

The Economic, Fiscal, and Social Impacts of State Prevailing Wage Laws: Choosing Between the High Road and the Low Road in the Construction Industry

Frank Manzo IV, MPP
Policy Director,
Illinois Economic Policy Institute

Alex Lantsberg, MCP, AICP
Research Analyst,
Smart Cities Prevail

Kevin Duncan, Ph. D.
Senior Economist,
BCG Economics,
Professor of Economics,
Colorado State University-Pueblo

February 9, 2016



About the Authors

Frank Manzo IV, MPP is the Policy Director of the Midwest Economic Policy Institute, a division of the Illinois Economic Policy Institute. He holds a Master of Public Policy from the University of Chicago, Harris School of Public Policy and a Bachelor of Arts in Economics and Political Science from the University of Illinois at Urbana-Champaign. He specializes in labor market analysis, infrastructure investment, economic development, the low-wage labor force, and public finance. He has authored or coauthored several applied research papers specifically pertaining to prevailing wage laws, including studies for Illinois, Indiana, and Michigan. Other projects include analyses on the social and economic effects of labor unions, the minimum wage, right-to-work laws, construction apprenticeship programs, public spending on transportation and clean water infrastructure, and public-private partnerships.

Alex Lantsberg, MCP, AICP is a Research Analyst with Smart Cities Prevail, a leading construction industry research and education organization. Alex holds a Master of City Planning from the University of California, Berkeley and a Bachelor of Science in Finance from Northern Illinois University. He was admitted to the American Institute of City Planning in 2013. Having completed the advanced training program in IMPLAN, the leading economic impact software, Lantsberg has co-authored numerous economic impact studies, including research analyzing the economic impact of prevailing wage laws in California, Wisconsin and Michigan, the public costs of wage and benefit restructuring, and the economic impact of minimum wage. Lantsberg has also conducted considerable research around of sustainable urban energy, water, and wastewater infrastructure planning.

Kevin Duncan, PhD is Senior Economist, BCG Economics and Professor of Economics at Colorado State University-Pueblo where he teaches business and regional economics in the Hassan School of Business. He has participated in U.S. Bank economic forums, served as the Director of the Center for Business and Economic Research, and held the position as Senior Economist of the Healy Center at CSU-Pueblo. He has authored over 70 peer-reviewed academic papers and applied business and regional reports. His research on prevailing wage laws has appeared in leading national and international peer-reviewed academic journals such as *Construction Management and Economics*, *Industrial and Labor Relations Review*, and *Industrial Relations*. He received his Ph. D. in Economics from the University of Utah and his BA in Economics from the University of California, Riverside.

Table of Contents

About the Authors.....	Page i
Executive Summary.....	Page iii
Introduction.....	Page 1

I: Prevailing Wage Laws, Construction Costs, and Construction Labor Market Outcomes

Prevailing Wage Laws and Construction Costs.....	Page 2
Background on the Statistical Analysis of Prevailing Wages.....	Page 13
Summary Statistics of the CPS-ASEC Data.....	Page 15
Prevailing Wage, Worker Incomes, and Worker Self-Sufficiency	Page 19
Prevailing Wage, Reliance on Public Assistance, and Worker Tax Contributions	Page 27

II: Economic Impact of a National Weakening of State Prevailing Wage Laws

The IMPLAN Economic Impact Software.....	Page 33
The Economic Impacts of Prevailing Wages: Leakage Effects.....	Page 34
Economic Impact of Weakening or Repealing Prevailing Wages in States with Average or Strong Policies.....	Page 36
Economic Impact Results.....	Page 40
Conclusion	Page 44
Appendix.....	Page 46

Executive Summary

Opponents of prevailing wage laws claim that repealing or weakening the wage policy will save taxpayer dollars, yet 75% of recent peer-reviewed studies indicate that construction costs are not affected by prevailing wages. However, the absence of prevailing wages increases taxpayer burdens by increasing the likelihood that construction workers will earn incomes below the poverty level, become more dependent on public assistance, and will not have health insurance and retirement benefits. Furthermore, prevailing wages perform an important economic development function by reducing the leakage of construction funds, jobs, income, and spending from the local economy. Weakening or repealing prevailing wages does not reduce construction costs, but increases poverty and decreases economic activity. In fact, weakening or repealing state-level prevailing wage laws in the 25 states that currently have strong or average wage policies would have negative economic, fiscal, and social impacts on the U.S. economy.

This study is a data-driven examination of prevailing wage laws with the economic impacts and statistical analysis of construction worker labor market outcomes based on information from the U.S. Census Bureau (the *Current Population Survey*, *American Community Survey*, and the *Economic Census of Construction*) and the *National Health Expenditures Survey*. The economic impact results are obtained from IMPLAN, an input-output model that is based on data from the U.S. Bureau of Economic Analysis. All of the quantitative analyses presented in this report are reproducible. The review of the research on prevailing wages and construction costs distinguishes between those studies that were peer reviewed and those studies that were not examined by experts prior to publication.

The Purpose and Consequences of Prevailing Wages

The main purpose of prevailing wage laws is to protect local construction labor standards from distortions associated with publicly funded construction.¹ Large infusions of government spending into an area, along with a contract award process that favors the lowest bidder, may attract contractors from areas where construction worker wage rates are lower and where the industry underinvests in skills development. Competition between these out-of-area and local contractors may result in the erosion of local compensation standards and the labor market institutions designed to develop and enhance workers' skills and safety. Prevailing wage laws create a level playing field for all contractors by ensuring that public works expenditures maintain and support local area standards.

This study is motivated by three consequences of prevailing wage laws. The first involves the effect of the wage policy on the cost of public construction. The second addresses the relation between the absence of adequate prevailing wage protection, construction worker poverty, and dependence on public assistance that impacts taxpayers. The third consequence concerns the economic impact of prevailing wage laws. This study is organized along these issues.

Summary of Research on Prevailing Wage Laws and Construction Costs

The research addressing the relationship between prevailing wage laws and construction costs can be divided into two groups. The research that has been peer reviewed and the research that has not been examined by experts prior to the publication of results.

The overwhelming majority of peer-reviewed research conducted over the last 15 years forms the consensus view that construction costs are not affected by prevailing wages. For example, 80% of

¹ As an example see "The Davis-Bacon Act Protecting Wage Equality Since 1931," Wage and Hour Division, U.S. Department of Labor. Accessed at: <http://www.dol.gov/whd/programs/dbra/Survey/conformancefaq.htm>.

peer-reviewed studies find that the wage policy does not affect the cost of building public schools. For all project types examined, 75% of studies reach this same conclusion. This body of research utilizes state-of-the-art statistical techniques and software to empirically examine samples of construction projects. Peer-reviewed research also indicates that prevailing wages are associated with increased productivity and efficiency. Prevailing wages do not alter the level of bid competition, an important determinant of project costs. Furthermore, winning bids do not change when contractors move between projects that require prevailing wages and projects that are not covered by the wage policy.

Why don't prevailing wages increase construction costs? First, labor costs are a low (and declining) percentage of total costs in the construction industry— approximately 23% of all building costs in the U.S.² Contractors also reduce expenditures on materials, fuels, rental equipment, and profit when wages are higher.³ Finally, peer-reviewed research indicates that when wages increase in the construction industry, contractors respond by utilizing more capital equipment and substituting skilled workers for less-productive counterparts.⁴ Since labor costs represent a small portion of overall costs, relatively minor changes are needed to offset the effect of the wage policy.

The results of peer-reviewed research contrast sharply with the findings of research that has not been reviewed by experts. The preponderance of these studies suggests that prevailing wages increase costs, with estimates ranging as high as 36%. The majority of these studies are based on the wage differential method. This is an outdated, theoretical approach that estimates the cost of the wage policy by comparing prevailing wage rates to alternative wages that would be paid in the absence of the policy.

By focusing exclusively on wage differences as the basis of the prevailing wage cost effect, the wage differential method ignores changes in labor productivity, material and fuel costs, contractor profit, and other construction efficiencies that change with wage rates. With this approach, it is not a question of *if* there is a cost impact; it is a question of how large the cost effect is. Because of this bias, the wage differential method is fundamentally unscientific. The statistical analysis that is the basis of peer-reviewed studies allows researchers to determine *if* a cost effect exists before measuring its size. Additionally, the wage differential method provides a large prevailing wage cost impact when results from other analyses yield overwhelming evidence that no such effect exists.⁵ Because of the method's numerous shortcomings, studies using this approach would not survive a peer review.⁶ In sum, wage differential studies provide cost estimates that are too high and promise savings with the repeal or weakening of prevailing wage laws that cannot be delivered.

² See the 2012 U.S. Census Bureau, *Economic Census of Construction*, Construction: Geographic Area Series: Detailed Statistics for Establishments, accessed at:

http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_23A1&prodType=table.

³ See "How Weakening Wisconsin's Prevailing Wage Policy Would Affect Public Construction Costs and Economic Activity," by Kevin Duncan and Alex Lantsberg, May 22, 2015. Accessed at: <http://www.faircontracting.org/wp-content/uploads/2015/05/How-Weakening-Wisconsin%E2%80%99s-Prevailing-Wage-Policy-Would-Affect-Public-Construction-Costs-and-Economic-Activity2.pdf>.

⁴ See William Blankenau and Steven Cassou, "Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change between Skilled and Unskilled Labor." *Applied Economics*, 2011, Vol. 43, pp. 3129-3142 and Edward Balistreri, Christine McDaniel and Eina Vivian Wong, "An Estimation of U.S. Industry-Level Capital-Labor Substitution Elasticities: Support for Cobb-Douglas." *The North American Journal of Economics and Finance*, 2003, Vol. 14, No. 3, 343-356.

⁵ See Kevin Duncan, "Using Wage Differences to Measure the Cost Effect of Prevailing Wage Laws: An Exercise in Futility," Institute for Construction Economics Research, forthcoming.

⁶ The last peer-reviewed study based on the wage differential method was published in 2001. See Keller, Edward C. and William T. Hartman. 2001 'Prevailing Wage Rates: the Effects on School Construction Costs, Levels of Taxation, and State Reimbursements,' *Journal of Education Finance*, Vol. 27, pp. 713-728.

In spite of these shortcomings, wage differential studies have been referenced in testimony regarding prevailing wage policy. For example, James Sherk, Ph. D. of the Heritage Foundation cited three wage differential studies in his 2015 testimony before the Indiana State Senate.⁷ Dr. Sherk also referenced a wage differential study during his testimony before the U.S. House of Representatives in 2011.⁸ There is very little evidence that a distinction is made between research that has and has not been peer-reviewed in the public policy debate regarding prevailing wage laws. In this debate, decisions are too often influenced by ideology rather than the highest standards of research.

Statistical Analysis of Construction Worker Earnings, Poverty, Reliance on Public Assistance, and Health and Retirement Benefits

Prevailing wage laws result in net positive contributions to the tax base by increasing income tax contributions and reducing reliance on public assistance. Due to their higher personal incomes, blue-collar construction workers in the 25 states with average and strong prevailing wage laws contribute \$3,289 per year in federal income taxes (on average, after credits and deductions and adjusted for differences in costs of living). Their equivalents in the 25 states with weak or no prevailing wage laws only contribute \$1,964 in annual federal income taxes. As a result of higher incomes, construction workers in states with average or strong prevailing wage laws are less likely to earn an income below the official poverty level. On average, only 9.4% of construction workers in states with average/strong wage policies earn incomes below the poverty level while 15.2% of these same workers in states with weak or no prevailing wage laws earn below poverty-level incomes. As a consequence of less poverty, only 5.1% of blue-collar construction workers receive aid from the Supplemental Nutrition Assistance Program (SNAP) in states with average/strong prevailing wage laws while 9.2% of construction workers in states with weak or no wage policies receive SNAP. Similarly, 12.2% of construction workers in states with at least average laws receive Earned Income Tax Credits (EITC) while 15.3% of counterparts in states with less than average prevailing wage laws qualify for these credits. These data reveal how strong or average prevailing wage laws play a significant role in fostering self-sufficient, middle-class incomes for construction workers.

If all 25 states with strong or average prevailing wage legislation weakened or outright repealed their laws, an additional 99,000 blue-collar construction workers would see their incomes fall below the poverty level. Weakening or repealing prevailing wage laws across the nation would result in 319,000 more construction workers losing their health insurance coverage and 124,000 construction workers losing their pension plan at work, resulting in increased reliance on public insurance programs. In addition, weakening or repealing prevailing wage laws across the country would increase blue-collar construction worker enrollment in SNAP by 102,000 workers, translating into an additional \$308.5 million cost to taxpayers every year. Similarly, an estimated 36,000 more construction workers would receive EITC, costing taxpayers another \$74.6 million a year. At the same time, the loss in construction worker earnings would be accompanied by a loss in federal income tax contributions of over \$3.4 billion. The findings reported in this study for government assistance such as SNAP are likely to be understated and *conservative* estimates. Recent research indicates that the data used here to

⁷ See James Sherk, Ph. D., “How the Common Construction Wage Affects the Cost and Quality of Construction Projects,” the Heritage Foundation, July 24, 2015. Accessed at: <http://www.heritage.org/research/all-research?categories=testimony>.

⁸ See James Sherk, Ph. D., “Examining the Department of Labor’s Implementation of the Davis-Bacon Act,” The Heritage Foundation, April 28, 2011. Accessed at: <http://www.heritage.org/research/all-research?categories=testimony>.

measure government assistance (the *Current Population Survey*) considerably under-reports government transfers of income.⁹

These national findings can be applied to states that are considering (or have already) repealed or weakened their prevailing wage laws. For example, in Wisconsin, which repealed its prevailing wage standard earlier this year, approximately 2,300 more construction workers are expected to fall below the official poverty line, with about 2,400 more Wisconsin workers expected to rely on food stamps, and 900 more to rely on EITC assistance. A total of 7,700 construction workers will likely lose health insurance coverage and 3,000 workers will lose their employer-provided pension plans across the Badger State.

Michigan, which is currently circulating a petition to circumvent an expected veto of prevailing wage repeal by Republican Governor Rick Snyder, can expect approximately 4,300 more construction workers earning below the official poverty line if repeal efforts are successful. This would result in about 4,400 additional construction workers in Michigan receiving food stamps and 1,500 more relying on EITC assistance. A total of 13,500 blue-collar construction workers would lose health insurance coverage and 5,300 would lose their employer-provided pension plans across the Wolverine State. In both states, the increase in workers relying on government assistance programs would increase costs to taxpayers.

While the preponderance of peer-reviewed research indicates that prevailing wages do not affect taxpayers through increased construction costs, results of this study reveal how the repeal or weakening of prevailing wages increases taxpayer burdens by increasing expenditures on public assistance and reducing tax revenue.

Prevailing wage laws also reduce disparities in the construction industry. By increasing construction worker incomes, prevailing wages close the earnings gap between blue-collar workers and white-collar managers and supervisors. Strong and average prevailing wage laws increase the earning of all blue-collar workers with larger earnings increases for those at the lower end of the income distribution. Because prevailing wage laws particularly affect low-income construction workers, the absence of the wage policy pushes the most vulnerable into poverty. In addition, strong or average prevailing wage laws increase the probability that a nonwhite individual works as a blue-collar construction worker by 5.6 percentage points. Thus, prevailing wages close the employment gap between racial or ethnic groups.

