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By Kevin Duncan and Russell Ormiston

Introduction

In recent years, states and municipalities have been increasingly engaged in heated, often partisan, debates over the future of prevailing wage laws. In addition to the repeal of state prevailing wage laws in West Virginia and Kentucky, there have been high-profile political challenges in several states including Wisconsin and Nevada. Numerous city councils and county commissioners have been concurrently engaged in similar debates regarding local prevailing wage ordinances. References to economic studies often accompany these calls for legislative action, as advocates on both sides of the debate can point to papers supporting their position. The lack of consensus among researchers, however, is mostly attributable to differences in empirical methodology and scientific rigor. To improve the clarity of future public policy debates on prevailing wage laws, this paper summarizes the current state of research on these policies, highlighting recent academic findings and identifying empirical shortcomings inherent in a number of oft-cited non-academic studies.

Federal prevailing wage laws are governed by the Davis-Bacon Act of 1931, which mandates that construction contractors and subcontractors hired on federally funded or assisted contracts valued at \$2,000 or more “must pay their laborers and mechanics employed under the contract no

less than the locally prevailing wages and fringe benefits for corresponding work on similar projects in the area,” (U.S. Department of Labor, n.d.). The primary, long-standing goal of the Davis-Bacon Act has been to protect communities from the deterioration of local labor standards that may occur if large government projects—often awarded to the lowest bidder—attract contractors from lower-wage areas (U.S. Department of Labor, 2015). In addition to federal contracts, 29 states and numerous cities and counties have enacted similar ordinances to cover corresponding state and local projects. The goals of these regional regulations are varied, from preserving local labor standards to ensuring a qualified and safe workforce on public projects through the promotion of apprenticeship training.

While prevailing wage laws are present across federal, state and local jurisdictions, there are considerable differences in how each determines a local area’s “prevailing wage.” For federal projects, the Davis-Bacon Act requires the U.S. Department of Labor to conduct wage surveys for detailed job classifications and type of work. Similar wage surveys are used in a majority of states with prevailing wage laws, however some exceptions exist. For example, Vermont bases its prevailing wage on the Bureau of Labor Statistics’ Occupational Employment Statistics and requires an additional 42.5 percent in fringe benefits. Other states, such as Massachusetts, Pennsylvania and New Jersey, establish wage and benefits rates in accordance with local collective bargaining agreements. Whether labor union compensation rates directly establish a locality’s prevailing wage or merely influence it through the calculation of an average rate, organized labor’s influence has resulted in clear fault lines between prevailing wage’s strongest advocates (union contractors and employees) and opponents (select non-union contractors).

The ongoing political dialogue on prevailing wage laws requires a comprehensive research review to inform debate and guide future legislative action. Focusing on research published since 2000, this paper summarizes research studies that address the four most debated issues surrounding the effects of prevailing wage laws: (a) construction costs, (b) education and training, (c) workplace safety, and (d) the racial composition of the labor force. This study will prioritize research published in academic journals or working papers, as these studies represent the most thoughtful and rigorous analyses. Published academic papers have been through the peer-review process where anonymous independent experts critically evaluate the methodologies and conclusions of each study before it can be accepted for publication. In contrast, unpublished studies and advocacy research—often cited in public debates over prevailing wage laws—can suffer from undetected or unexplained methodological defects that produce inaccurate or misleading conclusions.

Construction Costs

Among policymakers and researchers, the predominant interest in prevailing wage laws has been in understanding their effect on public construction costs. The most common public argument supporting the repeal of existing prevailing wage laws has been that doing so will save taxpayers money. This logic assumes that repeal will lead to lower wages and, as a result, lower labor costs on public projects. However, this argument ignores fundamental differences between high-wage and low-wage construction. This includes skill and productivity differences between high-wage and low-wage workers, greater use of capital as labor costs increase, increased rates of training and safety among high-wage workers, and other issues tied to variations in the quality of labor,

capital and management. These effects have the potential to offset some, if not all, of the cost increases associated with higher wage and benefit rates.

The potential of cost offsets in the presence of higher wages in the construction industry renders simple arguments inconclusive in predicting the impact of prevailing wage laws on the cost of public projects. As a result, researchers must address this question empirically. The most credible approach to estimate the cost impact of prevailing wage laws has been to examine the effects on a project-by-project basis. By identifying a pool of public construction projects with common features across jurisdictions and years, researchers can use regression analysis to control for many of the differences inherent in unique projects (e.g., square feet, number of stories) and therefore isolate the cost differential attributable to the presence of a prevailing wage law.

