



# WHICH LABOR MARKET INSTITUTIONS REDUCE INCOME INEQUALITY?

*Labor Unions, Prevailing Wage Laws, and Right-to-Work Laws  
in the Construction Industry*



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## Labor Unions, Prevailing Wage Laws, and Right-to-Work Laws in the Construction Industry

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## EXECUTIVE SUMMARY

This joint Research Report by the Illinois Economic Policy Institute and the University of Illinois Labor Education Program analyzes the effects that labor market institutions have on income inequality in the construction industry. The analysis has resulted in the following key findings.

### CAUSES OF INCOME INEQUALITY

- The largest contributor to rising income inequality has been the gradual, long-term decline in labor union membership.
- The union wage premium is between 10 and 17 percent, helping lower- and middle-income workers most.
- Right-to-work laws decrease unionization by between 5 and 8 percentage points and reduce the average worker's earnings by 6 percent in the national economy.

### WHY CARE ABOUT INEQUALITY? CONSIDERING THE COSTS

- Poorer Americans spend a larger share of their incomes in the economy. A redistribution of income to the wealthy *may* reduce aggregate demand in the economy.
- Declining equality of opportunity poses a serious threat to economic growth, as the poor have fewer resources to invest in their own education or in entrepreneurial activity.
- Income inequality may increase the probability of financial crises, lower life expectancy, increase criminal activity and murder rates, and reduce national happiness.

### THE CONSTRUCTION INDUSTRY

- From 2009 to 2011, there were 8.90 million total American residents employed in the construction industry on average, with workers in “construction occupations” averaging to 5.91 million (66.4 percent) and chief executives accounting for about 95,000 of the industry's workers.
- The average construction CEO earned \$131,018 in total income while a typical “construction occupation” worker earned \$36,290.
- 64.2 percent of construction occupation workers had only a high school degree or less while 5.9 percent held at least a bachelor's degree. For CEOs, only 25.4 percent had a high school degree or less while 39.0 percent had a bachelor's or advanced degree.
- The construction industry had 1.24 million labor union members on average from 2009 to 2011, for a three-year union membership rate of 14.0 percent. Union membership in right-to-work states was 4.9 percent.

### CONSTRUCTION WORKER INCOMES

- Women made \$0.91 for every dollar of *total income* that a man earned in construction, compared to \$0.66 per dollar in the national economy.
- The construction industry income premium is highest for workers with less education and is positive for all levels of education except for those with a professional or doctorate degree.
- 49.9 percent of those employed in construction earned a “middle-class” income between \$30,000 and \$85,000.

### LABOR MARKET INSTITUTIONS AND TOTAL INCOME

- In collective-bargaining states with a prevailing wage law, total incomes were higher and more equal. In those worker-friendly states, the average CEO earned 3.35 times more than the typical worker.
- Prevailing wage laws did a good job matching common construction rates to the actual market price of labor, increasing “construction occupation” worker incomes by just 1.2 percent and having no effect on CEO incomes.
- Right-to-work laws decreased “construction occupation” worker incomes by 13.5 percent and CEO incomes by 17.9 percent, likely due to reduced consumer demand in the larger economy.
- Unionization raised “construction occupation” worker incomes by 21.7 percent, aligning with the finding that union productivity is 17 to 22 percent higher than nonunion output.

- A 10 percentage-point increase in a state’s construction industry unionization lowered CEO incomes by 6.4 percent on average in the state. This partially offsets the negative effect that right-to-work laws have on CEO incomes.
- Going up from one level of education to another raises a worker’s total income by 12.5 percent in the industry, about the same benefit as moving from a right-to-work state to a collective-bargaining state.

### LABOR MARKET INSTITUTIONS AND INCOME INEQUALITY

- The top 10 percent of those employed in the construction industry earn *650 to 708 percent more* in annual income than the bottom 10 percent.
- Workers in collective-bargaining states and prevailing wage law states earn higher, more equitable total incomes than their counterparts in anti-worker-policy states.
- For the median worker, employment in a collective-bargaining state yielded a 26.7 percent total income benefit compared to his or her equivalent in a right-to-work state.
- The median worker in a prevailing wage law state experienced a 16.7 percent premium compared to the median worker in a state without a prevailing wage law.
- Right-to-work laws increase inequality metrics by 2.5 to 8.2 percent. This is *in addition to* a decrease in incomes.
- Prevailing wage laws reduce inequality between the highest earners and the lowest earners by 45.1 percent but do not reduce inequality between the top 10 percent and the median worker. This is because the policy lifts more workers into well-paying middle-class jobs but has no negative effect on those at the top.
- Labor unions are the most effective institution at reducing income inequality: a state union membership rate that was 10 percentage points higher reduced income inequality by between 4.7 and 14.5 percent. A half-unionized industry would have 23.6 to 72.4 percent less inequality than an industry with no union members.
- A larger share of construction employment by state and local governments also reduces inequality.

### POLICY IMPLICATIONS

- Jobs in “construction and extraction occupations” are predicted to increase by 21.4 percent from 2012 to 2022.
- STATES SHOULD AVOID REPEALING PREVAILING WAGE LAWS. Indeed, prevailing wage laws should be *strengthened* in some states to cover more construction workers. Prevailing wage rates establish minimum income levels that allow workers to support a family, increase apprenticeship program rates and productivity, have no effect on CEOs of construction firms, and reduce income inequality— helping the poorest workers most.
- CONSTRUCTION UNIONIZATION SHOULD BE ENCOURAGED. Union workers in construction are more productive and earn higher incomes. Unions are also the most effective institution at reducing income inequality.
- IN THE AMERICAN ECONOMY, WAGE FLOORS SHOULD BE ELEVATED TO REDUCE RICH-POOR INCOME INEQUALITY. The prevailing wage law was effective at reducing inequality of the highest earners compared to the lowest earners.
- RIGHT-TO-WORK LAWS SHOULD BE REPEALED TO INCREASE WORKER PRODUCTIVITY AND RAISE WORKER INCOMES. Right-to-work laws reduce construction incomes by 13 percent and the incomes of all American workers by around 6 percent, while having no proven record of stimulating employment growth. By reducing union membership, right-to-work laws increase inequality, reduce worker training, increase workplace fatalities, and have negative effects on state budgets.

### CONCLUSIONS

This report finds that unionization and prevailing wage laws strongly reduce income inequality in the construction industry while right-to-work laws tend to intensify the problem. Ultimately, pro-worker policies are the best strategy for raising worker incomes, increasing consumer demand, and reducing inequality.

## INTRODUCTION

Income inequality in America has risen to levels not seen at any time since the late 1920s. Global economic transformations, changes in the political landscape, new business incentives, and changes in the presence and strength of labor market institutions have all played contributing roles in the rise in inequality. While income inequality has increased for almost all developed economies over the past few decades, the United States has seen the largest increase among advanced nations (Weeks, 2005). This trend toward a larger income gap has caused President Barack Obama to designate income inequality, which he has called the “defining challenge of our time,” as a top priority for his administration in 2014 (*U.S. News*, 2014).

The rise in income inequality has been characterized by exorbitant growth at the very top of the income distribution. Since 1979, pre-tax, post-transfer household income grew by 15.1 percent for the top 20 percent of American households compared to 12.6 percent for the middle quintile and 9.9 percent for the bottom 20 percent. If realized taxable capital gains are included in “income,” the total income of the top quintile expanded by 37.5 percent. While middle- and lower-class household incomes also grew under this definition of income, they increased by a smaller amount— 20.2 percent for the middle quintile and 26.4 percent for the bottom quintile (Armour et al., 2013). Furthermore, the U.S. Congress Joint Economic Committee found that the richest 10 percent of American households accrued 49.7 percent of *total U.S. income* in 2007, up from 34.6 percent in 1980 and topping its 1928 peak of 49.3 percent (U.S. Congress Joint Economic Committee, 2010).

While the Great Recession actually reduced income inequality, the economic recovery has seen the rich once again get richer. The U.S. Congress Joint Economic Committee noted that the share of total income held by the richest 10 percent of households fell slightly in 2008, to 48.2 percent. On a family-level, incomes of the top 1 percent of American families fell by 36.3 percent in real terms from 2007 to 2009 compared to an 11.6 percent fall for the bottom 99 percent (Saez, 2013). Thus, while incomes declined for everyone, the richest Americans lost more *as a share* of their annual incomes, largely due to a dramatic drop in realized capital gains from the stock market crash. This is because the wealthy tend to have a disproportionate share of financial assets and investments compared to the poor; in 2007, the top 1 percent earned 56.2 percent of all capital and business income, up from 31.8 percent in 1979 (Bivens & Mishel, 2013). From 2009 to 2011, however, average real (i.e., inflation-adjusted) incomes increased by a modest 1.7 percent. But the top 1 percent of earners captured 121 percent of these income gains, as their per-family incomes grew by 11.2 percent while the bottom 99 percent actually saw their incomes shrink by 0.4 percent (Saez, 2013).

Various changes to labor market policy have been proposed to address rising inequality and catalyze economic growth. Some economists, lawmakers, and activists have proposed alterations to labor law that would facilitate union organizing efforts. Conversely, others have suggested the opposite approach: encouraging the spread of right-to-work laws in states, which discourage unionization and are claimed to support business activity. Another strategy in the discourse is to implement a wage floor, such as a minimum wage or a living wage, to guarantee that workers earn an income commensurate with the cost of living. These proposals all seek to address income inequality through the strengthening or weakening of labor market institutions.

This joint Research Report by the Illinois Economic Policy Institute and the University of Illinois Labor Education Program analyzes the effects that labor market institutions have on a particular economic sector: the construction industry. Compared to the national economy, the construction industry is characterized by high levels of unionization and high wages which reduce income inequality. Construction also employs a disproportionate share of the type of workers who have been hit hardest by inequality trends— men and those with less than a bachelor’s degree. Finally, while right-to-work laws affect construction workers just like those in any other industry, a unique wage floor policy exists for construction workers on public works projects in some states. The policy— a prevailing wage law or a “common construction wage” law— aims to establish a minimum income by setting wages

and fringe benefits on publicly-financed construction projects at the level of compensation associated with similar work in the community. Prevailing wage laws are designed to augment living standards in communities and ensure that economic development is broadly shared. Each of these distinguishing features renders the construction industry an ideal case study to assess the effects of labor market institutions on income inequality.



The Research Report is broken up into five sections. The first section investigates the causes of income inequality through the lenses of structural changes to the American economy, changes in executive compensation, and changes in labor market institutions. The second considers all the potential and real costs of extreme income inequality. The next two sections provide statistical analyses, with the former detailing data sources and the methodology of the report. The latter presents the results on the effects of labor market institutions on total incomes and income inequality in the construction industry. Finally, the report transitions into a discussion of policy implications from the findings for the construction industry as well as public policy lessons that can be learned and applied to the rest of the economy. The study concludes by recapping key findings.

## 1. CAUSES OF INCOME INEQUALITY

### *Structural Changes in the American Economy*

Many researchers have suggested that structural economic transformations have contributed most to increased income inequality in America. Globalization and increased trade with low-wage countries have created a downward pressure on the wages of occupations which can be easily outsourced but have rewarded workers in high-skilled occupations (Pavcnik, 2011). The shift away from a manufacturing-based to a service-based economy has also been a factor. As a share of the nation's gross domestic product (GDP), manufacturing output has fallen from 17.4 percent in 1980 to 7.5 percent in 2010; meanwhile, inequality has escalated and middle-class jobs have disappeared. With a larger manufacturing component to the economy, America would have more "high-paying, middle class jobs [which] would go a long way towards reducing that polarization of wealth and income" (Dunn, 2012). Finally, the increased dichotomization of jobs into low- and high-skilled occupations is often cited as a factor increasing income inequality (Autor, 2011), although recent research suggests that this polarization is not large enough to affect wage inequality (Mishel et al., 2013). Instead, other factors in the labor market may be even more important.