Military veterans represent a larger share of the construction labor force (8.4%) compared to total employment in the U.S. (7.5%). Veterans also represent a larger share of construction occupations in states with average/strong prevailing wage policies where the construction industry is more likely to provide middle-class incomes as well as health and retirement benefits. For example, veterans represent 8.6% of construction employment and 6.8% of the overall work force in states with average/strong prevailing wage laws. On the other hand, vets make up 8.0% of all construction workers and 8.5% of total employment in states with no/weak prevailing wages laws. Veterans disproportionately benefit from adequate prevailing wage policies. Weakening or repealing prevailing wages in states with at least adequate wage policies has a disproportionate and adverse effect on veterans.

⁹ See Bruce Meyer and Nikolas Mittag, "Using Linked Survey and Administrative Data to Better Measure Income: Implications for Poverty, Program Effectiveness and Holes in the Safety Net." National Bureau of Economic Research (NBER), 2015, Working Paper 21676. Accessed at: <http://www.nber.org/papers/w21676>.

Prevailing Wages and the Economic Impact of Spending Leakages

By protecting local wages, prevailing wage laws also protect work for local contractors and construction workers. When local companies and workers are employed on a project, more project funds remain in the local economy and stimulate additional economic activity. Without adequate prevailing wage policies, more work is completed by out-of-area contractors with more project funds, jobs, income, spending, and economic activity leaking out of the local economy. To illustrate this effect, we present new data measuring the leakage impacts associated with the weakening or repeal of prevailing wages in Michigan and Wisconsin.¹⁰ Impacts from these states are applicable and reproducible for other states considering changes in prevailing wage policy.

Data from the *Economic Census of Construction* indicate that states with weak/no prevailing wages have about 2% more of the total value of construction completed by out-of-state contractors than states with strong/average policies. The corresponding policy-induced leakages from the Wisconsin and Michigan economies would be approximately \$500 million and \$673 million, respectively. The impact of these leakages would ripple throughout the economies of these states and affect industries that are unrelated to the construction industry.

If efforts to repeal Michigan's prevailing wage law are successful, with more work completed by out-of-state contractors the state can expect a decrease in economic activity of approximately \$1.5 billion, the loss of over 9,700 jobs, and a decrease in state and local tax revenue over \$55 million. These impacts would be experienced each year following prevailing wage repeal. With a weaker prevailing wage policy and more work completed by out-of-state contractors, Wisconsin can expect a decrease in economic activity of approximately \$1.1 billion. Employment would decrease by over 6,700 jobs and state and local tax revenue would decrease by more than \$40 million dollars annually. These results indicate that for every dollar of construction value that is completed by an out-of-state contractor, economic activity decreases by \$2.15 in Michigan and \$2.26 in Wisconsin.¹¹

Prevailing Wages and the Economic Impact Due to Changes in Construction Expenditures

The allocation of construction expenditures differs between states with different prevailing wage policies. States with strong/average policies have relatively higher labor costs, lower material and fuel expenditures, and lower contractor profits. We measure the economic impact *if* the 25 states with strong/average prevailing wages were to weaken or repeal their wage policies and assume the cost structure of states with less than average policies. This type of policy change would result in reductions in construction worker wages and benefits of \$23 billion, an increase in materials expenditures of \$18 billion, and an increase in contractor profits of \$5 billion.

The economic impact analysis of this scenario indicates that the largest effect is due to changes in construction worker wages and benefits. The increase in proprietor income would marginally improve

¹⁰ The leakage impacts are reported separately here. In our previous examination of Wisconsin and Michigan, the leakage impacts were not reported separately and were included as part of the overall results. See "The Cost of Repealing Michigan's Prevailing Wage Policy: Impacts on Total Construction Costs and Economic Activity," by Kevin Duncan, Alex Lantsberg, and Frank Manzo IV, June 17, 2015. Accessed at: <http://illinoisepi.org/countrysidenonprofit/wp-content/uploads/2014/06/The-Cost-of-Repealing-Michigans-PWL-FINAL.pdf> and "How Weakening Wisconsin's Prevailing Wage Policy Would Affect Public Construction Costs and Economic Activity," by Kevin Duncan and Alex Lantsberg, May 22, 2015. Accessed at: <http://www.faircontracting.org/wp-content/uploads/2015/05/How-Weakening-Wisconsin%E2%80%99s-Prevailing-Wage-Policy-Would-Affect-Public-Construction-Costs-and-Economic-Activity2.pdf>.

¹¹ The per-dollar impact is obtained by dividing the total economic impact by the initial level of spending. The figure of \$2.15 for Michigan is obtained by dividing \$1.45 billion by \$673 million.

economic activity, as would new spending on materials, fuels, and rental equipment. However, the impact of materials and fuel costs is due to the relatively less efficient construction methods used in states with no/weak prevailing wage polices.¹² These inefficiencies can be eliminated by adequate prevailing wages. Omitting the economic impact associated with inefficient use of materials and fuels results in a decrease in national economic activity of approximately \$65 billion, the loss of 400,000 jobs, and a combined federal, state, and local tax revenue decrease of over \$8 billion.

Conclusion

Prevailing wage legislation is part of a broader set of interrelated institutional arrangements that promote a strong construction industry and a thriving middle class, including a stronger emphasis on apprenticeship training, skilled workmanship, workplace safety, increased access to health insurance and retirement security.¹³ Prevailing wage laws support a high road economy by establishing the underlying legal framework for a construction industry that provides the skills needed to build quality infrastructure for a growing, technologically-sophisticated, and competitive economy. By fostering an economy with a strong middle class, prevailing wages promote sound public sector budgets at all levels of government.

Legislators have a choice between this construction industry high road and the low road that leads to less training, lower quality workmanship, more waste and inefficiency at the worksite, higher levels of poverty, increased taxpayer burdens, and reduced economic activity.

¹² This inefficiency is similar to an increase in output following a natural disaster (earthquake, flood, etc.). While a disaster or inefficient use of materials and fuel generates economic activity, it is not desirable in an economic or social sense.

¹³ For more discussion of these issues see Peter Philips, "Lessons for Post-Katrina Reconstruction: A High-Road vs. Low-Road Recovery." Briefing Paper, Economic Policy Institute, 2005 and Alison Dickson-Quesada, Frank Manzo, Dale Belman, and Robert Bruno, "A Weakened State: The Economic and Social Impacts of Repeal of the Prevailing Wage Law in Illinois." School of Labor and Employment Relations, Labor Education Program, University of Illinois at Urbana-Champaign, 2013.

Introduction

The main purpose of a prevailing wage law is to protect local construction labor standards and labor market institutions in the competitive public bidding process.¹⁴ Large infusions of government spending into an area, along with a contract award process that favors the lowest bidder, may attract contractors from areas where construction worker wage rates are lower and where the industry underinvests in skills development. Competition between local and these out-of-area contractors may result in the erosion of local compensation standards and the labor market institutions designed to develop and enhance workers' skills and safety. Prevailing wage laws create a level playing field for all contractors by ensuring that public works expenditures maintain and support local area standards.

This report examines the consequences of prevailing wage laws. By protecting local wages, prevailing wage laws protect work for local contractors and construction workers. When local workers and companies are employed, more of the project funds remain in the local economy, stimulating additional economic activity. Prevailing wage laws also have an economic impact by altering the component cost shares of the construction industry in ways that increase economic activity. An ongoing public policy debate centers on the effect of prevailing wage rates on construction costs and an extensive body of research has examined this issue. A related issue concerns the impact of prevailing wages on taxpayers via the relationships between the wage policy, construction worker poverty, reliance of public assistance, presence of health insurance coverage, and funding for retirement.

The remainder of this study is organized into two parts. Part I of the report examines the effect of prevailing wages on taxpayers. This section includes a comprehensive review of the research on the effect of prevailing wage laws and construction costs. This review traces the research from inception

¹⁴ As an example see "The Davis-Bacon Act Protecting Wage Equality Since 1931," Wage and Hour Division, U.S. Department of Labor. Accessed at: <http://www.dol.gov/whd/programs/dbra/Survey/conformancefaq.htm>.

in the late 1970s to the present. Another cost consideration of prevailing wage laws is the effect of the wage policy on construction worker poverty, reliance on public assistance, and health and retirement coverage that also affects taxpayers. Part II examines the economic impact on the U.S. economy of weakening or repealing state-level prevailing wage laws. This section includes a description of economic impact analysis and software along with a description of how the cost components of the construction industry change with a change in prevailing wage policy. These data illustrate how U. S. economic activity would change if the prevailing wage laws in the 25 states with average and strong wage policies as of 2012 were to be weakened or repealed. The economic impact associated with the leakage of project funds and spending from a local economy is illustrated for states that have recently considered weakening or repealing their wage policies (Wisconsin and Michigan).

I: Prevailing Wage Laws, Construction Costs, and Construction Labor Market Outcomes

Prevailing Wage Policies and Construction Costs

This section of the report summarizes the research on the effect of prevailing wage policies on construction costs. While all research is sampled, distinctions are made between research that has and has not been peer-reviewed.¹⁵ A peer-review is not based on whether reviewers agree with the research results. Rather, the purpose of the review is to ensure quality, provide credibility, and maintain standards in the discipline. One benefit of this type of review is that peer experts are more likely to detect errors that may not be obvious to casual readers. It is entirely up to casual readers to evaluate the accuracy of research that has not been peer reviewed. This survey covers this research from its inception in the late 1970s to the present. With the development of advanced statistical software and greater access to project-level data over the last 40 years, the methods employed by

¹⁵ Peer reviewed research is published in academic journals. These types of publications are listed in footnotes and can be identified by journal names that appear in italics and are underlined.

researchers have evolved. Regardless, the preponderance of this research, whether dated or recent, indicates that prevailing wages either have no effect or a negligible impact on construction costs.

Early studies relied on an intuitive approach to measure the cost effect of prevailing wage laws, using the difference between prevailing wages and wage rates that would be paid in the absence of the policy. This “wage differential” method is based on the following steps:

1. Calculate the percentage difference between prevailing wages and alternative rates that would be paid in the absence of the wage policy.
2. Calculate the percentage of labor costs (wages and benefits) to total construction costs.
3. Multiply the percentages from steps 1 and 2 to obtain the percentage increase in total costs due to prevailing wages.

This method is often used in fiscal notes when legislatures are considering policy changes and time constraints prevent the use of other more precise methods of measuring the cost impact of prevailing wages. Recent use of the wage differential method by the Vermont Legislative Joint Fiscal Office provides a good illustration. During the 2015 legislation session, Vermont’s “Capital Bill” sought to switch from the current state prevailing wage policy that did not include health and retirement benefits up to federal Davis-Bacon standards.¹⁶ Following the first step of the wage differential method, the Vermont Legislative Joint Fiscal Office estimated that Davis-Bacon rates exceeded current prevailing wage rates by 20% to 30%. Results of step 2 indicated that labor costs represented 32% of total construction costs.¹⁷ If labor costs are 32% of total costs and if Davis-Bacon rates are 20% higher than current prevailing wage rates, then switching to Davis-Bacon rates would

¹⁶ See “Prevailing Wage Mandate Tacked onto \$157 million Capital Bill,” VTDigger.org. May 8, 2015. Accessed at: <http://vtdigger.org/2015/05/08/senate-approves-157-million-capital-bill/>.

¹⁷ See “Components of the Capital Bill-Prevailing Wage,” Fiscal Note-Revised, Vermont Legislative Joint Fiscal Office, July 24, 2015. Accessed at: http://www.leg.state.vt.us/jfo/fiscal_notes/2015_H_492%20Prevailing%20Wages%20Fiscal%20Note%20%28Revised%29%203-25-2015.pdf.

increase labor costs by 6.4% ($20\% \times 32\%$). Since labor costs are the only cost component thought to be affected by the wage policy, the increase in labor costs is the same percentage-point increase in total costs (6.4%). With average capital bill authorizations of \$72 million, the change in prevailing wages would increase expenditures by \$4,608,000 ($6.4\% \times \72 million). Given the ease of this approach, the wage differential is often referred to as a “back of the envelope” estimate.¹⁸

Before the introduction of modern statistical software, academic research beginning in the late 1970s utilized the wage differential method. A survey of this early research by Professor Bilginsoy and Philips indicates that these studies, many of which were peer-reviewed, provide a prevailing wage cost effect ranging from zero to 3%.¹⁹ This low range contrasts considerably with the results of recent studies based on the wage-differential method, none of which have been peer-reviewed. Results of these new “back of the envelope” studies suggest that prevailing wages increase costs by as much as 36%.

For example, the Anderson Economic Group estimates that, due to the difference between prevailing wages and alternative rates, Michigan’s prevailing wage laws adds 7.5% to the cost of school construction in the state.²⁰ Several other studies by the Mackinac Center for Public Policy have also focused on the Michigan prevailing wage policy and found that prevailing wages increase costs from 7.2% to 15%.²¹ A report by the Beacon Hill Institute indicates that Davis-Bacon prevailing

¹⁸ See Peter Philips “Mr. Rosaen’s Magical Thinking A Short Evaluation of Alex Rosaen’s 2013 Prevailing Wage Methodology,” Department of Economics Working Paper Series, University of Utah, November 20, 2013. Accessed at: https://ideas.repec.org/p/uta/papers/2013_12.html.

¹⁹ See Bilginsoy, Cihan and Peter Philips. 2000 ‘Prevailing Wage Regulations and School Construction Costs: Evidence from British Columbia.’ *Journal of Education Finance*, Vol. 24, 415-432.

²⁰ See Alex L. Rosaen. 2013. “The Impact of Michigan’s Prevailing Wage Law on Education Construction Expenditures.” Prepared by the Anderson Economic Group, LLC, November 13, 2013. Accessed at: <http://prevailingwagetruth.com/wp-content/uploads/2013/11/AEG-Report-MI-PW-Law-and-Education-Construction-2.pdf>.

²¹ See Paul Kersey, J. D., “The Effect of Michigan’s Prevailing Wage Law,” Mackinac Center for Public Policy, August 27, 2007. Accessed at: <http://www.michigancapitolconfidential.com/8907>, John Taylor, Ph. D. 2007. “Prevailing Wage Laws,” Mackinac Center for Public Policy, April 16, 2007. Accessed at: <http://www.mackinac.org/8473>, and Richard Vedder, Ph. D. “Michigan’s Prevailing Wage Law and Its Effects on Government Spending and Construction Employment,” A Mackinac Center Report, September 1999. Accessed at: <https://www.mackinac.org/archives/1999/s1999-07.pdf>.

wages increase construction costs by 9.9%.²² Two additional studies have examined the State of New York's policy. The Citizens Housing and Planning Council estimates that the Empire State's wage policy increases construction costs by 25%.²³ The Center for Government Research provides an impact of 36%.²⁴ All of these studies possess numerous errors that would not survive a peer review.²⁵

A fundamental and fatal flaw of the wage differential method is that this approach is not capable of including numerous other changes that take place when wages change in the construction industry. Evidence from peer-reviewed studies indicates that that when wages increase, more skilled construction workers and more capital equipment are utilized in construction.²⁶ Material costs, fuel costs, and contractor profits are all lower when construction worker wages and benefits are higher.²⁷ Each of these changes occurs as a result of efforts to maintain overall costs and competitive bids in light of standardized wage rates. By ignoring these changes, studies utilizing the wage differential method are based on an incomplete understanding of the construction industry and provide a cost estimate of the prevailing wages that is too high.

²² See Sarah Glassman, MSEP, Michael Head, MSEP, David Tuerck, Ph. D., and Paul Bachman, MSIE. "The Federal Davis-Bacon Act: The Prevailing Mismeasure of Wages," Beacon Hill Institute, February 2008. Accessed at: <http://www.beaconhill.org/BHISTudies/PrevWage08/DavisBaconPrevWage080207Final.pdf>.