Regression analysis represents the dominant empirical tool in economists' toolbox for a reason: it allows researchers to separate the effects of multiple variables on a singular outcome (e.g., construction costs). However, accurate estimation of these effects requires particular attention paid to the variables included in the empirical model and overall study design. As demonstrated in Belman et al. (2010), regression models that do not adequately account for critical physical differences between construction projects will result in inaccurate estimates of the cost effects of regulation (i.e., omitted variable bias). Researchers have addressed these concerns by analyzing three narrow classifications of public projects—public schools, highways and public housing—that minimize the inherent differences between projects and, as a result, produce more unbiased estimates of the cost effects of prevailing wage laws.

School Construction

Public school construction has been the primary focus of academic and non-academic studies on the cost effect of prevailing wage laws. In addition to providing researchers with a considerable volume of projects to study over time, public school construction features substantial commonality in their characteristics (e.g., classroom space, gymnasiums) across jurisdictions, allowing the potential cost impact of prevailing wage laws to be isolated more easily. The two most extensive studies examined public school construction in the United States between 1991 and 1999. Azari-Rad, Philips and Prus (2002) used data from F.W. Dodge data to examine the accepted bid costs for 4,974 public and private schools across the country, building a regression model that controls for school size, type (elementary/middle/high), season in which construction started, local market conditions, and a series of variables to isolate the effects of state prevailing wage laws from the potential cost differences between public and private schools.¹ The results indicated that prevailing wage laws do not have a statistically significant impact on construction costs.

In a follow-up study, Azari-Rad, Philips and Prus (2003) augmented their analysis of school construction costs by examining how they may be affected by the “strength” of a respective state’s prevailing wage law. These regulations differ across states on the basis of the minimum contract threshold, the breadth of work and occupations covered, the enforced wage rate, and a variety of other factors. To those ends, Thieblot (1995) developed a scoring system for state

¹ The use of accepted bid costs from F.W. Dodge—instead of collecting data on final costs—is common practice within construction research. Given that bid costs do not include potential change orders or cost overruns, the use of bid costs instead of actual costs represents a potential shortcoming of these studies. However, in the absence of evidence that these would differ across jurisdictions on the basis of prevailing wage laws, there is no reason to assume that the use of bid costs would bias the results.!

prevailing wage laws that allowed the authors to categorize a state's policy as "strong" or "weak." Analyzing 4,653 public schools built between 1991 and 1999, Azari-Rad, Philips and Prus (2003) demonstrated that the presence of state prevailing wage laws, whether they be strong or weak, have no statistically significant impact on school construction costs.

Vincent and Monkkonen (2010) followed a similar approach in a study of the effect of state regulations on school construction costs. Analyzing final bid costs for 2,645 public schools built between 1995 and 2004, the authors used a regression model to estimate the cost impact of state prevailing wage laws, state siting regulations and the availability of state funds for school construction. Controlling for size, number of stories, type of school, and local conditions, the authors estimated that state prevailing wage laws raised school construction costs by 8-13 percent, an effect that was statistically significant. In addition to finding results contrary to previous research, the study also contended that state policies were additive, as school construction in states with three regulations was estimated to cost nearly 30 percent more than in states with no policies.

Duncan, Philips and Prus (2014) examined the relationship between school construction costs in British Columbia and the Skill Development and Fair Wage Policy. Enacted in 1992, the policy represented a *de facto* prevailing wage law by establishing a wage and benefit floor for large construction projects funded by the provincial government. Using bid cost data on 498 schools built between 1989 and 1995, the authors developed a regression model that controlled for school size, number of stories, location in Vancouver, and a number of other variables. The results indicated that, after controlling for these factors, there was no statistically significant

difference in the construction costs of public schools in British Columbia before and after the policy was enacted. In an earlier study, Bilginsoy and Philips (2000) also examined the effects of Skill Development and Fair Wage Policy on school construction costs in British Columbia between 1989 and 1995. In a sample of 54 schools located within close geographical proximity, the study demonstrated that the enactment of the policy had no statistically significant effect on school construction costs in the area.

While the papers summarized above were published in academic journals, three other oft-cited, non-peer reviewed studies have employed a regression approach and F.W. Dodge data to examine the effects of prevailing wage laws on school construction costs; none of them found statistically significant cost effects. Examining 358 schools built in the Mid-Atlantic Region of the United States between 1991 and 1997, Prus (1999) did not find statistically significant differences between school construction costs between states with and without a prevailing wage law; the author also found no significant difference in bid costs between 124 Maryland schools based on the presence of local prevailing wage laws. The Ohio Legislative Service Commission (2002) examined the 1997 exemption of school construction from Ohio's prevailing wage law by investigating school construction costs within the state between 1992 and 2001. Separate regressions on large new projects (n=256), small new projects (n=194) and additions (n=646) failed to uncover any statistically significant difference in bid costs before and after the exemption.² Kelsay (2015) studied 266 schools built in West Virginia and five neighboring states

