

Kentucky's Prevailing Wage Law

An Economic Impact Analysis

Peter Philips, Professor of Economics

University of Utah— January 2014

T: 801 581-7481 DD: 801 587-8337 E: Philips@economics.utah.edu

1 Executive Summary

- ✚ This study considers the effects of repealing Kentucky's prevailing wage law.
 - It looks at the differences in the quality and productivity of the construction workforces in prevailing wage law states and no-law states
 - It evaluates the arguments of prevailing wage law critics.
 - It presents studies on the cost effects actually experienced in Kentucky, Ohio and Michigan as these states altered their prevailing wage law policies.
 - It looks at the dangers associated with cutthroat bidding on public works and evaluates the benefits of leveling the bidding playing field for local contractors and workers.
- ✚ Construction workers are more productive in prevailing wage law states.
 - In states with prevailing wage laws, value added per blue-collar construction worker both on-and-off public works is, on average, 14% higher than in construction for states without prevailing wage laws.
 - Furthermore, if we focus on public works this productivity advantage is even greater. In water, sewer and related construction, value added per worker is 21% higher in states with prevailing wage laws; value added per workers is 31% higher in highway, street and bridge construction where state prevailing wage laws exists; and in other heavy and civil engineering work, value added per worker is 33% higher in states with prevailing wage laws.
 - This higher productivity reflects the higher skill level, the better educational attainment, the greater use of registered apprenticeship training, the more experience and the less injury prone characteristics of construction workers in prevailing wage law states.
- ✚ Prevailing wage repeals lead to younger, less-experienced, less trained, more injury-prone construction workforces simply because prevailing wage repeals undercut local labor standards and start a race to the bottom.
 - Construction workers in no-law states report 12% more disabilities compared to construction workers in prevailing wage law states even though (or more probably because), on average, the construction workforce in no-law states is younger and less experienced.
- ✚ Construction workers both on-and-off public works in prevailing wage law states are better educated.
 - For all blue-collar construction workers both on-and-off public works, these prevailing wage law states have 3.3% fewer high-school dropouts working construction, 2.7% more high school graduates working construction and 0.6% more college graduates working as blue-collar construction workers.
- ✚ Prevailing wage law repeals lead to a loss of registered apprenticeship training and a corresponding loss of skills and income.
 - In Kansas, after that state repealed its prevailing wage law, registered apprenticeships fell by 38%.
 - In Kentucky, registered male apprentices earn \$5,719 more per year than their less-trained male counterparts within 6 years after beginning their apprenticeship.
 - Over their lifetime, registered apprenticeship graduates earn \$301,533 more in wages and benefits compared to their less-trained counterparts.
 - Proponents of prevailing wage repeal are fighting for less human capital accumulation in Kentucky, less training, a less skilled labor force in Kentucky who over their lifetime will earn \$300,000 less with the corresponding loss both in construction quality and in middle class Kentucky incomes for blue-collar workers.
- ✚ A skilled and capable construction labor force is an essential ingredient in the overall competitive advantages Kentucky brings to a globalized market place. Being able to build technically advanced, high-quality public infrastructure and private business facilities, built-right, on-time, the-first-time is key to effective participation of

all of Kentucky's businesses in the world economy. Prevailing wage law repeal risks losing this comparative advantage.

- ✚ Advocates for repealing Kentucky's prevailing wage law assert that such a repeal would cut wages on public works by 17% to 24%; and they further assert that most wages on public works after repeal would range from \$14 to \$18.
 - While repeal advocates do not say exactly how much money would be saved by repeal, they nonetheless assert that "millions of dollars" in public construction costs would be saved by repeal.
- ✚ In asserting that a prevailing wage repeal will push down wages on public works by 17% to 24%.
 - Critics assume that this kind of wage cut will not affect labor productivity at all.
 - Given that blue-collar labor costs including both wages and benefits on Kentucky public works are 20% of total payments to contractors,
 - and making the dubious assumption that productivity and wages are not connected to each other,
 - critics rely on an outdated and discredited back-of-the-envelope calculation to assert that a 24% cut in wages will result in a 4.8% savings on total payments to contractors on public works.
 - Alternatively, they argue that a 17% wage cut will yield a 3.4% savings on public construction costs.
 - These calculations are simple as well as simple-minded. They go like this:
 - blue-collar labor costs are 20% of total public construction costs;
 - wages after repeal will be 24% (or 17%) lower;
 - simply assume that there is no connections between wages paid and work done;
 - conclude that 24% in lower wages times 20% in labor costs results in a 4.8% savings in total construction costs.
- ✚ This hypothetical savings is a mirage.
 - Draconian wage cuts always lead to lost productivity.
 - Back-of-the-envelope calculations based on dubious assumptions are a discredited methodology.
 - A better approach is to look at what really happens when a state repeals its prevailing wage law.
- ✚ In a natural experiment in the 1990's where Kentucky enacted its prevailing wage law in 1996, Ohio repealed its prevailing wage law for schools in 1997, and Michigan suspended its prevailing wage law due to a court ruling from late 1995 to early 1997, there were no cost savings found in building schools in any of these states associated with the times when prevailing wage mandates were lifted.
- ✚ Furthermore, a 2013 study of Ohio school construction found no evidence to support the assertion that in the 2000's Ohio was saving money by not having prevailing wages on school projects.
- ✚ Nonetheless, prevailing wage law repeals have hurt the entire Ohio construction labor market.
 - Wages for Ohio construction workers fell by 7% relative to Kentucky construction workers both on-and-off public works after Ohio exempted schools from prevailing wage requirements.
 - Prevailing wage law repeals undercut local labor standards in drive down wages across all of construction.
- ✚ Kentucky has one of the highest poverty rates in the county.
 - Driving down wages on public works to \$14 to \$18 in an industry where unemployment averages twice that of the overall state economy and annual hours typically run around 1500 per year for a full-time construction worker would force the families of blue-collar breadwinners on public construction to straddle the poverty line;
 - and push many more Kentucky children into poverty when one-out-of-four Kentucky children already lives in poverty.
- ✚ Prevailing wages in Kentucky mandate that Kentucky workers be paid decent wages and benefits consistent with local labor standards in the county or region in which the public project is being built.

- Prevailing wage critic Senator Chris McDaniel believes that construction workers living in his district should earn from 23% to 40% less than the median individual male income of \$35,028 in Kenton County.
- Where once blue-collar construction work was considered an honorable craft, and still is under prevailing wages, Senator McDaniel believes that on public works, construction should be considered among the worst jobs a man can aspire to.
- ✚ In prevailing wage law states, all construction workers, not just public construction workers, are paid more—but they also do more as the following facts demonstrate.
 - Construction workers are better paid in prevailing wage law states.
 - In these states, construction workers both on-and-off public works are paid 18% more in wages, 25% more in social security and workplace injury insurance contributions and 56% more in pension and health insurance.
 - This means that in states like Kentucky it is easier to train construction workers and know that the human capital investment in apprenticeship training will not be lost to the industry due to labor market turbulence and temporary loss of jobs.
 - This means that in states like Kentucky it is easier to know that trained workers will continue to accumulate additional experience without leaving the industry and know that contractors and owners will benefit in terms of a more productive workforce and higher quality construction projects.
- ✚ With repeal of prevailing wage regulations, total construction blue-collar earnings will be lower in Kentucky by \$75 to \$152 million or 3.2% to 6.5% of the state's overall blue-collar construction payroll. This is an annually recurring loss of income both on-and-off public works.
- ✚ However, this loss is only the lost income Kentucky construction workers suffer. The total lost income effect of a repeal for all of Kentucky across all industries is higher because construction workers, in turn, will have less to spend in Kentucky.
 - Taking this induced effect into account, the total lost income to all Kentucky workers inside and outside of construction ranges from \$125 to \$252 million annually;
- ✚ Because of this lost income, Kentucky would lose from \$10 million to \$20 million in tax revenues annually;
 - The state would lose \$7.5 to \$15.2 million in income tax revenue annually;
 - The state would lose \$2.25 to \$4.55 million in sales tax revenue annually.
- ✚ Particularly in bad economic times, state and federal public works expenditures are aimed not only at refurbishing public infrastructure but also stimulating local employment and work for local contractors.
 - The role of prevailing wage regulations in leveling the playing field for local contractors and local workers relative to contractors and workers coming from lower wage states can play a significant role in insuring that government expenditures in fact stimulate local employment and local business activity.
- ✚ In assessing the effects of a repeal of prevailing wages, critics of Kentucky's prevailing wage regulations fail to adequately analyze real overall construction costs. They do not consider the effects of cheap-labor construction practices on:
 - Whether or not projects are completed on time.
 - Cost overruns.
 - Downstream maintenance costs.
 - The effect of repeals on cutthroat bidding practices leading to unqualified contractors winning the work but being unable to complete the job.
 - How the repeal of prevailing wage regulations destroys apprenticeship training programs and the future qualifications of Kentucky's construction labor force.
 - How the loss of health insurance can lead to increased public health costs,

- Nor is there any consideration of how the loss of pension benefits may raise the public cost of supporting the elderly.
- How the removal of prevailing wage regulations encourages the subsequent proliferation of misclassified workers.
- The costs of unscrupulous low-wage contractors shedding payroll tax costs by giving their workers 1099 forms rather than W-2's.
- The cost to Kentucky's unemployment insurance and workers compensation system of the loss of contributions when the floodgates to unregulated construction lead to a sea of gray market behavior.

CONTENTS

| | | |
|----------|--|----------|
| 1 | Executive Summary | 2 |
| 2 | Figures and Tables | 6 |
| 3 | About the Author | 8 |
| 4 | The Costs and Benefits of Prevailing Wages | 9 |
| 4.1 | Critics Advocate Poverty Level Income for Public Construction Workers | 9 |
| 4.2 | Are Prevailing Wage Rates Fair? | 11 |
| 4.3 | Critics Claim Repeal Will Drop Construction Wages and Benefits by 24% | 13 |
| 4.4 | Problems with the Wage-Differential Method | 16 |
| 4.4.1 | This Method Assumes There Is No Relationship between Wages Paid and Work Performed | 16 |
| 4.4.2 | Substitution and Productivity Effects Tie Wages to Output | 16 |
| 4.4.3 | Low-Wage Construction Risks the Ability to Deliver On-Time, Built-Right Projects | 17 |
| 4.5 | Labor Costs Are 20% of Total Costs on Kentucky Public Construction | 18 |
| 4.5.1 | The Wage-Differential Approach Is Outdated and Discredited | 18 |
| 4.5.2 | Giving the Devil His Due | 19 |
| 4.6 | The Efficiency of Prevailing Wages | 23 |
| 4.6.1 | An Example of How the Cheap Labor Approach Squanders Skills | 24 |
| 4.6.2 | Skilled Workers Earn More | 24 |
| 4.6.3 | Prevailing Wage Law States Have Better Educated Construction Workers | 26 |
| 4.6.4 | Prevailing Wage Law States Have More Productive Construction Workers | 27 |
| 4.6.5 | Prevailing Wage Law States Have More Experienced and Safer Construction Workers | 28 |

| | | |
|-----------|--|-----------|
| 4.7 | A Natural Experiment: School Construction Costs in Kentucky, Ohio and Michigan | 29 |
| 4.8 | Ohio Exempts Schools from Prevailing Wage Requirements | 32 |
| 5 | The Impact of Repeal on Kentucky Income and Tax Revenues | 34 |
| 5.1 | Overview | 34 |
| 5.2 | Methodology | 35 |
| 5.3 | Impact of the Prevailing Wage Law on the State Income Level | 37 |
| 5.4 | Impact on State Tax Revenues | 39 |
| 5.5 | Income and Tax-Revenue Findings Summarized | 40 |
| 6 | The Dangers of Low-Ball Bidding | 40 |
| 6.1 | A Low-Wage Contractor Burns Down an Historic Building | 41 |
| 6.2 | Could prevailing wage regulations have prevented the Old Cap fire? | 43 |
| 7 | Conclusion | 44 |
| 8 | Appendix A: The <i>Program Review and Investigation Report</i> | 46 |
| 8.1 | The Erroneous Assumptions and Analysis of the <i>Program Review and Investigation Report</i> | 46 |
| 9 | Bibliography | 51 |
| 10 | Endnotes | 55 |

2 Figures and Tables

| | |
|--|----|
| Figure 1: U.S. civilian and construction monthly unemployment rates 2000 to 2013, not seasonally adjusted | 10 |
| Figure 2: Labor costs as a percent of total costs in Kentucky construction 1972 to 2007 | 20 |
| Figure 3: Percent of work done by type of contractor comparing state-county-municipal construction to private construction in Kentucky, 2007 | 21 |
| Figure 4: Comparison of wages, pensions and benefits paid in states with and without prevailing wage laws..... | 25 |
| Figure 5: Percent difference in education attainment between prevailing wage law states and no-law states for construction workers broken down by skilled, semi-skilled and unskilled construction workers. | 26 |

| | |
|--|----|
| Figure 6: Difference in the value added per construction worker in prevailing wage law-states compared to no law states by all construction and segments where prevailing wage law regulations most often apply | 27 |
| Figure 7: Average potential experience of construction workers in no-law and prevailing wage-law states plus the increase in reported disabilities for construction workers in no-law states compared to law states, 2009-11 | 28 |
| Figure 8: Prevailing wage policy by state, Kentucky, Ohio, Michigan, 1991-2000 | 29 |
| Figure 9: Median square foot cost of new elementary schools before and after law changes in Kentucky and Ohio, 1992-2000 | 30 |
| Figure 10: Kentucky construction income as a percent of Ohio construction income before and after Kentucky adopted a prevailing wage law and before and after Ohio exempted schools from prevailing wages | 36 |
| Figure 11: A sketch of the original, historic Iowa capitol, Old Cap | 41 |
| Figure 12: The Old Cap fire caused by an out-of-state, low-wage contractor using cheaper but prohibited heat techniques to remove paint and asbestos | 42 |
| Figure 13: Value of machinery rented per blue-collar worker by blue-collar income, and value added per blue-collar worker by the value of rented machinery per worker, 50 states and DC, 2002 | 47 |
| Figure 14: Value added per construction worker by average construction worker income in law and no-law states, 2007... 50 | |
| | |
| Table 1: 2013 prevailing wage rates for Kenton County, Kentucky | 11 |
| Table 2: Prevailing wage rates in Kenton County, Kentucky 2013 and corresponding family earnings if wife worked full time and earned 76% of husband | 12 |
| Table 3: Hypothetical savings from prevailing wage repeal using the discredited wage differential approach..... | 22 |
| Table 4: Description of the new schools used in the study | 30 |
| Table 5: Real, inflation adjusted square-foot cost of new public school construction in Kentucky, Ohio and Michigan 1992-2000 | 31 |
| Table 6: Differences in the average bid price per square foot for Ohio public schools by union and nonunion contractor, 2000 to 2007 | 33 |
| Table 7: Two estimates of the income and employment effects of a repeal of the Kentucky prevailing wage | 38 |
| Table 8: Estimated loss in state income and tax revenues due to lower construction worker income after repeal of Kentucky's prevailing wage law | 39 |

3 About the Author

Peter Philips is a Professor of Economics at the University of Utah. He received his BA from Pomona College and his MA and Ph.D. from Stanford University. Philips is one of the country's leading experts on the construction labor market. He is the coauthor/editor of several books including *The Economics of Prevailing Wage Laws*, (Ashgate Publishers 2005) co-edited with Hamid Azari-Rad and Mark Prus, and *Building Chaos: An International Comparison of the Effects of Deregulation on the Construction*, (2003 Routledge Press, London) co-edited with Gerhard Bosch). Philips is also the author of over 60 scholarly articles; included among his recent peer-reviewed academic publications are:

- 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
- Kevin Duncan, Peter Philips and Mark Prus, "Using Stochastic Frontier Regression to Estimate the Construction Cost Inefficiency of Prevailing Wage Laws," *Engineering, Construction and Architectural Management*, Vol. 19 Iss: 3, pp.320 - 334. Published, 05/02/2012
- Sheng Li and Peter Philips, "Construction Procurement Auctions: Do Entrant Bidders Employ More Aggressive Strategies than Incumbent Bidders?," *Review of Industrial Organization*, Volume 40, Number 3, 191-205. Published, 04/06/2012
- JaeWhan Kim and Peter Philips, "Determinants of quits and dismissals on a long-lasting, unionized, industrial construction project." *Journal of Construction Engineering and Management*, 138(5), 661-669. Published, 07/25/2011
- Jaewhan Kim and Peter Philips, "Effect of Multiemployer Collective Bargaining on Employer-Provided Health Insurance in the Construction Industry," *Journal of Labor Research*. Published, 07/12/2010
- Jaewhan Kim and Peter Philips,, "Health Insurance and Worker Retention in the Construction Industry," *Journal of Labor Research*, 2010, Volume 31, Number 1, 20-38. Published, 02/24/2010
- Kevin Duncan, Peter Philips and Mark Prus, "The Effects of Prevailing Wage Regulations on Construction Efficiency in British Columbia," *International Journal of Construction Education and Research*, 1550-3984, Volume 5, Issue 2, April 2009
- Sheng Li and Peter Philips, "Analysis of the Impacts of the Number of Bidders upon Bid Values: Implications for Contractor Prequalification and Project Timing & Bundling," *Journal of Public Works Management & Policy*, Vol. 12, No. 3, 503-514 (2008)
- *Construction Research at NIOSH: Reviews of Research Programs of the National Institute for Occupational Safety and Health*, The National Academies Press, Washington, DC, 2008 (16 co-authors). Published, 12/01/2008.

Disclosure and disclaimer: This report was commissioned by the Kentucky State Building and Construction Trades Council. The facts, evidence and analysis presented in this report are those of the author who is solely responsible for its content and do not represent the views of the Kentucky State Building and Construction Trades Council, the University of Utah nor the University of Utah Economics Department nor any other entity. No party has been given prior review or right of approval for any of the contents in this report.

Notice: This document is in the public domain and may be freely distributed.

Photo front cover: Kentucky Division of Properties, Advisory Commission,
<http://www.historicproperties.ky.gov/adcomm/>

4 The Costs and Benefits of Prevailing Wages

4.1 Critics Advocate Poverty Level Income for Public Construction Workers

In 2012, Kentucky had the fifth highest poverty rate in the country at 19.4%. More than one out of four Kentucky children lives in poverty with a child-poverty rate of 26.5%.ⁱ The child poverty rate in Kentucky is one-third higher than the average for the US and the overall poverty rate in Kentucky is 20% higher than the US average.ⁱⁱ Construction workers account for about 10% of Kentucky's male labor force and some critics of prevailing wages think that paying these Kentucky workers less-than-poverty wages on public works is a good idea. Repealing prevailing wage regulations would increase the already too-high poverty rate and child poverty rate in Kentucky by driving single-breadwinner construction workers into poverty.

The poverty level of income for a family of four in Kentucky is \$23,550.ⁱⁱⁱ Some critics of prevailing wages assert that local construction workers on public works should and will be paid from \$14 to \$18 an hour subsequent to a repeal of Kentucky's prevailing wage law. The construction work-year in Kentucky involves many hours of forced unemployment when construction workers are between jobs or the construction season has ended or the economy smashes construction even harder than everywhere else. With construction workers typically working around 1500 hours per year, \$14 to \$18 per hour results in an annual income of \$21,000 to \$27,000 per year. Thus, prevailing wage critics advocate that a father whose wife does not work because she is taking care of two young children, or a divorced father with three children in his care should earn an income that at best straddles the poverty line. If the business cycle is in one of its periodic downturns (as it is now) and 1500 hours of work are not forthcoming, prevailing wage critics advocate that even more construction workers should get shoved beneath the poverty line.

Construction is a turbulent industry—the most turbulent major industry in the economy. Job-layoffs as projects end, seasonal unemployment and cyclical unemployment are much more common than in most industries. Figure 1 compares the construction monthly unemployment rate to the overall unemployment rate from 2000 to 2013. This figure shows that in good times and in bad, construction unemployment is systematically higher than for the rest of the economy. While some of this difference is cyclical—you can see in Figure 1 that the Great Recession has pounded construction much harder than the overall economy—much of this difference in unemployment is seasonal. In the down-season, construction unemployment is typically two-to-three times higher than the overall unemployment rate. Some of the difference is neither seasonal nor cyclical but rather structural. Construction jobs come and go. When a worker finishes one job, there is often a period of unemployment while that worker looks for a new job often with a new contractor. Finding a new job takes time leaving the worker out-of-work until new work can be found. So in the boom and in the bust, in the peak-season and in the off-season, and in the times-between-jobs, construction unemployment is higher than overall employment.

This means that to be a full-time worker in construction is different than being a full-time worker in other industries. While other industries count 2080 hours per year (40 hours per week times 52 weeks) as full time, in construction given chronic unemployment, for most construction workers, full-time is around 1500 hours per year.

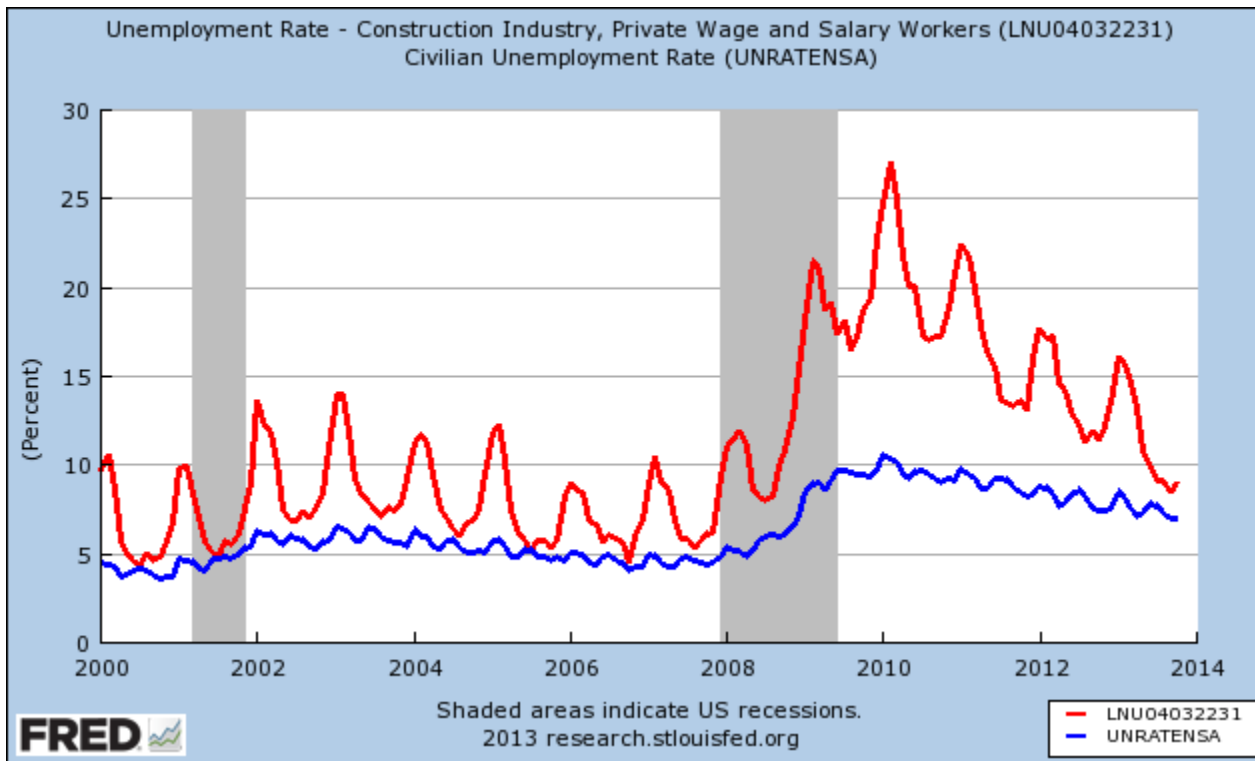


Figure 1: U.S. civilian and construction monthly unemployment rates 2000 to 2013, not seasonally adjusted^{iv}

As mentioned above, prevailing wage critics such as Senator Chris McDaniel who represents the 23rd District in northern Kenton County, Kentucky, think that construction workers on public works should earn \$14 to \$18 per hour.^v At \$14 per hour and 1500 hours per year, this amounts to \$21,000 per year in income or 10% below the poverty line in Kentucky. At the high end for the best construction workers, Senator McDaniel advocates that top-skilled construction workers should earn \$18 per hour. At 1500 hours per year, \$18 per hour amounts to \$27,000—16% above the poverty line.