²³ See Elizabeth A. Roistacher, Ph. D., Jerilyn Perine and Harold Schultz, *Prevailing Wisdom: The Potential Impact of Prevailing Wages on Affordable Housing*, Citizens Housing & Planning Council, New York (December 2008). Accessed at: <http://chpcny.org/wp-content/uploads/2011/02/Prevailing-Wisdom-web-version1.pdf>.

²⁴ See Kent Gardner, Ph. D. and Rochelle Ruffner, Ph. D., "Prevailing Wage in New York State: The Impact of Project Costs and Competitiveness," Center for Government Research, January 2008. Accessed at: <http://reports.cgr.org/download-single-report/1532>.

²⁵ For a thorough review of these studies and the wage differential method see Kevin Duncan. 2015. "Using Wage Differences to Measure the Cost Effect of Prevailing Wage Laws: An Exercise in Futility," Institute for Construction Economics Research, September 15.

²⁶ See William Blankenau and Steven Cassou, "Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change between Skilled and Unskilled Labor." *Applied Economics*, 2011, Vol. 43, pp. 3129-3142 and Edward Balistreri, Christine McDaniel and Eina Vivian Wong, "An Estimation of U.S. Industry-Level Capital-Labor Substitution Elasticities: Support for Cobb-Douglas." *The North American Journal of Economics and Finance*, 2003, Vol. 14, No. 3, 343-356.

²⁷ See "How Weakening Wisconsin's Prevailing Wage Policy Would Affect Public Construction Costs and Economic Activity," by Kevin Duncan and Alex Lantsberg, May 22, 2015. Accessed at: <http://www.faircontracting.org/wp-content/uploads/2015/05/How-Weakening-Wisconsin%E2%80%99s-Prevailing-Wage-Policy-Would-Affect-Public-Construction-Costs-and-Economic-Activity2.pdf>.

Other methods make use of advances in statistical software and access to project-level data to analyze the effect of prevailing wages on all construction costs. A common approach is to compare the total costs of projects covered by prevailing wage laws to the total costs of projects that are not covered by the wage policy. Statistical methods such as regression analysis make it possible to make this type of comparison, taking other project differences into account. While new methods and data have addressed some problems, other issues have arisen. A statistical comparison of two types of projects requires that the researcher is able to include all the important project characteristics that affect construction costs. However, if construction projects have differences other than the wage policy, and if these differences are not taken into account, the analysis can result in an incomplete and inaccurate measure of the cost effect of the wage policy. In other words, comparing prevailing wage projects to other projects may be like making a proverbial apples-to-oranges comparison.

A good example of such an apples-to-oranges comparison is found in the study by Professors Fraundorf, Farrell, and Mason, who compared public construction projects that were covered by the Davis-Bacon Act to privately-funded projects that were not covered by the policy.²⁸ This comparison found that federally-funded projects were between 26% and 35% more expensive than comparable privately-funded projects. There are several problems with this study and its findings. Data from the *Economic Census of Construction* indicate that, around the time of this study, labor costs were approximately 30% of total construction costs. It is unlikely that the difference between federal and private project costs, due to prevailing wages, would be about 30% when labor only accounts 30% of total costs. It is more likely that the measured cost effect is due to factors other than the wage policy. Publicly-funded projects typically have a greater life expectancy that requires higher standards of quality. If so, the prevailing wage cost effect obtained in the study by Fraundorf, Farrell, and Mason

²⁸ See Fraundorf, Martha, John P. Farrell and Robert Mason. 1984. 'The Effect of the Davis-Bacon Act on Construction Costs in Rural Areas.' *The Review of Economics and Statistics*, 66, 142- 146.

may be due to the combined effect of the wage policy and other differences between federal or public projects. But the analysis was unable to isolate the effect of the wage policy from these other factors.

School construction projects are relatively similar and provide more of an apples-to-apples comparison. Several studies have compared construction costs for schools built with and without prevailing wage regulations. Many of these studies have taken advantage of the introduction of a prevailing wage policy in British Columbia to compare school construction costs. Professors Bilginsoy and Philips examine the impact of British Columbia's Skill Development and Fair Wage Policy, which is similar to "strong" prevailing wage policies in the U.S.²⁹ Using regression analysis to take a number of factors into consideration— including the construction business cycle, number of competitors, type of school, and a time trend— the construction bid costs under the policy were not statistically different from built before the introduction of prevailing wages.³⁰

Professors Duncan, Philips, and Prus examine the effect of British Columbia's prevailing wage standard by including a control group of private school projects.³¹ This analysis indicates that before the introduction of the prevailing wage policy, the cost of building public schools was approximately 40% more expensive than the costs of comparable private schools.³² This cost differential did not change after the wage policy was introduced. These authors have also used the British Columbian example to study the effect of prevailing wage laws on the productivity and efficiency of construction. They find that prior to the introduction of the wage legislation, public school projects were 16% to

²⁹ Bilginsoy, Cihan and Peter Philips. 2000 'Prevailing Wage Regulations and School Construction Costs: Evidence from British Columbia.' *Journal of Education Finance*, Vol. 24, 415-432.

³⁰ Statistical analysis makes a distinction between 'statistically significant' and 'statistically insignificant' results. A statistically significant result is unlikely to have occurred due to chance. If a result is statistically insignificant, then the measured result is likely to have occurred due to chance.

³¹ See Duncan, Kevin, Philips, Peter, and Prus, Mark. 2014. "Prevailing Wage Regulations and School Construction Costs: Cumulative Evidence from British Columbia." *Industrial Relations*, Vol. 53, No. 4, October, pp. 593-616.

³² Professors Duncan and Prus examine the effect of the British Columbian wage policy on assorted building types, (assembly halls, hospitals, offices, schools, etc.), and find a similar effect. See Duncan, K. and Prus, M. 2005. "Prevailing Wage Laws and Construction Costs: Evidence from British Columbia's Skills Development and Fair Wage Policy" in *The Economics of Prevailing Wage Laws*, Azari-Rad, Hamid, Philips, Peter and Prus, Mark, eds. (Aldershot, G.B.: Ashgate), pp. 123-148.

19% smaller, in terms of square feet, than comparable private structures (given the same project expenditure). This size differential did not change after the policy was in effect.³³ These results suggest that prevailing wage requirements do not alter labor or other input utilization in a way that significantly affects the relative size of covered and uncovered projects. The authors also find that average total efficiency for public school construction is 94.6% (100% is optimal construction efficiency).³⁴ Average efficiency for projects covered by the introductory stage of British Columbia's construction wage legislation was 86.6%. This policy mandated apprenticeship training requiring journeymen to divide time between teaching and building, which can explain the decrease in efficiency when the policy was first introduced. Regardless, by the time of the expansion of the policy 17 months later, the average efficiency of covered projects increased to 99.8%. These findings suggest that the introduction of prevailing wage laws disrupted construction efficiency. However, in a relatively short period of time, the construction industry adjusted to wage requirements by actually improving overall construction efficiency in a way that is consistent with stable total costs. A similar pattern was observed with respect to cost efficiency.³⁵ Taken together, these studies of prevailing wages in British Columbia provide a comprehensive analysis that fails to find an effect on construction costs or efficiency consistent with the view that prevailing wages increase construction costs.

Professors Azari-Rad, Philips, and Prus find similar results in two studies that examine school construction in the U.S. After taking into account differences in project size, type, location, and other factors, they found no evidence that schools built in states with prevailing wage laws were more

³³ See Duncan, Kevin, Philips, Peter, and Prus, Mark. 2006. "Prevailing Wage Legislation and Public School Construction Efficiency: A Stochastic Frontier Approach," *Construction Management and Economics*, Vol. 24, June 2006. pp. 625-634.

³⁴ See Duncan, Kevin, Philips, Peter, and Prus, Mark. 2009. "The Effects of Prevailing Wage Regulations on Construction Efficiency in British Columbia," *International Journal of Construction Education and Research*, Vol. 5, No.1, pp. 63-78.

³⁵ See Duncan, Kevin, Philips, Peter, and Prus, Mark. 2012. "Using Stochastic Frontier Regression to Estimate the Construction Cost Efficiency of Prevailing Wage Laws." *Engineering, Construction and Architectural Management*, Vol. 19, No. 3, pp 320-334.

costly.³⁶ Professor Atalah tests the hypothesis that prevailing wages increase school construction costs by examining 8,093 bids submitted by signatory contractors that pay union wage and benefit rates and by “open shop” contractors. A comparison of bids between these two groups indicates that there is no significant difference in bid costs.³⁷ Union rates set the upper bound for prevailing wage rates. Wages paid by open shop contractors represent wages at the other extreme, if prevailing wages do not apply. If costs do not differ between these extremes, the inference is that prevailing wages do not affect costs. Professors Keller and Hartman compare labor costs under prevailing wage regulations and “open shop” conditions and report that Pennsylvania’s prevailing wage law adds, on average, 2.25% to the cost of building public schools, though this analysis is based on the flawed wage differential method.³⁸ Vincent and Monkkonen report a prevailing wage cost effect ranging from 8% to 13%.³⁹

Thus, of the ten peer-reviewed studies that examine the effect of prevailing wages on school construction costs, eight provide evidence that the wage policy does not affect costs. Two other studies find positive cost effects, but the results of one of the studies are questionable because the analysis is based on the outdated wage differential method.

A series of studies by Professor Duncan have focused on the effect of Davis-Bacon prevailing wage requirements on the cost of highway resurfacing in Colorado. The first study compares the costs of projects funded by the federal government to projects financed by the State of Colorado.⁴⁰ Federal

³⁶ See Hamid Azari-Rad, Peter Philips and Mark Prus. 2003 ‘State Prevailing Wage Laws and School Construction Costs.’ *Industrial Relations*, Vol. 42, No. 3, pp. 445-457 and Hamid Azari-Rad, Peter Philips and Mark Prus. 2002. ‘Making Hay When It Rains: The Effect Prevailing Wage Regulations, Scale Economies, Seasonal, Cyclical and Local Business Patterns Have On School Construction Costs.’ *Journal of Education Finance*, Vol.27, 997-1012.

³⁷ See Alan Atalah. 2013. ‘Comparison of Union and Non-Union Bids on Ohio School Facilities Commission Construction Projects,’ *International Journal of Economics and Management Engineering*, Vol. 3, Issue 1, pp. 29-35.

³⁸ This 2001 study is the last peer-reviewed paper based on the wage differential method. See Keller, Edward C. and William T. Hartman. 2001 ‘Prevailing Wage Rates: the Effects on School Construction Costs, Levels of Taxation, and State Reimbursements,’ *Journal of Education Finance*, Vol. 27, pp. 713-728.

³⁹ See Jeffrey Vincent, Jeffrey and Paavo Monkkonen. 2010. ‘The Impact of State Regulations on the Cost of Public School Construction,’ *Journal of Education Finance*, Vol. 35, No. 4, spring, pp. 313-330.

⁴⁰ See Duncan, Kevin. 2015. ‘The Effect of Federal Davis-Bacon and Disadvantaged Business Enterprise Regulations on Highway Maintenance Costs.’ *Industrial and Labor Relations Review*, Vol. 68, No. 1, pp. 212-237.

funding requires the payment of Davis-Bacon prevailing wages while state-funded projects in Colorado are not covered by a wage policy. Resurfacing projects funded by the federal government are more costly, but are also larger and more complex than state projects. After taking these and other project characteristics into account, there is no difference in average project costs, regardless of prevailing wage coverage. This study also indicates that the level of bid competition does not vary between state and federal projects. Additional analysis compares resurfacing costs as contractors switch from federal to state projects.⁴¹ Once again, after taking differences in project size and complexity into consideration, winning bids on less-regulated state projects are not different than winning bids on federal projects that require the payment of prevailing wages. Finally, when prevailing wage and benefit rates changed from union to average rates, the relative cost of federal resurfacing projects did not change.⁴² From at least the mid-1990s until 2002, union rates prevailed for all of the job classifications involved in highway resurfacing. From April 2002 until the next wage determination in 2011, average rates prevailed for 85% of these job classifications. This represented an 18% decrease in total hourly compensation for these workers, yet the relative costs of federal projects did not change. The level of bid competition on federal projects also did not change.

Similar to the school studies in British Columbia, the studies examining highway resurfacing in Colorado examine the effect of prevailing wages from multiple perspectives. Any single study may have errors or other limitations that contribute to an imprecise measure of the relationship between prevailing wages and construction costs. This issue is minimized when a comprehensive approach is taken that consistently indicates that prevailing wages are unrelated to costs.

⁴¹ See Duncan, Kevin. 2015. "Do Federal Davis-Bacon and Disadvantaged Business Enterprise Regulations Affect Aggressive Bidding? Evidence from Highway Procurement Auction," *Journal of Public Procurement*, Vol. 15, Issue 3, pp. 291-316.

⁴² See Duncan, Kevin. 2015. "Do Construction Costs Decrease When Davis-Bacon Prevailing Wages Change from Union to Average Rates?" Working Paper, Colorado State University-Pueblo.

How can construction costs not be affected by prevailing wages? First, labor costs comprise a low and historically declining share of total costs in the construction industry. According to data from the *Economic Census of Construction*, labor costs (wages and benefits) represent 22.8% of total construction costs for the entire U.S. construction industry in 2012.⁴³ Second, peer-reviewed research indicates that, when wages increase in the construction industry, skilled workers replace less-skilled workers and more capital equipment is utilized.⁴⁴ These changes increase productivity and tend to offset the cost effect of higher wages. As the data in Figure 2 illustrates, when wages are higher, contractors reduce material, fuel, and rental equipment costs as well as profit rates. These changes increase efficiency, stabilize costs, and allow for continued competitive bids.

These types of changes are important, particularly to nonunion contractors. Prevailing wages are uneven in their effect. Since these wage rates are typically equal to or lower than rates paid by union contractors, prevailing wages do not affect the labor costs of these contractors. It is when prevailing wages exceed those paid by nonunion establishments that changes must be made to maintain

⁴³ The *Economic Census of Construction* for 2012 does not report labor costs as a percent of total costs. This ratio must be calculated based on other data. Here, labor cost as a percent of total construction cost is derived by dividing total construction worker payroll, plus proportionally allocated total fringe benefits, by the net value of construction work. The net value of construction is based on the value of work completed by a contractor, less the value of work subcontracted to other contractors. The *Economic Census of Construction* defines construction worker payroll as the gross earnings paid in the reporting year to all construction workers on the payroll of construction establishments. It includes all forms of compensation such as salaries, wages, commissions, dismissal pay, bonuses, and vacation and sick leave pay, prior to deductions such as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The *Economic Census of Construction* defines the net value of construction as the receipts, billings, or sales for construction work done by contractors, less the value of construction work subcontracted to others. The net value of construction does not include contractor business receipts from retail and wholesale trade, rental of equipment without operator, manufacturing, transportation, legal services, insurance, finance, rental of property and other real estate operations, and other nonconstruction activities. Receipts for separately definable architectural and engineering work for others are also excluded. Nonoperating income such as interest, dividends, the sale of fixed assets, and receipts from other business operations in foreign countries are also excluded. See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012. Accessed at: See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012. Accessed at:

http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_23A1&prodType=table.

⁴⁴ See William Blankenau and Steven Cassou, "Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change between Skilled and Unskilled Labor." *Applied Economics*, 2011, Vol. 43, pp. 3129-3142 and Edward Balistreri, Christine McDaniel and Eina Vivian Wong, "An Estimation of U.S. Industry-Level Capital-Labor Substitution Elasticities: Support for Cobb-Douglas." *The North American Journal of Economics and Finance*, 2003, Vol. 14, No. 3, 343-356.

competitive bids with union contractors. Since labor costs are such a low percentage of total construction costs, limited adjustments are needed to maintain stable costs when wage rates increase.