² The Ohio Legislative Service Commission (2002) report posited that the school construction exemption in the state's prevailing wage law saved the state 10.7 percent; however this estimate was derived from three regression models in which none of the prevailing wage coefficients were even close to statistical significance. The decision to explicitly dismiss concerns over statistical significance (p. 60) is at odds with normal statistical practice as found in peer-reviewed journals or introductory econometrics textbooks.

between 2006 and 2013 and, using regression analysis, also found that the presence of a state prevailing wage law had no significant impact on the construction costs of new public schools.^{3,4}

The use of regression analysis to model school construction costs is not without methodological concerns.⁵ However, it is revealing that every academic study of the cost effects of prevailing wage laws in the last 15 years has employed regression analysis. It is additionally compelling that seven of the eight studies that examined public school construction using this approach failed to uncover a statistically significant link between prevailing wage laws and school construction costs; this includes four of five peer-reviewed articles. However, the narrative of prevailing wage laws raising school construction costs persists due to the pervasiveness of non-academic research that relies on a simplistic empirical approach that produces upward-biased estimates: the “wage differential” method.

A recent example of this approach, Rosaen and Taylor (2015), estimated the cost impact of Michigan’s prevailing wage law by multiplying (a) the wage premium associated with prevailing wages relative to lower-cost market alternatives (25 percent) and (b) the percentage of construction costs attributable to wages and benefits (24 percent). The subsequent product—6.1

³ In addition to his analysis of the effects of state prevailing wage laws on the cost of public school construction, Kelsay (2015) expanded his analysis to the construction of all non-residential buildings (n=1082) for which data was available through F.W. Dodge in a six-state area between 2006 and 2013. After controlling for building types and public construction, the study found that the presence of a state prevailing wage law had no statistically significant effect on public construction costs. Kelsay, Wray and Pinkham (2004) employed a comparable methodology in an examination of construction costs of 3,082 projects built across a 12-state area between 1993 and 2002, with results similarly finding no significant difference in construction costs based on the presence of a state prevailing wage law.

⁴ In an examination of school construction costs in Pennsylvania, Wial (1999) also used regression modeling to indicate that changes in the calculation of the state’s prevailing wage had no statistically significant cost effects. While the model specification mirrored those used in later studies, the paper buried this discussion in a footnote and did not present the results of the model’s estimation.

⁵ In addition to omitted variable bias identified by Belman et al. (2010), Dickson-Queada et al. (2015) also suggests that causality may be a concern in studies of prevailing wage as these policies are more prevalent in higher-cost markets (i.e., endogeneity bias).

percent—is touted as the increase in public construction costs attributable to the presence of a prevailing wage law; multiplying that by the \$21 billion spent by the state of Michigan on applicable school construction between 2003 and 2012, the authors posit that the state’s prevailing wage law cost taxpayers an additional \$1.267 billion over those ten years. A number of other non-academic studies utilize variants on this approach; they typically report that state and federal prevailing wage laws increase public construction costs on all projects by 8-36 percent (Vedder, 1999; Kersey, 2007; Gardner and Ruffner, 2008; Glassman et al., 2008; Vermont Legislative Joint Fiscal Office, 2014). The most recent academic study to employ this method—Keller and Hartman (2001)—suggested that Pennsylvania’s prevailing wage law increased public school construction by 2.25 percent.

Studies relying on the wage differential approach, however, suffer from methodological defects that render them misleading as critical analyses of the cost impact of prevailing wage laws. First, by simply comparing the prevailing wage to some arbitrary lower rate, this method is built upon the assumption that prevailing wage laws *must* increase construction costs. However, as described above, most academic studies fail to find statistically significant evidence supporting that position. As a result, the wage differential approach rules out the potential cost offsets attributable to contractors hiring fewer and more skilled workers or substituting capital for more expensive labor.

Overlooking these cost offsets is misguided given the results of Atalah (2012, 2013), which offer evidence that contractors bidding on school construction projects are able to offset higher wages with increased capital substitution and a more-skilled workforce. In the former study, the author

examined 8,093 bids on public school construction projects in Ohio between 2000 and 2007 following the 1997 exemption of public school construction from the state’s prevailing wage law. Comparing the bid cost per square foot between union contractors—who presumably pay the highest local wage rates—and non-union contractors, the author found no statistically significant difference between the bids statewide. The only significant difference occurred in an examination of Southern Ohio, with the author finding that bids from non-union contractors were significantly *higher* than their union counterparts. In the latter study, the author employed the same data set and approach but instead compared union and non-union bids within each trade. While within-trade samples tended to be small, the study found no statistically significant difference between bids from union and non-union contractors for most trades.⁶

A second methodological defect of the wage differential method is that most studies compare prevailing wages to the average wage for all construction workers in a state, including those working in residential construction. But residential construction workers are typically drawn from a different subset of craft workers—who are typically less skilled and earn less—than those employed elsewhere in the construction industry. As a result, an analysis of this issue by the Minnesota Office of the Legislative Auditor (2007) led it to conclude that the wage differential method “may overstate the possible savings from repeal of state prevailing wage laws,” (p. 77).

