# Economic Openness, Power Resources and Income Inequality in the American States

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Data from American states over the 18-year period from 1987 through 2004 are used to explore the economic and political determinants of rising income inequality. Error Correction Models are used to examine both the short- and long-run effects of economic openness (i.e., trade, foreign direct investment in the United States, and immigration) and "power resources" (by which is meant, government ideologies and union strength) on state-level income inequality in the United States. Results show that during the period examined international trade and immigration each increased income inequality but that foreign direct investment decreased it. The indicate that states with liberal governments and/or strong labor unions were likely to experience decreases in inequality, and that Democratic presidents contributed to a decreasing income inequality in American states.

**Key Words:** income inequality, power resources, trade, FDI, immigration

*Acronyms used in this article:* Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), Current Population Survey (CPS), Current Population Survey Annual Social and Economic Supplements (CPS-ASEC), Foreign Direct Investment (FDI), cross-sectional and time-series (CSTS), Error Correction Models (ECM),- Gross State Products (GSP).

The past three decades witnessed a resurgence of income inequality in a number of western developed countries, spawning waves of discussions about inequality's economic and political determinants. In cross-national studies, scholars have largely focused their attention on two genres of explanation: the socioeconomic and the political reasons. On the one hand, economists argue that globalization such as trade openness, foreign direct investment (FDI) and migration, along with other socioeconomic factors, have caused rising income inequality during this time period

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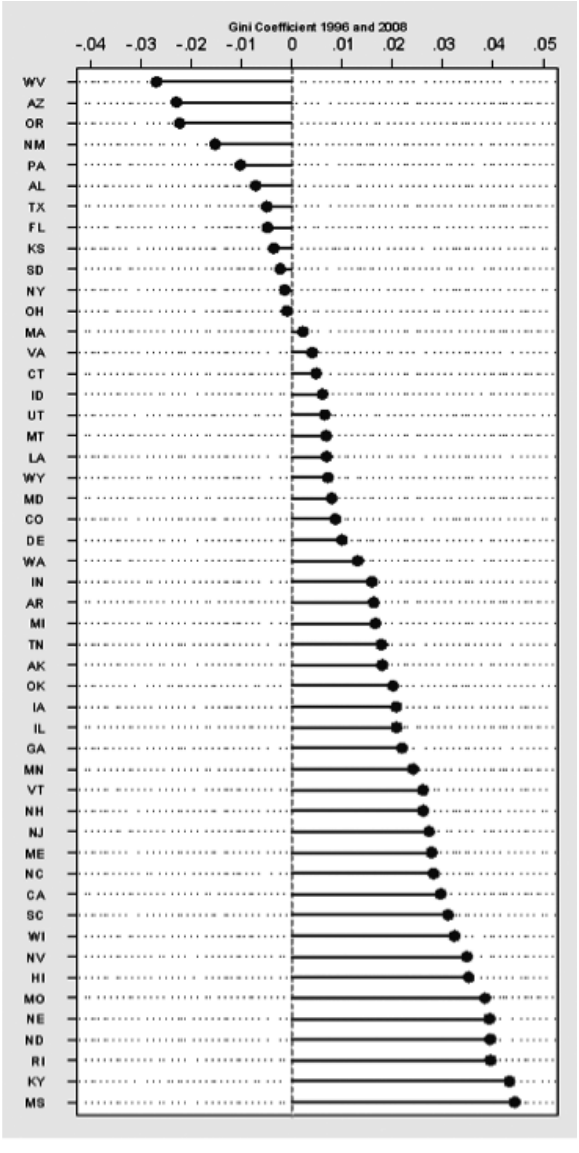
(Borjas, 1994; Richardson, 1995; Williamson, 1997; Hatton & Williamson, 1998; Alderson & Nielsen, 2002; Levy & Temin, 2007). Political scientists, on the other hand, argue that political power such as the ideological orientation of the incumbent political parties and strength of labor unions influences income inequality through various distributive and redistributive policies (Korpi, 1978; Huber & Stephens, 2001; Bradley, Huber, Moller, Nielsen, & Stephens, 2003; Moller, Bradley, Huber, Nielsen, & Stephens, 2003; Huber, Nielsen, Pribble, & Stephens, 2006).

Previous research on income inequality in the U.S. has focused primarily on the national level and little empirical research has examined the effect of globalization. The lack of research on globalization (or economic openness) and inequality is partly due to the lack of cases in a single-country study because data on some key variables only go back to a few decades. Lijphart (1971) in his classic article encourages scholars to use intra-national comparison to overcome this "lack of case" issue. Luckily, in a federal system such as the American one, the states differ from one another in a variety of political and socioeconomic features. For instance, although inequality has increased across the country, American states vary in their levels of income inequality as well as in their motives and ability to fight against its rising. (Kelly & Witko, 2012). In fact, over the past fifteen years, some states managed to decrease their income inequality, yet other states experienced a fast-growing disparity. Figure 1 here shows the growth of income inequality from 1996 to 2010 in American states. In addition, although policies of trade, FDI and migration are largely made by the federal government, states experience vastly different levels of economic openness in all three areas (for an example see Figure 2 for variation in trade openness across states).[1]

It is curious how globalization influences income inequality in American states with varying political environments. First of all, economic openness is indeed an important explanation for rising income inequality in the U.S. In particular, international trade and immigration have each