The findings of other studies are generally consistent with those described above. An examination of public works projects in five northern California cities (Palo Alto, Mountain View, San Carlos, San Jose, and Sunnyvale) finds no evidence that wage policies affect the bid process or outcome in a way that increases construction costs.⁴⁵ Professors Kim, Chang, and Philips do not find any support for the view that wage policies discourage bidding by nonunion contractors, reduce the number of bidders, or prevent nonunion contractors from winning bids on prevailing wage projects. Additionally, the authors find no statistically significant differences between the winning bid and two measures of project costs (the engineer's estimate and the median bid). Their findings indicate that prevailing wage laws of northern California cities are not associated with higher construction costs.

On the other hand, professors Dunn, Quigley, and Rosenthal used data on publicly-funded affordable housing projects in California to find that prevailing wage requirements increased subsidized-housing projects' total costs by between 9.5% and 37.9%.⁴⁶ An obvious problem with this estimate concerns the measured impact and labor costs as a percentage of total costs. It is unlikely that the total cost of construction would fall by up to 38% from a wage policy that affects only 23% of total costs.⁴⁷

⁴⁵ See JaeWhan Kim, Kuo-Liang Chang and Peter Philips, "The Effect of Prevailing Wage Regulations on Contractor Bid Participation and Behavior: A Comparison of Palo Alto, California with Four Nearby Prevailing Wage Municipalities" *Industrial Relations*, Vol. 51, Issue 4, pp. 874-891, October, 2012.

⁴⁶ See Dunn, Sarah, Quigley, John, and Rosenthal, Larry. 2005. "The Effect of Prevailing Wage Regulations on the Cost of Low-Income Housing," *Industrial and Labor Relations Review*, Vol. 59, No. 1, pp. 141-157.

⁴⁷ The authors provide 'rough' data specific to housing construction in selected California cities indicating that labor's share of construction costs range from 42% to 46% of total costs. Even if labor costs are 46% of total costs, it is unrealistic to assume that total costs would fall by up to 38%. The implication is that labor's share of total costs would fall from 46% to about 17% (0.46 x 0.38 reduction if the wage laws was repealed). This figure for labor's share of total cost (17%) is unrealistically too low.

Background on the Statistical Analysis of Prevailing Wages

This section of the report compares labor market outcomes for construction workers residing in states with strong/average prevailing wages and in states with weak/no wage policies. Data from the Annual Social and Economic Supplement (ASEC) of the *Current Population Survey* of the U.S. Census Bureau contain economic and demographic information on a large number of construction workers.⁴⁸ The *Current Population Survey* is a poll of randomly-selected households across America, jointly sponsored by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics. Data are collected through personal and telephone interviews of the civilian non-institutionalized population ages 15 years old and older. Weights are provided by statisticians at the U.S. Census Bureau to match the survey sample to the overall American population.

The Annual Social and Economic Supplement provides additional data on income and noncash benefits, including food stamps and public and private health insurance plans. In total, the dataset comprises 77,337 observations from persons connected to the construction industry across America—including 66,786 individuals who are employed—over ten years from the beginning of 2004 through the end of 2013. The 77,337 individuals surveyed over ten years is the actual sample size. When weighted to match the actual U.S. population, the data represent an average of 12.3 million Americans in construction labor force per year. This includes approximately 6.0 million employed blue-collar construction workers in an average year. Adjusting the 77,337-person sample size using weighting techniques provided by the U.S. Census Bureau to account for demographic groups who are under-sampled or oversampled allows the data to mirror the actual construction industry.⁴⁹ The information

⁴⁸ See "Poverty," *Current Population Survey Annual Social and Economic Supplement*, US Census Bureau. Accessed at: <http://www.census.gov/hhes/www/poverty/publications/pubs-cps.html>.

⁴⁹ An example of a traditionally under-sampled group is foreign-born immigrants, who may be more difficult to reach via telephone or home visits. On the other hand, an example of a traditionally oversampled group is stay-at-home parents, who are more likely to be home to take the survey, tend to have more availability on a given day, and are consequently more likely to answer survey questions.

was extracted from the Integrated Public Use Microdata Series (IPUMS-CPS) project by the Minnesota Population Center at the University of Minnesota.⁵⁰

To understand the actual and unique impact that strong/average prevailing wage laws have on worker incomes and public sector budgets, the statistical method of ‘regression analysis’ was utilized. This statistical technique, a “curve fitting” method, allows us to compare labor market outcomes between workers in the two groups of states, taking other individual characteristics into consideration. For example, we are able to compare earnings between individuals in states with different wage policies, taking into account other factors that also influence income (education, marital status, gender, race, etc.). This analysis allows us to ask questions such as “if the same worker moved from a state without strong/average prevailing wage legislation to a state with a strong/average prevailing wage law, how much would his or her income increase or decrease?” Statistical analysis also allows us to determine if a measured difference is statistically significant or not. A difference that is not statistically significant is likely due to chance. A statistically significant finding is an indication of a causal relationship.

The effects of residence in a state with strong/average prevailing wages on construction worker wage income, the distribution of income, poverty level status, eligibility for public assistance, health and retirement coverage, income tax contributions, etc. are examined in Part II. Two types of models are utilized in the examination. The first is referred to as the “Standard Analysis.” The second, called the “Advanced Analysis,” is more statistically comprehensive. For a technical explanation of each model, please see the Appendix at the conclusion of this report.

There are limitations to these statistical approaches. First, data from the *Current Population Survey* reports a worker’s state of residence rather than state of employment, so the results may be

⁵⁰ See Sarah Flood, Miriam King, Steven Ruggles, and J. Robert Warren. Integrated Public Use Microdata Series, *Current Population Survey*: Version 4.0. [Machine-readable database]. Minneapolis: University of Minnesota, 2015.

biased by workers who live in states without strong/average prevailing wage laws but work in states with a strong/average prevailing wage law (e.g., living in Iowa but working in Minnesota) and vice-versa. Second, the data is based on household survey responses rather than on administrative payroll reports. There may be more potential for human error in reporting income and government assistance than official payroll records. In addition, a recent paper by Professor Bruce Meyer at the University of Chicago and Nikolas Mittag at CERGE, Charles University has found that the *Current Population Survey* and other household data considerably under-reports government transfers of income.⁵¹ Using data from New York, the researchers find that the *Current Population Survey* misses 40 percent of all Supplemental Nutrition Assistance Program (SNAP) food stamp recipients. The largest instance of underreporting is for single mother households. Blue-collar construction occupations are male-dominated, so underreporting is a smaller issue for this industry. Nevertheless, it is a potential limitation to the analysis that follows. All government assistance findings are likely to be *conservative* estimates as a result. The final limitations are those associated with all statistical models, such as lurking and unobservable variables.

Summary Statistics of the CPS-ASEC Data

Table 1 provides summary statistics for all employed blue-collar construction workers in the dataset, by state of employment. Blue-collar construction workers are defined as all workers employed in “construction occupations,” such as construction laborers, operating engineers, electricians, carpenters, plumbers, pipefitters, and painters. First-line supervisors are excluded. These numbers describe “what is.” For example, without considering any other factors, what is the average wage and salary income of a blue-collar construction worker in a state without a strong/average prevailing wage law compared to the same income in a state with a strong/average law?

⁵¹ See Bruce Meyer and Nikolas Mittag, “Using Linked Survey and Administrative Data to Better Measure Income: Implications for Poverty, Program Effectiveness and Holes in the Safety Net.” National Bureau of Economic Research (NBER), 2015, Working Paper 21676. Accessed at: <http://www.nber.org/papers/w21676>.

The blue-collar construction workforce is generally comparable in states with a weak or no prevailing wage law and in states with a strong or average law (Table 1). For blue-collar construction workers in both types of states, approximately 7-in-10 are employed by private contractors, the average age is about 38 or 39, and only 2% of the workforce is female. The construction industry employs more foreign-born immigrants in states with a weak or no prevailing wage law; a larger fraction of the workforce is white, non-Latino in states with an average or strong law. In addition, military veterans are a larger share of the construction workforce.

Data from the *Current Population Survey* (2004-2013) indicate that military veterans represent a larger share of the construction labor force (8.4%) compared to total employment in the U.S. (7.5%).⁵² In particular, veterans represent a larger share of construction occupations in states with average/strong prevailing wage policies. For example, veterans represent 8.6% of construction employment and 6.8% of the overall work force in states with average/strong prevailing wage laws. On the other hand, vets make up only 8.0% of all construction workers and 8.5% of total employment in states with no/weak prevailing wages laws. Other data reported in Table 1 indicate that construction jobs in states with at least adequate prevailing wage laws offer higher incomes and are more likely to provide self-sufficient jobs. Taken together, these data reveal how vets disproportionately chose careers in construction where the industry is more likely to provide a solid, middle-class income in states with at least average prevailing wage policies. The data also indicate that weakening or repealing prevailing wages in states with at least adequate wage policies has a disproportionate and adverse effect on veterans.

⁵² All of the differences in veteran labor force representation, described here and below, are statistically different at the 0.05 level.

Table 1. General Information on Blue-Collar Construction Workers, 2004-2013

Summary Statistics	Weak/No PWL	Strong/Average PWL
Unweighted Observations (n=)	34,735	43,602
Weighted Annual Observations (N=)	2,755,126	3,257,248
<i>Employment</i>		
Real wage and salary income*	\$32,212	\$44,095
Works for private sector	72.4%	71.6%
Self-employed	24.2%	24.6%
Works for federal government	0.4%	0.1%
Works for state government	0.9%	1.0%
Works for local government	1.9%	2.5%
<i>Demographics</i>		
Age	37.7	38.6
White, non-Latino	54.7%	65.5%
Female	2.3%	2.0%
Married	56.0%	58.1%
Foreign-born immigrant	32.9%	28.7%
Military veteran	8.0%	8.6%
<i>Education</i>		
Less than a high school degree	32.6%	20.3%
High school degree or equivalent	39.7%	48.2%
Some college, no degree	14.0%	15.5%
College degree	13.8%	16.0%
<i>Poverty, Government Assistance, and Taxes</i>		
Lives below official poverty line	15.2%	9.4%
Receives SNAP assistance	9.2%	5.1%
Real SNAP value (for recipients)**	\$3,103	\$3,113
Receives Earned Income Tax Credits (EITC)	15.3%	12.2%
Real EITC value (for recipients)**	\$2,134	\$2,026
Real federal income taxes paid, after credits**	\$1,964	\$3,289

Source: Current Population Survey, Annual Social and Economic Supplement (2004-2013).

*Adjusted for both inflation (Consumer Price Index) and regional differences (Regional Price Parities Index).

**Adjusted only for inflation (Consumer Price Index).

As shown in Table 1, personal economic outcomes contrast starkly. After adjusting for both inflation and regional price parities, the average wage and salary income for blue-collar construction workers is \$44,095 in states with a strong or average prevailing wage law, or \$11,883 greater than their counterparts in states with a weak or no law (\$32,212). While prevailing wage may be responsible for a portion of this income differential, many other factors also improve incomes in states with prevailing wage protections. For example, blue-collar construction workers are better educated in states with a strong or average prevailing wage law, where 79.7% have at least a high school degree or equivalent

compared to 67.4% in states with a weak or no law. This includes 31.5% of workers with at least some college education in average/strong prevailing wage states compared to just 27.8% in weak/average law states.

Other data reported in Table 1 indicate that approximately 9.4% of construction workers in states with strong/average prevailing wages earn an income that places them below the official poverty line, but the analogous working poverty rate is 15.2% in states without effective protections. As a result, fewer blue-collar construction workers receive SNAP assistance (5.1%) and Earned Income Tax Credits (12.2%) in states with strong/average prevailing wage laws than in those without (9.1% and 15.3%, respectively). Due to their higher personal incomes, blue-collar construction workers in states with strong/average prevailing wage laws contribute \$3,289 per year in federal income taxes after credits and deductions on average. Their equivalents in states without an adequate law only contribute \$1,964 on average in annual federal income taxes after credits and deductions. Construction workers in states with a strong or average prevailing wage law generate more tax revenue and receive less government assistance.

Table 2 translates the government assistance and tax outcomes reported in Table 1 into actual dollar values. By multiplying the total recipients of a government program by the average real value of the public assistance, we estimate the cost of government assistance to taxpayers. Despite having fewer total blue-collar construction workers (2.76 million workers) than states with adequate laws (3.26 million workers), states with a weak or no law cost American taxpayers more in food stamps (SNAP assistance) paid to blue-collar construction workers— \$786.5 million to \$512.1 million— and more in Earned Income Tax Credits deducted from tax receipts— \$896.8 million to \$803.9 million. Construction workers of states with a strong or average prevailing wage law, meanwhile, add almost *twice* as much in federal income tax revenues to support these programs. Data from the *Current Population Survey* suggest that Internal Revenue Service collects an estimated \$10.7 billion in income

taxes paid by blue-collar construction workers every year in states with strong/average prevailing wage laws compared to only about \$5.4 billion per year from their counterparts in other states.

Table 2. Public Assistance for, and Tax Contributions of, Blue-Collar Construction Workers

Government Assistance and Tax Contributions	Weak/No PWL	Strong/Average PWL
Total SNAP recipients	253,472	164,491
Real SNAP assistance value	\$3,103	\$3,113
<i>Estimated total SNAP assistance</i>	<i>\$786.5 million</i>	<i>\$512.1 million</i>
Total EITC recipients	420,157	396,733
Real EITC value	\$2,134	\$2,026
<i>Estimated total EITC assistance</i>	<i>\$896.8 million</i>	<i>\$803.9 million</i>
Total blue-collar construction workers	2,755,126	3,257,248
Real federal income taxes paid, after credits	\$1,964	\$3,289
<i>Estimated total EITC assistance</i>	<i>\$5,411.1 million</i>	<i>\$10,713.1 million</i>

Source: Current Population Survey, Annual Social and Economic Supplement (2004-2013).

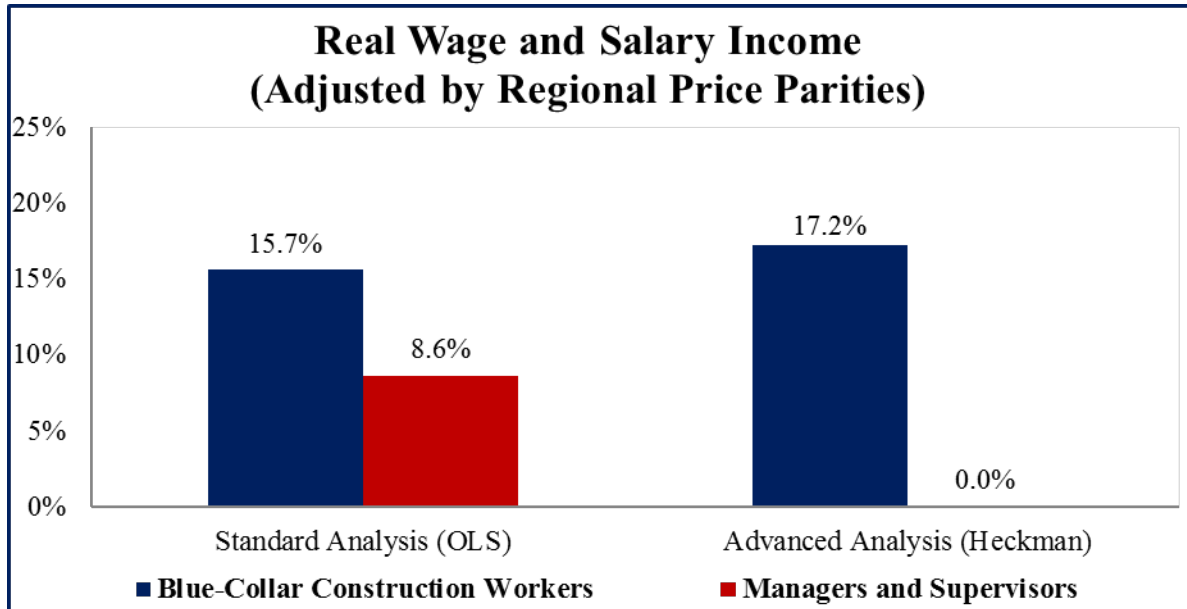
Prevailing Wages, Worker Incomes, and Worker Self-Sufficiency

While the summary statistics of Tables 1 and 2 report “what is,” the remainder of Part I investigate “how much” strong or average prevailing wage legislation is uniquely responsible for these outcomes. Determining the causal impact of prevailing wage after netting out the effects of all other variables allows us to assess the consequences of repealing or weakening prevailing wage laws in the 25 states with average/strong policies.

