

**Survey of the Research on Changes in Prevailing Wage Rates  
and Total Construction Costs: Implications for the Proposed Capital Bill.**

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## About the Author

**Kevin Duncan** is Professor of Economics, Hasan School of Business, Colorado State University-Pueblo where he specializes in labor, and regional economics. He received his Ph.D. from the University of Utah in 1987 and his B.A. from the University of California, Riverside in 1981. Duncan is the author of over 60 academic papers and applied regional projects and is the winner of several honors and awards including the Provost's Award for Excellence in Teaching, the Provost's Award for Excellence in Scholarship, the Outstanding Faculty Member Award for the Hasan School of Business, the Enterprise Rent-A-Car Student Choice Award for Excellence in Teaching, the Dean's Advisory



Council Award for Outstanding Faculty Member, as well as the Dean's Award for Excellence in Teaching. His research on prevailing wage laws has appeared in leading international and national peer-reviewed journals such as *Construction Management and Economics*, *Industrial and Labor Relations Review*, and *Industrial Relations*. He has provided expert testimony to the Colorado, Hawaii, and Vermont state legislatures on policies related to construction labor markets. His research was referenced by the California Senate President pro Tem, Darrel Steinberg, in support of SB7 (2013) that extends the payment of prevailing wages on public works to charter cities.

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### Executive Summary

Proposed legislation seeks to change Vermont's prevailing wage rates that are currently based on data obtained from the Bureau of Labor Statistics to federal Davis-Bacon rates. The Vermont Department of Labor has requested information on the experiences of other states that have adopted federal prevailing wages. The purpose of this study is to respond to this request. The preponderance of research addressing the effect of changes in prevailing wage rates indicates that altering these wages, up or down, does not affect building costs. Supplemental research indicates that when wages increase, more skilled and productive construction labor and equipment is utilized contributing to more efficient material use. Since labor costs are a low percent of total construction costs, relatively small increases in productivity and efficiency are needed to offset the impact of higher wage rates. The current prevailing wage policy in Vermont does not include health and retirement benefits. Research indicates that construction workers are less likely to have employer-funded health insurance and are more likely to have their health care uncompensated. By omitting health benefits from the state's prevailing wage, the current policy shifts the costs of medical care from those contractors who do not offer this benefit to the health care industry and to the citizens of Vermont. Adopting Davis-Bacon wage and benefits rates addresses this shortcoming of the current policy.

## Introduction

Legislation has been proposed to the Vermont State Legislature that would alter the prevailing wage rates paid on state-funded construction. Prevailing wage rates are currently based on occupational data obtained from the U.S. Department of Labor, Bureau of Labor Statistics. The policy change would base prevailing wage rates on Davis-Bacon prevailing compensation that is paid on federally funded construction in Vermont. While differences exist in the methods of determining construction occupation wages between the Bureau of Labor Statistics and the Davis-Bacon Act, the major change involves the inclusion of health and retirement benefits, if these benefits prevail at the county level. The Vermont Department of Labor has requested information and reports from other states that have adopted federal prevailing wages. This study responds to this request by providing a brief review of the research on the effect of prevailing wages on construction costs.

It may be useful to consider the general relationships between wages, costs, and labor productivity before addressing the specifics of prevailing wages and the construction industry. Followers of the financial news are aware that, for the U.S. economy as a whole, labor costs can be a good indicator of inflation. This is because labor costs are, on average, two-thirds of all production costs.<sup>1</sup> This provides evidence for the intuitive understanding that as wages increase, so do production costs and prices. However, increases in labor costs that are also accompanied by increases in labor productivity are associated with stable production costs and prices. There are important similarities and differences between the construction industry and the overall economy that are helpful in understanding the effect of prevailing wages on building costs.

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<sup>1</sup> For an example, see Anirvan Banerji at: <http://www.bls.gov/opub/mlr/cwc/the-relationship-between-labor-costs-and-inflation-a-cyclical-viewpoint.pdf>.

