Union Membership and Coverage database provided by unionstats.com provides time-consistent national and state-level estimates of the union density from the years 1964-2013. The two sources that are combined to create this database are Current Population Survey data and the discontinued *Directory of National Unions and Employee Associations* that was a publication of the Bureau of Labor Statistics.

Statement of Model

Model: $INCOME\_MEASURE = \beta_0 + \beta_1 UNION + \beta_2 STATEMIN + \beta_3 LF\_PART\_RATE + \beta_4 BLACK + \beta_5 HISPANIC + \beta_6 OTHER + \beta_7 HIGHSCH + \beta_8 SOMECOLLEGE + \beta_9 MORECOLLEGE + \beta_{10} MSA + \beta_{11} FHEAD + \beta_{12} RECENT\_INT + \beta_{13} AGE<18 + \beta_{14} AGE>65 + STDUM1\text{-}STDUM51 + YR96\text{-}YR11 + \varepsilon.$

Dependent Variables

GINI: The Gini Coefficient of family income inequality for each state. The Gini Coefficient lies between zero and one, increasing in value with income inequality. This implies that the Gini Coefficient would be zero if the actual distribution of income was perfectly equal and one if the actual distribution of income was perfectly unequal. The methodology behind the Gini Coefficient is that it is the area between the perfectly equal Lorenz curve[1] and the actual Lorenz curve. This area is a measurement of income inequality.

[1] Lorenz Curve- this curve reports the cumulative share of income accruing to the various quintiles of households in a given population. In a perfectly equal world the Lorenz Curve would be a straight 45° angle.

TopDecile: TopDecile of family income is a commonly used measure of income inequality in the United States. It is the percentage income share of the top 10% of family income earners in the U.S.

Top 1%: Top 1% of family income is a commonly used measure of income inequality in the United States. It is the percentage income share of the top 1% of family income earners in the U.S.

Independent Variables:

UNION: Variable indicates the union density. It is the percentage of non-agricultural wage and salary employees that have membership in labor union/employee association.

BLACK: Variable that indicates the percentage of a state's population that is African American.

HISPANIC: Variable indicates the percentage of a state's population that is Hispanic.

OTHER: Variable indicates the percentage of a state's population that is other.

MSA: Variable indicates the percent of a state's population that resides in a metropolitan area.

FHEAD: Variable indicates the percent of the state's families that are headed by females.

HIGHSCH: Variable indicates the percent of the state's labor force that has attainted a high school diploma.

SOMECOLLEGE: Variable indicates the percent of the state's labor force that has attended college but has not earned a Bachelor's degree.

COLLEGEHIGHER: Variable indicates the percent of the state's labor force that has earned a bachelors degree or higher.

AGE<18: Variable indicates the percent of the state's population that is less than 18 years old.

AGE>64: Variable indicates the percent of the state's population that is 65 years old and older.

RECENT_INT: Variable indicates the percent of the state's population that internationally immigrated in the previous five years.

LF_PART_RATE: Variable indicates the percent of the state's population above the age of 15 that are in the labor force.

STATEMIN: Variable indicates the real value of the state minimum wage in each U.S. state and the District of Columbia

STDUM1-STDUM51: Dummy variable that indicates each U.S. State and the District of Columbia

YR96-YR11: Dummy variable that indicates each year used in the study

Description of Variables

The three dependent variables used in the analysis are the Gini coefficient of family income inequality, Top decile income share, and the Top 1% income share in the United States. I decided to use the Gini coefficient as a dependent variable because of the fact that it is one of the best measures of income inequality available. A multitude of past studies including Chintrakarn, Herzer, and Nunnenkamp (2011), Partridge, Rickman, and Levernier (1996), and Atif et al. (2012) have used this coefficient as well. The methodology behind the Gini coefficient is that it is the area between the perfectly equal Lorenz curve and the actual Lorenz curve. Figure 1 provides a visual example of how the coefficient is derived. The area that is highlighted in gray is the measurement of inequality. The coefficient lies between zero and one, increasing in value with income inequality. This implies that the Gini coefficient would be zero if the actual distribution of income was perfectly equal and one if the actual distribution of income was perfectly unequal. The Gini coefficient