Results reported in Figure 1 indicate that residing in a state with at least average prevailing wages increases incomes in the construction industry. Even after accounting for all other factors, a strong/average prevailing wage increases a blue-collar construction worker’s earnings by between 15.7% and 17.2% per year. These results are statistically significant. Prevailing wage legislation has a much smaller impact on managers and supervisors in the construction industry. While the Standard Analysis finds that prevailing wage increases the wage and salary income of an average manager or supervisor by about 8.6%, the more comprehensive Advanced Analysis finds that prevailing wage neither raises nor reduces his or her earnings. By substantially improving the incomes of blue-collar

construction workers and having a smaller or no effect on their managers and supervisors, prevailing wage helps to reduce income inequality in the construction industry.

Figure 1. The Impact of Strong/Average Prevailing Wage on Real Wage and Salary Incomes

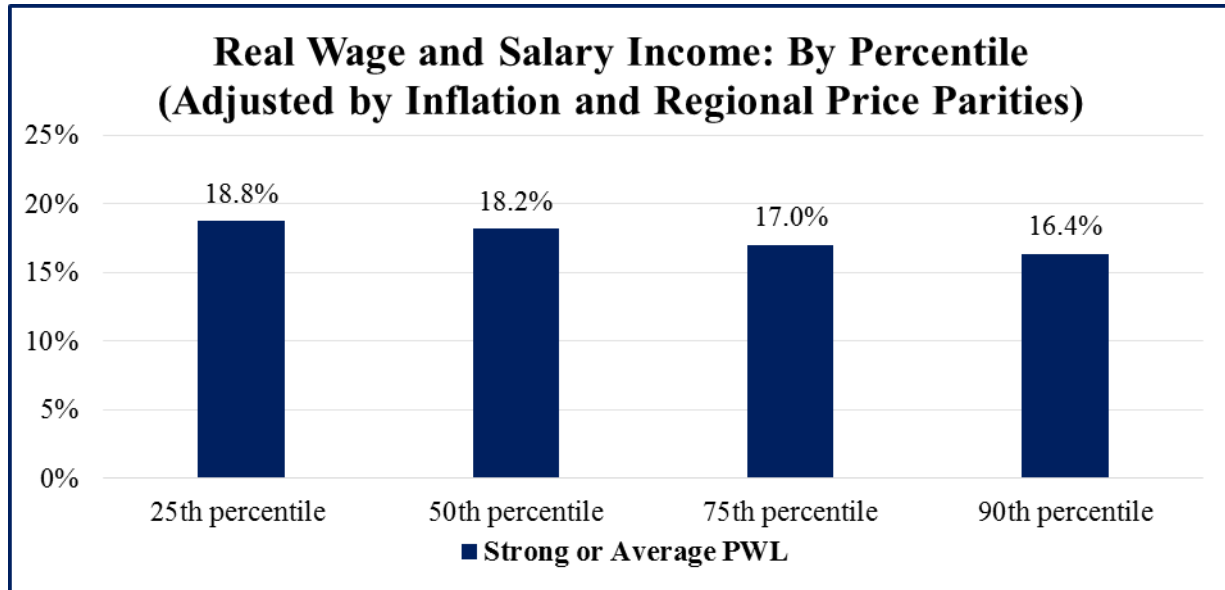


Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report.

While prevailing wage reduces income inequality between blue-collar construction workers and construction managers and supervisors, the policy also raises and compresses earnings *within* the blue-collar construction workforce. Results reported in Figure 2 detail the effects of the wage policy on the distribution of income for different blue-collar construction worker earnings levels. Strong or average prevailing wage laws increase the incomes of all construction workers in a statistically significant way. The effects are largest at the lower ends of the income distributions. For example, strong or average prevailing wage laws increase earnings by 18.8% for the 25th percentile, versus 18.2% for the median worker. The increase for the top 10 percent of blue-collar construction workers (the 90th percentile) is only 16.4%. The results illustrate how adequate prevailing wage policies improve personal incomes for all construction workers but benefit low-income and workers most. Strong or average prevailing

wage laws are an effective institution that reduces wage inequality in the construction industry, fostering middle-class incomes for construction workers and their families.

Figure 2. Prevailing Wage and the Distribution of Income for Blue-Collar Construction Workers

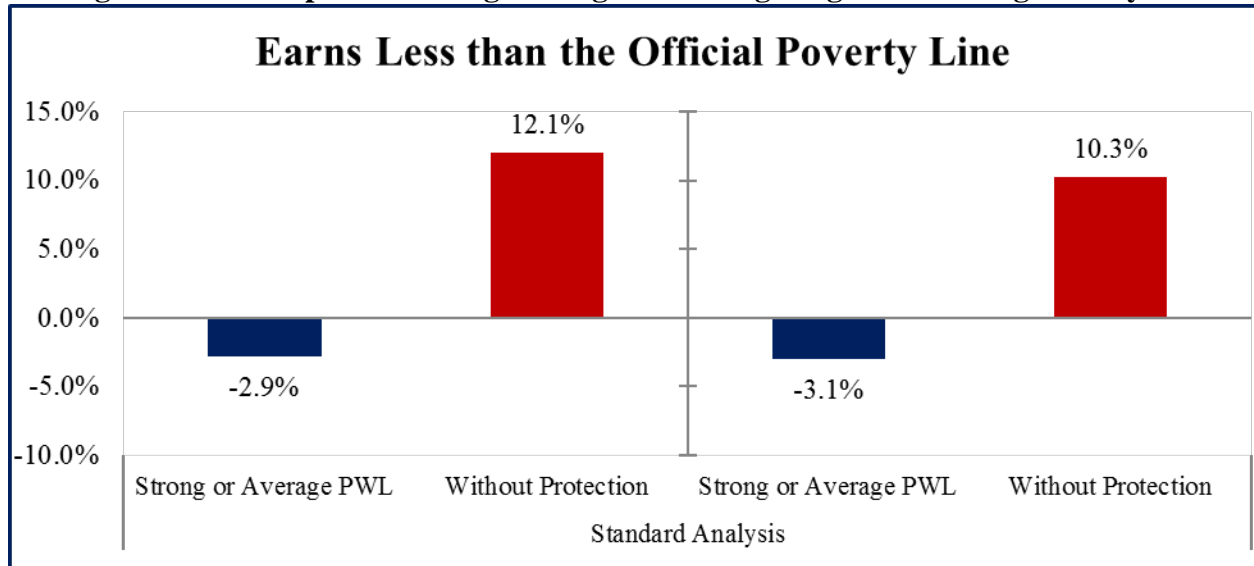


Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report.

The finding that prevailing wage legislation has larger benefits for the lowest-paid workers is reflected in an analysis of the working poverty rate for blue-collar construction workers. Data reported in Figure 3 reveals that strong/average prevailing wages decrease the probability that a construction worker will earn an income below the official poverty level by about 3 percentage points. Independent of all other observable factors (including race, gender, and education), the chances that a blue-collar construction worker, who is not a union member and does not live in a state with at least average prevailing wages, will earn an income below the poverty line is between 10.3% and 12.1%. Those baseline estimates are reported in Figure 3 as a state economy “without protections” for workers because they are also independent of the effect of union membership and adequate prevailing wage requirements. The Advanced Analysis indicates that the number of construction workers in poverty in states with a weak or no law would be reduced by 30% if they enacted or strengthened prevailing

wage.⁵³ Strong/average prevailing wages significantly reduce the poverty rate for construction workers.

Figure 3. The Impact of Strong/Average Prevailing Wage on Working Poverty



Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report.

A common argument against prevailing wage laws is that they exclude non-white workers from employment in the construction industry. The current evidence that prevailing wage discriminates against non-white workers is founded on weak and incomplete analyses which, if corrected, do not support the argument. Vedder and Galloway find that federal and state prevailing wage laws were associated with a reduced proportion of African-Americans in the construction labor force.⁵⁴ The finding, however, is merely descriptive (i.e., a “what is” analysis) and fails to control for other factors which may influence the results (i.e., a “how much” analysis). Thieblot slightly improves on their study by adjusting 1990 Census data on the proportion of African-Americans in the construction labor force to the racial composition of the share of African-Americans who are employed overall.⁵⁵ His research also suggests that prevailing wages discriminate against hiring African-Americans. However,

⁵³ $-3.1 \text{ percentage points} \div 10.3 \text{ percentage points} = -30.1\%$.

⁵⁴ See Vedder, R. and D. Galloway. (1995). “Cracked Foundation: Repealing the Davis-Bacon Act.” Center for the Study of American Business.

⁵⁵ See Thieblot, A. (1999). “Prevailing Wage Laws and Black Employment in the Construction Industry” *Journal of Labor Research*. Volume XX, Number 1.

Thieblot also does not allow for other meaningful factors to determine outcomes, rendering much of his analysis statistically meaningless.

Table 3 provides results from an advanced analysis of employment in the construction industry. The analysis controls for the type of worker who typically enters the construction industry. Certain individuals may be more likely to want to work a blue-collar construction job based on a number of factors, including their level of education, their age, and whether or not the state has a prevailing wage law that they might expect to raise their lifetime personal earnings. Once we have accounted for the type of worker who typically wants to work in construction, we investigate the impact of strong or average prevailing wage laws on the probability that a non-white worker has a construction job, the probability that a female worker has a job, and the probability that a foreign-born immigrant has a job. Note that this analysis does not explore whether prevailing wage encourages or discourages a given worker from seeking employment in a blue-collar construction occupation; rather, it explores impacts on workers who self-select into the trades and want to work a blue-collar construction job.

Without considering the impact of a strong or average prevailing wage law, the results indicate that non-white and female workers are less likely to work in construction overall (Table 3). Compared to white, non-Latino individuals, minority workers are 7.6 percentage points less likely to work a blue-collar construction job. Similarly, a female worker is 32.3 percentage points less likely than a comparable male worker from being employed in a blue-collar construction job, regardless of whether the state has an adequate prevailing wage law or not. Foreign-born immigrant workers, on the other hand, are statistically no more or less likely to work in construction than native-born residents. The presence of a strong or average prevailing wage law actually *increases* the chances that any given worker who wants to work in construction actually has a blue-collar construction job by 4.2 percentage points— independent of the person's race, gender, or place of birth.

The evaluation of “how much” a strong or average prevailing wage law specifically affects minority employment in a construction occupation produces results that are at odds with the “what is” analyses by Vedder and Galloway and by Thieblot (Table 3). After netting out the general fact that non-white and female workers are less likely to be employed in a construction job regardless of where they live, a strong or average prevailing wage law actually increases the likelihood that a non-white individual worker in a construction occupation by a statistically significant 5.6 percentage points. This impact is *in addition to* the 4.2 percentage-point increase in the probability of employment due to strong/average prevailing wage laws for all workers. Prevailing wage has no statistically significant effect on female employment in construction other than the 4.2 percentage-point increase provided to all workers. On the other hand, a strong or average prevailing wage law decreases the chance that a foreign-born immigrant is employed in a blue-collar construction job by 8.9 percentage points.

This analysis has three implications. First, strong or average prevailing wage laws increase non-white employment in construction occupations and help to correct a racial employment gap that persists in construction regardless of wage policy. Second, strong or average prevailing wage laws have no discriminatory employment effect for women compared to men. Finally, prevailing wage laws reduce the chances of employment of foreign-born workers. The laws improve outcomes for a non-white worker, as long as he or she is not an immigrant to the United States. This aligns with a finding by Professor Philips that states with prevailing wage laws tend to address skilled labor shortages through industry-sponsored apprenticeship programs for local workers, while the response in states without prevailing wage laws is to advocate for guest-worker programs which increase labor supply and drive down worker wages.⁵⁶

⁵⁶ See “Wisconsin’s Prevailing-Wage Law: An Economic Impact Analysis,” by Peter Philips, April, 2015. Accessed at http://www.wisconsincontractorcoalition.com/application/files/9914/2889/7832/Wisconsin_Report_April_2015.pdf.

Table 3. The Impact of Strong/Average Prevailing Wage on the Likelihood of Employment

Probability of Being Employed in a Blue-Collar Construction Job	Independent Effect
Non-white	-7.6%
Female	-32.3%
Foreign-born immigrant	0.0%
Strong/average PWL	+4.2%
<i>Interaction: Strong/average PWL & Non-white</i>	+5.6%
<i>Interaction: Strong/average PWL & Female</i>	0.0%
<i>Interaction: Strong/average PWL & Immigrant</i>	-8.9%

Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report.

In addition to higher personal incomes, reduced income inequality in construction, reduced racial employment inequality in construction, and fewer workers below the official poverty line, strong/average prevailing wages increase the likelihood that a worker has both health insurance coverage and a pension plan available at work (Table 4). An effective state prevailing wage law increases the probability that a construction workers is covered by health insurance in the past month by between 8.0 and 9.8 percentage points (see Advanced and Standard Analysis). The baseline without worker protections is 59% to 60%, meaning that three-in-five construction workers would be covered by a health insurance plan even without prevailing wage or union membership. However, with effective prevailing wage legislation increasing coverage by 8.0 percentage points in the Advanced Analysis, a construction worker would have a 68% chance of having a health care plan.⁵⁷ All of these results are statistically significant. Prevailing wage helps to significantly increase private health coverage, ensuring that construction workers are self-sufficient and not forced to rely on public insurance programs.

⁵⁷ 60.3 percentage points + 24.8 percentage points + 8.0 percentage points = 93.1 percentage points.

Table 4. The Impact of Strong/Average Prevailing Wage on the Likelihoods of Health Insurance Coverage and Pension Plan Coverage

Economic Outcome	Standard Analysis		Advanced Analysis (Heckman)	
	Strong/Average PWL	Without Protection (No Strong/Ave PWL, No Union)	Strong/Average PWL	Without Protection (No Strong/Ave PWL, No Union)
Has Health Insurance	+9.8%	59.1%	+8.0%	60.3%
Has a Pension Plan at Work	+3.8%	26.1%	+0.0%	38.7%

Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report. "Without protection" indicates that the individual worker does not live in a state with a strong or average prevailing wage law and is not a member of a labor union.