### *Changes in CEO Compensation*

The rise in income inequality has been characterized by trends in the compensation of chief executives in America. During the recovery, CEO compensation increased to \$14.1 million on average in 2012, up 37.4 percent since 2009 (Mishel & Sabadish, 2013). This finding has been corroborated in another study which noted that total firm value of the top 500 companies in America grew by 19 percent but CEO compensation grew more, by 22 percent from 2009 to 2011 (Gabaix et al., 2012).

Increases in CEO compensation are not inherently bad. If the economy is improving and income growth is widely shared or if the market for CEO productive abilities has gotten more competitive, then rising CEO pay may be efficient (Falato et al., 2012). However, CEO compensation has increased dramatically compared to the average worker. The average CEO earned 29.0 times the amount of his or her workers in 1978, 122.6 times the compensation level in 1995, and 272.9 times greater in 2012. Additionally, CEO compensation was 4.70 times greater than the *rest* of the top 0.1 percent of wage earners in 2010 compared to an average of 3.08 times from 1947 to 1979 (Mishel & Sabadish, 2013). There is also a general lack of association between actual year-to-year firm performance and CEO pay. Instead, firm size (by total assets) and tenure at the firm are the largest statistically significant factors influencing CEO compensation (Lin et al., 2013). These findings have led some researchers to conclude that CEO compensation growth is due mainly to the creation of new “economic rents”—redistributions of income from workers to CEOs through business decisions, changes in corporate governance structures, and tax code adjustments (Bivens & Mishel, 2013).

### *Changes in Labor Market Institutions*

The United States has experienced an era of privatization and deregulation which has seen public policy changes in the labor market contribute to income inequality. Increasingly lax employment laws have led to frequent wage theft violations amongst vulnerable and misclassified low-income workers, transferring money from the poor to the rest of the income distribution (Bernhardt et al., 2009). The expansion of tax cuts and loopholes which have most benefited the well-off have also contributed (Huang & Frenzt, 2012). The declining real value of the minimum wage, which is not pegged to inflation, has further increased inequality (U.S. Congress Joint Economic Committee, 2010), particularly among women (Gordon & Dew-Becker, 2008).

In terms of labor market institutions and their influence on wage and income inequality, by far the largest factor has been the gradual, long-term decline in labor union membership among American workers. In the early 1990s, two leading labor economists found that unions raise worker wages by between 10 and 17 percent (Freeman, 1991; Card, 1992). This union wage premium has held over time (Hirsch & Macpherson, 2006; Schmitt, 2008). Additionally, lower- and middle-class workers have tended to benefit most from unionization. In the 1970s and 1980s, unions raised the wages of the bottom two quintiles by 23 to 32 percent, of the middle quintile by between 13 and 19 percent, and of the fourth quintile by 5 to 7 percent. Only for the top 20 percent of wage earners did unionization lower wages, by 7 to 11 percent (Card, 1992).

In 2008, the union hourly wage premium was 11.9 percent for the average worker nationwide (Schmitt, 2008). But for the first four deciles of the wage distribution (the 10<sup>th</sup>, 20<sup>th</sup>, 30<sup>th</sup>, and 40<sup>th</sup> percentiles), the wage effect was 15.0 to 20.6 percent. The union wage premium was 13.7 percent for the median worker in America and between 6.1 percent and 12.0 percent for the top four deciles. Accordingly, “unions benefit lower- and middle-wage workers most,” helping to reduce wage inequality (Schmitt, 2008). Wage dispersion has also been found to be 25 percent lower in unionized firms than in nonunion workplaces. As a result, in the 1980s and 1990s, unionization reduced wage inequality in the national economy by as much as 10 percent (Freeman, 1996).

The decline of unionization has affected the income distribution of men more than women. The increase in the 50-10 ratio for men (i.e., higher wages at the median compared to the bottom 10 percent of earners) has been found to be caused mainly by shrinking unionization whereas the declining real value of the minimum wage is the main cause of the 50-10 ratio increase for women (Gordon & Dew-Becker, 2008). From 1973 to 1993, declines in union membership explained 10 to 20 percent of the rise in male wage inequality, although unions forestalled increases in wage inequality in the public sector for *both* men and women (Card, 1998). That labor union

weakening has contributed greatly to male wage inequality but had a smaller effect on female incomes is a finding that has held for the economies of both the United States and the United Kingdom (Gosling & Lemieux, 2004).

If declining labor union membership is associated with a decrease in the earnings of lower- and middle-income workers, then policies which reduce unionization are also likely to contribute to the rise in income inequality. One such policy is a right-to-work (RTW) law, which is a state-level policy that prohibits a collective bargaining unit from negotiating union security clauses with an employer to ensure that all beneficiaries of unionization pay a fair share. An early 1983 study reported that union organizing activity is reduced by almost 50 percent in the first five years after passage of a RTW law and by 25 percent in the sixth to tenth years after passage (Ellwood & Fine, 1983). Consequently, union membership rates decline by 5 to 10 percentage points as a result of passage (Ellwood & Fine, 1983). Overall, the accumulation of academic studies finds that RTW laws decrease unionization by between 5 and 8 percentage points (Reed, 2013; Collins, 2012).

Previous studies on the impact that RTW has on earnings are varied and mixed. Many studies show that RTW by itself has no statistically significant impact or a small negative impact on earnings while others estimate an effect as large as an 18.3 percent decrease in worker wages. Due to flawed methodologies in the studies which find increases in wages due to RTW, a comprehensive review suggests that RTW lowers wages by between 0 and 6 percent on average (Manzo et al., 2013). One study found that RTW is associated with a 2.3 percent reduction in worker wages but a 1.9 percent increase in proprietor incomes, indicating that RTW acts as a transfer of income from employees to owners, with little to no trickle-down effect to non-unionized workers (Stevens, 2009).

A 2013 report by researchers at the University of Illinois and the University of Michigan affirms many of these findings (Manzo et al., 2013). The study finds that the union wage premium is 12 to 13 percent for workers in collective-bargaining (non-RTW) states and 10 percent in RTW states. But the policy lowers a state's total union membership rate by 2 to 10 percentage points, indicating that worker wages may fall as a result of union decline. Holding union membership and all other factors constant, however, RTW's distinctive effect is a 6 percent decrease in the earnings of the average worker nationwide. RTW's effect is strongest in industries that are characterized by middle-class wages, high union density, and a significant fraction of male employment: The policy was found to lower manufacturing worker earnings by 9 percent and construction worker earnings by more than 22 percent (Manzo et al., 2013).

Another labor market institution that may affect unions in the construction industry is the presence of a prevailing wage law (PWL) or common construction wage law. PWLs establish minimum standards in labor markets by setting labor costs for publicly-financed projects at levels of income associated with comparable work on projects in the community. Previous studies on PWLs have found that repealing a PWL reduces construction unionization by 1.5 percentage points and lowers the union wage premium by 11.2 percentage points after five years (Kessler & Katz, 2001). Repeal of a PWL has also been found to diminish the construction earnings premium by between 2 and 4 percent (Azari et al., 1993; Kessler & Katz, 2001). Repeal further reduces apprenticeship training by 40 percent, reduces non-white employment in construction, and increases workplace injuries by 15 percent (Philips & Waitzman, 1995). Finally, while early studies indicated that PWLs increase construction costs by between 1.5 and 3.0 percent, they ignored changes in labor hours, productivity, labor-capital substitution, and other factors. More recent, methodologically-sound analyses have found that PWLs have no statistically significant impact on total project costs (Duncan, 2011; Dickson Quesada et al., 2013). This is because only 25 to 30 percent of total construction costs are due to labor costs (Duncan, 2011). A 2 to 4 percent increase in construction wages through PWL rates therefore has only a small impact on total costs, especially if worker productivity is improved, contractors are incentivized to hire more skilled labor, and employers are forced to compete over better management.

In a 2013 study, researchers at the University of Illinois and Michigan State University analyzed the economic and social impacts of PWLs (Dickson Quesada et al., 2013). PWLs were found to increase the cost of public construction projects *at most* by 2 percent, an estimate that does not account for changes in workforce composition, labor productivity, and management practices. Due to decreased consumer demand, repeal of the PWL in Illinois, for example, would result in about 3,300 net jobs lost in the state economy, \$1 billion in lost state GDP, a \$365 million decline in construction worker earnings, and \$44 million in lost state and local tax revenues annually—effects which mostly harm lower- and middle-income workers. The study also finds that PWLs support construction apprenticeship programs (with apprenticeship participation rates that are 1.7 to 1.9 times those of non-PWL states) and that PWLs do not reduce African-American participation in construction (Dickson Quesada et al., 2013). Each of these findings suggests, but does not definitively reveal, that PWLs may reduce income inequality in a state’s economy.

## 2. WHY CARE ABOUT INEQUALITY? CONSIDERING THE COSTS

The confluence of economic and policy changes has caused income to be distributed more unevenly over time in America. But inequality is not *necessarily* bad. Workers need incentives to work hard, to invest in their own human capital, and to be entrepreneurial. At some threshold, though, the marginal benefit from these incentives is less than the marginal costs in terms of declining wages, reduced consumer demand, diminished equality of opportunity, social unrest and psychological costs, and other issues.

Potentially the biggest threat derived from economic inequality is that poorer Americans spend larger shares of their incomes in the economy. If economic and policy changes have made the rich richer and the rest of Americans poorer, then the wealth redistribution may have real implications on national consumer demand. Indeed, multi-source evidence from the Panel Survey of Income Dynamics, the Survey of Consumer Finances, and the Consumer Expenditure Survey demonstrates that a \$10,000 increase in income is associated with 1 to 7 percentage point increase in a household’s *savings* rate (Dynan et al., 2004). Among households in which the primary earner is 40 to 49 years old, median savings rates range from -23 percent for the lowest quintile to 46 percent for the highest quintile. Since the rich do save more and marginal propensities to consume vary significantly based on income, “government policies that redistribute across income groups can have real effects on saving” and consumer demand (Dynan et al., 2004). Furthermore, from 1980 to 2007, consumption inequality largely mirrored income inequality: during that time, after-tax income inequality increased by 33 percent while consumption expenditures grew more unequal by between 17 and 28 percent (Aguiar & Bils, 2011). At some point, extreme income inequality likely increases consumption inequality by so much that the effect on total consumer demand is negative, resulting in job losses throughout the economy.

Declining equality of opportunity also poses a serious threat to economic growth. With great income disparity, opportunity is polarized, and the poor have fewer resources to invest in their own education or in entrepreneurial activity (Berg & Ostry, 2011; Kruger, 2012; Stiglitz, 2013). Those with less access to opportunities or who are credit-constrained are disadvantaged in free-market economies. In addition, class mobility stagnates with more income inequality. Less upward mobility for the least-advantaged in America combined with a higher likelihood that children of the richest parents end up at the top of the income distribution translate into low intergenerational mobility, which “changes opportunities, incentives, and institutions—shifting the balance of power” (Corak, 2013). Low intergenerational class mobility means that the talents of many go unrealized, increasing economic inefficiency (Kruger, 2012; Stiglitz, 2013).

Extreme income inequality can have real social repercussions (Stiglitz, 2013). While Barro (1999) suggested that there is a tradeoff in developed countries between more redistributive equality and more GDP growth, recent

research has found that income inequality may be harmful to economic growth by increasing the probability of financial crises (Rajan, 2010; Berg & Ostry, 2011). Income inequality has also been shown to be correlated with lower life expectancy and higher mortality rates (Deaton, 2003); worse health outcomes may deteriorate aggregate worker productivity. Recent evidence suggests that income inequality increases the level of crime, activity that is economically inefficient and costs taxpayer dollars (Chintrakarn & Dierk, 2012). In fact, there is a 35 percent correlation between income inequality and murder rates in urban areas (Glaeser et al., 2008). In urban America, “income growth and population growth is lower in places where the income distribution is particularly unequal” once education and skills are accounted for” (Glaeser et al., 2008).