Finally, the starting assumption of the wage differential method also implicitly presumes that any construction cost increases are necessarily and completely borne by taxpayers. In contrast,

⁶ Of the 18 trades examined, Atalah (2013) did find statistically significant differences between the bids of union and non-union contractors in five trades: plumbing, HVAC, existing conditions, earthwork and electrical. However, there was not uniformity in the direction of the difference, as non-union contractors exhibited higher bids in two trades while union contractors offered higher bids in three trades.!

Duncan and Lantsberg (2015) demonstrate that contractor profits and material costs are lower in states with prevailing wage laws, offering a reminder that the burden of cost increases—if they exist—may be shared between contractors and the government. Previous studies relying on the wage differential method have ignored this outcome, further overstating the presumed cost effects of prevailing wage laws. Taken together, it is clear that the methodological defects of the wage differential method demonstrate an incomplete understanding of construction labor markets that produces inaccurate estimates of the cost effects of prevailing wage laws.

In sum, the most advanced studies published in recent years offer limited evidence supporting the hypothesis that prevailing wage laws increase school construction costs. A review of the literature demonstrates a clear dichotomy in empirical methodologies utilized across studies. The differences between these approaches are critical. While there have been numerous non-academic studies touting substantial cost effects of prevailing wage laws, they rely on a simplistic approach—the wage differential method—that demonstrates a deficient understanding of construction markets that renders them ineffective at best and, at worst, misleading. More rigorous analyses using the preferred method of economists—regression—is far more tempered, as seven of eight studies utilizing this approach have failed to find statistically significant evidence indicating that prevailing wage laws have any effect on school construction costs.

Highway Maintenance

While research examining the cost effects of prevailing wage laws has primarily focused on public school construction, Vitaliano (2002) analyzed the effect of these regulations on highway

expenditures in a study on the economic efficiency of state departments of transportation. Using data from 1996, the author built a six-variable regression model of highway costs that included an indicator of whether the state had a prevailing wage law. The results demonstrated that prevailing wage law increased overall state costs by 8 percent, an effect that was statistically significant. However, total state-level expenditures on highways depend on a number of important factors not included into the regression model, including the amount of new highway construction ordered and the level of law enforcement staffing on the roadways. Without these critical variables, the resulting omitted variable bias substantially weakens the credibility of the established link between prevailing wage laws and increased costs.

To resolve the omitted variable problem, Duncan (2015a, 2015b) examined the cost impact of the federal Davis-Bacon Act on highway maintenance in Colorado between 2000 and 2011. Resurfacing projects on state highways (state funding) and interstate highways (federal funding) in Colorado are built according to the same standards, using the same material, employ the same types of workers, and feature the same requirements of contractors except for two additional policies that govern federal projects: the Davis-Bacon Act and the Disadvantaged Business Enterprise Program. Using a regression model to control for a variety of other factors—such as location, year and type of terrain—that may affect project cost, the author found no statistically significant evidence suggesting that these two federal policies had any impact on project bid cost or the number of bidders. Duncan (2015b) expanded the analysis to examine whether bids were more aggressive when contractors switched from federal projects to less-regulated state projects; the results again failed to find any indication suggesting that the two federal policies had any statistically significant impact on contractor bids.

Public Housing Construction

As the single academic study examining the cost effect of prevailing wage laws on public housing construction, Dunn, Quigley and Rosenthal (2005) analyzed the construction of 205 new public housing projects that were approved and completed between 1997 and 2002. Applications for projects subsidized by the California Low Income Housing Tax Credit offered detailed information on project costs and characteristics, including a question that allowed the authors to confirm that a contractor was required to pay prevailing wages on account of governmental subsidies. Building extensive regression models, the authors estimated that prevailing wage laws increased project costs by 9 to 11 percent using ordinary least squares and, further demonstrating the importance of methodological choice, 19 to 37 percent when using an instrumental variables approach.

