

Case No. S251135

JUL 18 2015
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IN THE SUPREME COURT OF THE STATE OF CALIFORNIA ^{Deputy}

JOHN BUSKER,

Plaintiff-Appellant,

v.

WABTEC COPORATION, ET AL.,

Defendants-Respondents;

On Certification from the
United States Court of Appeals for the Ninth Circuit, Case No. 17-55165
Judge Otis D. Wright, II, Case No. 2-15-cv-08194-ODW-AFM

**APPENDIX OF AMICUS CURIAE SHEET METAL WORKERS'
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EXHIBIT 1

**Implications of Clarifying the Definition of Public Works and Prevailing
Wage Coverage in New York: Effects on Construction Costs, Bid
Competition, Economic Development, and Apprenticeship Training.**

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This report is based on publicly available information and is reproducible.

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About the Author:

Kevin Duncan, Ph. D. is a Professor of Economics at Colorado State University-Pueblo and has been a visiting scholar at the Institute for Research on Labor and Employment at the University of California, Berkeley. He teaches business and regional economics in the Hasan School of Business. Duncan has conducted applied research for the local chamber of commerce, the economic development corporation, businesses, non-profits, various state and local policy proposals, and labor unions. He has also examined the effect of prevailing wage laws on construction costs and productivity, construction worker poverty and reliance on public assistance, minority employment in the construction industry, and the economic impact of the wage policy. Duncan’s research has been used in 20 states to inform construction labor market policy. His research on prevailing wage laws has appeared in leading national and international peer-reviewed academic journals such as *Construction Management and Economics* (University of Reading, UK), *Industrial and Labor Relations Review* (Cornell University), and *Industrial Relations* (UC Berkeley). He received his Ph. D. in Economics from the University of Utah and his BA in Economics from the University of California, Riverside.

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Executive Summary

Introduction and Purpose of the Study

The main purpose of a prevailing wage law is to protect local construction labor standards from distortions associated with publicly-funded construction.¹ Large infusions of government spending into an area, along with a contract award process that favors the lowest bidder, may attract contractors from areas where construction worker wage rates are relatively low. The infusion of low-wage contractors may result in the erosion of local compensation standards. Prevailing wage laws create a level playing field for all contractors while ensuring that public works expenditures maintain and support local area standards. New York's prevailing wage law was established in 1897. The law requires that contractors and subcontractors under a public works contract with a state or local government entity must pay prevailing wage and fringe benefit rates to all construction workers. The New York State Department of Labor determines prevailing wage schedules for each county and for detailed job classifications (carpenters, electricians, etc.). The prevailing wage and benefit rate in New York is reflective of a negotiation between a group of businesses and laborers in a particular trade in a particular area.

Many in New York are seeking to clarify the definition of a public works project and argue that prevailing wages should apply to previously excluded projects by local development corporations, municipal corporations, and industrial development agencies, etc., where the issuance of bonds and grants by the state, tax credits, and other forms of public subsidies are used to finance construction.² The purpose of this study is to examine the implications of utilizing such prevailing wage coverage. This study contains a review of the research addressing the effect of prevailing wages on construction costs and the level of bid competition. The impact of the proposed policy change on economic activity and economic development in New York State is also measured. Since prevailing wages in New York are based on negotiations between contractors and trade unions, the state's wage policy supports unionization in the construction industry where jointly managed union-contractor training programs are responsible for the overwhelming majority of training enrollments, expenditures and assets. The study includes a comparison of jointly managed union-contractor training programs and nonunion programs in New York with respect to minority and female enrollment and training program resources.

Research on Prevailing Wage Laws, Construction Costs, and Bid Competition

The following review of the research examining the effect of prevailing wages on construction costs makes a distinction between studies that have and have not been reviewed by experts in the field prior to publication. Research methods typically vary between studies that have and have not been peer-reviewed. The research that has been reviewed is almost always based on the examination of hundreds or thousands of contractor bids and utilizes specialized statistical techniques and software. On the other hand, research that has not been peer-reviewed,

¹ As an example, see "History, Davis-Bacon and Related Acts," Wage and Hour Division, U.S. Department of Labor. Assessed at: <https://www.dol.gov/whd/govcontracts/dbra.htm>.

² For an example from the 2018 legislative session in New York see "A05498 Summary," New York State Assembly. Accessed at: http://assembly.state.ny.us/leg/?default_fld=&leg_video=&bn=A05498&term=2017&Summary=Y&Memo=Y&Text=Y. Also see Fred Kotler. 2018. "ILR Impact Brief – New York State Prevailing Wage Law: Defining Public Work." IRL School, Cornell University. Accessed at: <https://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1060&context=briefs>.

particularly studies that use a wage difference approach in measuring the cost impact of prevailing wages, are often based on hypothetical construction projects or incomplete economic information about the construction industry.

The preponderance of peer-reviewed research conducted in the 21st century indicates that prevailing wage laws do not increase the cost of public construction.³ Nine out of eleven peer-reviewed studies that examine the effect of the wage policy on school construction costs provide evidence supporting this conclusion. Six other studies examine the effect of prevailing wage laws on the cost of different types of construction such as highways, and office buildings, etc. Results from five of these studies suggest that prevailing wage standards do not increase construction costs. Of the combined 17 peer-reviewed studies over the last 18 years, 82% indicate that prevailing wages are not associated with increased construction costs. Why is it unlikely that prevailing wages increase construction costs? First, labor costs are a low percentage of total costs in the construction industry— approximately 23% of all building costs in the U.S. Consequently, only minor changes in labor productivity and other construction costs are needed to offset the effect of the wage policy.

Three other peer-reviewed studies examine the effect of prevailing wage laws on the cost of building affordable housing. All of these studies find increased costs ranging from 5% to 37%. There are several reasons why the results for affordable housing differ from the studies described above. Given the relatively low skills required in residential construction, low-wage, low skilled workers may have an advantage over higher paid and skilled counterparts. Regardless, all of the affordable housing studies have difficulty separating the effect of prevailing wage requirements from other low-income housing regulations that may also increase construction costs. This limitation contributes to an inflated cost estimate. Additionally, any increased cost effect of the wage policy may be influenced by changes in illegal cost-saving contractor practices when prevailing wages apply. Such practices include wage theft, worker misclassification (paying workers as contractors rather than as employees), and the hiring of undocumented laborers. According to the U.S. Department of Labor the construction industry had the highest level of back-pay settlements among low wage, high violation industries in 2016. These problems are particularly problematic in the residential segment of the industry. What is true of the construction industry nationwide is true of the industry in New York. For example, Governor Cuomo's 2017 partnership with State and District Attorneys in the New York City area was initiated in response to reports of widespread worker exploitation in construction.⁴ According to the New York State Department of Labor, immigrant workers are more likely to be victims of wage theft and to work under unsafe conditions, particularly at non-union construction sites. New York's prevailing wage policy includes regulations, such as requiring contractors to submit certified payroll records that discourage wage theft. By making certified payroll records public and accessible on-line, the State of California makes it easier for construction workers employed on prevailing wage projects to compare their earnings to those reported by the

³ This research is described in greater detail in the body of the report. For a summary of the broader research that examines the effect of prevailing wages on costs, training, safety, and the racial composition of the construction labor force see Kevin Duncan and Russell Ormiston. 2017. *Prevailing Wage Laws: What Do We Know?* Institute for Construction Economics Research (ICERES). Accessed at: <http://iceres.org/vwp-content/uploads/2014/10/prevailing-wage-review-duncan-ormiston.pdf>.

⁴ See "Governor Cuomo, Attorney General Schneiderman Partner with Prosecutors to Crackdown on Wage Theft in the Construction Industry," Press Release, New York State Department of Labor, December 4, 2017. Accessed at: <https://www.labor.ny.gov/pressreleases/2017/december-04-2017.shtm>

contractor.⁵ Regardless, certified payroll records and other requirements of prevailing wage standards may discourage contractors who engage in illegal employment practices to reduce bids and construction costs from participating in affordable housing projects that are covered by the wage policy. As a consequence, the costs of building these types of projects are higher with the application of prevailing wage standards.

The preponderance of peer-reviewed research contrasts with the findings of research that has not been peer-reviewed, particularly with respect to studies that use a wage differential approach in measuring the cost impact of the wage policy. Studies by the Center for Government Research (CGR) and the Empire Center are examples of this type of research.⁶ The authors of the CGR study calculate that prevailing wages in New York exceed alternative market rates by 67%. Using a hypothetical construction project with labor costs equal to 54% of total construction costs, the authors conclude that the wage policy adds 36% to the cost of public construction ($67\% \times 54\% = 36\%$). The Empire Center study utilizes a similar wage differential approach and reports that New York's prevailing wage policy adds from 13% to 25% to the cost of public construction. The implication that public construction costs would decrease by 13%, 25%, or 36% with the elimination of prevailing wage regulations must be balanced with information from the U.S. Census Bureau indicating that labor costs (wages and benefits) only represent about 24% of total construction costs in New York.⁷

By focusing exclusively on wage differences in measuring the cost effect of prevailing wages, the approach used in the CGR and Empire Center studies ignores changes in labor productivity and other construction costs that also change with wage rates. Peer-reviewed research indicates that skilled labor replaces less-skilled workers and capital equipment replaces all grades of labor when wages rise in the construction industry. Additional research indicates that as wages increase contractors spend less on materials, supplies, fuels, etc, and earn lower profits. All of these changes tend to mitigate the effect of prevailing wage rates on total construction costs. However, the wage differential method used by CGR and the Empire Center is unable to capture the effect of these changes. This omission results in a cost estimate that is too high. This underscores the importance of using actual contractor bids to assess the cost of the wage policy.

To illustrate differences in the two approaches, the author of this study has used the wage differential method to measure the impact of federal Davis-Bacon prevailing wage requirements on the cost of highway resurfacing in Colorado.⁸ Results from the wage differential approach

⁵ See "eCPR Search," Department of Industrial Relations, State of California. Accessed at: <https://efiling.dir.ca.gov/eCPR/pages/search>. For a simple illustration of viewing a certified payroll, at the web site select a small county (Alpine) at the *County* prompt. Select the date of program inception (2-1-18) at the *Date Range From* prompt and the current date at the *Date Range To* prompt. Click *Search* and PDF copies of weekly and complete certified payrolls can be selected for public works completed in this county. Employee names, addresses, and social security numbers are redacted.

⁶ See Center for Government Research, "Prevailing Wage in New York State," January 2008 accessed at: <http://reports.cgr.org/details/1532> and Empire Center. 2017. "Prevailing Wage: New York's Costly Public Works Pay Mandate" accessed at: <https://www.empirecenter.org/publications/prevailing-wage/>.

⁷ 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_2012_US_23A1&prodType=table.

⁸ Kevin Duncan, "The Wage Differential Method: Promising Construction Costs Savings with the Repeal or Weakening of Prevailing Wage Laws that Cannot be Delivered," September 2016. Accessed at <https://www.csupueblo.edu/hasan-school-of-business/doc/kevin-duncan/wage-differential-method-critique-duncan-2016.pdf>.

suggest that prevailing wages increase costs from 7% to 17%. This contrasts with the results of three studies based on the statistical analysis of contractor bids indicating that highway resurfacing projects in Colorado that are covered by prevailing wages are no more costly, or less competitive than comparable projects that are not covered by prevailing wages. Additionally, bids do not change when contractors switch from projects that are and are not covered by the Davis-Bacon Act, nor do construction costs change when prevailing wages for the detailed jobs involved in highway resurfacing decrease from union rates to lower average rates. The wage differential method will indicate a prevailing wage cost impact when the statistical analysis of contractor bids provides overwhelming evidence that no such cost effect exists. As a consequence, studies based on wage differences, including the studies by the Center for Government Research and the Empire Center should not be considered when determining public policy.

A common complaint about prevailing wage is that the wage policy increases construction costs by reducing the level of bid competition. This claim is often made in the absence of any empirical evidence. There have been three peer-reviewed studies that examine the effect of prevailing wages on the level of bid competition. These studies are based on different construction projects and policies such as a broad array of public works projects in Northern California that are covered by that state's wage policy, highway construction in Colorado covered by federal Davis-Bacon wage requirements, and school construction regulated by British Columbia's minimum wage policy. The examination of project bids in California and Colorado find no difference in the level of bid competition between projects that are, and are not covered by the wage policy. The British Columbian example indicates that bid competition increased with the introduction of the wage standard with this effect diminishing over time.

The Economic Impact of Applying Prevailing Wage Coverage to Currently Excluded Publicly-Subsidized Construction

The effect of prevailing wage requirements on contractor labor costs is uneven. For those contractors who pay union wage and benefit rates, or close to union rates, the minimum wage requirement has no impact or a very small effect on overall employee compensation. It is the contractor who pays substantially less than the union rate who faces significant changes in labor cost when confronted with prevailing wage requirements. The low-wage, low-benefit contractor must make substantial changes in labor productivity and overall construction efficiency to compete with other contractors whose labor costs are not significantly affected by the wage requirements. Some of the adjustments contractors make likely involve decreased profit margins. This is particularly the case if the payment of prevailing wages is not associated with increased construction costs as the preponderance of peer-reviewed research indicates.

Consequently, applying prevailing wage coverage to projects receiving public subsidies would alter the distribution of wage and profit income in a way that would affect the state's economy. This impact is illustrated with application of prevailing wages to construction subsidized by Industrial Development Agencies (IDAs). Based on the analysis of active, state-wide IDA projects in 2014, the expansion of prevailing wages would shift approximately \$2.1 billion of about \$63.4 billion in state-wide IDA-subsidized construction value (2017 dollars)

from contractor to construction worker income.⁹ Because those with lower incomes spend more of their earnings in New York, the net effect of the shift in contractor profit to construction worker wages and benefits would increase overall economic activity in the state by approximately \$1.8 billion. The corresponding net employment change is approximately 6,200 jobs. With the payment of prevailing wages on IDA-subsidized construction, state and local tax revenue would increase by approximately \$73 million.

According to the IMPLAN economic impact software, the increase in construction worker earning and health and retirement benefits would result in additional revenue for a variety of service and retail businesses in the state. For example, the increase in construction worker benefits would mean more revenue for organizations involved in insurance and financial services (over \$1.2 billion in additional revenue with over 3,000 more jobs). Hospitals and other health care providers would experience and increase in business of over \$75 million in revenue and over 460 new jobs. The impact would spread to other service and retail industries. For example, the restaurant industry could expect additional sales of over \$23 million and the creation of over 280 jobs. The dispersion of the impact across various industries reveals the economic development aspect of prevailing wages. The wage policy stimulates economic activity in industries that are not directly related to the construction industry.

In addition to providing state-wide economic benefits, prevailing wage laws contribute to increased living standards and a greater likelihood of self-sufficiency for all construction workers. Numerous studies show that more blue-collar construction workers receive employer-provided health insurance and pension benefits, and fewer earn annual incomes below the federal poverty level in states with at least adequate prevailing wage protection.¹⁰

Prevailing Wages and Apprenticeship Training

Formal apprenticeship training is the foundation of skill development in New York's construction industry. Prevailing wages create a strong incentive to employ apprentices because contractors are allowed to pay trainees a lower rate than journeyworkers. This incentive increases demand for apprentices and draws more trainees and resources into the state's training programs. Since prevailing wages in New York are based on negotiations between contractors and trade unions, the state's wage policy supports unionization in the construction industry where jointly managed union-contractor training programs are responsible for the overwhelming majority of training expenditures and assets. The result is a stable supply of trained construction employees available for work throughout the state's construction industry.

Apprenticeship training in the open shop segment of New York's construction industry is offered by individual contractors, groups of contractors involved in particular types of work, and by the Associated Builders and Contractors (ABC). In the unionized segment of the state's

⁹ See "Annual Performance Report on New York State's Industrial Development Agencies, Fiscal Year Ending 2014." Office of the New York State Comptroller, June 2016. Accessed at: https://www.osc.state.ny.us/localgov/pubs/research/ida_reports/2016/idaperformance.pdf

¹⁰ For examples see Kevin Duncan and Frank Manzo IV. 2016. *The Economic, Fiscal, and Social Effects of Kentucky's Prevailing Wage Law*. Accessed at: <https://illinoisepi.org/site/wp-content/themes/hollow/docs/prevailing-wage/kentucky-report-duncan-and-manzo-2016-final.pdf>. See also Ari Fenn, Zhi Li, Gabriel Pleites, Chimedkham Zorigtbaatar, and Peter Philips. 2018. "The Effect of Prevailing Wage Repeals on Construction Worker Incomes and Benefits," Public Works and Management, DOI:10.1177/1087724X18758340, p. 1-19.

construction industry, contractors who are signatories to collective bargaining agreements and unions jointly manage apprenticeship training for a trade. Funding for training in jointly managed programs is financed by a “cents per hour” addition to the total wage and benefit package negotiated with signatory contractors. These types of fees are rare in open shop training arrangements where sponsoring contractors directly pay for the cost of training.

The cents per hour funding of joint union-contractor programs results in substantial differences in training resources between the two types of programs. This difference can be illustrated in a comparison of training assets and expenditures between the ABC and jointly managed union-contractor programs in New York. ABC is the only broad-based construction association in New York that provides open shop contractors with accredited instruction to meet the requirements of state-approved programs. ABC offers apprenticeships in carpentry, operating engineer, skilled laborer, iron worker, and cement finisher/mason trades.¹¹ According to the 2015 tax filing (IRS Form 990) for the nonprofit training program affiliated with ABC, the program had three employees, approximately \$350,000 in training expenditures, and net assets of about \$149,000. Information obtained from the New York State Department of Labor indicates that there are over 225 construction apprenticeship programs in New York. Jointly managed union-contractor programs represent approximately 78% of all programs. Funding data for 11 of these programs that offer the same trade training as ABC indicates combined net assets of over \$87 million, \$18.0 million in expenditures, and 128 employees. These data are consistent with information from other states. For example, in Indiana, Illinois, and Wisconsin joint union-contractor programs are responsible for 94%, 95%, and 99% of construction apprentice training expenditures, respectively.¹²

Joint union-contractor programs in New York offer training for all construction trades (from asbestos to sheet metal workers). Furthermore, there is training in some trades that is only offered by joint programs. According to the data obtained from the New York State Department of Labor, there were no open shop apprenticeship programs for roofers, elevator/escalator constructors, boiler makers, and iron workers in 2016.

Jointly managed union-contractor training programs in New York are also responsible for almost all minority and female apprenticeship enrollments in New York. For example, 97% of minority and 98% of female construction apprentices are enrolled in union-contractor programs.¹³ Additionally, 98% of minority and 93% of female construction workers employed by or associated with the organizations providing the training are attached to joint union-contractor programs. This trend in female and minority program participation is not exclusive to

¹¹ See Merit Apprenticeship Alliance. Accessed at: <http://meritalliance.org/>.

¹² See Philips, Peter. 2015. “Indiana’s Common Construction Wage Law: and Economic Impact Analysis.” Accessed at: http://www.isbctc.org/Uploads/UploadedFiles/docs/Philips_Indiana_Report_January_2015.pdf and Peter Philips. 2015.

“Wisconsin’s Prevailing Wage Laws: An Economic Impact Analysis.” Accessed at: http://www.wisconsincontractorcoalition.com/application/files/9914/2889/7832/Wisconsin_Report_April_2015.pdf and Frank Manzo IV and Robert Bruno. 2016. “The Impact of Apprenticeship Programs in Illinois: An Analysis of Economic and Social Effects.” Accessed at: https://illinoisepi.files.wordpress.com/2016/08/pcmr-ilepi-impactofapprenticeshipprograms_newcover.pdf.

¹³ This information was derived from the “affirmative action” letter the New York State Department of Labor sent to all registered construction apprenticeship programs. The information was obtained by a Freedom of Information Act Request by the New York State Building and Construction Trades Council.

New York. For example, 94% of female and 88% of minority apprentices in Ohio are enrolled in joint union-contractor programs.¹⁴

In addition to possessing advantages in minority and female apprenticeship participation, joint union-contractor programs also have higher completion rates. While a request for this information was made to the New York State Department of Labor, the information was not available in time for this report. Data from other states reveal differences in program completion rates. For example, jointly managed programs in Kentucky have overall completion rates that are 35% higher than open shop programs.¹⁵ Completion rates in jointly managed programs are also higher for female, veteran, and African-American apprentices in Kentucky. Overall completion rates are 21% higher in Ohio's joint programs compared to open shop offerings.¹⁶ Because joint union-contractor programs have higher enrollments and completion rates, these programs are responsible for most graduates. For example, between 2004 and 2015, 79% of apprentices in Ohio were enrolled in joint programs. With a 21% higher completion rate, these programs were responsible for 83% of graduating apprentices in Ohio over the period.

Some claim that prevailing wage laws are motivated by construction union desires to limit employment to white, male construction workers. For example, in objecting to the extension of prevailing wage requirements to the construction of affordable housing in New York City, David Bernstein urges "... New York officials who care about promoting racial diversity need to stop supporting prevailing wage mandates, which only have the opposite effect of sanctioning the long-standing pattern of racial discrimination practiced by New York's construction unions."¹⁷ Bernstein's claims are not supported by the demographic information for New York's construction training programs that provide substantial evidence to the contrary. Whatever past practice has been, recent evidence indicates that construction unions are responsible for almost all minority and female apprenticeships and employment in New York's construction industry. Rather than being excluded from joint union-contractor training programs, minority and female apprentices may select these programs because of greater inclusion, higher program quality, and the greater likelihood of program completion.

Conclusion

Some business and economic development groups call for changes and limitations to New York's prevailing wage policy.¹⁸ These groups should keep in mind that a trained and skilled construction labor force stabilizes building costs over time. Prevailing wage laws support

¹⁴ See Onsarigo, Lameck; Alan Atalah; Frank Manzo IV; and Kevin Duncan. 2017. The Economic, Fiscal, and Social Effects of Ohio's Prevailing Wage Law. Accessed at: <https://midwestepi.files.wordpress.com/2016/05/bowling-green-su-kent-state-ohio-pw-study-4-10-17.pdf>.

¹⁵ Duncan, Kevin and Frank Manzo IV. 2016. The Economic, Fiscal, and Social Effects of Kentucky's Prevailing Wage Law. Colorado State University-Pueblo; Midwest Economic Policy Institute. Accessed at: <https://illinoisepi.files.wordpress.com/2016/12/kentucky-report-duncan-and-manzo-2016-final.pdf>.

¹⁶ See Onsarigo, Lameck; Alan Atalah; Frank Manzo IV; and Kevin Duncan, 2017, above.

¹⁷ See "David E. Bernstein: The racism behind prevailing wage," Daily News Opinion by David E. Bernstein, January 25, 2016. Accessed at: <http://www.nvdailynews.com/opinion/david-e-bernstein-racism-behind-prevailing-wage-article-1.2506556>.

¹⁸ See for examples "New York business groups pushing changes to wage law," Daily News, December 18, 2017. Accessed at: <http://www.nvdailynews.com/news/politics/business-groups-pushing-costly-wage-law-article-1.3706108>. See also, "Memorandum RE: A5498 (Bronson)/S.2975 (Murphy) regarding imposition of a prevailing wage mandate on economic development projects OPPOSE," New York State Economic Development Council, February 17, 2017. Accessed at: <http://www.nvsedc.org/wp-content/uploads/2017/02/021717-Bill-Memo-A.5498-Bronson-S.2975-Murphy.pdf>.

training in the construction industry by creating incentives for the use of apprentices. Joint union-contractor training programs in New York are responsible for the overwhelming preponderance of training resources and minority and female apprentices. As is the case in any industry, trained construction workers are more expensive than untrained workers. Since labor costs (wages and benefits) are about 24% of total construction costs in New York, any cost effect associated with the use of trained construction workers that is not offset by increased worker productivity is expected to be small. Claims to weaken New York's prevailing wage law are short-sighted and would harm the state's construction industry. On the other hand, applying prevailing wage coverage to currently excluded publicly-subsidized construction in New York would increase training resources, apprenticeship enrollments, and the supply of skilled construction workers. This application of prevailing wage coverage would increase construction worker income and benefits in ways that would increase economic activity and enhance economic development in New York.

Purpose of Prevailing Wage Laws, New York’s Current Policy, and Proposed Changes

The main purpose of a prevailing wage law is to protect local construction labor standards from distortions associated with publicly-funded construction.¹⁹ Large infusions of government spending into an area, along with a contract award process that favors the lowest bidder, may attract contractors from areas where construction worker wage rates are relatively low. The infusion of low-wage contractors may result in the erosion of local compensation standards. Prevailing wage laws create a level playing field for all contractors while ensuring that public works expenditures maintain and support local area standards.

New York’s prevailing wage law was established in 1897. The law requires that contractors and subcontractors under a public works contract with a state or local government entity must pay prevailing wage and fringe benefit rates to all construction workers.²⁰ At present, public works and prevailing wage coverage do not apply to construction funded by state grants, the issuance of tax-exempt industrial revenue bonds, or to construction subsidized by local development corporations, municipal corporations, and industrial development agencies.²¹

The Labor Department determines prevailing wage schedules for each county and for detailed job classifications (carpenter, electrician, etc.). The prevailing wage and benefit rate is reflective of a negotiation between a group of businesses and laborers in a particular trade in a

¹⁹ As an example, see “Prevailing Wage Guide to Public Works Contracts,” Montana Department of Labor and Industry. Accessed at: <http://erd.dli.mt.gov/labor-standards/public-contracts-prevailing-wage-law/prevailing-wage-guide-on-public-works-contracts>. See also, “Washington State Prevailing Wage Law,” Washington State Department of Labor and Industries. Accessed at: <http://www.lni.wa.gov/IPUB/700-032-000.pdf>.

²⁰ See “The Bureau of Public Work,” New York State Department of Labor. Accessed at: <https://labor.ny.gov/workerprotection/publicwork/PWContents.shtm> and “General Provisions of Laws Covering Workers on Public Works Contracts,” New York State Department of Labor. Accessed at: [https://labor.ny.gov/workerprotection/publicwork/PDFs/Art.8General%20Provisions%20of%20Laws%20Covering%20Worker.p](https://labor.ny.gov/workerprotection/publicwork/PDFs/Art.8General%20Provisions%20of%20Laws%20Covering%20Worker.pdf)
[df](https://labor.ny.gov/workerprotection/publicwork/PDFs/Art.8General%20Provisions%20of%20Laws%20Covering%20Worker.pdf).

²¹ “Article 8 (Construction): Frequently Asked Questions,” New York State Department of Labor. Accessed at: https://labor.ny.gov/workerprotection/publicwork/PW_faq1.shtm#1.

particular area.²² The rate and is updated annually. Prevailing wage and benefit rates are publicly available from the New York State Department of Labor.²³

New York's prevailing wage policy allows apprentices employed on public works to be paid according to the standards of the training program.²⁴ Construction industry apprentices earn a fraction of the total hourly compensation of fully-trained journey worker rate (as low as 50%). On public works projects in New York, construction workers cannot be paid as apprentices unless they are registered in a training program that is certified by the New York State Commissioner of Labor. Additionally, apprentices employed on public works projects must work under the supervision of journeyworkers in ratios that cannot exceed those promulgated by the Department of Labor.²⁵

Proposed Changes to New York's Prevailing Wage Law

There is New York legislation that would clarify the definition of a public works project and apply prevailing wage coverage to previously excluded projects.²⁶ For example, public works projects would be expanded to include construction subsidized by local development corporations, municipal corporations, and industrial development agencies, etc.

²² Ibid.

²³ "Article 8 Prevailing Wage Schedules," New York State Department of Labor. Accessed at: <https://applications.labor.ny.gov/wpp/publicViewPWChanges.do?method=showlt#>.

²⁴ See "General Provisions of Laws Covering Workers on Public Work Contracts," New York State Department of Labor. Accessed at: <https://labor.ny.gov/workerprotection/publicwork/PDFs/Art.8General%20Provisions%20of%20Laws%20Covering%20Worker.pdf>.

²⁵ "Article 8 Prevailing Wage Schedules," New York State Department of Labor. Accessed at: <https://applications.labor.ny.gov/wpp/publicViewPWChanges.do?method=showlt#>.

²⁶ For the 2018 legislative session see "A05498 Summary," New York State Assembly. Accessed at: http://assembly.state.ny.us/leg/?default_fld=&leg_video=&bn=A05498&term=2017&Summary=Y&Memo=Y&Text=Y. The issue is rooted in different language used in Article 1, Section 17 of the Constitution of the State of New York that refers to the payment of prevailing wages on "any public work" to the current use of a three-pronged test to determine if a particular public work is subject to the requirements of the State Constitution. See "The Constitution of the State of New York," New York State (accessed at https://www.dos.ny.gov/info/constitution/article_1_bill_of_rights.html) and "Article 8 (Construction): Frequently Asked Questions," New York State Department of Labor (accessed at: https://labor.ny.gov/workerprotection/publicwork/PW_faq1.shtml#0).

Public funds used to finance public works construction would be expanded to include the issuance of bonds and grants by the state, tax credits, and other forms of public subsidies, etc.

Purpose of the Study

The purpose of this study is to examine the implications of defining public work to the areas detailed above. This study contains a review of the academic research and other studies on prevailing wages and construction costs in New York and in other jurisdictions. The research on the effect of the wage policy on bid competition is also reviewed. The proposed legislation is controversial. Opponents claim that the proposed application of prevailing wage coverage will limit economic development.²⁷ On the other hand, proponents of the legislation argue that the application of prevailing wages will increase economic activity.²⁸ In response to this controversy, the report measures the impact of the proposed policy change on economic activity and economic development in New York State. The role of prevailing wages in supporting apprenticeship training in the construction industry is examined. This includes a comparison of jointly managed union-contractor training programs to nonunion programs with respect to enrollment and completion rates and financial resources. Differences in minority and female enrollments between joint union-contractor and nonunion apprenticeship programs in New York are evaluated.

Review of Research on Prevailing Wage Laws, Construction Costs, and Bid Competition

It is intuitive to think that increases in wage rates lead to increases in the costs of producing and to higher prices for goods and services. This perception is supported by data for

²⁷ "Legislative Memo," The Business Council, March 30, 2017. Accessed at: <http://www.bcnys.org/inside/Legmemos/2017-18/prevailing-wage-mandates.html>

²⁸ "Definition of Public Works," NYS Building & Construction Trades Council, n.d. Accessed at: <http://www.nybuildingtrades.com/definition-of-public-works>.

the U.S. economy where labor costs are about two-thirds of all production costs.²⁹ So, an increase in wages and labor costs has a disproportionately large impact on overall costs and prices. Followers of the financial news are also aware that an increase in wage rates and labor costs accompanied by an increase in labor productivity is associated with stable production costs and inflation.³⁰ In recognizing that wages and labor productivity both affect costs, it is necessary to adjust the initial intuition that higher wages automatically mean higher costs and prices.

By extension, the initial intuition suggests that since prevailing wage laws establish a floor below which wages cannot fall, the policy contributes to increased construction costs. There are important differences between the impacts of wages on costs in the overall economy and in the construction industry that do not support the intuitive view. While labor costs are a relatively high percentage of total production costs for the overall economy, these costs are a low percentage of total costs in the construction industry. The most reliable data on construction costs can be obtained from the U.S. Census Bureau's *Economic Census of Construction*.³¹ 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) for all types of construction are approximately 23% of total costs in the industry.³² The

²⁹ According to data from the Bureau of Labor Statistics multifactor productivity program, labor's average share of costs in the private business sector (excluding government enterprises) is 65% for the 1987 to 2013 period. See "Private Business and Private Nonfarm Business Multifactor Productivity Tables," Multifactor Productivity, Bureau of Labor Statistics, U.S. Department of Labor. Accessed at: <http://www.bls.gov/mfp/mprdownload.htm>.

³⁰ For an illustration of these relationships see "U.S. productivity rises in second quarter, keeps labor costs in check," Reuters, August, 9, 2017. Accessed at: <https://www.reuters.com/article/us-usa-economy-productivity/u-s-productivity-rises-in-second-quarter-keeps-labor-costs-in-check-idUSKBN1APIFV>.

³¹ 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_2012_US_23A1&prodType=table.

³² The *Economic Census of Construction* for 2012 does not report labor costs as a percent of total costs. This ratio must be calculated based on other data. Here, labor cost as a percent of total construction cost is derived by dividing total construction worker payroll, plus proportionally allocated total fringe benefits, by the net value of construction work. The net value of construction is based on the value of work completed by a contractor, less the value of work subcontracted to other contractors. The *Economic Census of Construction* defines construction worker payroll as the gross earnings paid in the reporting year to all construction workers on the payroll of construction establishments. It includes all forms of compensation such as salaries, wages, commissions, dismissal pay, bonuses, and vacation and sick leave pay, prior to deductions such as employees' Social Security

corresponding figure for New York State is 24%. Numerous studies use data from the *Economic Census of Construction* for different years and segments of the construction industry and also find that labor costs are a low percent of overall construction costs.³³

While it is an established practice to consider the combined effects of wages, labor costs, and labor productivity when considering cost pressures and inflation for the U.S. economy, these relationships are almost always ignored in the policy debate over the cost impact of prevailing wages. It is important to keep in mind that wage rates in the construction industry are linked to productivity and efficiency. Blankenau and Cassou (2011) find that the use of skilled and unskilled construction labor is very sensitive to wage rates.³⁴ When construction wage rates increase, more skilled and productive construction workers replace less skilled workers. Changes in wage rates also affect the use of other construction inputs and costs. Balistreri, McDaniel, and Wong (2003) find that when wages increase more capital equipment and machinery is used in construction in a way that increases labor productivity.³⁵ Duncan and Lantsberg (2015) find that in states with average or strong prevailing wage laws, labor costs

contributions, withholding taxes, group insurance, union dues, and savings bonds. The *Economic Census of Construction* defines the net value of construction as the receipts, billings, or sales for construction work done by contractors, less the value of construction work subcontracted to others. The net value of construction does not include contractor business receipts from retail and wholesale trade, rental of equipment without operator, manufacturing, transportation, legal services, insurance, finance, rental of property and other real estate operations, and other nonconstruction activities. Receipts for separately definable architectural and engineering work for others are also excluded. Nonoperating income such as interest, dividends, the sale of fixed assets, and receipts from other business operations in foreign countries are also excluded. See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012. Accessed at: See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012. Accessed at:

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

³³ See for example, Philips, Peter. 2014. "Kentucky's Prevailing Wage Law: An Economic Impact Analysis." Accessed at:

<http://www.faircontracting.org/wp-content/uploads/2014/02/Kentucky-Report-2014-Philips.pdf>. Also see, Duncan, Kevin and Waddoups, Jeff. 2014. "Does the Release of Davis-Bacon Certified Payrolls Cause Competitive Harm to Contractors?"

Accessed at:

https://www.denvergov.org/content/dam/denvergov/Portals/741/documents/PW_General/Torres%20Report%20on%20Certified%20Payrolls-%20Duncan%20and%20Waddoups%20December%202014%20Final.pdf.

³⁴ Blankenau, William and Cassou, Steve. 2011. "Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change Between Skilled and Unskilled Labor." *Applied Economics*, Vol. 43, pp. 3129-3142. In this study skilled workers are defined as those with 16 or more years of education and unskilled workers are defined as those with 12 or fewer years of schooling.

³⁵ Balistreri, Edward, Christine McDaniel, and Eina Vivian Wong. 2003. "An Estimation of U.S. Industry-Level Capital-Labor Substitution Elasticities: Support for Cobb-Douglas." *The North American Journal of Economics and Finance*, Vol. 14, No. 3, 343-356.

(wages and benefits) are higher, but material and fuel costs and contractor profits are lower compared to states with weak or no wage policies.³⁶ It follows that the use of higher paid and productive construction workers results in more efficient use of materials and fuels.

All of these characteristics of the construction industry require modification to the initial intuition that prevailing wage rates increase construction costs. Since labor costs are a low percent of total construction costs, relatively minor changes in labor productivity, material and fuel costs, and contractor profit are needed to offset any inflationary effect of prevailing wages. The preponderance of academic research indicates that prevailing wage laws are not associated with increased construction costs, suggesting that these types of cost-saving adjustments take place under the wage policy.

While the overwhelming majority of academic research indicates that there is no statistically significant prevailing wage cost effect, not all studies reach this conclusion. The research on this topic differs with respect to peer-review and in terms of research techniques. Research that appears in academic journals has been reviewed by peer experts before publication of the study. A peer-review is not based on whether reviewers agree with the research results. Rather, the purpose of the review is to ensure quality, provide credibility, and maintain standards in the discipline. One benefit of this type of review is that peer experts are more likely to detect errors and shortcomings that may not be obvious to casual readers. It is entirely up to casual readers to evaluate the accuracy of research that has not been peer reviewed. Additionally, methods of measuring the cost impact of prevailing wage laws range from detailed statistical analysis of hundreds or thousands of contractor bids submitted under actual market and

³⁶ Duncan, Kevin and Lantsberg, Alex. 2015. "Building the Golden State: The Economic Impacts of California's Prevailing Wage Policy." Accessed at: <https://www.smartcitiesprevail.org/wp-content/uploads/sites/24/2017/03/SCP-Building-the-Golden-State-WEB.pdf>.

competitive conditions to simple wage comparisons of hypothetical construction projects. Peer-reviewed academic research uniformly relies on the statistical analysis of actual contractor bids, while many other studies base the cost effect of the wage policy on differences between prevailing and alternative market rates. These wage differential studies suffer from the same limitations as the intuitive approach to assessing the impact of wage rates on costs and prices.

Studies on the Cost of New York's Prevailing Wage Policy Based on Wage Differences

A 2008 study by Kent Gardner and Rochelle Ruffer of the Center for Governmental Research examines the effect prevailing wage requirements on the cost of public construction in the state of New York.³⁷ The study was sponsored by the New York State Economic Development Council in response to concern that the State Legislature was considering legislation to apply prevailing wage requirements to construction projects receiving subsidies from industrial development authorities. The study is based on the impact of prevailing wages on labor costs and total project costs for seven metropolitan areas in the state. Results suggest that New York's prevailing wage policy increases the cost of public construction by 36%. There are numerous shortcomings associated with wage difference method used in this study that contribute to an unrealistic cost estimate that is greater than labor's share of overall construction costs.³⁸ For example, information from the most recent the U.S. Census Bureau's *Economic Census of Construction* indicates that labor costs (wages and benefits) are 23.9% of construction

³⁷ Center for Government Research, "Prevailing Wage in New York State," January 2008. Accessed at: <http://reports.cgr.org/details/1532>.

³⁸ For a detailed examination of this method see, Kevin Duncan, "The Wage Differential Method: Promising Construction Costs Savings with the Repeal or Weakening of Prevailing Wage Laws that Cannot be Delivered," September 2016. Accessed at <https://www.csupueblo.edu/hasan-school-of-business/doc/kevin-duncan/wage-differential-method-critique-duncan-2016.pdf>.

costs in New York. This is slightly higher than the corresponding average for all construction in the U.S. of 23.0%.³⁹

The study by the Center for Government Research is not based on an examination of contractor bids, but on a hypothetical construction project. To illustrate the effect of prevailing wages on labor costs the authors create a prototype project involving 200,000 hours of labor and \$5 million in material costs. Specifically, the authors compare labor costs under prevailing wages to labor costs based on alternative, market-based rates. Hourly wage information from the Occupational Employment Statistics (OES) of the Bureau of Labor Statistics is used as the alternative wage.⁴⁰ Since these wage data do not include benefits, the researchers add an hourly benefit rate equal to 25.8% of hourly wages. The weighted average alternative wage for the 17 most common construction occupations across New York State is approximately \$29.37 per hour wages and estimated benefits (based on data for 2006).⁴¹ The corresponding weighted average prevailing wage and benefit rates is about \$49.98 per hour. These data indicate that prevailing wage compensation exceeds the alternative market rate by 67%. With this wage information in hand, labor costs and total project costs under the two wage regimes for the prototype projects can be calculated as follows.⁴²

³⁹ See Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012. Accessed at: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_23A1&prodType=table.