Finally, research on economic growth and personal satisfaction has found that rising national income is strongly associated with increased national happiness, but that greater income inequality reduces aggregate wellbeing. Since 1990, the “inequality of happiness” has worsened by 4.1 percent nationwide, including by 6.9 percent for females, 0.9 percent for white residents, and a significant 43.6 percent for African-American residents (Dutta & Foster, 2011). For every decade since the 1970s, the South has had the greatest happiness disparity in America, likely due to lower wages and incomes. Other researchers find that taking a dollar from a rich person and giving it to a poor person results in an aggregate wellbeing gain because the benefit to the poor individual exceeds the loss to the rich person (Sacks et al., 2012). Since the goal of economic policy is to maximize happiness (or “utility”), societies may thus be able to become *more* efficient through policy changes which increase equality.



### 3. DATA AND METHODOLOGY

This report predominately utilizes data from the Integrated Public Use Microdata Series (IPUMS-USA) for 2009, 2010, and 2011. The datasets are derived from the American Community Survey (ACS) 5-year sample from 2007-2011 by the United States Census Bureau, include a 5.0 percent sample of the national population, and can be statistically weighted to match the American population (Ruggles et al., 2010). Because the ACS provides annual data compared to the decadal nature of the Census, it “help[s] determine how more than \$400 billion in federal and state funds are distributed each year” (U.S. Census Bureau, 2013). The data was extracted from the user-friendly Minnesota Population Center from the University of Minnesota (Ruggles et al., 2010).

The IPUMS-USA dataset is remarkably large, capturing 4,116,780 total observations of employed persons in America. For the construction industry alone, there are 246,847 observations of employed individuals with reported earnings. The dataset also allows for analyses of total income— a respondent’s total pre-tax personal income or losses from all sources— and the effect of demographic, geographic, educational attainment, and other work variables on total income. Because the ACS does not ask about labor unions, IPUMS-USA records do not include a variable for union membership or coverage. Yet unionization is an important determinant of worker

income and income inequality, so union membership probabilities by state from Hirsch and Macpherson's "Union Membership and Coverage Database" are coded into the dataset for each worker. Hirsch and Macpherson's union data is from the Current Population Survey's Outgoing Rotation Group (CPS-ORG) series. Though not a one-for-one measure of unionization's effect on an individual worker due to potential sampling errors, the state-level union probability variable allows for a dependable estimate of unionization's impact on incomes and income equality for three reasons: First, as long as Hirsch and Macpherson's estimates are correct, then union probabilities should mirror the larger population. Second, the statistical analyses in this paper report the effect of a 100 percentage point change in the probability of being a union member (i.e., the effect of actually being a union member compare to not being one) on the dependent variable. Finally, the probability measure helps to pinpoint the effect of industry unionization on the incomes of CEOs, who by law cannot be union members.

The analysis conducted employs a statistical approach which aims to account for unmeasured characteristics, parsing out the actual causal effect that unionization, right-to-work laws, and prevailing wage laws have— or do not have— on worker incomes and income inequality. The empirical strategy, an ordinary least squares (OLS) regression model, is run three times: one evaluating the correlation of unionization, PWLs, and RTW on total incomes; a second evaluating their effects after controlling for demographic, educational, and work factors; and a third time to include 24 distinct occupations. The models are run on five dependent variables: the total incomes of all workers in the construction industry, the total incomes of "construction occupation" workers in the industry, the total incomes of CEOs and other executives in the industry, and two income inequality indices (the 90-10 ratio and the 90-50 ratio). All regressions can be found in the Appendix.

### *Limitations*

There are four limitations to the analysis which follows. First, prevailing wage laws vary significantly by state. The "strength" of a PWL depends on at least four categories: threshold contract amounts, types of contracts covered, the methods for setting rates, and the breadth of work covered (Dickson Quesada et al., 2013). In this analysis, PWL is simply a dummy variable: a value of 1 indicates that the respondent worker is employed in a state with a PWL while a 0 means that he or she works in a state without a PWL. There is no accounting for PWL strength.

Second, the period of analysis, 2009 to 2011, was characterized by both labor market bust (2009 to parts of 2010) and recovery (parts of 2010 to 2011) in the national economy. While the dataset is remarkably large and allows for robust analysis, findings from this period may not necessarily hold for other three-year periods distinguished by strong economic growth.

Third, the measure of income used is "total income," a respondent's total pre-tax personal income or losses from all sources. Total income includes money from sources such as business income and social programs, not strictly from salaries and hourly wages. However, given that the construction industry tends to raise low-income worker wages and reduce inequality (as demonstrated in the next section), income received from social programs such as food stamps and welfare is minimal. Additionally, total income is utilized both because CEOs earn considerable portions of their pre-tax income from "business income" and investments and because self-employment is common in the construction industry. Annual wage and salary income or hourly wage rates are other possible measures to use in gauging income inequality, as are post-tax calculations.

Finally, in this study, 90-10 and 90-50 ratios (explained in the next section) for each state in each year are calculated and then assigned to individual respondent workers who lived in that state in that year. For individual observations, these inequality ratios are therefore actually state-level indices but nevertheless allow for assessment of the association that certain factors have on income inequality.

## 4. FINDINGS

### *Descriptive Statistics*

Table 1 provides an occupational breakdown of employed workers in the construction industry from 2009 to 2011. The American Community Survey statistics are sorted into 24 aggregated occupational groups defined by the U.S. Census Bureau. “Construction occupations” include typical blue-collar construction jobs such as first-line supervisors, boilermakers, carpenters, pipefitters, operating engineers, highway maintenance workers, laborers, electricians, and related occupations. For a full breakdown of jobs described as “construction occupations,” please see Table A in the Appendix.

From 2009 to 2011, there were 8.90 million total American residents employed in the construction industry on average each year (Table 1). Workers in “construction occupations” amounted to 5.91 million (66.4 percent) of this total and there were just over 95,000 chief executives (1.1 percent) of construction firms and organizations. Manager occupations (11.3 percent), office administration and support occupations (5.5 percent), maintenance and repair occupations (5.2 percent), and transportation and moving occupations (2.7 percent) were also large components of the construction industry workforce, accounting for about one-fourth of all construction jobs. Production, architecture and engineering, sales, and all other occupations combined made up the remaining 6.7 percent of the construction workforce.

TABLE 1: OCCUPATIONAL BREAKDOWN OF EMPLOYED WORKERS, CONSTRUCTION INDUSTRY, 2009-2011

| Occupation                                    | Weighted N= | Percentage |
|---|-------------|------------|
| <i>Total Employees</i>                        | 8,899,428   | 100.00%    |
| Construction occupations                      | 5,905,378   | 66.36%     |
| CEOs  | 95,193      | 1.07%      |
| Manager occupations                           | 1,005,007   | 11.29%     |
| Office administration and support occupations | 487,968     | 5.48%      |
| Maintenance and repair occupations            | 461,258     | 5.18%      |
| Transportation and moving occupations         | 237,968     | 2.67%      |
| Production occupations                        | 165,267     | 1.86%      |
| Architecture and engineering occupations      | 130,596     | 1.47%      |
| Sales occupations                             | 94,524      | 1.06%      |
| All other occupations                         | 201,543     | 2.26%      |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. The total number of observations of persons employed the construction industry was 247,469. Responses are weighted to match the actual national population.

Descriptive statistics of employed construction workers in the United States from 2009 to 2011 are presented in Table 2, itemized by educational attainment, income, work, and demographic characteristics. From 2009 to 2011, the construction industry typically paid a middle-class wage of \$35.84 per hour to the average employee (this includes workers of all occupations, as shown in Table 1). Due to the pervasiveness of short-term, part-time work and the seasonal nature of construction projects, this translated to an average annual total income of \$43,730 in the industry. Only 67.2 percent of those employed in the construction industry received any health insurance (Table 2).

The comparison between contractor chief executives and “construction occupation” workers is striking. The average CEO earned an hourly wage or salary of \$109.02 per hour and took home \$131,018 in total annual

income from 2009 to 2011. Over 9 in 10 of CEOs (92.4 percent) were covered by a health insurance policy in those three years. By contrast, construction occupation workers made \$28.97 per hour on average and earned \$36,290 in total income; just 6 in 10 workers (59.1 percent) had health insurance (Table 2).

TABLE 2: DESCRIPTIVE STATISTICS OF EMPLOYED WORKERS, CONSTRUCTION INDUSTRY, 2009-2011

|                                    | Total Construction Industry | Construction Occupations | CEOs         |
|------------------------------------|-----------------------------|--------------------------|--------------|
| Observations                       | 247,469                     | 158,895                  | 2,889        |
| Weighted N=                        | 8,899,428                   | 5,905,378                | 95,193       |
| <i>Income Characteristics</i>      |                             |                          |              |
| Total income                       | \$43,729.90                 | \$36,290.41              | \$131,017.90 |
| Hourly wage/salary                 | \$35.84                     | \$28.97                  | \$109.02     |
| Has health insurance               | 67.19%                      | 59.12%                   | 92.41%       |
| • By employer                      | • 53.52%                    | • 45.87%                 | • 71.89%     |
| <i>Work Characteristics</i>        |                             |                          |              |
| Self-employed                      | 25.56%                      | 26.74%                   | 52.64%       |
| Federal government                 | 0.42%                       | 0.19%                    | 0.06%        |
| Local government                   | 2.97%                       | 2.82%                    | 0.46%        |
| State government                   | 1.48%                       | 1.37%                    | 0.05%        |
| Private firm                       | 68.22%                      | 67.59%                   | 45.79%       |
| Nonprofit                          | 1.12%                       | 1.10%                    | 0.71%        |
| Prevailing wage state              | 68.33%                      | 68.83%                   | 63.76%       |
| Right-to-work state                | 44.00%                      | 43.98%                   | 43.55%       |
| Usual hours worked                 | 40.65 hours                 | 39.83 hours              | 47.37 hours  |
| <i>Demographic Characteristics</i> |                             |                          |              |
| Age                                | 41.39                       | 40.11                    | 49.55        |
| Head of household                  | 53.52%                      | 50.40%                   | 66.13%       |
| Married                            | 59.93%                      | 56.50%                   | 83.50%       |
| White                              | 67.54%                      | 61.60%                   | 88.23%       |
| African-American                   | 5.05%                       | 5.22%                    | 2.17%        |
| Asian                              | 1.68%                       | 1.37%                    | 2.00%        |
| Latino/a                           | 23.95%                      | 29.98%                   | 5.96%        |
| Immigrant                          | 23.73%                      | 29.20%                   | 10.16%       |
| Female                             | 9.14%                       | 2.24%                    | 11.03%       |
| Male                               | 90.86%                      | 97.76%                   | 88.97%       |
| Veteran                            | 8.59%                       | 7.86%                    | 10.98%       |
| Lives in a city                    | 12.76%                      | 13.72%                   | 8.79%        |
| <i>Educational Attainment</i>      |                             |                          |              |
| In school                          | 3.73%                       | 3.49%                    | 1.19%        |
| Less than high school              | 17.28%                      | 22.05%                   | 3.74%        |
| High school                        | 38.66%                      | 42.09%                   | 21.67%       |
| Some college                       | 22.53%                      | 20.51%                   | 25.73%       |
| Associate's                        | 6.23%                       | 4.98%                    | 8.74%        |
| Bachelor's                         | 9.69%                       | 5.08%                    | 29.46%       |
| Master's                           | 1.67%                       | 0.63%                    | 8.03%        |
| Professional or doctorate          | 0.33%                       | 0.16%                    | 1.53%        |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

Work characteristics are largely uniform across the construction industry, regardless of occupation. About 95 in every 100 American residents employed in the construction industry worked for a private firm, nonprofit organization, or were self-employed from 2009 to 2011, a finding which holds for both CEOs and construction occupation workers. In addition, about two-thirds of the industry (68.3 percent) were employed in a state with a prevailing wage law while just over two-fifths (44.0 percent) were employed in a state with a right-to-work policy in place. The only major divergence between CEOs and construction occupation workers is in reported usual hours worked each week: CEOs said they usually worked 47.4 hours during the week while construction occupation workers reported that they worked 39.8 in a usual workweek (Table 2).