for each state from 1996-2011 is calculated. In addition to using the Gini Coefficient, a separate regression is ran using the TopDecile income share in the United States as the independent variable. The decision to use this variable is based on the fact that it is a commonly used measure of income inequality in the United States. It is the percentage income share of the top 10% of family income earners in the U.S. Also, like the Gini coefficient, this variable has been used in a multitude of pre-existing studies as a measure of income inequality. My decision to use the Top 1% income share as the dependent variable in my third regression is based on the same reasons why I used the Gini coefficient and Top Decile income share. In addition, I decided to use this variable in particular because of the fact that in recent years the Top 1% of income earners in the United States have received an immensely disproportionate amount of the total income gains.

The independent variables that are employed in this analysis were all chosen in order to examine their effect on inequality. First off, the union membership variable indicates the percentage of state's workers that have membership in either labor unions or employee associations. By using this variable I plan on measuring the effect that labor union participation rates have had on income inequality in the period from 1996 - 2011. This variable in particular is pivotal because of the fact that it measures the main objective of this study. According to Lynk, Clancy, and Fudge (2013) unionization affects income inequality because of the fact that lower levels of unionization make it harder for labor unions to bargain fair wages and benefits for their members. As a result, as unionization erodes and the bargaining rights of workers began to disappear, inequality increases. According to Freeman

(1991), inequality in general was much lower in OECD countries that had strong union participation and much higher in OECD countries that had weaker union participation.

A number of race variables are used in this analysis in order to measure the racial dynamics of inequality as well. The black variable provides the percentage of a state's population that is African American, while the Hispanic variable gives the percentage of the population that is of Hispanic origin. The other variable indicates the percentage of a state's population that is not African-American, Hispanic, or white. In addition, a number of education variables are included in the analysis as well. The some college variable indicates the percent of a state's labor force that has attended college but has not earned a bachelors degree or higher. The college higher variable measures the percent of a state's labor force that has earned a bachelors degree or higher. The reason I include these variables is in order to see the effect that education has had on income inequality. Also, I include a variable that indicates the percent of a state's families that are headed by females as well. According to Partridge, Rickman, and Levernier (1996), the relationship between female-headed households and income inequality has likely increased over time due to higher divorce rates and an increase in the amount of women having children out of wedlock in the period of their study. This factor was significant in explaining inequality in their study. Additionally, I include a variable for recent international immigration that indicates the percent of a state's population that internationally immigrated in the previous five years. Like the female-headed household variable, my decision to use this variable in this study is based on the fact that it was

statistically significant in Partridge, Rickman, and Levernier (1996). They argue that international migration should be positively related to income inequality because of the fact that immigrants compete with low-skilled natives in the labor market. A number of age variables are included in the model in order to examine the effect that age has had on income inequality too. The variable Age<18 measures the percent of a state's population that is less than 18 years old, while the variable Age>64 measures the percent of a state's population that is 65 years or older.

I include a variable that measures the real value of the minimum wage in each U.S state as well. According to Dinardo, Fortin, and Lemieux (1996), the decline in the real value of the minimum wage from 1979 to 1988 explained a large proportion of the increase in wage inequality during that period. Also, the LF_PART_RATE variable that is used in the model indicates the percent of the state's population above the age of 15 that is in the labor force. This variable is employed in order to see if higher labor force participation rates decrease income inequality. According to Partridge, Rickman, and Levernier (1996), this variable controls for cross-state differences in labor-force participation and discouraged workers effects for both men and women and is expected to be negatively related to income inequality. The MSA variable that is used in the study indicates the percent of a state's population that resides in a metropolitan area. The reasoning behind using this variable in the study is because previous papers have found that greater metropolitan shares of population increase income inequality. According to Partridge, Rickman, Levernier (1996), if there is a large prevalence of service producing industries with a bimodal wage distribution centered in metropolitan

areas, then the relationship between metropolitan areas and income inequality is expected to be positive. In the United States this relationship is most likely going to be positive because of the fact that most American metropolitan areas are starting to shift over to a service economy. Finally, a dummy variable for each U.S. state along with the District of Columbia and dummies for the years 1996-2011 are employed in the analysis.