⁴⁰ See Occupational Employment Statistics. Accessed at: <https://www.bls.gov/oes/>

⁴¹ The weighted average hourly rates can be derived by dividing reported labor costs of \$5,874,734 by 200,000 hours that rounds to \$29.37 per hour. The same method can be used to determine the weighted average hourly prevailing rate.

⁴² This is based on rounded data reported at the bottom of the table on page 6 of the study by Center for Government Research, accessed at: <http://reports.cgr.org/details/1532>.

Labor and Total Costs under Alternative Market Compensation Rates:

Labor Costs = $\$29.37 \times 200,000$ hours = $\$5,874,000$

Material Costs = $\$5$ million

Total Costs = $\$10,874,000$

Labor and Total Costs under Prevailing Wage Compensation Rates:

Labor Costs = $\$48.98 \times 200,000$ hours = $\$9,796,000$

Material Costs = $\$5$ million

Total Costs = $\$14,796,000$

The difference in labor costs under the two wage regimes is $\$3,922,000$ ($\$9,796,000 - \$5,874,000$). The percent difference in labor costs is the same as the same as the difference in wages (67%).⁴³ The difference in total project cost is $\$3,895,000$ and the percentage increase in total costs associated with prevailing wages for the state is 36% ($\$3,895,000 / \$10,874,000$). Using wage differences for different regions of the state, the authors estimate that applying prevailing wage requirements to IDA projects would increase the total cost of a typical construction project by 23% for upstate regions (Albany, Buffalo, Rochester, Syracuse) and 52% for downstate regions (Poughkeepsie, Long Island, NYC). All of these cost estimates are either approximately equal to, or exceed state average labor costs as a percent of total construction costs. For example, information from the most recent the U.S. Census Bureau's *Economic Census of Construction* indicates that labor costs (wages and benefits) are 23.9% of construction

⁴³ The difference between labor market and prevailing wage labor costs is $\$3,922,000$. The percentage difference between labor costs under market and prevailing wages in $\$3,922,000 / \$5,874,000 = 67\%$.

costs in New York. This is slightly higher than the corresponding average for all construction in the U.S. of 23.0%.⁴⁴

One reason why these cost estimates are unrealistically high is that they are based on an estimate of material costs only. Under the method used by the Center for Government Research, the smaller the non-labor cost component, the larger the prevailing wage cost effect. The authors use a hypothetical material cost component of \$5 million. Under the alternative market wage scenario, labor costs are 54% of combined labor and material costs (\$5,874,000 / \$10,874,000). Under prevailing wages, labor costs are 66% of combined labor and material costs (\$9,796,000 / \$14,796,000). The midpoint between these two measures is 60% $([54\% + 66\%]/2)$. These percentages from the hypothetical example are close to the corresponding ratio of actual data reported in the *Economic Census of Construction* indicating that labor costs (wages and benefits) are 63% of combined labor and material costs in New York. However, there are far more costs that contractors incur in addition to material costs.

While material and labor costs are a portion of construction costs, contractor bids also reflect over head costs (administration, depreciation expenses, propriety payments, taxes, etc.) as well as the costs of fuels, lubricants, power, rental equipment, and contractor profits, etc. The net value of a contractor's construction reported in the *Economic Census of Construction* is based on all of the payments and costs described above.⁴⁵ When labor costs are compared to this comprehensive cost measure, construction worker compensation shares averages 23.9% in New York. When this broader cost measure is used in the method employed in the study by the

⁴⁴ See U.S. Census, "Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012." Accessed at: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_23A1&prodType=table.

⁴⁵ In the *Economic Census of Construction* the net value of construction is based on a contractor's value of construction, minus the value of work that was subcontracted and performed by other contractors. See U.S. Census, "Construction: Geographic Area Series: Detailed Statistics for Establishments: 2012." Accessed at: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_23A1&prodType=table.

Center for Government Research, the estimated prevailing wage cost impact is substantially smaller. The sensitivity of the Center's prevailing wage cost estimate to the measure of construction costs used is illustrated in the following example. If labor costs under prevailing wages exceed alternative market rates by 67%, and if labor costs under market wages are 54% of total costs (labor and material costs), the cost effect of prevailing wage requirements is 36% ($67\% \times 54\%$). However, if the actual measure of labor costs obtained from the *Economic Census of Construction* (23.9%) is used, the cost impact decreases to 16% ($67\% \times 23.9\%$).

This cost estimate is still too high as the analysis is based the assumption of equal productivity for all workers.⁴⁶ This assumption ignores the observed changes in labor utilization when wages change in the construction industry. Contractors adjust to higher wage rates by increasing labor productivity. This means that for the method described above, labor hours will not remain equal (at 200,000 hours) under market and prevailing rates. Therefore, the labor costs under prevailing wages should be less than the estimated level of \$9,796,000. But, making this adjustment in an accurate manner is beyond the scope of this hypothetical method and can best be addressed through an examination of actual contractor bids.

When contractors face any cost change, whether it involves labor or another source, bids are adjusted accordingly. The wage difference approach used by the Center for Government Research and others assumes that the added costs of prevailing wages are passed entirely and directly through to costs and bids. However, prevailing wage policies are uneven in their effect. Since prevailing rates in New York are set according to collective bargaining rates, the wage policy does not affect the wage and labor costs of union contractors. Nonunion contractors,

⁴⁶ See page 17 of the study by Center for Government Research, accessed at: <http://reports.cgr.org/details/1532>.

particularly those who pay wages and benefits substantially lower than the union scale, are the ones that face significant wage increases on covered projects. Competition with union contractors prevents nonunion contractors from passing increased labor costs directly through to their bids. Cost-saving methods must be taken that involve more efficient and productive construction, reduce costs, and reduce profit margins. The wage difference method is unable to address these types of change and any prevailing wage cost estimate obtained from this method should be interpreted with extreme caution.

Kent Gardner and E.J. McMahon conducted a follow-up study in 2017 that examines the effect of prevailing wages on construction costs in major metropolitan areas in New York.⁴⁷ As is the case with the 2008 study, this more recent report by the Empire Center is not based on the analysis of actual contractor bids. Instead, the authors rely on a slightly modified wage difference approach. Specifically, the new method is based on differences between alternative market wages and prevailing rates for the most common construction trades and a measure of labor's contribution to total project costs. While there is insufficient reporting to reproduce the method used in this study, the authors report that prevailing wages exceed alternative market rates from 57% (Albany) to 95% (New York City). These wage differences are thought to contribute to increases in total project costs ranging from 13% (in Albany) to 25% (in New York City). While these more recent cost impacts are lower than the 36% reported in the 2008 study, these results are still affected by the limitations of a largely hypothetical illustrations versus an analysis of actual contractor bids.

⁴⁷ See Empire Center. 2017. "Prevailing Wage: New York's Costly Public Works Pay Mandate." Accessed at: <https://www.empirecenter.org/publications/prevailing-wage/>.

The studies by the Center of Government Research and the Empire Center are based on the assertion that large differences between alternative market rates and prevailing wages must result in increased construction costs. There have been very few studies of construction costs in New York that are based on the examination of contractor bids. Studies have been conducted in other metropolitan areas characterized by high unionization rates and large differences between OES wage data and prevailing wages with results indicating that prevailing wages are not associated with increased construction costs.⁴⁸ For example, in an examination of 340 municipal projects (airports, streets, and sewers, etc.) in five cities located in, or near the San Jose-Sunnyvale-Santa Clara metropolitan, Kim, Kuo-Liang, and Philips (2012) find that contractor bids, relative to the engineer's cost estimate of the project, were no higher in cities with prevailing wage laws than in municipalities without the wage policy.⁴⁹ The comparison of OES wage data for the San Jose-Sunnyvale-Santa Clara metropolitan area and corresponding prevailing wages for the cities included in the study by Kim, Kuo-Liang, and Philips indicate that prevailing wages exceed alternative market rates from 57% to 116% with an average of 80% for selected occupations.⁵⁰ This range in wage differences is comparable to that reported in the Empire Center study with a seven-metro area average of 72%, a lower limit of 57% (Albany) and 95% (New York City). However, the examination of contractor bids from the northern California cities indicates that prevailing wage projects are no more costly than projects that are not covered

⁴⁸ According to data obtained from the Current Population Survey Outgoing Rotation Groups for the 2003-2013 period, union density in the New York metropolitan area in construction was 33% and 32% in the San Jose metro area. See "CPS Outgoing Rotation Group," CERP data. Accessed at: <http://ceprdata.org/cps-uniform-data-extracts/cps-outgoing-rotation-group/>.

⁴⁹ See JaeWhan Kim, Chang Kuo-Liang, and Peter Philips. 2012. "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. This study compares bids to the engineer's estimate of project costs. This estimate is included as a control for project size.

⁵⁰ The comparison is made using the 29% benefit addition to OES wages for the top seven construction occupations identified in the Empire Center and Center for Government Research studies. The cities included in the study by Kim, Kuo-Liang, and Philips (2012) are Mountain View, Palo Alto, San Carlos (in San Mateo County), San Jose, and Santa Clara. Wage data from the Occupational Employment Statistics is for OES May 2016 and available at <https://www.bls.gov/oes/>. Applicable prevailing wage rates for California can be obtained from "Director's General Prevailing Wage Determinations," Department of Industrial Relations, State of California. Accessed at: <https://www.dir.ca.gov/OPRL/dprevwagedetermination.htm>.

by the wage policy, despite substantial measured wage differences. How can this be the case? The examination of contractor bids includes changes in labor productivity and utilization that contractors make when competing for prevailing wage projects. The simple comparison of wage rates to determine the effect of the wage policy is unable to capture these changes. Given the numerous shortcomings of this approach and the availability of superior research methods, studies employing the wage differential method would not survive a review by expert peers. The last peer-reviewed study based on the comparison of wage differences to assess the effect of prevailing wage on total construction costs was published in 2001.⁵¹

Despite the weaknesses of the wage differential method used in the studies by the Center of Government Research and the Empire Center, their findings are referenced by organizations that seek to limit prevailing wage coverage or to weaken the wage policy. For example, the New York State Economic Development Council references the Center for Government Research study in its 2017 memorandum in opposition to applying prevailing wage coverage to projects receiving public subsidies.⁵² The state Business Council references the results of the Empire Center study in calling for changes to New York's prevailing wage law.⁵³ It is regrettable that these organizations chose to reference research that is based on the flawed wage differential method when there is abundant peer-reviewed, academic research that is based on the statistically analysis of contractor bids. The preponderance of this research reaches conclusions

⁵¹ See Keller, Edward and Hartman, William. 2001 'Prevailing Wage Rates: the Effects on School Construction Costs, Levels of Taxation, and State Reimbursements,' *Journal of Education Finance*, Vol. 27, pp. 713-728. More recently Clark (2005) compares wage rates to assess the impact of Kentucky's prevailing wage law, but this analysis is limited to the examination of labor costs, not total construction costs. See Clark, Mike. 2005. "The Effects of Prevailing Wage Laws: a Comparison of Individual Worker's Wages Earned on and off Prevailing Wage Construction Projects." *Journal of Labor Research* 26: 725-737.

⁵² See New York State Economic Development Council. 2017. "Memorandum," February 17. Accessed at: <http://www.nysedc.org/wp-content/uploads/2017/02/021717-Bill-Memo-A.5498-Bronson-S.2975-Murphy.pdf>.

⁵³ See "New York business groups pushing for changes to wage law," Daily News, December 18, 2017. Accessed at: <http://www.nydailynews.com/news/politics/business-groups-pushing-costly-wage-law-article-1.3706108>.

that are at variance with the findings of the reports submitted by the Center of Government Research and the Empire Center.

Peer-Reviewed Research on the Cost Impact of Prevailing Wages

While the wage differential studies ignore other factors that change with wage rates in the construction industry, the research methods used in peer-reviewed research typically include these changes. There have been 20 peer-reviewed studies examining the cost implications of prevailing wage laws since 2000. The preponderance of the evidence indicates that prevailing wage standards are not associated with increased construction costs.

Academic research on prevailing wages typically compares total costs of projects covered by prevailing wage laws to the total costs of projects that are not covered by the wage policy, taking into consideration other factors that affect construction costs⁵⁴ Examining the total cost of construction has the advantage over the wage differential approach. The former method captures changes in wage rates and in other construction inputs and costs that occur when prevailing wages apply. Researchers often examine the effect of prevailing wages on school construction for two reasons: 1) the cost of education, including school construction is important to the public and to policy makers, and 2) since these types of projects are relatively similar the effect of the wage policy on costs can be measured with greater accuracy. Academic studies typically use statistical analysis that provides an estimate of the wage policy as well as information on whether the estimate is statistically significant. A statistically significant estimate implies causation and is not likely due to random chance. On the other hand, an estimate that is not statistically significant is likely due to random chance, implying the lack of correlation.

⁵⁴ For example, if prevailing wage projects are larger or more complex than projects that are not covered by the wage policy, and if this information is not included in the statistical analysis, results will indicate that prevailing wage projects are more expensive. Consequently, it is necessary to examine the effect of the wage policy taking into account project size and complexity.

Azari-Rad, Philips and Prus (2002) examine winning bids for 4,974 public and private schools built in states between 1991 and 1999 that were, and were not covered by prevailing wage laws.⁵⁵ 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) expand their analysis to compare schools built in states with prevailing wage laws of differing strength. Regardless, their analysis of 4,653 schools built between 1991 and 1999 finds that prevailing wage laws (strong, weak, or otherwise) are not related to school construction costs.

Alan Atalah examines the effect of prevailing wages on school construction costs in two studies. Both studies are based on the examination over 8,000 bids for school construction projects built in Ohio between 2000 and 2007. Atalah (2013a) compares bids, adjusted for the square-foot size of the school, that were submitted by contractors who were signatories to collective bargaining agreements and who pay union wage and benefit rates to the bids submitted by of open shop contractors who typically pay lower rates. A comparison of average bid-costs for schools built across the state indicates that there is no statistically significant difference in this cost measure between the two groups of contractors.⁵⁶ The exception is schools built in the southern region of the state where costs by union contractors were lower than nonunion contractors. Ohio excluded school construction in 1997. Union rates are used to determine prevailing wage and benefit rates for other publicly funded construction in Ohio.⁵⁷ Wages paid

⁵⁵ Low, winning contractor bids are the measure of total costs, but this measure excludes change orders and cost overruns that may be related to prevailing wage legislation. The two studies that have been able to collect information on add-on charges report that these additional costs are lower on projects covered by prevailing wages. See Bilginsoy, Cihan. (1999). "Labor Market Regulation and the Winner's Curse," *Economic Inquiry*, 37(3): 387-400 and Peter Philips, Garth Mangum, Norm Waitzman, and Anne Yeagle. 1995. "Losing Ground: Lessons from the Repeal of Nine "Little Davis-Bacon" Acts. Working Paper, Department of Economics, University of Utah. Accessed at: http://www.faircontracting.org/PDFs/prevailing_wages/losingground.pdf.

⁵⁶Atalah, Alan. 2013a. "Comparison of Union and Non-Union Bids on Ohio School Facilities Commission Construction Projects," *International Journal of Economics and Management Engineering*, Vol. 3, Issue 1, pp. 29-35.

⁵⁷ See "Chapter 4115: Wages and Hours on Public Works," LA Writer, Ohio Laws and Rules. Accessed at <http://codes.ohio.gov/orc/4115>.

by open shop contractors represent wages at the other extreme, if prevailing wages do not apply. If costs do not differ between these extremes, the inference is that prevailing wages do not affect costs.

The second study by Professor Atalah yields mixed results regarding the cost impact of prevailing wages.⁵⁸ This study compares bids that were submitted by different trades (plumbing, electrical, etc.) that did and did not pay union rates. Results indicate that all bids and winning bids (adjusted for the square-foot size of the school) were higher for three (16.7%) of 18 the trades that paid union rates (compared to the same trades that did not pay union rates). Specifically, all bids and winning bids were higher for union contractors doing work on existing conditions, plumbing, and earthwork. In two (11.1%) of the 18 trade categories, all bids and winning bids submitted by union contractors were lower. Specifically, HVAC and electrical union contracts had lower bid prices. There were no statistically significant differences in bid-costs per square foot for 72.2% (13/18) of the other trades, regardless of payment of union wage and benefit rates.⁵⁹ In sum, the studies by Professor Atalah find that, by and large, the payment of union wage rates are not associated with increased bid costs. There are a few cases where bids are higher for some trades when union rates are paid. There are also a few cases where bids are lower for some trades when union rates are paid. There is also evidence that for the southern region of the state, bids based on the payment of union wages are lower than bids based on nonunion wage rates.

⁵⁸ Alan Atalah. 2013. "Impact of Prevailing Wages on the Cost among the Various Construction Trades," *Journal of Civil Engineering and Architecture*, Vol. 7, No. 4, pp. 670-676.

⁵⁹ These projects include the trades involved in the following Construction Specifications Institute categories: communications, concrete, conveying equipment, electronic safety and security, equipment, finishing, fire suppression, furnishings, masonry, openings, structural steel, thermal and moisture protection, and wood, plastics and composites work.

Keller and Hartman (2001) compare labor costs for 25 school construction projects in Pennsylvania under prevailing wage regulations and “open shop” conditions and report that Pennsylvania’s prevailing wage law adds, on average, 2.25% to the cost of building public schools. However, this analysis is limited since the findings are based on the comparison of wage rates and labor costs, rather than a direct examination of the wage policy on total construction costs.⁶⁰ Vincent and Monkkonen (2010) examine 2,645 schools built across the U.S. under various regulatory settings and report a prevailing wage cost effect ranging from 8% to 13%.⁶¹ While this study takes into consideration other factors such as project size, type of school, as well as policies other than prevailing wage laws that may also affect construction costs, the effect of the business cycle is not included. Swings in economic activity have a substantial impact on material and other construction costs. For example, professors Azari-Rad, Philips, and Prus find that doubling the unemployment rate in a state is associated with a 21% decrease in school construction costs. If the states that have prevailing wage laws also have lower rates of unemployment, the cost estimate of the wage policy reported in the study by Vincent and Monkkonen is too high.

Several studies have compared construction costs for schools built with and without prevailing wage regulations. Many of these studies have taken advantage of the introduction of a prevailing wage policy in British Columbia to compare school construction costs. The introduction of this wage policy allows for a “natural experiment” by comparing construction costs before and after the policy within the same jurisdiction. This type of comparison is an opportunity to isolate the impact of the wage policy when there was no other policy change

⁶⁰ This 2001 study is the last peer-reviewed paper that uses a wage difference comparison to measure the total costs of the wage policy. See Keller, Edward and Hartman, William. 2001 ‘Prevailing Wage Rates: the Effects on School Construction Costs, Levels of Taxation, and State Reimbursements,’ *Journal of Education Finance*, Vol. 27, pp. 713-728.

⁶¹ Vincent, Jeffery and Monkkonen, Paavo. 2010. “The Impact of State Regulations on the Cost of Public School Construction,” *Journal of Education Finance*, Vol. 35, No. 4, spring, pp. 313-330.

affecting construction labor markets over the period of the study. The law in British Columbia was similar to strong state-level prevailing wage laws in the U.S.⁶²

Bilginsoy and Philips (2000) examine the impact of British Columbia's Skill Development and Fair Wage Policy on the construction of 54 public schools built before and after the introduction of the wage policy⁶³ Results indicate the absence of statistically different cost differences for schools built before the introduction of prevailing wages. This study does not include a control group of similar projects that were not affected by the wage policy.

Duncan, Philips, and Prus (2014) examine the effect of British Columbia's prevailing wage standard by including a control group of private school projects.⁶⁴ This analysis of 498 school projects indicates that before the introduction of the prevailing wage policy, the cost of building public schools was approximately 40% more expensive than the costs of comparable private schools. This cost differential did not change after the wage policy was introduced. These authors have also used the British Columbian example to study the effect of prevailing wage laws on the productivity and efficiency of construction.⁶⁵ Their examination of 528 school projects indicates that the introduction of the wage legislation, public school projects were 16% to 19% smaller, in terms of square feet, than comparable private structures (given the same project expenditure). This size differential did not change after the policy was in effect. These results suggest that prevailing wage requirements do not alter labor or other input utilization in a way that significantly affects the relative size of covered and uncovered projects. The authors

⁶² See Duncan, Kevin; Peter Philips; and Mark Prus. (2012). "Using Stochastic Frontier Regression to Estimate the Construction Cost Efficiency of Prevailing Wage Laws," *Engineering, Construction and Architectural Management*, 19(3): 320-334.

⁶³ Bilginsoy, Cihan and Philips, Peter. 2000 'Prevailing Wage Regulations and School Construction Costs: Evidence from British Columbia.' *Journal of Education Finance*, Vol. 24, 415-432.

⁶⁴ Duncan, Kevin, Philips, Peter, and Prus, Mark. 2014. "Prevailing Wage Regulations and School Construction Costs: Cumulative Evidence from British Columbia." *Industrial Relations*, Vol. 53; No. 4, October, pp. 593-616.

⁶⁵ Duncan, Kevin, Philips, Peter, and Prus, Mark. 2006. "Prevailing Wage Legislation and Public School Construction Efficiency: A Stochastic Frontier Approach," *Construction Management and Economics*, Vol. 24, June 2006. pp. 625-634.

also find the introduction of the British Columbian wage policy was associated with an increase in the inefficiency of construction of 8.6%.⁶⁶ The examination of 438 school projects reveals that the inefficiency of construction decreased by 31.8% for projects covered by the expansion of the policy 17 months after its introduction. The net change in construction inefficiency associated with the wage policy was 23.2%. These findings suggest that the introduction of prevailing wage laws disrupted construction efficiency. However, in a relatively short period of time, the construction industry adjusted to wage requirements by actually improving overall construction efficiency in a way that is consistent with stable total costs. A similar pattern was observed with respect to cost efficiency.⁶⁷

It is the nature of empirical analysis that every study will have some flaws, even minor ones that limit the interpretation of results. It is simply not possible for any researcher to have all of the information needed for complete analysis. However, when numerous studies, employing different research techniques and sample configurations reach the same conclusion, evidence mounts in favor of the shared finding. This is the case regarding the research on prevailing wages in British Columbia. Taken together, all of the studies of prevailing wages in British Columbia provide a consistent and comprehensive analysis that fails to find an effect on school construction costs or efficiency consistent with the view that prevailing wages increase construction costs.

Of the 11 peer-reviewed studies that examine the effect of prevailing wages on school construction costs, seven provide evidence that the wage policy is not associated with increased construction costs. Two other studies find positive cost effects, but the results of one of the

⁶⁶ Duncan, Kevin, Philips, Peter, and Prus, Mark. 2009. "The Effects of Prevailing Wage Regulations on Construction Efficiency in British Columbia," *International Journal of Construction Education and Research*, Vol. 5, No.1, pp. 63-78.

⁶⁷ Duncan, Kevin, Philips, Peter, and Prus, Mark. 2012. "Using Stochastic Frontier Regression to Estimate the Construction Cost Efficiency of Prevailing Wage Laws." *Engineering, Construction and Architectural Management*, Vo. 19, No. 3, pp 320-334.

studies are questionable because the analysis is based on the outdated wage differential method. Two other studies report mixed results suggesting that, in general, prevailing wage requirements do not increase costs, but that there are some cases where costs are higher, and some cases where costs are lower under the wage policy.

Two studies by Duncan (2015a and 2015b) focus on the effect of federal requirements on the cost of highway resurfacing in Colorado. The first study compares the costs of over 130 projects funded by the federal government to projects financed by the State of Colorado over the 2000-2011 period.⁶⁸ Federal funding requires the payment of Davis-Bacon prevailing wages and adherence to the Disadvantaged Business Enterprise policy while state-funded projects in Colorado are not covered by either of the federal regulations.⁶⁹ Resurfacing projects funded by the federal government are more costly, but are also larger and more complex than state projects. After taking these and other project characteristics into account, there is no statistically significant difference in average project costs, regardless of prevailing wage coverage. Additional analysis compares resurfacing costs as contractors switch from federal to state projects.⁷⁰ The examination of 91 winning bids on highway resurfacing projects indicates that bids on less-regulated state projects are not different, in terms of statistical significance than winning bids on federal projects. Results of these studies indicate that the combined effects of the Davis-Bacon Act and the Disadvantaged Business Enterprise policy do not affect the cost or level of bid competition. On the other hand, in an examination of 50 state departments of

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

⁶⁹ The goal of the Disadvantaged Business Enterprise provision is to ensure that small subcontracting companies, owned and controlled by socially and economically disadvantaged individuals, can compete fairly on federally funded highway, airport, and other transit projects. This provision requires the U.S Department of Transportation to ensure that at least 10 percent of the funds authorized for highway projects be expended on disadvantaged businesses. Accessed at: <https://www.transportation.gov/osdbu/disadvantaged-business-enterprise/definition-disadvantaged-business-enterprise>.

⁷⁰ Duncan, Kevin. 2015. "Do Federal Davis-Bacon and Disadvantaged Business Enterprise Regulations Affect Aggressive Bidding? Evidence from Highway Procurement Auction," *Journal of Public Procurement*, Vol. 15, Issue 3, pp. 291-316.

transportation, Vitaliano (2002) finds that the cost inefficiency of state-level prevailing wage laws adds about \$10 million (8%) to the annual cost of maintaining the nation's highway system.⁷¹ This impact is statistically significant.

The findings of other studies are generally consistent with those described above. An examination of 340 public works projects in five northern California cities (Palo Alto, Mountain View, San Carlos, San Jose, and Sunnyvale) finds no evidence that prevailing wage policies affect the bid process or outcome in a way that increases construction costs.⁷² Kim, Chang, and Philips (2012) do not find any support for the view that wage policies discourage bidding by nonunion contractors, reduce the number of bidders, or prevent nonunion contractors from winning bids on prevailing wage projects. Their findings indicate that prevailing wage laws of northern California cities are not associated with higher construction costs.

In an analysis of the prevailing wage standard in British Columbia, Duncan and Prus (2005) find that the introduction of the policy did not alter the construction cost differential between a wide array of 723 public and private building types.⁷³ Public structures were from 43% to 40% more expensive to build than private structures before and after the introduction of the wage policy. This study has the advantage of including a control group of projects that were not affected by the wage policy and takes into considerations the type of structure (schools, hospitals, clinics, assembly buildings etc.), project size, and other characteristics of the building.

⁷¹ Vitaliano, Donald. 2002. "An Econometric Assessment of the Economic Efficiency of State Departments of Transportation," *International Journal of Transportation Economics*, Vol. 29, No. 2, pp. 167-180.

⁷² Kim, JaeWhan, Chang, Kuo-Liang and Philips, Peter. 2012. "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.

⁷³ Duncan, Kevin and Prus, Mark. 2005. Prevailing wage laws and construction costs: evidence from British Columbia's Skills Development and Fair Wage Policy. In Hamid Azari-Rad, Peter Philips, and Mark Prus (Eds.), *The Economics of Prevailing Wage Laws*, pp. 123-148. Aldershot, UK: Ashgate.

Kaboub and Kelsay (2014) examine the construction of over 3,000 projects in 12 midwestern states between 1993 and 2002. Results for 13 different project types (hospitals, schools, manufacturing and office buildings, etc.) indicate that while public projects are more expensive than the construction of comparable private structures, the presence of prevailing wage laws did not alter this cost differential.

While the research addressing prevailing wages and the cost of building schools, highways, and offices, etc. generally finds no statistically significant cost effect, the results regarding the construction of affordable housing differ. There are three peer-reviewed studies that examine the effect of prevailing wage requirements on the cost of building affordable housing in California that was subsidized by state and federal Low-Income Housing Tax Credit policies. All three studies utilize data obtained from the California Tax Credit Allocation Committee and all of the studies find that construction and total project costs are higher when prevailing wages apply with impacts ranging between 5% and 37%.

Dunn, Quigley, and Rosenthal (2005) analyze the construction of 205 new housing projects that were completed between 1997 and 2002 and report that construction (site preparation and building) costs were from 9% to 37% higher on covered projects.⁷⁴ These authors also find that total project costs, including building, land, engineering, financing, and developer costs, etc. were from 10% to 37% higher when prevailing wages apply. Palm and Niemeier (2017) examine 496 housing projects built between 2008 and 2016 and report

⁷⁴ Dunn, Sarah; John Quigley; and Larry Rosenthal. (2005). "The Effects of Prevailing Wage Regulations on the Cost of Low-Income Housing," *Industrial and Labor Relations Review*, 59(1): 141-157.

prevailing wage cost effects between 15% and 16% per unit.⁷⁵ Littlehale's (2017) study is based on housing built between 2001 and 2011 and this author finds that prevailing wage requirements increase total project costs (excluding land acquisition costs) from 5% to 7%.⁷⁶ A 2016 study by New York City Independent Budget Office reports prevailing wage requirements added 13% to the cost of building affordable housing projects in New York.⁷⁷ This analysis is based on 201 projects and is within the range of cost impacts reported in the peer-reviewed studies. The variation in results between these three peer-reviewed papers is due to the different statistical models used by the researchers. Littlehale's model has the lower cost estimates due to additional measures of project complexity.

There are several possible explanations why the results for affordable housing differ from those of other building types. First, residential construction requires fewer skills than other building activity. In this case, low skilled, low wage workers may have a cost advantage over higher paid, higher skilled workers in this type of construction. Also, there are numerous federal and state tax subsidies and other government involvement involved in affordable housing in addition to prevailing wage regulations. Therefore, it may be difficult to separate the effect of prevailing wages on construction costs from the effects of other policies.

The additional regulations associated with affordable housing construction, particularly the submission of certified payroll records required by prevailing wage regulations, may deter those contractors who engage in wage theft and other illegal compensation standards to reduce

⁷⁵ Palm, Matthew and Deb Niemeier. (2017). "Does Placing Affordable Housing Near Rail Raise Development Costs? Evidence From California's Four Largest Metropolitan Planning Organizations," *Housing Policy Debate*, 1-19.

⁷⁶ Littlehale, Scott. Forthcoming. "Revisiting the Cost of Developing New Subsidized Housing: The Relative Import of Construction Wage Standards and Nonprofit Development." *Berkeley Planning Journal*.

⁷⁷ See New York City Independent Budget Office. 2016. "The Impact of Prevailing Wage Requirements on Affordable Housing Construction in New York City," February. Accessed at: <http://www.ibo.nyc.ny.us/iboreports/the-impact-of-prevailing-wage-requirement-on-affordable-housing-construction-in-new-york-city.pdf>.

bids and construction costs. By making certified payroll records public and accessible on-line, the State of California has made it easier for construction workers employed on prevailing wage projects to compare their earnings to those reported by the contractor.⁷⁸ Regardless, illegal cost-saving practices such as worker misclassification (paying workers as contractors instead of employees), wage theft, and the hiring of undocumented laborers are problematic in the construction industry, particularly for residential construction.⁷⁹ Regardless of the sector, construction had the highest level of back wage settlements (\$41.7 million) in 2016 among the U.S. Department of Labor's low wage, high violation industries.⁸⁰ Construction ranked second, behind food services, with respect to the number of back wage cases and workers involved.

What is true of the construction industry nationwide is true of the industry in New York. For example, in 2017 Governor Cuomo announced the results of a broad partnership with New York State Attorney General Schneiderman and the District Attorneys of all five New York City Counties, Westchester, and Nassau Counties to bring criminal charges against contractors who engaged in wage theft.⁸¹ The General Attorney's office reports that since 2011, nearly \$30 million in stolen wages for more than 21,000 workers has been recovered. The New York State Department of Labor indicated the crackdown in the downstate construction industry was initiated in response to reports of widespread worker exploitation in the industry. Immigrant workers, who comprise a disproportionate number of the construction workforce, are more likely

⁷⁸ See "eCPR Search," Department of Industrial Relations, State of California. Accessed at: <https://efiling.dir.ca.gov/eCPR/pages/search>. For a simple illustration of viewing a certified payroll, at the web site select a small county (Alpine) at the *County* prompt. Select the date of program inception (2-1-18) at the *Date Range From* prompt and the current date at the *Date Range To* prompt. Click *Search* and PDF copies of weekly and complete certified payrolls can be selected for public works completed in this county. Employee names, addresses, and social security numbers are redacted.

⁷⁹ Juravich, Tom, Ablavsky, Essie, and Williams, Jake. 2015. "The Epidemic of Wage Theft in Residential Construction in Massachusetts," Labor Center, University of Massachusetts-Amherst. Accessed at: https://www.umass.edu/lrrc/sites/default/files/Wage_Theft_Report.pdf.

⁸⁰ U.S. Department of Labor, Low Wage, High Violation Industries <https://www.dol.gov/whd/data/datatables.htm>.

⁸¹ New York State Department of Labor. 2017. "Governor Cuomo, Attorney General Schneiderman Partner with Prosecutors to Crackdown on Wage Theft in the Construction Industry," Press Release Archive, December 4. Accessed at: <https://www.labor.ny.gov/pressreleases/2017/december-04-2017.shtml>

to victims of wage theft and to work under unsafe conditions, particularly at non-union construction sites. According to Manhattan District Attorney Cyrus Vance, Jr.:

"Every week, New Yorkers lose \$20 million in unpaid wages. And every day, construction workers who risk their lives doing dangerous jobs have to wonder whether they'll actually be paid for their work. Wage theft is one of the most pervasive problems in New York City and State, and in the construction industry in particular, workers are all too often preyed upon by their employers, who are able to steal millions of dollars in unpaid wages."

The point is that at least part of the increased prevailing wage cost effect found in affordable housing studies can likely be attributable to the decline in cost-saving, but illegal, employment practices when the wage policy is in effect.

There have been 20 peer-reviewed studies examining the cost implications of prevailing wage laws since 2000. Nine of the eleven school studies fail to find that prevailing wages are consistently associated with increased construction costs. Two other studies find positive cost impacts and a third study yields mixed results. There are nine additional studies that examine other types of projects with five of these studies finding that prevailing wages have no statistically significant cost effect. Of the total of 20 peer-reviewed studies, 14 (70%) fail to find a statistically significant prevailing wage cost effect.

In addition to the peer-reviewed research, there have been other studies that are based on the examination of winning contractor bid data to measure the cost effect of prevailing wages. In an examination of new construction costs in Kentucky, Michigan, and Ohio during periods in the 1990s when prevailing wage policies for school projects changed within these states, Philips (2014) finds that there was no statistically significant difference in average square foot school

construction costs associated with a change in prevailing wage policies.⁸² This study is based on the analysis of 391 projects. Onsarigo, Atalah, Manzo, and Duncan (2017) examine 110 public schools built in Ohio between 2013 and 2014.⁸³ Some of the construction projects received federal funding and were covered by federal Davis-Bacon prevailing wage requirements. Results indicate that the cost of these schools were no different that the school construction that was not covered by the wage policy. This is one of four other studies of school construction costs in Ohio that has either been peer-reviewed or conducted by state agencies that find that prevailing wage or similar construction labor market policies are not associated with increased construction costs.⁸⁴

Prevailing Wage Laws and Bid Competition

Many prevailing wage opponents assert that one way the wage policy increases construction costs is by reducing the level of bid competition. This claim is often made in the absence of any empirical evidence.⁸⁵ There have been three peer-reviewed studies and one other report that empirically examine the effect of the wage policy on the level of bid competition. All of these studies are based on the statistical analysis of contractor bids and all find that prevailing

⁸² Philips, Peter. 2014. Kentucky's Prevailing Wage Law: An Economic Impact Analysis. Accessed at: <http://www.faircontracting.org/wp-content/uploads/2014/02/Kentucky-Report-2014-Philips.pdf>.

⁸³ Onsarigo, Lameck; Alan Atalah; Frank Manzo IV; and Kevin Duncan. (2017). *The Economic, Fiscal, and Social Effects of Ohio's Prevailing Wage Law*. Kent State University; Bowling Green State University; Midwest Economic Policy Institute; Colorado State University-Pueblo. Accessed at: <https://illinoisepi.org/site/wp-content/themes/hollow/docs/prevailing-wage/bowling-green-su-kent-state-ohio-pw-study-4-10-17.pdf>.

⁸⁴ There are numerous other studies that have not been peer-reviewed that are based on the statistical analysis of contractor bids that find do not find evidence that prevailing wage laws increase construction costs. For examples see Prus, Mark. 1996. "The Effect of State Prevailing Wage Laws on Total Construction Costs. Accessed at: http://www.faircontracting.org/PDFs/prevailing_wages/effects_davisbacon.pdf. Prus, Mark. 1999. "Prevailing Wage Laws and School Construction Costs: An Analysis of Public School Construction in Maryland and the Mid Atlantic States." Accessed at: <http://eric.ed.gov/?id=ED456630>. Wial, Howard. 1999. "Do Lower Prevailing Wages Reduce Public Construction Costs," Keystone Research Center. Accessed at: http://keystoneresearch.org/sites/default/files/krc_prevailwage_costs.pdf. Kelsey, Michael. 2015. "The Adverse Economic Impact From Repeal of the Prevailing Wage Law in West Virginia." Accessed at: <http://www.faircontracting.org/wp-content/uploads/2015/01/The-Adverse-Economic-Impact-from-Repeal-of-the-PW-Law-in-WV-Dr.-Michael-Kelsay-Full-Report.pdf>.

⁸⁵ For an example, see George Leef. 2010. Prevailing Wage Laws: Public Interest or Special Interest Legislation? *Cato Journal*, 30(1):137-154.

wage requirements do not reduce the number of bidders. In an examination of public works projects in five northern California cities, Kim, Kuo-Liang, and Philips (2012) find no evidence that prevailing wage policies affect the number of bidders.⁸⁶ In an examination of highway construction in Colorado, Duncan (2015) finds that the level of bid competition does not differ between federally funded projects that require the payment of prevailing wage laws and adherence to the Disadvantage Business Enterprise policy and state-funded projects that are not subject to either of these policies.⁸⁷ In an examination of the of school construction costs in British Columbia, Bilginsoy (1999) finds that introduction of prevailing wage requirements was associated with an increase bid competition that diminished over time.⁸⁸ While the study of school construction costs in Ohio by Onsarigo, Atalah, Manzo, and Duncan (2017) has not been peer-reviewed, these authors also find that prevailing wage requirements are also associated with increased bid competition.⁸⁹ The level of bid competition is an important determinant of contractor bids and construction costs. All of the studies that have used data on project bids and the number of bidders as the basis of their examination find that the wage policy does not increase costs by reducing the level of bid competition.

⁸⁶ See JaeWhan Kim, Chang Kuo-Liang, and Peter Philips. 2012. "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.

⁸⁷ See Kevin Duncan. 2015. "The Effect of Federal Davis-Bacon and Disadvantaged Business Enterprise Regulations on Highway Maintenance Costs." *Industrial and Labor Relations Review*, Vol. 68, No. 1, pp. 212-237

⁸⁸ See Cihan Bilginsoy. 1999. "Labor Market Regulation on the Winner's Curse." *Economic Inquiry* 37: 387-400.

⁸⁹ See Lameck Onsarigo, Alan Atalah, Frank Manzo, and Kevin Duncan. 2017. "The Economic, Fiscal, and Social Effects of Ohio's Prevailing Wage Law." Accessed at: <https://midwestepi.files.wordpress.com/2016/05/bowling-green-su-kent-state-ohio-pw-study-4-10-17.pdf>.