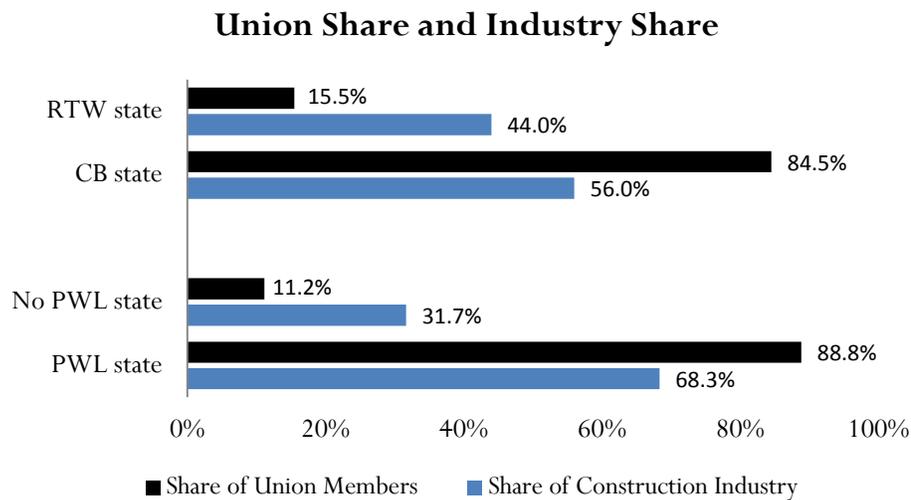
CEOs were generally older, more white, more native-born, and more suburban or rural than both construction occupation workers and the average employee in the industry. Interestingly, CEOs also had a higher propensity to be married than the rest of the industry and included a higher percentage of females than construction occupation workers. Finally, CEOs were, not surprisingly, higher-educated than the rest of the industry or than construction occupation workers. In the entire construction industry, 55.9 percent of the workforce had only a high school degree or less while 11.7 percent held at least a bachelor’s degree. For construction occupation workers, the comparable shares were respectively 64.2 percent and 5.9 percent. However, only 25.4 percent of CEOs had a high school degree or less while 39.0 percent had a bachelor’s or advanced degree (Table 2).

TABLE 3: CONSTRUCTION INDUSTRY UNIONIZATION, 2009-2011

| Union Membership Rate        | Weighted N= | Union Membership Rate | Union Members | Share of Union Members |
|------------------------------|-------------|-----------------------|---------------|------------------------|
| Total construction industry  | 8,899,428   | 13.96%                | 1,242,054     | 100.00%                |
| Right-to-work state          | 3,915,792   | 4.91%                 | 192,279       | 15.48%                 |
| Collective-bargaining state  | 4,983,646   | 21.06%                | 1,049,775     | 84.52%                 |
| No prevailing wage law state | 2,818,658   | 4.92%                 | 138,667       | 11.16%                 |
| Prevailing wage law state    | 6,080,770   | 18.15%                | 1,103,387     | 88.84%                 |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011; Hirsch and Macpherson’s Union Membership and Coverage Database (2013). The total number of observations of persons employed the construction industry was 247,469. Responses are weighted to match the actual national population.

FIGURE 1: UNION SHARE AND INDUSTRY SHARE, 2009-2011



Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011; Hirsch and Macpherson’s Union Membership and Coverage Database (2013).

The construction industry as a whole had 1.24 million labor union members on average from 2009 to 2011, for a three-year union membership rate of 14.0 percent (Table 3). Industry unionization, however, differed starkly across states by the presence of right-to-work and prevailing wage laws. In states with prevailing wage laws (PWLs), 18.1 percent of construction workers were unionized. By contrast, only 4.9 percent of construction workers were union members in states without a PWL (Table 3). In addition, the unionization rate was 21.1 percent in collective-bargaining (CB) states compared to 4.9 percent in right-to-work (RTW) states. Consequently, even though RTW states accounted for 44.0 percent of all construction workers, just 15.5 percent of all construction union members resided in RTW states (Figure 1).

### *Construction Worker Incomes*

A disaggregated comparison of total incomes in the construction industry to the national workforce produces disparate and surprising findings. First, men employed in the construction industry earned 20.9 percent less than the average workingman in America. This finding is due largely to the fact that construction workers tended to have lower educational attainment levels and fewer work hours than the general workforce. Nevertheless, for women, employment in the construction industry yielded an 8.4 percent total income *premium* compared to the typical workingwoman. As a result, the male-to-female income gap was far smaller in the construction industry: women earned \$0.91 for every dollar of total income that a man made in construction compared to \$0.66 per dollar in the national economy (Table 4).

Similarly, total incomes, uncontrolled for education, tended to be lower for construction workers across racial or ethnic identification than their counterparts in the rest of the economy. For Caucasians, Latinos or Latinas, and Asians or Pacific Islanders, the construction industry produced total incomes that were 4.5 to 6.1 percent less than the comparable national average. On the other hand, African-Americans saw a 2.8 percent income premium by working in the construction industry (Table 4).

In addition, though women only comprised 9.1 percent of the construction workforce, women of each racial or ethnic group benefitted from employment in the industry. For white women, the income premium was 4.7 percent from 2009 to 2011. Non-white females fared even better: African-American women earned 20.5 percent more than their counterparts in the national economy while Latinas made 17.0 percent more and Asian or Pacific Islander women earned 12.6 percent more (Table 4). Each of these total income gains illustrates how the construction industry contributes toward a more equal national economy.

However, when total incomes are correlated by level of educational attainment, the construction industry increased worker incomes nearly across the board, and particularly by more for those with lower levels of education. For workers with less than a high school education, working in the construction industry returned 31.0 percent more income than the average worker with the same level of education. The construction industry premium was also nearly one-fourth for those with a high school degree and with some college training but no degree. The premium benefit to working in construction was 15.4 percent for American residents with an associate's degree, 11.4 percent for those with a bachelor's degree, and 12.8 percent for those with a master's degree. Only for workers with a professional (J.D., M.D., etc.) degree or a doctorate did employment in the construction industry produce total incomes that were lower than the national average for people with the same educational credentials (-28.3 percent) (Table 4).



TABLE 4: TOTAL INCOME BY DEMOGRAPHIC VARIABLE, CONSTRUCTION INDUSTRY VS. U.S. EMPLOYED WORKERS, 2009-2011

| Variable                         | Construction Industry | U.S. Employed Workers | Difference     |
|----------------------------------|-----------------------|-----------------------|----------------|
|                                  | Total Income          | Total Income          | Income Premium |
| <i>Gender</i>                    |                       |                       |                |
| Male                             | \$44,000              | \$55,615              | -20.88%        |
| Female                           | \$39,915              | \$36,823              | 8.40%          |
| Female-to-Male                   | \$0.91 per dollar     | \$0.66 per dollar     |                |
| <i>Race or ethnicity</i>         |                       |                       |                |
| White, non-Latino                | \$49,152              | \$51,466              | -4.50%         |
| African-American                 | \$36,907              | \$35,915              | 2.76%          |
| Latino/a                         | \$29,275              | \$31,035              | -5.67%         |
| Asian or Pacific Islander        | \$50,774              | \$54,068              | -6.09%         |
| <i>Women</i>                     |                       |                       |                |
| White, non-Latino                | \$40,837              | \$39,022              | 4.65%          |
| African-American                 | \$39,745              | \$32,972              | 20.54%         |
| Latino/a                         | \$31,263              | \$26,713              | 17.03%         |
| Asian or Pacific Islander        | \$50,553              | \$44,893              | 12.61%         |
| <i>Educational attainment</i>    |                       |                       |                |
| Less than high school degree     | \$28,067              | \$21,428              | 30.98%         |
| High school degree               | \$39,910              | \$32,586              | 22.48%         |
| Some college degree              | \$46,145              | \$36,322              | 27.05%         |
| Associate's degree               | \$50,152              | \$43,447              | 15.43%         |
| Bachelor's degree                | \$70,757              | \$63,502              | 11.42%         |
| Master's degree                  | \$90,488              | \$80,236              | 12.78%         |
| Professional or doctorate degree | \$91,343              | \$127,399             | -28.30%        |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. The total number of observations of persons employed the construction industry was 247,469. The total number of observations of all employed persons in all industries was 4,116,780. Responses are weighted to match the actual national population.

The construction industry premium becomes smaller as higher levels of educational attainment are achieved, but nonetheless remained positive except at the highest credential. This translated into both higher incomes for workers in the industry *and* a more equitable distribution of total earned income. For instance, construction workers with a high school degree made \$7,324 more than the national average for people holding a high school degree while the comparable figure was \$7,255 more for bachelor's degree holders. For both cases, average total incomes are raised. However, bachelor's degree holders earned 1.77 times the amount of those with a high school degree or equivalent in the construction industry compared to 1.95 times in the American labor market (Table 4).

Table 5 presents the relative compression of income in the construction industry compared to the total employed population in America. As a percentage of the American workforce, 27.7 percent of workers earned \$19,999 or less in total income, 45.1 percent earned \$30,000 to \$85,000, and 5.5 percent earned \$120,000 or more from 2009 to 2011. Comparatively, during that time, 24.1 percent of construction industry employees earned \$19,999 or less, 49.9 percent earned a "middle-class" income between \$30,000 and \$85,000, and 3.5 percent earned \$120,000 or more. Additionally, while the average total income of the economy (\$46,733) exceeds the average for the construction industry (\$43,730), the median construction industry worker earned slightly more (\$34,000) than the median worker in the entire labor market (\$33,700). Together, these numbers substantiate the notion that construction wages were distributed more evenly than in the rest of America (Table 5).

TABLE 5: CONSTRUCTION PREMIUM BY INCOME LEVEL, CONSTRUCTION INDUSTRY VS. U.S. EMPLOYED WORKERS, 2009-2011

| Total Incomes          | Construction Industry | Employed U.S. Population |
|------------------------|-----------------------|--------------------------|
| \$19,999 or less       | 24.12%                | 27.69%                   |
| \$20,000 to \$39,999   | 33.38%                | 29.52%                   |
| \$40,000 to \$59,999   | 20.88%                | 18.79%                   |
| \$60,000 to \$79,999   | 10.73%                | 10.23%                   |
| \$80,000 to \$99,999   | 4.88%                 | 5.19%                    |
| \$100,000 to \$119,999 | 2.49%                 | 3.04%                    |
| \$120,000 or more      | 3.52%                 | 5.54%                    |
| Average                | \$43,730              | \$46,733                 |
| Median                 | \$34,000              | \$33,700                 |
| \$30,000 to \$85,000   | 49.93%                | 45.13%                   |
| Observations           | 246,847               | 4,116,780                |
| Weighted N=            | 8,880,958             | 141,063,496              |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

### *Labor Market Institutions and Total Income*

To evaluate the effect of established labor market policies on worker incomes and income inequality, simple averages of construction worker total incomes are calculated. Table 6 dissects average total incomes for construction occupation workers and CEOs in four states: RTW states without a PWL, RTW states with a PWL, CB states without a PWL, and CB states with a PWL. A ratio of CEO income compared to construction occupation workers is also reported, to understand how the combinations of policies may have increased or decreased inequality.