So Senator McDaniel thinks that Kentucky single-breadwinner construction workers should straddle the poverty line, some a bit above it and others below.

Senator McDaniel also believes that construction workers living in his district should earn from 23% to 40% less than the median male income of \$35,028 in his Kenton County district.^{vi} Where once blue-collar construction work was considered an honorable craft, Senator McDaniel believes that on public works, construction should be considered among the worst jobs a man can aspire to.

But Senator McDaniel is quoted as saying that prevailing wage mandates require that construction workers be paid \$44 per hour on public works.^{vii} While in general, Senator McDaniel is wrong about this, Table 1 shows that Senator McDaniel is almost correct for one rare construction occupation in his district—construction divers. Construction divers are highly skilled workers who work under water with welding torches and explosives. In construction, particularly away from coastal waters, they also face longer periods of intermittent construction work yielding fewer hours per year or they are forced to travel long distances across the country in order to find work. In Senator McDaniel's Kenton County, construction divers are mandated a prevailing wage of \$40.58 per hour.

Table 1: 2013 prevailing wage rates for Kenton County, Kentucky^{viii}

| | Prevailing Wage Rate | Annual Income at 1500 hours* |
|---|----------------------|------------------------------|
| Mason Tender | \$14.45 | \$21,675 |
| Hod carrier | \$14.75 | \$22,125 |
| Glaziers | \$15.00 | \$22,500 |
| 2013 Kentucky Poverty Income (family of 4) | | \$23,550 |
| Common Laborers | \$17.17 | \$25,755 |
| Carpenter | \$21.47 | \$32,205 |
| Bricklayer | \$21.86 | \$32,790 |
| Cement Masons | \$22.00 | \$33,000 |
| Structural Ironworkers | \$25.00 | \$37,500 |
| Electricians | \$26.35 | \$39,525 |
| Plumber & Pipefitter | \$29.60 | \$44,400 |
| Divers | \$40.58 | \$48,696 |

* Construction divers are estimated to have 1200 hours per year

The Department of Labor describes construction divers thus:

Work below surface of water, using scuba gear to inspect, repair, remove, or install equipment and structures. May use a variety of power and hand tools, such as drills, sledgehammers, torches, and welding equipment. May conduct tests or experiments, rig explosives, or photograph structures or marine life.^{ix}

This is not only highly skilled and dangerous work, it is also unusual and not typical prevailing wage construction work.

In contrast, common construction laborers are a very typical construction occupation accounting for 10% to 20% of all construction workers in Senator McDaniel's district. Table 1 shows that in Senator McDaniel's district, Kentucky's prevailing wage law requires that construction laborers be paid \$17.17 per hour or \$25,755 per year. This is too much according to Senator McDaniel. Without prevailing wage regulations, construction laborers could be paid \$14 per hour or \$21,000 per year—pushing those workers who are single breadwinners with a family of four 10% below the poverty line.

Indeed, even with prevailing wage mandates, in Senator McDaniel's district, Table 1 shows that mason tenders, hod carriers and glaziers in a family of four where they are the breadwinners already *are* below the poverty line. Dropping wage rates on public construction to \$14 an hour would have all single breadwinner construction workers earning less than a poverty income. Dropping wage rates on public construction in Senator McDaniel's district to \$18 per hour would have these construction workers who are the breadwinners in four person households in his district earning just 16% above poverty. In short, critics of the Kentucky prevailing wage law such as Senator McDaniel are opposed to anything except poverty level wages for construction families trying to allow the wife and mother stay home to take care of their children.

4.2 Are Prevailing Wage Rates Fair?

But while some construction workers are the sole breadwinner in their families, other Kentucky construction workers' spouses do work already. Now let us consider what Senator McDaniel has in mind for a construction worker's family where both the husband and wife work full time.

Senator McDaniel thinks the construction workers in his district working on public works are being paid too much money. As mentioned above, he proposes that his district's construction workers should be paid \$14 per hour on the low end and \$18 per hour on the high end on public construction. How does that compare with the average family earnings in Kenton County when the wife's income is added to this \$21,000 to \$27,000 per year?

The average family income in Kenton County is \$64,012.^x In Kentucky, fully employed adult women earn, on average 76% of what fully employed men earn.^{xi} Table 2 assumes a fully-employed construction worker husband with a fully-employed wife earning 76% of what he makes. Senator McDaniel's low-end proposal would have the construction worker husband earning \$14 per hour or \$21,000 per year. In **Table 2**, his wife earns an additional \$15,960 (or 76% of \$21,000) for a family income of \$36,960 or 58% of what the average family earns in Senator McDaniel's district. At Senator McDaniel's high end wage, the most he thinks a construction worker should make in his district is \$18 per hour which translates to a family income of \$47,529 or 74% of the average family income in his district. **In short, Senator McDaniel thinks all blue-collar construction workers' families where both spouses are working should be kept 26% to 42% below the average income and economic standing in his district.**

Table 2: Prevailing wage rates in Kenton County, Kentucky 2013 and corresponding family earnings if wife worked full time and earned 76% of husband

| | Prevailing Wage Rate | Annual Income at 1500 hours | Wife's Income=76% of Husband's | Family Income | Percent of Kenton County Average Family income |
|----------------------------|----------------------|-----------------------------|--------------------------------|-----------------|--|
| McDaniel's low end | \$14.00 | \$21,000 | \$15,960 | \$36,960 | 58% |
| Mason Tender | \$14.45 | \$21,675 | \$16,473 | \$38,148 | 60% |
| Hod carrier | \$14.75 | \$22,125 | \$16,815 | \$38,940 | 61% |
| Glaziers | \$15.00 | \$22,500 | \$17,100 | \$39,600 | 62% |
| Common Laborers | \$17.17 | \$25,755 | \$19,574 | \$45,329 | 71% |
| McDaniel's high end | \$18.00 | \$27,000 | \$20,520 | \$47,520 | 74% |
| Carpenter | \$21.47 | \$32,205 | \$24,476 | \$56,681 | 89% |
| Bricklayer | \$21.86 | \$32,790 | \$24,920 | \$57,710 | 90% |
| Cement Masons | \$22.00 | \$33,000 | \$25,080 | \$58,080 | 91% |
| Average for County | \$24.25 | \$36,375 | \$27,645 | \$64,020 | 100% |
| Structural Ironworkers | \$25.00 | \$37,500 | \$28,500 | \$66,000 | 103% |
| Electricians | \$26.35 | \$39,525 | \$30,039 | \$69,564 | 109% |
| Plumber & Pipefitter | \$29.60 | \$44,400 | \$33,744 | \$78,144 | 122% |
| Divers | \$40.58 | \$48,696 | \$37,009 | \$85,705 | 134% |

Indeed, even under current prevailing wage rules, many construction worker families are already below average compared to the earnings of the average family in Senator McDaniel's district. Carpenters, bricklayers and cement masons, along with mason tenders, hod carriers, glaziers and laborers already earn lower family incomes compared to the average family in Senator McDaniel's district. The good Senator just wants to push these workers down farther and have all other construction workers and their working spouses join them.

On the other hand, under Kentucky's prevailing wage law, structural ironworkers, electricians, plumbers and pipefitters all earn from 3% to 22% more than the average family in Kenton County. Is this fair? Ironworkers, electricians, plumbers and pipefitters are among the most skilled construction workers. All go through 4 and 5 year apprenticeship training—roughly equivalent to a college degree. **Senator McDaniel thinks this is not fair. He thinks that all blue-collar construction workers on public construction, regardless of their training, regardless of their skills, regardless of the unemployment they must endure, regardless of the dangers of their job, regardless of the fact that their bodies will wear out long**

before most other workers, should get paid no more than 74% of the average family income in his county. Does Senator McDaniel believe that average income for his district is too good for construction workers and their families?

4.3 Critics Claim Repeal Will Drop Construction Wages and Benefits by 24%

It is important to point out that up to the time of the writing of this report, no critic of Kentucky's prevailing wage regulations has actually specified just how much money the state hypothetically will save by pushing single breadwinning construction workers into poverty and pushing two-breadwinner construction families well below average household income in Kentucky. They have asserted that wages will fall substantially but they then just leave it to the listener or reader to assume that lower wage rates will lead to substantial construction cost savings.

We will see below that paying workers less will not lead to lower construction costs because lower wage rates result in lower labor productivity. Construction is a skilled occupation that relies on the construction worker's training, experience and judgment in order for the job to be done safely and done right the first time. Pushing wage rates down to \$14 per hour runs the risk of losing skilled and experienced workers, increasing labor turnover, endangering the safety of the job and interrupting the work flow through mistakes and accidents. All of these productivity issues are ignored by Kentucky's prevailing wage law critics. They nonetheless blithely assert that repealing prevailing wage requirements will save Kentucky taxpayers "millions of dollars every year."

Paying workers less will not lead to lower construction costs if lower wage rates result in lower labor productivity.

These critics of Kentucky's prevailing wage law often refer to the *Program Review and Investigation Report* of 2001 in support of the notion that Kentucky's prevailing wage requirements raise public construction costs. For instance, David Adkisson, president of the Kentucky Chamber of Commerce in October, in October 2013 stated:

"The Kentucky Chamber strongly urges the General Assembly to repeal the state's prevailing wage law as it drafts the 2014-1016 budget," wrote Adkisson. "This move would save taxpayers millions of dollars every year; money that would be far better spent meeting the critical needs of our citizens especially educating our children."

Adkisson referred to a Legislative Research Commission report that concludes that labor costs are increased 17 to 24 percent per project due to the prevailing wage law, which affects projects like roads, school construction and renovation, bridges and public water and sewer construction.

David Adkisson as quoted in "Chamber President, Local Physician Call for Prevailing Wage Law Change," Surfky.com, Oct. 20, 2013^{xii}

The 2001 *Program Review* indeed found that wages on public works would fall by 17% to 24% after the repeal of Kentucky's prevailing wage. Nevertheless, the *Program Review and Investigation Report* emphasized that this did not mean that total construction costs would fall by 24% or even 17%. As the *Report* stated:

It is important to understand that this estimate **does not** imply that prevailing wages increased the costs of these projects by twenty-four percent. Rather, it indicates that the wage portion of construction costs was twenty-four percent higher as a result of prevailing wages.^{xiii} (emphasis in the original)

In fact, the Review took pains to state that it did not know how much, if at all, total construction costs would fall after wages fell by 24%. Assuming that labor productivity would be the same after a 24% cut in wages, the Review concluded that costs must at least fall somewhat. Accepting for the moment this (doubtful) assumption about productivity not being connected to wages, below we show that the Review's analysis implies that payments to construction contractors excluding land purchases and engineering/design and other services would fall by 3.4% to 4.8%. If one included public construction design, engineering and project management costs in the calculation, all of which are part of public construction costs, the decline in public construction costs even under the doubtful assumption that wages and productivity are unrelated would be less even within the confines of this simplistic back-of-the-envelope calculation.

However, the *Program Review and Investigation Report* assumption that wages can be cut by as much as 24% with little or no effect on labor productivity, capital invested per worker, labor-management strategies, worker morale, etc. is wrong. Therefore we examine the *Report's* analysis in detail in Appendix A.

But it is important to note here that the *Program Review and Investigation Report* did not examine actual construction costs. Rather theirs is a simple back of the envelope calculation that argues—if wages fall by 24% what will happen to total costs assuming labor productivity does not change?

Registered apprenticeship completers receive an average of \$301,533 more in compensation than nonparticipants over their careers. By encouraging cheap labor strategies, repeal would substantially reduce apprenticeship training.

In the main body of the work presented here we summarize a study of actual start costs¹ in new school construction in Kentucky, Ohio and Michigan. We examine how these total costs of construction were affected when 1) Kentucky implemented prevailing wages for school construction (1996), 2) Ohio eliminated prevailing wage regulations for school construction (1997), and 3) Michigan first suspended and then re-implemented prevailing wages for school construction with the hiatus lasting from late 1994 to the middle of 1997. This natural experiment allows us to test the effects of the law on costs without making any assumptions about what happens to wages or labor productivity. This “the proof is in the pudding” approach finds no measurably meaningful or statistically significant difference in new school construction due to the presence or absence of prevailing wage regulations.

School construction costs can remain relatively the same even when wages are substantially higher in states with prevailing wage laws simply because contractors respond to this regulation by substituting skilled for unskilled workers, better equipping their workers and better managing their projects. Many of these contractors are union contractors using the truly excellent apprenticeship programs jointly managed by management and labor under collective bargaining. There are also many nonunion contractors that follow the high-wage, high-skill competition strategies encouraged by prevailing wage laws. Both these union and nonunion skilled-labor contractors rely upon apprenticeship-trained and experienced construction workers for the bulk of their labor force. Excluded from public works by these regulations are the cheap labor contractors that typically use larger numbers of less-skilled, untrained and less-well paid workers. In short, prevailing wage regulations discourage construction contractors that rely on a labor strategy that pushes many of their employees down into poverty.

In contrast, the high-skilled approach to construction leads to a better workforce earning higher incomes. A 2012 *Mathematica* study of registered apprenticeships found just that:

[Registered apprenticeships are] designed to improve the productivity of apprentices through on-the-job training and related technical instruction. We assessed RA [registered apprenticeship] effectiveness by comparing the

¹ Start cost is the same as accepted bid price. Final costs will include any additional cost overruns.

earnings of RA participants to those of nonparticipants, adjusting for differences in pre-enrollment earnings and demographic characteristics. We found that RA participation was associated with substantially higher annual earnings in every state studied.^{xiv}

The study found that in Kentucky, registered male apprentices earned \$5,719 more than those who had not participated in registered apprenticeship training about six years after enrolling in an apprenticeship.^{xv} In my own study of apprenticeship training in Kansas in the first four years after that state repealed its prevailing wage law in 1987, Kansas' construction apprenticeship training fell by 38%.^{xvi} The loss of apprenticeship training associated with prevailing wage law repeal can be devastating. The *Mathematica* study concluded:

Over the career of an apprentice, we estimated the average earnings gain associated with completing the RA [registered apprenticeship] program would be \$240,037. Including benefits, RA completers would receive an average of \$301,533 more in compensation than nonparticipants over their careers.^{xvii}

The loss of apprenticeship trained construction workers after prevailing wage law repeal corresponds to a gain in the number of bogus, "independent contractors" in construction. Low-wage, cheap labor contractors are tempted to avoid payroll taxes by converting their workers into so-called independent contractors. This lets the contractor avoid worker compensation insurance contributions, unemployment insurance and social security taxes. These "independent contractors" are disproportionately high in states without prevailing wage laws.^{xviii}

In states that have repealed prevailing wages, apprenticeship training falls. Average wages fall. Productivity falls and value added per worker falls. More disturbingly, contractors abandon paying health insurance and some contractors start passing out 1099's to their workers rather than W-2's.

It is important to know that the *Program Review and Investigation Report* is not an accounting of construction costs. It is a back-of-the-envelope hypothetical calculation about wages and wages only. There is no consideration of whether or not projects are completed on time. There is no consideration of cost overruns. There is no consideration of the effect of repeals on cutthroat bidding practices leading to unqualified contractors winning the work but being unable to complete the job. There is no consideration of downstream maintenance costs. There is no consideration of how the repeal of prevailing wage regulations destroys apprenticeship training programs and the future qualifications of the construction labor force. There is no consideration of how the loss of health insurance can lead to increased public health costs, nor is there any consideration of how the loss of pension benefits may raise the public cost of supporting the elderly. There is no consideration of how the removal of prevailing wage regulations encourages the subsequent proliferation of misclassified workers.² There is no accounting for the costs of unscrupulous low-wage contractors shedding payroll tax costs by giving their workers 1099 forms rather than W-2's. There is no accounting of the cost to Kentucky's unemployment insurance and workers compensation system of the loss of contributions when the floodgates to unregulated construction lead to a sea of black-market, under-the-table behavior. Nevertheless, keeping these crucial omissions in mind, here we begin by taking Mr. Adkisson's reliance on the 2001 *Report* at face value.

The face value of the Adkisson criticism of prevailing wages relative to public construction costs is rooted in a discredited methodology known as the **wage-differential** approach. This approach asserts that: 1) prevailing wage requirements are

² Misclassification of workers occurs when a contractor gives his workers 1099 tax forms rather than W-2s thus misclassifying them as independent subcontractors. This allows the contractor to avoid paying payroll taxes—social security contributions, workers comp and unemployment premiums. By jettisoning payroll taxes, unscrupulous contractors can underbid legitimate contractors on public works while transferring the costs of workers comp and unemployment insurance to others including the taxpayer.

too high by X%; 2) total blue collar labor costs on public works is Y% of total construction costs. So you will save Z% on total construction costs which equals X% times Y% if you repeal prevailing wage laws. Here we show why this thought experiment is discredited.³

4.4 Problems with the Wage-Differential Method

4.4.1 This Method Assumes There Is No Relationship between Wages Paid and Work Performed

To make this back-of-the-envelope calculation, one needs to know the share of labor costs as a percent of total construction costs (excluding the purchase of land); you also need to know the impact of a prevailing wage repeal on wage rates and benefits; and you need to know the substitutability between skilled labor and less-skilled labor and between labor and capital; and finally you need to know the responsiveness of labor productivity to a declining wage rate and lost benefits.

Higher wages can actually raise the productivity of workers and reduce average costs by creating incentives to work harder or more responsibly or more efficiently or more steadily.

This thought process would conclude as follows: a 4.8% cost saving can be attained if: (1) labor costs constitute 20% of all construction costs; (2) wage rates decline by 24% in the absence of the prevailing wage law; (3) a 24% decline in prevailing wage rates has no effect on the contractor's choice over alternative techniques of production (that is, alternative combinations of various grades of labor and capital that can be used on the job site); and (4) a 24% decline in prevailing wages has no effect on labor productivity, worker experience, worker skill sets, worker training, work ethic, or worker's willingness to assume responsibility for quality work on-the-job. In other words, **one has to assume there is no relationship between wages paid and work performed.** The implausibility of this assumption is a main reason why this methodology is discredited.

4.4.2 Substitution and Productivity Effects Tie Wages to Output

To assume that there is no connection between wages paid and work performed, the critics of Kentucky's prevailing wage law must make two types of assumptions—one involving the substitution effect and one involving the productivity effect both in relation to driving down wages. Here we examine the significance of the labor substitution and labor productivity assumptions.

First, we consider the substitution effect. Standard economic theory based on profit maximizing firm behavior predicts that an increase in the price of a factor of production (any input), all else being constant, will cause substitution away from this factor of production towards other factors of production. Suppose three factors of production are used on a construction site: 1) capital (tools, equipment, and machinery), 2) more skilled and experienced labor, and 3) less-skilled labor and less experienced labor. Suppose a legislative change forces contractors to pay less-skilled workers a higher wage. If the contractor continues using the same combination of capital, skilled and less-skilled labor, the cost of production would increase. However, as long as capital and skilled labor can be substituted for the less-skilled and less experienced labor, a profit-maximizing or cost-minimizing contractor would find it advantageous to use fewer less-skilled labor, which is now relatively more expensive, and more capital and skilled labor, which are now relatively cheaper. In the

³ Reflecting the discredited status of this approach, peer reviewed academic journals no longer accept papers based on this methodology.

real world, what contractors do is invest in apprenticeship training programs that build up the human capital of their labor force. So new workers become worth investing in under prevailing wages. Looking across the landscape of American construction, there is more apprenticeship training in states with prevailing wage laws compared to those without it.

Responding to higher wage rates by creating or substituting relatively more expensive, more productive factors of production for cheaper, less productive factors can partially offset the higher wage rates. So the cost of construction might rise, but not by as much as it would in the absence of substituting more skilled labor and better equipment for less skilled labor.

Now let us consider the productivity effect, which has become prominent in economic theory in the last two decades. Economists posit that higher wages by raising the opportunity cost of losing the job may lower labor turnover, create an atmosphere of fairness, and improve morale. In short, higher wages can create a craft or professional ethos where the worker takes ownership in the work that he or she does. When higher wages create better morale, a deeper work commitment and improved work ethic, these wages are called efficiency wages.

Higher skills and a professional work ethic are relevant to the construction industry. Construction is a boom-bust industry with both seasonal and cyclical turbulence that makes it difficult to build and retain the human capital

needed to provide the quality construction required by both private and public owners. Higher efficiency wages provide the incentives needed to retain skilled workers in the industry and eliminates the need to constantly remake the required skill structure after each seasonal and cyclical downturn puts an unemployment squeeze on the labor force.

Efficiency wage theory points out that higher wages can actually raise the productivity of workers and reduce average costs by creating incentives to work harder or more responsibly or more efficiently or more steadily.

In addition, construction is an industry that relies upon the craft ethic of skilled workers. Construction workers often have to work independently away from close supervision. Efficiency wages, including good benefits provide the incentives needed to induce construction workers to own their work and have a craft pride in the quality of their work. These two factors—the need to retain human capital in a turbulent industry that is constantly throwing workers out of work, and the need to have construction workers internalize a craftwork ethic and take overall responsibility for the quality of their own work—mean that higher wages in fact induce higher productivity in construction. Construction is a classic example of the efficiency wage effect on productivity from higher wage rates and better benefits.