The Economic Impact of Applying Prevailing Wage Coverage to Currently Excluded Publicly-Subsidized Construction

The effect of prevailing wage requirements on contractor labor costs is uneven. For those contractors who pay union wage and benefit rates, or close to union rates, the minimum wage requirement has no impact or a very small effect on overall employee compensation. It is the contractor who pays substantially less than the union rate who faces significant changes in labor cost when confronted with prevailing wage requirements. The low-wage, low-benefit contractor must make substantial changes in labor productivity and overall construction efficiency to compete with other contractors whose labor costs are not significantly affected by the wage requirements. Some of the adjustments these contractors make likely involve lower profit margins. This is particularly the case if the payment of prevailing wages is not associated with increased construction costs as the preponderance of peer-reviewed research reveals. This identifies the basic conflict over prevailing wages: the trade-off between higher wages for construction workers and lower contractor profits.

There are winners and losers when it comes to prevailing wages. The publicly available data and peer-reviewed research indicates that without prevailing wages, construction worker incomes are lower.⁹⁰ This sets the stage for increased contractor profits.⁹¹ With the wage policy, wage income is higher and profits are lower. Important considerations for policy makers

⁹⁰ Duncan, Kevin and Lantsberg, Alex. 2015. "Building the Golden State: The Economic Impacts of California's Prevailing Wage Policy." Accessed at: <https://www.smartcitiesprevail.org/wp-content/uploads/sites/24/2017/03/SCP-Building-the-Golden-State-WEB.pdf>. See also Kessler, Daniel and Lawrence Katz. 2001. "Prevailing Wage Laws and Construction Labor Markets," *Industrial and Labor Relations Review*, Vol. 54, No. 2, pp. 259-274.

⁹¹ According to recent research, the elasticity of construction labor demand is inelastic (-0.14). This means that total wage bill will decrease with a decrease in wage rates. A decrease in labor costs creates conditions for increased profit. The opposite is also the case. With inelastic labor demand, higher wages mean an increased overall labor costs and fewer funds available for profit. For the estimates of labor demand elasticities for construction and other industries see Maiti, Abhradeep, and Debarshi Indra. 2016. "Regional Variations in Labor Demand Elasticity: Evidence from U.S. Counties." *Journal of Regional Science*, Vol. 56, No. 4, pp. 635-658.

concern not only the effect of the wage policy on construction costs and training in the construction industry, but also the net impact on the economy associated with changes in wage and profit income. This section of the report measures the changes in wage and profit income associated with applying prevailing wage requirements to IDA-subsidized construction activity and the resulting change in state-level economic activity.⁹² These projects were selected because of the availability of information on project value and the share of value represented by construction activity. This type of detailed information is not publicly available for other development agencies that would also be affected by the proposed policy change such as Regional Economic Development Councils.⁹³

The impact is based on the best publicly available data, peer-reviewed research, and state-of-the-art economic impact software with the most recent data for New York State. Several steps are necessary to measure this impact. The most recent data on state-wide IDA projects is used to determine the amount of project value that consists of construction activity. Labor costs for IDA projects without prevailing wage requirements are compared to labor costs under the wage policy. Wage increases in construction, or any other industry are associated with reduced hours of labor demanded, the use of more productive labor, and the substitution of capital equipment for all grades of labor. These factors are considered to determine labor costs with and without the wage policy. As the preponderance of peer-reviewed research indicates, prevailing

⁹² By protecting local wage rates prevailing wage laws also protect work for local contractors and their employees in ways that increase economic activity. For an example see. Onsarigo, Lameck; Alan Atalah; Frank Manzo IV; and Kevin Duncan. (2017). *The Economic, Fiscal, and Social Effects of Ohio's Prevailing Wage Law*. Kent State University; Bowling Green State University; Midwest Economic Policy Institute; Colorado State University-Pueblo. Accessed at: <https://illinoisepi.org/site/wp-content/themes/hollow/docs/prevailing-wage/bowling-green-su-kent-state-ohio-pw-study-4-10-17.pdf>. Some IDAs have local hire requirements for subsidized construction work. For examples see the local hire polices for Erie and Orange counties accessed at: <http://www.ecidany.com/news/article/current/2013/05/22/100158/the-erie-county-industrial-development-agency-has-adopted-a-policy-to-ensure-local-workers-are-hired-for-construction-jobs-on-agency-aided-projects> and <http://www.ocnyida.com/wp-content/uploads/01-12-2017-Labor-Policy-Adopted-2.pdf>. To the extent these policies are enforceable, they mimic prevailing wage laws. Since local hire provisions have an impact similar to prevailing wage laws, this study examine the economic impact of prevailing wages on the distribution of wage and profit income.

⁹³ See "CFA Projects," Regional Economic Development Councils, New York State. Accessed at: <https://regionalcouncils.ny.gov/cfa/projects>.

wages are not associated with increased construction costs. If costs remain stable, and if efforts to increase labor productivity do not entirely offset higher prevailing wage rates, some of the adjustment will involve reduced profits for low-wage, low-benefit contractors.⁹⁴ This residual portion of IDA construction value is the basis of the economic impact.

Data Analysis

The Office of the New York State Comptroller (OSC) submitted its most recent performance report on IDAs in 2016.⁹⁵ In 2015, Comptroller DiNapoli successfully pursued legislation to improve the quality of the information that IDAs gather about the projects in their region. Additionally, the Comptroller Office worked with the Authorities Budget Office to create the Public Authority Reporting Information System (PARIS) that is a repository for IDA information that allows it to be maintained in a consistent manner. Consequently, this report contains the best publicly available information about IDA subsidized projects. IDAs are meant to advance the job opportunities, health, general prosperity and economic welfare of the people of New York State. IDAs may perform these functions by, among other things, acquiring and disposing of property, and by issuing debt. Property under the jurisdiction, control or supervision of an IDA is exempt from property taxes as well as mortgage recording taxes, and some purchases for IDA projects are eligible for exemption from State and local sales taxes. IDAs fund their operations by charging fees to businesses that obtain financial assistance for an IDA project⁹⁶

⁹⁴ There is no way to reliably measure and include additional profits that can be obtained through the use of change orders.

⁹⁵ Office of the New York State Comptroller, "Annual Performance Report on New York State's Industrial Development Agencies. Fiscal Year Ending 2014," June 2016. Accessed at: https://www.osc.state.ny.us/localgov/pubs/research/ida_reports/2016/idaperformance.pdf.

⁹⁶ Ibid.

The OSC report is based on data for 2014 when there were 109 active IDAs across the state with 4,581 active development projects worth a total value of \$83.7 billion. Total project value is measured as the total value of the assets associated with the project. For example, if a company were to build a new factory in an area, the project value would be the value of construction and any equipment installed in the facility.

Manufacturing is the most common type of project receiving IDA subsidies in New York. Manufacturing accounted for 1,216 projects (27%) of all projects in 2014. The next most common category is “services” that accounts for 21% of projects (978). The services category covers a wide range of projects including construction of the Yankees and Mets stadiums, supermarket renovations, and mixed-use property development. Regardless of the type of project, construction activity, including renovations and additions, are often involved. Information from the Erie County IDA can be used to estimate the portion of a project that involves some kind of construction activity.⁹⁷ The data for Erie County are unique in that the anticipated value of manufacturing, commercial, and housing projects, etc. is divided into equipment purchases, soft costs (architectural and engineering costs) land acquisition, and construction expenditures. An examination of manufacturing projects indicates that 53% of the total value of these projects involves construction activity. On the other hand, 78% of the total value for combined commercial, residential, and retail projects, etc. consisted of construction activity. The data from the Erie County IDA is used to determine the extent of state-wide IDA projects that would be affected by prevailing wage requirements, should the policy apply to these public-private partnerships.

⁹⁷ See “Project Log,” Erie County Industrial Development Agency. Accessed at: <http://www.ecidany.com/>.

Before making this determination it is important to recognize that IDAs in Nassau, Rockland, and Suffolk already have prevailing wage requirements for subsidized work.⁹⁸ While the policy for the Rockland County IDA applies to any and all construction, the policies for IDAs in Nassau and Suffolk counties apply to construction projects exceeding \$5 million. A \$5 million value threshold effectively excludes projects in Nassau and Suffolk counties from prevailing wage coverage.

The first step in determining the portion of state-wide IDA projects that involve construction activity, and would be affected by prevailing wage requirements, is to delete the value for projects in Rockland County. According to the 2016 OSC report, the total project value for Rockland County was approximately \$1.4 billion in 2014. Therefore, the state-wide value of \$83.7 billion in 2014, minus the value for Rockland County is \$82.3 billion. The data from the Erie County IDA can be used to determine how much of this net project value consists of construction. Taking into consideration the distribution of types of projects (manufacturing, commercial, etc.) and differences in the portion of projects that involve construction activity, approximately 72.7% (\$59.8 billion) in net project value involves construction activity.⁹⁹ Adjusting this figure by the most recent construction cost index available from the Bureau of Labor Statistics indicates that, in 2017 dollars, the total value of state-wide IDA projects that

⁹⁸ For the Nassau county IDA prevailing wage minimum threshold value requirement see: http://nida.and.prevaling.wageassauida.org/wp-content/uploads/2017/08/38_PREV%20WAGE%20POLICY%20NCIDA2017.pdf. For the Suffolk County value threshold requirement see: http://www.suffolkida.org/gallery/editor/file/IDA_Applications/SC_IDA_Construction_Wage_Policy.pdf. According to the Executive Director of Rockland County IDA, if a subsidized projects involve construction, prevailing wages are required and there is no minimum threshold value.

⁹⁹ For example, weighting is based on manufacturing representing 27% of all projects (based on the 2016 OSC report) and 52% of manufacturing project value involves construction (based on data from the Erie County IDA). A similar process is used for commercial, residential, etc., projects. The value of the 384 construction projects identified in the OSC report are assigned a 100% construction weight.

consisted of construction was \$63.4 billion.¹⁰⁰ According to data from the U.S Census Bureau's *Economic Census of Construction*, labor costs (wages and benefits) represent 23.9% of total construction costs in New York State. The percentage is based on the average for aggregated construction types (commercial, residential, specialty trades, etc.) and is slightly above the national average of 23%.¹⁰¹ Using the percentage for New York indicates that approximately \$15.2 billion of total project construction value represents labor costs (\$63.4 billion x 23.9%).

IDA Project Labor Costs with and without Prevailing Wage Regulations

According to information obtained from Northeast Regional Council of Carpenters, participation in IDA-subsidized construction activity by contractors who are signatories to collective bargaining agreements participation in IDA projects is uneven across the state and typically low. As a consequence, construction workers on these projects typically earn open shop wages and benefits. Since prevailing wage and benefits are based on collective bargaining rates, information on union rates is readily available. What is more difficult to determine are open shop rates of pay since these data are not publicly available. What is important is the compensation paid to trades workers who are employed on the typical IDA project. According to data from the Erie County IDA, most subsidized construction work involves renovations and additions to existing structures. Based on feedback from construction industry professionals, the trades that are typically involved in this kind of work include carpenters, electricians, plumbers, laborers, masons, sheet metal workers and painters. An examination of several sources suggests that nonunion construction workers earn approximately 85% of the average prevailing wage rate

¹⁰⁰ Adjusted by the year-to-date for November with the construction price index obtained from the Federal Reserve Bank of St. Louis, "Producer Price Index by Commodity for Final Demand: Construction," Accessed at: <https://fred.stlouisfed.org/series/PPIFDC>.

¹⁰¹ This is the best publicly information on construction labor costs available, despite that it is an average based on union and nonunion wage and benefit rates.

in New York.¹⁰² Other data indicate that open shop benefit rates are approximately 30% of average union/prevaling rates in New York.

Data for the state-wide prevailing wage and benefit rates, for the selected trades most likely to be involved in IDA-subsidized construction, are reported in Table 1 below.¹⁰³ These wage rates are used to estimate the corresponding open shop rates for the selected trades, based on the percentage differences described above. Hourly prevailing wage rates are relatively close to average wage rates in New York measured by the Occupational Employment Statistics (OES) available from the Bureau of Labor Statistics.¹⁰⁴ Differences in hourly prevailing wage rates, OES average rates, and estimated nonunion wages are relatively small compared to differences in voluntary fringe benefits. Union contractor benefits provide much more generous health insurance and retirement benefits than nonunion builders. These two benefits represent about 79% of total benefits offered to union workers.¹⁰⁵

¹⁰² ENR reports open shop wage and benefit rates by trade for New York and New Jersey in 2016 (see “Labor Gaps Bring Steady Pay Raises,” ENR, 3Q Cost Report Labor. Accessed at https://www.enr.com/ext/resources/Issues/National_Issues/2016/Oct-2016/10-Oct/ENR1010_QCR3.pdf. For the occupations used in the ENR study, open shop wage rates are approximately 70% of union/prevaling wage rates (benefits are about 22%). However, it is not clear if the ENR wage survey includes residential construction workers who typically have lower skills and earnings relative to those employed in industrial (manufacturing) construction that represents much of IDA projects. Indiana reports prevailing wage rates based on either collective bargaining agreements or nonunion rates obtained from the Associated Builders and Contractors. Marion County, with high unionization rates, indicates that open shop wage rates are 81% of union rates, benefits are about 38% (see Common Construction Wage Home, Indiana Department of Labor, accessed at: <https://www.in.gov/dol/2723.htm>. Duncan (2016) uses an algebraic method to determine nonunion rates, given union and prevailing rates and finds that nonunion workers earn approximately 88% of the union wage (see Duncan, Kevin. 2016. “The Wage Differential Method: Promising Construction Costs Savings with the Repeal or Weakening of Prevailing Wage Laws that Cannot be Delivered,” September. Accessed at <https://www.csupueblo.edu/hasan-school-of-business/doc/kevin-duncan/wage-differential-method-critique-duncan-2016.pdf>.) Additional benefit information was obtained from the U.S. Department of Labor, Bureau of Labor Statistics, “Employer Costs of Employee Compensation.” Accessed at: <https://www.bls.gov/news.release/eccc.toc.htm>. This information for 2017 indicates that nonunion voluntary fringe benefits are about 30% of union rates.

¹⁰³ Average PW rates for all 57 counties, plus the City of New York. Prevailing wage rates for the period for 07/01/2017 - 06/30/2018 were obtained from New York State Department of Labor, “Article 8 Prevailing Wage Schedules.” Accessed at: <https://applications.labor.ny.gov/wpp/publicViewPWChanges.do?method=showIt#>.

¹⁰⁴ Occupational Employment Statistics from May 2016. Accessed at: <https://www.bls.gov/oes/>.

¹⁰⁵ Based on 2015 data for carpenters obtained from the Empire Center study, Prevailing Wage, accessed at: <https://www.empirecenter.org/wp-content/uploads/2017/04/PW-final.pdf>.

Table 1. Average New York State Prevailing Wage and Benefits Compared to Occupation Employment Wages, and Estimated Open Shop Wage Rates.

Trade	Prevailing Wage	OES Average	Open Shop Wage	Prevailing Benefits	Open Shop Benefits
Carpenter	\$31.10	\$29.76	\$26.43	\$22.65	\$6.80
Electrician	\$36.37	\$35.10	\$30.91	\$25.30	\$7.60
Plumber	\$36.95	\$36.90	\$31.41	\$25.51	\$7.65
Laborer	\$27.03	\$23.11	\$22.98	\$21.64	\$6.50
Brick Mason	\$34.27	\$35.57	\$29.13	\$22.81	\$6.84
Sheet Metal	\$32.52	\$31.20	\$27.62	\$27.51	\$8.25
Painter	\$28.04	\$24.53	\$23.83	\$19.76	\$5.93
Weighted Average	\$31.79	\$29.84	\$27.02	\$23.49	\$7.05

Sources: "Article 8 Prevailing Wage Schedules for 07/01/2017 - 06/30/2018," York State Department of Labor Accessed at: <https://applications.labor.ny.gov/wpp/publicViewPWChanges.do?method=showIt#> and Occupational Employment Statistics, Bureau of Labor Statistics, U.S. Department of Labor accessed <https://www.bls.gov/oes/>.

These wage and benefit data are for the selected trades are weighted for the proportion of work each trade is typically employed.¹⁰⁶ The total package under the weighted average union rate is approximately \$55.30 (\$31.79 in wages and \$23.49 in benefits) and about \$34.00 (\$27.02 in wages and \$7.05 in benefits) for open shop workers. This hourly wage information can be used to determine the number of hours needed to complete \$63.4 billion in IDA construction work if labor costs on these projects in \$15.2 billion.¹⁰⁷

If nonunion rate is \$34.00 per hour, approximately 447,000 hours are needed to complete this work (447,000 hours = \$15.2 billion / \$34.00 per hour). If prevailing wages were required on these projects, the applicable rate would be approximately \$55.30 per hour. The increase in the wages paid to construction workers would stimulate changes that would affect the number of

¹⁰⁶ Based on hours worked for these trades on renovation projects obtained from the Northeast Regional Council of Carpenters and on employment by trade reported by the Occupational Employment Statistics for New York, accessed at <https://www.bls.gov/oes/>.

¹⁰⁷ The wage and benefit comparisons do not take into account the use of lower paid helpers on the nonunion side and the use of apprentices on the union side. Nonunion helpers earn significantly less than nonunion journeymen while apprentices are employed at fixed ratios relative to journeymen and earn reduced wages depending on their progress through the training program. Since the use of helpers likely reduces labor costs by more than the use of apprentices, the wage comparisons are likely to be too small and contribute to a relatively smaller, more conservative economic impact.

hours needed to complete the project. Construction labor demand, like the demand for other types of labor is downward sloping, meaning that an increase in wage rates is associated with a decrease in hours of labor demanded. Also, peer-reviewed research indicates that when wages increase in the construction industry, contractors take steps to increase the efficiency of construction by using more skilled workers and capital equipment.¹⁰⁸ After all of these changes are made, hours needed to complete \$63.4 billion in IDA construction projects would decrease to approximately 313 hours. With total hour prevailing wage compensation of \$55.30 per hour, labor costs would rise to \$17.3 billion dollars (from \$15.2 billion with the open shop rate of \$34.00).

The \$2.1 billion difference (\$17.3 billion - \$15.2 billion) represents the increase in labor costs that have not been adjusted away.¹⁰⁹ Since the preponderance of research indicates that

¹⁰⁸ When wages increase in construction, or any other industry, hours worked demanded will decrease. For example, recent research indicates that when wages in the construction industry increase by 1%, labor demand decreases by 0.14% (see Maiti, Abhradeep, and Debarshi Indra. 2016. "Regional Variations in Labor Demand Elasticity: Evidence from U.S. Counties." *Journal of Regional Science*, Vol. 56, No. 4, pp. 635-658). This low elasticity of labor demand is consistent with labor costs equal to a low percent of total construction costs. Regardless, this elasticity suggests that if wages increase from \$34.00 to \$55.30 (62%), demand for hours of work will decrease by approximately 8.7%. This means that with high wage rates, the hours of work would decrease from 447,000 to about 408,000 hours. Additionally, when wages rise in construction or any other industry, employers take steps to increase productivity to offset, at least partially, the cost effects of the increased wages. For example, skilled workers replace unskilled workers and capital equipment replaces all grades of labor (see Balistreri, Edward; Christine McDaniel; and Eina Vivian Wong. (2003). "An Estimation of U.S. Industry-Level Capital-Labor Substitution Elasticities: Support for Cobb-Douglas," *The North American Journal of Economics and Finance*, 14: 343-356 and Blankenau, William and Steven Cassou. (2011). "Industry Differences in the Elasticity of Substitution and Rate of Biased Technological Change between Skilled and Unskilled Labor," *Applied Economics*, 43: 3129-3142). The data needed to make adjustments to labor and capital equipment is not available for the type of projects used in this study. However, Duncan, Philips, and Prus (2009) report with the introduction of prevailing wage regulations in British Columbia, the inefficiency of construction increased by approximately 8.6 percentage points. However, for projects covered by the extension of the policy 17 months later, construction inefficiency decreased by about 31.8 percentage points. The net effect of these productivity changes is about 23.2% decrease in construction inefficiency (31.8 - 8.6). At the time of the British Columbia policy, prevailing wages were 119% of nonunion hourly wage (see Duncan, Philips and Prus 2014). The data reported in Table 4 (above) suggests that union wages are approximately 118%. Consequently, the effect of introducing prevailing wages on the efficiency of IDA-subsidized construction should be similar. Assuming that the net decrease in construction inefficiency applies to labor hours worked, the 23% net change is associated with a reduction in hours worked from 408,000 hours to 313,000 hours. With all of the adjustments associated with the switch to prevailing wages, labor costs with prevailing wages is approximately \$17.3 billion ($\$55.3 \times 313,000$ hours) versus \$15.2 billion ($\$34.00 \times 447,000$ hours).

¹⁰⁹ Based on the midpoint between \$15.2 billion and \$17.3 billion, the percent change in construction worker income and voluntary benefits (\$2.1 billion) attributed to the wage policy is approximately 13% ($\$2.1 \text{ billion} / \16.25 billion). This is slightly below the combined decrease in construction worker income and voluntary benefits associated with prevailing wage repeal reported in a recent study. The decrease in combined income and voluntary benefit ranges between 13.1% and 20.2%. See Ari Fenn, Zhi Li, Gabriel Pleites, Chimedlkham Zorigbaatar, and Peter Philips. 2018. "The Effect of Prevailing Wage Repeals on Construction Worker Incomes and Benefits," *Public Works and Management*, DOI:10.1177/1087724X18758340, p. 1-19.

prevailing wage laws are not associated with increased construction costs, this additional increase in wage costs is offset by a corresponding decrease in contractor profit. The amount represents about 3.3% of the total \$63.4 billion in construction activity (\$2.1 billion divided by \$63.4 billion).

The IMPLAN Economic Impact Software

The impact of the wage/profit trade-off associated with the application of prevailing wage laws to IDA-subsidized construction projects can be measured using the IMPLAN economic impact software. This economic impact analysis is based on the multiplier, or ripple effect, associated with net effect of an increase in wage income and a corresponding decrease in contractor profit income on New York's economy. IMPLAN (IMpact analysis for PLANning) was originally developed by the U.S. Department of Agriculture to assist the Forest Service with land and resource management planning. The Minnesota IMPLAN Group (MIG) started work on the data-driven model in the mid-1980s at the University of Minnesota. The software was privatized in 1993 and made available for public use. The software contains an input-output model with data available at the zip-code, county, state, and national levels.

Input-output analysis measures the inter-industry relationships within an economy. Specifically, input-output analysis is a means of measuring the market transactions between businesses and between businesses and consumers. This framework allows for the examination of how a change in one sector affects the entire economy. In this way, input-output analysis is able to analyze the economic effects of policy alternatives by measuring the multiplier, or ripple effect, as an initial change in wage and profit income stimulates further changes in transactions

between other businesses and households. The impact is measured in terms of changes in the level of economic activity, employment, and tax revenue within a region. The results reported in this study are based on the most recent IMPLAN data for state of New York (2016). IMPLAN deflators are used to adjust for changes in prices over time. The results are reported in 2018 dollars. The specific model is based on household income impacts as well as changes in health and retirement benefits associated with the extension of prevailing wages.

Economic Impact Results

Economic impact results are reported in Table 2. The extension of prevailing wage requirements to IDA construction activity would shift approximately \$2.1 billion in income from contractors to construction workers. The wage and benefit data reported in Table 1 suggests that fringe benefits represent 42% of the total package for workers earning prevailing wages (\$23.49/\$55.28) with wage income representing the remaining 58% (\$31.79/\$55.28). Benefits include contributions to health insurance and retirement pensions, but also include items related to income (vacation pay, etc.). Netting income-related items from benefits results in 62% of the total package allocated to construction worker income with approximately 38% of the package allocated toward health insurance and retirement plans.¹¹⁰ Based on this distribution, \$1.3 billion (62%) of the \$2.1 billion of additional construction worker income, attributed to the payment of prevailing wages, takes the form of construction worker income. The remaining 38% (\$800 million) is allocated between health and retirement plans. The new income for construction workers comes at the cost of reduced contractor profit of \$2.1 billion.

¹¹⁰ Based on detailed breakdown of carpenter total package for 2015 reported in based on 2015 data for carpenters obtained from the Empire Center study, Prevailing Wage, accessed at: <https://www.empirecenter.org/wp-content/uploads/2017/04/PW-final.pdf>. The impact focuses on the change in income and voluntary benefits and does not include changes in required benefits (social security and Medicare, etc.).

Table 2. Economic Impact Results of Applying Prevailing Wage Coverage to Construction Subsidized by Industrial Development Agencies.

Spending Category	Direct Spending Change	Economic Impact	Employment Impact	State and Local Impact
Worker Income	\$1.3 billion	\$1.4 billion	8,220	\$102.4 million
Worker Benefits	\$800 million	\$1.5 billion	4,980	\$55.8 million
Contractor Profit	-\$2.1 billion	-\$1.1 billion	-7,050	-\$85.5 million
Total	\$0.00	\$1.8 billion	6,150	\$72.7 million

Source IMPLAN with 2016 data for New York State.

The IMPLAN software adjusts household income impacts for spending that leaks out of the region. The spending data that is the basis of the software indicates that higher income households spend more of their income than lower income households. The spending that remains in the region examined induces additional economic activity. For example, construction workers earn relatively lower incomes.¹¹¹ As a consequence, more of this income is spent in New York. When construction workers buy retail items and services, employment and income in these industries increases. This induces additional income or what is known as the ripple (multiplier) effect. The net result for the leakage and induced effects of the additional construction worker income of \$1.3 billion is a positive \$1.4 billion. Since contractor income is relatively higher, more of the \$2.1 billion in income is already spent outside of New York. The impact of the decrease in contractor income that remained in the state is -\$1.1 billion. Since New York has well-developed insurance and financial services industries much of the \$800 million in benefits remains in the state and stimulates an additional \$1.5 billion in economic activity. The overall impact of three components is \$1.8 billion. The corresponding net employment change is approximately more 6,200 jobs. With the payment of prevailing wages on

¹¹¹ Average construction worker earning in New York in 2017 were approximately \$65,000 on average according data reported by Ormiston, Russell, Belman, Dale, and Hinkel, Matt. 2017. "New York's Prevailing Wage Law A cost Benefit Analysis." Economic Policy Institute. Accessed at: <https://www.epi.org/publication/new-yorks-prevailing-wage-law-a-cost-benefit-analysis/>.

IDA-subsidized construction state and local tax revenue will increase by approximately \$73 million.

The overall economic impact is the sum of industry-level impacts. The employment and revenue for the top 10 industries in the state that would be most affected by the extension of prevailing wages are listed in Table 3. Since the largest impact component is related to health and insurance benefits, it is not surprising that different aspects of the financial services industries would benefit from the extension of prevailing wages. The increase in construction worker income would mean more spending on health services, restaurants, and retail. Additional economic activity would stimulate the real estate and wholesale trade industries. The industry-level impact reveals the economic development aspect of prevailing wages. The wage policy stimulates economic activity in industries that are not related to the construction industry.

Table 3. Top 10 Industries Affected by Applying Prevailing Wage Coverage to Construction Subsidized by Industrial Development Agencies, by Employment and Sales Revenue.

Industry	Jobs	Sales Revenue
Funds and trusts	1,950	\$818.7 million
Other financial investments	958	\$265.3 million
Hospitals	330	\$56.7 million
Real estate	308	\$75.6 million
Securities and brokerages	209	\$70.1 million
Full-service restaurants	162	\$10.1 million
Offices of physicians	127	\$18.5 million
Limited-service restaurants	116	\$12.5 million
Retail - Food and beverage stores	98	\$7.0 million

Source IMPLAN with 2016 data for New York State.

The economic impact of prevailing wage laws is consistent with wage-led approaches to economic growth.¹¹² According to this view, a shift from profit to wage income results in an

¹¹² For an example, see Stockhammer, Engelbert and Onaran, Oziem. 2013. "Wage-Led Growth: Theory, Evidence, Policy," Review of Keynesian Economics, Vol. 1, Issue 1, DOI: <http://dx.doi.org/10.4337/roke.2013.01.04>.

overall increase in demand because of differences in spending propensities. This increase in demand offsets any supply-side investment and profit decreases associated with increased wages.

The distribution of profit and wage income is significant to contractors and construction workers. However, the economic impact is relatively small. For example, the impact of \$1.8 billion represents approximately 0.1% of overall economic activity in New York.¹¹³ The economic impact of prevailing wages is small for the same reason that the preponderance of research finds that construction costs are not affected by the presence of the wage policy: construction worker labor costs are a low percent of total construction costs.

Prevailing Wages and Apprenticeship Training

In addition to the fundamental goal of protecting local wage rates from distortions associated with public construction procurement, prevailing wage laws also facilitate formal training in the industry. Construction is distinct from other industries in that the inherent instability of building activity creates strong disincentives for employers and employees to invest in a highly skilled, efficient, and safe workforce. Due to fluctuations in seasons and economic activity, construction is the most unstable sector of New York's economy. Much of construction is outdoor activity and as a result, construction employment varies with the season. For example, comparing employment during the four peak summer months to the slowest four winter months indicates that construction employment decreased by 10.1% in New York over the 2016-2017 period.¹¹⁴ This rate outpaced employment fluctuations in other seasonally-sensitive industries

¹¹³ According to the Bureau of Economic Analysis, New York State's 2016 GDP was approximately \$1.5 trillion. In 2016. The IMPLAN impact reported above is based on output and sales revenue. GDP is based on value added and IMPLAN impact based on value added is \$1.1 billion or 0.07% of GDP. See "Regional Economic Accounts," Bureau of Economic Analysis, U.S. Department of Commerce. Accessed at: <https://www.bea.gov/regional/>.

¹¹⁴ These data are for all blue and white collar employees in the industry. The peak months in construction employment are typically June-September across the nation. December-March is marked by the lowest levels of employment. Data obtained from

such as New York's leisure, hospitality, and retail trade industries where employment decreased by 9.3% over the same period.¹¹⁵ The construction industry was particularly hard-hit by the Great Recession. New York's construction peaked in 2008 with 359,964 blue and white-collar employees. By 2010, employment in the industry decreased by 15.1% to 305,601 jobs. Over this same period, total employment in the state decreased by 3.6%.

The end result of instability in the construction industry is a loose attachment between contractors and their employees. When work is available, contractors take on additional workers, but typically shed employees when a project is completed, the season comes to an end, or the economy slows. As a consequence, there is little incentive for contractors to incur the expenses associated with training. There is no guarantee that the trained worker will be retained and it is likely that at some point a trained employee may work for a competing contractor. From the worker's perspective, there is also little incentive to incur the costs of training due to intermittent spells of unemployment between projects, transitions to work in other industries, and seasonal layoffs.¹¹⁶ Economic fluctuations exacerbate the training problem, with downturns resulting in fewer jobs for trainable young people followed by a shortage of skilled workers when the economy expands. The industry is currently experiencing a skilled labor shortage in construction with 60% of surveyed contractors reporting difficulty finding skilled workers during

the Quarterly Census of Wages and Employment of the Bureau of Labor Statistics, U.S. Department of Labor. Accessed at: <http://www.bls.gov/cew/>.

¹¹⁵ Peak employment in the leisure and hospitality industry typically occurs between May and August with the lowest employment between November-February. Peak employment in the retail industry occurs between October and January with low months between February and March. See the Quarterly Census of Employment and Wages. Accessed at: <http://www.bls.gov/cew/>.

¹¹⁶ For a detailed explanation see Philips, Peter, "Dual Worlds: The Two Growth Paths in U.S. Construction," in *Building Chaos: An International Comparison of the Effects of Deregulation on the Construction*, (Peter Philips and Gerhard Bosch, eds.) Routledge Press, London, 2003.

the third quarter of 2017.¹¹⁷ This shortage is rooted in the instability of the industry and the attendant disincentive for workers or contractors to incur the cost of training.

The challenges associated with training workers exist alongside the need for a skilled labor force that can build customized projects. Unlike manufacturing where the product and the production process are uniform, the majority of construction “output” is not standardized. Outside of residential construction, the majority of building sites, designs, and logistics vary from project to project. Broadly trained craft workers are needed to adjust to the non-routine aspects of customized construction.

The industry has responded to the mismatch between strong disincentives to train and the need for a skilled, safe, and sustained workforce by creating formal apprenticeship training programs. Apprenticeships typically involve a mix of on-the-job training and in-class theoretical education that covers the basic and specialized skills of a particular craft (for carpenters, electricians, and plumbers, etc.).¹¹⁸ During the on-the-job component of training, the apprentice earns less than the fully-trained journeyworker.¹¹⁹ With this arrangement the cost of training workers is shared between the apprentice and the employers who are sponsoring the training. Accordingly, apprenticeship programs address the disincentives that discourage employers and workers from pursuing training. Upon successful completion of the program, the apprentice becomes a certified journeyworker. The program results in a relatively homogenous skilled workforce in an industry that is otherwise largely free of certifications that reveal worker quality.

¹¹⁷ See “As Hurricanes Maria and Jose Approach, Construction Industry Still Suffering from Labor Shortage.” *Fortune*, September 18, 2017. Accessed at: <http://fortune.com/2017/09/18/hurricane-maria-hurricane-jose-construction-jobs/>

¹¹⁸ On-the-job training ranges between 6,000 to 8,000 hours (3-4 years) with in-class instruction ranging between 430 to 580 hours. See Bilginsoy, Cihan. 2003. “The Hazards of Training: Attrition and Retention in Construction Industry Apprenticeship Programs.” *Industrial and Labor Relations Review*, Vol. 27, Issue 1, pp. 54-67.

¹¹⁹ Compensation varies with the program, but usually starts at 50% of the hourly rate for the corresponding journey worker and increases with progression through the training program. See Bilginsoy, Cihan. 2007. “Delivering Skills: Apprenticeship Program Sponsorship and Transition from Training.” *Industrial Relations*, Vol. 46, No. 4, pp. 738-763.

The Office of Apprenticeships at the U.S. Department of Labor works in conjunction with approved State Apprenticeship Agencies to set basic standards for programs that meet federal requirements for formal apprenticeship and prevailing wage work. Within this framework, sponsors have freedom to determine program content, applicant qualifications, and other aspects of the program.¹²⁰ In the open shop (nonunion) segment of the construction industry, apprenticeship programs are sponsored by a single contractor or by groups of nonunion employers. These employers unilaterally determine program content, set entry requirements, select apprenticeships, and monitor trainee progress. In the unionized sector, apprenticeship training is jointly determined and managed by unions and contractors who are signatories to collective bargaining agreements.

In the open shop sector of New York's construction industry apprenticeship training is offered through independent contractors or groups of contractors involved in particular types of work (such as the Empire State Highway Contractors Association, Inc.).¹²¹ In addition the Associated Builders and Contractors, Inc. (ABC) provides training. This is the only broad-based construction association that provides open shop contractors with accredited related instruction to meet the requirements of state-approved programs.¹²² In the unionized segment of the state's construction industry, contractors who are signatories to collective bargaining agreements and unions jointly manage apprenticeship training for a trade.

¹²⁰ See "What is Registered Apprenticeship?" ApprenticeshipUSA, Employment and Training Administration, U.S. Department of Labor. Accessed at: <https://www.doleta.gov/OA/apprenticeship.cfm>.

¹²¹ For more information see "Apprentice Sponsor List," New York State Department of Labor. Accessed at: <https://labor.ny.gov/apprenticeship/sponsor/index.shtm>

¹²² See "Apprentice Related Instruction," Empire Chapter, Associated Builders and Contractors. Accessed at: <http://www.abcnys.org/en-us/education/apprenticeship.aspx>. Associated Builders and Contractors is affiliated with the nonprofit Empire State Merit Apprenticeship Alliance to oversee training finances. See Merit Apprentice Alliance accessed at: <http://meritalliance.org/>.

Unionization differs in construction compared to other industries. Certification elections that require employers to bargain in good faith that characterize unionization in manufacturing are rare in the construction industry. Due to the instability of the industry another form of unionization developed where contractors choose to enter into collective bargaining agreements to share the cost of apprenticeship training and to have access to trained workers and flexible workforce that accommodates instability in the industry. Numerous jointly managed union-contractor training programs oversee apprenticeship training programs for specific trades in New York.

There are other significant differences between open shop and jointly managed, union-contractor apprenticeship programs. Funding for training in jointly managed programs is financed by a “cents per hour” addition that is part of the total wage and benefit package negotiated with signatory contractors. These types of fees are rare in open shop training arrangements where sponsoring contractors pay for the cost of training directly. The important distinction is that, under the union system, the costs of training the next generation of workers is included in the project bid and is paid by the project owner. This is not the case under the “open shop” arrangement.¹²³ Also, nonunion training programs such as those offered by the Associated Builders and Contractors are characterized by task driven and modular training with a lower priority placed on the full-scope craft training characteristic of union-sponsored training programs.¹²⁴ Training is obligatory for all construction workers in the unionized sector where the rotation of trainees among different contractors increases exposure to multiple aspects of the

¹²³ See Construction Industry Institute. 2007. “Construction Industry Craft Training in the United States and Canada.” Accessed at <http://ps.businesssocialinc.com/media/uploads/abceastflorida/craftstudy.pdf>

¹²⁴ See Associated Builders and Contractors, Inc. “Craft Training & Apprenticeship.” Accessed at: <http://www.abc.org/en-us/educationtraining/crafttrainingapprenticeship.aspx> and See Vincent, Jeff. 2004. “Analysis of Construction Industry Apprenticeship Programs in Indiana.” Accessed at: http://www.faircontracting.org/PDFs/prevailing_wages/AnalysisofApprenticeshipProgramsinIndiana.pdf.

trade. On the other hand, formal apprenticeship training is not mandatory in the open shop segment where arrangements to rotate trainees among different contractors are not common.¹²⁵

An extensive body of research reveals that jointly managed union-contractor apprenticeship programs differ with respect to overall enrollment and completion rates, enrollment and completion rates for female, minority, and veteran trainees, as well financial support compared to open shop training programs. For example, a 2016 study by Duncan and Manzo that includes an examination of Kentucky's apprenticeship programs over the 2008-2016 period finds that approximately 80% of apprentices were enrolled in joint union-contractor programs.¹²⁶ These programs in Kentucky have completion rates that are 35% higher than open shop programs. Completion rates in jointly managed programs were also higher for female, veteran, and African-American apprentices. Jointly managed programs in Kentucky offer a full-array of training ranging from laborers to operating engineers. On the other hand, 79% of apprentices enrolled in open shop programs were pursuing training as electricians.

A 2017 study of Ohio's prevailing wage law by Onsarigo, Atalah, Manzo, and Duncan also includes an analysis of the state's apprenticeship programs and finds that jointly managed programs were responsible for 83% of overall apprenticeship enrollment, 94% of female, and 88% of minority enrollment.¹²⁷ From 2004 to 2015 joint union-contractor programs had completion rates that were 21% higher than open shop programs. As was the case in Kentucky, open shop programs offer a limited range of training in Ohio with 47% of apprentices pursuing

¹²⁵ Cihan Bilginsoy. 2007. "Delivering Skills: Apprenticeship Program Sponsorship and Transition from Training." *Industrial Relations*, Vol. 46, No. 4, pp. 738-763.

¹²⁶ Duncan, Kevin and Frank Manzo IV. (2016). *The Economic, Fiscal, and Social Effects of Kentucky's Prevailing Wage Law*. Colorado State University-Pueblo; Midwest Economic Policy Institute. Accessed at: <https://illinoisepi.org/site/wp-content/themes/hollow/docs/prevailing-wage/kentucky-report-duncan-and-manzo-2016-final.pdf>.

¹²⁷ Onsarigo, Lameck; Alan Atalah; Frank Manzo IV; and Kevin Duncan. (2017). *The Economic, Fiscal, and Social Effects of Ohio's Prevailing Wage Law*. Kent State University; Bowling Green State University; Midwest Economic Policy Institute; Colorado State University-Pueblo. Accessed at: <https://illinoisepi.org/site/wp-content/themes/hollow/docs/prevailing-wage/bowling-green-su-kent-state-ohio-pw-study-4-10-17.pdf>.

training as electricians. The distribution for jointly managed programs is more varied with 19% of trainees in programs for electricians.