The cursory results are somewhat mixed but nevertheless revealing. For individuals who lived in states that are hostile to workers in all industries— RTW states without a PWL— total income levels were depressed. In those states, construction occupation workers earned just \$31,963 in total income from 2009 to 2011. Meanwhile, construction CEOs earned 3.77 times the amount of their typical construction occupation worker (or 276.8 percent more) at \$120,441. For those in states most friendly to workers— CB states with a PWL— total incomes were both higher and more equal. Construction occupation workers took home \$40,032 annually while CEOs earned 3.35 times more (235.3 percent more) at \$134,221, still above the average for their counterparts in RTW states without a PWL. Interestingly, contractor chief executives earned most in states with PWLs (Table 6).

TABLE 6: AVERAGE TOTAL INCOMES OF CONSTRUCTION OCCUPATIONS AND CEOs BY STATE “LABOR FRIENDLINESS,” 2009-2011

| Total Income                       | Construction occupations | CEOs             | CEO-to-worker ratio |
|------------------------------------|--------------------------|------------------|---------------------|
| RTW, no PWL                        | \$31,963                 | \$120,441        | 3.768               |
| RTW, PWL                           | \$31,389                 | \$142,994        | 4.556               |
| CB, no PWL                         | \$36,075                 | \$157,611        | 4.369               |
| <b>CB, PWL</b>                     | <b>\$40,032</b>          | <b>\$134,221</b> | <b>3.353</b>        |
| <i>Total construction industry</i> | <i>\$36,290</i>          | <i>\$131,018</i> | <i>3.610</i>        |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. The total number of observations of persons employed the construction industry was 247,469. Responses are weighted to match the actual national population.

These averages suggest that states with strong, pro-labor institutions may benefit both workers and CEOs while reducing income inequality. But it is critically important to account for other factors that may impact incomes and inequality, such as union membership, worker education, demographics, and sector of employment. To understand the actual and unique effects of labor market institutions on incomes and inequality after accounting for other factors, a regression analysis is carried out. The full regression analysis for all workers in the construction industry is available in Table B of the Appendix.

A simple correlation between labor market institutions and total income shows that RTW laws lowered incomes of those employed in the construction industry while being a union member raised total incomes. Without controlling for a confluence of factors that may determine an employed person’s income, PWLs at first glance seem to have lowered incomes in the construction industry. However, when demographics, work characteristics, educational attainment, and yearly trends are accounted for, true causal effects are revealed. In the full model, PWLs are found to have increased worker incomes by between 1.6 and 1.7 percent and RTW laws decreased industry incomes by between 12.6 and 13.1 percent (Table 7).

TABLE 7: REGRESSION RESULTS OF LABOR MARKET INSTITUTIONS ON TOTAL INCOME, CONSTRUCTION INDUSTRY, 2009-2011

| Total Income        | Simple Model | Full Model, No Occupations | Full Model, with Occupations |
|---------------------|--------------|----------------------------|------------------------------|
| Prevailing wage law | -3.48%***    | 1.70%***                   | 1.61%***                     |
| Right-to-work law   | -12.85%***   | -13.07%***                 | -12.61%***                   |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: See Table B in the Appendix.

Education is a key determinant of income in the construction industry (Table 8). Holding all else constant including occupation, workers with less than a high school degree earned 16.5 percent less than those with a high school degree. An apples-to-apples assessment of workers shows that, compared to those with a high school degree, college-level education is beneficial: workers with some college but no degree earned 9.7 percent more, those with associate’s degrees made 13.1 percent more, bachelor’s degree holders earned 25.2 percent more, and industry employees with advanced degrees took home 33.9 to 37.4 percent more due to their credentials. In general, advancing from one level of education up to another raises a construction worker’s total income by 12.5 percent on average.<sup>1</sup> Thus, for all workers in the construction industry, working in a CB state instead of a RTW state has about the same benefit (12.6 percent) as earning a new educational degree.

TABLE 8: EDUCATION PREMIUM COMPARED TO A HIGH SCHOOL DEGREE OR EQUIVALENT, CONSTRUCTION INDUSTRY, 2009-2011

| Total Income              | Full Model, with Occupations |
|---------------------------|------------------------------|
| Less than high school     | -16.46%***                   |
| Some college              | 9.73%***                     |
| Associate’s               | 13.08%***                    |
| Bachelor’s                | 25.21%***                    |
| Master’s                  | 37.37%***                    |
| Professional or doctorate | 33.90%***                    |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: See Table B in the Appendix.

<sup>1</sup> That is, from less than a high school degree to a high school degree (16.46%), from a high school degree to an associate’s degree (13.08%), from an associate’s degree to a bachelor’s degree (12.13%), from a bachelor’s degree to a master’s degree (12.16%), and from a bachelor’s degree to a professional or doctorate degree (8.69%).

In Table 9, the effects of PWL, RTW, and unionization on total incomes are reported for both construction occupation workers and construction CEOs. Tables C and D in the Appendix respectively provide full regression outputs for the two occupational groups. On average, PWLs slightly raised construction occupation worker incomes by 1.2 percent from 2009 to 2011. For CEO incomes, PWLs had no statistically significant impact. Conversely, the effect of RTW laws on incomes was unambiguously negative for both occupation groups, lowering pay by 13.5 percent for the typical worker and *even more* for CEOs (17.9 percent) (Table 9).

The difference in the effect that unions had is striking. Labor union membership raised a construction occupation worker’s total income by 21.7 percent on average from 2009 to 2011. Meanwhile, a 10 percentage-point increase in the construction industry unionization rate of a state lowered construction CEO incomes in the state by 6.4 percent on average, indicating a partial transfer of income from CEOs to workers if union membership increases (Table 9).

TABLE 9: REGRESSION RESULTS OF INSTITUTIONS ON TOTAL INCOME, CONSTRUCTION OCCUPATIONS VS. CEOs, 2009-2011

|                     | Construction<br>Occupation Workers | CEOs       |
|---------------------|------------------------------------|------------|
| Total Income        | Full Model                         | Full Model |
| Prevailing wage law | 1.21%**                            | 4.48%      |
| Right-to-work law   | -13.51%***                         | -17.86%*** |
| 100% Unionization   | 21.74%***                          | -64.00%**  |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: See Tables C and D in the Appendix.

These findings merit four key takeaways. First, PWLs do a relatively good job of matching common construction wage rates to the actual prevailing market price of labor. Given that labor costs account for only about 30 percent of total construction costs, a 1.2 percent increase in construction occupation worker incomes means that PWLs roughly increase total costs by a minimal 0.36 percent. Second, PWLs reduced CEO-to-worker inequality because they raised worker incomes while having no impact on the earnings of CEOs. The lack of effect on CEOs is likely due to the fact that prevailing wage laws support a productive, well-trained workforce that has positive economic impacts on the regional economy (Dickson-Quesada et al., 2013). The policy is a net gain for the whole industry.

Another conclusion is that CEOs do not benefit from RTW laws. This is likely due to the reduction in consumer demand in the larger economy, since RTW laws shrink worker earnings (Manzo et al., 2013). Part of the negative impact on CEO incomes, however, is offset because RTW laws also reduce unionization. A RTW law would only have a positive effect on the total incomes of construction CEOs if the policy reduces the construction industry unionization rate by 29.3 percentage *points* or more. Since such a dramatic decrease is either improbable or impossible in nearly every state, RTW lowered the incomes of most contractor CEOs. RTW’s impact was therefore negative for both workers and executives. Fourth, the 21.7 percent union wage premium aligns with the finding that union productivity is 17 to 22 percent higher than nonunion output, measured by value added per employee after controlling for inter-area construction price differences (Allen, 1984). Both the income and productivity gaps are in significant part the byproduct of higher rates of apprenticeship training among unionized workers (Allen, 1984).

Appendix Tables C and D also provide conclusions regarding male-to-female inequality. While Table 2 reported that construction CEOs had more female representation than construction occupation workers (11.0 percent to 2.2 percent), being a female is statistically associated with an earnings loss of 29.2 percent compared to men among CEOs. By contrast, being a female is statistically associated with total incomes that were 18.1 percent

lower for construction occupation workers. Thus, while more women are CEOs as a share of the occupation compared to the industry average, gender inequality is more severe at the top than in the rest of the industry.

### *Labor Market Institutions and Income Inequality*

The “90-10 ratio” and the “90-50 ratio,” two common socioeconomic indices, are utilized in this report to get a true measure of income inequality in the construction industry. Each index is relatively easy to comprehend. The 90-10 ratio is how much more in income that the “poorest person” of the richest 10 percent earns compared to the “richest person” of the poorest 10 percent of employed workers. A ratio of two would mean that the top 10 percent earn at least 2 times as much as (or 100 percent more than) the bottom 10 percent of the workforce. Similarly, the 90-50 ratio is how much more in income the richest 10 percent make, at minimum, compared to the median worker.



Table 10 displays a breakdown of the total income distribution in the construction industry, sorted by presence of a RTW law and a PWL policy. The bottom 10 percent of workers earned \$10,000 or less both in states with RTW laws and in states without PWLs. In comparison, the bottom 10 percent earned up to \$11,000 in CB states and \$10,400 in states with PWLs. Similarly, the median construction industry worker earned just \$30,000 in total income in both RTW and No PWL states compared to \$38,000 in CB states and \$35,000 in PWL states. The top 10 percent of the construction workforce earned \$75,000 in RTW states, \$75,000 in No PWL states, \$85,000 in CB states, and \$84,000 in PWL states each year (Table 10). Thus, CB state and PWL states performed better than their respective anti-worker policy counterparts.

CB and PWL policies appear to compress the distribution of wages. Workers in states with CB laws and PWL policies earned more than their counterparts in states with anti-worker legislation at every level of the income distribution *except* for the top 1 percent (Table 10). Moreover, the income premium from pro-worker policies is highest for those at the very bottom and in the middle of the income distribution. For the median worker, employment in a CB state yielded a 26.7 percent total income benefit compared to his or her equivalent in a RTW state. Employment in a PWL state earned the median worker a 16.7 percent premium compared to the median worker in a state without a PWL from 2009 to 2011. The premiums are analogous but slightly smaller for the poorest 1 percent of workers and for those at the upper-end of the middle class (the 75<sup>th</sup> percentile of the distribution). As a result, the preliminary statistics suggest that RTW laws increase 90-50 inequality by 10.5 percent while PWLs reduce the ratio by 4.0 percent. Inequality as measured by the 90-10 ratio, however, initially appears to be lowered by RTW laws and worsened by PWLs (Table 10). Regardless of the state, the top 10 percent of construction workers earned between 650 and 708 percent more in annual income than the bottom 10 percent, estimates that are staggering but still below those of the national economy.

Table 11 shows correlation coefficients between construction labor market institutions and industry inequality metrics, without controlling for any other factors. The inequality ratios are converted into natural logarithmic form. This transformation “normalizes the data,” which allows for an evaluation of the effect that a policy has on a *percentage* increase or decrease in a given inequality ratio. A coefficient of (positive or negative) 1 indicates a (positive or negative) one-for-one association; a coefficient of 0 indicates no relationship between the variables.