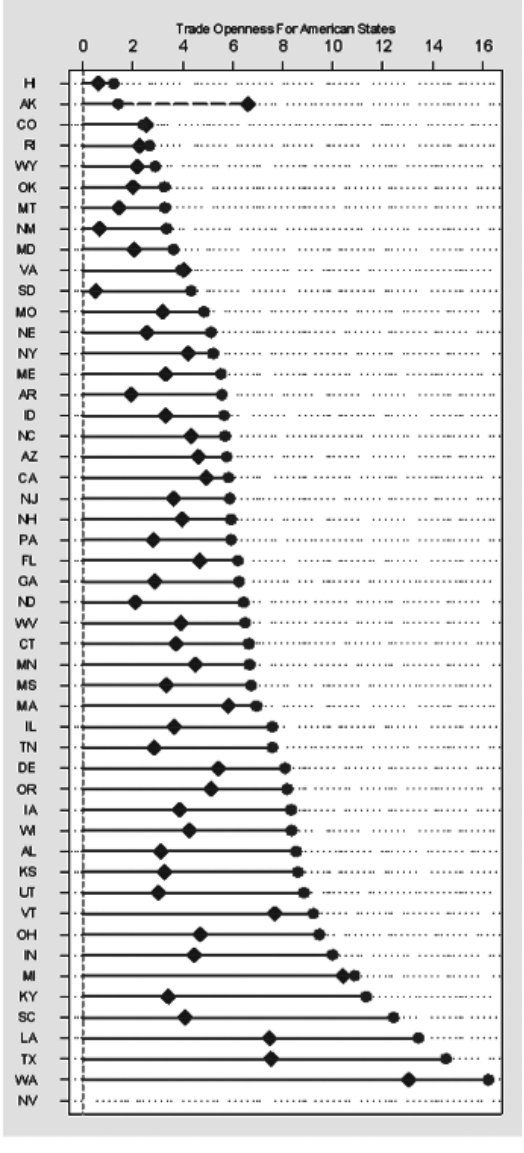
[1] As a matter of fact, state governments do have a basket of policy tools at their disposal that could influence levels of trade, foreign investment and immigration (Krueger and Xu 2015). For instance, states can use corporate tax policies to attract international business and capital into their states instead of neighboring states. Washington, for example, charges no corporate tax, but Pennsylvania charges a 9.9 percent corporate tax rate. States such as Arizona and Mississippi mandate all businesses to check their employees' status and work eligibility with the E-verify programs, while many other states do not have such a requirement written in law. All these different state policies will influence the levels of trade, FDI and immigration in the state.

**FIGURE 1. INCOME INEQUALITY INCREASE FROM 1996 TO 2008 FOR AMERICAN STATES**




**Note: The lines indicate the magnitude of income inequality increases for each state. Income inequality increases is measured by the gap between the 2008 and 1996 Gini coefficients. Data Source: Gini coefficients are calculated based on post-transfer family income from Current Population Survey Annual Social and Economic Supplements (CPS-ASEC).**

**FIGURE 2. TRADE OPENNESS FOR AMERICAN STATES IN 1987 AND 2008**




**Note: The 0-16 scale of the Y-axis refers to the manufacturing export as a percentage of the Gross State Products. The dotted lines with diamonds level of trade openness for 1987, and solid lines with circles indicate the level of trade openness for 2008. Data Source: Trade openness is measured by manufacturing export as a percent of the Gross State Products (GSP). Data are from Foreign Trade Division of the Department of Commerce, U.S. Census.**

significantly contributed to a growing gap between rich and poor during the past three decades.

Secondly, American states play an important role in fighting income inequality. The data show that states with a liberal state government or strong labor unions experience decreases in income inequality. They also show that state-level income inequality is self-correcting; in other words, when state income inequality is at a high level one year, state governments will actively fight it back and lower the level in the next year. These findings verify Kelly and Enns (2010) and Kelly and Witko's (2012) conclusion that states are active and capable in fighting inequality. Findings in this paper show strong evidence that power resource theory applies in the United States, as is also shown in Kelly and Witko's (2012) article. Democratic presidents, liberal (or left-leaning) state governments and strong labor unions can all decrease income inequality. Lastly, considering the fact that inequality data in cross-national studies are hardly ever consistently compiled but inequality data at the subnational level in the U.S. are compiled in a highly consistent manner,[2] findings from this subnational study can shed a more coherent and consistent light on our understanding of the dynamics between economic openness, power resources and income inequality.

In cross-national studies, scholars have long focused their attention on globalization as an explanation for rising inequality (Stolper & Samuelson, 1941; Borjas, Freeman, & Katz, 1992; Wood, 1994; Bernard & Jensen, 1995; Krugman & Venables, 1995; Cline, 1997; Wood, 1998; Feenstra & Hanson, 1999; Cline, 2001; Mahler, 2004; Lemieux, 2008; Jaumotte, Lall, & Papageorgiou, 2009). According to them, trade, foreign direct investment (FDI) into the country, and migration could all possibly lead to shifts of demand and supply of labor and capital, and therefore influence income inequality in one way or the other.

***Trade.*** Using a two-country model, Stolper and Samuelson (1941) argue that trade liberalization will result in increasing income inequality in countries with abundant high-skill high-technology labor. This is because countries with abundant high-skill high-technology labor will mostly export technology-intensive products and import cheap-labor intensive products. Exporting technology-intensive products could poten-

[2] Since countries often use different income definitions and the units could vary from individual to family or even household, it is extremely difficult to obtain comparable data on inequality across countries. This data consistency issue has been notorious for researchers interested in studying income inequality cross-nationally.

tially result in an increase in demand for high-skill labor in these developed countries. Consequently, employment opportunities and wages will increase for high-skill workers. Importing cheap labor-intensive products from developing countries, on the other hand, could result in a decrease in demand for low-skill workers, possibly leading to lowered wages or higher unemployment among them. The gap between the rich and poor as a result will likely enlarge. Countries such as the United States often have their strength in high-skill high-technology industries and therefore will often experience increases in income inequality when trading with developing countries. Autor et al. (2012) described this phenomenon vividly in their 2012 study. According to them, the increasing imports from developing countries, especially China, in recent years caused "higher unemployment, lower labor force participation, and reduced wages in local labor markets that house import-competition manufacturing industries" (Autor et al., 2012, 2121). A direct consequence of trade with China was that many former manufacturing workers in labor-intensive industries were left "unemployed for years, if not permanently" (Thoma, 2012, 1).