Other recent studies report that joint union-contractor programs provide the vast majority of human capital investment in the construction industry. A 2015 report by Philips examines apprenticeship programs in Indiana and finds that union programs were responsible for 94% of annual training expenditures. Open shop programs represented the remaining 6% of funding.¹²⁸ Philips' corresponding figures for Wisconsin were 95% and 5%, respectively.¹²⁹ Similarly, a 2016 study by Manzo and Bruno finds that joint union-contractor programs account for 99% of all privately-funded apprenticeship expenditures in Illinois.¹³⁰

Regulatory incentives to encourage training are not extensive in the U.S. construction industry. Prevailing wage laws play an important role in training by providing strong incentives for union and nonunion contractors to employ apprentices on covered projects. For example, under New York's prevailing wage law apprentices are paid as indicated by the approved program.¹³¹ Typically, apprentice wage rates are based on a fraction of the corresponding journey rate, starting as low as 50% and increasing with program progress. This wage savings creates a high demand for apprentices on public works projects that drives skill development for the entire construction industry. According to the *Economic Census of Construction*, the value of federal, state, and local construction represents 25.4% of the total value of building activity in

¹²⁸ Philips, Peter. 2015. "Indiana's Common Construction Wage Law: and Economic Impact Analysis.": Accessed at: http://www.isbctc.org/Uploads/UploadedFiles/docs/Philips_Indiana_Report_January_2015.pdf.

¹²⁹ Peter Philips. 2015. "Wisconsin's Prevailing Wage Laws: An Economic Impact Analysis." Accessed at: http://www.wisconsincontractorcoalition.com/application/files/9914/2889/7832/Wisconsin_Report_April_2015.pdf.

¹³⁰ Frank Manzo IV and Robert Bruno. 2016. "The Impact of Apprenticeship Programs in Illinois: An Analysis of Economic and Social Effects." Accessed at: https://illinoisepi.files.wordpress.com/2016/08/pemr-ilepi-impactofapprenticeshipprograms_newcover.pdf.

¹³¹ New York State Department of Labor, "General Provisions of Laws Covering Workers on Public Work Contracts." Accessed at: <https://labor.ny.gov/workerprotection/publicwork/PDFs/Art.8General%20Provisions%20of%20Laws%20Covering%20Worker.pdf>.

New York.¹³² The large percent of building activity covered by prevailing wage regulations in New York substantially increases the demand for apprentices. As a result, more resources are expended on training. The result is an increase in the number of skilled workers who are available for work on publicly- and privately-funded construction in New York.

Consequently, it is not surprising that research shows a strong connection between prevailing wage laws and training in the construction industry. For example, Cihan Bilginsoy finds that apprenticeship enrollments are from 6% to 8% higher in states with prevailing wage laws compared to states without the wage policy.¹³³ Bilginsoy also finds that apprentices in states with prevailing wage laws complete their on-the-job and classroom training at a faster rate than apprentices in states without the wage policy. This effect is strongest in states with stronger prevailing wage laws.¹³⁴

Since a lengthy process is required to obtain information from the New York State Department of Labor, this paper is not able to examine enrollment and completion rates as other studies have done. However, limited information is available on training assets and expenditures. Recent data are also available regarding demographic characteristics of apprentices enrolled in construction training programs in New York.

¹³² U. S. Census. (2012) (a). "Construction: Geographic Area Series: Detailed" Economic Census of Construction. U.S. Census Bureau. Accessed at:

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

¹³³ Cihan Bilginsoy. 2005. "Wage Regulation and Training: The Impact of State Prevailing Wage Laws on Apprenticeship," in Hamid Azari-Rad, Peter Philips and Mark J. Prus (eds.) *The Economics of Prevailing Wage Laws*, Aldershot, UK: Ashgate, pp.149-168.

¹³⁴ Armand Thieblot developed a classification system for state prevailing wage laws into weak, average, and strong polices. These are based on the contract value threshold that prevailing wages apply, the level of coverage at the municipal, county, or state level, the types of work/trades excluded, the determination of prevailing wage rates, and other item. See Thieblot, Armand. 1995. *State Prevailing Wage Laws: An Assessment at the Start of 1995*, Associated Building Contractors, Inc., Rosslyn, VA.

Apprenticeship programs typically establish nonprofit organizations to manage training finances.¹³⁵ As a consequence, information from the Internal Revenue Service (Form 990) can be used to gather financial information about programs.¹³⁶ To illustrate differences in training finances between open shop and joint union-contractor programs, data from the Associated Builders and Contractors program is compared to corresponding joint programs. This information is reported in Table 4 and is based on tax reporting information for either 2014 or 2015. The data indicate that according to IRS Form 990 data the nonprofit affiliated with the ABC training program reported revenue of approximately \$373,000, expenditures of approximately \$350,000, net assets of about \$149,000, and three employees for the 2015 tax filing. According to the nonprofit Merit Apprentices Alliance, these resources are used to offer apprenticeships in carpentry, operating engineer, skilled laborer, iron worker and cement finisher/mason trades.¹³⁷ Several joint union-contractor programs offer training in the same trades. The financial information for 11 of these programs is also reported in Table 4.

The joint union-contractor programs are located in the New York City area and in Albany, Monroe, and Tompkins counties. The data illustrate the disparity in training resources between open shop and joint projects. Even the smallest program (for laborers) greatly exceeds the assets and expenditures of the ABC program. The combined totals for the four labor union locals equals \$2.6 million in program revenue, \$2.3 million in expenditures, and \$6.9 million in net assets. The largest training resources are the combined Iron Worker Locals #40 and #361 with \$9.4 million in revenue, \$6.3 million in expenditures, and over \$41 million in net assets.

¹³⁵ The name of the training nonprofit or training trust must be known and this is often not the same as the name of the training program. This difference makes it difficult to search for nonprofits and to find comprehensive financial information.

¹³⁶ See ProPublica. (2017). "Search the IRS 990 Filings." Nonprofit Explorer. Accessed at: <https://projects.propublica.org/nonprofits/>.

¹³⁷ See "Industry Resources & Affiliations", Merit Apprenticeship Alliance. Accessed at: <http://meritalliance.org/about-us/industry-resources-affiliations/>.

The combined totals for these 11 programs equals \$23.5 million in revenue, \$18.0 million in expenditures, \$87.1 million in net assets, and 128 employees. The disparity between the ABC program and the 11 joint union-contractor programs is rooted in the cumulative effect of the cents per hour training fee that is added to the total compensation package of unionized construction workers.

Table 4. Apprentice Program Revenue, Expenses, and Net Assets for Selected Open Shop and Joint Union-Contractor Training Programs.

Training Program Name (s)	Apprenticeship Trades	Training Fund Revenue, Expenses, and Net Assets*	Training Program Employment*
Associated Builders and Contractors / Empire State Merit Apprentice Alliance, Inc.	Carpenters, Operating Engineers, Laborers, Iron Workers, Cement Finishers/Mason Trades	Revenue=\$373,015 Expenses =\$351,129 Assets=\$148,824	3 Employees
Empire State Carpenters Apprenticeship Committee (Northeast Regional Council of Carpenters Union)	Carpenters	Revenue=\$4.2 million Expen.=\$4.2 million Assets=\$9.6 million	51 Employees
Operating Engineers (Union Locals #117, #14-14B)	Operating Engineers	Revenue=\$4.4 million Expen.=\$3.0 million Assets=\$21.2 million	7 Employees
Laborers (Union Locals #1298, #91, #435, #785)	Laborers	Revenue=\$2.6 million Expen.=\$2.3 million Assets=\$6.9 million	12 Employees
Iron Workers (Union Locals #40, #361)	Iron Workers	Revenue=\$9.4 million Expen.=\$6.3 million Assets=\$41.4 million	29 Employees
Cement and Mason (Union Locals #20 and NY & LI Bricklayers)	Cement Finishers/Mason Trades	Revenue=\$2.9 million Expen.=\$2.2 million Assets=\$8.0 million	29 Employees

Sources: ProPublica, Nonprofit Explorer (<https://projects.propublica.org/nonprofits/>) and Apprenticeship Sponsor List, Department of Labor, State of New York (labor.ny.gov/apprenticeship/sponsor/index.shtm). Net assets are equal to total assets minus liabilities. * Based on 2014 or 2015 IRS Form 990.

Demographic information for apprentices enrolled in joint union-contractor and open shop training programs are reported in Table 5. This information was obtained from the New York Department of Labor and is based on information collected in August of 2016.¹³⁸ Specifically, the information was derived from the “affirmative action” letter the New York State Department of Labor sent to all registered apprenticeship programs associated with the building trades.¹³⁹ The information identifies the name and address of the training program, the training type (trade), and the number of minority and female apprentices enrolled in each program. The data reported in Table 5 indicates joint union-contractor programs account for virtually all minority and female enrollment in apprenticeship programs. While the share of joint programs varies by trade (from 65% for sheet metal to 100% for numerous other programs), joint programs represent about 77% of all building trades programs.¹⁴⁰ However, 97% of minority and 98% of female apprentices in New York State and enrolled in jointly managed programs. On the other hand, open shop programs represent about 23% of all programs and about 3% of minority and 2% of female apprenticeship enrollments. Furthermore, there is training in some trades that is only offered by joint programs. According to the data obtained from the New York State Department of Labor, there were no open shop apprenticeship programs for roofers, elevator/escalator constructors, boiler makers, and iron workers in 2016. As a consequence, joint union-contractor programs were responsible for all training and all training of minority and female apprentices in these trades. Even in trades where there is some mix of joint and open shop training programs, joint union-contractors sponsored programs account for all minority

¹³⁸ This information was derived from the “affirmative action” letter the New York State Department of Labor sent to all registered construction apprenticeship programs. The information was obtained by a Freedom of Information Request FOIA request by the New York State Building and Construction Trades Council.

¹³⁹ The information is based on the programs that responded. Presumably, this represents all training programs for the state’s building trades.

¹⁴⁰ Based on the information obtained from the New York State Department of Labor, there were 175 jointly managed union-contractor apprenticeship programs and 51 nonunion training programs as of August 16, 2016. At that time there were 4,275 minority and 804 female apprentices in jointly managed programs. There were 123 minority and 18 female apprentices enrolled in nonunion programs.

apprenticeship training in asbestos, cement, and bricklayer programs and for all female apprenticeship training in asbestos, sheet metal cement, plumber/pipefitter, bricklayer, and painter programs.

Table 5. Demographic Characteristics of Apprentices Enrolled in Joint Union-Contractor and Open Shop Training Programs, by Trade.

Trade	Percent Joint Union-Contractor Managed Apprenticeship Programs	Percent Minority Apprentices in Joint Union-Contractor Programs	Percent Female Apprentices in Joint Union-Contractor Programs
Insulation/Asbestos	86%	100%	100%
Carpenters	56%	99%	96%
Laborers	83%	96%	97%
Sheet Metal	64%	97%	100%
Roofers	100%	100%	100%
Operating Engineer	75%	77%	95%
Cement Mason/Plasterer	80%	100%	100%
Elevator/Escalator	100%	100%	100%
Boiler Maker	100%	100%	100%
Iron Worker	100%	100%	100%
Pipefitter/ Plumber	71%	98%	100%
Bricklayer/Tile/Terrazzo	97%	100%	100%
Painter/Glazier/Drywall Taper	95%	99%	100%
Electrician	54%	92%	99%
Total	78%	97%	98%

Source: New York State Department of Labor.

It is also possible to use the information obtained from the New York State Department of Labor to determine demographic characteristics of the journey trades workers who are employed by the establishments (for open shop programs) and the number of journey workers belonging to each of the union locals. These data are reported in Table 6. Since the apprentices in open shop training programs do not necessarily maintain employment with the establishment

after completing training, the data in the two tables need not be consistent. Similarly, the journey workers who are members of a union local may not have received their training from the local. So, the employments and apprenticeship data for joint programs may not be perfectly correlated. Regardless, the data reported in Table 3 indicate that joint union-contractor programs are responsible for the overwhelming majority of minority and female journey worker employment in the establishments and union locals that provide training. For employees employed by or associated with the establishments conducting the training, 98% of minority and 93% of female employees are associated with joint union-contractor programs.

Table 6. Demographic Characteristics of Apprentices Enrolled in Joint Union-Contractor and Open Shop Training Programs, by Trade. ¹⁴¹

Trade	Percent Joint Union-Contractor Managed Apprenticeship Programs	Percent Minority Apprentices in Joint Union-Contractor Programs	Percent Female Apprentices in Joint Union-Contractor Programs
Insulation/Asbestos	86%	95%	100%
Carpenters	56%	99%	93%
Laborers	83%	97%	90%
Sheet Metal	64%	93%	100%
Roofers	100%	100%	100%
Operating Engineer	75%	94%	87%
Cement Mason/Plasterer	80%	100%	100%
Elevator/Escalator	100%	100%	100%
Boiler Maker	100%	100%	100%
Iron Worker	100%	100%	100%
Pipefitter/ Plumber	71%	99%	96%
Bricklayer/Tile/Terrazzo	97%	100%	100%
Painter/Glazier/Drywall Taper	95%	99%	100%
Electrician	54%	91%	98%
Total	78%	98%	93%

Source: New York State Department of Labor.

¹⁴¹ Based on the information obtained from the New York State Department of Labor, there were 40,837 minority and 2,745 female journey workers employed through the unions and contractors involved with jointly managed training programs as of August 2016. At the same time there were 842 minority and 204 female journey workers employed by the nonunion contractors providing apprenticeship training.

Some claim that prevailing wage laws are motivated by construction union desires to limit employment to white, male construction workers. For example, in objecting to the extension of prevailing wage requirements to the construction of affordable housing in New York City, David Bernstein urged "... New York officials who care about promoting racial diversity need to stop supporting prevailing wage mandates, which only have the opposite effect of sanctioning the long-standing pattern of racial discrimination practiced by New York's construction unions."¹⁴² Bernstein's claims are not supported by the demographic information reported in tables 2 and 3 which provide substantial evidence to the contrary. Whatever past practice was, recent evidence indicates that construction unions are responsible for almost all minority and female apprenticeships and employment in New York's construction industry.¹⁴³ Rather than being excluded from joint union-contractor training programs, minority and female apprentices may select these programs because of greater inclusion of their groups, higher program quality, and the greater likelihood of program completion.

Some business and economic development groups call for changes and limitations to New York's prevailing wage policy.¹⁴⁴ These groups should keep in mind that a trained and skilled construction labor force stabilizes building costs over time. Prevailing wage laws support training in the construction industry by creating incentives for the use of apprentices. Joint union-contractor training programs in New York are responsible for the overwhelming

¹⁴² See "David E. Bernstein: The racism behind prevailing wage," Daily News Opinion by David E. Bernstein, January 25, 2016. Accessed at: <http://www.nydailynews.com/opinion/david-e-bernstein-racism-behind-prevailing-wage-article-1.2506556>.

¹⁴³ For a review of the academic and other research on the effect of prevailing wage laws on the racial composition of the construction labor force see Duncan, Kevin and Russell Ormiston. (2017). *Prevailing Wage Laws: What Do We Know?* Institute for Construction Economics Research (ICERES). Accessed at: <http://iceres.org/wp-content/uploads/2014/10/prevailing-wage-review-duncan-ormiston.pdf>.

¹⁴⁴ See for examples "New York business groups pushing changes to wage law," Daily News, December 18, 2017. Accessed at: <http://www.nydailynews.com/news/politics/business-groups-pushing-costly-wage-law-article-1.3706108>. See also, "Memorandum RE: A5498 (Bronson)/S.2975 (Murphy) regarding imposition of a prevailing wage mandate on economic development projects OPPOSE," New York State Economic Development Council, February 17, 2017. Accessed at: <http://www.nysedc.org/wp-content/uploads/2017/02/021717-Bill-Memo-A.5498-Bronson-S.2975-Murphy.pdf>.

preponderance of training resources and minority and female apprentices. As is the case in any industry, trained construction workers are more expensive than untrained workers. Since labor costs (wage and benefits) are about 24% of total construction costs in New York, any cost effect associated with the use of trained construction workers that is not offset by increased worker productivity is expected to be small. Claims to weaken New York's prevailing wage law are short-sighted and would harm the state's construction industry. On the other hand, applying prevailing wage coverage to previously excluded publicly-subsidized construction in New York would increase training resources, apprenticeship enrollments, and the supply of skilled construction workers.

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EXHIBIT 2

Losing Ground: Lessons from the Repeal of Nine "Little Davis-Bacon" Acts

**Peter Philips, Garth Mangum
Norm Waitzman, and Anne Yeagle**

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Executive Summary

Like the 1931 federal Davis-Bacon Act, legislation in 41 states has required that the "prevailing" wage be paid on state-government-funded construction projects. Between 1979 to 1988, however, nine states repealed their prevailing wage laws. (Nine states never had such a law.) The remaining 32 states have retained prevailing wages. These variations in state experience provide useful information with which to consider probable effects of additional state repeals or the proposed repeal of Davis-Bacon. This study found that state repeals of prevailing wage laws had several effects.

First, in Utah, whose experience was examined most closely, the state budget has not benefited from repeal of the prevailing wage law. The repeal helped drive down construction earnings and as a result, the state has lost substantial income tax and sales tax revenues. In the decade before the 1981 repeal in Utah, construction worker earnings averaged about 125 percent of average non-agricultural earnings. By 1993, construction worker earnings had fallen to 103 percent of the average earnings for Utah workers. This decline in earnings is a result of both lower wages and a subsequent shift to a less-skilled construction labor force.

Second, also in Utah, the size of total cost overruns on state road construction has tripled in the decade since repeal in comparison to the previous decade. The shift to a less-skilled labor force — lowering labor productivity along with wages — and the greater frequency of cost overruns have lessened any possible savings in public works construction costs associated with the repeal.

Third, looking at all the states, and controlling for a general downward trend in real construction earnings, variations in state unemployment rates, and regional differences in wages, repeals have cost construction workers in the nine states at least \$1,477 per year in earnings, on average (in 1994 dollars). The costs may eventually be higher as the effects of the more recent repeals mature, driving wages and training down further.

Fourth, controlling for a general downward trend in the amount of construction training, variations in state unemployment rates, and regional differences in training availability, the nine state repeals have reduced construction training in those states by 40 percent.

Fifth, minority representation in construction training programs has fallen even faster than have the training programs in repeal states. Until the various state repeals, minority apprenticeship participation mirrored the minority percentage of each state's population. After repeal, minorities became significantly under-represented in construction apprenticeship programs.

Sixth, occupational injuries in construction rose by 15 percent where state prevailing wage laws were repealed.

Based on these findings, we conclude that, if the federal Davis-Bacon Act were repealed:

- *Federal income tax collections would fall by at least \$1 billion per year* in real terms every year for the foreseeable future. This is because construction wage levels would decline across all states and — based on the experience of the nine repeal states — construction employment levels would not rise enough to offset this revenue loss. The figure for lost tax revenues may well be higher. If the experience of the nine states that never had a prevailing wage law is

indicative, lost tax revenues from a repeal of Davis-Bacon could rise to \$2 billion per year. Whether the losses are \$1 billion or \$2 billion, the government cannot count on making them up with its cost savings as a purchaser of construction. *The government will not break even.*

- *There would be 76,000 additional workplace injuries in construction annually, with 30,000 of them serious and thus requiring time off from work to recover.* As a result, more than 675,000 work days would be lost each year in construction. This could lead to additional workers' compensation costs of about \$3 billion per year, of which \$300 million would be passed on to the federal government as increased costs on public works.
- *Utah's experience suggests that repeal of Davis-Bacon would generate a period of significant cost overruns and the increased use of expensive change orders.* Although we cannot measure the exact costs of such practices, it is generally accepted that change orders add substantially to construction costs.

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I. The History of Prevailing Wage Laws in the United States

In February 1891, Samuel Gompers, president of the American Federation of Labor, visited Topeka, Kansas, to speak on what the local newspaper called "the great topic of labor." Ten years earlier, the AFL — at its own creation — had laid out legislative aims that included the eight-hour work day, the elimination of child labor, free public schooling, compulsory schooling laws, the elimination of convict labor, and prevailing wages on public works. These proposals were based on a belief that the American labor market should consist of highly skilled workers earning decent wages, with time for family, and with children free to earn an education. In pursuit of these aims, Gompers' political strategy in Kansas allied him with the Republican Party.

On the morning of Gompers's arrival, the Alliance Party, known to history as the Populist Party, withdrew an earlier invitation for him to speak in the hall of the state House of Representatives, which the party controlled. Gompers, who represented 900,000 workers, had fallen out of favor with the populists, reportedly because of his belief that the trade unions should not form a political party with the Alliance.¹ The Republicans, who controlled the Kansas Senate, invited Gompers to speak there, and he did.

Gompers was in Kansas to focus on the eight-hour day. Like other Americans, Kansans in 1891 typically worked six days per week, ten to twelve hours per day. In the older trades and crafts, such as carriage making and saddle making, where the work pace was slow and under the workers' direction, the long work day was tolerable. In the newer factories producing shoes, textiles, and the like; in the mines; and in the urban putting-out systems in needlework, six-day weeks and twelve-hour days were grueling. The AFL had made its prime objective a shortened work day and work week with as little cut in pay as possible. In his Topeka speech, Gompers declared:

Our banner floats high to the breeze and on that banner float is inscribed, "Eight hours work, eight hours rest and eight hours for mental and moral improvement."²

At that time, when there were no income supplement programs for the poor, low-income parents worked *and* had to send their children to work to make ends meet. This practice was later referred to by a North Carolina newspaper editor as "eating the seed corn." Each generation of poor condemned its offspring to poverty because the children grew up as illiterate as their parents. The prevalence of cheap child labor, which accounted for 5 percent of the manufacturing labor force in 1890 and a larger proportion of service sector workers, kept wages down and forced adult workers to put in the long hours to make ends meet. Gompers wanted regulation to force employers and the poor to adopt a strategy, however painful in the short run, of a high-wage, high-skilled growth path where children were in school and workers had the skills to justify wages that would allow for a family life. Gompers said,

The Federation endorses the total abolition of child labor under 14 years of age; an eight hour law for all laborers and mechanics employed by the government directly through contractors engaged on public work, and its rigid enforcement; protection of life and limb of workmen employed in factories, shops and mines; ...the extension of suffrage as well as equal work for equal pay to women.... The Federation favors measures, not parties.³

Although it was not clear at the time whether government could require private sector employers to honor the eight-hour day, government could set an example, Gompers believed. In state after state, he pleaded for the eight-hour day for government workers and private sector workers employed on public works. Gompers also pleaded for workers to be paid the "current" daily wage so they could afford the reduced work time. Government was being asked to set a good example for the private sector, to show that a refreshed labor force could produce in eight hours what a fatigued and bedraggled labor force turned out in ten or twelve hours. The prevailing wage law in its infancy was an attempt to obtain shorter working hours for *all* labor. The AFL paid attention to public works, however, because government at all levels was a major purchaser of construction. The AFL said government should not try to save money by eroding the wages of its citizens.

With similar logic, the AFL called for an end to convict labor. Many states employed convicts to pay for their keep. Convicts built roads on chain gangs, operated farms, made textiles, and sewed garments. Convict-made goods were sold, forcing down prices and the wages of working free citizens.

Thus, prevailing wage law legislation, at its birth, was embedded in an overarching intent to shorten the grueling working day for all labor, to compel the working poor to make ends meet in some fashion other than by sending their children into the factories, to compel children into schools so that they might become better workers and better citizens, to compel employers to adopt techniques that profited on the employment of skilled adult workers rather than unskilled child labor, to present government as an exemplar of good management by establishing the eight-hour day in government employment and on public works, and to abolish the practice of government saving tax dollars by grinding down wages on public works or through convict labor. It is not surprising, then, that the first prevailing wage law passed in the United States — in Kansas — was part of an eight-hour-day law.

Passage of State Prevailing Wage Laws

The Kansas Eight-Hour law. Kansas established the first prevailing wage law in 1891. In January 1890, the Kansas Bureau of Labor and Industrial Statistics, in preparation for its Sixth Annual Report, distributed a questionnaire to each trade union and the Knights of Labor Assembly. In response to a question about needed legislation, the Molder's Union of Parsons, Kansas, replied that he wanted "a law...against the letting of contracts for State work to unfair employers."⁴ This plea for the state to let out contracts fairly appears to be one of the first reports leading up to the enactment of a prevailing wage law.

In February 1891, the Second Annual Convention of the Kansas State Federation of Labor, in Topeka, approved a bill concerning state-paid wages. That month, the bill, which included the prevailing wage section, called "for an Eight Hour Law" and was brought forth by Mr. Avery of the Typographical Union No.121, Topeka. The bill stated,

That in no case shall any officer, board, or commission, doing or performing any service or furnishing any supplies to the State of Kansas under the provisions of the act be allowed to reduce the daily wages paid to employees engaged with him (or them) in performing such service or furnishing such supplies, on account of the reduction of hours provided for in the act. That in all cases such daily wages shall remain at the minimum rate which was in such cases paid and

received prior to the passage of the act.⁵

The eight-hour bill was one of four labor-related bills pending in the legislature: the weekly pay bill, the child-labor bill, and the bill to make the first Monday in September a holiday, which would become known as Labor Day. In addition, that year the Kansas State Federation of Labor approved a resolution calling "for the abolition of convict labor when in competition with free labor."⁶

The eight-hour bill, Senate Bill 151, failed in the Kansas senate March 6, 1891, with the prevailing wage section removed. But by March 10, when the prevailing wage section was put back in, the bill became law. This first prevailing wage law stated,

That not less than the current rate of per diem wages in the locality where the work is performed shall be paid to laborers, workmen, mechanics and other persons so employed by or on behalf of the state of Kansas....⁷

At first, however, the law was not enforced.⁸ Not until 1900, did the Kansas Bureau of Labor and Industrial Statistics report enforcement: "there were hundreds of complaints that were attended to by correspondence, and good results obtained."⁹

Prevailing wage laws in other states. New York was the second state to pass a prevailing wage law. New York's eight-hour law (Chapter 385) was amended in 1894 by Chapter 622 to include a prevailing wage law for those employed on public works. As in Kansas, however, there were many violations.¹⁰ Laws similar to those in Kansas and New York were passed in Oklahoma (1909), Idaho (1911), Arizona (1912), New Jersey (1913), Massachusetts (1914), and Nebraska (1923) (see table 1.1). These laws established a precedent for the creation of the federal Davis-Bacon prevailing wage law.

Passage of The Davis-Bacon Act

Three federal laws primarily affect prevailing wages in the United States: the Davis-Bacon Act of 1931 which applies to construction, the Walsh-Healey Public Contracts Act of 1936 which covers employers in manufacturing and supply industries, and the Service Contract Act of 1965 (known as the O'Hara-McNamara Service Act), covering suppliers of personal and business services. These laws attempt to neutralize the effects of government purchases on wage determination in the private sector. The Davis-Bacon Act is the most significant of the three laws.

Its objective is to prevent the federal government from affecting local wages and construction conditions; Davis-Bacon disallows the government from pushing down wages in competitive bidding. The government has always been a major purchaser of construction services. As such, the government holds the potential to use its bargaining power to force down wage rates.

Table 1.1 Prevailing Wage Laws, by State

States having prevailing wage laws	Year passed	States without prevailing wage laws		
Alaska	1931	Georgia		
Arkansas	1955	Iowa		
California	1931	Mississippi		
Connecticut	1935	North Carolina		
Delaware	1962	North Dakota		
District of Columbia	1931	South Carolina		
Hawaii	1955	South Dakota		
Illinois	1931	Vermont		
Indiana	1935	Virginia		
Kentucky	1940			
Maine	1933			
Maryland	1945			
Massachusetts	1914	States that repealed prevailing wage laws	Year passed	Year of repeal
Michigan	1965	Alabama	1941	1980
Minnesota	1973	Arizona	1912	1984
Missouri	1957	Colorado	1933	1985
Montana	1931	Florida	1933	1979
Nebraska	1923	Idaho	1911	1985
Nevada	1937	Kansas	1891	1987
New Jersey	1913	Louisiana	1968	1988
New Mexico	1937	New Hampshire	1941	1985
New York	1894	Utah	1933	1981
Ohio	1931			
Oklahoma	1909			
Oregon	1959			
Pennsylvania	1961			
Rhode Island	1935			
Tennessee	1953			
Texas	1933			
Washington	1945			
West Virginia	1933			
Wisconsin	1931			
Wyoming	1967			

Note: The District of Columbia is listed here, but not included in the count of states.

Source: State laws and corrected version of Armand J. Thieblot, Jr., *Prevailing Wage Legislation: The Davis-Bacon Act, State "Little Davis-Bacon Acts," The Walsh-Healey Act, and The Service Contract Act*. Philadelphia: The Wharton School, 1986, p.140.

For four years before the 1931 passage of the Davis-Bacon Act, 14 bills were introduced in Congress to establish prevailing wages in construction. Robert L. Bacon in 1927 introduced the first bill proposing a prevailing wage for construction, H.R. 17069. The member of Congress justified his measure as follows:

The Government is engaged in building in my district a Veteran's Bureau hospital. Bids were asked for. Several New York contractors bid, and in their bids, of course, they had to take into consideration the high labor standards prevailing in the State of New York...The bid, however, was let to a firm from Alabama who had brought some thousand non-union laborers from Alabama into Long Island, N.Y.; into my district. They were herded onto this job, they were housed in shacks, they were paid a very low wage, and the work proceeded...It seemed to me that the federal Government should not engage in construction work in any state and undermine the labor conditions and the labor wages paid in that State...The least the federal Government can do is comply with the local standards of wages and labor prevailing in the locality where the building construction is to take place.¹¹

Hearings for a federal prevailing wage law began in 1927 and continued in 1928 and 1930, but no bill was passed. On March 3, 1931, Bacon's original proposal, which he had reintroduced as H.R. 16619, was signed into law by President Hoover.¹²

The Davis-Bacon Act required payment of prevailing wages on federally financed construction projects. The law essentially ruled out bidding on construction worker wages on federally financed construction. The original language was vague, however, and prevailing wages generally were not determined before the acceptance of bids. In 1935, President Roosevelt signed clarifying amendments to the act, which became the basis of the current Davis-Bacon Act. The National Labor Relations Act of 1935 gave the Secretary of Labor authority to set the prevailing wage.

In 1935, Roosevelt's Secretary of Labor, Francis Perkins, established the original rules for determining the Davis-Bacon prevailing rates. The prevailing wage was said to be the wage paid to the majority, if a majority existed; if not, the 30-percent rule was used. The 30-percent rule means if 30 percent of the workers in an area are paid the same rate, that rate becomes the prevailing rate there. The 30-percent rule often resulted in the union wage being the prevailing wage. If the 30-percent rule did not apply, because at least 30 percent of the workers in a given occupation in the local labor market did not receive the same wage rate, the average wage rate was paid to workers doing the same job. The prevailing wage was determined this way for 50 years.

In 1985, President Reagan changed administration of Davis-Bacon, creating the 50-percent rule. The revised regulation reduces the influence of the negotiated union wage in most areas (see page 9, below).

The Tenth Amendment to the Constitution restricts the ability of the federal government to dictate contract terms for the states. Thus, work funded entirely by state or local governments is not covered by Davis-Bacon. Each state, county, or city can establish its own prevailing wage — if it chooses to do so — through legislation. In 1994, 29 percent of all county-level federal Davis-Bacon prevailing wage rates were taken from union contracts, 48 percent used average wages, and the remaining 23 percent of counties used a mix of union and average wages, depending on the occupation.

Repeals of Some State Prevailing Wage Laws

Kansas had passed the first prevailing wage law in 1891 and, by 1969, 41 states and the District of Columbia had prevailing wage laws. Several cities also passed local prevailing wage laws affecting construction. However, state governments began experiencing fiscal crises in the late 1970s. In 1978, California voters passed Proposition 13, restricting state expenditures, and the Labor Law Reform Bill failed in Congress. In this political context, many state legislatures believed that, to save tax dollars, government should use its bargaining power to lower construction costs, even if the probable effect of this action would be the lowering of construction wage rates and a possible effect might be the lowering of quality in the construction industry.

More than 51 bills have been introduced in 23 state legislatures to repeal or curtail so-called little Davis-Bacon legislation.¹³ Alabama, Arizona, Colorado, Florida, Idaho, New Hampshire, Kansas, Louisiana, and Utah have repealed their prevailing wage laws.

Florida. Florida, which passed its prevailing wage law in 1933, was the first state to repeal. The statute was repealed over the veto of the governor in 1979.¹⁴ One of the most populous counties, Broward, established its own local prevailing wage law and several cities in Broward passed similar laws.¹⁵

Alabama. Alabama was the next state to repeal, in 1980.¹⁶ After Alabama's repeal, the entire South from Virginia to Mississippi, except Tennessee, was without state prevailing wage law. Unsuccessful attempts were made in 1983 and 1984 to reinstate the 1968 Alabama laws. However, prevailing wage laws exist at the local level, such as one in Mobile for city-sponsored construction.¹⁷

Utah. Utah's prevailing wage law had been passed in 1933. Eventually, prevailing rates were set by hearings held in three districts that were created for this purpose. In addition to covering construction, the Utah statute established prevailing rates for piece work.

The first indications of intent to repeal the Utah law were heard from the local chapter of the national Associated Builders and Contractors (ABC) in 1978. (The ABC, nationally and in Utah, sought to represent the interests of non-union contractors.) The Utah ABC outlined its strategy in a letter to other state ABC chapters in 1978:

It is our hope that the major argument in favor of repeal would be based on tax savings and unnecessary government spending, rather than a union versus non-union argument.¹⁸

The ABC lobbying effort became public during the Utah legislative session in 1979. The sponsor of the Utah repeal, Republican Representative S. Garth Jones wrote in the *Deseret News*:

The prevailing wage rate is substantially the union pay scale. In 1933 the law was designed to place money into a depressed economy, to increase wages to get the economy moving. The law does the same thing today. But today, the economy is not depressed; inflation is the problem and the cost of government is too high. Repealing the prevailing wage will allow the free enterprise system to establish the wages of tradesmen at a substantial savings to the taxpayers. The prevailing wage law is inflationary. Additionally, the prevailing wage rate discourages non-union contractors from bidding public contracts. It encourages union contractors to bid public contracts. The effect is to force people looking for work to go to union contractors. The law is inconsistent with Utah's Right to Work law.(Feb. 23, 1979)

The first bill to repeal the statute was introduced in 1979, only to be vetoed by Democratic Governor Scott Matheson. In 1981, repeal bills were introduced in 14 states. Only in Utah did repeal succeed that year and it succeeded only after a second veto from Matheson.¹⁹

The bill was approved on almost straight party lines — Republicans favoring repeal and Democrats opposed. The *Salt Lake City Tribune* noted that only one Republican representative, who called himself a lifelong Republican and union member, voted against repeal and broke away from party lines.²⁰

When Matheson vetoed the bill in 1981, he said, "I'm convinced that repeal of this law is not in the best interests of working people in the trades whose skills are essential for a vigorous construction industry."²¹ Nonetheless, the Senate overrode the veto 21-7 and the repeal took effect 2 months later.

Those in favor of the repeal maintained that the prevailing wage law was inflationary and pro-union. Republican C. McClain (Mac) Haddow sponsored the 1981 repeal bill. He said, "the law is outmoded and is preserved only as a tool to extend union control. The law is contrary to Utah's right-to-work philosophy...."²²

Roger Evershed, president of the Associated Builders and Contractors, predicted a 10 to 15 percent savings on public works projects with repeal.²³

Arizona. The next state to repeal was Arizona in 1984.²⁴ Arizona's statute began as an eight-hour work day in 1912 and, by 1930, became a prevailing wage law. In a court test, the statute was found unconstitutional in September 1979.²⁵ In November 1984, voters repealed the statute in a ballot initiative, Proposition 300. Provisions of the ballot initiative prevented communities from implementing local prevailing wage statutes.²⁶

Idaho. Idaho's prevailing wage law was first enacted in 1911 as an eight-hour law. The statute was extensively amended until 1965; efforts to repeal it began in 1979. The legislature failed to override several vetoes but did repeal the law in 1985.²⁷ At the same time, overtime pay requirements for more than eight hours of work were repealed.²⁸

Colorado. Colorado also repealed its prevailing wage law in 1985.²⁹ Attempts for repeal began in the late 1970s, but it was not until after the governor had vetoed the bill several times that the veto was overridden and the repeal passed. Nevertheless, since 1985 at least one municipality, Pueblo, established its own prevailing wage rate for local construction.³⁰

New Hampshire. New Hampshire joined Colorado and Idaho in 1985 when it, too, repealed.³¹ Although legislators began in 1979 to try to repeal the prevailing wage law, they did not succeed until 1985. Influenced by reports of inflated costs on a school construction job, both houses passed repeal without the signature of Governor John Sununu.³²

Kansas and Louisiana. Kansas, the first to have a state prevailing wage law, repealed it in 1987.³³ Louisiana followed in 1988 with repeal over the initial veto of the governor.³⁴

Efforts to Repeal Other Prevailing Wage Laws

The Massachusetts ballot initiative. In Massachusetts, in 1988, thousands of union members, already active in the presidential election, worked with community groups to help defeat a ballot

initiative that would have repealed the state's 1914 prevailing wage law. The effort to block repeal in Massachusetts appears also to have slowed efforts to repeal other state prevailing wage laws until the midterm elections of 1994. Massachusetts Question 2, the repeal initiative and the hottest issue on the ballot that year, was defeated 58 to 42 percent on November 8.³⁵

The Massachusetts law requires contractors to pay employees on state-financed projects a predetermined wage. Prevailing wage rates are most often based on collective bargaining agreements, which vary by trade and geographical jurisdiction.³⁶

In 1988, the Associated Builders and Contractors (ABC) and Citizens for Limited Taxation formed a coalition that spearheaded the repeal effort, with a signature drive run by the "Fair Wage Committee." In March, a report by the Massachusetts Foundation for Economic Research, *The Peculiar Prevailing Wage Law*, presented the public rationale for a repeal of the state law.³⁷ The report stated that the many attempts to modify the prevailing wage law were defeated before reaching the governor's desk.³⁸ Using confidential data collected from a construction contractor, the authors estimated that the prevailing wage law increased construction costs by 14 percent through higher wage costs. The report concluded that, "in 1987, the prevailing wage law cost Massachusetts at least \$212 million dollars."³⁹

In August, in response to the report by the Foundation for Economic Research, the Regional Information Group of Data Resources Inc. presented a contrasting view. Data Resources said the earlier report had used insufficient data and oversimplified analyses.⁴⁰ Data Resources maintained that a repeal in 1990 would result in a "total wage loss of \$196 million and a net employment loss of 600." Data Resources concluded that although there would be nominal tax savings with a repeal, the overall impact would be to increase unemployment and lower living standards.⁴¹

By the end of a hard-fought campaign, community support included the Catholic Church; the Jewish Labor Committee; the Massachusetts Nurses Association; the National Women's Political Caucus; and the National Organization for Women.⁴²

A similar effort in 1994 to repeal by initiative failed on the Oregon ballot. The battleground has shifted back to state legislatures and the U.S. Congress.

Efforts to Repeal Davis-Bacon

The onset of state efforts to repeal prevailing wage laws coincided with U.S. Senate hearings in 1979 to repeal Davis-Bacon. During the first hearings, Davis-Bacon proponents defended the law with these points:

1. The act prevents the disruption of local wage and construction market conditions by the introduction of federally financed construction.
2. The act protects the prevailing living standards of construction workers by discouraging cutthroat competition by construction contractors.
3. The act provides equality of opportunity for contractors who are free to bid on the basis of skill, efficiency, and knowledge, rather than on their ability to slash labor standards.