TABLE 10: BREAKDOWN OF TOTAL INCOMES, CB VS. RTW WORKERS AND PWL VS. NO PWL WORKERS, 2009-2011

| Distribution Variable | CB States       | RTW States      | CB Premium    | PWL States      | No PWL States   | PWL Premium   |
|-----------------------|-----------------|-----------------|---------------|-----------------|-----------------|---------------|
| 1 Percent             | \$1,500         | \$1,200         | <b>25.00%</b> | \$1,500         | \$1,300         | <b>15.38%</b> |
| 5 Percent             | \$6,600         | \$5,800         | 13.79%        | \$6,200         | \$5,800         | 6.90%         |
| 10 Percent            | \$11,000        | \$10,000        | 10.00%        | \$10,400        | \$10,000        | 4.00%         |
| 25 Percent            | \$21,600        | \$18,000        | 20.00%        | \$20,000        | \$18,000        | 11.11%        |
| 50 Percent            | \$38,000        | \$30,000        | <b>26.67%</b> | \$35,000        | \$30,000        | <b>16.67%</b> |
| 75 Percent            | \$60,000        | \$48,400        | <b>23.97%</b> | \$57,000        | \$50,000        | <b>14.00%</b> |
| 90 Percent            | \$85,000        | \$75,000        | 13.33%        | \$84,000        | \$75,000        | 12.00%        |
| 95 Percent            | \$109,000       | \$100,000       | 9.00%         | \$106,000       | \$100,000       | 6.00%         |
| 99 Percent            | \$241,200       | \$245,000       | -1.55%        | \$242,000       | \$244,000       | -0.82%        |
| <i>Average</i>        | <i>\$46,947</i> | <i>\$39,635</i> | <i>18.45%</i> | <i>\$45,277</i> | <i>\$40,391</i> | <i>12.10%</i> |
| 90-10                 | 7.73            | 7.50            | 3.03%         | 8.08            | 7.50            | 7.69%         |
| 90-50                 | 2.24            | 2.50            | -10.53%       | 2.40            | 2.50            | -4.00%        |
| Observations          | 142,201         | 104,646         |               | 170,762         | 76,085          |               |
| Weighted N=           | 4,973,654       | 3,907,304       |               | 6,068,449       | 2,812,509       |               |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

The associations are mostly unsurprising. RTW's correlation coefficients are 0.47 with the 90-10 inequality ratio and 0.44 with the 90-50 index. That is, there was a moderate statistical relationship between RTW laws and more income inequality. Similarly, PWLs exhibit a strong negative (-0.52) relationship with the 90-10 ratio and a weak negative (-0.27) relationship with the 90-50 ratio, suggesting that PWLs compressed construction industry incomes, especially helping the poorest workers. Finally, an increase in the probability of being a union member in the construction industry has a strong association with reducing both 90-10 inequality (-0.50) and 90-50 inequality (-0.54) (Table 11).

TABLE 11: CORRELATION COEFFICIENTS BETWEEN LABOR MARKET INSTITUTIONS AND INEQUALITY INDICES, 2009 TO 2011

| Simple Correlation  | RTW    | PWL    | Prob(union) | ln(90-10 Ratio) | ln(90-50 Ratio) |
|---------------------|--------|--------|-------------|-----------------|-----------------|
| Right-to-work       | 1.000  |        |             |                 |                 |
| Prevailing wage law | -0.648 | 1.000  |             |                 |                 |
| Prob(union)         | -0.774 | 0.594  | 1.000       |                 |                 |
| ln(90-10 Ratio)     | 0.474  | -0.516 | -0.502      | 1.000           |                 |
| ln(90-50 Ratio)     | 0.444  | -0.273 | -0.541      | 0.685           | 1.000           |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. The total number of observations of persons employed the construction industry was 247,469. Responses are unweighted.

A full statistical analysis, which accounts for other factors, produces statistically significant results that largely support prior conclusions of this paper. Regression outputs are simplified in Table 12 and reported completely in Tables E and F of the Appendix. On average, RTW laws raised the 90-10 inequality ratio by between 8.1 and 8.2 percent and PWL rates reduced the 90-10 ratio by 45.1 percent. A 10 percentage-point increase in unionization in the construction industry lowers the 90-10 inequality index by 14.4 percent, and 50-percent unionization would result in industry inequality that is 71.9 to 72.4 percent lower than an industry with no unionization. For the 90-50 ratio, RTW laws increased inequality by 2.5 percent while a 10 percentage-point increase in unionization led

to a 4.7 percent reduction. A half-unionized industry would have seen a 23.6 to 23.7 percent reduction in the 90-50 ratio compared to a sector with no unions. Interestingly, PWLs were statistically associated with a small 1.6 percent increase in the 90-50 index from 2009 to 2011. Pairing this finding with the weak negative correlation found in Table 11, it appears that PWLs have no real effect on 90-50 inequality (Table 12).

TABLE 12: REGRESSION RESULTS OF INSTITUTIONS ON INCOME INEQUALITY INDICES, CONSTRUCTION INDUSTRY, 2009-2011

| Distribution Variable | 90-10 Inequality Ratio     |                              | 90-50 Inequality Ratio     |                              |
|-----------------------|----------------------------|------------------------------|----------------------------|------------------------------|
|                       | Full Model, No Occupations | Full Model, with Occupations | Full Model, No Occupations | Full Model, with Occupations |
| Right-to-work         | 8.11%***                   | 8.17%***                     | 2.50%***                   | 2.51%***                     |
| Prevailing wage law   | -45.09%***                 | -45.09%***                   | 1.57%***                   | 1.56%***                     |
| 10% Unionization      | -14.47%***                 | -14.38%***                   | -4.74%***                  | -4.72%***                    |
| 50% Unionization      | -72.36%***                 | -71.92%***                   | -23.71%***                 | -23.61%***                   |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: See Tables E and F in the Appendix.

Labor unions are unquestionably the most effective labor market institution at reducing income inequality. No other variable comes close to having the same explanatory power as unionization. RTW laws, however, increase construction inequality by a modest but statistically significant amount (by 2.5 to 8.2 percent). This increase in inequality is *in addition to* the 12.6 to 13.1 percent reduction in industry incomes as reported in Table 7, meaning that RTW laws are especially bad for the lowest-income workers. Furthermore, PWLs strongly reduce income inequality between the richest and poorest workers but do not reduce inequality between the top 10 percent and the median construction worker. This is because PWLs lift more workers into well-paying middle-class jobs but have no negative effect on the incomes of CEOs and those at the top. Lastly, though not shown in Table 12, a larger share of construction industry employment by state and local governments also reduces income inequality. Employment in state and local government is statistically associated with a 5.0 to 7.1 percent decline in the 90-10 ratio; state government employment reduces the 90-50 ratio by 0.8 to 1.0 percent (Tables E and F in Appendix).

## 5. POLICY IMPLICATIONS

Over the next decade, the construction industry is expected to be a driver of employment growth. While retail and food service jobs are predicted to add the most jobs between 2012 and 2022, construction employment is projected to grow by 2.6 percent per year between 2012 and 2022, the highest *percentage* growth along with the health care and social assistance sector. In total, jobs in “construction and extraction occupations” are predicted to increase by 21.4 percent over the decade (Bureau of Labor Statistics, 2013). To prevent income dispersion from widening as the economy recovers from the Great Recession, several public policy positions are recommended.

**STATES SHOULD AVOID REPEALING PREVAILING WAGE LAWS.** Prevailing wage laws should be *strengthened* in some states to cover more construction workers. Prevailing wage rates establish minimum income levels that allow workers to support a family, increase apprenticeship program rates and productivity, have no effect on construction CEOs, and reduce income inequality— helping the poorest workers most. As a result, prevailing wage laws have significant economic development impacts that extend far beyond the industry. In Illinois, prevailing wage laws create 3,300 jobs and generate an additional \$1.1 million in state GDP (Dickson Quesada et al., 2013). Bolstering prevailing wage laws in other states would augment these positive effects across the nation.

**CONSTRUCTION UNIONIZATION SHOULD BE ENCOURAGED.** Union workers in the construction industry are more productive and earn more than nonunion workers. Labor unions also promote high-road economic development

which supports a good wage, better fringe benefits for workers, and fewer workplace injuries, ensuring that all are rewarded for economic growth. In construction, unions are the most effective labor market institution at reducing income inequality. Right-to-work laws, on the other hand, reduce incomes by at least 12.6 percent in the construction industry and by even more (13.5 percent) for “construction occupation” workers, who are generally at the lower end of the income distribution in the industry. Right-to-work laws, by themselves, also lower the total incomes of contractor CEOs because consumer demand suffers in the whole economy. Even once income is transferred to chief executives after union membership falls, the aggregate effect on CEO incomes is still negative.

**IN THE AMERICAN ECONOMY, WAGE FLOORS SHOULD BE ELEVATED TO REDUCE 90-10 INCOME INEQUALITY.** The experience of the construction industry can impart lessons on the rest of the economy for addressing income inequality. One lesson is that wage floors are effective at reducing inequality between the highest-earning employed individuals and the lowest-earning workers. In construction, prevailing wage laws had positive impacts on workers but had no negative impact on contractor CEOs. Similarly, successful campaigns to raise the minimum wage or to implement a living wage would lift the incomes of the poorest workers and allow them to support a family. The finding that the wage floor had no negative impact on CEO incomes substantiates claims by advocates of a higher minimum wage that wage floors increase aggregate demand and have no negative effect on the economy (See Cooper, 2013; Lester, 2011; Dube et al., 2008; and Card & Krueger, 1994).

**RIGHT-TO-WORK LAWS SHOULD BE REPEALED TO INCREASE WORKER PRODUCTIVITY AND RAISE WORKER INCOMES.** Right-to-work laws have the effect of reducing worker incomes by around 6 percent on average while having no proven record of stimulating employment growth (Manzo et al., 2013). By reducing union membership, right-to-work laws increase gender and racial inequality, reduce worker training, increase workplace fatalities, and have negative effects on state budgets. For example, if right-to-work was passed in Illinois, annual total labor income would fall by \$36.0 billion over five years, resulting in an annual state income tax reduction of \$1.4 billion (Manzo et al., 2013). Under right-to-work, workers have less money to spend in the economy and the state has less money to spend on public infrastructure.

## CONCLUSIONS

Income inequality has increased to levels not seen in decades, characterized by significant growth at the very top of the income distribution. While the Great Recession actually reduced income inequality, the economic recovery has seen the rich once again get richer. Extreme income disparities can have negative effects on the economy by reducing aggregate demand, polarizing opportunities, stagnating intergenerational mobility, raising the probability of financial crises, worsening health outcomes, lowering worker productivity, increasing criminal activity, and decreasing aggregate happiness. Changes in labor market institutions have arguably been the most significant contributors to the growth in income inequality. Policymakers and legislators *can* amend public policies to reverse course through high-road solutions which grow real incomes, reduce inequality, and increase consumer demand.

The construction industry was not immune to vast income inequalities. Contractor CEOs earned 3.61 times the amount of the average “construction occupation” worker from 2009 to 2011. Additionally, women employed in construction did not earn the same amount as men for equal work, making \$0.91 for every dollar that a man made on average. Nonetheless, incomes in the construction industry were more equal than in the national economy. Construction work returned an income premium for workers across all educational attainment levels except for those with an advanced degree, and the premiums were largest for lesser-educated individuals.



On average, prevailing wage laws increased construction occupation worker incomes by 1.2 percent and had no statistically significant impact on contractor CEOs, partly because prevailing wage rates have such a minimal impact on total project costs and partly because prevailing wage laws support a productive, well-trained workforce. The relevant point is that prevailing wage laws reduced the income gap between the poor and the rich by 45.1 percent but did not decrease the disparity between the rich and the median worker.

Right-to-work laws have very negative impacts on the total incomes of both construction occupation workers (-13.5 percent) and CEOs (-17.9 percent). The policy also increased 90-10 income inequality by 8.1 percent and the 90-50 ratio by 2.5 percent, meaning that right-to-work laws are particularly damaging to the livelihoods of low-income workers. It is likely that the earnings downgrade experienced by construction CEOs in right-to-work states was the result of reduced consumer demand in the entire economy.

The labor market institution which most effectively shields workers from the consequences of inequality is the labor union. For construction occupation workers, labor union membership raised total incomes by 21.7 percent. On the other hand, a 10 percentage-point increase in construction industry unionization in a state was correlated with a 6.4 percent reduction in the average CEO's income. Conversely, a falling unionization rate indicates a transfer of income from workers to CEOs. Overall, with a union membership rate that was 10 percentage-points higher, the construction industry would have been 14.4 percent more equal in terms of the 90-10 ratio and 4.7 percent more equal using the 90-50 inequality index.