While labor costs are a relatively high percent of total production costs for the overall economy, these costs are a low percent of total costs in the construction industry. The most reliable data on construction labor costs can be obtained from the U.S. Census Bureau's *Economic Census of Construction*.<sup>2</sup> These data are derived from a survey of construction contractors in every state, every five years. Data from the most recent *Economic Census of Construction* indicates that labor costs (wages and benefits) are approximately 25% of the net value of construction for commercial and institutional building construction in Vermont.<sup>3</sup> The commercial and institutional building category captures many of the types of construction projects covered by Vermont's prevailing wage policy. Also, labor costs are about 24% of total costs for the entire construction industry in the state. These data are consistent with U.S. Census Bureau information from other states. For example, Professor Peter Philips reports that labor costs range between 17% and 20% for selected building types in Kentucky.<sup>4</sup> I have reported

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<sup>2</sup> See the U.S. Census Bureau, *Economic Census of Construction*, Construction: Geographic Area Series: Detailed Statistics for Establishments, accessed at: [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2007\\_US\\_23A1&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_23A1&prodType=table).

<sup>3</sup> The *Economic Census of Construction* for 2007 does not report labor costs as a percent of total costs. This ratio must be calculated based on other data. Here, labor cost as a percent of total construction cost is derived by dividing total construction worker payroll, plus proportionally allocated total fringe benefits, by the net value of construction work. The net value of construction is based on the value of work completed by a contractor, less the value of work subcontracted to other contractors. The *Economic Census of Construction* defines construction worker payroll as the gross earnings paid in the reporting year to all construction workers on the payroll of construction establishments. It includes all forms of compensation such as salaries, wages, commissions, dismissal pay, bonuses, and vacation and sick leave pay, prior to deductions such as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2007. Accessed at: [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2007\\_US\\_23A1&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_23A1&prodType=table). The *Economic Census of Construction* defines the net value of construction as the receipts, billings, or sales for construction work done by contractors, less the value of construction work subcontracted to others. The net value of construction does not include contractor business receipts from retail and wholesale trade, rental of equipment without operator, manufacturing, transportation, legal services, insurance, finance, rental of property and other real estate operations, and other nonconstruction activities. Receipts for separately definable architectural and engineering work for others are also excluded. Nonoperating income such as interest, dividends, the sale of fixed assets, and receipts from other business operations in foreign countries are also excluded. See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2007. Accessed at: [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2007\\_US\\_23A1&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_23A1&prodType=table).

<sup>4</sup> See Peter Philips, "Kentucky's Prevailing Wage Law: An Economic Impact Analysis," January 2014.

elsewhere that labor costs are approximately 22% of the net value of construction for highway, street, and bridge construction in Colorado.<sup>5</sup> Therefore, when wages increase in the construction industry, a relatively small portion of overall costs is affected.

It is also important to keep in mind that labor costs are linked to construction efficiency and productivity. For example, professors Blankenau and Cassou find that the use of skilled and unskilled construction labor is very sensitive to wage rates.<sup>6</sup> When construction wage rates increase, more skilled and productive construction workers are used instead of less skilled workers. Professors Balistreri, McDaniel, and Wong also find that when wages increase and more skilled construction workers are employed, more capital equipment and machinery is used in construction.<sup>7</sup> Consequently, when construction wages increase, for whatever reason, more productive workers are used along with more equipment. Consequently, since labor costs are a low percent of total construction costs, relatively small increases in labor productivity are needed to offset the impact of higher prevailing wage rates.