4. The act helps maintain the high quality of the construction labor force and equal employment opportunity in the construction trades by encouraging use of bona fide training programs on federally funded construction.⁴³

Advocates of repeal of Davis-Bacon said:

1. The act has inflated construction costs.
2. The act costs the federal government huge amounts of money.
3. The act is poorly administered.
4. The act is biased toward union contractors and hurts non-union contractors.
5. The act has caused wage inflation.
6. The act discriminates against minorities, because they are disproportionately represented among the low-skilled labor force.
7. The free-market system is suppressed.

Although the Davis-Bacon Act was not repealed in 1979, the Reagan administration changed the way the law is administered a few years later. The administration in 1985 altered the 30 percent rule. Until then, the Department of Labor used the modal — most common — wage to determine the prevailing wage for an occupation in a local labor market, if the modal wage to the penny accounted for more than 30 percent of all wages for that group.⁴⁴ If the modal wage accounted for fewer than 30 percent of all wages, the mean (average) wage was declared the prevailing wage.

The Reagan administration raised the threshold to 50 percent before the modal could be declared the prevailing wage. Union wages tend to be the modal wage and they tend to be above the mean or average wage for an occupation. So the Reagan administrative change had the effect of lowering the prevailing wage in areas where unions were weak. Given construction unionization rates have fallen from around 80 percent of the construction labor force in the 1940s to around 60 percent in the 1960s to around 25 percent in the 1980s, the impact of the Reagan administrative changes were substantial.⁴⁵

* * *

Some of the competing claims for and against Davis-Bacon can be tested against the experience of the states — those that have repealed state prevailing wage laws, as well as those that continue to have such laws, and states that have never legislated a prevailing wage. This study examines the contentions of Davis-Bacon proponents that prevailing wage laws prevent the disruption of local wage and construction labor markets and that prevailing wage laws protect living standards and discourage cutthroat competition. This study examines, as well, the contention of Davis-Bacon opponents that the law costs government considerable sums of money and discriminates against women and minority construction workers. The study also raises two new questions. First, what are the effects of prevailing wage laws on training and human capital formation in construction? Second, what effects do these laws have on the safety and health of construction workers?

II. The Economic Effects of Davis-Bacon Repeals

Cutthroat Bidding

As soon as the law was repealed, some of these non-union people [contractors] that had been doing small work around town suddenly just took off, and the union people [contractors] like ourselves, our market share decreased.

- President, a union construction company, Salt Lake City, 1993

[Our] company has consisted of my father and my grandfather and me from about 1963. [We are a double-breasted company.] Company A is a union [general] contractor that hires merit shop companies with no regard to union affiliation. Company B is a non-union merit shop company.... Our industry became very competitive during the mid-eighties, a lot of people are chasing the same type of work.

- General contractor, double-breasted company, Salt Lake City, 1993

We've been in business for 51 years. Before that my great-grandfather ran a construction company and so we've always done construction. Right now we're doing mostly mechanical, and we do utilities, Mountain Fuel, water lines, sewer lines, AT&T jobs. We've built homes. We've built golf courses. We've built apartment buildings. In the last probably about eight years [since the mid-1980s] there's a lot more small companies - little tiny, you know, dad and his three boys. We can't compete against them. We have too much overhead to do that and you get small start-up companies, they're willing to work for nothing for a while and you know they'll go out there for two years and just take these jobs dirt cheap. Sometimes they can't finish. They'll go broke in the middle but still, we don't want to work for nothing. We'd just rather lock the gate and wait.

- Office manager, union construction company, Salt Lake City, 1993

When Utah repealed its prevailing wage law in 1981, the structure of the construction industry changed dramatically. The most obvious effect was the decline of union membership and union contractors. But this was only the most obvious effect. Underlying the decline of union contractors was the rise of the small contractor and increasing turnover of contracting firms in the business. The industrial organization of the industry changed, with an increased reliance on subcontractors.

Comparing the 12 years prior to repeal to 10 years after repeal, the share of total construction employment accounted for by the typically bigger and more capital-intensive general contractors and heavy and highway contractors fell, while the share of total employment accounted for by specialty subcontractors rose (fig. 2.1).

With the entry into the market of more contractors and smaller contractors, competitive pressure to win bids heated up. This pushed wages down. An operating engineer familiar with the bidding wars stimulated by Utah's prevailing wage law repeal tells how the bidding affected labor.

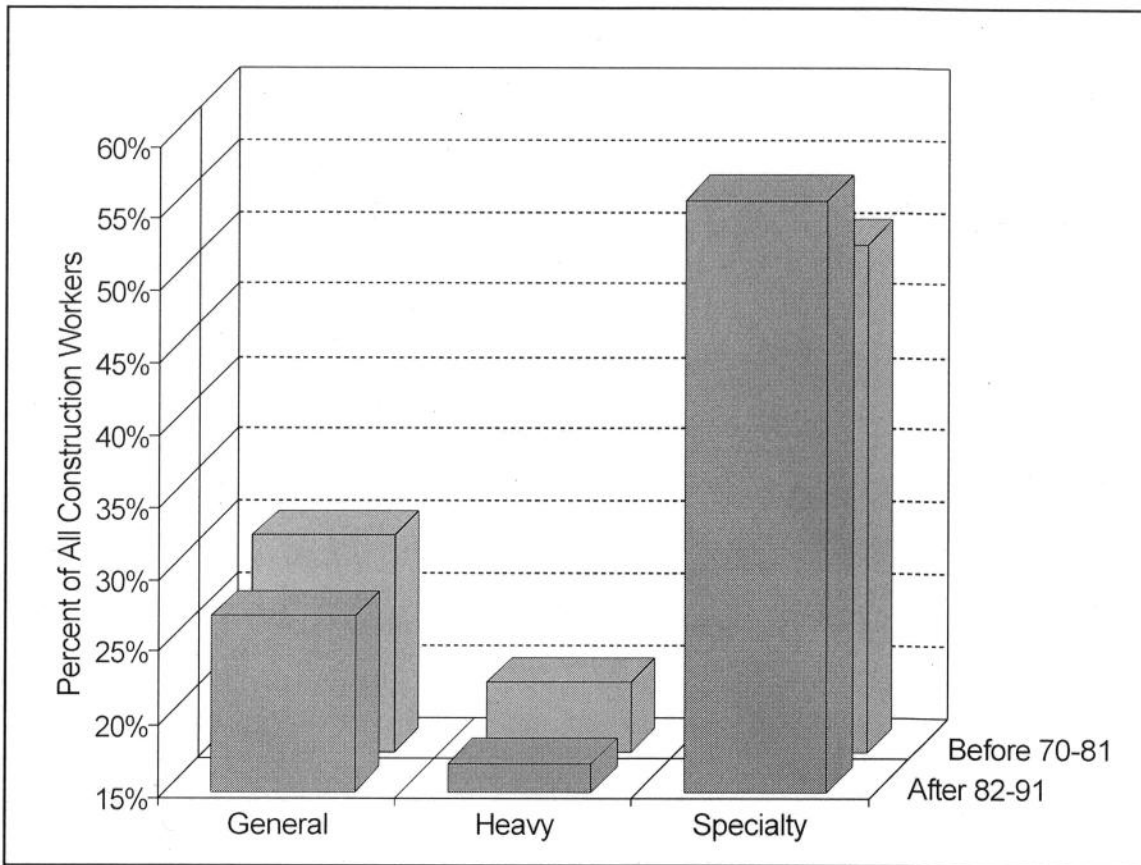


Figure 2.1 The mix of construction employment in Utah by contractor type, before and after the repeal of the state's prevailing wage law.

Source: Utah LMI Annual Report, Table 5.

After the repeal of the state's prevailing wage law, the distribution of employment shifted among types of contractors in Utah. In the decade before the 1981 repeal a higher percentage of construction employees worked for general contractors and heavy-and-highway contractors. These are typically larger firms. After the repeal, a higher percentage of employees worked for specialty contractors, which tend to be smaller firms.

When they repealed Utah's law, a lot of companies went out of business because of the cutthroat competition. A lot of companies just bought jobs so they could have a cash flow to make payments on their equipment. The design engineers would tell the contractor that let's say the job was going to cost a million dollars. The contractor would still go in there anyway and low-ball the bid. Then they would turn around to their workers and make their wages fit whatever they had to be to fit the low-ball bid.

The general contractors did a lot of bid shopping after the prevailing wage law was repealed. The general contractor would get a bid from the subcontractor of say \$50,000 and then he would low-ball the bid. Then, when the general got the job he would go back to the subcontractor and say yeah I've got the job but you've got to cut your bid to \$40,000 to have this job I've got and the sub would go back to the workers and say OK we've got this job but now I've got to cut your wages.

See costs of materials and supplies and equipment were stable. The price of bricks and the asphalt didn't go down just because you got this job. So the workers had to make up the difference for all this low-ball bidding. So basically the employer got their money off the backs of the worker. Whether it was to make money or just to break even, wages had to fall.

- Operating engineer, Bountiful, Utah, 1994

But wages were not the only factor to feel the strain of an overheated bidding process. Government purchasers of construction services were now exposed to practices of low-balling bids and over-running costs. Average annual cost overruns for the Utah Department of Transportation prior to the law's repeal was 2 percent of initial accepted bid (fig. 2.2). Since the repeal, however, overrun costs have risen to 7.3 percent of the initial bid. This rise in overrun costs has come despite the introduction of computers as a tool for contractors in preparing their bids.

The cause of these increased overrun costs is the post-repeal tendency for contractors to take more risks in the bidding process under the pressure of increased competition (fig. 2.3). When the state calls for bids on a project, the state engineer prepares an initial estimate of the project's cost. In the decade prior to the repeal of Utah's prevailing wage law, winning bids averaged 91 percent of the state engineer's estimate. After the repeal, winning bids have been, on average, 89 percent of the state engineer's estimate. Although contractors are apparently shaving their bids to win state contracts, these lower estimates have not proved to be a windfall for the state.

Instead, after Utah's prevailing wage law repeal, final construction costs have been running at 95 percent of the state engineer's initial estimate. This amounts to 6 percentage points above the accepted bids. Prior to Utah's repeal, final costs were running 93 percent of the engineer's estimate, only two points higher than initial accepted bid prices.

This does not necessarily mean that the pre-repeal construction was ultimately cheaper for the state, but it does mean that the relationship between accepted bid price and actual costs was more certain and that contractors promised less before Utah's repeal, but delivered more relative to the state engineer's cost estimates.⁴⁶

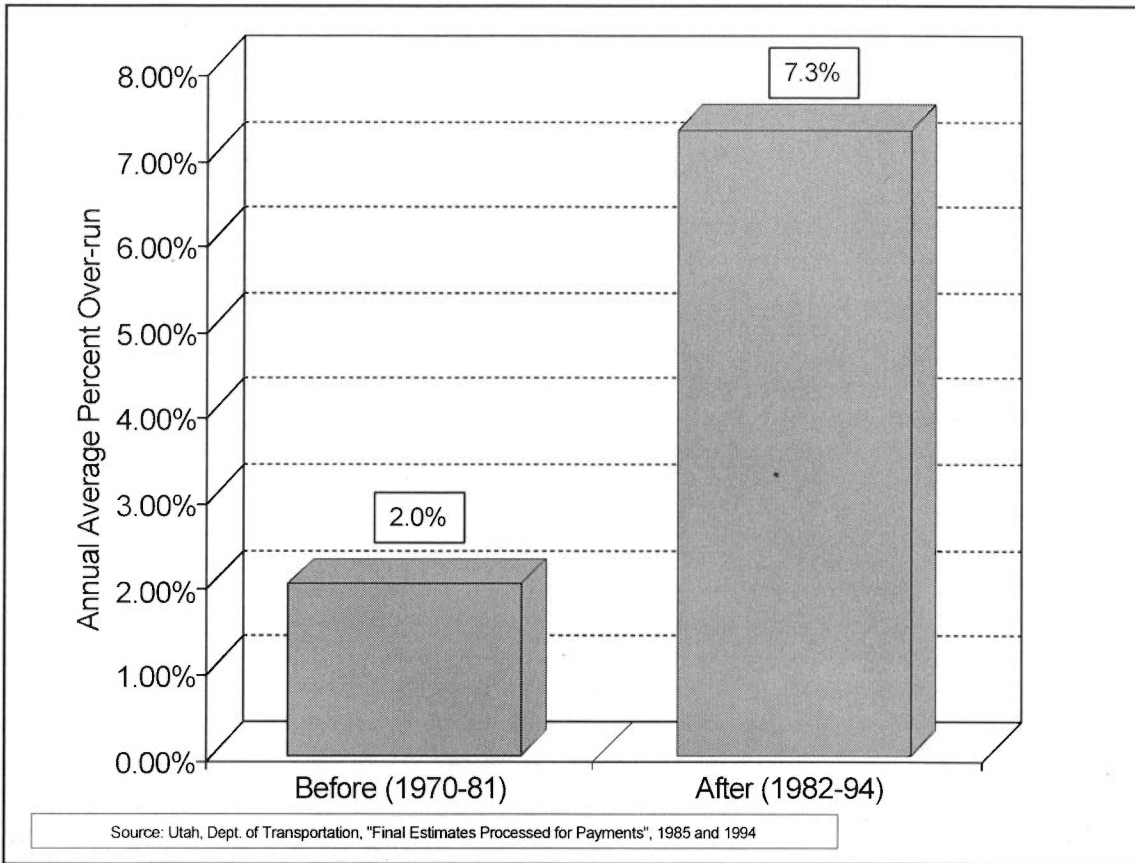


Figure 2.2 Average cost overruns as a percentage of accepted bids on Utah road construction, before and after repeal of the state prevailing wage law

Cost overruns on the construction of Utah roads averaged 2 percent over accepted bids in the decade before Utah's repeal of its prevailing wage law. In the decade after repeal, average cost overruns rose to 7.3 percent over the accepted bid. Change orders associated with cost overruns are one of the more expensive components of construction costs.

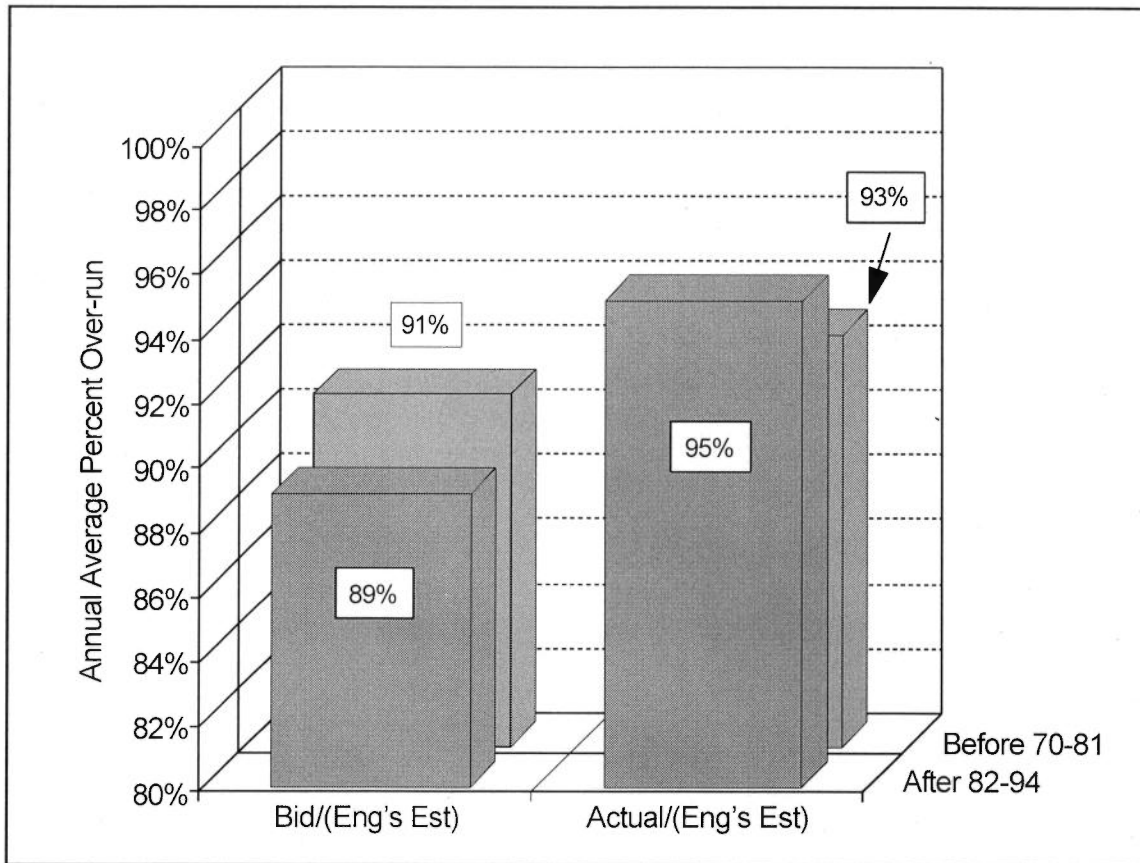


Figure 2.3 The ratio of accepted bids and final cost to the Utah state engineer's estimate of road construction project cost, before and after repeal of the state's prevailing wage law

After the Utah repeal of its prevailing wage law, competition among contractors heated up and contractors shaved their bids to win contracts. In the decade before the state repeal, accepted bids averaged 91 percent of the state engineer's estimated project cost on road construction. After repeal, accepted bids fell, on average, to 89 percent of the state engineer's estimates. However, this cutthroat bidding did not cut final project costs as a percentage of the state engineer's estimates. In the decade prior to the repeal of Utah's prevailing wage law, final costs averaged 93 percent of the state engineer's project cost estimate. In the decade after the repeal, because of a tripling of cost overruns, the final project costs averaged 95 percent of the state engineer's estimate.

A Loss of Earnings for All Construction Workers

Heightened competition after Utah's repeal has not only created uncertainty in the bidding process, but has also lowered Utah construction wages across the board. A union plumber describes this:

After Utah repealed its little Davis-Bacon law I was working on a job as a union plumber. The electricians on the job were non-union. At that time there was terrific pressure on wages and, as I remember, the IBEW [International Brotherhood of Electrical Workers] took a big wage cut – something like \$3 – from \$16 to \$13. Anyway, the day after the union electricians took that cut, the contractor came on the job and told these non-union guys they would have to take a \$3 cut too. There was a lot of animosity around that but they took the cut anyway. They had to. Our union held off two years before we had to do the same thing the electricians did, and when we took our cut the non-union plumbers' wages fell right along with ours.

– Union plumber, Salt lake City, 1994

Utah repealed its prevailing wage law just as the economy was falling into the 1982 recession. Thus, the effects of the repeal initially were tangled up with the effects of the recession. However, some of the nine states that have repealed their prevailing wage laws did so in good times and some in bad times. A comparison across states can somewhat disentangle effects of the business cycle from effects of a repeal.

Whatever a government might save in construction expenses from the repeal of a prevailing wage law, the saving has to be balanced against the loss of other revenues. The lower wages paid on government-financed construction have a ripple effect, lowering wages throughout the local construction industry. Construction workers in states that have a prevailing wage law have a higher average annual income than construction workers in states that have repealed a law; and those workers, in turn, earn more, on average, than do construction workers in states that have never had a prevailing wage law (fig. 2.4). That pattern may be explainable, however, for more than one reason. States that have different prevailing wage law policies may have higher or lower construction earnings for reasons unrelated to the wage law. For instance, repeal states might also be low-wage states in general.

It may thus be more useful to isolate earnings data for repeal states only – before and after (fig. 2.5). Average annual construction-worker earnings in the nine states that repealed their prevailing wage laws from 1979 through 1988 show a drop of \$1,835 from \$24,317, or about 7.5 percent in wages, adjusted for inflation and denominated in 1991 dollars, or \$2,016 in 1994 dollars. The nine states are not heavily unionized and a fall of this magnitude cannot be accounted for simply by a fall of union wages to the non-union level.

In recent years, the average construction unionization rate in the nine states that repealed their state prevailing wage laws has been around 13 percent of the construction labor force.⁴⁷ With this level of union coverage, for a fall in the union wage to account for all of the fall in the average wage, at the outset of the repeal, union workers would have had to have been earning 60 percent more than non-union workers.⁴⁸ Union wage differentials typically are around 10 to 20 percent above non-union wages. Because union wages are not sufficiently high and union coverage not sufficiently wide to account for all the fall in construction wages in these repeal states, we know that non-union workers have had to absorb some share of this average earnings decline.

If one assumes that the union differential is 20 percent above the non-union wage and, after the repeal, the union wage falls to the non-union wage, both wage rates will have to fall even further to attain an overall 7.5 percent cut in earnings. Assuming that the union wage would fall to the non-union rate and then they would both fall together, the union wage would have to fall by 21 percent and the non-union rate would have to fall by 5 percent to obtain an overall fall of 7.5 percent.⁴⁹ In fact, only rarely does the union rate fall entirely to the non-union wage. A reasonable assumption would be that the union rate prior to a repeal was 20 percent above the non-union rate and after the repeal fell to 10 percent above the non-union rate. Given a 7.5 percent overall fall in earnings and a 13 percent union membership rate, union wages would have to fall 14 percent and non-union wages would have to fall 6.3 percent to obtain an overall fall of 7.5 percent. In other words, while the union rate would have to fall twice as much as the non-union rate, the non-union sector of construction workers would have to absorb much of the average percentage wage cut. The effects of state repeals of prevailing wage laws are isolated neither to union workers nor to government-financed construction.⁵⁰ They generate across-the-board cuts in the earnings of all construction workers.

A Loss of State Tax Revenues

The tax revenue losses that result from lower construction wage levels are surprisingly large. Whatever the source of this earnings decline among construction workers, states with income taxes have lost tax revenues as a result of this decline in taxable income among construction workers. And, because this lost income means lost purchasing power, states that have repealed their prevailing wage laws have also lost some sales tax revenues. On average, construction workers account for 5 to 6 percent of a state's labor force. In Utah in 1991, individuals earning \$20,000 to \$30,000 paid a marginal state income tax rate of about 7 percent. Taking the 31,528 construction workers employed in Utah in 1991 and an average per capita decline in income of \$1,835, the total loss of annual income from the Utah construction industry in Utah in 1991 because Utah's 1981 repeal could be calculated as \$58 million (\$1,835 times 31,528). Given a marginal tax rate of 7 percent, 1991 lost state income tax revenues might amount to \$4 million (in 1991 dollars) (table 2.1). Assuming a marginal propensity to consume on sales-taxable items from changes in income of 80 percent and a sales tax rate of 6.25 percent, lost state sales tax revenues from this loss of income amount to \$2.9 million in 1991.⁵¹ Adding these two losses and bringing them to 1995 values using the consumer price index yields an estimated loss of \$8.2 million in state taxes in Utah in 1991 evaluated in 1995 dollars.

The figure of \$8.2 million in lost tax revenues may be an overestimate for four reasons, however. First, if wages fall and labor becomes cheaper, contractors might hire more workers. So we must consider possible increases in total income of construction workers resulting from possible increases in total construction employment after a fall in wages. Second, real wages have been falling in the United States generally, including the construction industry. Some of the lower wages after state repeals may simply reflect a long-term decline in real wages that would have taken place anyway. Third, annual earnings in construction are sensitive to unemployment. Earnings rise when unemployment falls and fall when unemployment increases. Because

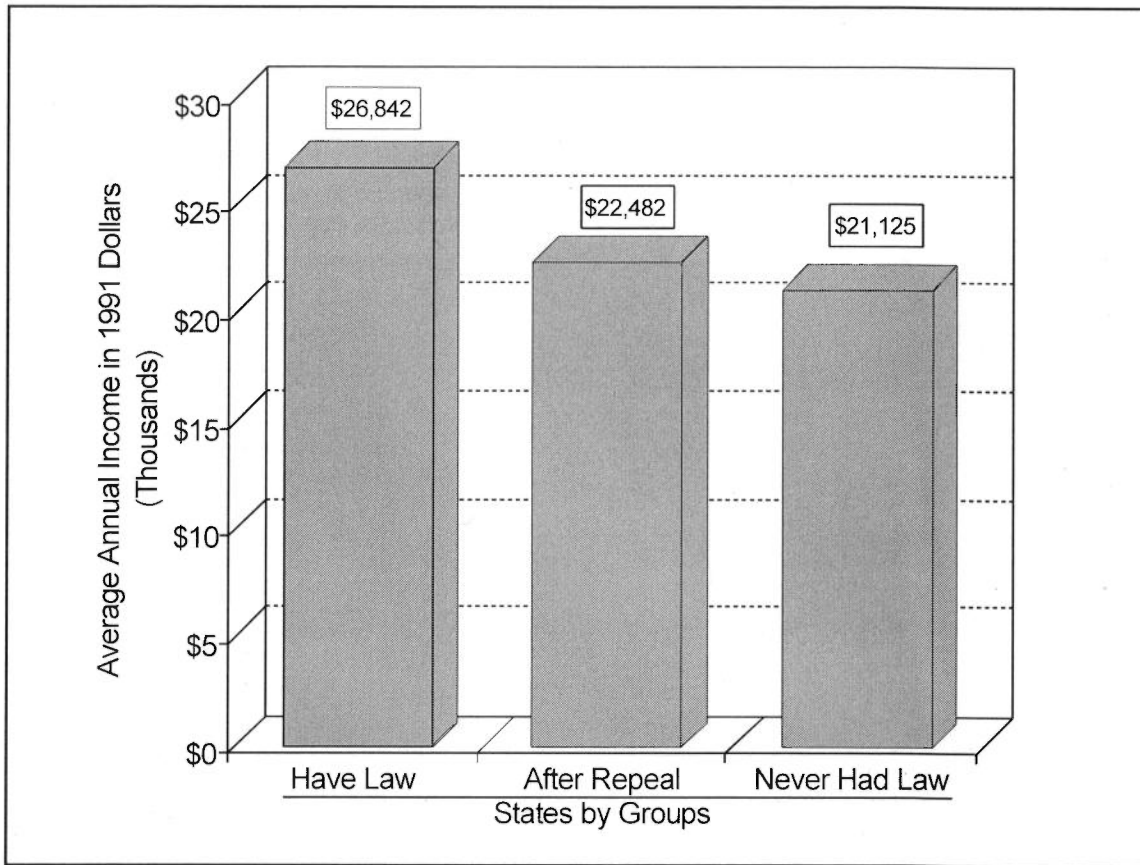


Figure 2.4 A comparison of annual construction earnings, by status of prevailing wage law
 Source: US DOL Employment and Earnings, 1975-91.

Figure 2.4 groups states into three categories (from left to right). The first bar, on the left, shows average annual income in 1991 dollars for construction workers in all states and years where a state prevailing wage law was enforced. This includes repeal states prior to repeal. The second bar shows the average annual earnings of construction workers in repeal states after repeal. The third bar represents average annual earnings for construction workers throughout 1975 to 1991 in all states that never had a prevailing wage law. These data provide initial evidence that repealing or never having a prevailing wage law lowers construction income not only on public works but across the entire state construction industry.

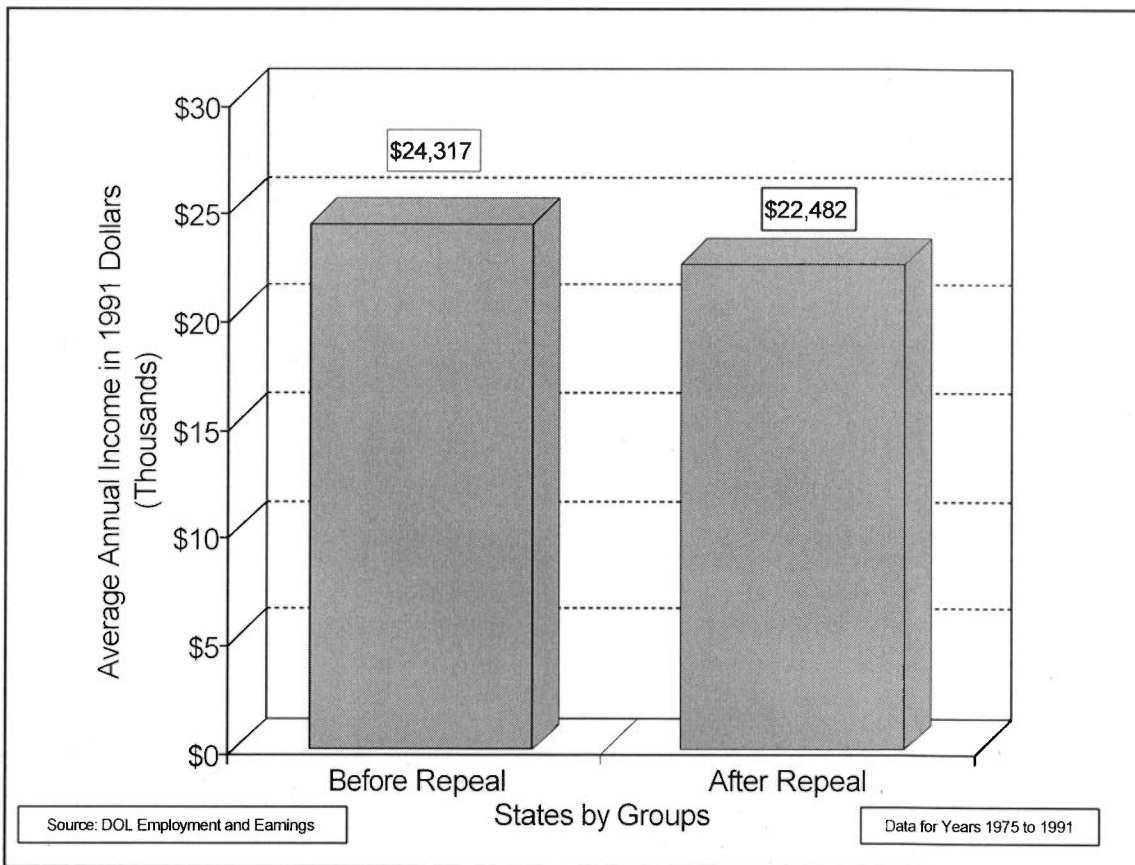


Figure 2.5 A comparison of construction earnings in nine repeal states only, before and after repeals (in 1991 dollars)

In the nine states that repealed their prevailing wage laws between 1979 and 1988, average annual income fell after the repeals (calculated in constant 1991 dollars). This fact does not control for other factors that might have been driving down wages, but it is prima facie evidence that the repeals forced lower earnings not just on public works but across the construction labor market.

Table 2.1 A simple estimate of Utah tax revenues lost in 1991 as a result of the 1981 state prevailing wage law repeal

Individual construction income prior to repeal (1991 dollars)	\$24,317
Individual construction income after repeal (1991 dollars)	\$22,482
Lost income due to repeal (1991 dollars)	\$1,835
1991 Utah construction employment	31,528
Total lost income in construction (1991 dollars)	\$57,853,880
Lost Utah income tax	\$4,049,772
Lost Utah sales tax	\$2,776,986
Total lost tax revenues	<u>\$6,826,758</u>
Total lost tax revenues in 1995 dollars	<u>\$8,192,109</u>

The average annual construction earnings in 1991 dollars for nine repeal states in the years after 1975 and before each state's repeal was \$24,317. In the years after each repeal up to 1991, the average construction earnings fell to \$22,482. Utah construction employment in 1991 was 31,528 workers and multiplying these by an annual loss of income of \$1,835 yields a total lost income in Utah construction of \$57.8 million. Based on Utah's income tax rate of slightly over 7 percent and a sales tax rate of slightly over 6 percent and a marginal propensity to consume taxable items of 80 percent, total lost state tax revenues were \$6.8 million. In 1995 dollars, this is \$8.2 million.

unemployment varies by state and year, some of the difference in earnings might be because of variations in the unemployment rate. Last, construction wages vary by region for reasons that are not directly due to the presence or absence of prevailing wage laws. These regional differences in earnings, unemployment, and long-term trends in wages can be accounted for by using linear regression analysis.

Regression Analysis of the Decline of Construction Worker Earnings

Using linear regression analysis, this section uses U.S. Department of Labor employment and earnings data for construction workers broken down by states for 1975-91 to re-estimate the construction earnings loss resulting from state repeals of prevailing wage laws. The analysis controls for long-term trends in wages, variations in unemployment, and variation in wages by region of the country, and then focuses on the effect of (1) never having had a prevailing wage law, (2) repealing a prevailing wage law, and (3) raising the threshold for implementing a state prevailing wage law to contracts worth \$500,000 or more.

U.S. Department of Labor employment and earnings data provide detailed information on annual construction earnings broken down by year, state, and type of construction contractor.⁵² For 1975-91, there are 27,778 separate observations. The inclusion in these data of information about prevailing-wage law status by state and year and translation of all money values into 1991 dollars (using the consumer price index) allows us to test for (1) the effect that never having had a prevailing wage law has on per capita construction earnings, (2) the effect on individual earnings of repealing a state prevailing wage law, and (3) the effect on individual earnings of raising the threshold for applying a prevailing wage law.

In this test, we control for regional differences in construction earnings, secular trends in earnings,⁵³ cyclical variations in earnings as a result of variations in unemployment, and differences in earnings by detailed contractor type.⁵⁴

The data used for this test include average earnings across all states, years, and construction trades — \$26,645 per year in 1991 dollars (table 2.2).⁵⁵ States that never had a prevailing wage law account for 15.6 percent of all the observations. States that repealed their laws account for 10.5 percent of all observations after repeal and 7.8 percent of all observations before they repealed their laws, for a combined total of 18.3 percent. States that had and retained their prevailing wage laws between 1975 and 1991 account for the remaining 66.1 percent of all observations in the data set. Maryland and Oklahoma, the states with prevailing wage laws but with threshold levels of projects costing \$500,000 or more, account for 4 percent of all observations. State-by-state unemployment rates in this period averaged 6.76 percent annually.

The results of this regression model estimating the effects of state repeals on construction earnings are statistically significant and the overall model has a goodness of fit of 73 percent, which means that 73 percent of the overall variation in annual earnings in the data set are explained by the model. The results may be read as follows (see table 2.3).

Begin with a constant amount of annual earnings of \$33,005. (This is a starting point calculated by the regression model and is typically called the "constant.") Then select a state and a year. In any state for any year we know the status of prevailing wage laws for construction. We use Utah as an example in column (3). Utah once had a prevailing wage law, but, by 1991, that law had been repealed. Furthermore, 1991 was 17 years after the beginning of the data set

Source: U.S. Bureau of Labor Statistics, Office of Earnings and Employment Statistics.

Table 2.2 A description of the data used in regression model of earnings decline

Observations	27,778
Average Earnings	\$26,645
<i>Variables</i>	<i>Percentage of data</i>
<i>Percent of all observations by region</i>	
South	29.9%
Midwest	13.9%
Atlantic	10.5%
Mountain	10.5%
Corn Belt	10.3%
Pacific	8.8%
New England	8.2%
Hawaii	1.1%
Alaska	0.4%
<i>Other control variables</i>	
Average state unemployment rate	6.76%
Percentage of states with threshold for applying state law of more than \$500,000	4.3%
<i>Legal variables</i>	
Percentage of all states that are repeal states	18.3%
Percentage of all states that never had state law	15.6%

Table 2.3 A regression estimate of the effects of state repeals on construction annual earnings, controlling for regional differences in earnings, and secular and cyclical trends in earnings

Regression Model Variables and Coefficients		Examples for 1991 (in 1991 Dollars)		
		Utah	Maryland	Georgia
(1)	(2)	(3)	(4)	(5)
Starting Point:	\$33,005	\$33,005	\$33,005	\$33,005
Regional Control Variables:				
Alaska	\$15,628			
Hawaii	\$7,982			
Midwest	\$4,768			
Pacific	\$4,638			
Atlantic	\$4,617		\$4,617	
New England	\$1,545			
Corn Belt	\$1,010			
Mountain	-\$79	-\$79		
South	-\$2,360			-\$2,360
Trend Control Variables:				
Secular Trend	-\$225	-\$3,829	-\$3,829	-\$3,829
Unemployment	-\$30,231	-\$1,481	-\$1,784	-\$1,512
Focus on Legal Variables:				
Never Had Law	-\$2,960			-\$2,960
Repeal	-\$1,350	-\$1,350		
Threshold \$500,000	-\$1,174		-\$1,174	
Predicted Income:		\$26,266	\$30,836	\$22,345

Table 2.3: Controlling for regional differences in construction annual earnings, and secular trends and cyclical variations in earnings, repeals in 9 states lowered construction earnings by \$1,350 annually in 1991 dollars. Having a threshold of \$500,000 for applying the state law had almost the same effect as a repeal but this is based on the experience of only two states. Never having had state prevailing wage laws has almost double the negative effect on earnings compared to having recently repealed the law. This suggests that the negative effects of repeals on earnings may not have fully matured by 1991, the end of our data series.

and thus, the time variable is set at 17 and Utah is in the mountain states region. Set all other regional variables to zero and multiply the mountain states control coefficient by 1. Multiply the secular trend control variable by 17 because this is the seventeenth year of the data set. Multiply the unemployment control by 4.9% because that was the unemployment rate in Utah in 1991. Set the "never had law" variable to zero because Utah did have a prevailing wage law up to 1981 and set the threshold variable to zero, because in 1991 Utah did not have a prevailing wage law (and even when it did, the threshold was below \$500,000). Now, set the repeal variable to 1 and multiply it times the repeal coefficient. Thus, the model now predicts Utah's 1991 construction income to be \$26,266. That is \$33,005 (the starting point) minus \$79 (lower wages in the mountain states) minus \$3,829 (secular down trend in real wages) minus \$1,481 (associated with unemployment) minus \$1,350 (because of Utah's prevailing-wage law repeal). The same exercise yields a predicted income of \$30,836 for Maryland in 1991 and \$22,345 for Georgia in 1991. Change the year and/or the state and the model predictions change. The R^2 statistic of 73 percent indicates that the model fits the data well and that the predicted values are close to the actual earnings in the various states for the various years.⁵⁶

Controlling for all these variables, the model estimates that the effect of the repeal of the nine state prevailing wage laws was a negative \$1,350 annual hit on construction earnings. Given average annual earnings of \$26,645, this means a decline in earnings of 5.1 percent. This is a low estimate of a repeal's effect on earnings. The effect of a repeal may accumulate with time. The states that never had prevailing wage laws in construction have lower construction wages — after controlling for regional differences in wages and differences in unemployment rates. The model estimates that, in the nine repeal states, construction earnings are \$2,960 less than in other states, controlling for other factors. This is an 11 percent reduction in construction earnings associated with never having had a prevailing wage law. The simple procedure in the previous section which compares construction earnings in repeal states before and after repeals estimates the repeal effect to have a 7.5 percent negative effect on earnings. *Thus, the range of estimated effects varies from 5.1 percent to 7.5 percent to an 11 percent decline in construction earnings associated with the repeal or absence of prevailing wage laws.*⁵⁷

Increased Employment Associated with Lower Wages

As construction labor becomes cheaper, contractors may alter their crew mix to use more workers who are unskilled. Have the nine state repeals of prevailing wage laws generated higher levels of employment? Construction employment varies markedly with seasonal and cyclical trends in the economy. These employment swings can hide the effect of more jobs generated by falling wages. For instance, Utah repealed its prevailing wage law just as the construction economy was going into recession. On the surface, it looked like the repeal and wage cuts did not generate more construction employment. Multivariate linear regression analysis can control for these variations and pick out the potentially hidden effect of a repeal, controlling for other factors.