Although few studies have examined state-level income inequality, economists have provided ample evidence that the increase of imports from low-skill labor-abundant countries like China and India has led to increases in wage inequality between low- and high-skill workers in the United States (Galbraith & Liu, 2001; Manasse & Turrini, 2001; Miller, 2001; Harrison, 2002; Feenstra & Hanson, 2003; Krugman, 2008; Autor et al., 2012). Based on this micro causal mechanism, we might well conclude that international trade, especially trade with developing countries like China, will lead to increases in income inequality in American states that actively engage in such trade.

***Foreign Direct Investment (FDI).*** FDI could influence income inequality but there are divided opinions about which direction the relationship runs. Jensen and Rosa (2007) point out two mechanisms through which FDI could reduce inequality. First, the capital brought in by foreign investors will likely compete with domestic capital for labor. As a result, the demand for labor will increase, and the returns to capital will decrease compared to returns to labor. Consequently, the income gap between workers in general and the business firms will be abridged. Secondly, if foreign companies primarily hire low-skill workers, the demand of low-skill labor will increase, followed by an increase in their wages. The gap between low-skill workers and other members of the society will consequently decrease. Or, even if foreign companies hire high-skill workers,

the income gap between high-skill workers and capital owners will still be abridged, although the gap between low- and high-skill workers might increase.

Therefore, if the foreign investment primarily hires and benefits low-skill workers, the gap between low-skill workers and other members of the society will decrease, and the gap between capital owners and workers in general will also be reduced, both of which will result in lower income inequality. However, if the foreign investment primarily hires and benefits high-skill workers, the effect of FDI on inequality could be obscure: on the one hand, the demand for high-skill workers will increase, which could lead to a closing gap between high-skill workers and capital owners; on the other hand, the income gap between low- and high-skill workers might increase. Weighing the two arguments and considering the fact that companies do not only hire one type of worker, we see that there is a good chance FDI could decrease income inequality. Therefore, we hypothesize that states with more foreign investment will likely have a lower level of income inequality.

***Immigration.*** Scholars have long found that inequality rises in resource-rich and immigrant-receiving countries, but decreases in migrant-exporting countries (Williamson 1997; Hatton and Williamson 1998). This is because when large numbers of low-skill immigrants flow into resource-rich countries, they could increase the supply of low-skill labor and hence lower the average wages for low-skill workers there. In the US, after the abolishment of the country quota system in the 1960s, the demographics of immigrants into the country have changed dramatically. As of 2010, more than half of the immigrants are from Latin American countries and a third of the newly arrived immigrants are immigrants entering illegally from Central America (Passel, 2005; Card, 2009; Camarota, 2012). Research has also shown that immigrants in the United States on average earn less than native-born Americans and tend to work in low-wage occupations (Borjas, 1994; Hanson, 2004). More recently, Camarota (2012) finds that the median household income for immigrants in 2011 is about 87 percent that of natives, and the median household income for immigrants who arrived to the US after 2000 is only 76 percent that of native-born Americans.

Immigrants with low skills could increase the supply of low-skill labor in the domestic labor market and therefore reduce the wages for the low-skill workers in general. It is estimated that immigrant workers coming to the United States between 1980 and 2000 reduced wages for American

high-school dropouts by 7.4 percent (Lerman, 1999; Borjas, 2004). Native low-skill workers in labor markets with a heavy immigrant presence often experience the sharpest decrease in their wages (Topel, 1994).

Even though high-skill immigrants also exist, especially those who possess high levels of education and stay to start their careers in the United States, they might have contributed to rising income inequality by joining the ranks of those at the higher end of the income distribution. The highly-bifurcated skill sets of immigrants could itself add to the polarization of the incomes between the rich and poor. Alderson & Nielsen (2002), Atkinson (2003), Reed (2001), Lerman (1999) and Card (2009) all find strong empirical evidence that immigrants have contributed to inequality in the United States, even though disagreements remain about the degree of the effect.[3]

In summary, economists and sociologists have examined the effect of globalization on income inequality cross-nationally. By using data from 16 OECD countries, Alderson and Nielsen (2002) have even shown evidence that globalization was one of the reasons income inequality had increased in these countries since the 1970s. More specifically, they find that trade, foreign direct investment, and to a lesser extent migration all contribute to the resurgence of inequality in advanced industrial societies.

Since the 1970s, transnational mobility of people, goods, services, capital and information has shattered many barriers set by national borders (Bosanceanu, 2009). United States has actively engaged in globalization activities such as international trade and foreign investment, as well as migration flows. In 2012, for example, the U.S. imported an equivalent of 2.76 trillion dollars' worth of goods and services and exported about 2.194 trillion dollars of goods and services. In the same year, the U.S. received 157 trillion dollars' investment from other countries and invested 328 trillion abroad. The country also has a historically high level of immigrants, with foreign-born individuals composing 13 percent of its total population. However, thus far, little existing research has examined the effect of globalization factors on state-level income inequality.

In this paper, we apply these theoretical arguments to the American state context and test the following hypotheses. First, if a state heavily engages in manufacturing imports or exports, it will experience rising

[3] Card (2009) finds that immigration explains about 5 percent of the increase of the wage inequality; Lerman (1999) and Atkinson (2003) argue that it explains 10 percent of the growth in earnings inequality; Reed (2001) suggests that immigration explains about 25-40 percent of the regional variance in the growth of Gini between 1969 and 1997.

income inequality. Second, states that have a lot of foreign investment will likely experience a decrease in income inequality. Third, states that receive lots of immigrants could very possibly experience an increase in income inequality because of the bifurcation of immigrants' skills and their impact on the domestic labor market.