Chapter 4

Empirical Results

The model that I employed in this empirical study was a panel data regression model to examine U.S. income disparity and the relationship that labor union participation has had on the trend in each of the 50 states. I used this model in particular to measure the effects throughout the period from 1996-2011. In total I ran three separate OLS regressions. The first regression that I ran included the Gini coefficient as my dependent variable and in the second regression I used the Top Decile income share as my dependent variable. In the third regression I used the Top 1% income share as the dependent variable.

A. Descriptive Statistics of the Model

Table 1 provides the descriptive statistics of the entire sample that is used in this empirical study. The total number of observations used in the study is 816. According to the statistics, the mean Gini coefficient for all the observations is 0.59, the Top decile income share is 42%, and the Top 1% income share is 17%. The union density variable for the observations is 11.97 percentage points and the average state minimum wage for the sample is $5.63. In addition, those individuals that are 18 and under make up 26% of the observations, while those individuals that are 65 and older make up 12%. The labor force participation rate in this case is 70%. The racial make up of the observations indicate that 73% of the sample is White, 11% is Black, 8% is Hispanic, and 7% is of other race or ethnicity. Also, the

educational background of the observations shows that 37% of the population has less than high school education, 24% have graduated from high school, 20% have some college experience, and 18% have a college degree or higher. Those individuals that live in a metropolitan statistical area make up 53% of the sample as well. Finally, 23% of the observations are households that are headed by females and 2% of the observations are made up of recent international migrants.

B. First Regression Results

In specification 1 of Table 2 I include the empirical results for the first regression that I ran. The dependent variable and measure of inequality in this case was the Gini coefficient. Like the Patridge, Rickman, and Levernier (1996) article, the union density variable that I generated in order to examine the relationship between unionization and the Gini coefficient had very little effect and was statistically insignificant in this case. These results differ from those of Dinardo, Fortin, and Lemieux (1996) and Freeman (1991) most likely because of the fact that their studies were analyzing the relationship between wage inequality and unionization. In this study, the main measure of inequality is the Gini index and income share distributions. The only wage variable that is included in this study is the state minimum wage. Also, it is worth noting that in Freeman (1991) it was found that de-unionization was a factor in the rise of inequality but was not the factor behind the trend towards inequality. According to his results, inequality would have increased substantially regardless of whether union density had been stable.

However, my results indicate that rises in the state minimum wage are both negatively and significantly related to income inequality in this model. According to the results, a one-dollar increase in the state minimum wage causes the Gini coefficient to decrease by 0.006, on average, holding everything else constant. These results make sense because as the minimum wage rises, the incomes of those at the very bottom of the income distribution should subsequently increase. As a result income inequality falls.

The results provide a number of interesting demographic and labor force characteristics as well. First off, the percentage of Hispanics and those of other race/ethnicity in a state's population interestingly had a negative effect on inequality during the period from 1997-2011. The control group for race dummies in this regression is the variable that indicates the percentage of a state's population that is white. According to the results, for every one-percentage point increase in the Hispanic population, the Gini coefficient decreased by 0.00138, on average, holding everything else constant. Also, on average, for every one-percentage point increase in a state's population that is not White, Hispanic, or Black, the Gini Coefficient decreased by 0.00140. These results are interesting because of the fact Partridge, Rickman, and Levernier (1996) found that increases in minority populations increase inequality, rather than decreasing it. They found that the percent of the population that is black was a significant cause of family income inequality during the period they were analyzing. The reasoning behind these results are not known and further research is warranted.