Table 2.4 presents the results of a generalized least-squares regression test of the hypothesis that, as construction earnings fall, all other things being equal, construction employment will rise. The model controls for variations in unemployment, secular trends in employment construction, and any nonwage effect on employment associated with the repeal of a state prevailing wage law. The focus variable in the model is average annual earnings in construction and the hypothesis is that the

relationship between earnings and employment should be negative. As earnings go down, employment might well go up. The regression model also includes control (dummy) variables for each state and each detailed industry classification (four-digit SIC; such as, plumbers and pipe fitters, SIC 1711). Thus, the model predicts construction employment in specific states, years, and each construction subclassification, such as plumbing and pipe fitting. In the data set for 1975-91, the average employment in a four-digit subclassification is 3,540 construction workers. The unemployment rate, not surprisingly, negatively affects construction employment and there is a small but statistically significant upward trend in employment. The effect of prevailing wage rate repeals on employment is negative, but this variable is not statistically significant which means the true direct effect of repeals on employment is zero.

However, the indirect effect of state repeals on employment working through lower earnings is not zero. The effect of earnings on employment is as theoretically expected. As earnings fall, employment increases and this estimated effect is statistically significant. From this relationship, we can estimate the indirect effect of state prevailing wage laws on employment through the repeals' effects on earnings.

Possible employment effects may be calculated for various levels of earnings decline. In table 2.5 column (1) presents hypothetical earnings declines and, in column (2), the results from table 2.4 are used to calculate a predicted increase in the construction industry when it is analyzed at the detail of 4-digit SIC codes (such as plumbers and pipe fitters, SIC 1711). As average annual construction earnings fall from a loss of \$500 to a loss of \$3,000, employment in given SIC industry groups rises from 24 new workers to 118 new workers.⁵⁸ Given an average employment size of a 4-digit-SIC industry group of 3,540, these hypothetical increases in employment translated in percentage terms to an increase of from 0.7 percent when earnings fall by \$500 to an employment increase of 4.0 percent when earnings in construction fall by \$3,000.

The Net Effect of Repeals on Government Budgets

The overall effect of state repeals of prevailing wage laws on state expenditures in construction and state tax revenues will depend on the amounts of government cost savings from such a repeal and lost tax revenues from a repeal. Government construction cost savings will depend on three questions: how much lower are wage costs after a repeal, how much lower is worker productivity at lower wages, and how much construction work does the government purchase? Lost tax revenues will depend on (1) the marginal income tax rate for construction workers earning \$20,000 to \$40,000 per year, (2) the sales tax rate, (3) the marginal propensity to consume taxable commodities for construction workers earning \$20,000 to \$40,000 per year, (4) lost per-capita construction income associated with a repeal, and (5) gained construction employment associated with a repeal. (The \$20,000 to \$40,000 range encompasses most construction workers.)

Previous estimates of construction cost savings associated with a hypothetical repeal of the federal Davis-Bacon Act range from 1 to 11 percent.⁵⁹ The Congressional Budget Office favors an estimate of a 1.5 percent cost savings associated with the wage effect plus a 0.2 percent cost savings because of paperwork associated with Davis-Bacon.⁶⁰ The savings may be higher or lower.

Table 2.4 Effects of wages on employment, controlling for state differences in employment, differences in the size of SIC groupings, the direct effects of repeals, and secular and cyclical trends

(1)	(2)
Starting point:	5,500 workers in each SIC group in state
Unemployment rate	Subtract 211 workers for each percentage-point rise in unemployment
Secular trend	Add 31 workers for each additional year
Repeal	Subtract 170 workers (not statistically significant)
Average Earnings	Subtract 47.1 workers per \$1,000 increase in earnings
Number of Observations	27,778
Avg. Employment in SIC Group by State and Year	3,540

Note: An example of a four-digit SIC (Standard Industrial Classification) group is plumbers and pipe fitters, SIC 1711.

Controlling for state differences in construction employment, differences in the size of four-digit SIC groups (such as plumbing versus electrical), secular trends, and cyclical variations in employment in each state – and the direct effect of repeals on employment – a fall in earnings resulting from a fall in wages raises employment in construction. For an average-size SIC group of 3,540 workers, a

Table 2.5 Effects of construction earnings decline on employment for an average-sized detailed standard industrial classification of 3,540 workers per state

Various Hypothetical Earnings Declines	Predicted Rise in Employment Because of A Fall in Annual Construction Earnings	Percentage Rise In Employment Because of a Fall in Earnings
(1)	(2)	(3)
-\$500	24	0.7%
-\$1,000	47	1.3%
-\$1,500	71	2.0%
-\$2,000	94	2.7%
-\$2,500	118	3.3%

As repeats force a fall in construction wages and earnings, construction employment rises. The model in table 2.4 indicates that a \$500 fall in earnings results in a 0.7 percent rise in employment. An average annual \$3,000 drop in earnings would result in a 4 percent rise in employment. This is an "inelastic" demand for labor – the percentage that earnings declines is substantially higher than the resulting percentage rise in employment (for the 4-digit SIC group). This means that even though employment rises when wages fall, the rise in employment is relatively small compared to the fall in wages. Consequently,

The effect in Utah. In this section, we will simply accept all ranges of hypothetical or estimated savings rates from 1 to 11 percent in order to examine our model of lost tax revenues as it applies to Utah (see table 2.6).

Rows 1 through 10 of table 2.6 provide half of the information needed to calculate the net effect on Utah's budget balances associated with the repeal of Utah's prevailing wage law in construction. Row 2 shows the level of employment in construction in Utah for 1987 to 1993. Taking from our regression model the value of lost income associated with a repeal of a state prevailing wage law (-\$1,350) and translating that into 1994 dollars, using the consumer price index (-\$1,477), we multiply this lost income times the level of construction employment in Utah for each year. This lost income associated with a repeal, denominated in 1994 dollars, is shown in row 3. Row 4 shows the gained amount of employment associated with a fall in construction wages and earnings because of a repeal. Row 5 shows average construction worker income in each year (in 1994 dollars). Row 6 shows the gained income due to additional workers shown in row 4 multiplied by average construction worker income in row 5. Row 7 reports the difference between GROSS lost income due to lower earnings and gained income due to lower wages. This net lost income is the source of the lost income tax revenues reported in row 8.

Utah's income tax rate is flat at 7.2 percent above modest exemptions and deductions. Utah's sales tax rate is 6.25 percent. For construction workers, it is conservative to assume an 80 percent marginal propensity to consume locally on items subject to sales tax. This means that as a construction worker's income rises by \$1,000, that worker will spend \$800 on local commodities subject to state sales taxes. This allows for 20 percent of additional income to go to savings or purchases not subject to sales taxes. (Food purchases are subject to sales taxes in Utah.) Row 9 reports lost sales tax revenues as a result of net lost income reported in row 7. Row 10 combines lost income and sales tax revenues.

Rows 12 and 13 report in 1994 dollars the value of building and road construction in Utah not covered by the federal Davis-Bacon Act. Roughly 20 percent of road work in Utah is not covered by the federal prevailing wage law. Rows 16 through 21 calculate, again in 1994 dollars, hypothetical levels of construction cost savings associated with Utah's repeal of its prevailing wage law. These hypothetical savings range from 1 to 11 percent of total construction costs. Rows 23 to 28 subtract lost tax revenues from construction cost savings for the various hypothetical levels of cost savings.

Rows 23 to 28 show that in Utah, at total construction cost savings of below 3 percent, the repeal of the state's prevailing wage law tended to increase state finance deficits. The loss in tax revenues associated with lost construction worker earnings exceeded likely gains in construction cost savings. At and above 5 percent in total construction cost savings, the repeal helped tip the balance of state finances into the surplus. Using the Congressional Budget Office's estimate of a 1.5 percent increase in construction cost savings plus 0.2 percent in paperwork, the state of Utah would have lost more in tax revenues than it gained in construction cost savings every year since it repealed its prevailing wage law in 1981.

The likely effect of a Davis-Bacon repeal on federal budgets. For construction workers earning \$20,000 to \$40,000, federal marginal income tax rates range from 16 to 28 percent. There are no widely significant federal sales taxes. With these changes in mind, and using federal data for construction employment, we can use the above model to estimate the tax revenue effects of a repeal of Davis-Bacon (table 2.7).

Table 2.6 The relation of hypothetical construction-cost savings to tax revenues

1	Year	1987	1988	1989	1990	1991	1992	1993
2	Employment	26676	24981	25868	27836	31528	34902	39715
3	Lost Income	(\$39,397,044)	(\$36,893,746)	(\$38,203,731)	(\$41,110,216)	(\$46,562,828)	(\$51,545,795)	(\$58,653,981)
4	Gained Employment	478	447	463	498	564	625	711
5	Income	\$26,206	\$26,329	\$25,940	\$25,213	\$25,166	\$23,933	\$23,041
6	Gained Income	\$12,513,453	\$11,773,180	\$12,011,379	\$12,562,530	\$14,202,408	\$14,952,327	\$16,379,981
7	Net Lost Income	(\$26,883,591)	(\$25,120,566)	(\$26,192,352)	(\$28,547,686)	(\$32,360,421)	(\$36,593,468)	(\$42,274,000)
8	Lost Income Tax	(\$1,881,851)	(\$1,758,440)	(\$1,833,465)	(\$1,998,338)	(\$2,265,229)	(\$2,561,543)	(\$2,959,180)
9	Lost Sales Taxes	(\$1,344,180)	(\$1,256,028)	(\$1,309,618)	(\$1,427,384)	(\$1,618,021)	(\$1,829,673)	(\$2,113,700)
10	Total Lost Taxes	(\$3,226,031)	(\$3,014,468)	(\$3,143,082)	(\$3,425,722)	(\$3,883,250)	(\$4,391,216)	(\$5,072,880)
11	Value of State-Financed Construction							
12	Buildings	\$94,436,620	\$78,089,603	\$93,725,806	\$78,661,056	\$87,518,355	\$108,325,018	\$118,790,378
13	Roads	\$21,117,077	\$9,824,176	\$17,183,065	\$11,970,161	\$27,677,680	\$14,337,135	\$13,824,742
14	Total	\$115,553,697	\$87,913,779	\$110,908,871	\$90,631,217	\$115,196,035	\$122,662,153	\$132,615,120
15	Hypothetical Savings in Construction Costs							
16	1%	\$1,155,537	\$879,138	\$1,109,089	\$906,312	\$1,151,960	\$1,226,622	\$1,326,151
17	3%	\$3,466,611	\$2,637,413	\$3,327,266	\$2,718,936	\$3,455,881	\$3,679,865	\$3,978,454
18	5%	\$5,777,685	\$4,395,689	\$5,545,444	\$4,531,561	\$5,759,802	\$6,133,108	\$6,630,756
19	7%	\$8,088,759	\$6,153,964	\$7,763,621	\$6,344,185	\$8,063,722	\$8,586,351	\$9,283,058
20	9%	\$10,399,833	\$7,912,240	\$9,981,798	\$8,156,809	\$10,367,643	\$11,039,594	\$11,935,361
21	11%	\$12,710,907	\$9,670,516	\$12,199,976	\$9,969,434	\$12,671,564	\$13,492,837	\$14,587,663
22	Net Gain (or Loss) in Tax Revenues							
23	1%	(\$2,070,494)	(\$2,135,330)	(\$2,033,994)	(\$2,519,410)	(\$2,731,290)	(\$3,164,595)	(\$3,746,729)
24	3%	\$240,580	(\$377,055)	\$184,184	(\$706,786)	(\$427,369)	(\$711,352)	(\$1,094,426)
25	5%	\$2,551,654	\$1,381,221	\$2,402,361	\$1,105,839	\$1,876,551	\$1,741,891	\$1,557,876
26	7%	\$4,862,728	\$3,139,497	\$4,620,539	\$2,918,463	\$4,180,472	\$4,195,134	\$4,210,178
27	9%	\$7,173,802	\$4,897,772	\$6,838,716	\$4,731,087	\$6,484,393	\$6,648,378	\$6,862,481
28	11%	\$9,484,876	\$6,656,048	\$9,056,894	\$6,543,712	\$8,788,313	\$9,101,621	\$9,514,783

Table 2.7 Projected effect of a repeal of Davis-Bacon on the federal budget

1	Employment	6,000,000		
2	Lost Income (Employment*\$1,477)	\$8,862,000,000		
3	Gained Employment (Employment*1.0179)	107,400		
4	Avg. Income in 1994	\$27,373		
5	Gained Income from New Employment	\$2,939,829,040		
6	Net Lost Income	\$5,922,170,960		
7	Lost Income Tax at Various Marginal Income Tax Rates			
8	16% Marginal Rate	\$947,547,354		
9	20% Marginal Rate	\$1,184,434,192		
10	28% Marginal Rate	\$1,658,207,869		
11	Value of Federal Construction	\$11,528,571,429		
12	Hypothetical Savings in Construction			
13	1%	\$115,285,714		
14	3%	\$345,857,143		
15	5%	\$576,428,571		
16	7%	\$807,000,000		
17	9%	\$1,037,571,429		
18	11%	\$1,268,142,857		
19	Net Gain (Loss) in Budget	16% Marginal Rate	20% Marginal Rate	28% Marginal Rate
20	1%	(\$832,261,639)	(\$1,069,148,478)	(\$1,542,922,154)
21	3%	(\$601,690,211)	(\$838,577,049)	(\$1,312,350,726)
22	5%	(\$371,118,782)	(\$608,005,621)	(\$1,081,779,297)
23	7%	(\$140,547,354)	(\$377,434,192)	(\$851,207,869)
24	9%	\$90,024,075	(\$146,862,763)	(\$620,636,440)
25	11%	\$320,595,504	\$83,708,665	(\$390,065,012)

With an employment level of 6 million construction workers and an average annual earning of \$27,000, the lost income from lower wages exceeds the gained income from increased employment. This results in differing values of lost income tax revenues depending on the assumed marginal tax rate. With a value for federal construction of \$11.5 billion, the hypothetical savings on construction from a repeal depends on the assumed cost-savings rate. At a marginal income tax rate of 16 percent, net budgetary savings from a repeal occur only with construction cost savings rates above 5 percent. At a 20 percent marginal tax rate, net budgetary savings from a repeal occur only with construction cost savings rates above 9 percent. At a 28 percent marginal tax rate, net budgetary savings from a repeal never occur within the range of cost savings between 1 and 11 percent. In short, a repeal of the Davis-Bacon Act will hurt the federal budget deficit.

There are approximately 6 million construction workers in the United States.⁶¹ Table 2.7, row 2 shows what would have been the loss in income that these construction workers would have experienced given the 1994 value (-\$1,477) of our regression estimate of the effect of state repeals on construction income. Row 3 presents an estimate of increased national construction employment associated with lower wages. Row 4 presents average annual income for construction workers in 1994. Row 5 multiplies gained employment in row 3 times average income in row 4 to obtain the increase in total construction workers' income associated with a hypothetical repeal of the Davis-Bacon Act. Row 6 subtracts gained workers' income from new employment from lost income as a result of lower wages to yield net lost worker income resulting from a hypothetical repeal. Rows 8 through 10 present lost income tax revenues due to net lost income at three marginal tax rates of 16, 20 and 28 percent. In fiscal year 1990-91, the federal government spent \$10.491 billion on construction.⁶² Row 11 presents this sum in 1994 dollars. Rows 13 through 18 present levels of hypothetical savings in construction costs associated with a repeal of Davis-Bacon. Recall that the Congressional Budget Office estimates total the savings to be 1.7 percent, but others have presented savings estimates between 0.5 percent and 11 percent. Rows 20 through 25 present the net effect on the federal budget of hypothetical construction cost savings at various projected rates minus tax revenue losses at various marginal tax rates. Rows 20 through 25 show that only at very low marginal tax rates and very high construction cost savings rates does the federal budget benefit from a repeal of Davis-Bacon. At a marginal tax rate of 20 percent and a construction cost savings rate of 3 percent, the federal budget loses \$838 million annually in 1994 dollars based on the 1991 level of federal government expenditures on construction.

Summary

In Utah, the repeal of the state prevailing wage law led to an overheated bidding process which added uncertainty to the cost of state construction. In the decade before the repeal, cost overruns on state-financed road construction averaged 2 percent of accepted bids. In the decade after the repeal, average road construction cost overruns rose to 7 percent of the accepted bid. A closer inspection of the data showed that, after repeal, contractors tended to present bids at a lower percentage of the state engineer's estimate of project costs but that, after change orders, the projects ended up costing the state a higher percentage of the state engineer's project cost estimate than in the decade prior to repeal. After the Utah repeal, contractors shaved their bids to get state jobs and more than made up for low-ball bids with subsequent change orders. This caused the increased cost overruns.

An econometric analysis controlling for variations in regional differences in construction earnings, variations in unemployment rates, and general trends in real earnings showed that the nine state repeals' effects on earnings was a loss of \$1,477 in 1994 dollars. Econometric modeling also showed that construction employment rose in repeal states after repeal by about 1.7 percent. This employment increase appeared controlling for variations in unemployment and long-term trends in construction employment growth.

Thus, in assessing the budget effect of repeals of prevailing wage laws, we are able to do two things. First, balancing the overall loss of construction worker income resulting from lower average earnings against the overall gain in construction worker income resulting from higher construction employment, we are able to estimate the change in overall construction worker income and consequently the change in government tax revenues resulting from these repeals. Second, taking a very wide range of hypothetical construction cost savings, we are able to estimate the net gain or

loss to government budgets associated with repeals.

In Utah, given its structure of income and sales taxes, the state budget would benefit from its repeal of the prevailing wage law if construction cost savings were at or above 3 percent. At the Congressional Budget Office estimate of a 1.7 percent construction cost savings (including paperwork costs), the state of Utah's budget has annually lost money as a result of the repeal every year since the repeal. Whether the state budget has gained or lost from it repeal is an open question. It is certain that Utah construction workers have lost income, not only on public works employment but across the construction labor market.

At the federal level, construction cost savings must be substantially higher to generate any budget benefit from a repeal of the Davis-Bacon Act because of the federal income tax structure. At the more conservative estimate of 3 percent construction cost savings with a 20 percent marginal tax rate and the 1991 level of federal construction spending (in 1994 dollars), the federal government would lose \$838 million per year by repealing the Davis-Bacon Act.

The justification often given for repealing the Davis-Bacon Act is that a repeal would help cut the federal deficit. That is incorrect. A repeal of Davis-Bacon would help raise the federal budget deficit. This is because the purpose and effect of a repeal is to lower the cost of wages on federally funded construction projects. But lower wages and earnings will not be isolated to federally financed public works. Earnings would decline across the entire construction labor market and the government would lose more in income tax revenues than it will gain in construction cost savings.

III. The Effect of State Repeals of Prevailing Wage Laws on Training and Minority Participation in Training

This chapter presents a case study of the effects of the repeal in 1981 of Utah's prevailing wage law on unionization, construction earnings, and training. The Utah repeal accelerated the decline in the union share of the state's construction labor market, drove down average construction wages in the state, and decreased union apprenticeship training for construction. No public or private source has offset the decline in training. In response to the decline in union membership and training, contractors have reduced turnover in order to retain skilled workers and to minimize screening and training costs. In response not only to the decline in construction wages but also to the coincident decline in health and pension benefits, however, experienced construction workers are leaving their trades for careers in other industries. Thus, while construction firm turnover is on the decline, turnover in the industry is on the rise.⁶³

This chapter examines also whether the Utah experience in training can be generalized to the eight other states that have repealed their prevailing wage laws in construction. The U.S. Department of Labor Bureau of Apprenticeship Training keeps state-by-state records on registered union and non-union apprenticeship programs in construction. These records suggest that what happened in Utah is typical of what has happened in other states after repeal of their prevailing wage laws. The ratio of apprentices to journeymen in construction is higher in states that retain their prevailing wage laws compared with states that never had such a law. The rate of apprenticeship training in states that repealed their prevailing wage laws was substantially higher before the repeal compared with after the repeal. This remains true even when one controls for regional differences in training rates, the effect of unemployment, and long-term trends in training.

There are not many minority workers in Utah in construction, but nationally there are. ("Minority" here refers to nonwhites, male and female.) Some have argued that prevailing wage law repeals will open job opportunities for unskilled minority workers and lower the unemployment rate of minorities, relative to whites. However, there is no evidence to support this claim. Black-white unemployment ratios *rose* in repeal states after repeals. Black-white unemployment ratios tend to be slightly higher in states that have never had prevailing wage laws compared to states that have retained their laws. While repealing prevailing wage laws probably has not caused black-white unemployment ratios to go up, there is no evidence to suggest that a repeal of the Davis-Bacon Act would cause black-white unemployment ratios to decline.

The repeal of prevailing wage laws has especially hurt the training of minorities. There are proportionately more minorities trained as construction apprentices in states that retain their prevailing wage laws compared with states that have never had such laws. In repeal states, the proportion of minorities trained in construction apprenticeship programs declines substantially after the repeals. This remains true after controlling for regional differences in relative training rates, unemployment, and long-term trends in minority training which are independent of state repeals of prevailing wage laws.

The decline in minority participation in construction apprenticeships after repeal is tied to a decline in unionization. Union apprenticeship programs tend to be large. Apprenticeship coordinators move apprentices from contractor to contractor in order to broaden the experiences of the apprentice. Typically, because non-union apprenticeship programs tie the apprentice to one contractor, the non-union programs tend to be small, single-firm programs, as opposed to larger,

joint programs. At the same time, affirmative action regulation of apprenticeship programs applies only to programs having five or more apprentices. With the repeal of prevailing wage laws, not only does formal apprenticeship training decline, but also remaining apprentices are found more often in smaller apprenticeship programs. Thus, one effect of state repeals of prevailing wage laws has been to move more apprenticeship training out from under the oversight of affirmative action regulation. The result has been a substantial decline in minority participation in the remaining apprenticeship training.

The Effect of Repeal on Construction Unions and Wages

When Utah repealed its prevailing wage law in construction, wages became a focus of competition between contractors bidding on state jobs. Many union contractors went non-union or double-breasted (with union and non-union subsidiaries) to match or beat the lower wages of non-union contractors, and other union contractors lost market share.

Because construction employment was falling, many union members went non-union with their traditional employers to stay employed. The vice president of a large industrial and commercial general contracting firm in Utah noted that, after the repeal,

There were a lot of union workers that carried their card in their shoe. They worked open shop until a union job came available. A lot of folks all of a sudden started to find homes over there [in the open shop] and never came back (personal interview, May 15, 1993).

Consequently, in the short-run, at least, contractors that remained union did not have a significant labor productivity advantage over many of the newly non-union contractors. This effectively forced remaining union contractors out of much of the construction market.

With the decline of union contractors, Utah construction union membership fell (fig. 3.1).⁶⁴ The decline in membership was accelerated by the 1982 recession. Union membership appeared to recover from the recession, but many dues-paying members were working open shop. With the onset of the next downturn in Utah construction in 1986, union membership began to fall steadily. These data are consistent with the story that union members working in the open shop eventually found a home there and quit paying their union dues.

With the repeal of the prevailing wage law and the resulting decline in unionization in Utah, average wages in construction fell relative to the average Utah wage (fig. 3.2). Construction wages, which had ranged from 120 to 125 percent of the average Utah wage before the construction boom of the 1970s, exceeded 130 percent during the boom. When construction employment growth stopped in the late 1970s, construction wages fell back toward the high end of their normal premium over average Utah wages. But with the repeal of the prevailing wage law, construction wages fell to a new lower range of 110 to 115 percent of the average wage in Utah. This is an across-the-board decline in construction wages and not isolated to union earnings nor the earnings of construction labor on public works. This relative decline in construction earnings in Utah is consistent with the overall decline in construction wages following repeal (chapter II).

The data for Utah actually underestimate the effect of Utah's repeal on construction workers' earnings, in part because the data do not include the change in value of benefits.

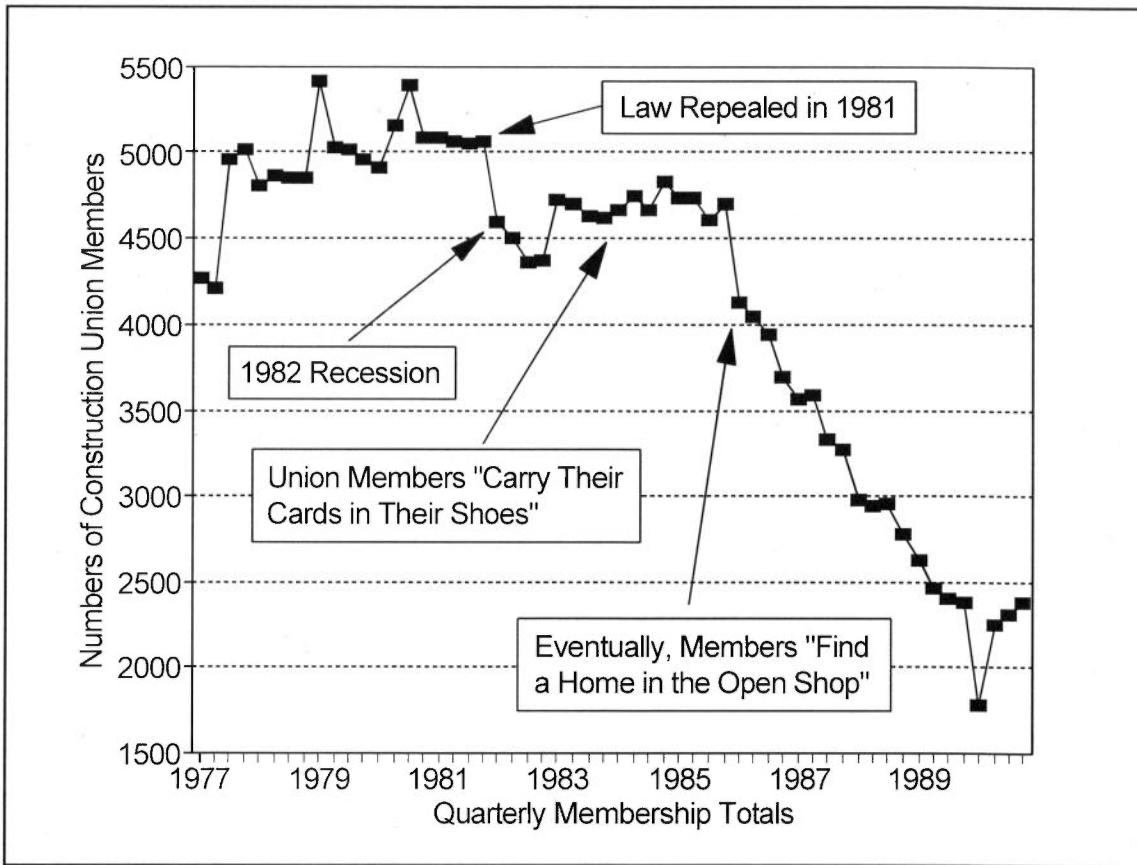


Figure 3.1 Union membership in construction in Utah, 1977-89
 Source: Utah State Building and Construction Trades dues records.

Union membership began to decline with the prevailing wage law repeal and the onset of the 1982 recession. Membership recovered somewhat in 1983 but not as fast as overall construction employment. With the 1985 downturn in Utah construction employment, union membership began a steady decline to less than half its late-1970s peak.

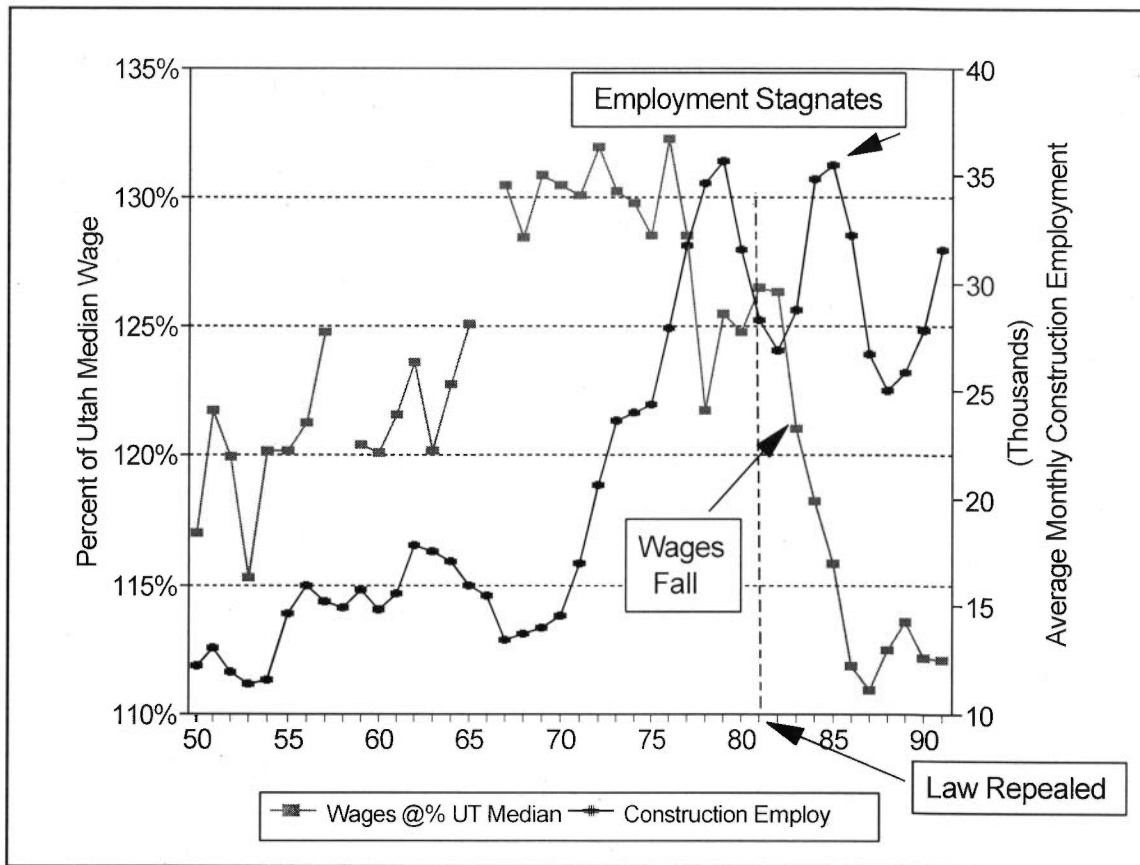


Figure 3.2 Construction wages as a percentage of the Utah median wage and Utah construction employment

Source: Utah Job Security, Division of Labor Market Information, Annual Report, table 5.

Construction employment (measured in thousands on the right-hand Y-axis) in Utah grew rapidly in the 1970s, but growth stopped in the 1980s and cyclical fluctuations became more pronounced. Wages (measured as a percentage of the median Utah wage) ranged between 120 and 125% of the Utah median wage prior to the construction boom of the 1970s. These construction earnings rose above 130% of Utah's median wage income during the boom. As the boom ended, construction wages moved down to their normal range. With the repeal of Utah's prevailing wage law in 1981, wages plummeted.

Typically, unionized construction workers receive better health and pension benefits than do non-unionized workers. Lower benefits, particularly health and pension benefits, contribute to the increase in overall labor turnover in and out of the construction industry in Utah. This increased occupational turnover, we will see, led to a younger, less trained, and less experienced labor force.

The Relation between Repeals and Black Unemployment

It has been argued that the Davis-Bacon Act was passed, in part, to restrict southern blacks from northern construction job opportunities. It is further claimed that the current high and rising ratio of black unemployment rates relative to white unemployment rates is partly due to restrictions that prevailing wage laws impose on the ability of unskilled black labor to compete with better skilled white labor. From these beliefs, it is argued that a repeal of the Davis-Bacon Act would lower black unemployment relative to white unemployment by opening up jobs for less-skilled black labor.⁶⁵

These arguments are not directly supported by the available evidence. Black unemployment rates are separately collected for only five of the nine states that have repealed their state prevailing wage laws. Arizona, Idaho, New Hampshire, and Utah do not have large-enough black populations to generate meaningful unemployment statistics. However, Alabama, Colorado, Florida, Kansas, and Louisiana do have sufficient black populations to test the above argument. The ratio of black-to-white unemployment for five repeal states can be shown using state unemployment rates for white and blacks and white males and black males (fig. 3.3). In all cases, black unemployment rates are more than twice the rate of white unemployment. Before the repeal of state prevailing wage laws, however, the male black-to-white unemployment ratio and the overall black-to-white unemployment ratio were both less than their corresponding ratios after these states repealed their prevailing wage laws.

This does not mean that the repeals caused the black-to-white unemployment ratios to rise. Black-to-white unemployment ratios were rising across the country in the 1980s in repeal states and elsewhere. The rise in the black-to-white unemployment ratios simply reflects this time trend.⁶⁶

By comparing the states that retain their prevailing wage laws with those states that never had prevailing wage laws, we can eliminate the effect of time trends in black-to-white unemployment ratios. The black-to-white unemployment ratio and the male black-to-white unemployment ratio are both lower for states with prevailing wage laws compared to states without prevailing wage laws — averaging unemployment rates across states and years from 1974 to 1992 (fig.3.4).⁶⁷ The male unemployment ratios in figure 3.4 are almost the same and statistically they are not different.

In terms of employment, rather than unemployment, in 1990 14 percent of all persons employed in construction were minorities (here defined as nonwhites plus hispanics). In the 32 states which had prevailing wage laws, 14 percent of all construction workers were minority workers, and in the 9 states that had never had prevailing wage laws plus the 9 states which had repealed their laws, 14 percent of all construction workers were minority workers. In all states, minorities were under-represented in construction. The average minority population in states which had prevailing wage laws was 20 percent and the average minority population in states without prevailing wage laws in 1990 was 19 percent.⁶⁸ Thus, minorities were under-represented in both state groupings. However, there is little here to suggest that repealing prevailing wage laws would ameliorate this under-representation. The construction employment prospects of minorities are quite similar in both states

with and without prevailing wage laws regulating public construction.

These data do not support the proposition that a repeal of the Davis-Bacon Act would ameliorate in any significant way the relative unemployment of blacks to whites.

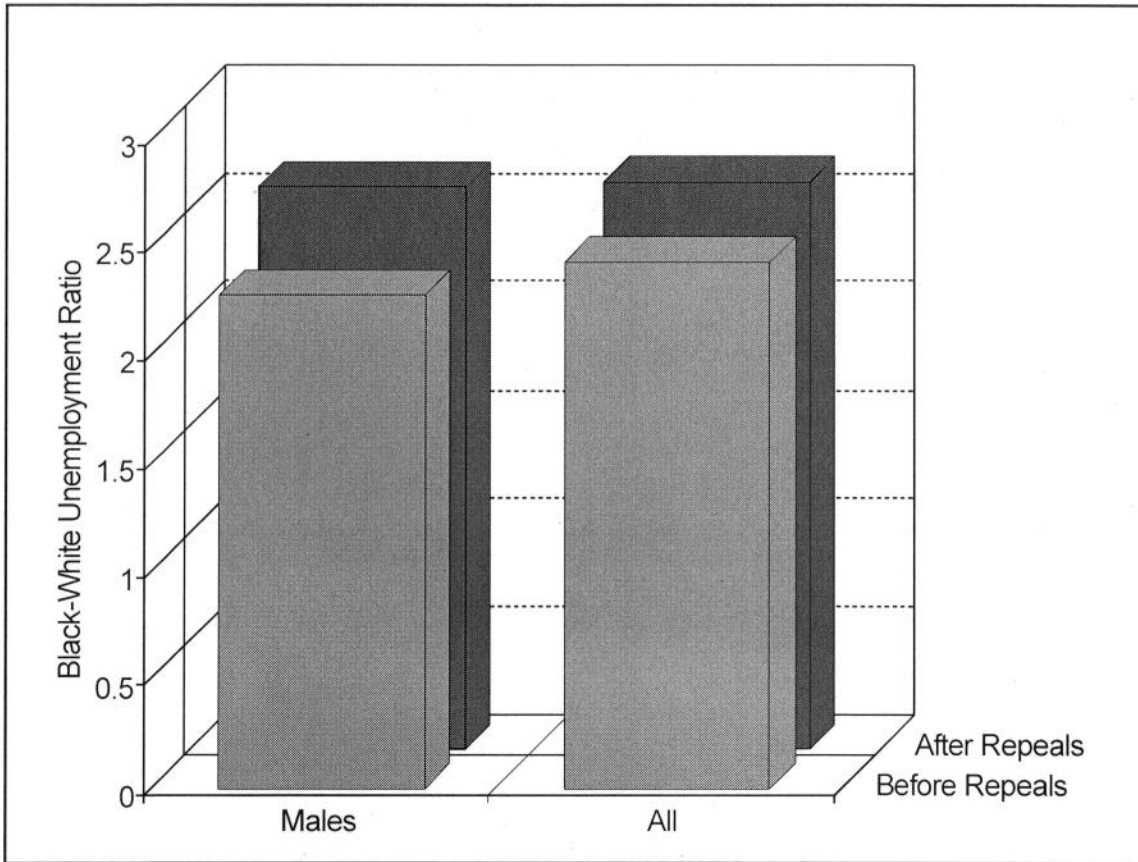


Figure 3.3 The ratio of black-white unemployment in five repeal states before and after repeals
 Source: US DOL *Geographical Profile of Employment and Unemployment 1974-92*.

Five repeal states – Alabama, Colorado, Florida, Kansas, and Louisiana – have sufficient black populations to report a separate black unemployment rate and a black male unemployment rate. In these five states, in the decade prior to repeals, the ratio of black to white unemployment rates was 2.43. After repeals, the ratio rose to 2.61 which means black unemployment was even higher in relation to white unemployment. For males, the black-to-white unemployment ratio was 2.28 before repeals and 2.60 after repeals. These ratios are based on unemployment rates for the entire state not simply construction. If repeals opened job opportunities for blacks, the effect is hidden. Black-white unemployment ratios rose throughout the 1980s and the rise is not due directly to the repeals.

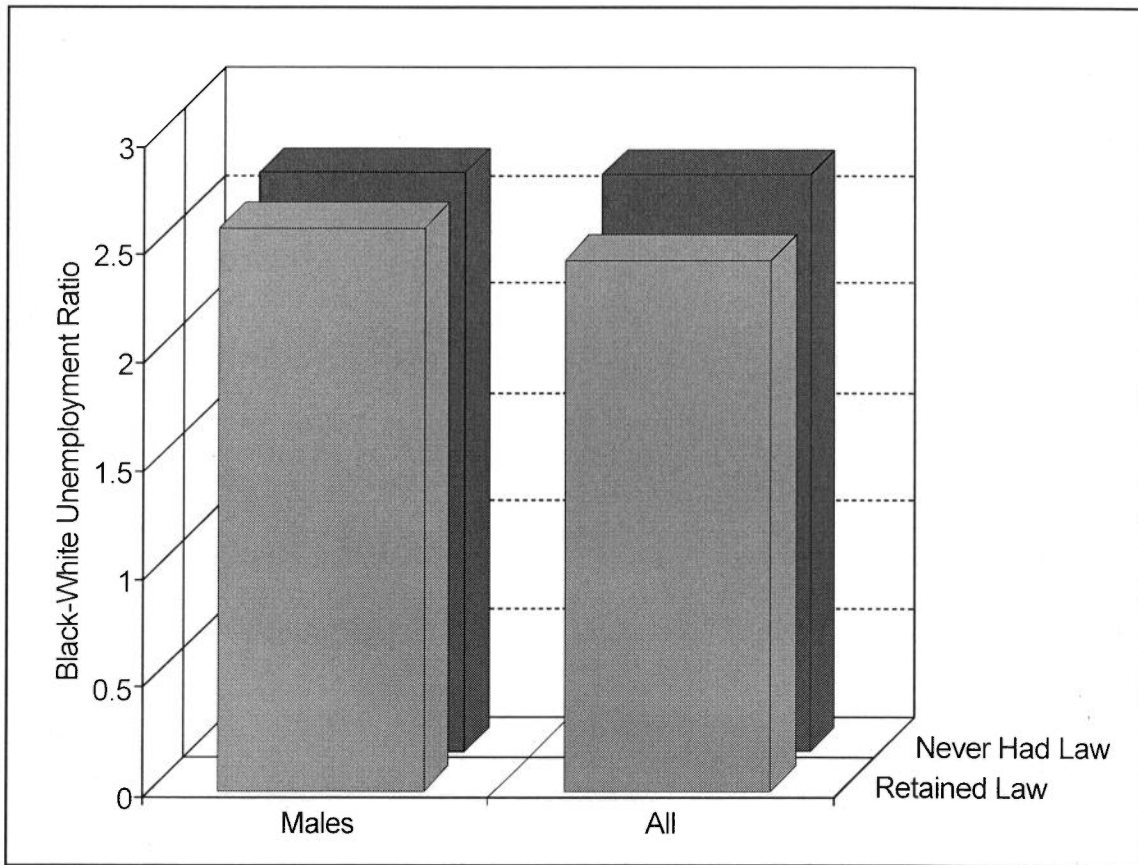


Figure 3.4 Black-white unemployment ratio for states that retained and never had state wage law

Source: US DOL *Geographical Profile of Employment and Unemployment 1974-92*.