**State Politics, Policy and Income Inequality**

Political and institutional factors can also influence income inequality in the United States. In cross-national literature, scholars have proposed the "power resource theory" to connect the distribution of power in society with income distribution and redistribution outcomes (Stephens, 1976; Korpi, 1978; Huber & Stephens, 2001; Bradley et al., 2003; Huber et al., 2006). The core thesis is that the political power of lower and working classes who favor more distribution and redistribution will promote equal economic outcomes. Empirically, scholars find that strong left parties and labor unions represent the lower and working classes' interests, and therefore contribute to more equal distributions through greater social spending, more progressive taxes, higher wages for workers, and more equally distributed social services (Sawyer, 1976; Tufte, 1980; Freeman, 1993; Western, 1995; Huber & Stephens, 2001; Bradley et al., 2003; Card, Lemieux, & Riddell, 2003; Moller et al., 2003; Piketty, 2003; Huber et al., 2006).

In the American context, scholars discover that the Democratic party more often represents the interests of the lower and working classes; and therefore, Democratic politicians are more likely to produce policies that promote income equality. On the national level, Bartels (20r(Y q®08) directly connects lower levels of income equality to Democratic presidents. According to him, Democratic control of the presidency leads to higher income growth for the poor and middle-class, but Republican control of the presidency creates further divergence between the income of the rich and poor. Under Republican presidents, income tax cuts benefit the rich more than the poor, the federal estate tax was gradually phased out and the real minimum wages decreased substantially, all of which contributes to increasing income inequality (Bartels, 2008,197, 225).

There is also a positive relationship between de-unionization and inequality in recent years. Unionization is an important way for workers to bargain collectively for higher wages and better benefits, and therefore could abridge the income gaps between the workers and their employers However, unionization fell the most rapidly after the 1980s and inequality rose at the same time period (Lemieux, 2008). Freeman (1993) and Card

(1992) find that de-unionization accounts for around 20 percent of the increase in wage inequality for US males in the 1980s, while DiNardo et al. (1996) find that de-unionization accounts for a third of the increase in the 90/50 gap between 1979 and 1988.

At the state level, Kelly and Witko (2012) have applied the power resource theory to study state-level income inequality. They argue that both state governments and the federal government could influence income inequality through two mechanisms—distribution through the market and redistribution through the government process. Although the federal government has taken a larger responsibility in redistribution (i.e., the welfare system), states have assumed much more discretion in welfare provisions after the 1996 welfare reform. In addition, state governments could influence income distribution through economic policies such as regulations on wages and salaries (e,g, minimum wage), union formation and labor negotiation power, etc. Kelly and Witko (2012) discover that income inequality tends to be lower in states with a liberal electorate that supports a left party government, or states with a stronger union presence.

Based on the power resource theory, we can conclude that states with more liberal state governments and stronger labor unions will have lower income inequality levels. At the federal level, Democratic presidents should also be associated with lower inequality levels.

**Other Explanations for Rising Inequality in America**

Socioeconomic factors like economic growth, the size of the manufacturing sector, the unemployed population, education levels, the share of racial minorities in the population, and female labor force participation have all been documented by scholarly literature to influence income inequality (Kuznets, 1953; Kuznets, 1955; Dooley & Gottschalk, 1985; Thurow, 1987; Treas, 1987; Rodwin & Sazanami, 1991; Gottschalk, 1997; Nielsen & Alderson, 1997; Bartels, 2005, 2009; Kelly & Witko, 2012). First of all, according to Kuznets (1953, 1955), there is an inverted U-shaped relationship between economic development and inequality. In other words, income inequality increases and then decreases as the economy develops. Based on Kuznets' prediction, inequality should have decreased since the 1970s, but surprisingly it increased substantially in the United States and other developed countries. Therefore, scholars claim that the recent increase of income inequality is a divergence at the right tail of the Kuznets' inverted U-shape (Harrison & Bluestone, 1988; Noah, 2012). Furthermore, scholars like Bartels (2005, 2009) express concerns that the

rising income inequality in the United States is due to the uneven spread of the benefits of economic growth across income groups. Considering that the gains of economic growth disproportionately benefit the top-income group, we can speculate a positive linear relationship between economic development and income inequality after the 1970s in the United States.

Second, as mentioned above, the manufacturing sector is characterized by high productivity and collective bargaining power, and therefore is a more equal sector compared to agriculture and service sectors (Rodwin & Sazanami, 1991; Grant & Wallace, 1994; Benard & Jensen, 1998). Using American county-level data, Nielsen and Alderson (1997) indeed find that manufacturing employment has a negative effect on inequality. Therefore , we posit a negative relationship between the size of the manufacturing sector and state-level inequality.

Third, education levels of the population also influence income inequality. Over the past three decades, the American education system has not kept up with the technological revolution. As a result, the demand for high-skill workers has grown faster than the supply, and their income has grown substantially (Dooley & Gottschalk, 1985; Gottschalk, 1997; Bartels, 2008). On the other hand, workers with low levels of education have also failed to keep up with the technological requirements of today's economy. Empirical research has shown support for such a relationship. For instance, Crenshaw and Ameen (1994) and Nielsen and Alderson (1997) find that the education level of the population influences income inequality, with both high and low levels of education leading to higher inequality. Based on the above argument, I suggest that the shares of high- and low-educated population are both positively related to inequality.

Fourth, as Kuznets (1955) argues, metropolitan areas inherently contain greater inequality because of their greater social and economic diversity. Therefore, we propose that the share of the urban population will have a negative effect on income inequality.

Fifth, the income gap between white and black households has been documented in previous literature (Nielsen & Alderson, 1997). Since African Americans have lower mean incomes than whites, an increase in the black population should be associated with greater dispersion in overall state incomes. Indeed, Kelly and Witko (2012) find that income inequality is higher in states with larger nonwhite populations. Therefore, we anticipate a positive association between the black population and state-level income inequality.

Sixth, Thurow (1987) predicts a positive relationship between unemployment and income inequality, since a high unemployment rate creates more people at the lower ends of the income distribution. From this, we can posit a positive relationship between the size of the unemployed population and inequality.

Lastly, conventional wisdom indicates that more women joining the workforce could lead to widening family income gaps, because high-income and high-educated women tend to marry high-income men. However, Nielsen and Alderson (1997) and Treas (1978) show that female labor force participation—especially the participation of low-income women—has an equalizing effect on family income. We follow Nielsen and Alderson and hypothesize that female labor force participation is negatively associated with state-level income inequality.