Here we will focus first on the impact of prevailing wage laws on building costs and follow two threads of analysis to assess the hypothetical cost savings of a repeal based on the wage-differential method. First, we will make use of data from the *US Economic Census for Construction* to gauge the share of labor in total contractor costs and potential levels of savings from a repeal of the Kentucky prevailing wage law. In this measurement we will ignore the important substitution, productivity and efficiency wage effects discussed above. Thus, the exercise will overstate potential savings from a repeal of Kentucky's prevailing wage law. Second, we will introduce the total cost effect that incorporates substitution, productivity and efficiency wage effects using an analysis of a natural experiment involving Kentucky, Ohio and Michigan and an analysis of Ohio's public school exemption from prevailing wage laws.

4.4.3 Low-Wage Construction Risks the Ability to Deliver On-Time, Built-Right Projects

A caveat is in order regarding the definition of the total cost. The total cost effect defined above, even after incorporating substitution and productivity effects, is still limited because it does not take into consideration the long-term dynamic impact of prevailing wage legislation. The long-term effects relate to the development path of the construction industry. If low wages lead to higher turnover for the entire industry, lower training, and increasing use of less-experienced or less-

skilled workers, higher injury and fatality rates, and lower quality craftsmanship, then prevailing wage laws produce industry-wide and economy-wide benefits in Kentucky by discouraging a low-wage, low-skill development path. All the players in Kentucky's economy rely upon a construction labor force that has the ability to deliver on-time projects built right the first time. By driving wages in construction down to a range between \$14 and \$18 per hour, repeal advocates put all the economic actors in Kentucky at risk by creating a low-wage, low-skilled construction labor force that may not be able to deliver the goods.

The anticipated consequence of the low-wage, low-skill growth path is deteriorating quality of construction and cost-overruns, which raise long-term maintenance costs even if the immediate costs of buildings allegedly would be lower. If prevailing wage regulations encourage the payment of health insurance and pension benefits in construction, then they reduce the social costs of construction associated with uncompensated care at hospitals and unmet needs of senior citizens.

Also, if a local construction industry has difficulty providing technologically advanced infrastructure, then a low-wage development path for construction can also reduce the ability of the local economy to develop technically advanced and globally competitive local industries.

In addition, in periods of economic downturn when state and federal public works expenditures are aimed not only at refurbishing public infrastructure but also stimulating local employment, the role of prevailing wage regulations in leveling the playing field for local contractors and local workers relative to contractors and workers coming from outside the area may play a significant role in insuring that government expenditures in fact stimulate local employment and local business activity.

Any evaluation of the expected savings from eliminating prevailing wage mandates would not be complete without accounting for these factors.

4.5 Labor Costs Are 20% of Total Costs on Kentucky Public Construction

4.5.1 The Wage-Differential Approach Is Outdated and Discredited

The **"wage-differential"** approach first estimates the hypothetical wage that would be paid if the project were not covered by prevailing wage law. It is assumed the lower wage is fully passed on to the owner of the project in lower contract costs rather than bumping up contractor profits. With these assumptions in hand, this method then estimates the counterfactual construction cost that would exist in the absence of the law and compares it with a hypothetical cost under the law.

Most of these wage-differential studies are old, and generally suggest savings estimates that are modest. The estimated cost inflation attributable to the prevailing wage differential was on the order of 1.5 to 3% of public construction expenditure according to most studies (Gujarati, 1967; GAO, 1979, 1981; Goldfarb and Morrall, 1978, 1981; Gould and Bittlingmayer, 1980; Keller and Hartman, 2001). A few recent non-peer-reviewed, think-tank studies, however, have estimated more substantial savings figures. Vedder (1999) and Kersey (2007) of the Mackinac Center for Public Policy found a higher estimate of 10% savings for Michigan. Similarly, Glassman et al. (2008) of the Beacon Hill Institute provide a higher estimate of 9.9% savings. In contrast, some wage-differential studies such as Bourdon and Levitt (1980) find no upward bias in wages originating from prevailing wages, and Allen (1983) argued that the prevailing wage effect is very weak, raising construction costs merely by 0.3 to 0.4%.

The last legitimate peer-reviewed academic journal to publish the wage-differential methodology was the Keller and Hartman 2001 paper. Many papers using more modern econometric and statistical analysis have since been published including those of this author.⁴ From an academic standpoint, the wage differential approach is no longer acceptable.

Closer inspection of the studies that adopt the wage-differential method raises questions concerning their methodological adequacy. For our purposes, an extended engagement with such idiosyncratic methodological shortcomings would be missing the forest for the trees. We refer interested readers to a comprehensive literature review of this method.^{xix} The most salient point is that this approach does not control for other factors that affect construction costs, including structure types and specifications, substitutability between inputs (e.g. different grades of labor and capital), and variability in productivity levels.

4.5.2 Giving the Devil His Due

In the remainder of this section, however, we will carry on as if the wage-differential approach were still plausible and carry out an example of how it is used to estimate cost savings of a Kentucky repeal under the conditions that are most favorable to the wage-differential argument by ignoring all these other factors that affect the total project cost.

Closer inspection of the studies that adopt the wage-differential method raises questions concerning their methodological adequacy.

The amount of savings that would be attained by a cut in wages depends on the share of labor costs in the total cost of construction. If labor costs, including wages and benefits, constitute a large portion of the total cost, then the potential savings that would be realized by wage/benefit reductions are also going to be higher. So it is important to accurately calculate labor costs.

The appropriate data source for this exercise is the *U.S. Economic Census, Construction* which surveys construction contractors in every state every five years. We will use the results of the 2007 survey, since the results of the most recent 2012 survey have yet to be released.

⁴ 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; Kevin Duncan, Peter Philips and Mark Prus, "Using Stochastic Frontier Regression to Estimate the Construction Cost Inefficiency of Prevailing Wage Laws," *Engineering, Construction and Architectural Management*," Vol. 19 Iss: 3, pp.320 - 334. Published, 05/02/2012 ; Kevin Duncan, Peter Philips and Mark Prus, "The Effects of Prevailing Wage Regulations on Construction Efficiency in British Columbia," *International Journal of Construction Education and Research*, 1550-3984, Volume 5, Issue 2, April 2009

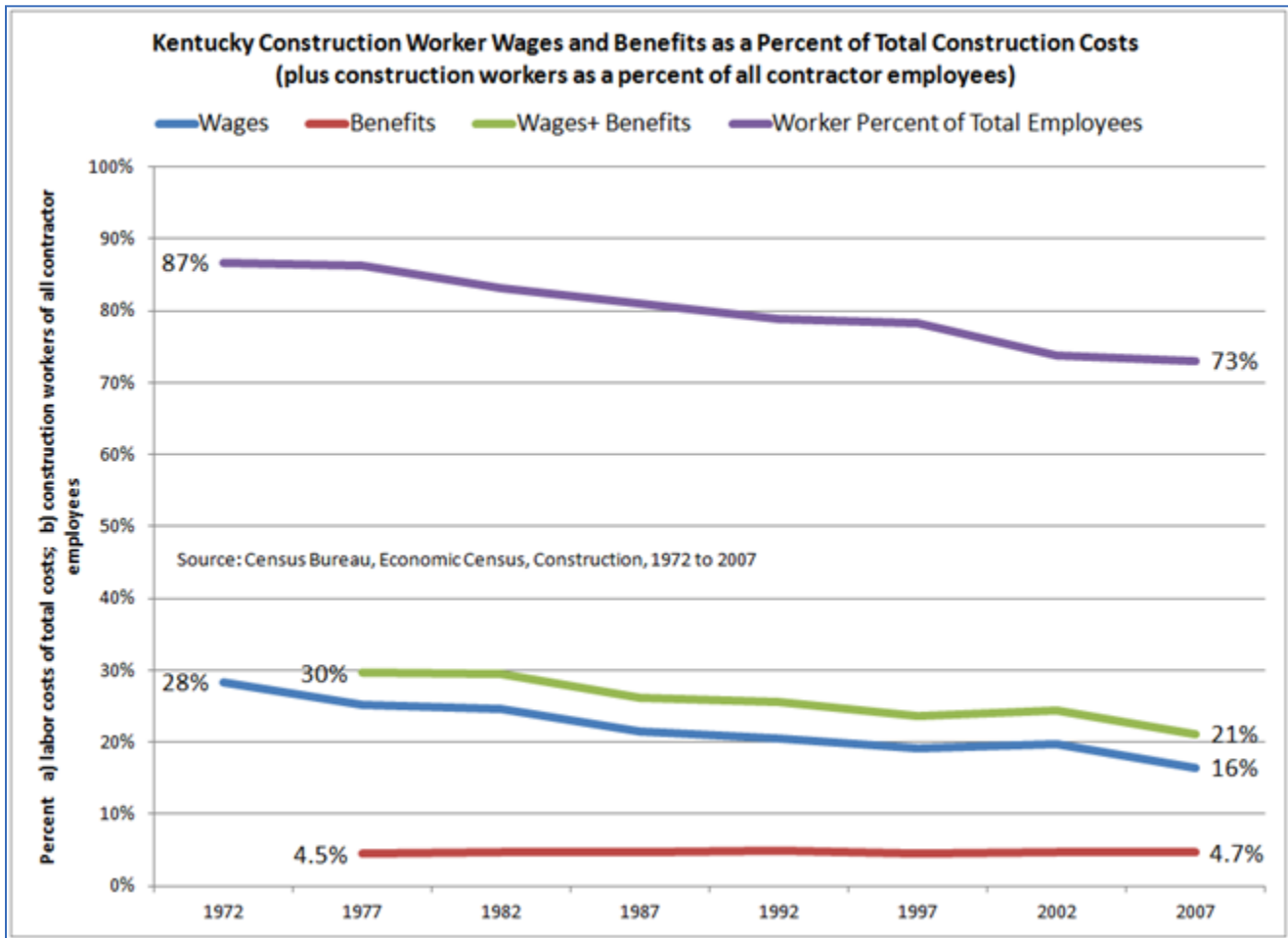


Figure 2: Labor costs as a percent of total costs in Kentucky construction 1972 to 2007

For the period 1972 to 2007, Figure 2 shows Kentucky blue-collar labor costs—wages and benefits including payroll taxes—as a percent of total construction costs (excluding land acquisition costs, construction design and oversight services not provided by construction contractors). Figure 2 also shows blue-collar workers as a percent of all construction contractor employees again from 1972 to 2007. Over this period, blue collar workers have fallen from 87% of all construction contractor employees to 73%. Blue collar wages have fallen from 28% of the total costs contractors charged owners to 16%. Blue collar benefits including payroll taxes in percentage terms have remained almost constant from 1977 to 2007 at 4.7% of the total costs charged by contractors to owners in construction. In 2007 in Kentucky, blue-collar labor costs as a percent of total costs were 21%. This means that, on average, whatever potential savings a repeal of prevailing wage requirements might bring, they cannot exceed 21% of total construction costs and under that implausible scenario, all construction workers would have to work for free.

We pause here to consider the possibility that some contractors may assert that *their* labor costs are higher than 21% of total costs. There are several factors that may account for this. First, the contractor may be considering not only blue-collar-labor but also that contractor's white-collar-labor costs. Second, the contractor may be a subcontractor who was not responsible for the purchase of construction materials. Third, the contractor might have in mind a renovation project that did not involve significant material or white-collar labor costs. And finally, fourth, contractors when considering their labor costs do not typically put their own profit in the denominator as a part of total costs. Indeed, profits are not a cost to the contractor but rather are a return on investment. But to the owner, the contractor's profit is a cost. So for these four

reasons, the U.S. Economic Census for Construction data are more reliable than the testimony of individual contractors regarding blue-collar labor costs as a percent of total costs.

It might be argued that public works construction involves more blue-collar labor than is typical of all construction in Kentucky. In fact, however, just the opposite is true. State, county and municipal construction in Kentucky typically involves less blue-collar labor than the typical private construction project. This is primarily because public works involves more infrastructure construction such as roads, sewers, water treatment plants. Heavy and civil contractors doing this kind of work tend to have lower blue-collar labor costs as a percent of total costs.

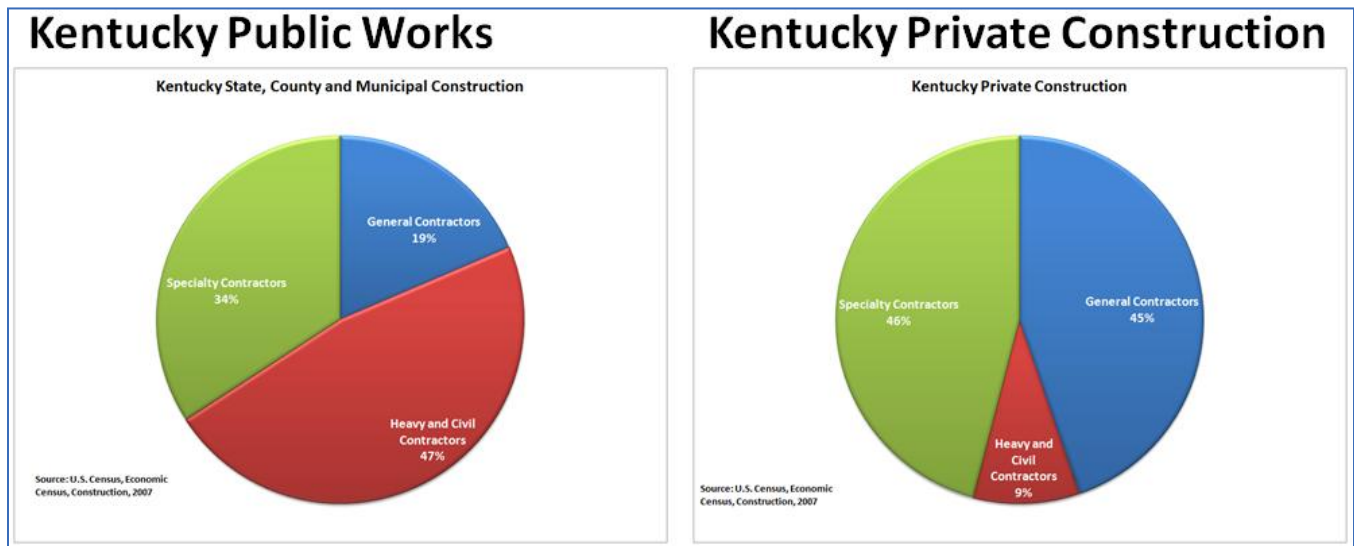


Figure 3: Percent of work done by type of contractor comparing state-county-municipal construction to private construction in Kentucky, 2007

Figure 3 shows that in 2007 in Kentucky, 47% of state, county and municipal construction was performed by heavy and civil engineering contractors (formerly called heavy and highway contractors). In contrast, only 9% of private construction was done by heavy and civil engineering contractors. While for overall construction in Kentucky in 2007 the average blue-collar labor costs (including benefits and payroll taxes) were 21% of total construction costs (excluding land acquisition and other costs that are not payments to contractors), for highway, street and bridge construction blue-collar labor costs were 17% of total construction costs and other civil-engineering construction blue-collar labor costs were 20% of total construction costs. **Across all state, county and municipal construction in Kentucky in 2007, blue-collar labor costs were 20.3% of total construction costs compared to 21.2% for all construction in Kentucky. So if anything, public construction in Kentucky has lower blue-collar labor costs as a percent of total costs compared to private construction.**

And a key point is this: **blue-collar labor costs as a percent of total costs have continuously fallen for as long as we have data.** Figure 2 shows that over the 30 years from 1977 to 2007, blue collar labor costs as a percent of total costs in Kentucky have fallen by one-third. This is partly due to technological change and rising blue-collar construction labor productivity. It is also due to the rise of white-collar employment as some general contractors and other construction contractors assume some of the architectural, engineering and project management activities traditionally performed by others. (See Figure 2.) By 2014, one can fairly assume that blue-collar labor costs have fallen further as a percent of total construction costs in Kentucky. The significance of this fact is as follows: **repealing prevailing wage regulation based on the assertion that such a repeal will substantially reduce public construction costs. This claim has cost-cutters aiming at an already shrinking piece of the overall pie. Even if all the implausible assumptions of the wage-differential**

approach were true, the alleged savings claimed would continually diminish over time as the role of blue-collar labor costs become an ever smaller share of overall payments to contractors.

Table 3: Hypothetical savings from prevailing wage repeal using the **discredited** wage differential approach⁵

| Original Cost Structure | | | | Lower Blue Collar Wage | | Hypothetical Changed Cost Structure | | | Drop in Total Costs |
|-------------------------|------------------------|----------------------|-----------------------------|-------------------------------|-----------------------------|-------------------------------------|----------------------|----------------|---------------------|
| Total Cost | Blue Collar Labor Cost | Other Non-Land Costs | Blue Collar Wage + Benefits | New Blue-Collar Wage+ Benefit | Drop in Wage + Benefit Rate | Blue Collar Labor Cost | Other Non-Land Costs | New Total Cost | |
| A | B | C | D | E | F | G | H | I | J |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$2.28 | 95% | \$10,000 | \$800,000 | \$810,000 | 19% |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$4.56 | 90% | \$20,000 | \$800,000 | \$820,000 | 18% |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$11.39 | 75% | \$50,000 | \$800,000 | \$850,000 | 15% |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$22.78 | 50% | \$100,000 | \$800,000 | \$900,000 | 10% |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$34.17 | 25% | \$150,000 | \$800,000 | \$950,000 | 5% |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$41.00 | 10% | \$180,000 | \$800,000 | \$980,000 | 2% |
| \$1,000,000 | \$200,000 | \$800,000 | \$45.56 | \$43.28 | 5% | \$190,000 | \$800,000 | \$990,000 | 1% |

*Drop in total costs rounded to the nearest percent.

Table 3 presents an example of the wage-differential approach and how it tries to analyze the projected effects of repealing prevailing wages. In columns A through D, Table 3 shows a hypothetical million dollar construction project with blue-collar-labor wages and benefits accounting for 20% of the million dollar total cost. Column D shows a hypothetical prevailing wage plus benefits prior to repeal. This wage and benefit package of \$45.56 is the 2013 Kentucky prevailing wage for skilled plumbers and pipefitters in Fayette County. It includes \$30.00 in wages and \$15.56 in health insurance, pension and other benefits. (This is Senator McDaniel's hypothetical case that construction workers earn \$44 per hour only this includes benefits, is for the most skilled type of construction worker and in one of the highest paid areas of the state). Column E presents a range of hypothesized lower wages due to repeal. These range from a 95% fall in wages to a 5% fall in wages. So the various wage rates considered range from two rates below the federal minimum wage (\$2.28 and \$4.56 per hour counting benefits) and 5 wage-plus-benefit packages above the minimum wage ranging from \$11.39 per hour to \$43.28 per hour. Columns G through I show the corresponding blue collar labor costs, other non-land costs and total costs (i.e. payments to contractors) under the new lower hypothesized wage rates and lock-step declines in blue collar labor costs. ("Lock-step" is because of the assumption that there is no connection between wages and productivity).

In the case of Kentucky, Dave Adkisson, president of the Kentucky Chamber of Commerce referring to the 2001 Legislative Research Commission Report argues that "labor costs are increased 17 to 24 percent per project due to the prevailing wage law..."⁵ Using the wage-difference methodology in Table 3, a 17% decline in Kentucky construction wages and benefits on public works would amount to a 3.4% decline in total public construction costs. A 24% decline in wages and benefits on

⁵ Note: \$45.56 assumed wage and benefit rate equals the plumber and pipefitters Kentucky prevailing wage base rate of \$30.00 and fringe benefits of \$15.56 for Fayette County in 2013. See p. 7 of KENTUCKY LABOR CABINET PREVAILING WAGE DETERMINATION CURRENT REVISION LOCALITY NO. 008 <http://www.labor.ky.gov/dows/doesam/pw/Current%20Prevailing%20Wage%20Rates/LOC%2008%20-%20CR8-008%20-%20073013.pdf>

Kentucky public works would result in a 4.8% decline in Kentucky public construction costs. If Senator McDaniel got his way and wages in this example were driven down to \$14 to \$18 per hour, a 60% to 70% cut in wages, again assuming that this draconian wage cut had no connection to labor productivity and that contractors did not grab some of these wage cuts in higher profits, then total payment to contractors would fall by 11% to 13%. Of course, one could ask workers to work for free and even more money could be saved—20%! But no one thinks that cutting wages by 100% would have no effect on labor productivity. In fact, most people would think that cutting wages by 100% would mean workers would not even show up for work. Nonetheless, Senator McDaniel seems to think that cutting wages by 70% will not affect labor's willingness or ability to work in any way.

We review the Legislative Research Commission Report in Appendix A. Here we simply note that **Mr. Adkisson's hypothetical savings of 3.4% to 4.8% will disappear and never be achieved if dropping wage rates and benefits by 17% to 24% have negative impacts on labor productivity. Senator McDaniel's hypothetical that wages can be cut by 70% with no effect on apprenticeship training, human capital formation, worker retention or worker morale is risible.**

Research has shown that construction workers with decent health insurance benefits are 40% more likely to stay in construction than workers without health insurance.

As mentioned above, prevailing wage rates induce contractors to substitute relatively less expensive capital and skilled labor for less-skilled labor. They invest in apprenticeship training. They manage the job site better partly by having skilled labor capable of self-management. These substitutions can offset some and possibly even all of the costs associated with a higher wage rate. Efficiency wages round out the adjustments by inducing workers to want to work harder, smarter, better. These factors are not considered by the wage-differential approach represented in the table above nor in the arguments of prevailing wage critics relying upon the wage-differential approach.

4.6 The Efficiency of Prevailing Wages

Calculations in Table 3 overlook the issues of working harder, smarter, better. These efficiency wage factors link higher wages and higher productivity together. Higher wages can in the case of construction directly raise productivity by raising the opportunity cost of losing a job and giving incentives to workers to work harder and smarter. Efficiency wages create worker ownership in their own work and a craft ethic. Workers internalize a sense of responsibility and reliability. In construction work where getting it done right the first time is an essential element in timely delivery of quality craftsmanship, higher wages and higher productivity can easily go hand-in-hand. It is notable that the critics of prevailing wages do not factor in the issue of timely delivery of a project into their calculation of construction costs.