Comparing the black-to-white unemployment ratio in states that retained their state prevailing wage laws throughout the last 25 years with the ratio in those states that never had state prevailing wage laws eliminates the effect of a strong time trend that shows up in before-and-after analysis. The male black-to-white unemployment ratio is slightly higher in the states that never had prevailing wage laws compared with states that retained theirs. The difference is not statistically significant. The overall black-to-white unemployment ratio is significantly greater in the states that never had a prevailing wage law, but this is because of female unemployment differentials, which are unlikely to be significantly affected by construction employment patterns.

A Decline in Training

With the decline in union membership and in relative wages, training for construction in union apprenticeships and through vocational schools, declined in Utah. Union apprenticeships are tied to the availability of union jobs. For instance, unionized plumbers and pipe fitters in Utah, the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, historically have attempted to maintain apprenticeship rates at 10 to 15 percent of the number of union journeymen plumbers in the state (fig. 3.5). As employment boomed in the 1970s, however, the union could not meet the demand for journeymen from union contractors. Consequently, the union increased apprenticeship rates to a peak of 25 percent in 1975. The boom persisted, but the backlog had been remedied. So the union lowered its apprenticeship rate back to normal ranges by 1978. Employment during the construction boom peaked in 1979 and membership in the plumbers and pipefitters' union peaked in 1981.

With the repeal of the Utah prevailing wage law, the union dropped its apprenticeship rate to 10 percent, a historical low. Union membership fell slightly in 1982 and began a steeper decline in 1983. Faced with these sustained declines in membership, the union cut its apprenticeship rate even lower in 1986 and thereafter. Unions hit harder by declines in membership have scaled back their apprenticeship programs further. The carpenters' union, Utah locals 184 and 1498 of the United Brotherhood of Carpenters and Joiners of America, which graduated seventy in a class in 1977, graduated five in 1992. The Utah International Union of Bricklayers and Allied Craftsmen suspended its apprenticeship program altogether.

The decline in union apprenticeship training in Utah has not been offset by a rise in other sources of training. Because the repeal of Utah's prevailing wage law was motivated by a desire to limit state expenditures, state legislators were not eager to raise funding for state-sponsored vocational training.

Although the number of vocational graduates in construction grew in the 1970s, the construction labor force grew more rapidly. Thus, while the 1970s was the heyday of vocational training at Salt Lake Community College, vocational graduates as a percentage of the construction labor force had already begun to decline.⁶⁹

The steady decline in state-supported vocational training as a percentage of the construction labor force through good times and bad supports the notion that the state has simply tried to get out of the business of vocational training in construction. The fall in union membership and wages has made construction a less attractive career. At the same time, unions are less able to train construction workers. As unions are weakened and community colleges drift toward academic offerings, the capacity to respond smoothly to an upsurge in construction jobs is undercut. And federally sponsored Job Corps vocational training is not in a position to fill in the gap.

Federal revenues pay for Job Corps training in Utah at the Weber Basin and Clearfield centers. Federal funding in real terms for these centers has not expanded, but the Weber Basin Job Corps Center, which draws predominantly from the Utah population, has significantly cut its construction worker training throughout the 1980s. This center committed itself to changing from an all-male student population in 1980 to 50 percent female by 1990. To accommodate this switch, training for traditionally male occupations such as construction, have been scaled back

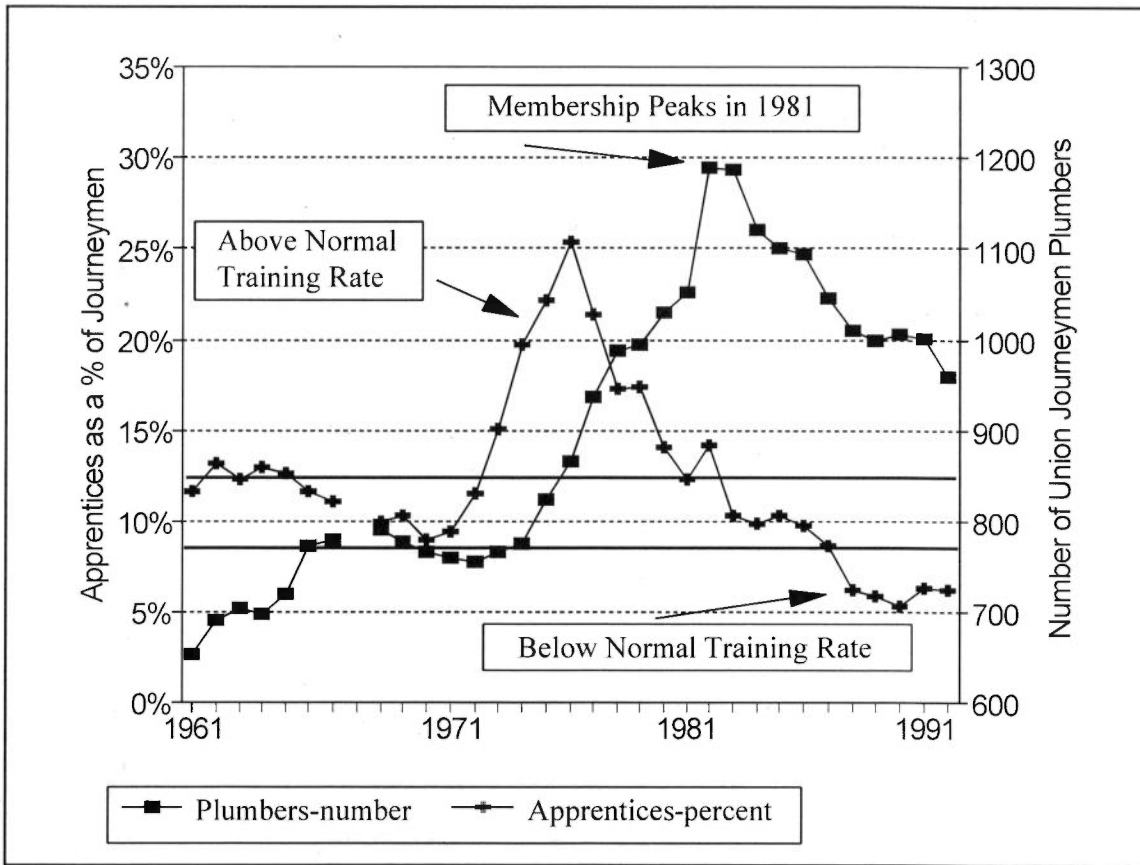


Figure 3.5 Apprentice plumbers as a percentage of journeymen plumbers in Utah, 1961 to 1991
 Source: Utah plumbers and pipe fitters locals' membership records.

The plumbers' union in Utah has historically attempted to train apprentices at a rate of 10 to 15 percent of their journeymen members. As employment boomed in the 1970s, the union could not meet journeyman demand and consequently expanded apprenticeship training rapidly. As the numbers of journeymen grew to meet demand, apprenticeship training was reduced to normal rates. But with the repeal of the state prevailing wage law in 1981, union membership declined and apprenticeship training rates were cut to all-time lows.

to accommodate new offerings in traditionally female occupations, such as office management and clerical work. Cement masonry and heavy-equipment training have been eliminated, and instruction in carpentry, painting, and brick laying has been cut in half.

The Clearfield Center has graduated approximately 100 construction trainees per year since the early 1970s. Fewer Clearfield graduates go into the Utah labor market, compared with Weber Basin graduates, because most of Clearfield's students are from out of state. Perhaps 10 percent of Clearfield's graduates go into the Utah labor market, but this percentage rises during periods of local labor shortage. It is estimated, however, that at most only 25 percent of Clearfield's graduates will stay in Utah.

Even without union pressure, it is possible that a shortage of skilled construction workers in Utah will raise wages and induce a new generation of young people to enter construction vocational training for the industry. Nonetheless Utah is now in a building boom – when wages would normally rise – and annual earnings in construction relative to annual earnings for all Utahns continue to fall. In 1993, the most recent year for which data are available, the construction earnings premium fell to a historic new low of 103 percent of the average annual earnings for all non-agricultural workers in Utah.⁷⁰

Utah is now in a building boom, one that has come quickly. High-quality training programs, which take time to create, are not in place to meet the demand. This adds an additional lag to the usual time it takes to train a skilled laborer. Utah's current boom has relied partly on using a less-skilled labor force (which partly accounts for the lower construction earnings premium) and partly on travelers from California, which is currently in a construction lull. Whether the Utah construction industry can rely, in the long run, on training systems for construction workers in California remains to be seen. A pick-up in California construction would quickly bleed away the skilled workers Utah is now attracting. This is one difference between state repeals of prevailing wage laws and a federal repeal of the Davis-Bacon Act. If construction cycles are not synchronized, it is at least possible, if a state is lucky, for one state to freely ride on the training systems of another state. A repeal of Davis-Bacon would create a nationwide decline in training. Under such a circumstance free riding on the training of another area would not be an option.

Market Responses: Training, Turnover, and Careers

The market in Utah has not successfully made up for the decline in union and state-sponsored training. At the national level, the non-union Associated Builders and Contractors (ABC) has attempted to replicate the union system of bargaining for hourly contributions to a training fund. It is difficult, however, to induce ABC's member contractors to include general training costs in their bids. Each contractor fears that his competitors will not include training costs. Thus, in an attempt to be the low-cost bidder, ABC contractors often refrain from including training costs despite the ABC initiative. Consequently, very little ABC training has occurred in Utah.

In Utah, non-union apprenticeship programs operate, however, in the licensed trades of electricians and plumbers. In 1992, there were 846 non-union licensed apprentice electricians in Utah and 2,068 non-union journeymen. Thus, there are 4 apprentices for every 10 journeymen in the non-union sector. In contrast, there were 123 apprentices and 607 journeymen in the union sector in 1992, or 2 apprentices for every 10 journeymen. In the non-union sector, apprentices begin at around \$6 per hour with no benefits. Over a four-year period, the state mandates that the apprentice wage rise

to 80 percent of a journeyman's pay. In the union sector, apprentices begin at \$7 per hour with an additional \$3 in benefits. Their wages rise to \$14 per hour plus \$3 in benefits over five years. Non-union apprentices are sponsored by a particular contractor that oversees on-the-job training, and these apprentices take classwork at a participating community college. Union apprentices work under the direction of an apprenticeship coordinator, rotate among employers for on-the-job training, and take classes at community colleges and union apprenticeship centers. Roughly 90 to 95 percent of the union apprentices complete their programs and graduate to journeymen status, while only 15 to 20 percent of the non-union apprentices graduate. Given these rates, in four years, out of 846 non-union apprentices, we should expect 125 to 170 journeymen to be graduated. In five years in the union sector, out of 123 apprentices, 110 to 115 apprentices would graduate to journeymen electrician. Thus, while the non-union sector accounts for more than 85 percent of all electrician apprentices, it accounts for about 60 percent of journeymen graduates.

Economic theory is consistent with this pattern wherein non-union apprentices are paid less and graduate at a lower rate than union apprentices. Economic theory posits that in the absence of marketwide institutions or government subsidies, individual workers will have to pay for their own on-the-job training when the skills learned are general to an industry and not specific and unique to the activities of a particular firm. The worker-learner pays for training by accepting a wage that is lower than the value to the firm of that worker's marginal product. By working for less than the worker's worth to the employer, the worker pays the employer for on-the-job training. That beginning non-union electrical apprentices earn \$6 per hour while union apprentices earn \$10 per hour (including benefits) is consistent with the theoretical proposition that non-union apprentices pay for their own training by taking a discounted wage below their marginal value to the contractor.

Because the employer does not pay much for non-union training, the theory suggests that the employer has no stake in the worker's training. If the worker leaves, the employer does not lose any investment in the worker's human capital. So, the employer will tolerate high levels of turnover. Because the worker is receiving less than what the worker can earn in other jobs with no on-the-job training, the worker may be tempted to exit jobs with training when current personal budget needs become pressing. So, on both the employer side and the worker side, turnover is tolerated in the non-union sector. This view is consistent with the higher turnover rates among non-union apprentices, but other factors also contribute to the roughly 70 percentage point differential in non-union to union graduation rates.

Because the non-union employer prices new hands at discounted wages that shield the employer from investing in the human capital of new workers, the employer does not screen new workers extensively to forestall subsequent turnover. The employer's failure to preselect new workers for aptitudes and attitudes consistent with a long-term attachment to construction work adds to the turnover among non-union construction apprentices. In contrast, the joint apprenticeship boards of unions and union contractors do considerable preselection for aptitude and attitude before letting a candidate into an apprenticeship program. This is because the union contractors and unions will invest in the union apprentices' training.⁷¹

In the non-union sector, workers may also leave apprenticeships if it becomes apparent that the employer offering training at a discounted wage is not delivering on that training promise to train. Because employers are able to discount wages of apprentices below their current worth to the employer, it is tempting to engage in bait-and-switch tactics whereby training is promised but not delivered. By saving on training costs, the employer can earn an additional profit from employing

green hands at discounted wages. In the union sector, because employers and union journeymen invest in the training of the apprentices, bait-and-switch tactics are less attractive. Because the apprentices' wage is not discounted as much below what they could earn elsewhere, the apprentices are not as tempted to leave. Thus, the non-union sector must begin training five apprentices to graduate one journeyman, while the ratio in the union sector is close to one to one.

While non-union contractors tolerate high levels of turnover among apprentices, with the decline in training and union membership, non-union Utah contractors have sought to reduce the turnover among trained journeymen. There has been a long-term decline in labor turnover in construction (fig. 3.6). This long-term decline can be explained with a pooled, cross-sectional, time-series linear regression model, as can the differences in turnover rates in Utah by contractor type from 1956 to 1991 (table 3.1). Not surprisingly, this model shows that turnover was higher in years in which variations in monthly construction employment were great. It also shows that contractors with larger crews tolerated proportionately more turnover. Contractors employing more-expensive labor sought to reduce turnover. When union membership was a high percentage of the construction labor force, turnover was higher simply because contractors losing one good worker could turn to the hiring hall for a reasonable substitute at little additional cost. When vocational schools were graduating a large number of construction-trained students relative to the Utah construction labor market, contractors tolerated more turnover because the market had proportionately more trained substitutes. The numbers of union membership and vocational graduates have been on the decline, however. Thus, this regression model shows that, over time, contractors have responded by reducing the turnover among journeymen .

Although turnover at the firm level has been on the decline, workers may be entering and leaving construction at higher rates than 20 years ago. In 1970, Utah construction workers, on average, were 42 years old.⁷² By 1990, before the recent construction boom had begun in Utah, the age had fallen to 33 years.⁷³ Much of this decline may be due to the construction expansion in the 1970s, which brought in a new generation of younger workers. But the decline in age may also be a result of both the decline in health and retirement benefits and the decline in relative wages associated with the decline in unions. Although non-union contractors increasingly are providing health and retirement benefits, especially to their key people, the health benefits tend to be more expensive for a given level of care and the retirement 401K plans lack the insurance component associated with union-defined benefit plans.

National Trends in Registered Apprenticeship Training

The U.S. Department of Labor, Bureau of Apprenticeship Training, monitors registered apprenticeship programs – union and non-union – in the construction industry. Data are available for 1975-78 and 1987-90. Not all states have reported to the Bureau of Apprenticeship Training for all years during these periods. Nonetheless, 29 states did report registered construction apprentices for every one of those years. The states included 6 states that eventually repealed

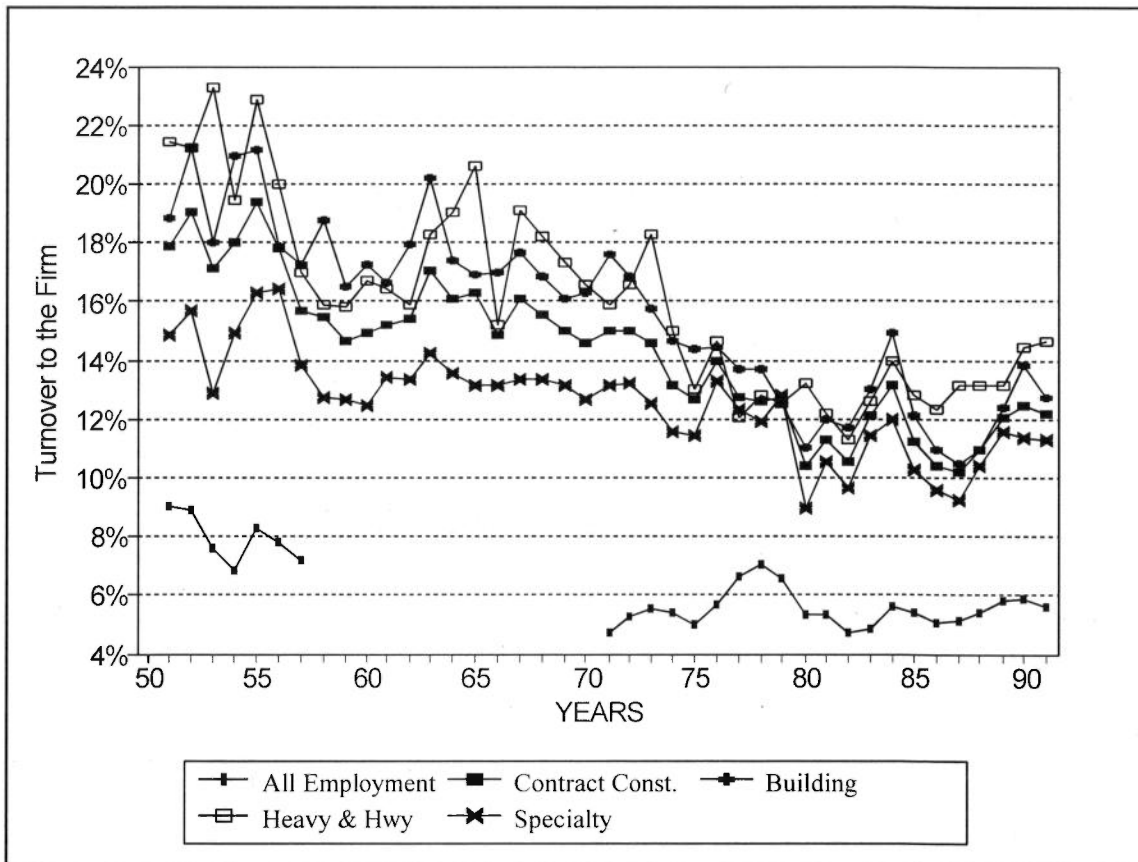


Figure 3.6 Turnover in Utah's construction industry compared with all employment statewide
 Source: Utah Job Security, Division of Labor Market Information Annual Report, table 5.

As the number of trained journeymen in Union hiring halls declines and the number of non-union journeymen declines, firms respond by reducing firm turnover. Later, it will be shown that while firm turnover in Utah construction is declining, career turnover is on the rise.

Table 3.1. Linear regression model of turnover rate in construction in Utah.
Source: Utah Job Security, Annual Report, Table 5.

Dependent variable = firm turnover in construction^a

<u>Variable^b</u>	Actual <u>Coefficient</u>	Standardized <u>Coefficient</u>
Union Members ^c	1.76	.24
New Vocational Graduates ^c	2.45	.20
Real Wage	-.076	-.62
Seasonality	2.12	.15
Workers per Contractor	.052	.40
(Constant)	-1.88	

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^a The actual variable is $\ln(\text{turnover}/(1-\text{turnover}))$ to meet the technical requirement in linear regressions of having an unbounded dependent variable.

^b All independent variables are statistically significant at the 1% level.

^c As a percent of the construction labor force.

Adjusted R Square = .24

Number of Cases = 351

Time Period = 1956 to 1991

Contractor Type = 4 digit SIC

Contractors in Utah tolerate higher labor turnover when union membership is a high percentage of the labor force, and when new vocational school graduates are plentiful. Turnover is more common in years when monthly employment fluctuates a lot. Contractors are more willing to tolerate turnover among lower paid workers and contractors with larger work crews must accept higher levels of turnover. Standardized coefficients indicate that worker skill and crew size have the largest impact on variations in employer turnover rates while both the availability of union members and new vocational graduates have larger effects than seasonal fluctuations in employment.

their prevailing wage laws, 4 states that never had prevailing wage laws, and 19 states that retained a state prevailing wage law throughout the period. These 29 states can be divided into the categories "repeal," "never-had," and "retained-law," for comparison (figs. 3.7 and 3.8). No state had repealed its prevailing wage law by 1978. By the end of the first quarter of 1987, all nine repeal states had passed their repeals except Louisiana which repealed in 1988. The data for 1987 are for the summer of 1987, after Kansas had repealed in that year.⁷⁴

In the "before" period, states that had prevailing wage laws – those that retained such a law and those that had not yet repealed theirs – typically trained a higher percentage of registered apprentices than the states that never had a prevailing wage law. For unknown reasons, the year 1976 is an exception to this pattern. During this pre-repeal period, the states that would eventually repeal their laws had as high or higher training rates compared with the states that kept their laws throughout the period. By 1987, training rates had fallen for all states, but they had fallen least in states that had retained their prevailing wage laws. By 1989, the states that had repealed their prevailing wage laws had training rates as low as the states that never had prevailing wage laws. This is clear evidence that repealing state prevailing wage laws lowers formal apprenticeship training.

A simple analysis can help isolate the effect on training of repealing state prevailing wage laws from a general downward trend in construction apprenticeship training. Apprenticeship training rates for states that repeal their prevailing wage laws in the late 1970s and 1980s are presented as a percentage of the training rates of states that retained their prevailing wage laws (table 3.2, col. 2). Throughout the 1970s, before repeals, the repeal states had training rates that were at or above the average training rates for states that had and would keep their prevailing wage laws. After the repeals in the late 1980s, the repeal states had training rates that fell to as little as 63 percent of the training rates of states that kept their prevailing wage laws. By 1990, the repeal states had relative training rates that were as low as the states that never had prevailing wage laws. Thus, while training in construction has been falling for all states, the fall for repeal states has been the most precipitous and – setting time trends aside – the repeal states matched the training rates of the retaining states prior to repeal and fell to the rates of states never having had prevailing wage laws after the repeal.⁷⁵

Unlike the simple analysis just presented, however, a multiple linear regression analysis can control for other factors, such as differences in state unemployment rates or regional differences in training (table 3.3). The dependent variable in the analysis is a transformation of the training rate for each state, where the training rate is calculated as registered apprentices as a percentage of all construction employees in a state and year. For technical reasons associated with the assumptions of linear regression analysis, the actual dependent variable is the natural log of the odds ratio of the training rate where the odds ratio is calculated as (the percent trained) divided by (one minus the percent trained).⁷⁶

In the regression model, regional differences in training rates are controlled for with the regions corresponding to standard Bureau of Labor Statistics regional categorizations. Unemployment differences are controlled for by state and year. The data are for the years 1975-78 and 1987-90. The focus variable is REPEAL, a dummy variable equalling 1 once a state repeals its prevailing wage law. A second focus variable is NEVERHAD which equals zero for all states except for those nine states that never had a state prevailing wage law in construction. For those states, NEVERHAD equals 1. There are 297 observations in the data set. California,

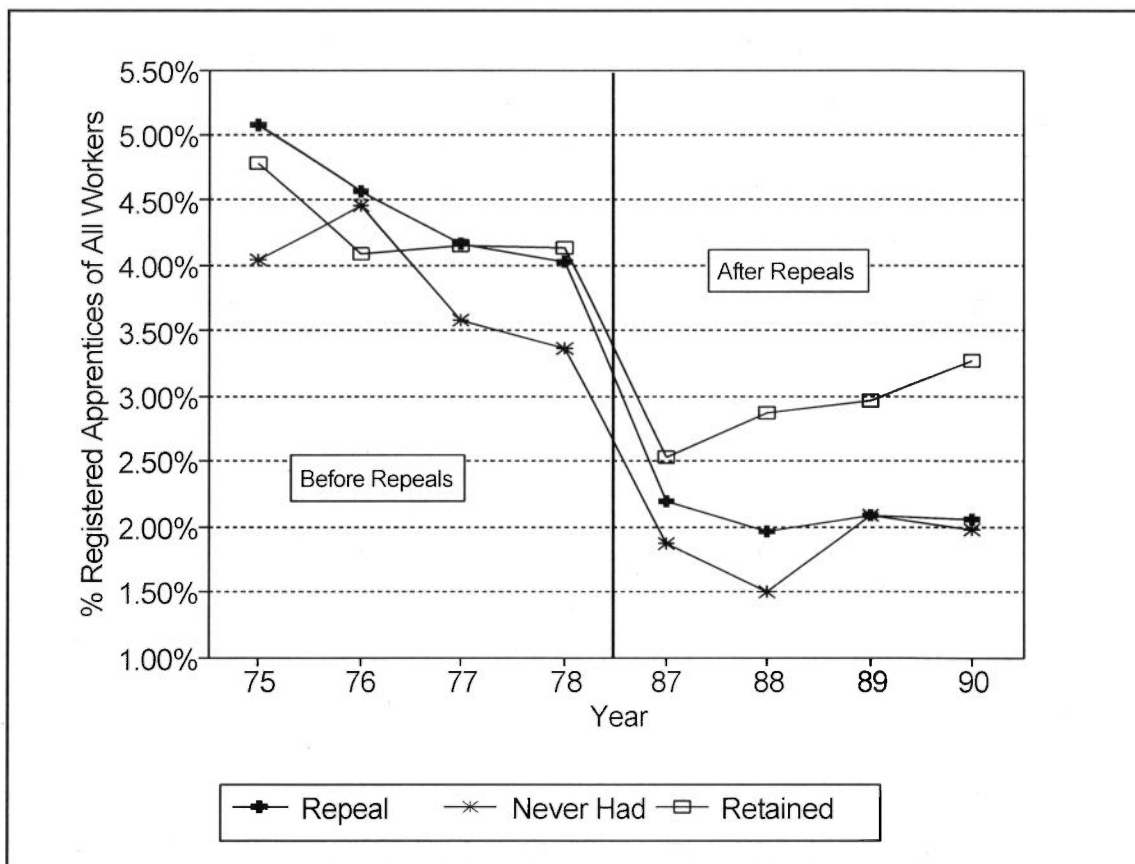


Figure 3.7 Apprenticeship training rates, by state groups, before and after repeals
 Source: U.S. Department of Labor, Bureaus of Labor Statistics and Apprenticeship Training.

This figure shows apprentices as a percentage of all construction workers in 29 states grouped by state treatment of prevailing wage law. In the four years before the repeal of state prevailing wage laws, states that would eventually repeal their laws had high apprenticeship training rates. States that would retain their prevailing wage laws also had high training rates. Except in 1976, states that never had prevailing wage laws in construction had relatively low training rates. In all state groupings, training rates in the late 1980s were lower than training rates in the late 1970s. However, after the several state repeals, those states that retained their prevailing wage laws had relatively higher training rates. Those states that repealed their prevailing wage laws eventually had training rates that matched the states that had never had prevailing wage laws.

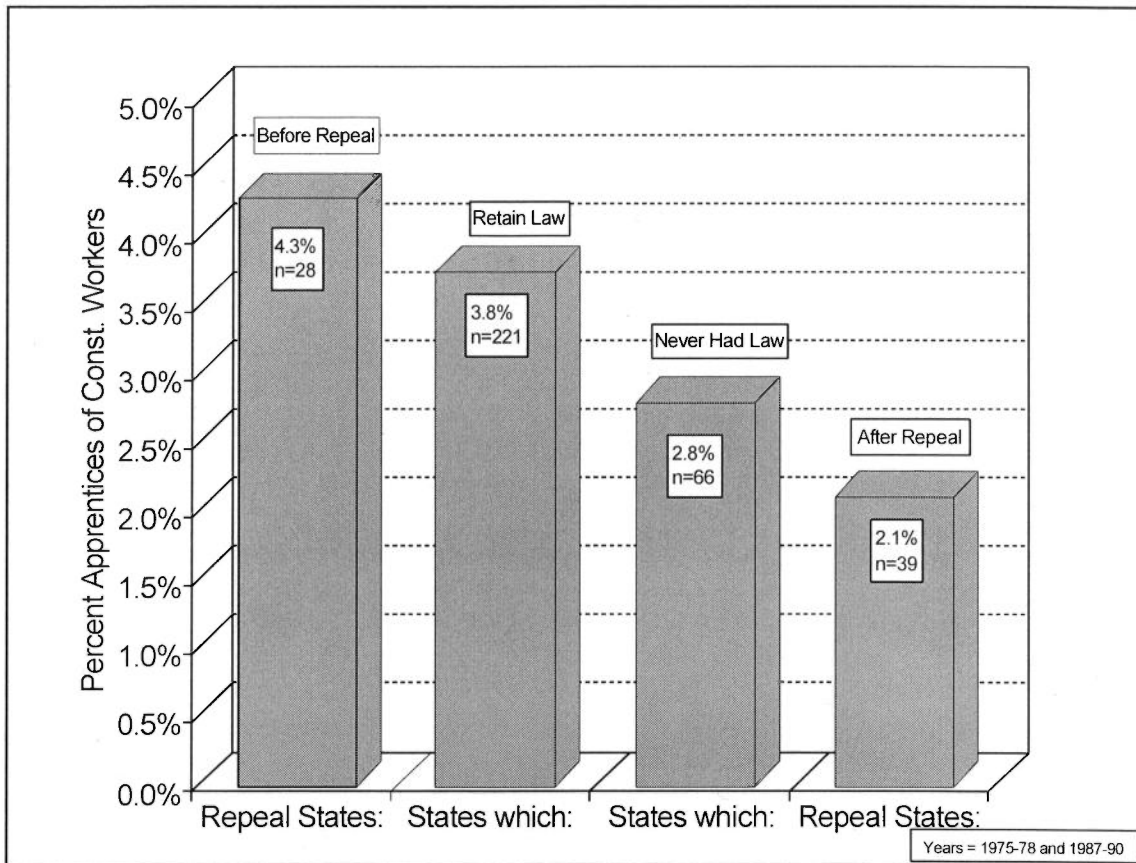


Figure 3.8 Apprenticeship training rates, by state

Source: U.S. Department of Labor Bureaus of Labor Statistics and Apprenticeship Training.

States are grouped here into four categories, repeal states before and after their repeals of prevailing wage laws, states that retained their prevailing wage laws, and states that never had prevailing wage laws. This simple pattern shows that repealing or not having prevailing wage laws reduces formal training in construction. (Part of this before-and-after picture is due to an overall downward trend in registered apprenticeship rates in construction overtime.) Repeals hurt apprenticeship training because repeals hurt unions. Non-union construction contractors do less training and less formal, high quality training.

Delaware, the District of Columbia, Hawaii, and Rhode Island are omitted from the analysis because they did not report to the Bureau of Apprenticeship Training of the U.S. Department of Labor during the second period of our analysis. The model is a good fit of the data with an adjusted R^2 of 45 percent, and all variables are statistically significant.

The focus variable in the regression analysis REPEAL – a marker for states that repealed their prevailing wage laws – is negative. This means that – controlling for unemployment, time trends and regional differences in training – when states repeal their prevailing wage laws, the training rate goes down. At the mean training rate for the entire data set of 3.7 percent, this model indicates that repeals drove down training rates to around 2.1 percent. The NEVERHAD variable, marking states that have never had a prevailing wage law, is also negative and statistically significant but smaller than the REPEAL variable. This is because of a close correlation (about 40 percent) between never having had a prevailing wage law and being a southern state. This means the analysis could not fully distinguish between the hypothesis that training rates in the South were low because many of these states never had prevailing wage laws and the hypothesis that other reasons associated with being a southern state caused training rates to be low. The REPEAL effect was easier to pick up compared to the NEVERHAD effect, simply because the repeal states presented information about their training rates before and after each state repealed its prevailing wage law.

Thus, looking at training rates from a variety of measures and methods of analysis, it is clear that state repeals of prevailing wage laws have significantly lowered formal, organized, and quality training of construction workers. The effect is to lower training rates by about 40 percent.

When apprenticeship training falls as a result of repeals of state prevailing wage laws, minority participation in apprenticeship programs falls even farther (fig. 3.9). Minorities comprise almost 20 percent of all construction apprentices in the repeal states in the years before repeal of state prevailing wage laws. In the same states, after repeal of their prevailing wage laws, minority participation in apprenticeship programs falls to just under 13 percent of all apprentices. While construction apprenticeship training is falling in these states by around 40 percent, the share of minorities in this downsized training also falls by about 36 percent. One reason for the decline in minority training is the decline in union training.

In figure 3.9, the share of minorities in apprenticeship training appears the same for states that retain their prevailing wage laws and states that never had such laws, but this is an illusion. Many of the states that have never adopted prevailing wage laws are in the South where there is a high percentage of minorities in the overall state population (fig. 3.10). We account for that factor with the ratio of the minority percentage in construction apprenticeship programs, divided by the minority percentage in the state population. This ratio is 100 percent if the two percentages are equal. We call this the "minority reflection percentage" because it measures whether minorities in apprenticeships reflect minorities in the state population.

In the repeal states before repeal, the minority reflection percentage was 107 percent, which means that the construction apprenticeship programs slightly over-represented minorities. After repeal, minority representation in apprenticeships fell to 85 percent of minority representation in the state population. In the states that retained their prevailing wage laws throughout the period under review, minority representation in apprenticeships just about mirrored minority representation in the state population (a ratio of 102 percent). But, in states that never

Table 3.2 Training rates in repeal and never-had states as a percentage of training rates in states which retained their wage laws

	Repeal States	States Never Having Had Law
(1)	(2)	(3)
1975	106%	85%
1976	112%	109%
1977	100%	86%
1978	97%	81%
1987	87%	74%
1988	68%	52%
1989	70%	70%
1990	63%	60%

Except in 1976, the states that never had prevailing wage laws have training rates which fall from 86 percent of the training rates of states which retain their prevailing wage laws to 60 percent of the training rates of states which retain their law. Repeal states mirror the training rates of retaining states prior to their repeals. After the several repeals of state prevailing wage laws --from 1979 to 1988-- the average training rate in repeal states falls to 63 percent of the training rates in states retaining their law. This is a simple way of viewing the roughly 40 percent drop in registered construction apprenticeship training caused by state repeals of their prevailing wage laws.

Table 3.3 Training rates in repeal and never-had states as a percentage of training rates in states that retained their wage laws, 1975-78 and 1987-90

Source: US DOL, BLS and BAT.

Dependent Variable= Log of the Odds Ratio of the Percent Apprentices

<u>Independent Variables</u>	<u>Effect on Percent Trained</u>
Region 1	-1.11
Region 2	-0.99
Region 3	-0.77
Region 4	-0.81
Region 5	-1.18
Region 6	-1.10
Region 7	-0.53
Region 8	-0.55
Time trend	-0.02
State unemployment rate	0.04
Marker for states never having had law (NEVERHAD)	-0.13
Marker for states once they repealed their law (REPEAL)	-0.44
Constant	-0.78
-----Adjusted R square =.45	
Number of Cases	=297
Years	=1975-78 and 1987-90

All variables are statistically significant at the 1% level except the marker for states never having had a prevailing wage law. That variable is significant at the 10% level.

Region 1: CT MA NH RI VT ME Region 2: NY NJ DC PA DE MD
 Region 3: WI IL IN OH MI Region 4: ND SD MO MN KS IA NE
 Region 5: WV VA NC SC GA FL Region 6: TX OK NM AZ
 AS MS LA AR TN KY

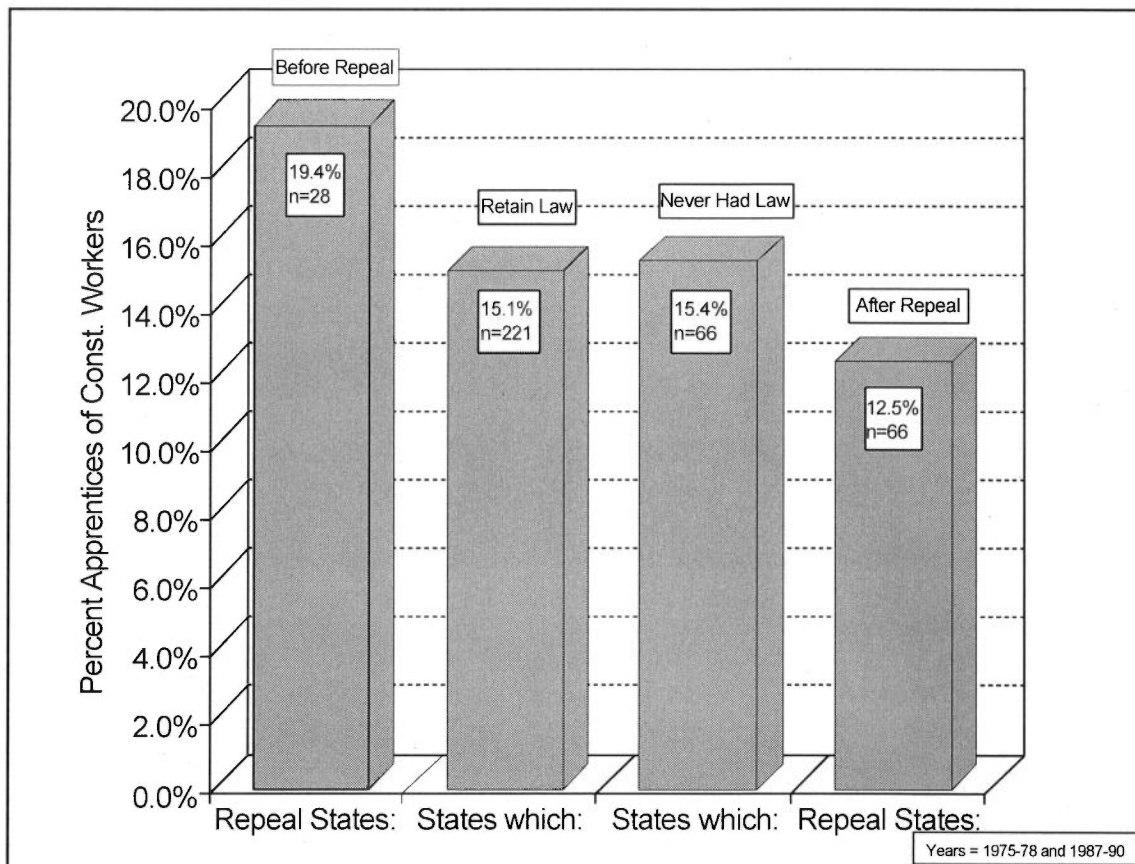


Figure 3.9 Minorities as a percentage of all construction apprentices by state groups
 Source: U.S. Department of Labor Bureaus of Labor Statistics and Apprenticeship Training.

In repeal states, before repeal of their prevailing wage laws in construction, minority participation in registered apprenticeship programs averaged 19.4 percent of all apprentices. After the repeals, minority participation fell to 12.5 percent of all apprentices. The n=28 and n=66 refer to the number of state-year observations in each group. States that kept their prevailing wage laws and states that never had prevailing wage laws had roughly the same rate of minority participation throughout 1975-78 and 1987-90. On average, however, populations of the states that never had prevailing wage laws had higher proportions of minorities.