Along with Mr. Alex Lantsberg, I have used data from the *Economic Census of Construction* to compare construction cost components between states with differing wage policies.<sup>8</sup> We find that in states with weak or no prevailing wage requirements, construction worker labor costs and fringe benefits are lower compared to states with average or strong prevailing wage policies. Value added per construction worker is also lower in these states with

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<sup>5</sup> See Kevin Duncan, "The Effect of Federal Davis-Bacon and Disadvantaged Business Enterprise Regulations on Highway Maintenance Costs," *Industrial and Labor Relations Review*, January, 2015, Vol. 68, No. 1, pp. 212-237. Accessed at: <http://ilr.sagepub.com/content/68/1.toc>.

<sup>6</sup> See William Blankenau and Steven Cassou, "Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change Between Skilled and Unskilled Labor." *Applied Economics*, 2011, Vol. 43, pp. 3129-3142.

<sup>7</sup> See Edward Balistreri, Christine McDaniel and Eina Vivian Wong, "An Estimation of U.S. Industry-Level Capital-Labor Substitution Elasticities: Support for Cobb-Douglas." *The North American Journal of Economics and Finance*, 2003, Vol. 14, No. 3, 343-356.

<sup>8</sup> See Kevin Duncan and Alex Lantsberg, "Building the Golden State: The Economic Impacts of California's Prevailing Wage Policy." To be released by SmartCitiesPrevail.org, February 2015.

weak or no prevailing wages. The combined costs of materials, fuels, and equipment rentals are higher in states without meaningful prevailing wage standards. These findings suggest that higher material and fuel expenses are likely a consequence of the increased use of less productive labor in those states with less than average prevailing wage laws. Regardless, the data from the *Economic Census of Construction* suggests that states without effective prevailing wage laws have lower labor costs, but also have lower labor productivity and other construction cost components that are higher.<sup>9</sup>

### **Summary of Research on Changes in Prevailing Wages and Construction Costs**

The preponderance of the research on prevailing wage laws indicates that wage standards are not associated with increased construction costs in a statistically significant way.<sup>10</sup> The evidence presented above provides an explanation of these findings. As prevailing wage laws increase construction wage rates, the industry responds by utilizing more productive labor and equipment. These changes are also associated with more efficient materials use. All of these changes contribute to stable construction costs even as wages increase.

The remainder of this paper will attempt to address the request from the Vermont Department of Labor for a summary of information and reports from other states and jurisdictions that have adopted federal prevailing wages. I am unaware of any studies that examine the specific change being considered in Vermont (the switch from Bureau of Labor Statistics average wages to Davis-Bacon prevailing wage and benefit rates). However, there are

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<sup>9</sup> When comparing construction industry outcomes in states with and without prevailing wages, it is important to recognize that the differences cannot be entirely attributed to the wage policy. Rather, prevailing wage standards are part of a set of integrated and complementary institutions that contribute to a construction workforce that is trained, productive, stable, and where the construction industry finances more of pension and health benefits instead of shifting these costs to the rest of society.

<sup>10</sup> A comprehensive review of the literature can be found in Kevin Duncan, “An illustration of the Impact on the Santa Clara County Economy of Repealing the Prevailing Wage Policy of the City of San Jose.” Submitted to Working Partnerships USA, February 11, 2011.

numerous studies that are sufficiently similar to provide Vermont legislators with information regarding the expected outcome of the policy change. The studies discussed below were selected because they all examine the effect of a change in, or introduction of, prevailing wage rates within a jurisdiction. Other studies examine the effect of prevailing wages on construction costs by comparing projects that are, and are not, covered by the wage policy. These comparisons often involve data from different jurisdictions. Regardless of the approach, the preponderance of this research indicates that prevailing wage rates are unrelated to construction costs.

Of particular relevance to the Vermont State Legislature, is my current research on highway resurfacing projects that examines the cost effect of a change in prevailing wages from union to average wage and benefit rates.<sup>11</sup> For example, from at least the mid 1990s to April of 2002, prevailing wage and benefit rates for the detailed job classifications involved in highway resurfacing projects in Colorado were based on union rates. From April 2002 until the next prevailing wage survey in the fall of 2011, average wage and benefit rates prevailed. This change applied to 11 of the 13 detailed job classifications involved in highway resurfacing and represented an average 18% decrease in total hourly compensation for these jobs. Despite this substantial decrease in the overwhelming majority of the wages paid for highway resurfacing, there was no corresponding decrease in the cost of federally funded resurfacing work relative to comparable state-funded projects.