It is worth noting that all of the education variables, which include those with a high school diploma, those with some college experience, and those with a college education or higher were statistically insignificant in this regression. On the other hand, consistent with Partridge, Rickman, and Levernier (1996) the variable that measures the amount of people that live in a metropolitan statistical area (MSA) was statistically significant. According to the results, for every on percentage point increase in the amount of people living in a metropolitan area, the Gini coefficient increased by 0.00064, on average, holding everything else constant. According to Partridge, Rickman, and Levernier (1996), urbanization is traditionally looked at as measure of economic development, which normally should mean a greater metropolitan share should reduce income inequality. However, they go on to explain that if service producing industries like financial services and retail trade are centered in metropolitan areas then the relationship between metropolitan areas and inequality is expected to be positive. The reason being is because a large percentage of service sector jobs are often menial and low paying. According to Ensinger (2010), high paying manufacturing jobs are rapidly disappearing, only to be replaced by low paying service sector jobs. This trend is only expected to continue, as the American economy is believed to continue shifting from a manufacturing to a service economy as well.

In addition, the results of this regression indicate that states that have a higher percentage of people under the age of 18 increases inequality. According to the results, for every one-percentage point increase in the under-18 population, the Gini coefficient rises by 0.00261, on average, holding everything else constant. A

possible explanation for this result is because for the most part the under 18 population either does not work or is employed in low paying jobs. As a result, a rise in this population causes inequality to rise.

C. Second Regression Results

In specification 2 of Table 2 I include the empirical results for the second regression that I ran. In this model, I included the top decile income share as my dependent variable and measure of income inequality. Like the first regression and Partridge, Rickman, and Levernier (1996) the effect that the union density variable has on the top decile income share was insignificant in this regression as well. In addition, all of the race dummy variables in this case were insignificant too.

However, in contrast to the Partridge, Rickman, and Levernier (1996) article, most of the education variables are significant and provide some valuable information regarding the educational effect on the Top decile income share. The control group for the education dummy variables is those individuals with less than a high school education. According to the results, for every one-percentage point increase in the amount of people with just a high school education, the Top decile income share increases by 0.11 percentage points, on average, holding everything else constant. Also, on average, for every one-percentage point increase in the amount of people with some college experience, the Top decile income share increases by 0.10 percentage points. The reasoning behind these results is tough to interpret, however one can look at inequality in education to explain part of it. According to the findings of Gregorio and Lee (2002), educational factors including

higher attainment and more equal distribution of education play a role in changing income distribution. They mention in their study that income inequality is positively correlated with inequalities in education and negatively correlated with the average level of schooling. As the population of individuals with just a high school degree or just some college experience increases, instead of pursuing a college degree or higher, the distribution of education becomes more unequal and the income distribution is subsequently likely to become more unequal as well.

Finally, like the results in the first regression, the Metropolitan Statistical Area (MSA) variable was statistically and positively related to income inequality as well. According to the results, for every one-percentage point increase in the amount of people living in a metropolitan area, the Top Decile income share increased by 0.02 percentage points, on average, holding everything else constant. In addition, like the first regression, the population under-18 variable is significantly and positively related to income inequality in this model as well. According to the results, for one percentage point increase in the under-18 population, the Top decile income share increases by 0.0009 percentage points, on average, holding everything else constant. The reasoning behind this result is unknown and further study is needed. It is worth noting that the female head of household and state minimum wage variables were insignificant in this model.

D. Third Regression Results

The results from the third and final regression that I ran is located it specification 3 of Table 2. In this model I used the Top 1% income share as my dependent variable and measure of income inequality. Like the first two regressions, the union density variable ended up being insignificant in this model as well.