As the industry booms in the next decade, two steps should be taken so that construction drives high-road economic growth and reduces inequality. First, state should avoid repealing prevailing wage laws or common construction wage laws; instead, they should be strengthened to cover more workers. Second, construction unionization should be encouraged to ensure that workers share in the benefits of growth in the new economy. Additionally, two lessons from the construction industry should inspire policy action in the larger economy. The first is that wage floors should be elevated to reduce 90-10 income inequality. Wage floors will not solve all inequality—especially for middle-class workers—but they should be incorporated into any plan to reduce the rich-poor income gap. Second, right-to-work laws should be repealed to increase worker productivity and safety, to raise worker incomes, and to grow the economy.

While there has been much public debate about how to reduce income inequality, this report finds that the labor market institutions most effective at achieving this aim are labor unions and government-enforced wage floors in the construction industry. While unionization and prevailing wage laws strongly reduce income inequality, right-to-work laws tend to intensify the problem. Ultimately, pro-worker policies are the best approach for raising worker incomes, increasing consumer demand, and reducing inequality.

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## APPENDIX

TABLE A: CONSTRUCTION OCCUPATION WORKERS, AMERICAN COMMUNITY SURVEY DEFINITIONS

| <b>Construction Occupations</b>   |
|---|
| <ul style="list-style-type: none"> <li>• First-Line Supervisors of Construction Trades and Extraction Workers</li> <li>• Boilermakers</li> <li>• Brickmasons, Blockmasons, and Stonemasons</li> <li>• Carpenters</li> <li>• Carpet, Floor, and Tile Installers and Finishers</li> <li>• Cement Masons, Concrete Finishers, and Terrazzo Workers</li> <li>• Construction Laborers</li> <li>• Paving, Surfacing, and Tamping Equipment Operators</li> <li>• Pile-Driver Operators</li> <li>• Operating Engineers and Other Construction Equipment Operators</li> <li>• Drywall Installers, Ceiling Tile Installers, and Tapers</li> <li>• Electricians</li> <li>• Glaziers</li> <li>• Insulation Workers</li> <li>• Painters, Construction and Maintenance</li> <li>• Paperhangers</li> <li>• Pipelayers, Plumbers, Pipefitters, and Steamfitters</li> <li>• Plasterers and Stucco Masons</li> <li>• Reinforcing Iron and Rebar Workers</li> <li>• Roofers</li> <li>• Sheet Metal Workers</li> <li>• Structural Iron and Steel Workers</li> <li>• Helpers</li> <li>• Construction and Building Inspectors</li> <li>• Elevator Installers and Repairers</li> <li>• Fence Erectors</li> <li>• Hazardous Materials Removal Workers</li> <li>• Highway Maintenance Workers</li> <li>• Rail-Track Laying and Maintenance Equipment Operators</li> <li>• Septic Tank Servicers and Sewer Pipe Cleaners</li> <li>• Miscellaneous Construction and Related Workers</li> </ul> |

Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. For more, please visit <https://usa.ipums.org/usa/volii/c2ssoccup.shtml>.

TABLE B: SIMPLE OLS REGRESSION OF IMPACT OF LABOR MARKET INSTITUTIONS ON TOTAL INCOME, CONSTRUCTION INDUSTRY, 2009-2011

| ln(Total Income)          | <u>Total Income</u> |            |             |            |             |            |
|---------------------------|---------------------|------------|-------------|------------|-------------|------------|
|                           | (1)                 |            | (2)         |            | (3)         |            |
|                           | Coefficient         | (St. Err.) | Coefficient | (St. Err.) | Coefficient | (St. Err.) |
| Prevailing wage law       | -0.0348***          | (0.0055)   | 0.0170***   | (0.0046)   | 0.0161***   | (0.0046)   |
| Right-to-work law         | -0.1285***          | (0.0065)   | -0.1307***  | (0.0055)   | -0.1261***  | (0.0054)   |
| Prob(union)               | 0.5232***           | (0.0030)   | 0.0255      | (0.0250)   | 0.0901***   | (0.0247)   |
| Age                       |                     |            | 0.0376***   | (0.0008)   | 0.0374***   | (0.0008)   |
| Age <sup>2</sup>          |                     |            | -0.0003***  | (0.0000)   | -0.0003***  | (0.0000)   |
| Head of household         |                     |            | 0.1885***   | (0.0033)   | 0.1783***   | (0.0032)   |
| Married                   |                     |            | 0.2288***   | (0.0035)   | 0.2120***   | (0.0034)   |
| White, non-Latino         |                     |            | 0.0533***   | (0.0143)   | 0.0508***   | (0.0141)   |
| African-American          |                     |            | -0.1186***  | (0.0159)   | -0.0967***  | (0.0157)   |
| American Indian           |                     |            | -0.1720***  | (0.0250)   | -0.1512***  | (0.0247)   |
| Asian                     |                     |            | 0.0124      | (0.0187)   | -0.0056     | (0.0185)   |
| Latino/a                  |                     |            | -0.0863***  | (0.0149)   | -0.0708***  | (0.0147)   |
| Immigrant                 |                     |            | -0.0716***  | (0.0055)   | -0.0587***  | (0.0054)   |
| In school                 |                     |            | -0.3285***  | (0.0088)   | -0.3292***  | (0.0087)   |
| Less than high school     |                     |            | -0.1723***  | (0.0042)   | -0.1646***  | (0.0048)   |
| Some college              |                     |            | 0.1274***   | (0.0042)   | 0.0973***   | (0.0048)   |
| Associate's               |                     |            | 0.1806***   | (0.0069)   | 0.1308***   | (0.0068)   |
| Bachelor's                |                     |            | 0.3904***   | (0.0058)   | 0.2521***   | (0.0068)   |
| Master's                  |                     |            | 0.5564***   | (0.0126)   | 0.3737***   | (0.0127)   |
| Professional or doctorate |                     |            | 0.5153***   | (0.0278)   | 0.3390***   | (0.0280)   |
| Female                    |                     |            | -0.1267***  | (0.0057)   | -0.1635***  | (0.0074)   |
| Self-employed             |                     |            | 0.5010***   | (0.0326)   | 0.4859***   | (0.0321)   |
| Federal government        |                     |            | 1.0439***   | (0.0406)   | 1.0134***   | (0.0402)   |
| Local government          |                     |            | 0.8357***   | (0.0337)   | 0.8647***   | (0.0333)   |
| State government          |                     |            | 0.8192***   | (0.0349)   | 0.8283***   | (0.0345)   |
| Private firm              |                     |            | 0.8155***   | (0.0325)   | 0.8152***   | (0.0320)   |
| Nonprofit                 |                     |            | 0.7378***   | (0.0357)   | 0.7370***   | (0.0352)   |
| Veteran                   |                     |            | 0.0139**    | (0.0060)   | 0.0150**    | (0.0059)   |
| Lives in a city           |                     |            | -0.0087*    | (0.0050)   | -0.0106**   | (0.0049)   |
| Usual hours worked        |                     |            | 0.0283***   | (0.0002)   | 0.0265***   | (0.0002)   |
| Yearly trend              |                     |            | -0.0246***  | (0.0019)   | -0.0231***  | (0.0019)   |
| Occupation Dummies        |                     | N          |             | N          |             | Y          |
| Constant                  | 10.3327***          | (0.0077)   | 7.2146***   | (0.0395)   | 7.6204***   | (0.0415)   |
| R <sup>2</sup>            | 0.0113              |            | 0.3162      |            | 0.3349      |            |
| Observations              | 246,847             |            | 246,847     |            | 246,847     |            |
| Weighted N=               | 8,880,958           |            | 8,880,958   |            | 8,880,958   |            |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

TABLE C: SIMPLE OLS REGRESSION OF IMPACT OF LABOR MARKET INSTITUTIONS ON TOTAL INCOME, CONSTRUCTION OCCUPATION WORKERS, 2009-2011

| ln(Total Income)          | <u>Total Income</u> |            |             |            |
|---------------------------|---------------------|------------|-------------|------------|
|                           | (1)                 |            | (2)         |            |
|                           | Coefficient         | (St. Err.) | Coefficient | (St. Err.) |
| Prevailing wage law       | -0.0282***          | (0.0066)   | 0.0121**    | (0.0057)   |
| Right-to-work law         | -0.1226***          | (0.0079)   | -0.1351***  | (0.0068)   |
| Prob(union)               | 0.7903***           | (0.0036)   | 0.2174***   | (0.0311)   |
| Age                       |                     |            | 0.0410***   | (0.0010)   |
| Age <sup>2</sup>          |                     |            | -0.0003***  | (0.0000)   |
| Head of household         |                     |            | 0.1862***   | (0.0041)   |
| Married                   |                     |            | 0.2278***   | (0.0043)   |
| White, non-Latino         |                     |            | 0.0690***   | (0.0179)   |
| African-American          |                     |            | -0.1186***  | (0.0198)   |
| American Indian           |                     |            | -0.1380***  | (0.0302)   |
| Asian                     |                     |            | -0.0592**   | (0.0243)   |
| Latino/a                  |                     |            | -0.0619***  | (0.0185)   |
| Immigrant                 |                     |            | -0.0583***  | (0.0066)   |
| In school                 |                     |            | -0.3663***  | (0.0113)   |
| Less than high school     |                     |            | -0.1588***  | (0.0055)   |
| Some college              |                     |            | 0.1027***   | (0.0053)   |
| Associate's               |                     |            | 0.1456***   | (0.0093)   |
| Bachelor's                |                     |            | 0.1659***   | (0.0093)   |
| Master's                  |                     |            | 0.2455***   | (0.0250)   |
| Professional or doctorate |                     |            | 0.1671***   | (0.0490)   |
| Female                    |                     |            | -0.1806***  | (0.0133)   |
| Self-employed             |                     |            | 0.4846***   | (0.0452)   |
| Federal government        |                     |            | 0.9715***   | (0.0635)   |
| Local government          |                     |            | 0.8541***   | (0.0465)   |
| State government          |                     |            | 0.8373***   | (0.0480)   |
| Private firm              |                     |            | 0.8045***   | (0.0451)   |
| Nonprofit                 |                     |            | 0.7293***   | (0.0487)   |
| Veteran                   |                     |            | 0.0231**    | (0.0077)   |
| Lives in a city           |                     |            | -0.0230***  | (0.0060)   |
| Usual hours worked        |                     |            | 0.0282***   | (0.0002)   |
| Yearly trend              |                     |            | -0.0245***  | (0.0024)   |
| Constant                  | 10.1379***          | (0.0094)   | 7.1243***   | (0.0528)   |
| R <sup>2</sup>            | 0.0188              |            | 0.2833      |            |
| Observations              | 158,472             |            | 158,472     |            |
| Weighted N=               | 5,893,104           |            | 5,893,104   |            |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