My further analysis of highway resurfacing projects in Colorado indicates that when contractors switch from federal-funded projects to state-funded construction, there is no

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<sup>11</sup> See Kevin Duncan, "Do Construction Costs Decrease When Davis-Bacon Prevailing Wages Change from Union to Average Rates?" Working Paper, Colorado State University-Pueblo.

statistically significant difference in bid prices.<sup>12</sup> All highway resurfacing projects in Colorado follow the same safety and quality standards, as well as anti-discrimination and disability policies, regardless of state or federal funding. Projects funded by the federal government also require adherence to Davis-Bacon and Disadvantaged Business Enterprise policies.<sup>13</sup> When contractors switch from state to federally funded projects, one additional difference is the payment of prevailing wages. But, this requirement is not associated with higher bid prices when projects of comparable size and complexity are considered. This finding illustrates that when contractors switch from projects that require prevailing wages to comparable projects that are not covered by the wage policy, there is no difference in bid prices.

Other researchers have also found that construction costs do not decrease when prevailing wage rates decrease, or when state-level prevailing wage laws are repealed. For example, Professor Wial examined the effect of a change in Pennsylvania's prevailing wage survey and wage determination.<sup>14</sup> Before the survey change in the mid 1990s, union wage and benefit rates usually prevailed in most counties. After the change, union rates continued to prevail in some counties, but switched to lower rates in other counties. Wial's examination of these changes on school construction costs indicates that, while lower wage and benefit rates were intended to save taxpayers money, there was no measureable relative cost impact.

In an examination of construction costs in Kentucky, Michigan, and Ohio during periods in the 1990s when prevailing wage policies for school projects changed within these states,

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<sup>12</sup> See Kevin Duncan, "Do Federal Davis-Bacon and Disadvantaged Business Enterprise Regulations Affect Aggressive Bidding? Evidence from Highway Procurement Auctions." Currently under publication consideration at the *Journal of Public Procurement*.

<sup>13</sup> The Disadvantaged Business Enterprise (DBE) Program of the U.S. Department of Transportation requires that a minimum of 10% of highway expenditures involve contracting companies that are owned by socially and economically disadvantaged individuals. See U.S. DOT DBE Program at: <http://www.dot.gov/osdbu/disadvantaged-business-enterprise>.

<sup>14</sup> See Howard Wial, "Do Lower Prevailing Wages Reduce Public Construction Costs," Keystone Research Center, July, 1999.

Professor Philips finds that there was no statistically significant difference in school construction costs associated with a change in prevailing wage policies.<sup>15</sup> Professor Philips also reports that the value added per construction worker, a measure of labor productivity, is 14% higher in states with prevailing wage laws, construction job-related disabilities are 12% higher in states without prevailing wages, and repeal of prevailing wages is associated with a substantial decrease in the kind of apprenticeships that are associated with future productivity growth.<sup>16</sup>

Taken together, the studies examining the effect of decreases in, or the elimination of prevailing wages, reveal that these changes are not associated with reduced construction costs. Why would this occur? As described above, the research by professors Blankenau, Cassou, Balistreri, McDaniel, and Wong indicate that as construction wages decrease, so does the use of skilled construction workers as well as the use of equipment. Both of these changes tend to decrease construction worker productivity. While wage rates decrease on state-funded projects, when prevailing wages are decreased or eliminated, construction worker labor productivity decreases in a way that increases construction costs.