Other academic research that examines the benefits of prevailing wage laws by Professor Waddoups has explored the connection between the lack of employment-based health insurance and the disproportionate uncompensated care costs that accrue to public hospitals and, by extension, the community.⁵⁸ In particular, Waddoups' study documented the particularly low incidence of employment-based health insurance among construction workers and the corresponding disproportionately high incidence of uncompensated care among construction workers at a local public hospital. The findings clearly demonstrate that a large share of uncompensated care is attributable to the construction industry relative to its size, which means that local taxes supporting the hospital are higher than they would otherwise be. To the extent that cross-subsidies from paying patients cover uncompensated care costs, prices of health care— and thus, insurance prices— are higher than they would be without the high levels of uncompensated care.

Data reported in Table 4 also indicate that strong/average prevailing wages increase the probability that a construction worker is enrolled in a pension plan at work by up to 3.8 percentage points. The Advanced Analysis finds a positive but statistically insignificant effect of prevailing wage,

⁵⁸ See Jeff Waddoups, "Health Care Subsidies in Construction: Does the Public Sector Subsidize Low Wage Contractors?". Accessed at: http://www.researchgate.net/publication/237102337_Health_Care_Subsidies_in_Construction_Does_the_Public_Sector_Subsidize_Low_Wage_Contractors.

so the results are reported as 0.0%. The 3.8 percentage-point effect indicates that the wage policy contributes towards increased worker self-reliance and less dependency on government retirement programs.

Prevailing Wage, Reliance on Public Assistance, and Worker Tax Contributions

Prevailing wage raises and compresses worker earnings, fostering self-sufficient construction workers. In theory, these economic outcomes should reduce reliance on government programs and should enhance public sector budgets. This subsection investigates whether this intuition is true, evaluating “how much” prevailing wage impacts public assistance payments and tax revenue contributions.

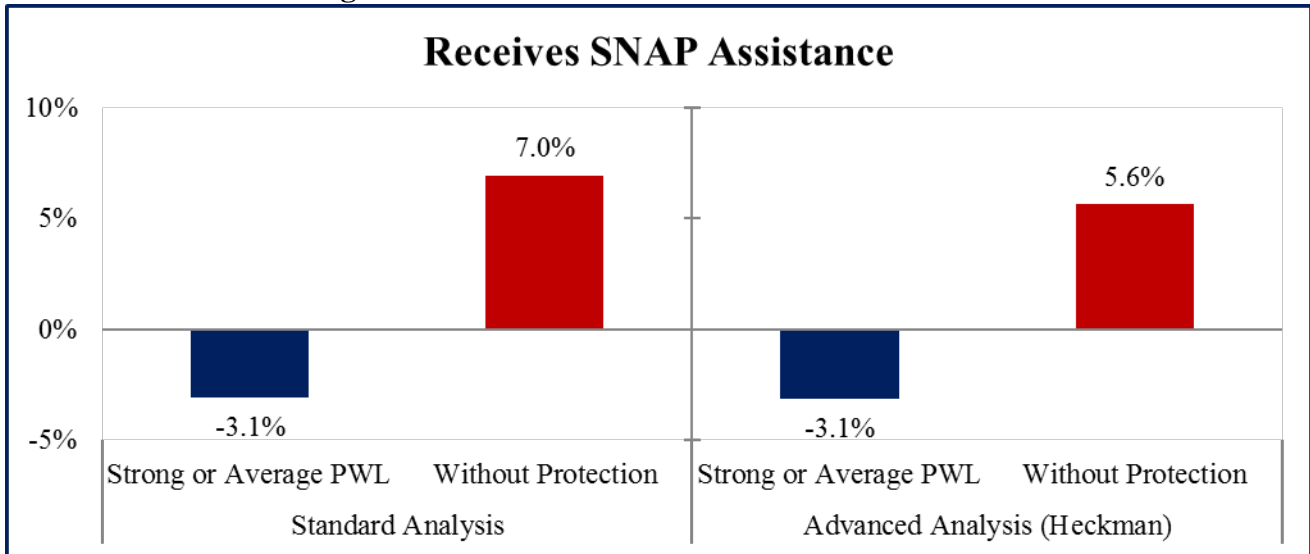
Results reported in Figure 4 indicate that strong or average prevailing wage laws reduce the probability that a blue-collar construction worker receives Supplemental Nutrition Assistance Program (SNAP) aid by 3.1 percentage points. This finding is statistically significant in both the Standard Analysis and the Advanced Analysis. The “without protection” baseline in the Advanced Analysis is 5.6%, meaning that individual construction workers living in a weak or no law state who are not members of a labor union have a 5.6% chance of relying on food stamps. Prevailing wage, on the other hand, lowers this likelihood to 2.5%. In other words, the total number of construction workers receiving food stamp assistance is currently 55% lower in states with strong or average prevailing wage laws on average than it otherwise would be if the states had a weak or no law.⁵⁹

The Earned Income Tax Credit (EITC) is a benefit for working people who have low to moderate income. Strong or average prevailing wages decrease the probability of qualifying for the EITC by about 1 percentage point (Figure 5). Results for the Advanced Analysis are statistically insignificant, but the Standard Analysis finds that prevailing wage reduces EITC reliance by 1.1 percentage point. Relative to the baseline without worker protection from prevailing wage or a labor

⁵⁹ -3.1 percentage points ÷ 5.6 percentage points = -55.4%.

union, prevailing wage lowers the number of blue-collar construction workers receiving this federal government assistance by about 8%.⁶⁰ In other words, the total number of construction workers who get Earned Income Tax Credits is currently 8% lower in states with strong or average prevailing wage laws on average than it otherwise would be if the states had a weak or no law.

Figure 4. The Impact of Strong/Average Prevailing Wage on Reliance on Supplemental Nutrition Assistance Program



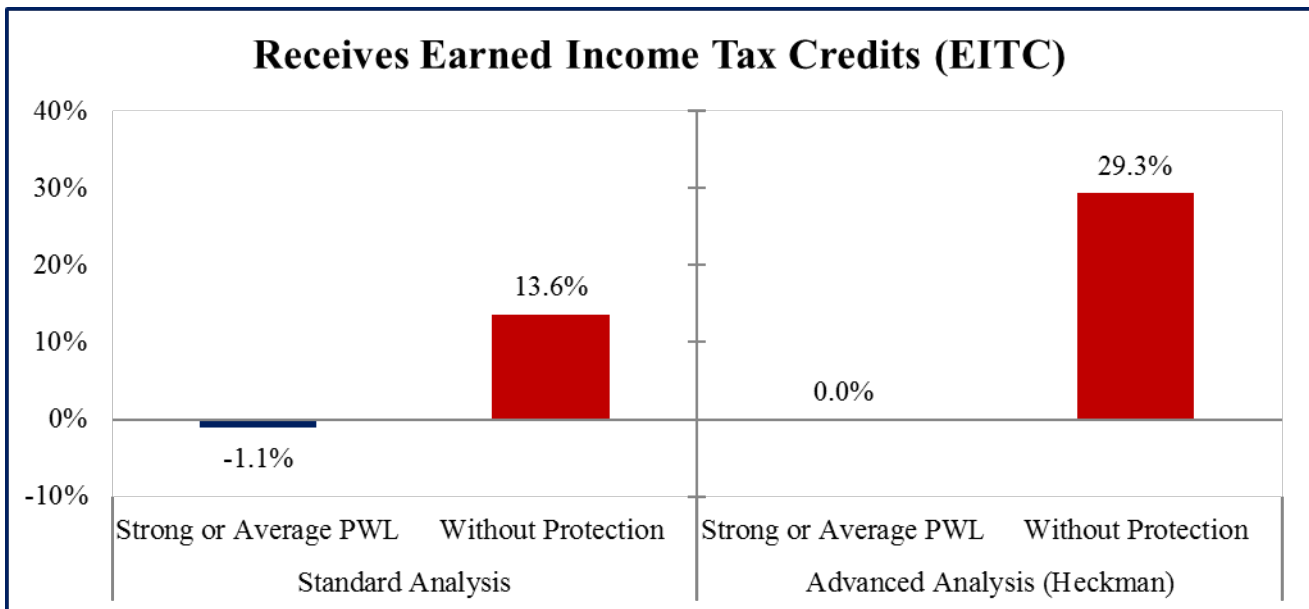
Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report. "Without protection" indicates that the individual worker does not live in a state with a strong or average prevailing wage law and is not a member of a labor union.

The higher incomes associated with strong or average prevailing wage laws preclude blue-collar construction workers from receiving public assistance. Blue-collar construction workers are more likely to be self-sufficient in states with effective prevailing wage laws. This lowers costs borne by taxpayers. Simultaneously, the higher worker earnings from prevailing wages also increase the contributions of blue-collar construction workers to the federal budget (Table 5). Without worker protections from prevailing wage or a labor union, the average blue-collar construction employee annually pays \$2,631 in real federal income taxes after credits and deductions. By living in a state with a strong or average prevailing wage law, however, the average blue-collar construction worker

⁶⁰ -1.1 percentage points ÷ 13.6 percentage points = -8.1%.

sees a \$1,057 hike in his or her federal income tax liability after credits and deductions— due to the accompanying increase in his or her personal income. As discussed in previous sections, this added income is also spent throughout the economy, which increases state income tax revenues, local property tax revenues, and state and local sales tax revenues. Strong/average prevailing wage policies therefore positively impact the public budget by adding tax revenues and cutting public assistance expenditures.

Figure 5. The Impact of Strong/Average Prevailing Wage on Reliance on the Earned Income Tax Credit



Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report. "Without protection" indicates that the individual worker does not live in a state with a strong or average prevailing wage law and is not a member of a labor union.

Table 5. The Impact of Strong/Average Prevailing Wage on Federal Income Tax Liability

Economic Outcome	Strong/Average PWL	Without Protection
Real federal income taxes paid (after credits and deductions)	+\$1,057	\$2,631

Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013). For partial regression results, please see the Appendix following the conclusion of this report. "Without protection" indicates that the individual worker does not live in a state with a strong or average prevailing wage law and is not a member of a labor union.

Finally, Table 6 aggregates the findings of Part II to forecast both the number of affected workers and the total dollar impact on the federal budget from weakening prevailing wage. Note that, given the finding by Professors Meyer and Mittag that government assistance is actually underreported by the *Current Population Survey* Annual Social and Economic Supplement (ASEC), Table 6 likely provides conservative estimates.⁶¹ If all states with strong or average prevailing wage legislation weakened or outright repealed their laws, blue-collar construction workers earning an income below the poverty line would increase by 3.1 percentage points, resulting in an estimated 99,000 newly impoverished workers. Weakening or repealing prevailing wage laws across the nation would result in 319,000 construction workers losing their health insurance coverage and 124,000 construction workers losing their pension plan at work, resulting in increased reliance on public insurance programs.⁶² In addition, weakening or repealing prevailing wage laws across the country would be expected to increase blue-collar construction worker enrollment in the Supplemental Nutrition Assistance Program (SNAP) by 102,000 workers, translating into an additional \$308.5 million cost to taxpayers every year. Similarly, an estimated 36,000 more construction workers would receive Earned Income Tax Credits,

⁶¹ See Bruce Meyer and Nikolas Mittag, "Using Linked Survey and Administrative Data to Better Measure Income: Implications for Poverty, Program Effectiveness and Holes in the Safety Net." National Bureau of Economic Research (NBER), 2015, Working Paper 21676. Accessed at: <http://www.nber.org/papers/w21676>.

⁶² It is important to note that these are all, in essence, non-union construction workers. The method of statistical analysis utilized in this report investigates the impact of weakening or repealing prevailing wage independent of all other factors, including union membership. The analysis assumes that weakening or repealing prevailing wage laws would have no impact on union membership (i.e., that the number of union members in construction would be the same before and after the policy change). Given that unions statistically increase construction worker incomes (especially for low-wage workers) and significantly reduce the chances that a given worker lives below the poverty line, receives SNAP assistance, and gets EITC reimbursements, these numbers almost exclusively reflect changes in the non-union construction market. If union membership were to decline as a result of weakening or repealing prevailing wage, the estimated impacts would be *larger*.

costing taxpayers another \$74.6 million a year. At the same time, the loss in construction worker earnings would be accompanied by a loss in federal income tax contributions of over \$3.4 billion from blue-collar construction workers. Combined, the drop in federal income tax revenues plus the increase in food stamp and EITC costs for blue-collar construction workers would further strain the federal budget by almost \$4 billion every year.

Table 6. Estimated Impact of Weakening or Repealing Prevailing Wages on Public Budgets

Economic or Public Sector Budget Outcome	Percentage Point Change	Workers Affected	Average Value	Total Impact on Public Budgets
Lives below the official poverty line	+3.1%	+99,000	--	--
Has health insurance	-9.8%	-319,000	--	--
Has a pension plan available at work	-3.8%	-124,000	--	--
Supplemental Nutrition Assistance Program (SNAP)	+3.1%	+102,000	\$3,107	+308.5 million
Earned Income Tax Credit (EITC)	+1.1%	+36,000	\$2,082	+\$74.6 million
<i>Federal income taxes paid, after credits and deductions</i>	--	<i>3,260,000</i>	<i>-\$1,057</i>	<i>-\$3,442.9 million</i>

Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013).

This predictive national analysis can be applied to states that are considering repealing or weakening their prevailing wage laws. Note that it is a “static” assessment and assumes that nothing else changes other than the weakening or repeal of a prevailing wage law. For example, the analysis assumes that union membership is unchanged in construction occupations. It also assumes that prevailing wage alterations are not packaged with other policy changes, such as an increase in guest worker programs to address labor shortages.

Table 7 applies the national impacts to Wisconsin and Michigan, two Midwestern states that have recently considered changing their prevailing wage laws. The top-line figures in Table 7 are the average annual number of blue-collar construction workers in each state from 2004 through 2013. These estimates do not include extraction occupations, which are often grouped with construction

workers, and do not include first-line supervisors or managers. The rest of the table incorporates the data to understand how each state would be different by weakening or repealing their prevailing wage laws, reported in percentage values and total worker values. All total worker estimates are rounded to the nearest hundred.

Table 7. Estimated Impact of Weakening or Repealing Prevailing Wages on Government Assistance in Two Midwestern States

Midwestern States: Economic or Public Sector Budget Outcome	Wisconsin		Michigan	
	Actual (2004-2013)	With Weakened or No PWL	Actual (2004-2013)	With Weakened or No PWL
Average workers in construction occupations	77,600	77,600	138,500	138,500
Lives below the official poverty line	4.9%	7.9%	7.5%	10.6%
	3,800	6,100	10,400	14,700
Supplemental Nutrition Assistance Program (SNAP)	3.7%	6.8%	4.9%	8.0%
	2,900	5,300	6,700	11,100
Earned Income Tax Credit (EITC)	10.7%	11.8%	9.2%	10.3%
	8,300	9,200	12,800	14,300
Has health insurance	72.6%	62.8%	72.3%	62.5%
	56,400	48,700	100,100	86,600
Has a pension plan available at work	38.1%	34.3%	35.5%	31.7%
	29,600	26,600	49,200	43,900

Source: Authors' analysis of the Current Population Survey, Annual Social and Economic Supplement (2004-2013).

The data forecast that thousands of Midwestern construction workers would be forced to rely on government assistance if Wisconsin and Michigan weakened or repealed their prevailing wage laws (Table 7). In Wisconsin, approximately 2,300 workers earning a sufficient wage would experience an earnings decline that would put them below the official poverty line. This would result in about 2,400 new Wisconsin workers receiving food stamps and 900 more relying on EITC assistance. An estimated 7,700 blue-collar construction workers would lose health insurance coverage and

approximately 3,000 blue-collar construction workers would lose their employer-provided pension plan across the Badger State. The results are comparable for Michigan, which has a larger construction industry. Approximately 4,300 workers more would earn below the official poverty line, resulting in about 4,400 new Michigan workers receiving food stamps and 1,500 more relying on EITC assistance. An estimated 13,500 blue-collar construction workers would lose health insurance coverage and approximately 5,300 blue-collar construction workers would lose their employer-provided pension plan across the Wolverine State. In both states, the increase in workers relying on public assistance, tax assistance, public health insurance systems, and the public retirement system would all increase costs to taxpayers.