## Data and Methods

In order to test which factors explain income inequality, we utilize pooled cross-sectional time-series (CSTS) data from the American states from 1987-2004. We estimate state-level income inequality as a function of three globalization variables—trade, FDI, and migration, as well as a full set of political and socioeconomic controls that are suggested to influence inequality.

### *Dependent Variable*

***Income inequality***. We use Gini coefficients for state-level disposable family income inequality as the measure of the dependent variable. In the robustness check, we also use 90/10, 90/50, and 50/10 income ratios as measures for income inequality. Data on these measures come from Guetzkow, Western, and Rosenfeld (2007) for the period from 1985 to 2003, as well as the author's update of their data from 2004 to 2009 by using the same procedures. These measures are based on an income measure that includes wages, other earnings, and various government transfers and benefits. Since the political and institutional variables included in the models have implications for redistribution (e.g., taxation and welfare policies), it is appropriate to measure income inequality based on an income variable that includes a wide range of income sources, including both wages and income from government sources.

### *Independent Variables*

#### Economic Openness

***Trade.*** Since state-level importation data are not readily available,

we measure trade openness by the percentage of manufacturing exportation in state gross products. This measure is highly correlated with the total manufacturing trade (r=.79) as well as the total trade measure (r=.8). State-level manufacturing exportation data are collected from the Foreign Trade Division of the Department of Commerce in the Census.

***FDI.*** We use the total amount of FDI into the manufacturing sector as a percentage of the state gross product as the measure of FDI, considering that the manufacturing industry is the center of our theoretical argument. Data on foreign direct investment are collected from the Bureau of Economic Analysis (BEA).

***Immigration.*** We use the percentage of foreign-born population as part of the total population in each state as the measure of immigration.[4] Data on foreign-born population are collected from Current Population Surveys for the years 1996 to 2009; for other years, we collect data from the decennial Census and use a linear interpolation procedure to generate values for other years.

***Power Resources***

Based on the power resource theory, political power in favor of the lower and working classes have a negative effect on income inequality. We include three core independent variables to capture this left political power.

***Democratic presidents.*** Bartels (2008) suggests that a Democratic presidency is an important indicator of left political power and resulted in lower inequality in the United States. Therefore, we include partisanship of the presidents as an independent variable, with 0 indicating a Republican president and 1 indicating a Democratic president.

***Left state government.*** Kelly and Witko (2012) find that both the federal government and the state level government influence state-level income inequality. We follow their tradition and use state government liberalism to capture the left political power in state government. This measure was created by Berry et al. (1998).

***Union density.*** Union density, another measure of left political power, measures the percentage of nonagricultural wage and salary employees (including public-sector employees) who are union members. Hirsch (2012) compiled data on union density by using a combination of Bureau of Labor Statistics (BLS) and the Current Population Survey (CPS) data.

[4] This measure not only includes permanent resident immigrants and naturalized citizens, but also temporary legal foreign-born residents and undocumented immigrants.

***Control Variables***

***Real GDP per capita growth.*** We use the real per capita income growth rate as a measure of economic growth, and collect such data from the Bureau of Economic Analysis.

***Manufacturing sector.*** We measure the size of the manufacturing sector by the proportion of manufacturing products in the gross state product. We collect data on this measure from the BEA.

***College graduates.*** We include the percentage of college graduates as a share in a state's population as a control. Data on college graduates are collected from the Census.

***Urban population.*** We include percentage of urban population as a control variable and data on this measure are collected from the Census.

***Black population.*** We include the percentage of the black population as a control variable to estimate the effect of minority population on inequality.[5] Data are collected from the Census.

***Unemployment.*** We include the state unemployment rate as a control variable and data on this variable are collected from the Bureau of Labor Statistics.

***Female labor force participation.*** Following Nielsen and Alderson, we include female labor force participation as a control variable, and have collected data on this variable from the BLS.

***Model Specification***

The panel unit root analyses show evidence that state-level income inequality is a non-stationary process. Therefore, we use the dynamic specifications of the Error Correction Model (ECM) by modeling the first-order change in income inequality as a function of lagged income inequality, a lagged term and a first-order difference term of all the right-hand variables (De Boef, 2001; De Boef & Keele, 2008). An advantage of the ECM is that it captures both the short- and long-run effects of the independent variables on income inequality; in addition, the ECM helps minimize the potential of spurious regressions with the presence of non-stationary time-series data (De Boef & Granato, 1997). I also apply panel-corrected standard errors (PCSEs) to correct panel heteroskedasticity and contemporaneous correlation issues (Beck & Katz, 1995; Beck & Katz, 1996).

[5] We have replaced *Black Population* with *Nonwhite population* in the model and re-run the analyses. The results remain unchanged.

***Empirical Results***

In Table 1, we present the multivariate cross-sectional and time-series (CSTS) estimates for three models when using the Gini coefficient as the dependent variable. In the first model, we include only the control variables; in the second model, we add the three political independent variables (Left state government, union density, and Democratic president), and in the full model (3), we also include three globalization measures-trade, FDI and immigration. Turning to these results, all three models show that the lagged Gini coefficient has a significant and negative effect on the dependent variable, which indicates that a higher state-level inequality in the current time period leads to decreases in inequality in the next time period; therefore, state-level income inequality is self-correcting on the state level.

Turning to the political independent variables, we can see that Model (2) and (3) show consistent findings.

Δ *left state government power* has a negative and significant coefficient (b=-0.012 in both models), indicating that left state government power has an immediate negative effect on income inequality. In other words, a one-unit increase in left state government power this year will result in a 0.012 unit decrease in the dependent variable (i.e., Δ *Gini coefficient*) in the following year. To put it in context, *Gini coefficient* has a range from 27.8 to 48.5 with an average value of 37.5. In Model (3), after controlling for globalization factors, left state government power also has a negative and significant long-term effect. In keeping with De Boef and Keele (2008), we calculate the long-term effect as -0.01.[6] In other words, in the long run, left state government power could also decrease income inequality.