The state minimum wage variable had exactly the same result in this model as it did in the first regression that I ran where the Gini coefficient was the dependent variable. According to the results, for every one-dollar increase in the state minimum wage, the Top 1% income share falls by 0.60 percentage points, on average, holding everything else constant. Like the first model, this result can be explained because of the fact that as the minimum wage rises the income of those individuals at the bottom of the wealth distribution should increase, which as a result causes the income gap to decrease. Therefore, the Top 1% income share should decrease with changes in the minimum wage.

In contrast to Partridge, Rickman, and Levernier (1996), the college degree or higher variable is significant in explaining income inequality in this model. Out of all of the education dummy variables, it was only this variable that was statistically significant. According to the results, for every one percentage point increase in the amount of people in a state's population with a college degree or higher, the Top 1% income share decreases by 0.18 percentage points, on average, holding everything else constant. Going back to the Gregorio and Lee (2002) study, this result makes since because higher educational attainment is negatively correlated with

inequality. As the population of individuals with a college degree or higher increases, the distribution of education becomes more equal, which in turn causes income distribution to become more equal as well.

Chapter 5

Conclusions

A. Summary of the Findings

Using a panel data regression model with March Current Population survey (CPS) data from 1996-2011, this study examines the relationship between labor union participation and income inequality in each of the 50 U.S. states. This study differentiates itself from the previous literature surrounding the subject because of the fact that it analyzes the effect that decreased labor union participation has on income inequality in each of the 50 states during the period from 1996-2011.

Despite the fact that many look at decreased unionization has a major contributor to the recent spikes in income inequality, this study finds that from 1996-2011 decreased labor union participation had no effect whatsoever on income inequality in the United States of America. In all three models the union density variable was insignificant and had no effect on the Gini coefficient, Top Decile income share, and the Top 1% income share. As a result, I conclude that unionization is not an important factor in explaining U.S. income inequality during this period. However, the study did find that the percentage of people living inside a metropolitan area, the amount of people with just a high school diploma, and the amount of people with just some college experience are all both positively and significantly related to income inequality. On the other hand, I found that increases in the state minimum wage, the amount of people with a college degree or higher,

and increases in the Hispanic population or those of other race or ethnicity decreases income inequality.

B. Limitations

The major limitation of this study is the fact that it failed to find a significant relationship between labor union participation and income inequality during the period from 1996-2011. However, with the exception of Dinardo, Fortin, and Lemiuex (1996) and Freeman (1991) and the significant relationship they found between wage inequality and unionization, the previous studies that explored this relationship did not find any significance between the two either. In addition, the fact that my inequality data does not cover the years 2012 and 2013 was another limitation of this study.

C. Policy Implications

Despite the limitations of this study, the findings can be used to better understand the complex and confusing phenomenon of income inequality in the United States. For example, the fact that metropolitan areas tend to have higher income disparity should prompt politicians to explore ways in order to reverse this trend. In addition, the fact that it was found that attaining a college degree or higher decreases income inequality should be used as motivation in order to make higher education more affordable and reachable for less privileged students.

D. Suggestions for Future Research

Many experts and policymakers predict that labor union participation rates are going to continue to fall into the future. Every five or so years this relationship between unionization and inequality should be reevaluated in order to see if any significant results that can help explain the trend in U.S. income inequality turn up. In addition, in previous studies it was always found that increases in minorities caused inequality to rise. As a result of discovering that increases in the Hispanic and other race/ethnicity population actually decreased inequality in this study, further research into this relationship is warranted.