One example of the effect of efficiency wages in raising construction labor productivity comes in the case of health insurance benefits. Prevailing wage fringe benefits reflect primarily health and pension benefits. In most cases in Kentucky, prevailing wages require the payment of significant benefits. For instance, in Fayette County as mentioned above, plumbers and pipefitters receive \$15.56 per hour in pension benefits.^{xxi} Benefits such as these are required for most crafts in Fayette County. But not all crafts. The prevailing benefit for cement masons in Fayette County is 59 cents per hour clearly indicating that contractors are not required to provide health benefits to masons on public works in Fayette County. Research has shown that construction workers with decent health insurance benefits are 40% more likely to stay in construction than workers without health insurance. Research has also shown that construction workers with higher wage rates are more likely to stay within the industry through seasonal and cyclical turbulence and high unemployment.^{xxii}

4.6.1 An Example of How the Cheap Labor Approach Squanders Skills

In a profile of a nonunion construction worker, "Daniel," by the Commonwealth Fund, we see the case of an individual that moves from being covered by health insurance to not being covered:⁶

Like most of the construction workers he knows, Daniel has spent years flipflopping on and off health insurance. When he's been lucky, he's had jobs that last 7 or 8 months, working for a firm large enough to offer insurance to employees. When he's been less lucky, he's worked for smaller contractors or picked up some income doing home repairs as an independent laborer. In these situations, health insurance has never been an option.^{xxiii}

Like most construction workers, Daniel moves from contractor to contractor. But unlike most union construction workers, each move Daniel makes runs the risk of losing his health coverage. Thus, while Daniel's years of accumulated, industry specific human capital may induce him to remain in construction, he is nonetheless more susceptible to a job offer outside of construction compared to a comparably experienced union worker simply because that union worker going outside construction would run a risk of losing health insurance coverage. Also, nonunion workers who receive health insurance from their contractors are less likely than Daniel to leave construction. But when workers on public works receive 59 cents per hour in benefits, such as cement masons in Fayette County, they are more like Daniel. And in Daniel's case, the absence of health insurance has contributed to reduced productivity.

Lost skills and lost experience means greater risks of accidents, greater risks of work interruptions, greater risks that work is not completed on-time and greater risks that the work is done poorly requiring rebuilds and higher downstream maintenance costs.

One result of the on-again-off-again health insurance is that Daniel has never had the benefit of follow-up treatments after injuries. He has never had physical therapy, never received a neurological work-up to figure out why he doesn't have feeling in certain fingers, and never received a prescription for anti-inflammatory drugs or other medication that might have reduced the severity of his arthritis.^{xxiv}

At the time Daniel's case was described, he was 61 years old and out of the labor market. Rather than leaving construction for a better paying job or a job that provided health insurance, Daniel left because the absence of health insurance contributed to a loss of productivity that has disqualified him from further construction work. At this point Daniel has been unable to work for 2 years. As he sees it, at age 61, his years of hard work and injuries have caught up with him. In particular, he is afraid to climb ladders, an essential part of construction work. His concern, he explains, is both because of the numbness in his fingers (he's not sure he can grip the ladder) and because of deteriorating vision in his one good eye. (He suspects that glasses may help, but he can't afford them).

4.6.2 Skilled Workers Earn More

The loss of workers with substantial years of industry experience extinguishes that person's share of the accumulated human capital in the industry. And because construction is a cooperative production process, Daniel's absence reduces the possibilities of others learning from his experience-based knowledge. Union workers, workers with health insurance and

⁶ Daniel's story can be found here: http://www.commonwealthfund.org/usr_doc/site_docs/uninsuredprofiles/daniel.htm (last accessed Nov. 16, 2013) ; this passage about Daniel was taken from JaeWhan Kim and Peter Philips' summary of Daniel's story found here first appeared in JaeWhan Kim and Peter Philips, "Health Insurance and Worker Retention in the Construction Industry," *Journal of Labor Research*, 2010.

pension benefits, and workers with higher wages are more likely to remain in the construction industry longer both because their better wages, health insurance and pension benefits serve as incentives to remain.

Thus, not only will better remunerated workers tend to have more experience than poorly-paid workers, but also multi-employer apprenticeship programs provide a vehicle for contractors and the union, as a group, to invest more in the training of union workers. And the apprenticeship programs provide a formal method for older workers to transmit their know-how to younger workers. While unions account for about 25% of all blue collar construction workers, unions account for about 75% of all graduating construction apprentices.^{xxv} Because training and experience lead to a more productive and safe construction labor force, prevailing wage regulations that require higher wages and pension and health insurance provide a set of incentives to make the construction labor force more productive and safer. Critics of prevailing wage are arguing that the state can save money on public construction by reducing or eliminating health and pension benefits. If they succeed in eliminating these benefits, they may also succeed in substantially reducing construction labor productivity and construction industry attachment. Lost skills and lost experience means greater risks of accidents, greater risks of work interruptions, greater risks that work is not completed on-time and greater risks that the work is done poorly requiring rebuilds and higher downstream maintenance costs.

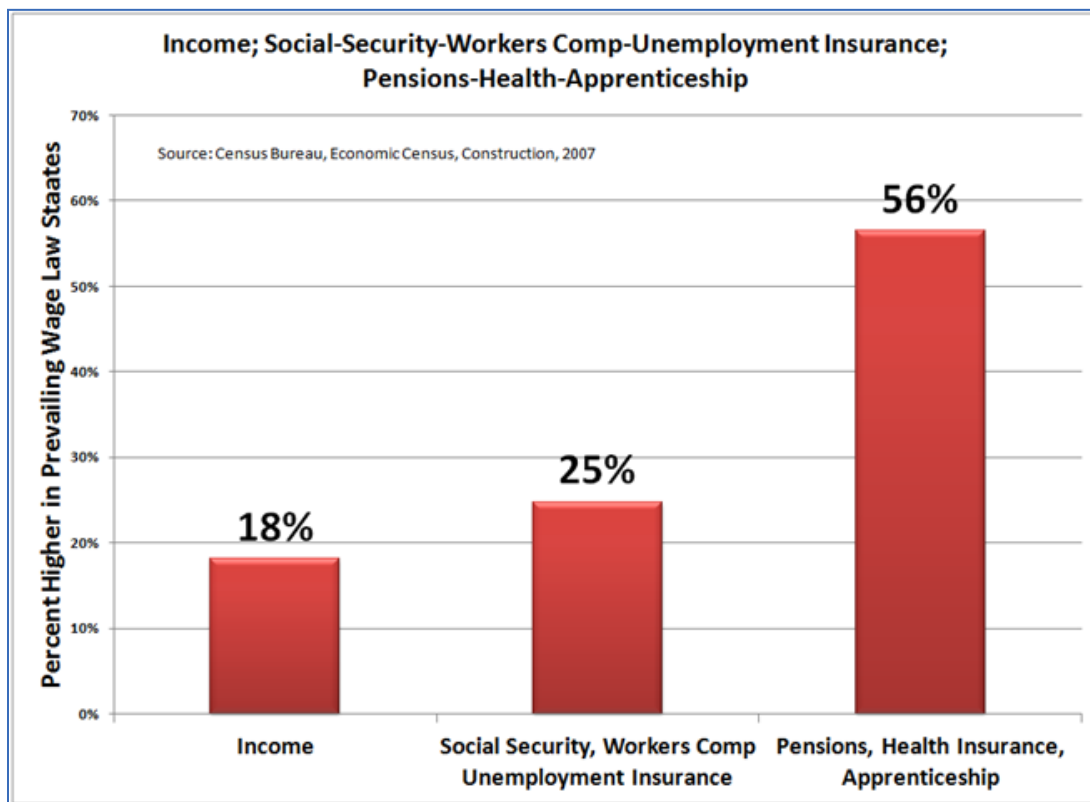


Figure 4: Comparison of wages, pensions and benefits paid in states with and without prevailing wage laws.

Figure 4 shows that in states with prevailing wage laws compared to states without prevailing wage laws, **construction workers are paid 18% more in wages, 25% more in social security and workplace injury insurance and 56% more in pension and health insurance.** This means that in states like Kentucky it is easier to train construction workers and know that the human capital investment in apprenticeship training will not be lost to the industry and know that trained workers will continue to accumulate additional experience without leaving the industry and know that

contractors and owners will benefit in terms of a more productive workforce and higher quality construction projects. Dropping wages and benefits as hypothesized in Table 3 will have the effect of pushing many of the best workers out of construction and attracting less skilled workers many of whom will be less likely to stay in construction long enough to accumulate sufficient experience to do the job safely and correctly.

4.6.3 Prevailing Wage Law States Have Better Educated Construction Workers

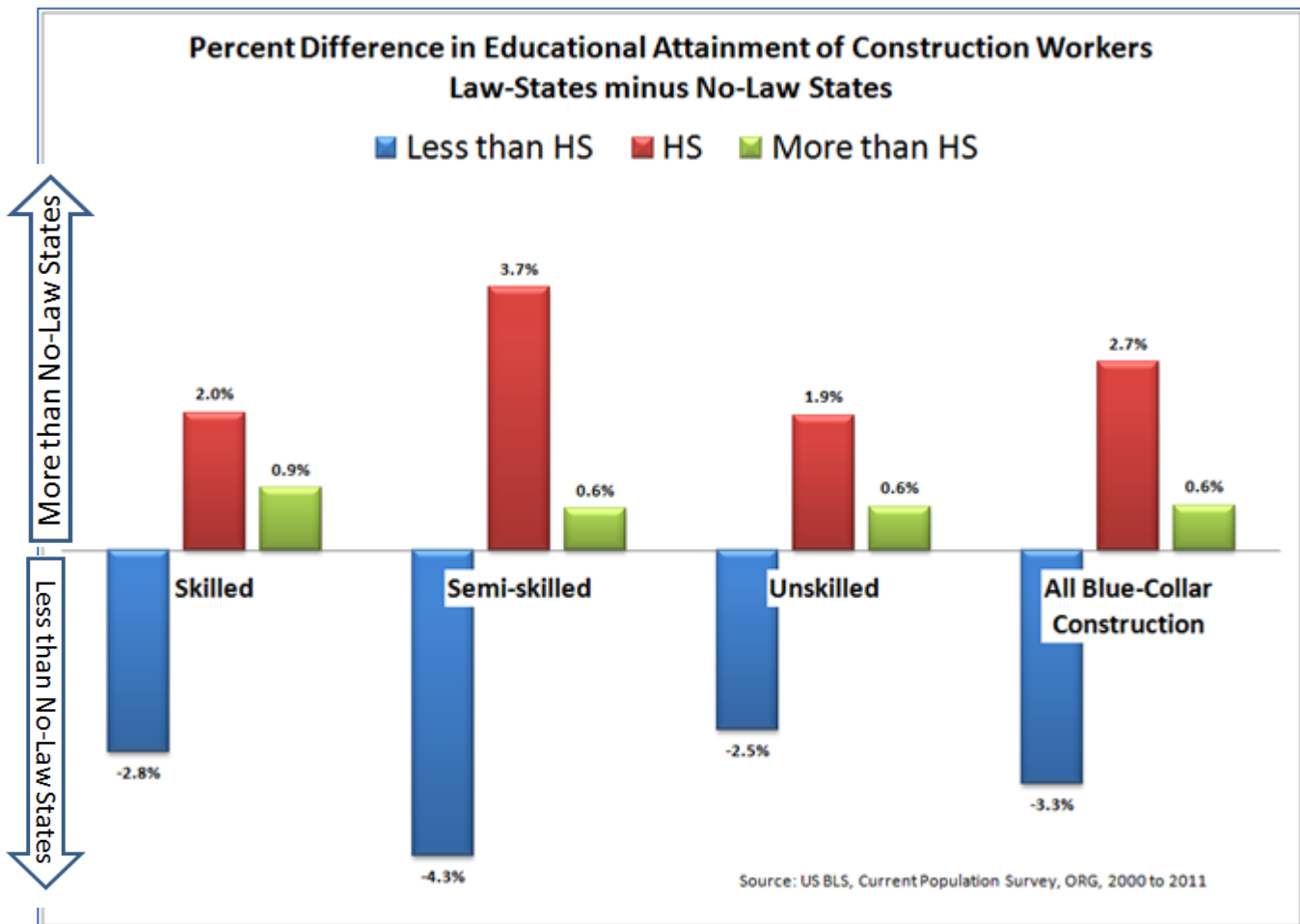


Figure 5: Percent difference in education attainment between prevailing wage law states and no-law states for construction workers broken down by skilled, semi-skilled and unskilled construction workers.

States with prevailing wage laws have a better educated construction labor force. Figure 5 shows that in states like Kentucky which have prevailing wage laws, for all blue-collar construction workers, these states have 3.3% fewer high-school dropouts working construction, 2.7% more high school graduates working construction and 0.6% more college graduates working as blue-collar construction workers. For skilled workers such as plumbers and electricians, prevailing wage law states have 2.8% fewer high-school dropouts, 2% more high-school graduates and 0.9% more college graduates working blue-collar skilled construction jobs. For semi-skilled workers such as carpenters, prevailing wage law states have 4.3% fewer dropouts, 3.7% more high-school graduates and 0.6% more college

graduates working in these semi-skilled blue-collar construction jobs. For unskilled workers such as construction laborers, prevailing wage law states have 2.5% fewer high school dropouts, 1.9% more high school graduates and 0.6% more college graduates working these less skilled blue-collar construction jobs compared to no-law states.⁷ Having construction workers who are more literate and numerate across the entire range of construction occupations makes the construction labor force in prevailing wage law states more productive and safer.

4.6.4 Prevailing Wage Law States Have More Productive Construction Workers

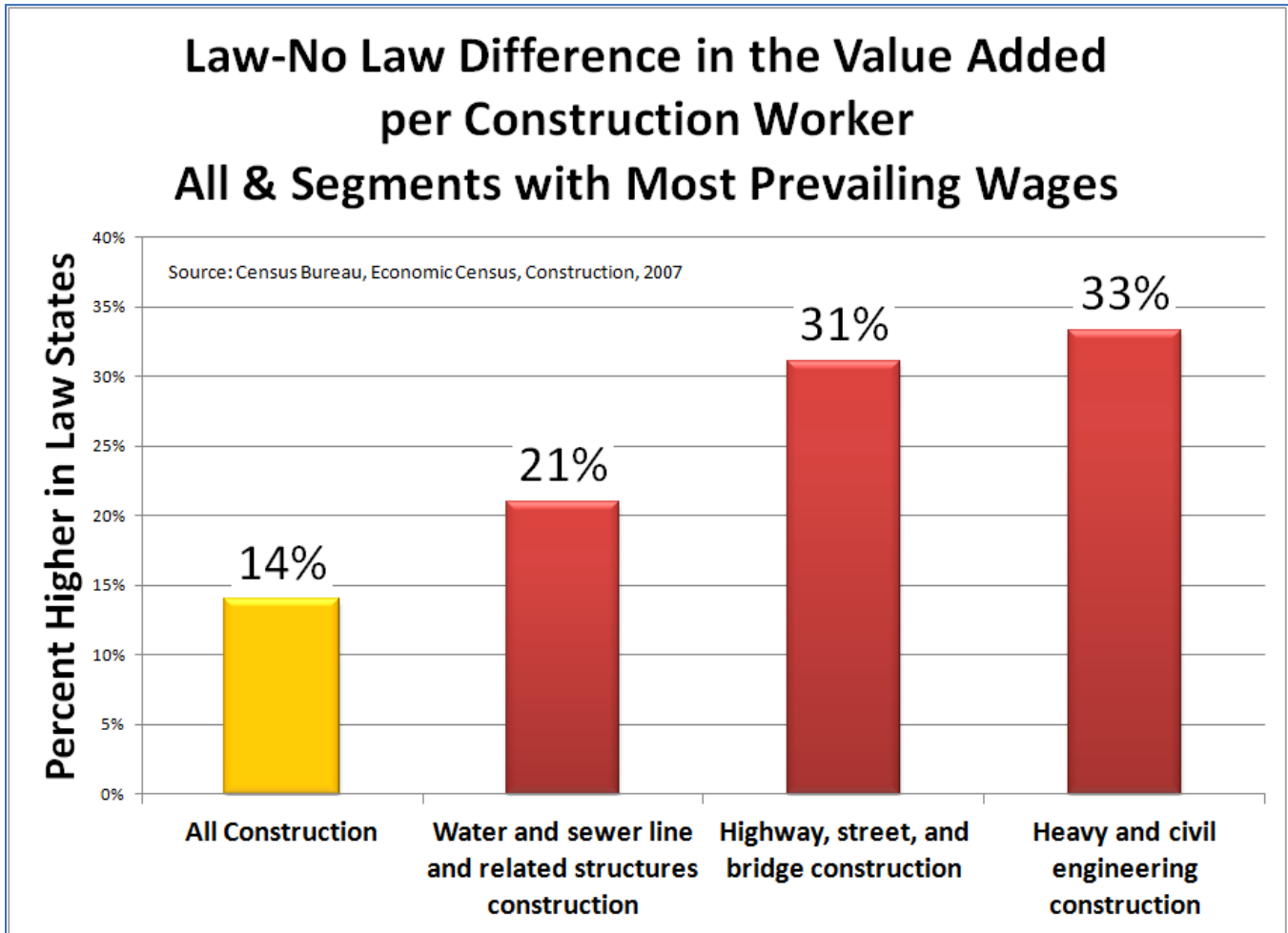


Figure 6: Difference in the value added per construction worker in prevailing wage law-states compared to no law states by all construction and segments where prevailing wage law regulations most often apply

The productivity effects of human-capital substitution and efficiency wages-and-benefits associated with prevailing wage laws can be seen quite clearly in the difference in value added per worker in states with prevailing wage laws compared to states without prevailing wage laws. **Figure 6** shows that **in states with prevailing wage laws, value added per worker is, on average, 14%**

⁷ Note that laborers may be doing unskilled tasks on a construction site but they still must be as skilled and careful as all the other workers on the site when it comes to safety. A poorly trained and inexperienced worker from a safety standpoint is a danger to himself, a danger to others and a threat to the critical path of the construction project. So having better educated unskilled workers is a boon to safety training and the smooth operation of the construction site.

higher than in construction for states without prevailing wage laws. Furthermore, if we focus on segments where much of the work is state, county or municipal public works, the value added per worker is even higher. These are segments of construction where in states with prevailing wage regulations prevailing wages are required. In water, sewer and related construction, value added per worker is 21% higher in states with prevailing wage laws; value added per workers is 31% higher in highway, street and bridge construction where state prevailing wage laws exists; and in other heavy and civil engineering work, value added per worker is 33% higher in states with prevailing wage laws. These higher value added per worker is a reflection of both more capital per worker, more human capital per workers and a greater commitment to the construction industry which leads to a more experienced labor force in prevailing wage law states. Reflecting this experience, construction workers in prevailing wage law states are older and more experienced than construction workers in no-law states and these more experienced workers get hurt less.

4.6.5 Prevailing Wage Law States Have More Experienced and Safer Construction Workers

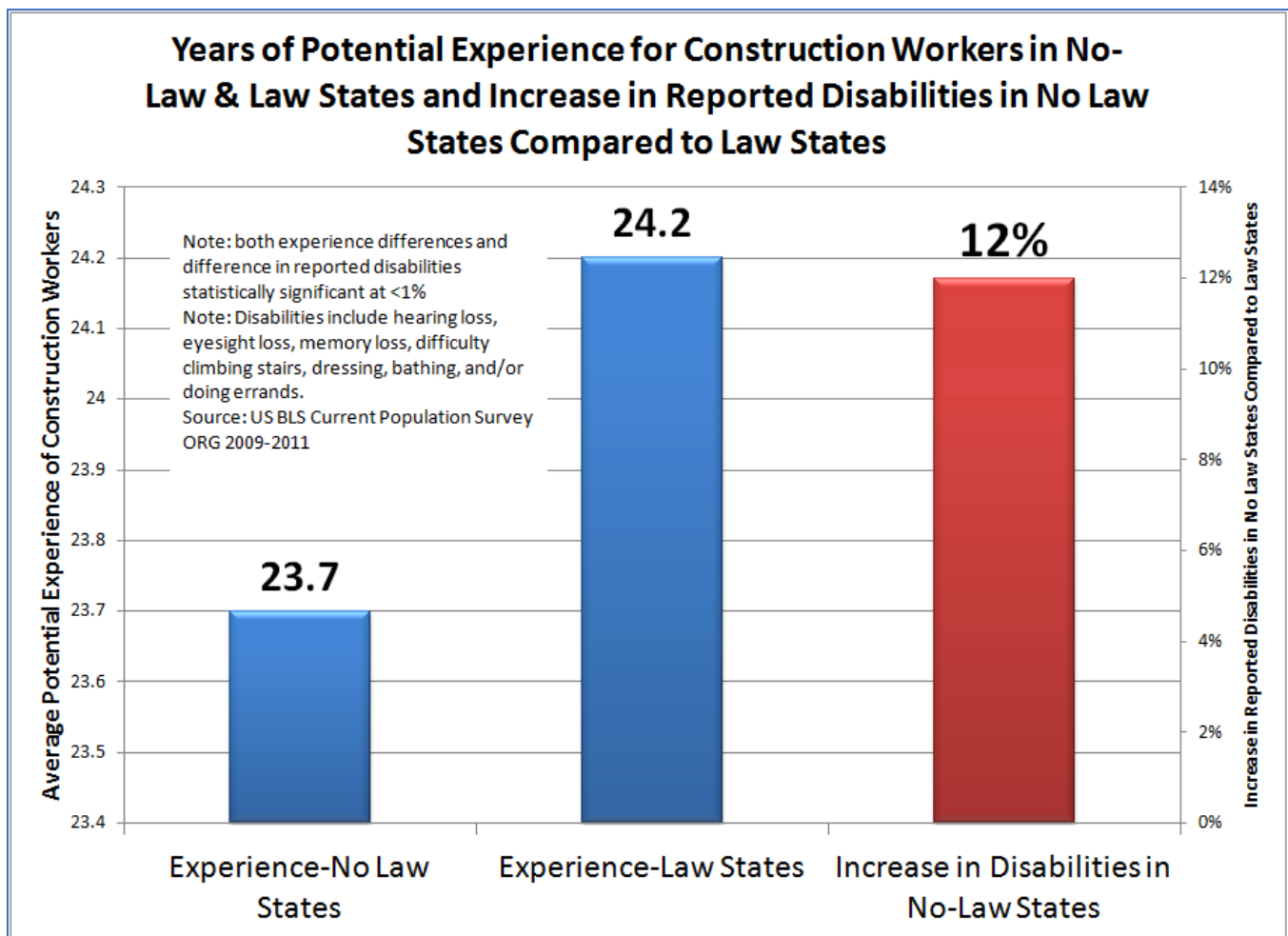


Figure 7: Average potential experience of construction workers in no-law and prevailing wage-law states plus the increase in reported disabilities for construction workers in no-law states compared to law states, 2009-11

Figure 7 shows that in 2009-2011, the average potential construction industry experience of blue-collar construction workers in no-law states was about a half-year less than in law states. While this difference is numerically small it is nonetheless statistically significant. More importantly, it is practically significant as well. **Construction workers in no-law states reported 12% more disabilities compared to construction workers in prevailing wage law states.** Construction is one of the most dangerous industries in the U.S. More workers die annually in construction than in any other industry segment. Injury rates in construction are among the highest of any industry segment.^{xxvi} Disabilities rise with age: to have the older, more experienced construction workforce in prevailing wage law states reporting fewer disabilities compared to the younger workforce in no-law states underscores the importance of even small differences in average potential construction experience.⁸ A workforce that knows how not to get hurt is also a workforce that knows how to get the job done safely, effectively and without interruption. Experience both creates and reflects higher productivity with safety being one of the markers of higher productivity. Safer workers interrupt the job less with fewer accidents and lose fewer skilled and experienced workers to accidents.