Union density is also shown to have a negative short- and long-run effect on Δ *Gini coefficient* in both Model (2) and (3). By using Model (3) as an example, both Δ*Union density* (b=-0.197) and *Union density* $_{t-1}$ (b=-0.062) have a negative and significant coefficient. Therefore, the short-run effect of union density is -0.197, indicating that a one-unit increase in union density this year will result in a 0.197 unit of decrease in *Gini coefficient.* Again, the average value for *Gini coefficient* is 37.5, and union density varies from 2.8 to 38.7 in all state years. The long-run effect

[6] The long-term effect can be calculated based on the coefficient of Left state government power $_{t-1}$ (b=-0.005) and the coefficient of Gini coefficient $_{t-1}$ (b=-0.487): -0.005/-(-0.487)=-0.01.

of union density is -0.127. The evidence shows that states with a stronger labor union presence will experience decreased inequality in both a short and long run.

At the federal level, Democratic presidency also turns out to have a negative and significant long-run effect on income inequality. The long-run effect is calculated as -2.158. In other words, when a Democratic President is in office, American states will on average have -2.158 points lower Gini coefficient in a long term. All three political variables (left state government power, union density, and Democratic presidency) all provide solid evidence for the power resource theory. Political power representing lower and working classes in the United States can also lower income inequality, just like in European countries.

How about globalization factors? Surprisingly, out of the three key indicators of globalization, only international migration has a significant effect. As one can see, both Δ *Immigration* (b=0.274) and *Immigration* $_{t-1}$ (b=0.084) have a positive and significant effect on the dependent variable. Again, based on De Boef and Keele (2008), the short-run effect of immigration is reflected by the coefficient of Δ *Immigration*, 0.274, which indicates that a one-unit increase in foreign-born population this year increases the Gini coefficient by about 0.274 in the next year. Using DeBoef and Keele's (2008) approach for measuring long-term effects, we calculate the long-term effect of immigration on the Gini coefficient as 0.172.[7]

Turning to the control variables, these three models also show consistent results. The size of the manufacturing industry has a negative and highly significant effect on inequality in the long run (although in the short-run, it seems to have a weakly significant positive effect). The size of the highly-educated population (i.e., percentage of college graduates) has a positive and significant long-run effect on inequality. The size of the Black population has a positive and significant effect on inequality in the long run as well, and female labor force participation could decrease income inequality in the short run and this effect is also statistically significant. All these effects are consistent across three models and within our expectations.

The findings from Model (1) and (2) are largely consistent with our expectation with only two exceptions. First, manufacturing FDI and trade do not seem to significantly influence the state-level Gini coefficient. Sec-

[7] Following DeBoef and Keele (2008), the long-term effect of immigration is: Long term effect = (0.084) / -(-0.487) = 0.172.

**TABLE 1: ECONOMIC OPENNESS, POWER RESOURCES, AND INCOME INEQUALITY IN AMERICAN STATES, 1987-2004**

| | Model (1) | | Model (2) | | Model (3) | |
|---|---|---|---|---|---|---|
| | **Coeff.** | **(SE)** | **Coeff.** | **(SE)** | **Coeff.** | **(SE)** |
| Gini Coefficient $_{t-1}$ | -.329*** | (.036) | -.382*** | (.037) | -.487*** | (.050) |
| Δ FDI | | | | | .004 | (.003) |
| FDI $_{t-1}$ | | | | | -.001 | (.005) |
| Δ Trade | | | | | .074 | (.064) |
| Trade $_{t-1}$ | | | | | .016 | (.018) |
| Δ Immigration | | | | | .274*** | (.081) |
| Immigration $_{t-1}$ | | | | | .084*** | (.017) |
| Δ Left state government power | | | -.012** | (.004) | -.012* | (.005) |
| Left state government power $_{t-1}$ | | | .000 | (.002) | -.005* | (.002) |
| Δ Union density | | | -.082* | (.035) | -.197*** | (.057) |
| Union density $_{t-1}$ | | | -.064*** | (.010) | -.062*** | (.013) |
| Δ Democratic President | | | .057 | (.352) | .032 | (.238) |
| Democratic President $_{t-1}$ | | | -.466* | (.227) | -1.051*** | (.204) |
| Δ Per capita growth | .030 | (.035) | .026 | (.032) | -.048 | (.034) |
| Per capita growth $_{t-1}$ | .025 | (.050) | .038 | (.047) | -.038 | (.054) |
| Δ % Manufacture | .116* | (.059) | .099+ | (.056) | .119+ | (.065) |
| % Manufacture $_{t-1}$ | -.027** | (.009) | -.027*** | (.008) | -.016+ | (.009) |
| Δ % College graduates | .001 | (.000) | .001+ | (.000) | .000 | (.000) |
| % College graduates $_{t-1}$ | .001*** | (.000) | .001*** | (.000) | .001*** | (.000) |
| Δ % Urban Population | .436 | (.301) | .359 | (.274) | .699 | (.602) |
| % Urban Population $_{t-1}$ | -.007+ | (.004) | .002 | (.004) | -.015** | (.005) |
| Δ % Black | -.841* | (.423) | -.375 | (.391) | -.060 | (.438) |
| % Black $_{t-1}$ | .024*** | (.005) | .010* | (.005) | .007+ | (.004) |
| Δ Unemployment rate | .079 | (.093) | .158+ | (.086) | .056 | (.107) |
| Unemployment rate $_{t-1}$ | .014 | (.051) | .130* | (.282) | .062 | (.054) |
| Δ Female labor force participation | -.136** | (.043) | -.137*** | (.282) | -.201*** | (.051) |
| Female labor force participation $_{t-1}$ | -.024 | (.021) | -.031 | (.034) | -.061* | (.029) |
| Constant | 12.191*** | (1.913) | 14.332*** | (1.832) | 22.823*** | (2.215) |
| N | 1550 | | 1550 | | 815 | |
| R-Square | .1783 | | .2194 | | .2964 | |
| Wald Chi-Square | 108.92 | | 144.61 | | 466.28 | |

Significance levels: + 0.10 level, * 0.05 level, ** 0.01 level, *** 0.001 level

ondly, different from what previous literature has suggested, we find that Democratic presidents and percentage of Democratic House Representatives are both associated with a potential to increase state-level income inequality; however, Democratic Senators tend to reduce state-level income inequality. In other words, the hypothesis on the Democratic Party's reducing income inequality only works on the Senate level on a national basis — not that of the House or the President.