Multiple California government agencies prepared a more recent, unpublished study that examined the factors that influence the cost of building affordable rental housing in the state (California Department of Housing and Community Development et al., 2014). Collecting data from 400 applications to the California Tax Credit Allocation Committee of projects that were completed between 2001 and 2011, the study estimated a substantial regression model of project costs that included the numerous characteristics of the project—including housing type, number of units, parking space and other variables—and an indicator of whether the contractor declared that they had paid prevailing wages on the project. The results suggest that prevailing wage laws increased project costs by 11 percent, an outcome that was statistically significant with 95

percent confidence. However, the authors noted that the magnitude and statistical significance of the prevailing wage variable was particularly sensitive to the specification of the model.⁷

There are a number of reasons potentially explaining the divergence of the results on public housing from research on school construction and highway maintenance that failed to find any cost effects of prevailing wage laws on public projects. First, as outlined in Dunn, Quigley and Rosenthal (2005), the results may be California-specific given that the state has among the most stringent—and most well-enforced—prevailing wage laws in the country. Second, residential construction projects are predominantly the domain of non-union contractors. Given that labor costs as a proportion of total costs were calculated to be 43 to 44 percent on these California projects—significantly higher than the industry average—it may be that the absence of certain types of contractors from the bidding process (e.g., more capital-intensive) led to statistically significant cost effects of prevailing wage regulations. Finally, complicating the narrative, the Minnesota Office of the Legislative Auditor (2007) noted that during the time of the first study, some affordable housing projects covered by prevailing wage laws were also covered by additional requirements of the Department of Housing and Urban Development (HUD). If HUD requirements are associated with increased construction costs and omitted from the models employed, then these studies may overstate the cost impact of prevailing wages.⁸

⁷ While the study’s primary regression results indicate that prevailing wages increased construction costs by 11 percent, the paper indicated that alternative regression specifications featured decreased magnitude and statistical significance of the prevailing wage variable (California Department of Housing and Community Development et al., 2014; p. 32). Further, the prevailing wage effect “varied very widely” across regions, leading the authors to contend that the prevailing wage effect across regions was “inconclusive” and may be influenced by omitted variable bias (p.37).

⁸ Another potential complication in these California studies is that prevailing wage laws require weekly payroll certification. This type of state vigilance and enforcement may, by itself, represent an adequate deterrent for contractors who lower costs by engaging in illegal labor practices such as worker misclassification, wage theft, or the hiring of undocumented laborers. If the residential sector of the construction industry features a disproportionate

Summary

The analysis of academic and non-academic research on the cost effects of prevailing wage laws reveals two critical findings. First, a majority of the most credible studies indicate that prevailing wage regulations do not have a statistically significant impact on construction costs for two of the largest areas of public construction: schools and highways. However, as evidenced by the California studies on public housing, exceptions may exist. Second, this review has demonstrated the importance of study methodology in developing accurate cost estimates of prevailing wage laws. Analyses relying on the wage differential method, in particular, feature debilitating methodological defects that yield inaccurate and potentially misleading conclusions about the cost impact of prevailing wage laws in construction markets. In contrast, it is revealing that every article on this subject that has been published in an academic journal within the past 15 years has used a regression-based empirical approach.

The use of regression, however, is not without its potential pitfalls. Estimating accurate cost effects of prevailing wage laws requires that the empirical model sufficiently control for variables that may conflate with the presence of government regulations. As an example, the study by Fraundorf, Farrell and Mason (1984) is often referenced in public debates to assert that prevailing wage laws increase public construction costs. However, their regression analysis of the costs of 215 diverse projects built in 1977-78 implicitly attributed the *entire* cost differential between public and private construction to the presence of prevailing wage. In a similar, more

number of such contractors, then at least part of the increased cost effects found in these studies would likely be attributable to the decline in cost-saving, but illegal, employment practices.

recent analysis of 3,120 projects built in the Midwest in 1993-2001, Kaboub and Kelsay (2014) correct this specification error and isolate the cost effects of prevailing wage laws from the cost premium attached to public construction projects. Their results suggest that while public projects cost 20-30 percent more to construct than private projects, prevailing wage laws did not have a statistically significant impact. Concerns in both studies, however, arise when using only a limited number of explanatory variables to explain construction costs of widely-dissimilar projects; this increases the likelihood that the results suffer from omitted variable bias. These types of concerns are minimized when examining narrow classifications of public projects, which likely explain why researchers have predominantly examined this question using this approach over the past 15 years.

Education and Training

Construction costs on public works are dependent on market conditions. In addition to changes in the price of raw materials (e.g., asphalt, wood), construction costs are contingent on the state of construction markets overall. For example, Azari-Rad, Philips and Prus (2002) demonstrated that an increase in the number of active construction projects in a city raises construction costs on public projects. This “bidding up” process of contractor services extends to the availability of skilled laborers in a region, as skill shortages can increase construction costs and create delays on time-sensitive projects (Shane, Molenaar, Anderson and Schexnayder, 2009). Despite these distortions, skill shortages in construction have persisted as a public policy concern for decades

(e.g., Weinberg, 1969). These shortages largely occur due to structural disincentives for training among many contractors given the transitory nature of employment of their workers.⁹

Prevailing wage laws, however, represent one of the few public policies that incentivizes worker training in the construction industry. First, these regulations allow for employer contributions to training funds to be counted as a part of the compensation required under the law. Second, these regulations promote apprenticeship programs by allowing enrolled workers to be paid at rates less than the prevailing wage during their apprenticeships. In the lone academic study dedicated to this issue, Bilginsoy (2005) examined the impact of state prevailing wage laws on apprenticeship training between 1989 and 1995 across the 36 states for which data was available through the U.S. Bureau of Apprenticeship Training. Employing regression analysis, the study found that apprenticeship enrollment was 6 to 8 percent higher in states with prevailing wage laws, a statistically significant outcome. The results also indicated that apprenticeship enrollment was higher as the ‘strength’ of the prevailing wage law increased. Further, the author demonstrated that apprenticeship program completion rates were significantly higher in states with prevailing wage laws.