II: Economic Impact of Weakening State Prevailing Wage Laws

The IMPLAN Economic Impact Software

The economic impact analysis reported in this section is based on the IMPLAN software to measure the ripple, or multiplier effects of changes to the state-level prevailing wage policies. Specifically, this software is used to estimate the impact on national economic activity, employment, and tax revenue. IMPLAN (IMpact analysis for PLANning) was originally developed by the U.S. Department of Agriculture to assist the Forest Service with land and resource management planning. The Minnesota IMPLAN Group (MIG, Inc.) started work on the data-driven model in the mid-1980s at the University of Minnesota. The software was privatized in 1993 and made available for public use. The software contains an input-output model with data available at the zip-code, county, state, and national levels.

Input-output analysis measures the inter-industry relationships within an economy and is particularly useful in analyzing policy alternatives. Specifically, input-output analysis is a means of measuring the market transactions between businesses and between businesses and consumers. This

framework allows for the examination of how a change in one sector affects the entire economy. In this way, input-output analysis is able to analyze the economic effects of changes in construction industry cost components and spending leakages by measuring the multiplier, or ripple effect, as an initial change in one industry stimulates further changes in transactions between other businesses and households. The results reported in this study are based on industry figures from the 2012 *Economic Census of Construction*, income distributions in the 2011 5-year *American Community Survey*, and 2007-2009 health care industry spending proportions from the *National Health Expenditures Survey*. IMPLAN deflators are used to adjust for changes in prices over time. The results are reported in constant 2015 dollars.

The Economic Impacts of Prevailing Wages: Effect of Spending Leakages

There are several ways prevailing wages affect economic activity in a region. First, prevailing wage laws are associated with a greater employment of local contractors and construction workers. When public construction funds are used to employ local companies and workers, local economic activity increases. The effect of higher incomes and spending ripples through the economy affecting industries that are not directly related to the construction industry. When prevailing wages are repealed or weakened, the opposite takes place. More funds leak out of the area economy as more contractors from other regions replace local contractors and their employees.

Previous research has investigated this aspect of prevailing wages. An examination of library construction in Santa Clara County, California found that 71% of subcontractors employed on prevailing wage projects were county residents.⁶³ When prevailing wages were not paid, only 12% of subcontractors resided within the county. Had 16 libraries– with a combined project value of \$177 million– been built without prevailing wages, economic activity in the county would have decreased

⁶³ See “Economic, Fiscal and Social Impact of Prevailing Wage on San Jose, California,” Economic Policy Brief, April 25, 2011. Accessed at: http://wpsa.org/5-13-11%20prevailing_wage_brief.pdf.

by over \$11 million, over 100 jobs would have been lost, and county sales and tax revenues would have fallen by approximately \$128,000.

Elsewhere we have examined the economic impact associated with weakening or repealing prevailing wages in Wisconsin and Michigan.⁶⁴ These studies measured the combined effects of increased work completed by out-of-state contractors as well as the impact associated with changes in construction cost components that vary with prevailing wage status. The leakage associated with the increased work completed by out-of-state contractors dominates the overall economic effect weakening or repealing prevailing wages.⁶⁵ In this study we report the leakage impact separately. For example, if Wisconsin weakened its prevailing wage law an additional \$500 million in private and public construction value would be completed by out-of-state contractors. Because of this leakage, economic activity would decrease in the state by approximately \$1.1 billion. Total employment would decrease by over 6,700 jobs and state and local tax revenue would decrease by over \$40 million dollars. These are annual impacts that would be sustained every year after the weakening of the wage policy. Evidence from Michigan is consistent with these results. Repeal of Michigan's prevailing wage policy would be associated with increased work by contractors from surrounding states of approximately \$670 million. This leakage would decrease economic activity by about \$1.5 billion, reduce state-wide employment by over 9,700 jobs and decrease state and local tax revenue by over \$55 million. Like the Wisconsin impact, the effect on the Michigan economy is not a one-time impact, but would decrease economic activity on an annual basis.

⁶⁴ See "How Weakening Wisconsin's Prevailing Wage Policy Would Affect Public Construction Costs and Economic Activity," by Kevin Duncan and Alex Lantsberg, May 22, 2015. Accessed at: <http://www.faircontracting.org/wp-content/uploads/2015/05/How-Weakening-Wisconsin%E2%80%99s-Prevailing-Wage-Policy-Would-Affect-Public-Construction-Costs-and-Economic-Activity2.pdf> and "The Cost of Repealing Michigan's Prevailing Wage Policy: Impacts on Total Construction Costs and Economic Activity," by Kevin Duncan, Alex Lantsberg, and Frank Manzo IV, June 17, 2015. Accessed at: <http://illinoisepi.org/countrysidenonprofit/wp-content/uploads/2014/06/The-Cost-of-Repealing-Michigans-PWL-FINAL.pdf>.

⁶⁵ The leakage impact represents 88% of the total impact associated with repeal or weakening prevailing wages in Michigan. The corresponding figure for the Wisconsin impact is 92%.

This current study examines the economic impact associated with changes in construction industry cost components with a change in prevailing wage policy. Construction establishments in states with strong and average prevailing wage laws have higher construction worker wage and benefit costs, lower material and fuel costs, and lower retained earnings by contractor firms. Establishments in states with no or weak prevailing wage regulations have lower construction worker wage and benefits costs, higher material and fuel costs, and higher retained earnings for contractors. The economic impact analysis used in this current study measures the net effect on *national* economic activity as these cost components change with changes in prevailing wage policies. Specifically, we measure the impact on the U.S economy if the 25 states with average or strong prevailing wage laws (in 2012) were to weaken or repeal their wage polices and alter the component costs accordingly.

Economic Impact on the U.S. Economy of Weakening or Repealing Prevailing Wage Laws in 25 States with Average or Strong Wage Polices

The economic impact is based on differences between states with strong/average prevailing wage laws and those with weak/no wage laws. To illustrate these differences, the United States is divided into two groups: 25 states with “average” and “strong” prevailing wage laws and 25 states with “weak” or no prevailing wage laws. Figure 5 maps the states by their prevailing wage status. We rely on several sources to determine the “strength” of state-level policies.⁶⁶ Armand Thieblot rated state-level prevailing wage laws based on factors including coverage thresholds, type of work excluded/included, and the determination of wage rates, etc.⁶⁷ Thieblot’s numeric rating ranges from 2 (for a state law with very low strength) to 17 (for a law with very high strength). The weighted

⁶⁶ We define the strength of a law on the ability to protect local wages on public projects from the depressing influence of nonlocal contractors.

⁶⁷ See Thieblot Armand J.1995. “*State Prevailing Wage Laws.*” Prepared for Associated Builders and Contractors, Inc.

Results from academic research indicate that when wages rise in the construction industry, more skilled construction workers replace less productive workers.⁶⁹ The use of more productive workers may be associated with more efficient construction and lower material and fuel cost shares in states with at least average prevailing wage policies. As Figure 6 reveals, material, fuels, and equipment rental costs are 44.6% of total costs in states with weak or no wage policy and are 41.8% in states with strong and average laws. In addition to employing more productive workers, contractors may economize on material and fuel costs in states with higher labor costs to keep overall costs low to remain competitive.

Other data reported in Figure 6 indicate that expenditures on administrative workers are the same in the two groups of states (at approximately 9%). Contractors in states with weak or no prevailing wage laws spend more on purchased construction services (9.4%, compared to 9.0% in states with at least average wage policies). Depreciation expenses are also higher in states with weak or no laws (4.1% versus 3.7%).

States with strong and average prevailing wage laws also differ in many other policy areas compared to those with weak and nonexistent ones. Prevailing wage laws are part of a set of interrelated institutional arrangements, including a stronger emphasis on apprenticeship training, greater workplace safety, higher participation rates in health insurance and retirement plans, , and middle-class wages that support working families.⁷⁰ Prevailing wage laws establish the underlying legal framework for a construction industry that provides the skills needed to build quality infrastructure for a growing, technologically-sophisticated, and competitive economy.

⁶⁹ See William Blankenau and Steven Cassou, “Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change between Skilled and Unskilled Labor.” *Applied Economics*, 2011, Vol. 43, pp. 3129-3142.

⁷⁰ See Peter Philips, “Kentucky’s Prevailing Wage Law: An Economic Impact Analysis,” 2014, accessed at: <http://www.faircontracting.org/wp-content/uploads/2014/02/Kentucky-Report-2014-Philips.pdf>; and Frank Manzo IV and Robert Bruno, “Which Labor Market Institutions Reduce Income Inequality? Labor Unions, Prevailing Wage Laws, and Right-to-Work Laws in the Construction Industry,” 2013, accessed at: http://illinoisepi.org/countrysidenonprofit/wp-content/uploads/2013/10/ILEPI-LEP-Research-Report_Institutions-Income-Inequality_ManzoBruno1.pdf.

In contrast to this “high road” construction industry, the construction “low road” does not have the same legal basis. In states with weak or no prevailing wage laws, there are lower levels of training and productivity and higher rates of job-related injury. One study found that, from 2008 through 2010, there were 8.5 fatal work-related injuries per 100,000 full-time construction workers in states with strong prevailing wage laws. By contrast, the fatality rate was 12.1 work-related deaths per 100,000 full-time construction workers in states without a prevailing wage law over that time.⁷¹ Wages and benefits are also lower, with evidence suggesting that there is greater reliance on public assistance, particularly related to uncompensated health care costs.⁷² A key assertion made by prevailing wage opponents is that prevailing wages increase construction costs, reduce the number projects, and decrease employment in the construction industry.⁷³ By implication, the goal is to achieve higher levels of economic activity and employee prosperity through lower construction worker wages, benefits, and related income. However, economic impact studies have made clear that it is repeal of prevailing wage laws that is associated with reduced construction activity in a state and reduced construction employment. Furthermore, reducing health and retirement benefits on public construction projects increases reliance on public assistance and increases taxpayer burdens.

The evidence reported in Figure 6 is illustrative of this problem. Without prevailing wages, worker benefits are lower and retained contractor income is higher. With lower health benefits, the

⁷¹ Alison Dickson-Quesada, Frank Manzo, Dale Belman, and Robert Bruno, “A Weakened State: The Economic and Social Impacts of Repeal of the Prevailing Wage Law in Illinois.” School of Labor and Employment Relations, Labor Education Program, University of Illinois at Urbana-Champaign, 2013.

⁷² See Jeff Waddoups, “Health Care Subsidies in Construction: Does the Public Sector Subsidize Low Wage Contractors?” 2005, Accessed at: http://www.researchgate.net/publication/237102337_Health_Care_Subsidies_in_Construction_Does_the_Public_Sector_Subsidize_Low_Wage_Contractors; and Frank Manzo IV and LeNee Carroll, “Self-Sufficient Construction Workers: Why Prevailing Wage Laws Are the Best Deal for Taxpayers,” 2014, accessed at: http://illinoisepi.org/countrysidenonprofit/wp-content/themes/12/docs/Self%20Sufficient%20Construction%20Workers_ManzoCarroll.pdf.

⁷³ See Paul Kersey, J. D., “The Effect of Michigan’s Prevailing Wage Law,” Mackinac Center for Public Policy, August 27, 2007. Accessed at: <http://www.michigancapitolconfidential.com/8907>, John Taylor, Ph. D. 2007. “Prevailing Wage Laws,” Mackinac Center for Public Policy, April 16, 2007. Accessed at: <http://www.mackinac.org/8473>, and Richard Vedder, Ph. D. “Michigan’s Prevailing Wage Law and Its Effects on Government Spending and Construction Employment,” A Mackinac Center Report, September 1999. Accessed at: <https://www.mackinac.org/archives/1999/s1999-07.pdf>.

costs are more likely to be shifted to taxpayers when construction workers cannot pay for their own healthcare. Without adequate prevailing wages and benefits, labor income is effectively redistributed to their employers, with taxpayers *left to make up the difference through increased reliance on the safety net*. In addition, the construction industry neither attracts nor produces the human capital skills necessary to contribute to a broadly competitive state economy under these conditions.

Economic Impact Results

The economic impact analysis is based on expected changes in construction industry cost components if the states with strong/average prevailing wages were to weaken or repeal their policies and move to the cost components of states with no/weak wage policies. The economic impact is based on the largest components (construction worker wages and benefits, material, fuel and rental equipment costs, and contractor profit).⁷⁴ The changes in these components are listed in Table 8. These data reflect changes in cost components associated with changes in prevailing wage laws in the two groups of states. For example, if prevailing wage laws were weakened or repealed in the 25 states with at least average policies, construction worker income would decrease by approximately \$23.0 billion. Expenditures on materials, fuel, and equipment rental would increase by \$17.9 billion. Contractor income would increase by \$5.1 billion. If prevailing wage policies in these states were to be weakened or repealed, the spending changes would ripple through the U.S. economy and affect other industries. The net effect of these changes is reported in Table 9.

⁷⁴ Differences in administrative workers, purchased services, and depreciation are not included because these components are small percentages of total costs and differences in these categories between two groups of states are small.

Table 8. Changes in Construction Cost Components Associated with Changes in Prevailing Wage Policies.

Construction Industry Changes Associated with Changes in Prevailing Wage Policies	Weakening in States with Strong/Average Laws
Change in Construction Worker Income, Health, & Retirement Benefits	-\$23.0 Billion
Change in Materials, Fuels, etc. Use	\$17.9 Billion
Change in Proprietor (Contractor) Income	\$5.1 Billion

Source: 2012 Economic Census of Construction

The economic impact results indicate that the largest effect is due to changes in construction worker wages and benefits. With a decrease income and benefits, economic activity would decrease by approximately \$82 billion. Employment would decrease by over 500,000 jobs and combined state, local, and federal tax revenue would decrease by over \$10 billion. The increase in proprietor income and corresponding spending would increase economic activity by approximately \$17 billion, create slightly over 100,000 jobs and contribute about \$2 billion in combined tax revenue. The increased spending on materials, fuels, and rental equipment would increase overall economic activity by over \$65 billion, increase employment by about 350,000 jobs and increase combined state, local, and federal tax revenue by approximately \$8 billion. Because the individual component effects push and pull the economy in different directions, the overall net effect of all three components is relatively small and mixed. Economic activity and tax revenue increases by \$400 million and \$200 million, respectively, but employment decreases by about 52,000 jobs.

Table 9. Economic Impact: Prevailing Wage Laws are Weakened or Repealed in States with Strong/Average Policies.

Component	Economic Activity (Value Added)	Employment	Combined State, Local, and Federal Tax Revenue
Construction Worker Wages and Benefits	-\$81.5 Billion	-503,000 Jobs	-\$10.2 Billion
Proprietor Income	\$16.6 Billion	102,000 Jobs	\$2.1 Billion
Materials, Fuels, and Rental Equipment Costs	\$65.3 Billion	349,000 Jobs	\$7.9 Billion
<i>Total</i>	<i>\$400 Million</i>	<i>-52,000 Jobs</i>	<i>\$200 Million</i>
<i>Total (Less Materials, Fuels, and Rental Equipment Costs)</i>	<i>-\$64.9 Billion</i>	<i>-401,000 Jobs</i>	<i>-\$8.1 Billion</i>

Source: IMPLAN.