To test the robustness of the findings, we have run another set of analyses, in which we use the 90/10, 90/50 and 50/10 income ratios as the dependent variables. The 90/10 income ratio measures the relative income between the top 10$^{th}$ percentile and the lowest 10$^{th}$ percentile income groups in each state. The 90/50 income ratio measures the relative income between the top 10$^{th}$ percentile and the 50$^{th}$ percentile income groups, and the 50/10 income ratio captures the relative income ratio between the 50$^{th}$ percentile and the lowest 10$^{th}$ percentile income groups. All three income ratios can be used to capture income inequality between certain income groups. Turning to the results in Table 2, one can see that most of the findings still hold. In addition, FDI and trade do significantly influence income differentials between income groups. As one can see from Model (1) of Table 2 which has the 90/10 income ratio as the dependent variable, $\Delta FDI,\ Trade_{t-1}$ and $Immigration_{t-1}$ all have significant effects on the 90/10 income ratio. More specifically, *FDI* has a negative short-run effect on the income ratio between the 90$^{th}$ and 10$^{th}$ income percentiles. A one-unit increase in FDI this year will result in a 0.004 unit decrease in the 90/10 income ratio in the following year. Both trade and immigration have a positive and significant effect on the 90/10 income ratio in the long run. The long-run effect is calculated as 0.028 (i.e., 0.015/0.544) for trade and 0.042 (i.e., 0.023/0.544) for immigration. Among the power resource variables, union density and Democratic president both have a negative long-run effect on the 90/10 income ratio. The long-run effect is -0.004 for union density and -0.520 for a Democratic president. Among the control variables, the size of manufacturing and female labor force participation both have negative long-term effects, and percentage of college graduates and unemployment rate both have a positive long-term effect on the 90/10 income ratio.

Turning to Model (2) in which we use the 90/50 income ratio as the dependent variable, it turns out that neither FDI nor trade in the manufacturing sector has a significant effect on the 90/50 income gap.

**TABLE 2: ECONOMIC OPENNESS, POWER RESOURCES, AND INCOME INEQUALITY IN AMERICAN STATES, 1987-2009**

| | (1) 90/10 | | (2) 90/50 | | (3) 50/10 | |
|---|---|---|---|---|---|---|
| | **Coeff.** | **(SE)** | **Coeff.** | **(SE)** | **Coeff.** | **(SE)** |
| Gini Coefficient $_{t-1}$ | -.544*** | (.069) | -.672*** | (.056) | -.625*** | (.074) |
| Δ FDI | -.004*** | (.001) | -.000 | (.000) | -.001*** | (.000) |
| FDI $_{t-1}$ | -.001 | (.002) | .000 | (.000) | -.001+ | (.000) |
| Δ Trade | -.030 | (.029) | .000 | (.006) | -.014 | (.010) |
| Trads $_{t-1}$ | .015* | (.007) | .002 | (.001) | .006 | (.003) |
| Δ Immigration | .077 | (.049) | .014 | (.010) | .011 | (.011) |
| Immigration $_{t-1}$ | .023*** | (.005) | .005*** | (.001) | .004* | (.002) |
| Δ Left state government power | .001 | (.002) | .000 | (.000) | .000 | (.001) |
| Left state government power $_{t-1}$ | -.000 | (.001) | .000 | (.000) | -.000 | (.000) |
| Δ Union density | .001 | (.027) | -.004 | (.004) | .006 | (.010) |
| Union density $_{t-1}$ | -.002*** | (.003) | -.007*** | (.001) | -.002 | (.001) |
| Δ Democratic President | .017 | (.058) | .010 | (.014) | .006 | (.015) |
| Democratic President $_{t-1}$ | -.283*** | (.052) | -.057*** | (.012) | -.064*** | (.013) |
| Δ Per capita growth | -.013 | (.014) | -.005+ | (.003) | -.001 | (.004) |
| Per capita growth $_{t-1}$ | -.029 | (.020) | -.007+ | (.004) | -.006 | (.006) |
| Δ % Manufacture | .031 | (.042) | .004 | (.007) | .006 | (.011) |
| % Manufacture $_{t-1}$ | -.010+ | (.006) | -.001 | (.001) | -.005+ | (.003) |
| Δ % College graduates | .000 | (.000) | .000 | (.000) | .000 | (.000) |
| % College graduates $_{t-1}$ | .000* | (.000) | .000*** | (.000) | -.000 | (.000) |
| Δ % Urban Population | .210 | (.184) | .024 | (.037) | .081 | (.062) |
| % Urban Population $_{t-1}$ | -.001 | (.002) | .000 | (.000) | -.001 | (.001) |
| Δ % Black | -.115 | (.120) | -.042+ | (.024) | -.019 | (.042) |
| % Black $_{t-1}$ | .001 | (.003) | .000 | (.001) | .000 | (.001) |
| Δ Unemployment rate | .000 | (.040) | .001 | (.007) | -.003 | (.014) |
| Unemployment rate $_{t-1}$ | .071* | (.029) | .006 | (.004) | .029* | (.012) |
| Δ Female labor force participation | -.010 | (.020) | -.006+ | (.004) | .003 | (.007) |
| Female labor force participation $_{t-1}$ | -.024*** | (.007) | -.009*** | (.002) | -.001 | (.003) |
| Constant | 5.129*** | (0.663) | 1.924*** | (.167) | 2.055*** | (.352) |
| N | 815 | | 815 | | 815 | |
| R-Square | . 3058 | | .3488 | | .3410 | |
| Wald Chi-Square | 432.21 | | 389.12 | | 720.11 | |