While a positive relationship between prevailing wage laws and apprenticeship opportunities was expected, disentangling the magnitude of the policy impact is more complicated. Prevailing wage laws are more prevalent in states with higher unionization rates (Dickson-Queada et al., 2013).

The enrollment model utilized by Bilginsoy (2005) excluded controls for state union density

⁹ While concerns about skill shortages have been prevalent in construction for decades, the damage wrought by the Great Recession on the construction industry has greatly exacerbated the problem. A steep decline in construction demand caused industry employment to decline by 25 percent between 2006 and 2010 (Paciorek, 2015), with contractors responding to economic instability by retaining older, more experienced and skilled workers while demonstrating a reluctance to hire and train younger workers (Janicki and McEntarfer, 2015).

rates by trade; as a result, the prevailing wage variable represents a partial proxy for a state's increased unionization rate.¹⁰ Given that union training programs enroll significantly more apprentices than their non-union counterparts (Bilginsoy and Glover, 2005), some portion of the estimated impact of state prevailing wage laws on apprenticeship enrollment is more likely a reflection of a state's increased union density. While this methodological argument intimates that the size of the policy impact is overstated in Bilginsoy (2005), an older unpublished study—Philips et al. (1995)—suggests that the effect may, in fact, be much larger. Using a state-level regression approach, this previous study demonstrated that the repeal of state prevailing wage laws was associated with a 44 percent decrease in the ratio of apprentices to journeymen in the 1970s and 1980s.

Workplace Safety

The debate over public policy in the construction industry is complicated by its high rates of workplace injuries and jobsite fatalities; the industry was responsible for one in five job-related deaths in the United States in 2014.¹¹ Policymakers, therefore, have a responsibility to consider how the rules that govern the construction of a public project may imperil the workforce tasked with its completion. To be clear, prevailing wage laws typically do not include safety requirements. However, such regulations may indirectly improve safety at the jobsite by facilitating collective bargaining and, subsequently, apprenticeship training.

¹⁰ Bilginsoy (2005) acknowledged this shortcoming, noting that data on state union density rates by trade is simply not available to researchers. The data from the U.S. Bureau of Apprenticeship Training also did not signify whether an apprentice was enrolled in a union or non-union apprenticeship program, further weakening the author's ability to infer causality.

¹¹ See "Fatal Occupational Injuries by Industry and Event or Exposure, all United States, 2014" via the Bureau of Labor Statistics at <http://www.bls.gov/iif/oshwc/foi/cftb0286.pdf>.

While research on this topic has been limited, the evidence to date generally suggests that prevailing wage laws are associated with improved workplace safety. Among the few published studies on the topic, Azari-Rad (2005) represents the most empirically rigorous to date. In an analysis of the construction industry between 1976 and 1999, the study indicates that non-fatal injury rates were 7 to 10 percent lower in states with a prevailing wage law. This conclusion mirrors the findings of a pair of recent studies that have yet to be published in academic circles. Most prominently, Dickson-Queada, et al. (2013) showed that, between 2008 and 2010, the average fatality rate in construction was lower in states with strong prevailing wage laws (8.53 deaths per 100,000 workers) when compared to states that never had such a policy (12.67 deaths). Philips (2014) found that construction workers reported 12 percent more disabilities (hearing, vision, memory loss, etc.) in states without prevailing wage laws compared to states with such a policy between 2009 and 2011. While these latter two studies did not employ a regression approach, it is telling that every study within the past 20 years point to the same conclusion: prevailing wage laws are empirically associated with decreased injury and fatality rates.

Given the paucity of recent research in this area, debate over the impact of prevailing wage laws on workplace safety continues to be shaped by a pair of older studies that are rooted in analyses of the 1981 repeal of Utah's prevailing wage law. Philips et al. (1995) employed a regression model to examine injury rates for plumbers and pipefitters in the United States between 1978 and 1991. The results demonstrated that states with prevailing wage laws had lower rates of total workplace injuries—and lower rates of serious injuries—compared to states that had either never

had the law or had repealed their law, effects that were statistically significant. While that outcome is consistent with more recent studies, Thieblot (1996) attempted to explicitly refute Philips et al. (1995) by citing summary statistics from the construction industry as a whole from 1975-1978 to suggest that states without prevailing wage laws had lower injury rates than states with the regulation. However, in addition to relying on older data, Thieblot (1996) did not allow for regional and economic differences that were demonstrated to be important influences on safety in the multivariate approach (i.e., regression) used by Philips et al. (1995).