TABLE D: SIMPLE OLS REGRESSION OF IMPACT OF LABOR MARKET INSTITUTIONS ON TOTAL INCOME, CONSTRUCTION CEOs, 2009-2011

| ln(Total Income)          | <u>Total Income</u> |            |             |            |
|---------------------------|---------------------|------------|-------------|------------|
|                           | (1)                 |            | (2)         |            |
|                           | Coefficient         | (St. Err.) | Coefficient | (St. Err.) |
| Prevailing wage law       | 0.1082*             | (0.0058)   | 0.0448      | (0.0518)   |
| Right-to-work law         | -0.1737***          | (0.0067)   | -0.1786***  | (0.0601)   |
| Prob(union)               | -0.7228***          | (0.2805)   | -0.6400**   | (0.2523)   |
| Age                       |                     |            | 0.0358***   | (0.0101)   |
| Age <sup>2</sup>          |                     |            | -0.0002*    | (0.0001)   |
| Head of household         |                     |            | 0.2306***   | (0.0347)   |
| Married                   |                     |            | 0.1464***   | (0.0452)   |
| White, non-Latino         |                     |            | 0.0133      | (0.1408)   |
| African-American          |                     |            | -0.0158     | (0.1769)   |
| American Indian           |                     |            | -0.4142     | (0.3077)   |
| Asian                     |                     |            | 0.0826      | (0.1820)   |
| Latino/a                  |                     |            | -0.0567     | (0.1551)   |
| Immigrant                 |                     |            | -0.0583     | (0.0614)   |
| In school                 |                     |            | -0.2587*    | (0.1493)   |
| Less than high school     |                     |            | -0.1210     | (0.0893)   |
| Some college              |                     |            | 0.1602***   | (0.0463)   |
| Associate's               |                     |            | 0.0469      | (0.0636)   |
| Bachelor's                |                     |            | 0.4096***   | (0.0454)   |
| Master's                  |                     |            | 0.5452***   | (0.0666)   |
| Professional or doctorate |                     |            | 0.5515***   | (0.1332)   |
| Female                    |                     |            | -0.2916***  | (0.0526)   |
| Self-employed             |                     |            | 1.2771***   | (0.2993)   |
| Federal government        |                     |            | 1.8843***   | (0.6978)   |
| Local government          |                     |            | 1.1067***   | (0.3801)   |
| State government          |                     |            | 0.9659      | (0.7582)   |
| Private firm              |                     |            | 1.6259***   | (0.2993)   |
| Nonprofit                 |                     |            | 1.6998***   | (0.3537)   |
| Veteran                   |                     |            | -0.0823     | (0.0554)   |
| Lives in a city           |                     |            | -0.0251     | (0.0576)   |
| Usual hours worked        |                     |            | 0.0115***   | (0.0013)   |
| Yearly trend              |                     |            | 0.0172      | (0.0195)   |
| Constant                  | 11.4907***          | (0.0094)   | 7.7952***   | (0.4144)   |
| R <sup>2</sup>            | 0.0077              |            | 0.2235      |            |
| Observations              | 2,880               |            | 2,880       |            |
| Weighted N=               | 94,930              |            | 94,930      |            |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

TABLE E: SIMPLE OLS REGRESSION OF IMPACT OF LABOR MARKET INSTITUTIONS ON 90-10 INEQUALITY RATIO, CONSTRUCTION INDUSTRY, 2009-2011

| ln(90-10 Ratio)           | <i>Inequality: 90-10 Ratio</i> |            |             |            |             |            |
|---------------------------|--------------------------------|------------|-------------|------------|-------------|------------|
|                           | (1)                            |            | (2)         |            | (3)         |            |
|                           | Coefficient                    | (St. Err.) | Coefficient | (St. Err.) | Coefficient | (St. Err.) |
| Prevailing wage law       | -0.4266***                     | (0.0030)   | -0.4509***  | (0.0030)   | -0.4509***  | (0.0030)   |
| Right-to-work law         | 0.0793***                      | (0.0035)   | 0.0811***   | (0.0035)   | 0.0817***   | (0.0035)   |
| Prob(union)               | -1.5965***                     | (0.0160)   | -1.4471***  | (0.0161)   | -1.4384***  | (0.0161)   |
| Age                       |                                |            | 0.0079***   | (0.0005)   | 0.0080***   | (0.0005)   |
| Age <sup>2</sup>          |                                |            | -0.0001***  | (0.0000)   | -0.0001***  | (0.0000)   |
| Head of household         |                                |            | -0.0005     | (0.0021)   | -0.0010     | (0.0022)   |
| Married                   |                                |            | -0.0120***  | (0.0092)   | -0.0144***  | (0.0092)   |
| White, non-Latino         |                                |            | -0.1196***  | (0.0092)   | -0.1206***  | (0.0092)   |
| African-American          |                                |            | -0.0498***  | (0.0102)   | -0.0473***  | (0.0102)   |
| American Indian           |                                |            | 0.0971***   | (0.0161)   | 0.1003***   | (0.0161)   |
| Asian                     |                                |            | 0.1425***   | (0.0120)   | 0.1408***   | (0.0120)   |
| Latino/a                  |                                |            | 0.0510***   | (0.0096)   | 0.0525***   | (0.0096)   |
| Immigrant                 |                                |            | -0.0199***  | (0.0035)   | -0.0176***  | (0.0035)   |
| In school                 |                                |            | 0.0126**    | (0.0057)   | 0.0121**    | (0.0057)   |
| Less than high school     |                                |            | -0.0104***  | (0.0031)   | -0.0088***  | (0.0031)   |
| Some college              |                                |            | 0.0238***   | (0.0027)   | 0.0189***   | (0.0027)   |
| Associate's               |                                |            | -0.0111***  | (0.0044)   | -0.0186***  | (0.0044)   |
| Bachelor's                |                                |            | 0.0213***   | (0.0037)   | 0.0043***   | (0.0039)   |
| Master's                  |                                |            | 0.0375***   | (0.0081)   | 0.0157*     | (0.0083)   |
| Professional or doctorate |                                |            | 0.0413**    | (0.0179)   | 0.0274      | (0.0274)   |
| Female                    |                                |            | 0.0185***   | (0.0038)   | 0.0052      | (0.0049)   |
| Self-employed             |                                |            | -0.0257     | (0.0210)   | -0.0267     | (0.0210)   |
| Federal government        |                                |            | 0.0185      | (0.0262)   | 0.0191      | (0.0262)   |
| Local government          |                                |            | -0.0561***  | (0.0217)   | -0.0500**   | (0.0217)   |
| State government          |                                |            | -0.0713***  | (0.0225)   | -0.0652***  | (0.0225)   |
| Private firm              |                                |            | -0.0163     | (0.0209)   | -0.0151     | (0.0209)   |
| Nonprofit                 |                                |            | -0.0257     | (0.0230)   | -0.0245     | (0.0230)   |
| Veteran                   |                                |            | 0.0127***   | (0.0038)   | 0.0124***   | (0.0038)   |
| Lives in a city           |                                |            | 0.0112***   | (0.0032)   | 0.0107***   | (0.0032)   |
| Usual hours worked        |                                |            | -0.0025***  | (0.0001)   | -0.0027***  | (0.0002)   |
| Yearly trend              |                                |            | -0.0092***  | (0.0012)   | -0.0090***  | (0.0012)   |
| Occupation Dummies        | N                              |            | N           |            | Y           |            |
| Constant                  | 3.9774***                      | (0.0042)   | 3.9908***   | (0.0254)   | 4.0474***   | (0.0270)   |
| R <sup>2</sup>            | 0.3266                         |            | 0.3426      |            | 0.3436      |            |
| Observations              | 247,469                        |            | 247,469     |            | 247,469     |            |
| Weighted N=               | 8,899,428                      |            | 8,899,428   |            | 8,899,428   |            |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.

TABLE F: SIMPLE OLS REGRESSION OF IMPACT OF LABOR MARKET INSTITUTIONS ON 90-50 INEQUALITY RATIO, CONSTRUCTION INDUSTRY, 2009-2011

| ln(90-50 Ratio)           | <i>Inequality: 90-50 Ratio</i> |            |             |            |             |            |
|---------------------------|--------------------------------|------------|-------------|------------|-------------|------------|
|                           | (1)                            |            | (2)         |            | (3)         |            |
|                           | Coefficient                    | (St. Err.) | Coefficient | (St. Err.) | Coefficient | (St. Err.) |
| Prevailing wage law       | 0.0243***                      | (0.0005)   | 0.0157***   | (0.0005)   | 0.0156***   | (0.0005)   |
| Right-to-work law         | 0.0239***                      | (0.0006)   | 0.0250***   | (0.0006)   | 0.0251***   | (0.0006)   |
| Prob(union)               | -0.5184***                     | (0.0027)   | -0.4743***  | (0.0026)   | -0.4721***  | (0.0026)   |
| Age                       |                                |            | 0.0012***   | (0.0001)   | 0.0013***   | (0.0001)   |
| Age <sup>2</sup>          |                                |            | -0.0000***  | (0.0000)   | -0.0000***  | (0.0000)   |
| Head of household         |                                |            | -0.0029***  | (0.0003)   | -0.0032***  | (0.0003)   |
| Married                   |                                |            | -0.0015***  | (0.0004)   | -0.0021***  | (0.0004)   |
| White, non-Latino         |                                |            | -0.0153***  | (0.0015)   | -0.0156***  | (0.0015)   |
| African-American          |                                |            | 0.0082***   | (0.0017)   | 0.0088***   | (0.0017)   |
| American Indian           |                                |            | -0.0164***  | (0.0026)   | -0.0157***  | (0.0026)   |
| Asian                     |                                |            | 0.0334***   | (0.0020)   | 0.0328***   | (0.0020)   |
| Latino/a                  |                                |            | 0.0279***   | (0.0016)   | 0.0281***   | (0.0016)   |
| Immigrant                 |                                |            | 0.0279***   | (0.0006)   | 0.0110***   | (0.0006)   |
| In school                 |                                |            | -0.0011     | (0.0009)   | -0.0013     | (0.0009)   |
| Less than high school     |                                |            | 0.0020***   | (0.0005)   | 0.0023***   | (0.0005)   |
| Some college              |                                |            | 0.0051***   | (0.0004)   | 0.0040***   | (0.0004)   |
| Associate's               |                                |            | -0.0015**   | (0.0007)   | -0.0031***  | (0.0007)   |
| Bachelor's                |                                |            | 0.0083***   | (0.0006)   | 0.0041***   | (0.0006)   |
| Master's                  |                                |            | 0.0137***   | (0.0013)   | 0.0084***   | (0.0014)   |
| Professional or doctorate |                                |            | 0.0123***   | (0.0029)   | 0.0076***   | (0.0030)   |
| Female                    |                                |            | 0.0056***   | (0.0006)   | 0.0009      | (0.0008)   |
| Self-employed             |                                |            | -0.0014     | (0.0034)   | -0.0014     | (0.0034)   |
| Federal government        |                                |            | -0.0021     | (0.0043)   | -0.0024     | (0.0043)   |
| Local government          |                                |            | -0.0037**   | (0.0035)   | -0.0023     | (0.0035)   |
| State government          |                                |            | -0.0095***  | (0.0037)   | -0.0085**   | (0.0037)   |
| Private firm              |                                |            | -0.0006     | (0.0034)   | -0.0001     | (0.0034)   |
| Nonprofit                 |                                |            | -0.0022     | (0.0038)   | -0.0017     | (0.0037)   |
| Veteran                   |                                |            | 0.0005      | (0.0006)   | 0.0005      | (0.0006)   |
| Lives in a city           |                                |            | 0.0287***   | (0.0005)   | 0.0286***   | (0.0005)   |
| Usual hours worked        |                                |            | -0.0003***  | (0.0000)   | -0.0003***  | (0.0000)   |
| Yearly trend              |                                |            | -0.0018***  | (0.0002)   | -0.0017***  | (0.0002)   |
| Occupation Dummies        | N                              |            | N           |            | Y           |            |
| Constant                  | 1.0142***                      | (0.0007)   | 0.9923***   | (0.0042)   | 1.0037***   | (0.0044)   |
| R <sup>2</sup>            | 0.3013                         |            | 0.3646      |            | 0.3664      |            |
| Observations              | 247,469                        |            | 247,469     |            | 247,469     |            |
| Weighted N=               | 8,899,428                      |            | 8,899,428   |            | 8,899,428   |            |

Three asterisks (\*\*\*) indicate significance at the 1% level, two asterisks (\*\*) indicates significance at the 5% level, and one asterisk (\*) indicates significance at the 10% level. Source: IPUMS-USA data from the American Community Survey 5.0 percent sample from 2007 to 2011. Responses are weighted to match the actual national population.



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