Significance levels: + 0.10 level, * 0.05 level, ** 0.01 level, *** 0.001 level

Immigration has a positive and significant effect on the 90/50 income ratio in the long run. In the long run, immigration increases the 90/50 income ratio by 0.007 (=0.005/0.672). Among the political resource variables, again, union density and a Democratic president both have a negative long-run effect on the 90/50 income ratio, and the long-run effect is 0.010 for union density and 0.085 for a Democratic president. Among the control variables, economic growth has a negative short- and long-run effect that is weakly significant; college graduates have a positive long-run effect; the size of the African American population has a negative long-term effect that is weakly significant. Female labor force participation has a negative short-run effect that is weakly significant and a highly significant negative long-run effect.

When we use the 50/10 income ratio as the dependent variable, FDI again turns out to have a negative short- and long-run effect; a one-unit increase in FDI this year will result in a 0.001 unit decrease in the 50/10 income ratio next year; FDI also has a negative long-run effect which is calculated as 0.002. Immigration has a positive long-run effect, which is calculated as 0.006. Among the political resource variables, only a Democratic president has a negative and significant long-run effect on the 50/10 income ratio. Among the control variables, the size of manufacturing has a negative long-run effect that is weakly significant; unemployment rate has a positive and significant long-run effect.

Overall, all the results show consistent evidence that the globalization factors indeed have an impact on income inequality in the U.S. Immigration has a strong positive effect on income inequality across the board. Trade has also contributed to the enlargement of the income gap between the rich and poor (i.e., the 90/10 income ratio). FDI, however, seems to have a negative and significant effect on the income gaps between the rich and poor, as well as the gap between the middle class and the poor (i.e., 90/10 and 50/10 income ratios).

A few political resource variables turn out to influence income inequality in the United States. For instance, a Democratic president has a negative effect on income inequality across the board.[8] Union density

[8] One may be curious if total trade and total FDI have the same effects as manufacturing trade and FDI on state-level income inequality. I have run the same sets of models with total trade (measured by total amount of export as a percentage of state gross products), total FDI (measured by total amount of FDI as a percentage of state gross products) and immigration. These models have shown similar results and consistent findings. Statistical results of these models can be obtained by contacting the author: pingxu@uri.edu

also decreases inequality measured by the Gini coefficient, the 90/10 and 90/50 income ratios. Left state government power depresses the general income inequality measured by Gini coefficient.

## Summary and Conclusion

This study centers on exploring the determinants of state-level income inequality, with a focus on the globalization factors that have been missing in previous literature and the political power resource factors. There are several interesting findings from this study, as we have just seen.

In addition to what we have indicated, among the control variables, generally speaking, a state with a larger manufacturing sector, a more evenly educated state population, higher levels of urbanization, a lower unemployment rate and a higher female labor force participation will have a lower income inequality.

Atkinson (2003) argues that income distribution is a fairly complicated phenomenon and that a single explanation cannot suffice for all regions and time periods. Globalization factors such as trade, FDI and migration were largely missing in previous studies of income inequality at the American state level. This project fills this gap in the literature and studies the effect of globalization on state-level inequality in different state political environments. Findings of this paper indeed show that the rising income inequality is caused by more than one factor. Globalization, political and demographic environments of a state all serve as credible explanations for the rising income inequality in the United States, at least from my exploration of inequality at the state level. More than anything, scholars interested in income inequality should consider a comprehensive list of explanations while studying determinants of rising inequality. Although this paper considers a relatively comprehensive list of explanations for inequality, it is not without limitations. For example, we did not directly consider the role of technology. The extent to which non-labor-intensive technology penetrates the state economy should have an impact on job displacement for low-skill workers. However, due to data limitation, we only considered this impact indirectly through the education level of the state population. Future studies are encouraged to examine more closely how technology plays a role in income inequality.

What are the political and policy implications of these findings? Under globalization, flows of labor (migration) have had and will continue to have an important effect on the increasing economic disparity

in the United States. Considering that high levels of income inequality could cause social conflicts and instability, the U.S. government may want to consider policies to reduce the gap between low-skill immigrants and other members of the society. American states could try to incorporate immigrants into a wider range of social safety net and possibly remove work barriers for legal low-skill immigrants in order to close the income gap between low-income immigrants and other members of the society. The government may also consider adopting measures to encourage admissions of high-skill immigrants instead of low-skill immigrants.

Those who wish to stimulate the economy, create more job opportunities and reduce income inequality will want to encourage FDI into the United States. Since trade hurts the low-skill manufacturing workers, it is not a good idea to liberalize trade completely considering that trade in the manufacturing sector results in rising income inequality. Although trade openness contributes to more equalized income distributions among countries, it raises income inequality domestically in the United States. Therefore, the U.S. needs to be cautious when liberalizing trade with other countries. The bottom line is that both the national and state governments need to bear in mind some of the detrimental consequences of globalization on domestic economic outcome and consider potential policy solutions before fully embracing it.

Second, this project takes a panoramic view of globalization and examines whether or not trade, FDI and immigration have a different effect on state-level income inequality. In the US, there are divided opinions about globalization, with supporters of the Washington Consensus/ neoliberalism in favor of liberalization of trade, FDI and interest rates, yet anti-globalization individuals dread the negative social and economic consequences resulting from globalization. Results of this paper show that at least some aspects of globalization and economic openness increase the income disparities in the United States, but not all aspects of economic openness do that. By providing answers to whether or not globalization increases domestic inequality, this paper could lend some insight to the debate surrounding globalization. National and state governments in the U.S. could use some caution at least while deciding whether or not to open up the rest of the world.

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