4.7 A Natural Experiment: School Construction Costs in Kentucky, Ohio and Michigan

Fortunately, we are not limited to the outmoded and discredited wage-differential approach. Rather than a doubtful back-of-the-envelope calculation based on even more doubtful assumptions about the lack of connection between wages and work, we can look at what has actually happened when states near Kentucky and including Kentucky have passed or repealed prevailing wage laws.

In the 1990s, a natural experiment occurred that can help us answer the question: how do prevailing wage regulations affect public construction costs? In 1996, Kentucky went from not having a prevailing wage law on public schools to implementing prevailing wages on all public school construction. In 1997, Ohio went from having prevailing wage regulations apply to public schools to removing the law. Due to a court decision, Michigan suspended its prevailing wage regulations on schools in late 1994 only to re-implement the regulation in the middle of 1997 when the court decision was overturned. So we have a natural experiment that employs both a before-and-after comparison within three adjoining states, and a here-and-there comparison across these three states looking at new school construction costs in each state. Furthermore, the type of construction, schools, is a relatively homogeneous set of construction projects and the time period is close together. So this natural experiment provides a close apples-to-apples comparison of public school construction with and without prevailing wage regulations. Figure 8 shows the timing in the 1990s when each state had and did not have prevailing wage regulations in force.

⁸ We cannot measure actual construction experience over decades because data do not track individuals over that length of time. "Potential experience" is defined as reported age minus 18 years.)

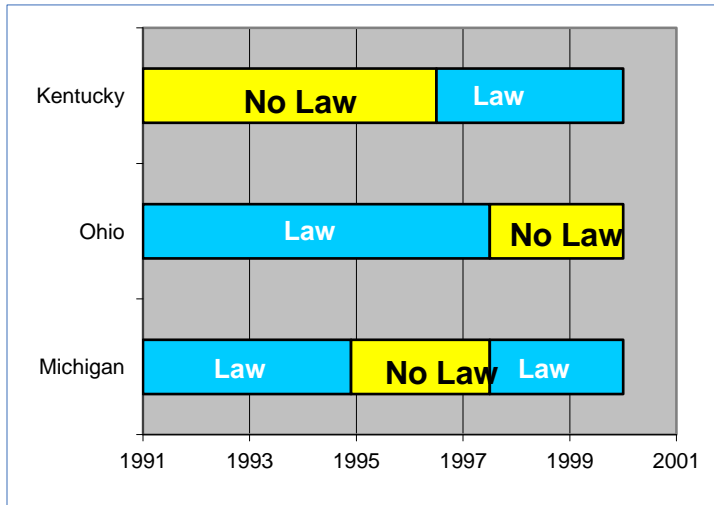


Figure 8: Prevailing wage policy by state, Kentucky, Ohio, Michigan, 1991-2000

Using FW Dodge data covering 391 new schools constructed in Kentucky, Ohio and Michigan over the period 1992 to 2000, analysis done by this author in 2001 showed that there was no measurable, statistically significant difference in the total cost of construction associated with the removal or prevailing wage regulations.^{xxvii}

Table 4: Description of the new schools used in the study

| Characteristic of Schools in Study | |
|---|-------------|
| Number of New Schools in Study | 391 |
| Average Square Foot Size of the School | 86,415 |
| Average Total Cost of the Project (Year 2000 dollars) | \$8,483,937 |
| Percent of All Schools | |
| Michigan | 38% |
| Ohio | 36% |
| Kentucky | 26% |
| Percent of School with a Gym-Pool Facility | 7% |
| Percent of Urban Schools | 32% |
| Percent of Schools Built Under Prevailing Wages | 49% |

Table 4 shows that of the 391 new schools with an average size of 86,415 square feet, almost half (49%) were built under prevailing wages and half (51%) were not. Michigan, which had prevailing wages, then dropped this requirement and then resumed prevailing wages, accounted for 38% of the schools in the sample. Ohio accounted for 36% and Kentucky accounted for 26% of the schools. Thirty-two percent of the schools were in urban areas while the rest were rural. All the monetary figures in the study were normalized in the year 2000 dollars and the average project cost was almost \$8.5 million. Before looking at all three states, we will start by looking at the two adjacent states of Kentucky and Ohio.

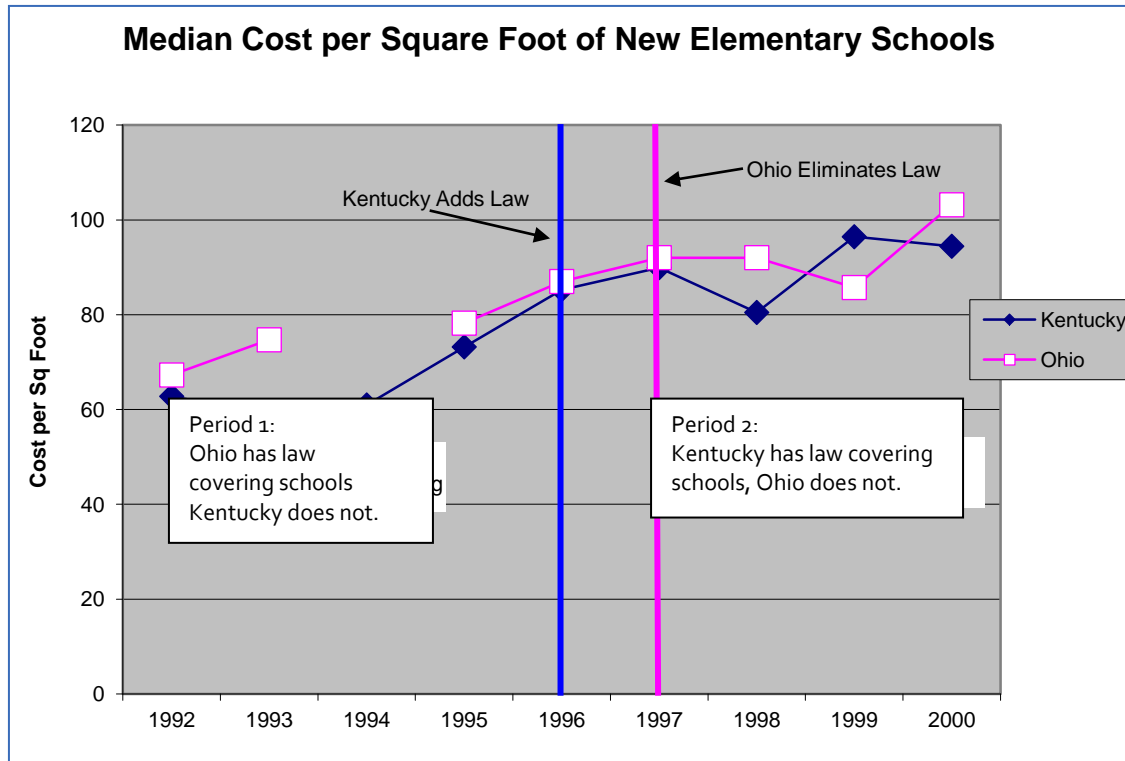


Figure 9: Median square foot cost of new elementary schools before and after law changes in Kentucky and Ohio, 1992-2000

A simple comparison in Figure 9 of the median square foot cost of new school construction based on “start costs” (or accepted bid price) in Kentucky and Ohio over the 1992 to 2000 time period shows no discernible cost effect either of Kentucky implementing prevailing wages in 1996 or Ohio removing prevailing wages for schools in 1997.^{xxviii} Table 5 shows the mean square foot cost of rural schools in periods in which there was no law (\$96) compared to when there was a law (\$98). Table 5 also shows for urban schools the mean (or average) square foot cost when there was no law (\$114) and when there was a law (\$114). **In both cases there is no statistically significant difference in these average square foot costs.**

Table 5: Real, inflation adjusted square-foot cost of new public school construction in Kentucky, Ohio and Michigan 1992-2000

| New Public Schools | | | | | | | | |
|--|---------------------------------------|--------------------|--------|------|--------------------|--------|----|---|
| Real (Inflation Adjusted) Square Foot Cost | | | | | | | | |
| a | b | c | | | e | f | | g |
| 1 | | Rural Schools | | | Urban Schools | | | |
| 2 | Mean | Standard Deviation | Number | Mean | Standard Deviation | Number | | |
| 3 | No Law | \$96 | \$26 | 161 | \$114 | \$36 | 40 | |
| 4 | Law | \$98 | \$24 | 104 | \$114 | \$34 | 86 | |
| 5 | t-test | -0.76 | | | 0.05 | | | |
| 6 | Statistically Significant Difference? | No | | | No | | | |

This 2001 *Kentucky-Ohio-Michigan Study* goes on to apply a more sophisticated econometric model to these 391 new schools finding that there were statistically significant effects on total costs if ground were broken on a project at the onset of winter, and that rural schools were statistically less expensive compared to urban schools, and that Kentucky schools were less expensive compared to Ohio and Michigan, and if a school had a pool it was more expensive than if it did not. However, ***there were no measurably or statistically significant effects of prevailing wages on total start costs.***

In subsequent peer-reviewed⁹ research on more than 4000 new schools built nationwide published in the *Journal of Education Finance*,^{xxix} the results of the *Kentucky-Ohio-Michigan Study* were confirmed. ***There was no measurably or statistically significant effect on start costs associated with the presence of prevailing wage regulations.*** Additionally, it was found that substantial savings on school construction could be found if schools were built counter-cyclically. By avoiding building into what *Engineering News Record* calls "cost storms" when construction is booming, there is a measurably large and statistically significant savings that can accrue to the public. Such counter-cyclical spending can also benefit the construction industry and the local community by dampening the chronic boom-bust cycle of construction. Those who wish to save on public construction monies would be well advised to avoid breaking ground as winter hits and to seek breaking ground when the economy slumps. Repealing prevailing wages will result in lower wages, benefits, training and productivity, but does not promise substantial savings on total construction costs. Ohio is an example where no savings could be found from exempting school construction from prevailing wage rules.

There was no measurably or statistically significant effect on start costs associated with the presence of prevailing wage regulations.

4.8 Ohio Exempts Schools from Prevailing Wage Requirements

When the 2001 Kentucky report upon which critics rely estimated that wages would drop by 17% to 24% on Kentucky public works, the report was essentially assuming that subsequent to a repeal, all workers would be paid nonunion wage rates and that union contractors would therefore not be competitive of public works. Here we find that in Ohio subsequent to the school exemption from prevailing wage requirements, union contractors continued to win public school jobs while still paying union wages. Indeed, we find that on average, union bids on public schools in Ohio have been slightly lower than nonunion bids subsequent to the exemption, although the difference was close enough to make the results not statistically significant. This is consistent with the findings in the previous section that Ohio school construction costs did not decline after the state exempted school construction from prevailing wages. The lesson from Ohio is that higher wage rates do not necessarily mean higher construction costs. And claiming correctly that wage rates will fall after repealing prevailing wage laws does not really mean that public construction costs will decline.

In 1997, Ohio exempted public school construction from prevailing wage requirements. In 2013, Professor Alan Atalah, Dean for Graduate Affairs and graduate coordinator for the Construction Management Department at Bowling Green University published his study of the impact of Ohio's prevailing wage exemption on Ohio's public school construction costs in Ohio. Dr. Atalah has a doctorate in Engineering with a specialization in Civil and Construction Engineering and teaches courses in Estimating and Bidding Strategies. This background led him to frame his study around the bids of union contractors paying what would have been Ohio's prevailing wage had the exemption not occurred compared to the bids of

⁹ Peer-review refers to the academic process whereby research proposed for publication is sent to a set of independent experts in the field for review. The research is only published after it passes the evaluation of these reviewers and the journal editor.

nonunion contractors on public schools who were free from prevailing wage requirements after the exemption took effect. Professor Atalah summarized the results of his study as follows:

In 1997, the Ohio senate passed Senate Bill 102 which established the Ohio School Facilities Commission as a separate agency to oversee the rebuilding projects of the public schools in Ohio. To lower the construction cost, the bill exempted construction contractors from paying prevailing wages on these projects based on the hypothesis that this exemption would save the Ohio tax payer 10.7%. Many other studies concluded that these savings would range from 1.5 to 26%. The purpose of this research was to investigate this hypothesis through the statistical analysis of 8093 bids received for the schools' construction from the years 2000 through 2007. Union contractors-who paid their workers union wages-and non-union contractors-who did not pay prevailing wages bid these projects. By comparing the bids/SF [bid price per square foot] from both groups (union and nonunion), the hypothesis was tested. The research indicated that there was no significant difference between the bids/SF for union contractors and the bids/SF for non-union contractors.^{xxx}

In Ohio, there was no significant difference between the bids per square foot for union contractors and non-union contractors despite union contractors paying what would have been the prevailing wage absent repeal.

Atalah divided his sample of 8093 bids into two sets—1) all bids except the lowest bid and 2) the lowest bids only. The hypothesis is as follows: if prevailing wage regulations increase bid costs, then eliminating prevailing wages will free nonunion contractors to pay lower wages while union contractors constrained by their collective bargaining agreements will continue to pay wages at or higher than what prevailing wage regulations would have required them to pay. So the question is—did nonunion contractor bids come in lower than union contractor bids on Ohio public schools after prevailing wage requirements were eliminated? **Table 6** shows that on average, both for the lowest bids on projects and for the bids which were not the lowest, nonunion contractors bid higher. However, from a statistical standpoint, the difference between union and nonunion contractor bids on Ohio public schools was insignificant. Thus, Dr. Atalah rejected the hypothesis that the elimination of prevailing wage requirements on Ohio public schools led to lower bids.

Table 6: Differences in the average bid price per square foot for Ohio public schools by union and nonunion contractor, 2000 to 2007^{xxxi}

| | Union / Non-Union Contractor | Number of Bids on Public School Projects | Average Bid Cost per Square Foot | Standard Deviation | Probability You Would Be Wrong if You Thought the Averages Were Different | Accept / Reject Hypothesis that Average Squarefoot Bid Costs Are Different |
|------------------------|------------------------------|--|----------------------------------|--------------------|---|--|
| All Bids Except Lowest | Union | 2,307 | 19.22 | 25.31 | 0.1936 | Reject |
| | Non-union | 4,286 | 20.49 | 43.03 | | |
| Lowest Bids | Union | 547 | 16.99 | 23.54 | 0.4199 | Reject |
| | Non-union | 949 | 18.49 | 39.57 | | |

5 The Impact of Repeal on Kentucky Income and Tax Revenues

5.1 Overview

While critics and proponents of prevailing wage regulations may disagree on many things, one thing they all do agree on is that repealing prevailing wages on Kentucky public works will lower the wage rates of many construction workers. One original purpose of prevailing wage laws was, in fact, to prevent the undercutting of local labor standards by not allowing cutthroat bidding on public works. Public bidding is not the same as private sector construction bidding. The public owner is generally not free to take any but the lowest bonded bidder while in the private sector the owner is free to take the second or any other bid based on a sense of better quality and performance or a belief that the lowest bidder is unreliable or missed something. In the public sector a cutthroat contractor can seize the project with a lowball bid and then work the specifications for change orders to make his profit there. The private sector owner can go on past experience and reputation to refuse cheap labor contractors trying to game the system. The case presented later in this report provides an excellent example in Iowa, a non-prevailing-wage-law state where the public owner was just such a victim of cutthroat bidding practices.

Repealing prevailing wages would allow cutthroat bidding based on cheap labor with a corresponding decline in public works wage rates potentially spilling over and lowering construction wages beyond public works. Because most construction workers are local, a decline in construction worker income has the potential to reduce local consumer demand creating a domino effect lowering the incomes of Kentucky workers beyond construction itself. We will see that these spillover and domino effects have happened elsewhere subsequent to prevailing wage repeals; and below, we will estimate the effect of a Kentucky repeal of prevailing wage regulations on construction worker income in Kentucky, overall Kentucky incomes and state income and sales tax revenues.

Indeed, as will be shown below that right next door, in Ohio, construction wages on-and-off public works fell 7% relative to Kentucky's construction wages after Ohio exempted public schools from prevailing wage requirements. More generally, the academic literature suggests that overall construction wages will fall from 4% to 8% after the repeal of a prevailing wage law. Because construction workers account for about 5% of any state's overall labor force, a 4% to 8% cut in local construction worker incomes can spill over into the local economy and local tax base.

However, as an offset, lower wages may lead contractors to hire more albeit cheaper workers. While these lower-paid workers are likely to be less skilled, and some may come from out-of-state, nonetheless, an increase in construction employment with a repeal of prevailing wages will partially offset the effects of lower local construction worker incomes. The academic literature suggests that every 1% decline in construction wages may lead to a 0.2% increase in construction employment.

The objective of this section is to examine how a repeal of the Kentucky state prevailing wage law would affect the annual earnings and employment of all Kentucky construction workers; and to examine the knock-on effects of a loss in Kentucky construction worker income but a possible gain in construction employment would have on state level income across all occupations as well as state income tax and sales tax revenues.

For this purpose, we will establish an employment and income baseline for the Kentucky construction industry. This involves calculating a representative set of values for annual construction employment and average construction earnings in Kentucky. With this baseline we will carry out hypothetical simulations to measure how these baseline values respond to a hypothetical repeal. This exercise requires knowledge of the magnitudes of structural parameters of the economy, including responsiveness of individual construction earnings to a repeal, the impact of a change in average construction wages on construction employment, and the spillover effect of the change in the total construction income on the rest of the state economy. Given these structural parameters, we will then calculate the impact of repeal on state income and tax revenues.

In section 5.2, we describe our methodology and how we chose the baseline state economic and the structural parameters. In section 5.3, we report our calculations of the impact of a prevailing wage law repeal on construction industry and aggregate income in Kentucky. Section 5.4 reports the estimated effects of the repeal on state income and sales tax revenues. We summarize findings in section 5.5.

5.2 Methodology

In constructing counterfactuals to estimate the tax-revenue impact of a prevailing wage law repeal in Kentucky, we first need a baseline of construction industry employment and earnings. In order to isolate the effects of year-to-year fluctuations in the level of construction activity, we chose the average values of construction employment and earnings over a ten-year period (2003-2012) as the baseline. This decade encompasses both a boom (2003-7), a bust (2008-10) and also a partial recovery (2011-12) in Kentucky construction activity. We obtained Kentucky construction employment and earnings figures from the US Bureau of Labor Statistics *Quarterly Census of Employment and Wages* (QCEW). These data include construction workers who were covered by unemployment insurance and exclude self-employed construction workers.^{xxxii}

The average annual Kentucky construction income over the period 2003 to 2012 (excluding benefits) expressed in 2013 prices using the Midwest urban consumer price index was \$44,519.^{xxxiii} Because blue collar workers, on average, earn less than white collar workers in Kentucky construction, blue collar income accounts to 67% of total Kentucky construction income despite accounting for 73% of construction employment (see Figure 2 above).^{xxxiv} Thus, we expect Kentucky average blue-collar construction income to be 8% less than overall average construction income.¹⁰ So the baseline blue-collar construction average income for Kentucky over the period 2003 to 2012 is estimated at 92% of the overall average construction industry income or \$40,957.

The annual average construction industry employment for Kentucky over the period 2003 to 2012 was 77,972 employees. In 2007, blue collar workers accounted for 73% of all construction employment in Kentucky (again see Figure 2 above). So we estimate the average number of blue collar construction workers in Kentucky over the period 2003 to 2012 to be 56,920 (or 73% of 77,972).

Estimation of construction income in the absence of prevailing wage law requires information on responses of the Kentucky construction earnings and employment levels to a repeal. We consider the impact on earnings first.

When the prevailing wage law is no longer effective, individual construction income is expected to decline both on and off public works. The literature provides several estimates of the size of this impact based on data from states which repealed their prevailing wage laws. Philips et al. (1995) found an 8% difference between the wages in the strong and weak law

¹⁰ The calculation is $(73\% \text{ of employment minus } 67\% \text{ of payroll}) = 6\% \text{ less than expected payroll}$ if blue collar average income was the same as the overall construction average income; $(6\% \text{ less than expected payroll}) / (73\% \text{ of employment}) = 8\% \text{ lower average annual income for blue collar workers compared to overall construction industry average}$.

states. Kessler and Katz (2001) estimated that construction worker wages declined by 2 to 4% in the long-run after the repeal. Based on average income levels in nine repeal states, Kelsay et al. (2004) reported that average annual earnings of a construction worker declined by 5% after the repeal.

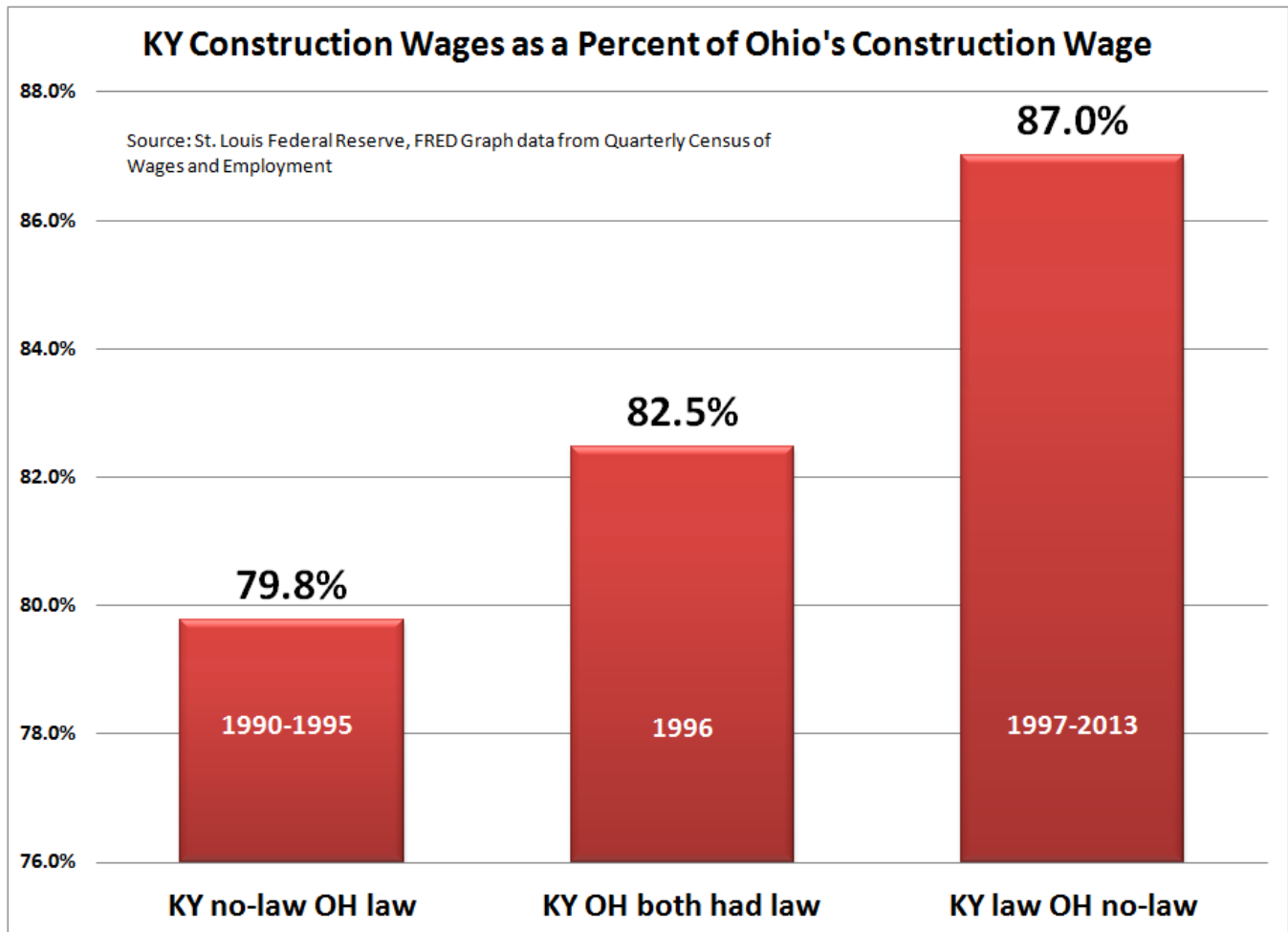


Figure 10: Kentucky construction income as a percent of Ohio construction income before and after Kentucky adopted a prevailing wage law and before and after Ohio exempted schools from prevailing wages

These estimates in the literature are consistent with the experience of Kentucky and Ohio. Recall that Kentucky adopted a prevailing wage regulation in 1996. Ohio exempted public schools and public higher education construction from prevailing wage regulations in 1997. Figure 10 shows that when Ohio had a prevailing wage law covering schools and Kentucky had no prevailing wage law, Kentucky construction wages were about 80% of Ohio construction wages. In the year 1996 when both states had prevailing wages, Kentucky's construction wages were 82.5% of Ohio's construction wages. After Ohio exempted public schools from prevailing wage regulations, Kentucky construction wages rose to 87% of Ohio's. This suggests that enacting prevailing wages in Kentucky and exempting a major piece of state public construction in Ohio led to a 7% change in overall construction statewide income by changing the law.