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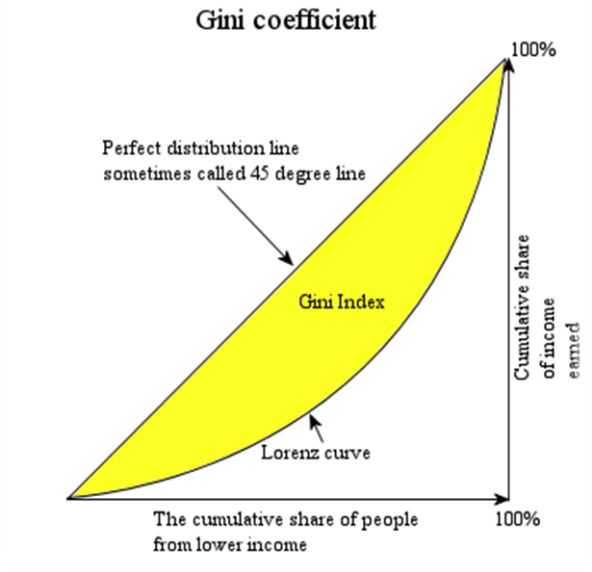
Figure 1: Geographical Representation of the Gini Coefficient



Source: ***http://people.stfx.ca/mgerriet/econ241/Gini%20coefficient%20-%20Wikipedia,%20the%20free%20encyclopedia.htm***

Table 1. Descriptive statistics for all observations

Variables	Statistics for Observations
Inequality Indices	
Gini Coefficient	0.59
	(0.04)
Top Decile	0.42
	(0.04)
Top One Percent	0.17
	(0.04)
Labor Force Characteristics	
Union Density	11.97
	(5.64)
State Minimum Wage	5.63
	(1.22)
Labor Force Participation	0.70
	(0.04)
Demographic Characteristics	
Race	
Non-Hispanic White	0.73
	(0.17)
Non-Hispanic Black	0.11
	(0.09)
Hispanic	0.08
	(0.09)
Other race/ethnicity	0.07
	(0.10)
Education level	
Less than high school	0.37
	(0.04)
High school graduate	0.24
	(0.03)
Some college	0.20
	(0.03)
College or higher	0.18
	(0.04)
MSA	0.53
	(0.29)
Female head of household	0.23
	(0.04)
Recent International Migration	0.02
	(0.01)
Participants under 18	0.26
	(0.03)
Participants over 65	0.12
	(0.02)
Number of Observations	816

Note: The reported values are the means. The standard errors are in parentheses.

Table 2. Estimates for OLS regressions

	Dependent Variables		
Independent Variables	(1) Gini Coefficient	(2) Top Decile	(3) Top 1%
Labor Force Characteristics			
Union Density	-0.0009	-0.0003	0.00001
	(0.0006)	(0.0003)	(0.0006)
State Minimum Wage	-0.006***	-0.0003	-0.006***
	(0.001)	(0.0006)	(0.001)
Labor Force Participation	0.065	0.010	0.073
	(0.054)	(0.026)	(0.045)
Demographic Characteristics			
Non-Hispanic Black	-0.002	-0.014	-0.015
	(0.053)	(0.026)	(0.044)
Hispanic	-0.138**	-0.022	-0.140
	(0.055)	(0.027)	(0.045)
Other race/ethnicity	-0.140**	0.032	-0.015
	(0.058)	(0.03)	(0.050)
High school graduate	0.073	0.111***	0.040
	(0.088)	(0.042)	(0.072)
Some college	0.066	0.093**	0.080
	(0.096)	(0.050)	(0.080)
College or higher	-0.134	-0.027	-0.184**
	(0.092)	(0.044)	(0.078)
MSA	0.064***	0.020***	0.016
	(0.013)	(0.006)	(0.011)
Female Head of Household	-0.060	0.030	0.016
	(0.051)	(0.025)	(0.042)
Recent Int. Migration	-0.200	-0.026	-0.153
	(0.128)	(0.062)	(0.105)
Population under 18	0.261***	0.090**	-0.021
	(0.094)	(0.046)	(0.080)
Population over 65	0.050	0.018	-0.0002
	(0.091)	(0.044)	(0.075)
Number of observations =	816		

Note: The standard errors are presented in parentheses. The values in the table represent the coefficients for each independent variable. These regressions are all controlled for the year and state dummy variables.
*Statistically significant at the 0.10 level.
**Statistically significant at the 0.05 level.
***Statistically significant at the 0.01 level.