The impact of materials, fuels, and rental equipment costs is due to the relatively less efficient construction methods used in states with no/weak prevailing wage polices. This inefficiency increases spending and, in turn, actually increases economic activity. However, an increase in economic activity due to inefficiency is similar to an increase in economic activity following a natural disaster (earthquake, flood, etc.). While a disaster or an inefficient use of materials, fuels, and rental equipment generates added economic activity, it is not desirable in an economic or social sense.⁷⁵ Omitting the economic impact associated with inefficient use of materials, fuels, and rental costs results in a decrease in economic activity of approximately \$65 billion, a decrease of 400,000 jobs, and a

⁷⁵ Standard economic theory of production predicts that companies alter the use of inputs depending on the relative costs of labor, capital equipment, etc. When labor costs are low, companies will utilize more labor and less capital equipment because labor is relatively cheap. This indicates that labor and capital are substitutes in production. Output can be produced, to some extent with either labor or equipment. The data for the component costs of construction indicate that labor and materials, fuels, and rental equipment are complements. When cheaper labor is employed, additional material, fuels, and rental equipment are needed. On the other hand, when more expensive and skilled labor is utilized, fewer materials, fuels and rental equipment are needed. These data indicate that the increased expenditures on materials, etc., are due to the relative inefficiency of lower paid and skilled workers. While this inefficiency is associated with increased economic activity, this effect is omitted here because it can be avoided with the use of more skilled construction labor. In either group of states, materials represent 91% of the total for this category with fuels representing 6% and rental equipment equal to 3% of the total.

combined tax revenue loss of over \$8 billion. The economic impact of \$65 billion is approximately 0.4% of total U.S. GDP.⁷⁶ The employment impact is 0.2% of total national employment.⁷⁷

The total economic impacts reported in Table 9 are the sum of industry-level effects. These impacts are reported in Table 10 for the impact based on construction worker wages, benefits, and contractor income (excluding the impact due to expenditures on materials, fuels, and rental equipment). The industry level impacts illustrate how the reductions in construction worker earnings and increases in contractor incomes associated with weakening or repealing prevailing wages ripple throughout the economy, exerting a negative impact on all industries. If the 25 states with strong/average prevailing wages were to weaken or repeal their policies, the health care industry would lose 85,000 jobs and suffer a decrease of approximately \$10 billion in revenue. The overall service industries (including food, real estate, financial, and all other services) would lose approximately 266,000 jobs and over \$36 billion in revenue with a change in prevailing wage policy. Among goods producers, the construction and manufacturing industries would each lose over 21,000 jobs and experience revenue reductions of \$4.3 billion and \$11.0 billion, respectively. Employment would decrease by over 34,000 jobs in the retail sector due to a revenue loss of over \$2.7 billion. These impacts, which would be experienced each year after a change in the wage policy, are primarily the result of the decrease in construction worker income and benefits.

⁷⁶ GDP for Q II, 2015 is \$17,913.7 billion (unadjusted for inflation). See "U.S. Economic Accounts," Bureau of Economic Analysis, U.S. Department of Commerce. Accessed at: <http://bea.gov/>.

⁷⁷ Compared to August 2015 when national employment was 142,288,000. See "Economy at a Glance," U.S. Bureau of Labor Statistics, U.S. Department of Labor. Accessed at: <http://www.bls.gov/eag/eag.us.htm>.

Table 10. Impact of Repealing Prevailing Wage on All Sectors of the U.S. Economy

Industry Category	Employment Change (Jobs)	Revenue Change (Millions)
Total Impact	-401,000	-\$64,900
Health care	-85,400	-\$10,312
Professional, business, and legal services	-59,000	-\$7,711
Retail trade	-34,300	-\$2,767
Other services	-29,500	-\$1,807
Financial activities (excluding real estate)	-28,900	-\$6,296
Government	-28,200	-\$2,726
Restaurants and bars	-26,200	-\$1,563
Construction	-21,500	-\$4,307
Manufacturing	-21,200	-\$11,042
Real estate	-12,800	-\$2,338
Arts, recreation, and accommodation services	-10,900	-\$1,142
Transportation and warehousing	-10,800	-\$1,537
Wholesale trade	-10,700	-\$2,524
Educational services	-7,900	-\$559
Information and communications	-6,200	-\$4,533
Agricultural, fishing, and hunting	-5,100	-\$683
Mining, energy, and utilities	-3,200	-\$2,062

Source: IMPLAN.

Conclusion

Prevailing wage legislation is part of a broader set of interrelated institutional arrangements to maintain a strong construction industry, including a stronger emphasis on apprenticeship training, greater workplace safety, higher participation rates in health insurance and retirement coverage, relatively higher unionization rates, and middle-class wages that support working families. If all state prevailing wage laws were to be weakened or repealed across the country, the data demonstrate that the

economic, fiscal, and social impacts would be catastrophic. A nationwide weakening of prevailing wage would reduce national economic output by nearly \$65 billion and result in the loss of over 400,000 jobs in the American labor market. The accompanying effect on public budgets would amount to over \$8 billion lost in state, local, and federal tax revenues.

Due to the approximately 17% drop in blue-collar construction worker incomes in states weakening the wage policy (and an even larger decrease in earnings for the lowest-paid construction workers), federal income taxes contributed by these workers after credits and deductions would fall by about \$3.4 billion alone. Approximately 310,000 blue-collar construction workers would lose their health insurance coverage and about 124,000 would see their pension plans at work vanish. The nationwide policy change would also increase working poverty by 99,000 individuals, as lower-paid construction workers would no longer be able to earn enough to exceed the official poverty line. Consequently, additional blue-collar construction workers would turn to public assistance programs to support their families. The total increased cost to American taxpayers would be an almost \$400 million in extra food stamps and Earned Income Tax Credits provided to construction workers who did not previously rely on government assistance programs.

Prevailing wage supports a high road economy with self-sufficient construction workers. Prevailing wage establishes the underlying legal framework for a construction industry that provides the skills needed to build quality infrastructure for a growing, technologically-sophisticated, and competitive economy. The policy also ensures that workers can support a middle-class family in the communities where they are constructing or repairing the infrastructure. By fostering an economy with a strong middle class, prevailing wage promotes sound public sector budgets at all levels of government.

Appendix

In nearly all analyses, we run two models for the ten-year (2004-2013) dataset:

- A weighted regression model using *svyset [iweight=earnwt]*. For both ordinary least squares (linear) and probit (probabilistic) regressions, the analysis includes all employed workers.
- A weighted model using *svyset [iweight=earnwt]*, with Heckman selection. For both Heckman regressions and Heckprobits, the analysis involves all workers attached to the labor force in construction occupations. The two-stage regression model is “selected” for employed residents controlling for observable factors including the presence of a strong/average prevailing wage law.

In all cases, the Heckman variant is likely the preferred regression. The former model allows us to see effects *among* the employed, while the latter is more comprehensive and corrects based on characteristics that make workers more likely to enter the construction industry.

Controls may include variables for usual hours worked per week, *year_ordinal*, *year_ordinal*², *age*, *age*², *gender*, *race/ethnicity*, *foreign-born status*, *marital status*, *veteran status*, *educational attainment*, *disability status*, *federal government employment*, *state government employment*, *local government employment*, *urban status*, and a constant. Thus, the regressions control for trends over time (the Great Recession occurred roughly in the middle of the period of analysis, which is generally captured by the *year_ordinal*² variable), demographics, education, full-time vs. part-time, urban status, and sector of employment.

All wage and salary income, government assistance values, and federal income tax contributions are adjusted by the Consumer Price Index (CPI-U) and reported in constant 2014 dollars. The wage and salary incomes are further adjusted by Regional Price Parities by the Bureau of Economic Analysis. State-level regional price parities are not reported prior to 2008. For the four years from 2004 through 2007, states were assigned their 2008 regional price parity. Regional price parities range from 0.858 to 1.182 for all states over the entire period of analysis, and the standard deviation for any given state never exceeds 0.013 (Arizona) from 2008 through 2013. Thus, 2008 regional price parities provide a valid approximation of 2004-2007 values. The assumption is unlikely to dramatically alter the findings.

APPENDIX TABLE 1: REGRESSIONS OF REAL WAGE/SALARY INCOME, RPP-ADJUSTED, BCCW

ln(real_inc_wage)	Standard Regression	Heckman Regression
<i>Strong/average PWL</i>	0.1566*** (0.0114)	0.1724*** (0.0390)
<i>Union member</i>	0.3028*** (0.0277)	0.3649*** (0.0286)
R ²	0.2511	
Rho		0.0376
Sigma		0.7843
Lamda		0.0295
Observations	30,922	45,483

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [both analyses]: usual hours worked, year_ordinal, year_ordinal², age, age², female, white, foreign-born, married, veteran, difficulty_any, less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, metro area dummies, and a constant.

APPENDIX TABLE 2: QUANTILE REGRESSIONS OF REAL WAGE/SALARY INCOME, RPP-ADJUSTED, BCCW

ln(real_inc_wage)	Mean	25TH	50TH	75TH	90TH
<i>Strong/average PWL</i>	0.1566*** (0.0007)	0.1875*** (0.0006)	0.1819*** (0.0007)	0.1700*** (0.0006)	0.1637*** (0.0011)
<i>Union member</i>	0.3028*** (0.0010)	0.3380*** (0.0008)	0.2987*** (0.0009)	0.2624*** (0.0007)	0.2073*** (0.0014)
R ²	0.2511	0.1612	0.1761	0.1789	0.1534
Observations	5,064	5,064	5,064	5,064	5,064

***P>|0.01|; **P>|0.05|; *P>|0.10|

This analysis is not a Heckman analysis. It is a standard quantile regression [qreg] with 10 weighted least-squares (WLS) iterations each before linear programming iterations. Control variables [all quantiles]: usual hours worked, year_ordinal, year_ordinal², age, age²,

female, white, less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, metro area dummies, and a constant.

APPENDIX TABLE 3: REGRESSIONS OF REAL SALARY INCOME, RPP-ADJ., MANAGERS/SUPERVISORS

ln(real_inc_wage)	Standard Regression	Heckman Regression
<i>Strong/average PWL</i>	0.0860*** (0.0203)	0.0171 (0.0259)
<i>Union member</i>	0.1455** (0.0647)	0.1467 (0.0796)
R ²	0.2053	
Rho		-0.0062
Sigma		0.7136
Lamda		-0.0044
Observations	8,729	11,508

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [both analyses]: usual hours worked, year_ordinal, year_ordinal², age, age², female, white, foreign-born, married, veteran, difficulty_any, less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, metro area dummies, and a constant.

APPENDIX TABLE 4: PROBIT REGRESSION OF FOOD STAMP RECIPIENCY, BCCW | margins, dydx

Prob(SNAP)	Standard Probit	Heckman Probit
<i>Strong/average PWL</i>	-0.0308*** (0.0036)	-0.0313*** (0.0030)
<i>Union member</i>	-0.0250* (0.0149)	-0.0280** (0.0125)
Constant	0.0695*** (0.0021)	0.0564*** (0.0017)
R ²	0.0000	
Rho		0.7307
Observations	38,714	46,854

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [Probit]: less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, and a constant; [Heckprobit]: year_ordinal, year_ordinal², bachelors degree, advanced degree, and a constant. Other variables failed to return Heckprobit outputs.

APPENDIX TABLE 5: PROBIT REGRESSION OF EITC RECIPIENCY, BCCW | margins, dydx

Prob(EITC)	Standard Probit	Heckman Probit
<i>Strong/average PWL</i>	-0.0112** (0.0045)	0.0431 (0.0512)
<i>Union member</i>	-0.0792*** (0.0176)	-0.0589*** (0.0220)
Constant	0.1358*** (0.0026)	0.2930*** (0.1129)
Prob>chi2	0.0000	
Rho		-0.9488
Observations	38,714	46,854

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [Probit]: year_ordinal, year_ordinal², age, age², female, white, foreign-born, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, and a constant; [Heckprobit] usual hours worked, year_ordinal, year_ordinal², age, age², female, white, foreign-born, married, veteran, difficulty_any, less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, metro area dummies, and a constant. The high constant term in the Heckprobit may indicate that blue-collar workers who enter the construction industry would be likely to receive EITC credits in another industry.

APPENDIX TABLE 6: PROBIT REGRESSION OF POVERTY STATUS, BCCW | *margins, dydx*

Prob(Below Poverty)	Standard Probit	Heckman Probit
<i>Strong/average PWL</i>	-0.0286*** (0.0044)	-0.0305*** (0.0068)
<i>Union member</i>	-0.1096*** (0.0219)	-0.0945*** (0.0082)
Constant	0.1207*** (0.0025)	0.1026*** (0.0232)
Prob>chi ²	0.0000	
Rho		0.4626
Observations	38,714	46,854

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [both analyses]: less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, and a constant.

APPENDIX TABLE 7: PROBIT REGRESSION OF HEALTH INSURANCE COVERAGE, BCCW | *margins, dydx*

Prob(Health Insurance)	Standard Probit	Heckman Probit
<i>Strong/average PWL</i>	0.0980*** (0.0044)	0.0798*** (0.0118)
<i>Union member</i>	0.2281*** (0.0189)	0.2481*** (0.0262)
Constant	0.5910*** (0.0022)	0.6025*** (0.0350)
Prob>chi ²	0.0000	
Rho		-0.2333
Observations	38,714	46,854

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [both analyses]: usual hours worked, year_ordinal, year_ordinal², age, age², female, white, foreign-born, married, veteran, difficulty_any, less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, metro area dummies, and a constant.

APPENDIX TABLE 8: PROBIT REGRESSION OF PENSION PLAN COVERAGE, BCCW | *margins, dydx*

Prob(Pension at work)	Standard Probit	Heckman Probit
<i>Strong/average PWL</i>	0.0382*** (0.0055)	0.0762* (0.0408)
<i>Union member</i>	0.3476*** (0.0136)	0.3565*** (0.0294)
Constant	0.2606*** (0.0036)	0.3867*** (0.1395)
Prob>chi ²	0.0000	
Rho		-0.9439
Observations	38,714	46,854

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables [both analyses]: less than high school degree, some college, associates degree, bachelors degree, advanced degree, federal government employment, state government employment, local government employment, and a constant.

APPENDIX TABLE 9: REAL FEDERAL INCOME TAXES PAID AFTER CREDITS/DEDUCTIONS, BCCW

Real fed tax after	Standard Regression
<i>Strong/average PWL</i>	1014.87*** (115.35)
<i>Union member</i>	1439.06*** (323.13)
R ²	0.0099
Observations	37,783

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables year_ordinal, year_ordinal², and a constant. The standard regression and the Heckman regression return the same outputs, like because, order to pay federal income taxes, an individual must be employed and earn an income.

APPENDIX TABLE 10: PROBIT REGRESSION OF BCCW EMPLOYMENT | *margins, dydx*

Prob(Employed)	Heckman Probit
<i>Strong/average PWL</i>	0.0419*** (0.0153)
<i>White*strong/avePWL</i>	-0.0564*** (0.0182)
<i>Female*strong/avePWL</i>	0.0276 (0.0267)
<i>Immigrant*strong/avePWL</i>	-0.0894*** (0.0180)
<i>White</i>	0.0755*** (0.0177)
<i>Female</i>	-0.3225*** (0.0303)
<i>Immigrant</i>	0.0432 (0.0273)
Constant	0.6298*** (0.0238)
Prob>chi ²	
Rho	0.6679
Observations	77,337

***P>|0.01|; **P>|0.05|; *P>|0.10|

Control variables: age, age², married, veteran, citizen status, right-to-work state, bachelors degree, advanced degree, and a constant.