The impact of a repeal on the compensation of construction workers is an important factor in determining the impact on the overall economy. Recognizing that there does not exist a commonly agreed upon figure by researchers, we will calculate the overall income effects of a hypothetical repeal under two alternative estimates of the law's impact on compensation. According to the first hypothetical, the repeal of the law lowers annual income by 4%; under the alternative, income declines by 8%.

Because government benefits data are limited, no effort is made to assess the effects of a repeal on benefits.¹¹ However, as Figure 4 above shows, across all of construction, in prevailing wage law states, health insurance premiums and pension contributions are over 50% higher than in states without prevailing wage laws. This suggests that any Kentucky repeal would result in a significant drop in construction worker benefits which would only add to the effects on income examined here.

The repeal of the Kentucky prevailing wage law would lower construction wages both on and off of public works and, given the baseline employment level, would lower total earnings in the industry. Employment would not, however, remain the same because employers would hire more workers at lower wages, and a higher employment level, in turn, would affect total industry earnings positively.

The second parameter we need to know in order to simulate how industry income levels would respond to a repeal is the elasticity of employment with respect to wages. The literature does not provide any estimates of this parameter for the Kentucky construction industry or for the Kentucky economy. However, many studies estimated this figure for the U.S. labor markets.¹² While there is some variation among the findings of these studies, there is agreement that the figure is quite small. It is commonly accepted that a one-percent drop in the wage rate raises employment by 0.2%, and this is the figure we will use in our estimations.

So, in sum, we will assume that wage rates will fall by from 4% to 8% after a hypothetical repeal and that construction employment will rise by 0.2% for every 1% fall in wages; so that a 4% hypothetical decline in wages will correspond to a 0.8% increase in employment and an 8% hypothetical decline in wages will correspond to a 1.6% increase in construction employment.

5.3 Impact of the Prevailing Wage Law on the State Income Level

Here we calculate the effect of a repeal on Kentucky construction worker income spilling over onto overall Kentucky income. The baseline total annual income in the Kentucky construction industry is the product of a baseline construction employment and a baseline construction average earnings. The impact of prevailing wage law on construction income is the difference between this baseline figure and the product of the hypothetical no-law industry income calculated from earnings and employment levels based on the parameters presented above.

These calculations are reported in **Table 7**. Row 1 in **Table 7** shows the two scenarios' wage assumption—a hypothetical wage drop of 4% and a hypothetical wage drop of 8% after repeal. Row 2 in **Table 7** shows the two scenarios' employment assumption—a hypothetical increase in construction employment of 0.8% and 1.6% after repeal. Rows 3 and 4 in **Table 7** state baseline annual construction employment and earnings respectively. The baseline blue-collar construction wage bill shown in row 5 is \$2,331 million. These estimates set up the two scenarios shown in columns A and B and developed in rows 7 through 15.

¹¹ The literature's estimates do not include the effect of a repeal on construction worker health insurance or retirement contributions. Government benefits data are limited but it is probably true that repeals have a greater negative impact on benefits compared to wages.

¹² See, for instance, Kniesner and Goldsmith (1987) and Belman (1988)

The scenario in column A of **Table 7** is based on the low-end estimate that wages would decline by 4% in the absence of the prevailing wage law. A repeal would reduce annual earnings per blue-collar construction worker by \$1,638 (that is: \$40,957 times 0.04) down to \$39,319, and raise employment by 455 (that is: 56,920 times 0.04 times 0.2) to 57,375.¹³ Thus, the wage bill in the absence of law is \$2,256 million (that is: \$39,319 times 57,375). These figures imply that the net income loss to the construction sector would be \$75 million or 3.2% of the total baseline construction payroll.

Under the high-end estimate of 8%, reported in column B, individual income declines to \$37,680, and employment rises to 57,831. Total income loss in the Kentucky construction sector would be \$152 million or 6.5% of the baseline payroll.

Table 7: Two estimates of the income and employment effects of a repeal of the Kentucky prevailing wage

| | | Income Decline After Repeal | |
|--|--|-----------------------------|-----------------|
| | | A | B |
| 1 | Percent decrease in Kentucky-wide overall construction income | 4% | 8% |
| 2 | Percent increase in Kentucky-wide overall construction employment | 0.8% | 1.6% |
| 3 | Baseline annual blue collar construction employment (73% of total) | 56,920 | 56,920 |
| 4 | Baseline annual blue collar per capita income in construction | \$40,957 | \$40,957 |
| 5 | Baseline blue collar construction industry total income | \$2,331,272,440 | \$2,331,272,440 |
| 6 Effects of repeal on construction industry: | | | |
| 7 | Decline in Kentucky-wide annual blue collar construction income | \$1,638 | \$3,277 |
| 8 | Increase in Kentucky-wide annual blue collar construction employment | 455 | 911 |
| 9 | Annual total blue collar income in construction after repeal | \$39,319 | \$37,680 |
| 10 | Annual total blue collar employment in construction after repeal | 57,375 | 57,831 |
| 11 | Construction blue collar income after repeal | \$2,255,925,715 | \$2,179,086,975 |
| 12 | Net construction industry income loss after repeal | \$75,346,725 | \$152,185,465 |
| 13 Effects of repeal on state income level: | | | |
| 14 | Earnings multiplier | 1.66 | 1.66 |
| 15 | Net state-wide all industries income loss: | \$125,075,564 | \$252,627,872 |

The adverse impact of the repeal on income, however, is not limited to either public works or the overall Kentucky construction industry. Since construction workers spend their incomes by purchasing goods and services produced in other industries, the decline in construction sector income spills over to other sectors of the state economy as well. The magnitude of this spillover effect is captured by the multiplier effect which measures the impact of a \$1 decline in one sector's income on the overall economy. For this purpose we use an income (also called an earnings) multiplier for construction in the state of Kentucky of 1.66.¹⁴ The value of the earnings multiplier for the Kentucky construction industry of 1.66 means that a \$1 decrease in construction earnings lowers total earnings in Kentucky by \$1.66. This value implies that the \$75 million decline construction sector income, under the low-end estimate of a 4% decline, reduces the total

¹³ This formula is baseline employment times change in wages times change in employment due to a change in wages. In scenario A the change in wages is 4% and scenario B the change in wages is 8%. The baseline employment and wage elasticities are the same in both scenarios.

¹⁴ This multiplier was taken from Janet Harrah and Anne Gallagher, "Economic Impact Analysis, Brent Spence Bridge Replacement/Rehabilitation Project," Table 1, Center for Economic Analysis and Development, Haile/US Bank College of Business, Northern Kentucky University, <http://buildournewbridgenow.com/wp-content/uploads/2013/01/NKU-Economic-Impact-Analysis.pdf>

state income across all industries by \$125 million once the linkages from construction to the rest of the economy are taken into account. At the high-end estimate of a \$152 million or 8% decline in construction income, the total decline in Kentucky statewide income across all industries is \$253 million. In the next section, we will calculate the loss of state tax revenues associated with these estimated losses in state income due to a repeal of Kentucky's state prevailing wage law.

5.4 Impact on State Tax Revenues

As the state income level declines, so do state tax revenues. In this section we calculate the magnitude of the impact of policy change on state tax revenues. We will estimate the impact on both state income tax revenue and sales tax collections, under the low- and high-end estimates presented in the previous section.

Column A of **Table 8** reports state tax revenue losses if a repeal lowers construction workers' earnings by 4%. The marginal state income tax rate in Kentucky is 6%. Following the findings reported in Table 7, the total state income loss of \$125 million would cost the state \$7.5 million in income tax revenue annually. If wages decline by 8% following the repeal, then the income tax loss would be \$15.1 million.

Table 8: Estimated loss in state income and tax revenues due to lower construction worker income after repeal of Kentucky's prevailing wage law

| Estimated Impact of Prevailing Wage Law Repeal on State Tax Revenues | | | |
|--|--|--------------------|---------------------|
| | | A | B |
| 1 | | 4% | 8% |
| 2 | Net state income loss | \$125,075,564 | \$252,627,872 |
| 3 | Impact on state income tax revenues | | |
| 4 | Income tax rate | 6% | 6% |
| 5 | State income tax revenue loss | \$7,504,534 | \$15,157,672 |
| 6 | Impact on sales tax revenue | | |
| 7 | Sales tax rate | 6% | 6% |
| 8 | State sales tax base | 30% | 30% |
| 9 | State sales tax loss | \$2,251,360 | \$4,547,302 |
| 10 | Net state tax revenue loss | \$9,755,894 | \$19,704,974 |

Kentucky's sales tax rate is 6%. In order to calculate sales tax loss due to declining income we need to know the state sales tax base for Kentucky. This sales tax base is basically the percent of Kentucky income spent on purchases within Kentucky that are subject to the Kentucky sales tax. Bruce and Fox (2000 Table 1) estimated the 2003 Kentucky state sales tax base as 44.2% of personal income. However, since 2000 internet sales have cut into state tax revenues. In the absence of other more recent estimates for Kentucky's sales tax base, we will assume that 30% of Kentucky income is spent on in-state purchases subject to the state's sales tax. Under these assumptions, the repeal of the prevailing wage law would reduce sales tax revenue by about \$2.25 million under the low-end estimate of 4% decline in construction earnings. The total decline in state tax revenue, the sum of income and sales tax losses, in scenario A adds up to \$9.8 million. Under the high-end estimate of 8% in scenario B, sales tax revenue declines by \$4.5 million and the total state tax revenue declines by \$19.7 million. So basically, repealing Kentucky's prevailing wage law will lower state tax revenues by \$10 million to \$20 million per year over the lifetime of the hypothetical repeal.

5.5 Income and Tax-Revenue Findings Summarized

Thus, we have shown the impact of the prevailing wage law on Kentucky income levels and tax revenues. It should be kept in mind that the income losses are defined narrowly in this section. Specifically latent effects of prevailing wage laws on building and workforce quality are ignored and only the wage and employment effects are considered. Also the loss of health care contributions and pension contributions are also set aside including the shifting of some of these costs onto the taxpayer. Using Kentucky's annual average construction employment and earnings over the 2003-2012 period as the baseline, we find that in the absence of prevailing wage laws:

- ✚ Construction blue-collar earnings will be lower in Kentucky by \$75 to \$152 million (in 2013 dollars), or 3.2% to 6.5% of the blue-collar construction wages. This is an annually recurring loss both on and off public works which depends on the low-and high-end estimates of wage response and corresponding employment response to a prevailing wage repeal. The total loss, however, will be greater because health and pension benefit cuts are likely to be larger than take-home wage cuts;
- ✚ The above estimate is only the loss of income to Kentucky construction workers. The total income effect for the state is higher because construction workers, in turn, spend much of their income in Kentucky and thus create a demand for the work of others. Taking this induced effect into account, the total lost income to Kentucky workers inside and outside of construction ranges from \$125 to \$252 million annually, again based on the low-and-high-end estimates of wage and employment responses to a prevailing wage repeal;
- ✚ Kentucky would lose from \$10 million to \$20 million in tax revenues annually;
 - The state would lose \$7.5 to \$15.2 million in income tax revenue annually;
 - The state would lose \$2.25 to \$4.55 million in sales tax revenue annually.
- ✚ Any hypothetical savings to the taxpayer associated with weakening or eliminating prevailing wage mandates have to be offset by counterbalancing hypothetical losses in state tax revenues as well as hypothetical losses to Kentucky citizens due to lower income.

6 The Dangers of Low-Ball Bidding

Bidding on public works is not the same as bidding on private construction. In the private sector, the owner has the option of taking the lowest bid, accepting another bid that seems more reasonable, going with a trusted contractor, considering contractor reputation and/or a variety of other factors and considerations. On public works, the public owner must accept the lowest responsible bidder where responsible generally means that the bidder is bonded. Compulsory low-bid acceptance is meant to forestall corruption in the public bidding process and bonding is meant to make the owner whole should the contractor prove nonperforming. However, bonding is an imperfect insurance. It often comes with project delays associated with replacing the nonperforming contractor and other uncompensated costs.

In construction, like in many areas of life, there is a right way and a wrong way of doing things. OSHA regulations, building codes and project specifications are all written to ensure that projects are built safely, correctly and according to the desires of the owner. Safety inspections, building inspections and owner oversight are all needed to get the job done right. But inspection is not enough. Construction work is dispersed. Inspectors and supervisors cannot be constantly looking over the shoulders of each and every construction worker.

For owners who want safe, up-to-code, high quality, on-time-construction, meeting specifications—the first line of defense is trained workers who know how to do things safely and correctly and who have their own craft values helping to ensure a quality project. You need a workforce that has the work ethic to insist things be done right the first time, and workers who have the job-security allowing them to resist pressures to do things unsafely or on the cheap. When you do not have these things, seemingly low-cost strategies can turn out very badly.

6.1 A Low-Wage Contractor Burns Down an Historic Building

A case in point is the restoration of the Iowa Old Capitol Dome. Iowa is one of the 18 states that do not have prevailing wage regulations. Low-ball bidding creates a lasting risk in no-law states such as Iowa that unscrupulous contractors will exploit government procurement procedures to grab work they cannot effectively and safely perform.

In the summer of 2000, Old Cap, Iowa's first state capitol, located at the heart of the University of Iowa campus, was slated for exterior renovations. Shive-Hattery, an engineering firm from Cedar Rapids, was given oversight of the program. In January, 2001, asbestos was discovered, and in August, 2001, Enviro Safe Air from South Dakota, (one of the other 17 states without prevailing wage laws) as the low bidder at \$105,876, began work on the asbestos removal portion of the contract.^{xxxv}

Phil Larson of Shive-Hattery said that he and other supervisors inspected almost daily the site where Enviro Safe Air employees worked. The University of Iowa official monitoring the project also inspected the site regularly: "Lots of people had eyes on them," Larson asserted.^{xxxvi} If inspection, by itself, could ensure a job done safely, Old Cap would not have burned.

But project overseers had faith in the asbestos removal subcontractor. "We think they [Enviro Safe Air] were doing the job properly. Our experience with them has been very good," Shive-Hattery's Larson said.^{xxxvii} Unfortunately, no background check had been done on Enviro Safe Air to see what the experience of other owners and project managers had been. Such a background check would have revealed that Enviro Safe Air had received 11 state code violations for the way it removed asbestos in the previous ten years. In May, prior to the Old Cap fire, Enviro Safe Air had settled a lawsuit out-of-court over asbestos removal violations.^{xxxviii}



Figure 11: A sketch of the original, historic Iowa capitol, Old Cap

At the price Enviro Safe Air had bid the job, it was proving difficult to complete the work on time and at a profit. The Old Cap fire occurred on November 20, 2001, almost two months behind the stated September 28 completion date for the asbestos removal.^{xxxix} The fast way to remove paint and asbestos is with heat guns and torches—but this is not a safe way for workers who are exposed to lead fumes and dried asbestos particles nor is it a safe way for a wooden building structure to be renovated. As early as the end of 2000, the University had decided heat guns should not be used.^{xl}

Nonetheless, heat guns and torches were being used on the Old Cap removal work, and the consequences were eerily predicted by another contractor on the job site. On October 23, 2001—about a month before the fire, Fritz Miller of Renaissance Restoration wrote an email to Al Bawden, a Shive-Hattery project manager, saying that Enviro Safe Air workers had set the building on fire several times. Two days later, he again emailed Bawden:

I have personally witnessed Enviro Safe personnel using open flame torches to remove paint on the cupola. This is an unsafe method of removal, and we have great worry that a catastrophic fire will result from this practice.^{xli} ... Burning material was falling from the work (on fire, not just smoldering)^{xlii}

Clearly, inspections of Enviro Safe's activities were not adequate. According to Miller, within 30 minutes of being told not to, Enviro Safe Air workers resumed the use of open flame torches to remove paint and asbestos.^{xliii} Drew Ives, interim associate vice president and director of the University of Iowa Facilities Services Group said after the fire: "The workers probably had a lot of pressure from the home office to pull off the job because it was costing them to have people there."^{xliv} Indeed, OSHA alleged that Enviro Safe Air instructed workers to use heat to remove material containing asbestos. This is not only a fire hazard. Heat can also dry the asbestos fibers allowing them to become airborne and creating a health risk to workers and others. Additionally, OSHA alleged that Enviro Safe Air improperly used open-flame torches to remove lead-based paint, another environmental (as well as fire) hazard. OSHA also said that Enviro Safe Air failed to properly train workers in removing lead-based paint.^{xlv} Regarding hazardous material removal workers, the US Department of Labor States:

No formal education beyond a high school diploma is required for a person to become a hazardous materials removal worker. Federal regulations require an individual to have a license to work in the occupation....Most employers provide technical training on the job, but a formal 32- to 40-hour training program must be completed if one is to be licensed as an asbestos abatement and lead abatement worker or a treatment, storage, and disposal worker.^{xlvi}

Apparently this is the training that OSHA asserted Enviro Safe Air did not provide its workers. And apparently prior to the fire no one investigated whether Enviro Safe Air was providing properly trained and licensed workers to the Old Cap job site. The DOL says that: "The occupation [of hazardous materials removal] is characterized by a relatively high rate of turnover, resulting in a number of job openings each year stemming from experienced workers leaving the occupation."^{xlvii} So this is an occupation where there is high labor turnover, experienced workers leave, a one-week training course is required but sometimes no one checks to see if workers have that training.

One on-line job board states that most asbestos removal and insulation workers receive only informal training:

Most insulation workers learn their trade informally on the job, although some complete formal apprenticeship programs. For entry-level jobs, insulation contractors prefer high school graduates who are in good physical condition and licensed to drive....Trainees who learn on the job receive instruction and supervision from experienced insulation workers. Trainees begin with simple tasks, such as carrying insulation or holding material while it is fastened in place. On-the-job training can take up to 2 years, depending on the nature of the work.^{xlviii}

In contrast, trainees in formal apprenticeship programs receive in depth instruction in all phases of insulation. Apprenticeship programs may be provided by a joint committee of local insulation contractors and the local union of the



Figure 12: The Old Cap fire caused by an out-of-state, low-wage contractor using cheaper but prohibited heat techniques to remove paint and asbestos

International Association of Heat and Frost Insulators and Asbestos Workers, to which many insulation workers belong. Programs normally consist of 4 years of on-the-job training coupled with classroom instruction, and trainees must pass practical and written tests to demonstrate their knowledge of the trade.^{xlix}

In all probability, the Old Cap fire would not have occurred if the workers on the job knew what they were doing. But to get a worker who knows what he or she is doing, you cannot reward contracts to contractors whose bidding strategy is based on paying the least amount of wages possible.

6.2 Could prevailing wage regulations have prevented the Old Cap fire?

One possibility is that had prevailing wage regulations been in force, Enviro Safe Air may not have been on the job in the first place. Subsequent to the fire, the University of Iowa banned Enviro Safe Air from submitting any further bids to the University.^l But this was shutting the door after the cows got out. Prevailing wage regulations discourage contractors from following a strategy of low-balling bids and then trying to maintain their profits and keep to schedule by using substandard materials or corner-cutting methods. Prevailing wage regulations reward contracts not to contractors who can bring the cheapest workers to the job, but to the contractors who can most efficiently manage high-wage, high skilled workers. Knowledgeable and experienced, high-skilled workers do things quickly by knowing what they are doing and using the right equipment and materials rather than by cutting corners and taking uncalled for risks.

Paying prevailing wages would allow the contractor to hire workers capable of doing the job the preferred, superior and safer way.

According to Terry Cole, president of Renaissance Restoration, in a September 13, 2001 letter to Shive-Hattery: Enviro Safe Air "at their own admission (has) no experience removing paint coatings and no experience working on historic structures." Enviro Safe Air had refused to try methods other than blow torches and heat guns and had rebuffed Renaissance Restoration's suggestion to use a product called Take-Off 2000.^{li} One of the purposes of prevailing wage regulations is to ensure that craft wages rather than unskilled wages are paid. Craft workers earn more because they know how to do more. They know not just one skill but a craft set of skills. Craft asbestos workers would know how to switch from one technique to another. Just as there is more than one way to skin a cat, there is more than one way to skin paint or asbestos off a building. Paying prevailing wages would allow the contractor to hire workers capable of doing the job the preferred, superior and safer way.

A **second possibility** is that under prevailing wages, workers would not have tolerated the techniques pushed by Enviro Safe Air. If you have to compete paying prevailing wages, you have to use trained workers. Trained workers know what burning lead paint can do to their lungs. They know what burning asbestos can do to their health. OSHA said that Enviro Safe Air did not properly train their workers in safe asbestos removal. If you have to pay prevailing wages, you will hire workers with experience and training in asbestos removal who in all likelihood have already been trained in safe procedures. In the case of Old Cap, what was safe for the workers was best for the owners—asbestos and lead paint removal that did not involve heat. We have seen that inspections alone do not work. You have to have workers who know the difference between safe and dangerous work procedures. In the case of the Old Cap fire, the contractor needed insulation workers who knew what they were doing, workers who had gone through an apprenticeship program. However, when you take pot-luck, that is not what you are likely to get.