Another approach in examining the effect of a change in construction wages within a jurisdiction is to take advantage of the “natural experiment” associated with the introduction of a prevailing wage policy. In the early 1990s the Province of British Columbia introduced a prevailing wage standard that has been extensively examined. This Canadian policy was similar to many stronger state-level prevailing wage laws in the U.S. and also required apprenticeship

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<sup>15</sup> All of these findings are reported in Peter Philips, “Kentucky’s Prevailing Wage Law,” January 2014.

<sup>16</sup> When comparing construction industry outcomes in states with and without prevailing wages, it is important to recognize that the differences cannot be entirely attributed to the wage policy. Rather, prevailing wage standards are part of a set of integrated and complementary institutions that contribute to a construction workforce that is trained, productive, stable, and where the construction industry finances more of pension and health benefits instead of shifting these costs to the rest of society.

training and supervision.<sup>17</sup> For example, professors Bilginsoy and Philips compare the cost of building public schools before and after the introduction of the British Columbian wage policy and report that schools built under the wage regulations were no more expensive than schools that were not covered by the policy.<sup>18</sup>

Along with professors Philips and Prus, I have examined the effect of the British Columbian policy on the cost and productivity of building schools. For example, we compare the cost of building public schools covered by the wage policy to the cost of building private schools that were not covered by the policy. Public schools were approximately 40% more expensive to build than comparable private schools before and after the wage policy.<sup>19</sup> One explanation of stable construction costs with the introduction of prevailing wages is that the productivity or efficiency of construction increases along with wage rates. We find evidence of this trend. For example, average efficiency for all public school construction in British Columbia was 95% during the early and mid 1990s. Construction efficiency on public schools covered by the first stage of the SDFW was 87%. Efficiency on projects covered by the expansion of the British Columbian wage policy, 17 months later, was 99.8%.<sup>20</sup> These results indicate that the introduction of this prevailing wage law was associated with an interruption in the efficiency of construction. But, contractors restored overall efficiency in a relatively short period of time.

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<sup>17</sup> For a complete description of the BC policy, see Kevin Duncan, Peter Philips, and Mark Prus, "Prevailing Wage Regulations and School Construction Costs: Cumulative Evidence from British Columbia" *Industrial Relations*, 2014, Vol. 53, No. 4, pp.593-616.

<sup>18</sup> See Cihan Bilginsoy and Peter Philips, "Prevailing Wage Regulations and School Construction Costs: Evidence from British Columbia." *Journal of Education Finance*, 2000, 24, 415- 432.

<sup>19</sup> See Kevin Duncan, Peter Philips, and Mark Prus, "Prevailing Wage Regulations and School Construction Costs: Cumulative Evidence from British Columbia" *Industrial Relations*, 2014, Vol. 53, No. 4, pp.593-616.

<sup>17</sup> See 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*, 2009, Vol. 5, No.1, pp. 63-78.

Not all studies report stable construction costs with the introduction of prevailing wages. Ms. Sarah Dunn and professors Quigley and Rosenthal examine the extension of prevailing wages to the construction of subsidized low income housing in California and report that construction costs increased from 9.5% up to 37%.<sup>21</sup> There are, however, several problems with the study. First, there is the issue of labor costs as a percent of total construction costs and the size of the estimated prevailing wage cost impact. The authors provide ‘rough’ data specific to housing construction in selected California cities indicating that labor’s share of construction costs range from 42% to 46% of total costs. Even if labor costs are 46% of total costs, it is unrealistic to assume that prevailing wages account for up to 37% of construction costs. The implication is that labor’s share of total costs would fall from 46% to about 17% ( $0.46 \times 0.37$ ) if the wage law was repealed. This figure for labor’s share of total cost (17%) is unrealistically too low.