The more recent consensus that prevailing wage laws are empirically associated with improved workplace safety is unsurprising. Prevailing wage laws are more prevalent in states that have higher union densities in construction (Dickson-Queada et al., 2013). As demonstrated in the academic research, union construction firms feature significantly lower injury and fatality rates than their non-union counterparts (Donado, 2015; Zullo, 2011).¹² There are myriad reasons that union contractors have better safety records, including higher training and apprenticeship rates (Bilginsoy, 2005), an increased willingness of union workers to report OSHA violations (Weil, 1991a, 1991b), and a workplace culture that more greatly emphasizes safety concerns (Gillen et al., 2002). Therefore, even in the absence of required safety regulations, there is strong evidence that prevailing wage laws support practices and institutions that contribute to lower injury and

¹² As a potential counterpoint, Roistacher, Perine and Shulz (2008) compared fatal injuries between union and non-union workers at building sites in New York City. In this non-published study, the authors found that 29 percent of fatalities were union members. Given that this was approximately equal to the unionization rate of the city's construction workforce (30 percent), the authors argued that unions failed to adequately promote safety. A clear shortcoming in this approach, however, is that it ignores differences in occupation. If union workers are more likely to be in perilous occupations—such as ironworkers—this may explain the larger number of fatalities in the organized sector. The importance of occupation was controlled for in Miller et al. (2013), which limited its focus to carpentry contractors in St. Louis, Mo. The study demonstrated that there were, on average, 4.77 OSHA violations per non-union worksite compared to 1.57 violations at union sites; the difference is statistically significant.

fatality rates, in part, by advantaging relatively safer union and non-union contractors in the bidding process.

Racial Composition of the Construction Workforce

During a time when policymakers were most concerned with ensuring workers' purchasing power, the Davis-Bacon Act of 1931 was originally advanced as a policy designed to protect local contractors and workers from being undercut by low-wage, outside competitors. Thieblot (1975), however, inferred an alternative motivation. Citing Congressional testimony, the author suggested that the Davis-Bacon Act was also motivated by the racial animus of Northern legislators who were trying to prohibit out-of-state contractors—featuring African-Americans in their employ—from competing with local contractors and their higher-cost white employees on federally funded construction projects. This hypothesis has been the subject of fierce debate within academic and non-academic circles without a clear consensus (Gallaway and Vedder, 1999; Azari-Rad and Philips, 2002; Bernstein and Leonard, 2009).

Although the original *intent* of the federal law remains an open question—and an issue that is outside the scope of this paper—the academic debate on the existence of any current discriminatory *effect* was stimulated by an exchange between Thieblot (1999, 2003) and Azari-Rad and Philips (2003). In the first study, Thieblot (1999) used state-level employment data from the 1990 U.S. Census to compare state ratios of (a) the proportion of the construction sector composed of African-Americans to (b) the proportion of all workers who were African-American. The results, based entirely on summary statistics, indicated that African-Americans

were more underrepresented in the construction labor force in states with a prevailing wage law compared to states without such regulations.¹³ In a direct challenge to this study, Azari-Rad and Philips (2003) used the same methodology and data to demonstrate that racial difference between “have law” and “no law” states was entirely driven by regional differences; after removing Southern states from the analysis, the results demonstrated no difference in African-American representation in construction on the basis of state prevailing wage laws. While Thieblot (2003) reiterated his initial conclusions, the lesson drawn from this exchange was clear: any rigorous analysis of the issue must control for differences between states—and workers—that may distort the empirical relationship between prevailing wage laws and African-American employment in construction.

In order to control for differences between states and potentially affected workers, two emerging, yet-to-be-published studies utilize individual-level data from the Current Population Survey (CPS) to offer potentially definitive evidence suggesting that prevailing wage laws have not had a discriminatory *effect* on construction labor markets within the last 30+ years.^{14,15} Belman,

¹³ Thieblot (1999) also suggested that African-Americans were more underrepresented in states with “strong” prevailing wage law (ratio=0.69) when compared to states with an “average” (0.65) or “weak” law (0.62). The author, however, does not test for the statistical significance of these differences; given that the miniscule gaps between these categories occur within a small sample, it is extraordinarily unlikely that these differences are significant at any reasonable level. As a result, the study’s stated conclusion on this issue is, at best, misrepresented.