Prevailing wage regulations would have increased the prospects that the workers on Old Cap would have been apprenticeship trained having received "in depth instruction in all phases of insulation."

Are prevailing wage regulations an absolute guarantee against fire and accident? Are they an absolute guarantee against poor design and engineering? Absolutely not. But prevailing wage regulations are an additional safeguard in a system

where both belts and suspenders are needed. Prevailing wage regulations put knowledgeable workers on the job with sufficient economic and job security that they can afford to resist unsafe construction methods.

Prevailing wages also encourage career workers in a volatile construction labor market. By paying decent wages and benefits, worker paid prevailing wages can afford to stay in the industry adding to their apprenticeship training through extended industry experience. Careers. Pride in craftsmanship. Experience. Work ethic. All these are needed to make system work. Inspections are not sufficient. Insurance never entirely makes up for what is lost. Prevailing wage regulations provide a third leg of the stool that is quality construction: Inspection—Insurance—Craftsmanship. Together these make for safe and successful construction.

Prevailing wage regulations also discourage out-of-state contractors by requiring that bidders on public works pay local wage and benefits.

Prevailing wages also eliminate the low-wage, slap-dash bidding strategies that lead to the use of untrained workers, unsafe workers and unqualified workers.

Prevailing wages also encourage career workers in a volatile construction labor market

7 Conclusion

Prevailing wage regulations serve multiple positive purposes making for a more productive and efficient local construction industry, creating a level playing field on public works for both local contractors and local workers, and creating a middle class blue-collar industry that promotes the training and human capital formation that in turn justifies the decent jobs created in construction.

Critics of prevailing wage laws claim that these benefits come at too high a cost. They assert that by eliminating prevailing wage requirements the state can save “millions” on public construction. However this claim is both vague and groundless. It is based on a discredited methodology sitting atop a false assumption. The false assumption is that there is no connection between wages paid and work done. The discredited methodology is a back-of-the-envelope calculation that says cutting wages by 25% when blue-collar labor costs are 20% of payments to contractors will yield a 5% cut in total construction costs. But if this were so, why not cut wages by 50% and save 10% on total construction costs? Better yet, cut wages by 100% and save the full 20% on construction costs. All these hypotheticals are possible if you only falsely assume that there is no connection between wages paid and work done.

Once we realize that wages are tied to labor productivity in one way or another, then we naturally move from this poorly constructed, hypothetical, back-of-the-envelope calculation to a more reasonable approach—looking at what has happened in the past when states repealed their prevailing wage law. This author’s study of Michigan, Ohio and Kentucky in the 1990’s showed that there were no statistically meaningful differences in school construction costs after Kentucky enacted a prevailing wage law covering schools, Ohio exempted schools from their prevailing wage requirements and Michigan suspended prevailing wages for school construction for a while and then resumed.

This three-state study for the 1990’s is consistent with a 2013 study of Ohio school construction in the 2000’s by Professor Alan Atalah, (Dean for Graduate Affairs and graduate coordinator for the Construction Management Department at Bowling Green University) which found no measurable savings from exempting school construction from prevailing wage requirements.

But where there are no certifiable savings from the repeal of prevailing wages, there are widely agreed upon costs. All parties agree that wages in construction will fall with the repeal of prevailing wage requirements. Indeed, one of the main purposes of prevailing wage laws is to maintain local labor standards; and one of the main purposes for repealing

prevailing wage regulations is to lower wages. In comparing Kentucky to Ohio, Ohio's wages across all of construction both on-and-off of public works fell 7% relative to Kentucky after Kentucky passed a prevailing wage law and Ohio exempted schools from prevailing wages.

Critics of prevailing wages find satisfaction in their conclusion that wages on public works may fall to between \$14 and \$18 per hour after a repeal of prevailing wages in Kentucky. They are silent regarding the spillover effect on all of construction. But such a repeal will lead to lower wages across construction. Taking wages and employment effects together, total construction blue-collar earnings will decline in Kentucky by \$75 to \$152 million (in 2013 dollars), or 3.2% to 6.5% of the blue-collar construction wages after a prevailing wage law repeal. Pension and health benefits will decline much more than this. In prevailing wage law states, benefits are, on average, 56% higher than in no-law states. So a repeal would likely cut pension and health benefits in half for all blue-collar construction workers in Kentucky.

But the damage will not be isolated to construction.

Construction workers make up about 5% of Kentucky's overall labor force. Kentucky construction workers will have less to spend which means that the low-wage spillover effect will spread to other industries that serve Kentucky's construction workers and their families. The total lost income from a repeal of prevailing wage

regulations in construction damaging Kentucky workers both inside and outside of construction ranges from \$125 to \$252 million annually. And the damage will spread to government. Lower Kentucky incomes mean lower state income and sales tax revenues. Kentucky would lose from \$10 million to \$20 million in tax revenues annually after a repeal.

But the damage will not be isolated to current Kentucky incomes and tax revenues. A low-wage construction labor force will be less able to deliver the high quality public infrastructure and private business facilities built-right and on-time the first time. In a globalized world, Kentucky needs world-class infrastructure and facilities brought to market when they are needed as they are needed. This is a necessary condition to build and maintain a world-competitive local market. Prevailing wage regulations encourage a high-skilled development path for construction which provides an educated and trained construction labor force capable of safely delivering technically demanding projects while surviving the turbulence of the worst industry business cycle in the overall US economy. Jettisoning prevailing wages risks the loss of apprenticeship programs, the loss of skilled and experienced workers, and the loss of safe working practices with all the human and economic costs that come from injuries interrupting both lives and projects.

But the damage is not limited to Kentucky's economy and the needs of Kentucky's industries—repealing prevailing wages threatens Kentucky's blue-collar middle class. Construction is a skilled industry. Construction operates the largest privately financed system of higher education in the country—the many union-contractor and contractor-only registered apprenticeship programs. These programs not only boost workers' skills, they boost workers' lifetime earnings by \$300,000. Prevailing wage law repeals promise to take that \$300,000 from each and every prospective construction worker in Kentucky who can no longer find or join a registered apprenticeship program. Prevailing wage repeal is a torpedo at the waterline of these apprenticeship programs. And when a prevailing wage repeal blows a hole in the Kentucky's apprenticeship program, it blows a hole in Kentucky's blue-collar middle class. In essence, advocates calling for the repeal of Kentucky's prevailing wage are advocating for a repeal of the American dream for working class Kentuckians.

While there are no certifiable benefits from the repeal of prevailing wages, there are well documented costs.

8 Appendix A: The *Program Review and Investigation Report*

In 2001, a *Program Review and Investigation Report* by Ginny Wilson and others asserted that the elimination of prevailing wage regulations would decrease wages by 17% to 24%.ⁱⁱⁱ However, the *Program Review and Investigation Report* explicitly states:

It is important to understand that this estimate **does not** imply that prevailing wages increased the costs of these projects by twenty-four percent. Rather, it indicates that the wage portion of construction costs was twenty-four percent higher as a result of prevailing wages.^{liii} (emphasis in the original)

The *Program Review and Investigation Report* makes no effort to determine wage costs as a percent of total costs. And **the *Program Review and Investigation Report* does not estimate any specific savings from a repeal of prevailing wage laws.**

The *Program Review and Investigation Report* is not an accounting of construction costs. It is a back-of-the-envelope hypothetical calculation about wages and wages only. There is no consideration of whether or not jobs are completed on time. There is no consideration of cost overruns. There is no consideration of the effect of repeals on cutthroat bidding practices leading to unqualified contractors winning the work but being unable to complete the job. There is no consideration of downstream maintenance costs. There is no consideration of how the repeal of prevailing wage regulations destroys apprenticeship training programs and the future qualifications of the construction labor force. There is no consideration of how the loss of health insurance can lead to increased public health costs, nor is there any consideration of how the loss of pension benefits may raise the public cost of supporting the elderly. There is no consideration of how the removal of prevailing wage regulations encourages the subsequent proliferation of misclassified workers.¹⁵ There is no accounting for the costs of unscrupulous low-wage contractors shedding payroll tax costs by giving their workers 1099 forms rather than W-2's. There is no accounting of the cost to Kentucky's unemployment insurance and workers compensation system of the loss of contributions when the floodgates to unregulated construction lead to a sea of black market behavior.

These are downstream costs that may well offset the alleged upfront savings that the *Program Review and Investigation Report* purported to find should Kentucky repeal its prevailing wage law.

8.1 The Erroneous Assumptions and Analysis of the *Program Review and Investigation Report*

The *Program Review and Investigation Report* makes simple erroneous assumptions that lead to false conclusions. First, the *Program Review and Investigation Report* assumes that as wages rise, labor costs as a percent of total costs will rise. And as wages fall, labor costs as a percent of total costs will fall. The *Program Review and Investigation Report* explicitly rejects the idea common to economics that as wages rise, contractors substitute capital for labor, skilled workers for unskilled workers and better labor management for lax labor management in order to offset those higher wage rates with higher labor productivity. The *Program Review and Investigation Report* states:

¹⁵ Misclassification of workers occurs when a contractor gives his workers 1099 tax forms rather than W-2s thus misclassifying them as subcontractors. This allows the contractor to avoid paying payroll taxes—social security contributions, workers comp and unemployment premiums. By jettisoning payroll taxes, unscrupulous contractors can underbid legitimate contractors on public works while transferring the costs of workers comp and unemployment insurance to others.

It is argued by some that the additional wage costs of requiring prevailing wages are offset because contractors substitute more productive workers or use more equipment. Because this analysis only examines the workers that actually worked on the project, it incorporates any productivity gains achieved by this type of substitution.^{liv}

The *Program Review and Investigation Report* is saying—"Hey, it's the same worker in both places, so it must be the same productivity! Right?" Wrong. This is false for three basic reasons.

- **First**, the *Program Review and Investigation Report* does not measure the **capital equipment provided the worker** on the prevailing wage job compared to the non-prevailing wage job. This is a mistake. Perhaps the *Program Review and Investigation Report* assumes: "Hey, it's the same contractor, so it has to be the same capital equipment!" Such an assumption would be false. Not only do contractors have older and newer, worse and better pieces of machinery in their warehouse, but also contractors often rent their machinery. On higher wage jobs, they are more likely to rent better, newer and more equipment to boost the productivity of their workers. Figure 13 (left side) shows the value of rented machinery per worker by state in 2002 by the average construction blue-collar income level in that state. Higher wages lead to more equipment provided each construction worker, and Figure 13 (right side) shows that more equipment per worker leads to higher individual labor productivity—something the *Program Review and Investigation Report* ignores.^{lv}

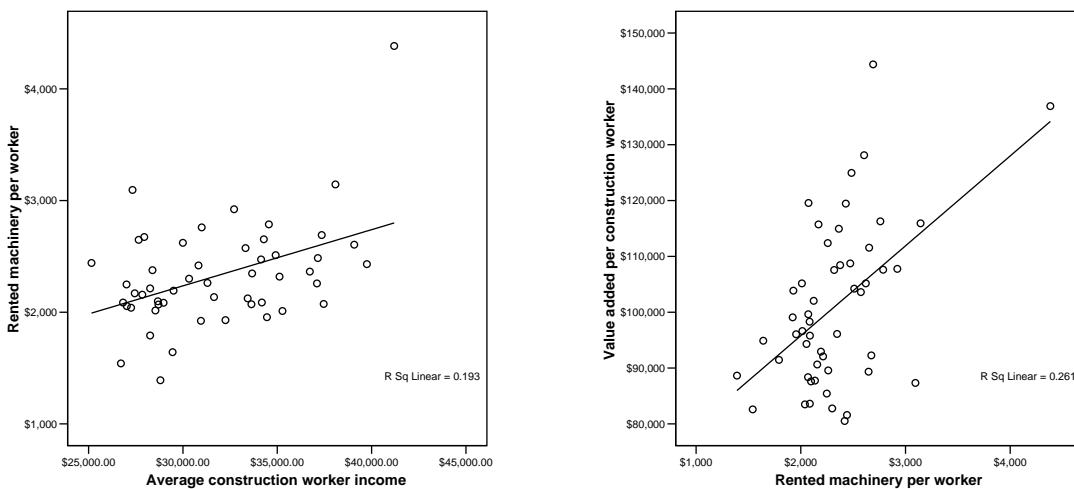


Figure 13: Value of machinery rented per blue-collar worker by blue-collar income, and value added per blue-collar worker by the value of rented machinery per worker, 50 states and DC, 2002

Now we come to the issues of **moonlighting** and **crew mix**. Workers' wages reflect workers' productivity. But what if a worker receives two different wage rates from the same employer on two different jobs? Which wage reflects that worker's actual productive abilities? Can a worker's productivity be different working for the same employer on two different jobs? The *Program Review and Investigation Report* assumes that a worker cannot have two different productivities on two different jobs, and if a worker is paid two different wage rates, then the lower of the two represents that worker's actual productivity. These are incorrect assumptions for two reasons. First, the *Program Review and Investigation Report* ignores the "**moonlighting effect**" where a worker takes a lower wage than his productivity in order to supplement his main work. A high school math teacher might teach driver's ed, or a skilled industrial electrician might re-wire someone's basement. In both cases, it is the higher wage rate that reflects the worker's actual productivity. Second, The *Program Review and Investigation Report* ignores the "**crew mix**" effect. Individual productivity is partially the result of the team of workers the individual joins. The *Program Review and Investigation Report* only looks at a random sample of individual workers drawn from different crews, and it never looks at the crew composition on prevailing wage jobs vs.

other work. Thus, it misses the fact that low-wage contractors tend to assign their A-Team to prevailing wage jobs. We can see these two effects by looking first at high-wage contractors that *typically do public works*, and then looking at low-wage contractors that *occasionally do public works*.

- **The case of the high-wage contractor that mainly does public works**
 - **The *Program Review and Investigation Report* mistakes moonlight wages for day-job productivity:**

Many contractors specialize in public school construction, or water and sewer projects, or road construction or other specific kinds of public works. For these contractors, the vast majority of their work is on these specific kinds of public projects. These contractors develop a skilled labor force that is compatible with the wages and requirements of public works. However, in moments of slack work, these contractors may take on a private job, sometimes small jobs or jobs requiring less skill. A road contractor may pour a residential driveway. A school contractor may refinish a basement. A waterworks contractor may put in a swimming pool. On these private jobs, their workers are over-skilled and underpaid. Their workers take this work at lower rates simply to fill in the inevitable slack time in the boom-bust pattern of construction. If their contractor offered a steady diet of this lesser work pouring driveways or refinishing basements, these over-skilled, underpaid workers would move on to better-paying jobs that better matched their qualifications. For these skilled workers, you cannot assume (as *The Program Review and Investigation Report* does) that their moonlight wage reflects their day-job productivity. And you cannot assume, as *The Program Review and Investigation Report* does, that eliminating prevailing wage regulations would induce these workers onto public construction for 24% lower wages.

- **The case of the low-wage contractor who does occasional public works**
 - **Bringing You're A-game and You're A-team**

Low-wage contractors who do only occasional public construction often select their best workers for this work in order to compete at the higher wages required by prevailing wage regulations. Worker productivity is not just an individual matter as *The Program Review and Investigation Report* assumes, nor is individual effort unresponsive to wages as it assumes. Any one construction worker's productivity is dependent on his crewmates who deliver material on time, cooperate well, complete tasks quickly and correctly, maintaining a strong work ethic and group morale. In short, teamwork affects individual productivity. Because *The Program Review and Investigation Report* looked at individuals instead of crews, it fails to capture the work-crew component of construction labor productivity. And you cannot assume, as *The Program Review and Investigation Report* does, that at 24% lower wages, these A-teams teams will be formed or that these teammates will apply themselves as they now do on this premium work.

By not looking at capital equipment per worker, by not looking at work crews, their composition and management, and by not knowing which job it examines is the worker's day job, the *Program Review and Investigation Report* totally loses track of the productivity effects wages can have. Furthermore, by looking at a random set of individuals instead of looking at construction projects, themselves, *The Program Review and Investigation Report* does not know if these projects were brought in on time, whether there were cost overruns or anything about the quality of the work done.

Knowing little about actual productivity in construction, *The Program Review and Investigation Report* nonetheless concludes that prevailing wages "do not ensure an associated improvement in quality or productivity."^{lvi} Despite this conclusion, *The Program Review and Investigation Report* concedes that

It is generally accepted that in a competitive labor market a higher quality worker will be able to command a higher wage, assuming all other factors equal. Therefore, one would expect that a \$20 plumber would likely do better work than a \$15 plumber.^{lvii}

Nonetheless, the *Program Review and Investigation Report*, relying upon Professor Steve Allen's 1984 and 1987 articles, argues that "in areas where unions have market power, they can bargain for wages above labor's contribution to the value of output and still maintain market share."^{lviii} Thus, concluding that "while some of the higher wages observed [on prevailing wage jobs] may be attributable to more qualified workers, the higher wages are also the result of market power of unions in the area."^{lix} Setting aside the fact that Professor Allen was referring to union strongholds such as Chicago, San Francisco and New York, the *Program Review and Investigation Report* either did not read or fully ignored the main thrust of the articles which it relies upon.

In the first of the two Steve Allen articles upon which The *Program Review and Investigation Report* relies, "Unionized Workers Are More Productive," Professor Allen summarizes his paper thus:

Apprenticeship training and hiring halls probably raise union productivity, while jurisdictional disputes and restrictive work rules lower it....union productivity, measured by value added per employee, is 44 to 52 percent higher than nonunion. The estimate declines to 17 to 22 percent when estimates of interarea construction price differences are used to deflate value added.^{lx}

Professor Allen then concludes his paper thusly:

The empirical evidence presented here strongly supports the hypothesis of a large, positive union productivity effect in this sector [i.e. construction]....Through what mechanism does unionism lead to higher productivity? The most likely factors, based upon the discussion of the case study evidence, were (1) better training at the journeyman level through joint apprenticeship programs, (2) changes in the occupational mix (including reduced use of unskilled labor and lower foreman to journeyman ratios), (3) reduced recruiting and screening costs for contractors, and (4) greater managerial ability.^{lxi}

Ignoring these major conclusions of Allen's research, the *Program Review and Investigation Report* focuses on a minor point that is irrelevant in the case of Kentucky. Allen finds that where union density is very strong, such as in the case of New York City, union workers receive higher wages than nonunion workers, not only because they are more productive but also because they have very strong market power. While this may hold for Chicago, New York and San Francisco, this is a fairly irrelevant point for Lexington, Louisville or rural Kentucky. In Kentucky, union workers have higher wages because they are better trained, better equipped and better managed. And, incidentally, this can also be said for most high-wage nonunion workers in Kentucky. You get what you pay for, and prevailing wage regulations simply require that on public works, you should buy the best.

And the best can be very good indeed. **Figure 14** shows value added per blue-collar construction worker by state in relation to annual wages in 2007 from the *US Census of Construction*. As wage income rises from \$30,000 per year to \$60,000, value added per worker goes from \$100,000 per year to \$220,000. While a small portion of this increase may be due to union market power in some states compared to others (the *Program Review and Investigation Report's* point), the vast majority of this increase in value added is due to the training and management improvements associated with higher wages that The *Program Review and Investigation Report* ignores and dismisses. The *Program Review and Investigation Report* also ignores the social costs associated with cheap, unskilled labor policies. The construction workers in states where their skills earn them a higher income contribute more to social security, workers compensation funds, unemployment insurance programs, health insurance, retirement programs, local taxes and the local economy.