Second, the study is based on an examination of residential projects subsidized by the California Low Income Housing Tax Credit and covered by the state prevailing wage law. The Office of the Legislative Auditor, State of Minnesota has criticized this report on the basis that the cost of the publicly funded projects included in this study may have been influenced by prevailing wage laws and by other factors such as more exacting Housing and Urban Development (HUD) construction standards that may also affect construction costs.<sup>22</sup> However, these additional factors are not considered separately from prevailing wage effects. The result is that the prevailing wage policy gets the blame for higher wages, when it is likely that the HUD standards and other characteristics raised the costs.

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<sup>21</sup> See Dunn, S., Quigley, J., and Rosenthal, L. 2005. “The Effect of Prevailing Wage Regulations on the Cost of Low-Income Housing.” *Industrial and Labor Relations Review*, Vol. 59, No. 1, pp. 141-157.

<sup>22</sup> See Office of Legislative Auditor. 2007. *Evaluation Report Prevailing Wages*. Program Evaluation Division, State of Minnesota. Accessed at <http://www.auditor.leg.state.mn.us/ped/pedrep/prevailingwages.pdf>.

Third, the study is based on a sample of 205 residential projects, yet the authors can only identify if the prevailing wage law applies or does not apply to 175 of the projects. Yet the 30 unidentified projects are still included in the sample. An appropriate statistical test would be based on the sample of 175 projects because the inclusion of the unidentified projects may bias the cost estimate.

### **Prevailing Wages and the Extension of Health Benefits in the Construction Industry**

The current prevailing wage policy in Vermont does not include health and retirement benefits. When benefits are excluded from Vermont's prevailing wages, the state is subsidizing contractors who do not pay benefits at the expense of contractors that offer benefits. Research indicates that construction workers are less likely to have employer-funded health insurance and are more likely to have their health care uncompensated. For example, Professor Waddoups documented the particularly low incidence of employment based health insurance among construction workers and the corresponding disproportionately high incidence of uncompensated care among construction workers at a local public hospital.<sup>23</sup> The findings clearly demonstrate that a large share of uncompensated care is attributable to the construction industry relative to its size, which means that local taxes supporting the hospital are higher than they would be otherwise. To the extent that cross-subsidies from paying patients cover uncompensated care costs, prices of health care, and therefore insurance prices, are higher than they would be without the high levels of uncompensated care.

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<sup>23</sup> See Waddoups, C. Jeffrey. 2005. "Health Care Subsidies in Construction: Does the Public Sector Subsidize Low Wage Contractors?" in Azari-Rad, Hamid, Peter Phillips, and Mark Prus, eds. *The Economics of Prevailing Wage Laws*, Ashgate Publishers, pp. 205-224.

By excluding benefits for workers on state-funded projects, Vermont is denying funds to these workers that can be used to meet the requirements of the Affordable Care Act. The compensation package for many other construction workers engaged in other projects in Vermont includes funds for this requirement. By omitting health benefits from the state's prevailing wage, the policy shifts the costs of medical care from those contractors who do not offer this benefit to the health care industry and to the citizens of Vermont. Adopting Davis-Bacon wage and benefits rates addresses the shortcomings of the current policy.

## **Conclusion**

Research addressing the effect of changes in, or the introduction of prevailing wages indicates that increases or decreases in construction wage rates do not affect building costs. Supplemental information suggests that when wages increase, more skilled and productive construction labor and equipment is utilized that contribute to more efficient material use. The evidence indicates that these changes offset the cost impact of higher wage rates.

An important cost to consider is the absence of health and retirement benefits under Vermont's current prevailing wage policy. The current prevailing wage policy in Vermont does not include health and retirement benefits. When benefits are excluded from Vermont's prevailing wages, the state is subsidizing contractors who do not pay benefits at the expense of contractors that offer benefits. Research indicates that construction workers are less likely to have employer-funded health insurance and are more likely to have their health care uncompensated. By omitting health benefits from the state's prevailing wage, the policy shifts the costs of medical care from those contractors who do not offer this benefit to the health care industry and to the

citizens of Vermont. Adopting Davis-Bacon wage and benefits rates addresses these shortcomings.