¹⁴ Keyes (1982) compared the minority unemployment rate in the eight states without a prevailing wage law (at the time) to the national minority unemployment rate for January 1982. Curiously, while the study contends that the results show the discriminatory effect of state prevailing wage laws, the data indicate that half of the states have an unemployment rate above the national average and half have a rate below the national mark. Given the inconsistency between the study’s results and conclusions, the arbitrary selection of states and its other empirical shortcomings—it ignores all other differences between states—this study offers more questions than answers regarding the effect of prevailing wage laws on minority employment.

¹⁵ Vedder and Gallaway (1999) used summary statistics from the U.S. Census to claim that Davis-Bacon Act decreased opportunities for African-American employment in construction between the 1920s and 1930s, however their approach ignored all other factors that may explain employment changes, including the Great Depression. The study also uses a summary approach to assert discriminatory effects of prevailing wage laws due to lower underrepresentation of African-Americans in higher-paying construction occupations in 1960 when compared in 1990, however the latter period was characterized by a considerable *weakening* of state prevailing wage laws—nine

Ormiston and Petty (2016) analyze worker-level data from the Current Population Survey between 1977 and 2006 to examine how state prevailing wage laws affect African-American employment in the construction industry. This study investigates the issue from two perspectives. The authors first explore how state prevailing wage laws affect the racial composition of the construction industry. Alternatively, the authors also examine how the presence and relative strength of prevailing wage regulations influence the industrial choice of African-American workers within a state. The results across both regression models provide a consistent story: perceived discrimination attributable to state prevailing wage laws in simple models completely dissipates in regression estimates that control for a state's racial composition and economic conditions of its construction industry.

Manzo, Lantsberg and Duncan (2015) reach even stronger conclusions. In an analysis of worker-level data from the Current Population Survey between 2004 and 2013, the authors build a two-step regression model of respondents' occupational choice. The authors find that, after controlling for individual demographics, strong or average state prevailing wage laws *increase* the likelihood that non-Latino minority workers enter a blue-collar construction occupation by 5.6 percentage points, a value that is statistically significant. While these two recent papers have yet to be published in academic journals and use different model specifications, it is revealing that neither found evidence suggesting that prevailing wage laws have a discriminatory *effect* against African-Americans.

states repealed theirs between 1979 to 1988—implying that the decline in status was attributable to something besides prevailing wage laws.!!

Conclusion

The debate over prevailing wage laws has been fueled, in part, by the conflicting conclusions presented by a stream of academic and non-academic studies published over the past 15 years. A number of these studies, however, suffer from methodological shortcomings that offer, at best, misguided interpretations of the economic effects of prevailing wage laws. Through a critical analysis of the literature, this paper concludes that:

- ¥ The most methodologically advanced studies indicate that prevailing wage laws do not increase public construction costs, although some exceptions—such as public housing in California—may exist.
- ¥ Although the number of studies is limited, recent research indicates that prevailing wage laws promote worker training and increased safety.
- ¥ While the original *intent* of prevailing wage laws remains open for debate, the most advanced studies on the topic indicate that these regulations do not currently have a discriminatory *effect* against African-Americans.

In addition to summarizing the recent literature on prevailing wage laws, this study also highlights the fundamental importance of analyzing these issues using the most appropriate empirical methodologies. For instance, while numerous studies claim that prevailing wage laws substantially increase public construction costs, most of the papers arriving at this conclusion

rely on a flawed empirical approach—the “wage differential” method—that demonstrates a clear misunderstanding of construction labor markets. Further, studies that depend entirely on summary statistics—such as Thieblot (1999)—ignore other socioeconomic and public policy factors; this empirical oversimplification leads to an increased likelihood of misinterpreting the economic impact of prevailing wage laws. These concerns are largely mitigated—if not completely resolved—by more careful studies that feature properly specified multivariate empirical approaches; the importance of empirical methodology cannot be understated.

While the primary goal of this paper was to provide a critical summary of the most credible and up-to-date research on prevailing wage laws, this literature review also was designed to provide a road map to present and future researchers interested in this topic. Prevailing wage analyses in recent decades have largely been the domain of a narrow group of economists; additional voices offering new insights are encouraged to join the discussion. In addition to strengthening existing areas of research, there are numerous unexplored research topics that could significantly expand the collective wisdom about the impact of prevailing wage laws. Most prominently, research has yet to examine the effect of prevailing wage laws on the on-time completion of public projects, an area of critical concern for policymakers. For instance, if a school construction project is not completed before the start of an academic year, this can impose a significant cost on a school district in a way that is not captured in the calculation of the explicit costs of construction. Another unexplored research area is that of downstream maintenance, including the costs of tear-outs or required renovations attributable to poor initial construction quality. Because the issue of prevailing wage laws is intimately tied to the questions of labor, capital, and management quality, these regulations may (or may not) promote on-time, high-quality construction.

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