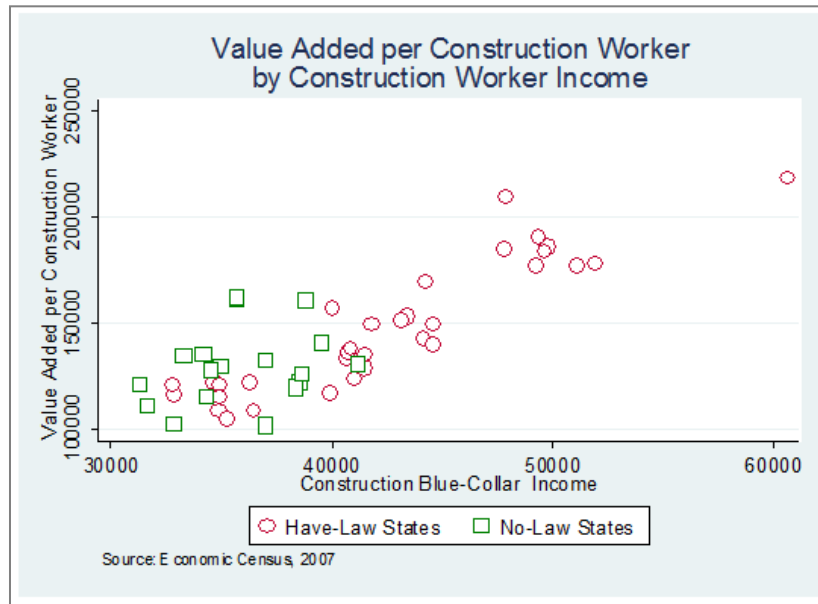


Figure 14: Value added per construction worker by average construction worker income in law and no-law states, 2007

9 Bibliography

- Allen, Steven G. 1983. "Much Ado about Davis-Bacon: A Critical Review and New Evidence," *Journal of Law and Economics*, 26(3), 707-736.
- Allen, Steven G. 1984. "Unionized Construction Workers Are More Productive," *Quarterly Journal of Economics*, 99(2) May.
- Allen, Steven G. 1987. "Can Union Labor Ever Cost Less?" *Quarterly Journal of Economics* 102(2), 347-73.
- Andrews, Lewis M. and D. Dowd Muska. 2006. *Blueprint for Reform: A Guide to Key Issues for Campaign 2006*, Hartford: Yankee Institute for Public Policy.
- Argyres, Annetta and Susan Moir. 2008. "Building Trades Apprentice Training in Massachusetts: An Analysis of Union and Non-Union Programs, 1997-2007," Labor Resource Center, University of Massachusetts Boston, October.
- Azari-Rad, Hamid, 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*, 23, 997-1012.
- Azari-Rad, Hamid, Peter Philips, and Mark Prus. 2003. "State Prevailing Wage Laws and School Construction Costs," *Industrial Relations*, 42(3), 445-457.
- Belman, Dale. 1988. "Concentration, Unionism, and Labor Earnings: A Sample Selection Approach," *The Review of Economics and Statistics*, August, 70, 391-397.
- Bernstein, David. 1993. "The Davis-Bacon Act: Let's Bring Jim Crow to an End," *Cato Briefing Paper*, No. 17, Washington, D.C.: Cato Institute.
- Bilginsoy, Cihan. 2005. "Registered Apprentices and Apprenticeship Programs in the U.S. Construction Industry between 1989 and 2003: An Examination of the AIMS, RAIS, and California Apprenticeship Agency Databases," University of Utah, Department of Economics Working Paper, No. 2005-09.
- Bilginsoy, Cihan 2007. "Delivering Skills: Apprenticeship Program Sponsorship and Transition from Training," *Industrial Relations*, 46(4), 738-765.
- Bilginsoy, Cihan and Peter Philips. 2000. "Prevailing Wage Regulation and School Construction Costs: Evidence from British Columbia," *Journal of Education Finance*, Winter 25(3), 415-431.
- Bourdon, Clinton C. and Raymond E. Levitt. 1980. *Union and Open Shop Construction*, Lexington, MA: Lexington Books.
- Brazier, Nona. 1994. "Stop Law that Hurts My Minority Business," *Wall Street Journal*, New York; Jan 12, p. A10.
- Bruce, Donald and William J. Fox. 2000. "E-Commerce in the Context of Declining State Sales Tax Bases," *National Tax Journal*. December, 53(4), Part 3, pp. 1373-1390.
- The Business Roundtable. 1982. "Training Problems in Open Shop Construction." Report D-4, New York, NY.
- The Business Roundtable. 1997. "Confronting the Skilled Construction Workforce Shortage," Construction Cost Effectiveness Task Force, New York, NY.
- Byrd, Barbara and Weinstein, Marc. 2005. "Construction Apprenticeship in Oregon: An analysis of Data in Union and Open-Shop Apprenticeship Programs." <http://www.uoregon.edu/~lerc/pdfs/apprentstudy.pdf>. 102

- CCM (Connecticut Conference of Municipalities). 2006. "Connecticut Prevailing Wage Rate Law: Reform Could Save State & Municipalities Millions," *Candidate Bulletin*. September 1, No. 06-04. <http://www.ccm-ct.org/advocacy/2006-2007/publicpolicy/candidatebulletino6-04.html> Accessed November 15, 2009.
- CCM (Connecticut Conference of Municipalities). 2009. "How to Spell Relief," March 12. http://www.ccmlac.org/lac_detail_doc_frames.cgi?540. Accessed November 15, 2009.
- Construction Industry Institute. 1992. "An Assessment of Education and Training Needs Among Construction Personnel." SP 14-2, University of Texas, Austin TX.
- Duncan, Kevin, Peter Philips and Mark Prus. 2006. "Prevailing Wage Legislation and Public School Construction Efficiency: A Stochastic Frontier Approach," *Construction Management and Economics*, June, 625-634.
- Dunn, Sarah, John M. Quigley and Larry A Rosenthal. 2005. "The Effects of Prevailing Wage Requirements on the Cost of Low-Income Housing," *Industrial and Labor Relations*, October 59(1), 141-157.
- ENR (Engineering News Record). 1995. "Craft Shortages Creeping In," 235(26), 34-35.
- Federation of the Organized Trades and Labor Unions of the United States and Canada. 1905. "Declaration of Principles" in *Proceedings of the American Federation of Labor, 1881 to 1888*, Reprinted 1905, Bloomington, Illinois: Pantograph Printing.
- Fraundorf, Martha, John Farrell, and Robert Mason. 1984. "The Effect of the Davis-Bacon Act on Construction Costs in Rural Areas," *The Review of Economics and Statistics*, February 66(1), 142-146.
- GAO (General Accounting Office). 1979. "The Davis-Bacon Act Should Be Repealed," Washington, D.C.: GAO.
- GAO (General Accounting Office). 1981. "Modifying the Davis-Bacon Act: Implications for the Labor Market and the Federal Budget," Washington, D.C.: GAO.
- GAO (Government Accountability Office). 2005. "Registered Apprenticeship Programs: Labor Can Better Use Data to Target Oversight," GAO-05-886, Washington, D.C.: GAO.
- Glassman, Sarah, Michael Head, David G. Tuerck and Paul Bachman, "The Federal Davis-Bacon Act: The Prevailing Mismeasure of Wages," Beacon Hill Institute at Suffolk University, February 2008.
- Goldfarb, Robert S. and John F. Morrall, 1978. "Cost Implications of Changing Davis-Bacon Administration," *Policy Analysis*, 4(4), 439-453.
- Goldfarb, Robert S. and John F. Morrall III. 1981. "The Davis-Bacon Act – An Appraisal of Recent Studies," *Industrial and Labor Relations Review* 34(2), 191-206.
- Gould, John P. and George Bittlingmeyer. 1980. "The Economics of the Davis-Bacon Act: An Analysis of Prevailing Wage Laws," Washington, D.C.: AEI for Public Policy Research.
- Gujarati, D.N. 1967. "The Economics of the Davis-Bacon Act." *Journal of business*. Vol. 40, No. 3, pp. 303-16
- Hodge, Scott Alan. 1990. "Davis Bacon: Racist Then, Racist Now," *The Wall Street Journal*, June 25.
- Johansson, Erin and Fred Feinstein. 2005. "Apprenticeship Training Programs in Maryland: A Case Study of the Construction Industry, 1990-2003," The Construction Policy Program University of Maryland School of Public Policy, March.

- Keller, Edward and William T. Hartman. 2001. "Prevailing Wage Rates: The Effects on School Construction Costs, Levels of Taxation, and State Reimbursements." *Journal of Education Finance*, Fall, 27, 713-728. 103
- Kelsay, Michael, L. Randall Wray, and Kelly Pinkham. 2004. "The Adverse Economic Impact from Repeal of the Prevailing Wage Law in Missouri," The Department of Economics, University of Missouri - Kansas City, January.
- Kersey, Paul. 2007. *The Effects of Michigan's prevailing Wage Law*, Midland, Michigan: Mackinac Center for Public Policy.
- Kessler, Daniel P and Lawrence Katz. 2001. "Prevailing Wage Laws and Construction Labor Markets." *Industrial & Labor Relations Review*, January, 54(2), 259-274.
- Kniep, Susan. 2006. "Testimony to the State of Connecticut's Labor and Public Employees Committee on Prevailing Wage Thresholds," March 16, (<http://www.ctact.org/default.asp?callcontent=yes&filename=Prevailing%20Wage%20Laws2.htm%20&location=Editorials&buttonname=Editorials>), accessed, November 30, 2009)
- Kniesner, Thomas J. and Arthur H. Goldsmith. 1987. "A Survey of Alternative Models of the Aggregate U.S. Labor Market." *Journal of Economic Literature*. September, 25, 1241-1280.
- Legislative Program Review and Investigations Committee. 1996. "Prevailing Wage Laws in Connecticut," Connecticut General Assembly. December.
- Londrigan, William J., and Joseph B. Wise, III. 1997. "Apprentice Training in Kentucky: A Comparison of Union and Non-Union Programs in the Building Trades," http://www.buildri.org/stuff/contentmgr/files/033b960965adoe51360d2428b0048f4e/pdf/full_text_apprenticeship_training_in_kentucky.pdf.
- National Joint Labor-Management Committee on Skill Shortages in Construction Industry. 2000. "The White Paper on the Construction Skill Shortage: Issues and Activities," Washington, D.C.: Federal Mediation and Conciliation Services.
- Mahalia, Nooshin. 2008. "Prevailing Wages and Government Contracting Costs: A Review of the Research," EPI Briefing Paper No. 215, Washington, D.C.
- Ohio Legislative Service Commission. 2002. "The Effects of the Exemption of School Construction Projects from Ohio's Prevailing Wage Law," Staff Research Report No. 149, May 20.
- Olsen, John G. 1979. "Labor and Material Requirements for New School Construction," *Monthly Labor Review*, April, 102(4).
- Petersen, J.S. and E.M. Godtland. 2005. "Benefits vs. Wages; How Prevailing Wage Laws Affect the Mix and Magnitude of Compensation to Construction Workers," in *The Economics of Prevailing Wage Laws*, H. Azari-Rad, P. Philips and M.J. Prus (eds.), Burlington VT: Ashgate.
- Philips, P., G. Mangum, N. Waitzman, and A. Yeagle. 1995. "Losing Ground: Lessons from the Repeal of Nine "Little Davis-Bacon Acts," Working Paper, Economics Department, University of Utah.
- Philips, Peter. 1998. "Kansas and Prevailing Wage Legislation," Prepared for the Kansas Senate Labor and Industries Committee, February.
- Philips, Peter. 2001. "A Comparison of Public School Construction Costs in Three Midwestern States That Have Changed Their Prevailing Wage Laws in the 1990's," University of Utah, Department of Economics, February.

- Prus, Mark J. 1996. "The Effect of State Prevailing Wage Laws on Total Construction Costs," State University of New York, Cortland. 104
- Prus, Mark J. 1999. "Prevailing Wage Laws and School Construction Costs: An Analysis of Public School Construction in Maryland and the Mid-Atlantic States." Prepared for the Prince George's County Council, Maryland, January.
- Thieblot, Armand J. 1975. *The Davis-Bacon Act*, Philadelphia: Industrial Research Unit, Philadelphia, PA: Wharton School, University of Pennsylvania.
- Thieblot, Armand J. 1986. *The Davis-Bacon Act, State "Little Davis-Bacon Acts, the Walsh-Healey Service Contract Act*, Philadelphia, PA: Wharton School, University of Pennsylvania.
- Thieblot, A.J. 1995. "State Prevailing Wage Laws: An Assessment at the Start of 1995," Associated Builders and Contractors, Inc., Rosslyn, VA..
- Tucker, Richard L., et al. 1999. "Key Workforce Challenges Facing the American Construction Industry: An Interim Assessment." Center for Construction Industry Studies, Report No. 3, The University of Texas, Austin, TX.
- U.S. Congress. 1868 *Congressional Globe*, 24 June, Washington, D.C.: Government Printing Office,
- U.S. Department of Commerce. 2005a. *Connecticut: 2002 Economic Census Construction—Geographic Area Series*, September.
- U.S. Department of Commerce. 2005b. *Industry Summary: 2002 Economic Census Construction—Subject Series*, September.
- Vedder, Richard. 1999. *Michigan's Prevailing Wage Law and Its Effects on Government Spending and Construction Employment*, Midland, Michigan: Mackinac Center for Public Policy.
- Waddoups, C.J. 2005. "Health Care Subsidies in Construction: Does the Public Sector Subsidize Low Wage Contractors?" in *The Economics of Prevailing Wage Laws*, H. Azari-Rad, P. Philips and M.J. Prus (eds.), Burlington VT: Ashgate.
- Wilson, Ginny, Mike Clark, Greg Hager, Cindy Upton, Betty Davis, Barry Boardman and Tom Hewlett. 2001. "An Analysis of Kentucky's Prevailing Wage Laws and Procedures," Research Report No. 304, Legislative Research Commission, December.
-

10 Endnotes

- ⁱ Valarie Honeycutt Spears and Linda J. Johnson, "Kentucky's 2012 poverty rate increased to 19.4 percent," Lexington Herald Leader, September 19, 2013 <http://www.kentucky.com/2013/09/19/2831627/kentuckys-2012-poverty-rate-increased.html> (accessed November 26, 2013).
- ⁱⁱ Wikipedia, Poverty in the United States, http://en.wikipedia.org/wiki/Poverty_in_the_United_States#Two_official_measures_of_poverty (accessed November 26, 2013).
- ⁱⁱⁱ Wikipedia, Poverty in the United States, http://en.wikipedia.org/wiki/Poverty_in_the_United_States#Two_official_measures_of_poverty (accessed November 26, 2013).
- ^{iv} Federal Reserve Bank of St. Louis, Economic Research Division, Unemployment Rate - Construction Industry, Private Wage and Salary Workers (LNU04032231), Percent, Monthly, Not Seasonally Adjusted, LNU04032231, Civilian Unemployment Rate (UNRATENSA), Percent, Monthly, Not Seasonally Adjusted, UNRATENSA, <http://research.stlouisfed.org/fred2/graph/> (accessed November 26, 2013).
- ^v "State Rep. tells Rotary his agenda priorities," November 15, 2013 <http://nky.cincinnati.com/article/20131115/NEWS0103/311150129&site=AB> (accessed November 26, 2013).
- ^{vi} Kenton County Income and Careers, <http://www.usa.com/kenton-county-ky-income-and-careers.htm> (accessed November 26, 2013).
- ^{vii} "State Rep. tells Rotary his agenda priorities," November 15, 2013 <http://nky.cincinnati.com/article/20131115/NEWS0103/311150129&site=AB> (accessed November 26, 2013).
- ^{viii} KENTUCKY LABOR CABINET, PREVAILING WAGE DETERMINATION, CURRENT REVISION, LOCALITY NO. 15, KENTON COUNTY <http://www.labor.ky.gov/dows/doesam/pw/Current%20Prevailing%20Wage%20Rates/LOC%2015%20-%20CR3-015%20-%20080913.pdf> (accessed November 26, 2013).
- ^{ix} US Bureau of Labor Statistics, Occupational Employment Statistics, Commercial Divers, <http://www.bls.gov/oes/current/oes499092.htm> (accessed November 26, 2013).
- ^x Kenton County Income and Careers, <http://www.usa.com/kenton-county-ky-income-and-careers.htm> (accessed November 26, 2013).
- ^{xi} American Association of University Women, "The Gender Pay Gap by State and Congressional District," <http://www.aauw.org/resource/gender-pay-gap-by-state-and-congressional-district/> (accessed November 26, 2013).
- ^{xii} Rita Dukes Smith, "Chamber President, Local Physician Call for Prevailing Wage Law Change," Surfky.com Oct 20, 2013 <http://surfky.com/index.php/communities/51-top-news-for-all-sites/39478-chamber-president-local-physician-call-for-prevailing-wage-law-change> (accessed November 26, 2013).
- ^{xiii} *Program Review and Investigation Report*, p. 58.
- ^{xiv} Debbie Reed et al., "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States," Final Report, July 25, 2012, Mathematica Policy Research, http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf (accessed December 2, 2013).
- ^{xv} Debbie Reed et al., "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States," Final Report, July 25, 2012, Mathematica Policy Research, Table 1, p. xv http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf (accessed December 2, 2013).
- ^{xvi} Peter Philips, "Kansas and Prevailing Wage Legislation," Prepared for the Kansas Senate Labor and Industries Committee, February 20, 1998, p. 35.
- ^{xvii} Debbie Reed et al., "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States," Final Report, July 25, 2012, Mathematica Policy Research, p. xvi, http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf (accessed December 2, 2013).
- ^{xviii} Peter Philips, "Low Road Detour: How Repealing Prevailing Wages Will Hurt Kentucky," January 2006, Table 4, p. 23.
- ^{xix} For a critical review of this literature see Nooshan Mahalia, "Prevailing wages and government contracting costs: A review of the research," Economic Policy Institute (2008). <http://www.epi.org/publication/bp215/> (accessed November 26, 2013).
- ^{xx} Rita Dukes Smith, "Chamber President, Local Physician Call for Prevailing Wage Law Change," Surfky.com Oct 20, 2013 <http://surfky.com/index.php/communities/51-top-news-for-all-sites/39478-chamber-president-local-physician-call-for-prevailing-wage-law-change> (accessed November 26, 2013).
- ^{xxi} KENTUCKY LABOR CABINET PREVAILING WAGE DETERMINATION CURRENT REVISION LOCALITY NO. 008, p. 2.

<http://www.labor.ky.gov/dows/doesam/pw/Current%20Prevailing%20Wage%20Rates/LOC%2008%20-%20CR8-008%20-%2020073013.pdf> (last accessed November 14, 2013).

^{xxiii} JaeWhan Kim and Peter Philips' summary of Daniel's story found here first appeared in JaeWhan Kim and Peter Philips, "Health Insurance and Worker Retention in the Construction Industry," *Journal of Labor Research*, 2010.

^{xxiii} "Profiles of the Uninsured: Daniel: Eligible for Social Security Disability Insurance, But Waiting," Susan Sered and Rushika Fernandopulle, The Commonwealth Fund, website:

http://www.cmfw.org/usr_doc/site_docs/uninsuredprofiles/daniel.htm (last accessed November 16, 2013).

^{xxiv} "Profiles of the Uninsured: Daniel: Eligible for Social Security Disability Insurance, But Waiting," Susan Sered and Rushika Fernandopulle, The Commonwealth Fund, website:

http://www.cmfw.org/usr_doc/site_docs/uninsuredprofiles/daniel.htm (last accessed November 16, 2013).

^{xxv} Peter Philips, (2003) "The United States Dual World: the Two Growth Paths in US Construction." In: Bosch G, Philips P (eds.) *Building chaos: an international comparison of deregulation in the construction industry*. Routledge, New York, pp 161–187

^{xxvi} The Center for construction training and Research, *The Construction Chart Book*,

<http://www.cpwr.com/publications/construction-chart-book> (last accessed November 16, 2013).

^{xxvii} Peter Philips, "A Comparison of Public School Construction Costs In Three Midwestern States that Have Changed Their Prevailing Wage Laws in the 1990s," University of Utah, 2001. (Hereinafter the *Kentucky-Ohio-Michigan Study*).

^{xxviii} "Start costs" refer to the accepted bid price and do not include change orders, cost overruns, downstream maintenance costs, scheduling problems or other auxiliary aspects of construction costs.

^{xxix} Hamid Azari-Rad, Peter Philips, and Mark Prus, "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*, 27 (SPRING 2002). 997-1012. Similar results were found by the same authors in "State Prevailing Wage Laws and School Construction Costs," *Industrial Relations*, Vol. 42, No. 3 (July 2003). Using Canadian data for British Columbia Cihan Bilginsoy and Peter Philips again found no measurably or statistically significant effect of the implementation of British Columbia's Fair Wage law: "Prevailing Wage Regulations and School Construction Costs: Evidence

From British Columbia," *Journal of Education Finance* v25 no3 pp. 415-31 Winter 2000. The *Journal of Education Finance* is published from the University of Arkansas and is "The leading journal in the field of education finance" *Industrial Relation* is published by the University of California and is one of the oldest labor economics journals in the US. Both journals accept articles for publication only after a rigorous blind reviewing process by experts in the field.

^{xxx} Atalah, Alan, "Comparison of Union and Non-Union Bids on Ohio School Facilities Commission Construction Projects," *International Journal of Economics and Management Engineering*, Mar. 2013, Vol. 3 Iss. 1, pp. 29-35.

^{xxxi} Atalah, Alan, "Comparison of Union and Non-Union Bids on Ohio School Facilities Commission Construction Projects," *International Journal of Economics and Management Engineering*, Mar. 2013, Vol. 3 Iss. 1, Tables III and IV, p. 33.

^{xxxii} US Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Kentucky, Series Id: ENU210001051012 (Kentucky state-wide private construction employment) and Series Id: ENU210003051012 (Kentucky state-wide private construction wages) <http://bls.gov/cew/#databases> Data extracted on: November 22, 2013.

^{xxxiii} US Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers, All Items, Midwest, Series Id: CUUS0200SA0 <http://bls.gov/cpi/#data> Data extracted on: November 22, 2013.

^{xxxiv} US Census Bureau, Economic Census, Construction, 2007, Geographic Area Series: Detailed Statistics <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t> (last accessed November 23, 2013).

^{xxxv} Associated Press, State and Local Wire, "Ill-fated Old Capitol in Iowa City was plagued with problems from the beginning, a review of documents related to the project shows."

^{xxxvi} Associated Press, State and Local Wire, "Shive-Hattery official defends company," November 29, 2001.

^{xxxvii} Associated Press, State and Local Wire, "Shive-Hattery official defends company," November 29, 2001.

^{xxxviii} Associated Press, State and Local Wire, "Repairs to Old Capitol escalate to more than \$5 million," November 30, 2001.

^{xxxix} Associated Press, State and Local Wire, "Ill-fated Old Capitol in Iowa City was plagued with problems from the beginning, a review of documents related to the project shows."

^{xl} "The use of heat guns to remove coatings is not advisable for safety reasons. The possible emission of hazardous fumes and potential for fire are concerns." From project meeting minutes cited in Associated Press, State and Local Wire, "Ill-fated Old Capitol in Iowa City was plagued with problems from the beginning, a review of documents related to the project shows," January 20, 2002.

^{xli} Associated Press, State and Local Wire, "Ill-fated Old Capitol in Iowa City was plagued with problems from the beginning, a review of documents related to the project shows," January 20, 2002.

-
- ^{xlii} Associated Press, State and Local Wire, “Computer messages warned of a potential fire at Old Capitol,” January 13, 2002.
- ^{xliii} Associated Press, State and Local Wire, “Computer messages warned of a potential fire at Old Capitol,” January 13, 2002.
- ^{xliv} Associated Press, State and Local Wire, “Ill-fated Old Capitol in Iowa City was plagued with problems from the beginning, a review of documents related to the project shows,” January 20, 2002.
- ^{xlv} Associated Press, State and Local Wire, “Asbestos removal company faces more citations,” February 28, 2002. An Enviro Safe attorney said that “I can’t imagine those [charges] are going to stick.”
- ^{xlvi} Department of Labor, Occupational Outlook Handbook, “Hazardous Materials Removal Workers,” <http://www.bls.gov/oco/ocos256.htm> (accessed November 16, 2013)
- ^{xlvii} Department of Labor, Occupational Outlook Handbook, “Hazardous Materials Removal Workers,” <http://www.bls.gov/oco/ocos256.htm> (accessed November 16, 2013)
- ^{xlviii} Diversity Working.Com—Largest Diversity Job Board Online, “Insulation Workers,” http://www.diversityworking.com/career/Construction_and_Real_Estate/Insulation_Workers/Insulation_Worker.html (accessed November 16, 2013).
- ^{xlix} Diversity Working.Com—Largest Diversity Job Board Online, “Insulation Workers,” http://www.diversityworking.com/career/Construction_and_Real_Estate/Insulation_Workers/Insulation_Worker.html (accessed November 16, 2013).
- ⁱ Associated Press, State and Local Wire, “Contractor no longer welcome on Iowa campus,” January 17, 2002.
- ⁱⁱ Associated Press, State and Local Wire, “Repairs to Old Capitol escalate to more than \$5 million,” November 30, 2001.
- ⁱⁱⁱ Ginny Wilson, et al., *An Analysis of Kentucky’s Prevailing Wage Laws and Procedures*, Research Report No. 304, Legislative Research Commission, Frankfort, Kentucky, December 13, 2001. (Hereinafter called the *Program Review and Investigation Report*). See in particular Table 4.4 p. 58.
- ^{liii} *Program Review and Investigation Report*, p. 58.
- ^{liv} *Program Review and Investigation Report*, pp. 58-59.
- ^{lv} Data for figures: US *Census of Construction*.
- ^{lvi} *Program Review and Investigation Report*, p. 65.
- ^{lvii} *Program Review and Investigation Report*, p. 64.
- ^{lviii} *Program Review and Investigation Report*, p. 64.
- ^{lix} *Program Review and Investigation Report*, p. 64.
- ^{lx} Steve Allen, “Unionized Workers Are More Productive,” *The Quarterly Journal of Economics* (Harvard), May, 1984, p. 251.
- ^{lxi} Allen (1984), p. 269.