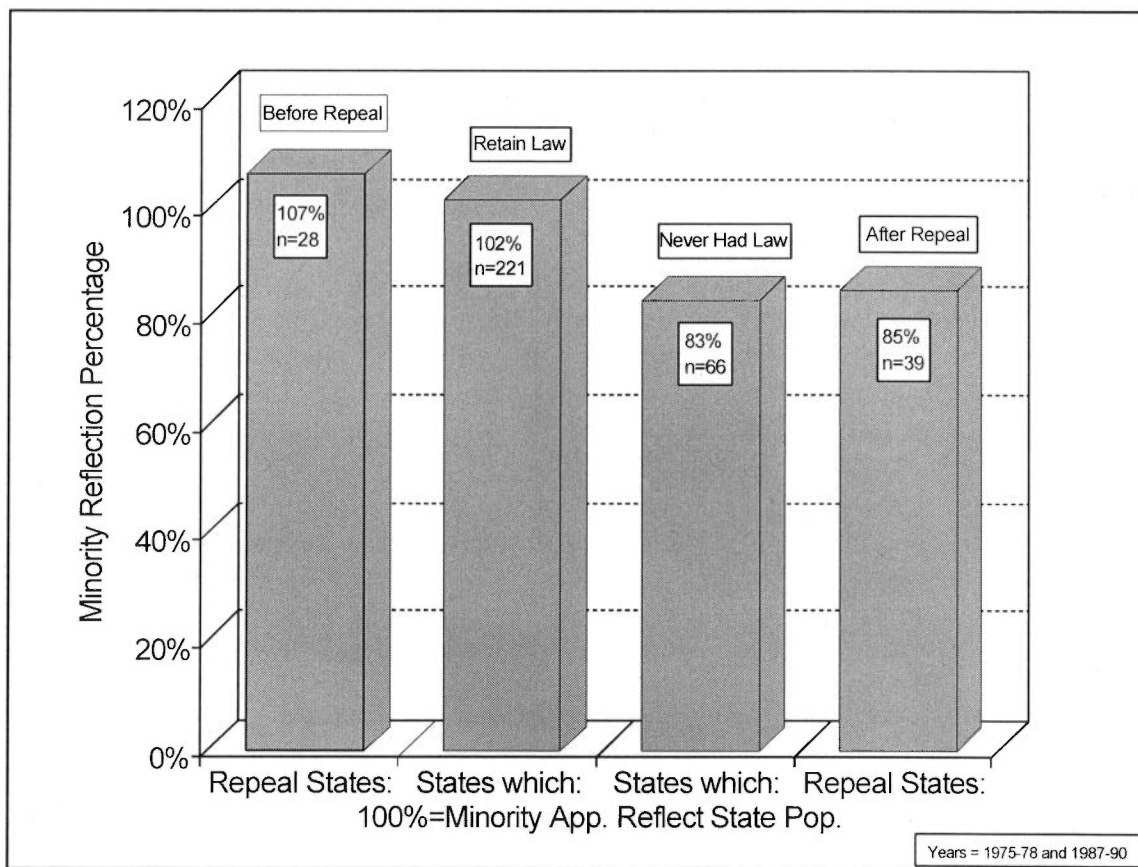


Figure 3.10 Ratio of the percentage of minorities in construction divided by the percentage of minorities in the state population, by state groups
 Source: U.S. Department of Labor, BAT and BLS.

This figure presents the ratio of the percentage of minorities in construction apprenticeships divided by the percentage of minorities in the state population. This ratio allows us to measure whether minorities are under-represented in construction apprenticeship programs. A ratio of 100% would show that the proportion of minority apprenticeships in each group of states exactly reflects the minority as part of the state population. Minority participation in construction apprenticeships mirrored the state population in repeal states prior to repeal. In fact, minorities were slightly over-represented at 107 percent. In states that retained their prevailing wage laws throughout the period (1975-78 and 1987-90), minorities again were very slightly over-represented at 102 percent. In repeal states, after the repeals, in contrast, minority participation in apprenticeships fell to levels that seriously under-represented minorities (85 percent) and resembled the under-representation characteristic throughout the period of states that never had prevailing wage laws (83 percent). Non-union apprenticeship programs tend to be small and do not fall within the oversight of affirmative action guidelines – which may be why the repeals have led to an under-representation of minorities in apprenticeships.

had prevailing wage laws, minority representation rates averaged 83 percent throughout the period. Thus, both repealing states prior to repeal and "retaining" states throughout the period had minority participation in construction apprenticeships that mirrored the state population. In contrast, both repealing states after the repeal and states which never had prevailing wage laws had substantially under-represented minority participation in construction apprenticeships.

Summary

Employment in construction is inherently unstable, because the industry fluctuates cyclically and seasonally – and firms expand and contract their employment as they win and lose job bids. Unions have acted like a flywheel in the industry, creating career workers when there were only casual jobs. Unions did this by facilitating the movement of journeymen from employer to employer and minimizing the employers' transaction and screening costs for the training. Unions also lowered training turnover by providing a mechanism whereby employers and journeymen could rationally invest in the human capital of apprentices. This raised the wages of apprentices so they would stay with training and induced the union and employers to promote the passage of apprentices to journeymen in order to preserve their investment. Unions also encouraged the career attachment of trained journeymen by providing relatively high wages and additional wages in the form of health and retirement insurance, which are increasingly attractive to workers as they age. By creating career jobs in a casual labor market, unions created the institutions needed to make human capital investment a rational market activity.

With the decline of unions in Utah, the formation and preservation of human capital skills have become less-rational. Self-investment by apprentices becomes more precarious as the differential between the apprentices' wage and alternative wages in other industries widens. It simply becomes more reasonable for apprentices to leave construction if unforeseen personal budget problems emerge. The high turnover among non-union apprentices represents in the aggregate a considerable loss of human capital to the construction industry, even though it is not a loss the employer or the state pays for directly. With the lowering of construction wages, it becomes reasonable for young construction workers to limit the amount of human capital they invest in themselves. With the worker's slower stake in construction skills and with the disappearance of wages in the form of health and old-age insurance, it becomes more reasonable for journeymen construction workers to abandon the construction field when they start families. This represents an additional loss of built-up human capital.

Contractors in Utah have attempted to minimize the effect of this increased skill volatility within the industry by encouraging firm attachment. Still, despite initiatives, such as profit-sharing, 401K plans, and health insurance, designed to attach key workers to a firm, construction turnover remains well above the average for the Utah labor market. In short, union decline has meant the decline of the career worker within Utah construction, a diminution in incentives to invest in construction skills, and an increased loss of accumulated human capital as apprentices and journeymen leave the trades. Although the loss of human capital and career jobs in this industry does not appear as a private cost on the ledgers of any contractor, the industry and society at large pay a price for the loss of financially secure occupations in construction. Not only is quality in the industry put at risk when human capital stocks are allowed to dwindle, but the quality of social life is imperiled when we dismantle the institutions that generate stable jobs out of unstable working conditions.

This instability is mirrored in the continuing decline of construction wages in Utah. Despite a return to boom times in Utah construction, construction worker earnings continue to fall relative to average annual earnings in the state. Utah's construction boom has had to piggy-back on the training of California construction workers. Whether Utah can continue this free ride is uncertain. What is certain is that there is no free ride from the effects of a federal repeal of Davis-Bacon. Experience from state repeals indicates that formal apprenticeship training in construction will fall by about 40 percent if Davis-Bacon is repealed. If state experiences are predictive, this will hurt minority workers most. In states that repealed their prevailing wage laws, minority participation in apprenticeship programs fell from reflecting each state's minority population to significantly under-representing minorities. This pattern is consistent with states that have never had prevailing wage laws. Although states that retain their prevailing wage laws have minority participation in apprenticeships that reflects their state populations, states that have never had prevailing wage laws have minority participation rates that are only about 80 percent of the rates in which minorities are present in the state population.

From chapter II, we have seen that a repeal of the Davis-Bacon Act will lower construction wages and earnings. That finding is consistent with the case study of Utah presented in this chapter. We have also seen that a repeal will significantly reduce training in construction. It may well be that as the stock of human capital falls in construction and as the jobs market becomes casual and turbulent, more minority workers will obtain jobs. But they will not obtain training as they do now in the states that retain their prevailing wage laws and they will not be entering into occupations that offer a middle-class income with benefits.

IV. Construction Safety Put at Risk

Construction is dangerous work. In fact, it is the nation's most dangerous industry. According to the U.S. Bureau of Labor Statistics:

- More than 900 construction workers are killed each year — 3 to 5 per workday.
- 510,500 work-related injuries and illnesses occur annually — almost 2,000 cases per day.⁷⁷
- 204,800 cases involve lost work days, for a total of 4.6 million days lost from work per year.

A recitation of the hazards associated with construction work, however, cannot ignore the substantial variability of accidents and their consequences across job sites and institutional environments. Accidents and injuries are the product of a complex interaction between worker and environment, and injuries will be either fostered or limited, depending on how well this interaction promotes safety. This chapter focuses on the effect of the repeal of state prevailing wage laws on injuries in construction. The focus on safety rather than overall health, at this juncture, is strictly a concession to the paucity of reliable data on illnesses related to construction.

Why might the repeal of a state prevailing wage law affect the safety record in construction? How does the presence or absence of such a law alter the important interaction of worker and environment? Certain parameters are key to the incidence of injury. For instance, construction work is more dangerous when workers are untrained and inexperienced. Stresses associated with a lack of job security, the pace of work, and the possible avenues for grievance all feed into the critical interaction of work and environment on any job site.

In Utah, following the 1981 repeal of the state's prevailing wage law, training declined as the construction labor market was going into recession (see chapter III). The lack of training and widespread use of inexperienced workers began to surface as the construction economy rebounded. One experienced pipe fitter recalls of that era:

Contractors were using inexperienced people with no training. They had no training program to begin with, they were hiring people off the street with no experience in the trade. What they would do is everyone that got hired on one project that did not have a history or work experience on a construction job, they had to wear a red sticker on their hard hat. They had to wear that for 30 days. Well everywhere you would look there were red stickers everywhere. I estimate that about 40 or 50% of the people had one on their hat. They called them "hamburger kids."

— Pipe fitter, Salt Lake City, 1994

Lack of training and inexperience are not the only sources of work injuries. In Utah there was a greater sense of job insecurity after the repeal of the state's prevailing wage law and the related decline in union work. Without union security, ex-union workers with training and experience found themselves taking chances they would not have taken prior to the repeal. One union worker who was forced to take work in the open shop recalls:

I got hurt in 1986. There was a great deal of pushing to get the job done. I was working with an older man that came out of retirement. He was about 70 years old. We were waiting for a cherry-picker to move some pipe. We were waiting for a couple of hours, because they laid off some operators. After two hours of waiting, two hours of superintendents eyeballing us, I went and

walked under the piece of pipe, which weighed 253 lbs. I carried it over to the structure, but I didn't see because the snow was covering a hole in the ground. I stepped in it, it was about 14 inches deep and 2 feet across. I pulled muscles in my back, pulled some discs in my back. What I was thinking of at the time was, I can't afford to lose this job. All these guys walking by me looking at me, I thought we better get this pipe in there some way. I was nervous, I should not have done it but I did.

— Union pipe fitter, Salt Lake City, 1994

Why Prevailing Wage Repeals Lead to Increased Injury Rates

We can postulate, based on studies of safety and health in the construction industry, why repeal of the state prevailing wage laws is associated with increases in injury rates. Take as the first premise these telling facts:

- The rate of injuries "decreases substantially as length of service increases."⁷⁸
- Large, experienced employers in construction have injury rates that are 80% below small-to-medium-size contractors.

Repeals of state prevailing wage laws have altered construction labor markets in those states in several ways that affect job site safety:

1. The bidding process has become cutthroat.
2. Workers are less likely to make a career of construction work.
3. Even as experienced workers are leaving the industry in increasing numbers, apprenticeship training has declined.

Cutthroat competitiveness in contracting. In Utah, the repeal of the state's prevailing wage law led to a burgeoning of start-up contractors with limited track records (chapter II). These new entrants joined existing contractors in a heated bidding process for state contracts that resulted in lower bids, but ultimately higher costs, as a percentage of the state engineer's estimate of the job cost. Cutthroat competitiveness, in other words, resulted in increased cost overruns. Inexperience at the firm level, small size, and cost pressures all contribute to compromised safety on the job.

Because of their relative inexperience, new firms tend to face greater on-site coordination problems than firms with longer track records. Such problems can add to costs, but also directly endanger safety. Problems in coordination, perhaps related to delivery of materials and equipment, or in scheduling work with subcontractors, lead to greater uncertainty with respect to the construction schedule. Uncertainty is a breeder of safety risk, as workers can less easily anticipate and plan for the daily contingencies of work.

New entrants in the industry also are generally smaller in size than established firms. Smaller firms have worse safety records than larger firms, in part because of greater laxity of enforcement of safety rules and the relative absence of formal safety programs.

Of greatest importance, however, is the firm's reaction to increased pressure to cut costs in the face of intensified competition and cost overruns. There is a tendency to speed up work and cut back on safeguards in the face of such pressures.

Workforce turnover. When state prevailing wage laws were repealed, worker turnover increased significantly, as the industry found it harder to retain workers for long-term careers (see chapter III). Repeals resulted in a decline in the union share of the construction labor market, driving down average construction wages in the state and decreasing union apprenticeship training for

construction. In response to the decline in union membership and training, contractors attempted to reduce turnover — to retain skilled workers and to minimize screening and training costs. Still, the decline in wages and in health and pension benefits drove experienced construction workers from their trades for careers in other industries. Thus, while construction firm turnover is on the decline, turnover in the whole industry is on the rise.

Those who now work on federally funded Davis-Bacon projects are more likely to be union trained because of the demanding nature of these large, civil engineering jobs. They are likely to know more about new processes and changes in technology, and they are more likely to have graduated from certified apprenticeship programs.

In states that retain their prevailing wage law — compared with those that never had such a law or repealed such a law — the proportion of construction workers receiving training is higher and injury rates are lower. A decline in wages and benefits leads to a flood of inexperienced workers into the industry as well as a decline in skilled, experienced workers needed to supervise the recruits and to assure that they work safely.

Decline in the skill base of the construction labor market. Experience is a major determinant of safe work performance — and productivity. Training of skilled construction workers is normally conducted through apprenticeship training programs, most of which are operated by unions and employers through joint trust funds. An integral part of this training is learning on the job while properly supervised. In that way, workers learn from experience while on a variety of projects. Among other things, apprentices are trained to identify and correct ergonomic problems, to detect physical hazards, and to detect the presence or release of hazardous chemicals. Knowledge about safety and health hazards, appropriate protective measures, and hazard communication methods are all important elements that apprenticeship programs provide.

When little Davis-Bacon acts are repealed, training and apprenticeship programs decline and the skill base of workers erodes (chapter III). Without employer incentives to continue apprenticeship programs, knowledge of proper safety and health procedures declines as well.

Summary. The combination of these factors — cutthroat competition, a decline in training, and an erosion of career attachments to the industry — affects the safety-related skill and experience base of the construction labor force. Workers become more injury-prone and know less about the kinds of risks they are taking. Furthermore, as the workforce becomes less skilled and its wages in construction decline, workers are forced to take more safety risks to simply make a living. Furthermore, contractors caught in the competitive speed-up often press their workers to speed up and take more chances. Workers are put at increased risk in an already hazardous industry.

A Comparison of Injury Rates

The U.S. Bureau of Labor Statistics' annual *Occupational Injuries and Illness Survey* reports accidents by state and year. Construction injuries vary by the type of work being done. We will analyze these BLS data for plumbers and pipe fitters employed by specialty contractors in the Standard Industrial Classification (SIC) 171. This specialty trade has injury rates in the mid-range of rates for construction and this trade is often employed on public works.

For pipe fitters in 1978-91, states that had state prevailing wage laws averaged 13.83 injuries for every 100 workers employed (fig. 4.1). In addition, in the states that repealed prevailing wage laws, injury rates for plumbers and pipe fitters before repeal was slightly less (13.54 per 100 workers) than the injury rates in other states with state prevailing wage laws. By contrast, states that never had state prevailing wage laws had higher injury rates (14.74 per 100 workers) and the repeal states, after they repealed the prevailing wage laws had the highest injury rates of 15.41 per 100 workers. These increases in injuries resulted in a similar increase in workdays lost per worker.⁷⁹

It is possible that injury rates might differ between states for reasons other than changes in legal status. The union pipe fitter who got hurt in Utah in 1986 slipped partly because of snowy conditions. Perhaps factors associated with safety unrelated to repeal coincidentally worsened after repeal. We controlled for factors such as regional differences in weather, time trends in injury rates, and the effects of unemployment in a multiple regression analysis of construction injuries among plumbers. This approach permitted us to isolate the effect on safety of changes strictly associated with the repeal of state prevailing wage laws.

We modeled injury cases per worker as a function of geographic regions, the unemployment rate, a time trend, and the legal status of state prevailing wage laws (table 4.1). Three measures of injury rates are reported: injury cases per worker (col. 2); serious injury cases per worker, defined as injury cases that required time off from work (col. 3); and the number of lost work days per worker (col. 4). In all three models, our focus variable, the act of repealing a state prevailing wage, has a positive coefficient. This means that as the states repealed their prevailing wage laws, injury rates went up according to all three measures.

In our model, the dependent variables are logged. This allows for a straightforward interpretation of the repeal variable as a percent increase in injury rates. So, as these states repealed their laws, the injury case rate went up by 14 percent, the serious injury case rate went up by 15 percent and the work days lost per worker per year went up by 12 percent. All of these findings are statistically significant.

All other things being equal, states that have never had prevailing wage laws also have higher injury rates for plumbers and pipe fitters in the construction industry. In terms of injuries per worker and serious injuries per worker, our results indicate that states that never had prevailing wage laws affecting construction had a statistically significant 5 to 9 percent higher rate compared with states that have prevailing wage laws.⁸⁰

The Cost of Injuries

The costs of injuries in the construction industry are staggering. Of the nation's \$62 billion spent on workers' compensation, approximately 30% goes for construction-related injuries and illnesses,

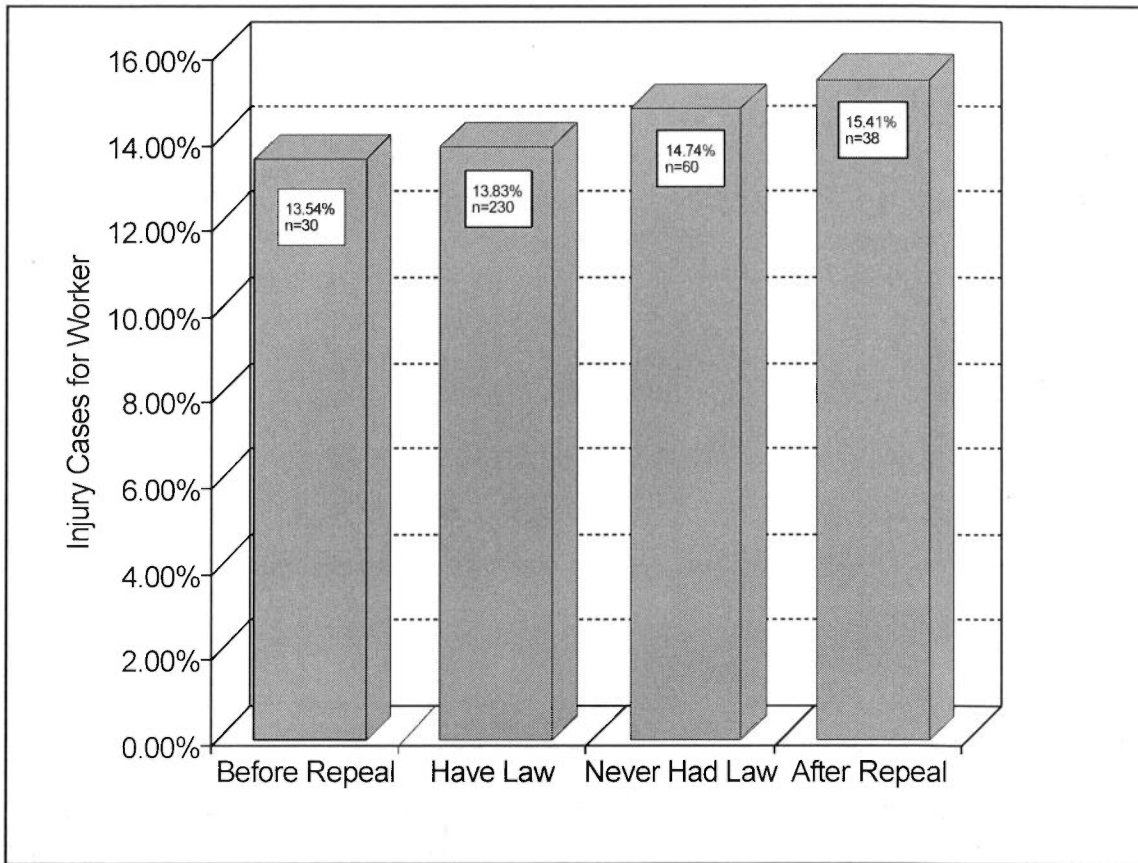


Figure 4.1 Injury rates in construction by status of prevailing wage law
 Source: U.S. Department of Labor, Bureau of Labor Statistics.

Injury rates in construction were relatively low in the nine repeal states prior to repeal (13.54 percent). After the various repeals, injury rates, on average, rose to 15.41 percent. In the 32 states that have retained prevailing wage laws, injury rates have been and remain relatively low. In nine states that have never had state prevailing wage laws, injury rates were and remain relatively high. The notation "n" refers to the numbers of state-year observations in each group. For instance, there were 230 state-year combinations for states that had prevailing wage laws in 1978-91.

Table 4.1 Regression model of the effect of state repeals on injury rates for plumbers and pipefitters

Source: US DOL, BLS.

Dependent variable: log of injury rate for plumbers and pipe fitters
(by year and state)

	Cases Per Worker	Serious Cases Per Worker	Days Lost Per Worker
(1)	(2)	(3)	(4)
(Constant)	-1.21	-2.16	-6.85
Region 1	-0.39	-0.41	-0.10*
Region 2	-0.27	-0.29	0.14*
Region 3	-0.46	-0.70	-0.35
Region 4	-0.40	-0.65	-0.44
Region 5	-0.34	-0.49	-0.29
Region 6	-0.33	-0.40	-0.13*
Region 7	-0.32	-0.64	-0.43
Region 8	-0.18	-0.26	-0.25
Time Trend	-0.02	0.00*	0.01
Unemployment	-0.18	-0.19	-0.04*
Never Had Law	0.09	0.07	0.05*
Repealed Law	0.14	0.15	0.12
Adjusted R ²	35%	49%	16%
Observations	350	313	350

* Not statistically significant.
(Regions are standards BLS categories).

In columns (2), (3) and (4), we report three models of injury rates, the first for injury cases per worker (2), the second for serious injuries per worker (3) and the last for days lost per worker (3). Controlling for regional differences in injury rates, general trends in injuries over time and variations in state unemployment rates, all three types of injuries are higher in states that have repealed their prevailing wage laws and states that never had such laws. In repeal states, injury rates climb from 12 to 15 percent compared to the rates prior to repeals.

or roughly \$20 billion. This, for a construction labor force which represents but 5 to 6 percent of the whole U.S. labor force. In addition to the direct costs of workers' compensation, there are numerous industry-related indirect costs connected to work-related injuries or deaths. These include job shutdowns and retraining of workers.

According to the Construction Industry Institute, "even when the estimates of claims are deleted from cost data, indirect costs still exceed the direct costs."⁸¹

Based on the our regression model of the experience of the nine states that repealed their prevailing wage laws, we project that national injury rates⁸² will increase by around 15% if the Davis-Bacon Act is repealed. What this will mean in terms of safety is:

- There will be 30,000 new cases of lost-time injuries each year, accounting for 675,000 days lost from work.
- Workers' compensation costs will increase by about \$3 billion per year.
- Because Davis-Bacon construction accounts for approximately 10 percent of all construction, it is estimated that repeal of the Davis-Bacon Act would increase federal construction costs by \$300 million per year in direct, workers'-compensation-related costs alone, and indirect costs would double this figure.

The numbers might prove larger, because a Davis-Bacon repeal in the wake of state repeals may have a larger impact on the construction industry.

Summary

The institutional context of work is critical to worker health and safety. State prevailing wage laws, on the surface, have little to do with worker health and safety. But such repeal has fundamentally altered an institutional context that was more conducive to workplace safety.

Repeals of state prevailing wage laws, therefore, have had hidden effects. Because the bidding process becomes overheated; because contractors, as a group, take less responsibility for training and safety; because workers feel less secure on the job; and because the workforce becomes less attached to and experienced with construction work; construction becomes more dangerous. Safety in an already relatively dangerous industry is put at risk by the repeal of prevailing wage laws.

V. Conclusion

The Effects of the Repeal of Prevailing Wage Laws

The federal system of government in the United States is sometimes called "democracy's workshop." The diverse experiences of the 50 states afford a valuable window for assessing the successes and failures of public policies. Between 1979 and 1988, nine states repealed their prevailing wage laws regulating the construction of public works. These legislative changes enable us to examine the before-and-after pictures of the effects of such repeals. Nine other states never had prevailing wage laws governing public construction, while the remaining thirty-two states retained prevailing wage laws. These "never-had" states and "retaining" states give us additional perspectives on what it means to keep or repeal prevailing wage laws.

Legislators are often forced to act on theory; this is one instance where they can act on facts and experience. The experience of the last 20 years in the application and removal of state prevailing wage laws on public construction offers insight into the prospective effects of further state repeals or the proposed repeal of the federal Davis-Bacon Act.

The Goals of State Prevailing Wage Laws

Prevailing wage laws were first enacted at the state level. Kansas passed the first prevailing wage law on public works in 1891 as part of legislation mandating the eight-hour work day. Prevailing wage laws were central to a larger effort to improve working conditions for American citizens. The notion was that child labor laws should enable children to be in school and the eight-hour work day should help allow workers time to spend with their families.

The proponents of prevailing wage legislation wanted to prevent the government from using its purchasing power to undermine the wages of its citizens. It was believed that the government should set an example, by paying the wages prevailing in a locality for each occupation hired by government contractors to build public projects.

Before the Great Depression, Arizona, Idaho, Kansas, Massachusetts, Nebraska, New Jersey, New York, and Oklahoma passed prevailing wage laws regulating state building and road construction. In 1931, Congress passed the Davis-Bacon Act. Soon thereafter, 18 additional states adopted prevailing wage laws. After World War II and until 1982, 15 more states passed prevailing wage laws. All of these laws raised the question: what was meant by a prevailing wage?

The Definition of a Prevailing Wage

Wages in local labor markets often have a peculiar distribution. Particularly where there are unions, but also in other circumstances, the highest wage in a local labor market is often the most commonly found wage rate. Even when the highest wage occurs most often, however, it will not be the average wage simply because the lower wages — however few or many — for that occupation will bring the average wage down.

Prevailing wage laws are intended to get the government out of the business of pulling down wages. The dilemma is that if the state pays the average wage, it will automatically undercut the most commonly found wage. Alternatively, if government pays the highest wage found, it will always be pulling the average wage up. When is the highest wage sufficiently common that it should be called the prevailing wage rate, even though it will never be the average wage?

In the federal law, this dilemma was resolved by a threshold rule. This rule stated that if the most commonly found wage rate, to the penny, accounted for more than 30 percent of all wages for an occupation in a local labor market, that was the prevailing wage even though it was not the average wage. On the other hand, if the most commonly found wage rate accounted for less than 30 percent of all wages for an occupation in a local area, the average wage rate prevailed.

In 1985, the Reagan administration revised the rule and raised the threshold to 50 percent. Today, Davis-Bacon wage rates are the average rate for an occupation in a local labor market except, in roughly one-third of the cases, where 50 percent of the wages in that area are precisely the same. If more than half of all workers in an occupation in an area make the same wage, that wage rate — even if it is above the average — is said to prevail. But two-thirds of the time the average wage prevails.

Modern opposition to prevailing wage laws is usually founded on one of two objections. Some people oppose the idea of the government agreeing in advance to pay the average wage rate for workers in specific occupations in a local area. This criticism is completely at odds with the original purpose of prevailing wage legislation, which was to prevent the government from hiring labor at below-standard rates. Other critics object to paying a prevailing wage that is greater than the average wage in the locality. The premise of this second objection has lost a great deal of its force in recent decades. As a result of the adoption of the 50 percent threshold, and the additional fact that unionization in the construction labor market has fallen from 70 percent to about 25 percent in the last three decades, there are far fewer cases in which the wages rates determined as prevailing are greater than the average rate.

The Financial Costs of State Repeals

Lower wages for all construction workers. Supporters of Utah's 1981 repeal of its prevailing wage law recognized that repeal would lower construction wages. They maintained, however, that the money saved on public works construction justified the government's indirectly lowering the wages and earnings of some of its citizens. And, indeed, construction earnings did fall. In Utah, construction workers, who through the 1950s, 1960s, and 1970s earned 120 to 130 percent of the average non-agricultural wage in the state, saw their wages fall steadily after repeal. By 1993, Utah construction workers were earning only 103 percent of the average annual earnings in Utah, even though Utah was then experiencing a massive construction boom, in which construction wages normally go up. This earnings decline affected all Utah construction workers — whether union or non-union, whether employed on publicly or privately financed projects.

Taking the nine repeal states as a whole, the average annual earnings of construction workers in these states fell from \$24,317 (in 1991 dollars) per year before the repeals to \$22,148 after the repeals. This is simple but compelling evidence that repeals of state prevailing wage laws have lowered construction wages.

A more complex analysis confirms this general observation. Using multiple linear regression analysis, we isolated the earnings effects of the state repeals while controlling for the business cycle, regional differences in wages and unemployment, and long-term trends in earnings and employment that are not associated with repeals of prevailing wage laws. We found that the nine repeals cost construction workers in those states \$1,477 (in 1994 dollars) per worker every year since state repeal. This was about a 5 percent drop in construction earnings attributable to each state's repeal of its prevailing wage law on public works.

A slight increase in construction employment. Proponents of state repeals maintained that the lowering of wages would be offset by an increase in construction employment. While high-paid,

high-skilled workers would be hurt by a repeal, it was believed, low-paid, low-skilled workers would have more job opportunities in construction.

Repeal proponents were right that cheaper construction labor would lead to an increase in construction employment. Again using regression analysis, we found that the repeal states experienced a 1.7 percent increase in construction employment that would not have occurred without these repeals. This was an unfavorable trade-off from the standpoint of workers, however, as their wages fell by 5 percent overall while their employment rose by less than 2 percent. It turned out to be a tough trade-off for government budget-watchers as well.

Lost tax revenues. As a group, construction workers lost income, because their wages dropped by 5 percent and their total employment rose by less than 2 percent. This caused the government to lose substantial tax revenues. In recent years, the state of Utah has lost \$3 million to \$5 million annually in sales tax and income tax revenues because it repealed its prevailing wage law in construction.

Increased construction cost overruns. Cost overruns are a hidden cost of repealing prevailing wage laws. In Utah, cost overruns resulted from an over-heated bidding process in which contractors, shaved their bids in an urgent effort to obtain government contracts. After the repeal, winning bids on state jobs came in lower than ever before, but the final job costs were a higher percentage of original estimates than ever before (chapter 2, fig. 2.3). Having underbid jobs, contractors and subcontractors would arrange change orders to get the jobs done or simply walk away from badly underbid jobs and leave the state to pick up the pieces. In Utah, cost overruns on the construction of state roads tripled in the 10 years after repeal, compared with the 10 years before.⁸³

The bottom line for Utah's budget. The Congressional Budget Office estimates that, should the federal Davis-Bacon Act be repealed, the federal government might save a total of 1.7 percent on its construction costs. This savings might even be less.⁸⁴ Using an even more conservative figure of 3 percent to estimate what Utah saved in construction costs by repealing its prevailing wage law, we calculate that the Utah state budget almost — but not quite — broke even. Balancing construction cost savings against lost tax revenues, in two of the years since 1987 the Utah budget saved more money in construction costs than it lost in tax revenues. In five of the years since 1987, the state lost more in tax revenues than it saved in construction costs (fig. 5.1). In either case, the net savings or losses were small compared with the lost earnings of Utah's citizens (table 2.6, row 3). But construction workers — and the industry — were to lose more than money when these repeals were enacted.

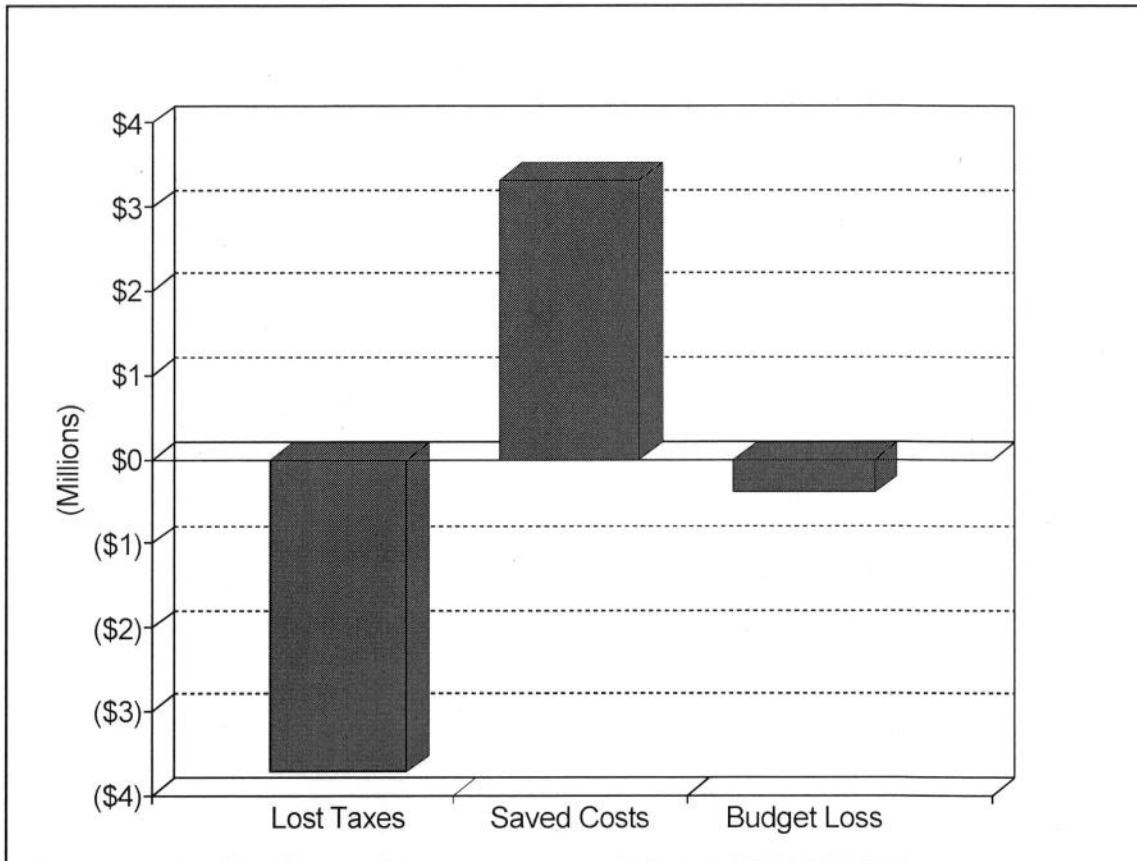


Figure 5.1 Average annual income-tax revenue loss and construction cost savings and net effect of repeal for Utah, 1987 to 1993, in 1994 dollars
 Source: Table 2.6.

On average, the repeal of Utah's prevailing wage law has cost the state budget \$400,000 per year from 1987 to 1993. This figure has been rising and reached \$1 million in 1993. Should the federal prevailing wage law be repealed, the gap between lost federal tax dollars and construction cost savings will be greater. This is partly because a Davis-Bacon repeal would affect more construction and more workers, but also because the federal government income tax rate is higher than Utah's. Obviously, the higher the income tax rate, the greater the tax

Other Costs of State Repeals

A less-skilled labor force. Unions and union contractors do the lion's share of worker training in the construction industry. Some very large non-union contractors do their own training, but most non-union contractors hire out-of-work union-trained construction workers and workers who have learned a trade on a catch-as-catch-can basis. Most non-union contractors are not big enough to afford to train and retain their own labor force. Contractors, understandably, are afraid that in the first slack period, the workers they trained will leave them and work for their competitors. Unions historically have compensated for this market failure by inducing union contractors to share the burden of training and to share each other's apprentices.

In Utah, the repeal of the prevailing wage law led to a dramatic decline in union apprenticeship programs because the repeal led to a dramatic decline in local construction unions. Having repealed the prevailing wage law, the state was not inclined to pour money into local community colleges and vocational training centers to make up the difference. At first after the repeal in 1981, the Utah construction economy limped along in the trough of a business cycle so the absence of quality training systems was not strongly missed. Non-union contractors hired out-of-work union members and the older generation of construction workers provided a relatively skilled labor force in the open shop of non-union construction.

In the last three years, however, Utah has experienced a massive construction boom. Few training systems were in place to meet this boom. Utah has filled the gap by relying on traveling construction workers from California, which is in a construction slump. Utah has also relied on a less-skilled labor force. Whether Utah will be able to continue to rely on California workers remains to be seen; if California's economy picks up, many of the skilled California travelers will likely return home to the increased wages there.

Utah's experience with declining availability of construction training was not unique. Comparing the decade before repeals to the decade after repeals, union and non-union apprenticeship rates in construction fell by more than half in the nine states that repealed their prevailing wage laws. States that retained their prevailing wage laws did not lose ground in apprenticeship training and states that never had prevailing wage laws had relatively low training rates in construction throughout the period.

The repeal of prevailing wage laws thus had the indirect effect of reducing training and hindering the formation of a skilled labor force. When unions declined in the wake of repeal, only state government could have picked up the pieces. The cost of expanded state-financed vocational training is a hidden cost of repealing prevailing wage laws. So far, it is a hidden cost that few repeal states have been willing to pay.

Slowed economic gains by minority workers. A faltering stock of human skills in construction is not the only nonmonetary cost that resulted from state repeals of prevailing wage laws. Construction used to be one of the few blue-collar occupations left where a worker lacking a college education could earn a middle-class income. Nationwide, the average construction income in 1994 was \$27,500. Becoming a skilled construction worker was a road out of poverty for minority workers. Before the nine state repeals, participation by minority group members — male and female nonwhites — in construction apprenticeships mirrored the minority populations in each state.

In the repeal states before the repeal of their prevailing wage laws, minorities accounted for almost 20 percent of all construction apprentices. After repeal, minority participation fell to 12.5 percent of all construction apprentices. Thus, after these repeals, minorities became significantly under-represented in construction apprenticeships.

One reason for this decline is that union apprenticeship programs usually enrolled dozens of

apprentices. Non-union apprenticeship programs tied to single employers tended to be smaller, often involving no more than one, two, or three apprentices. Affirmative action regulations do not cover apprenticeship programs of fewer than five apprentices. So the union programs had to fill out affirmative action plans and follow affirmative action guidelines, while the smaller programs did not.

When the repeals drove the union programs into decline, minority workers lost the most. For instance, the percentage of minority apprentices in construction, which reflected the minority proportion in each state's population before repeal, declined in the repeal states (fig. 5.2). Minority construction workers may still enter the industry but they are less likely to receive full formal training in the absence of prevailing wage legislation. Although it has been suggested that repeal of Davis-Bacon would lower black unemployment relative to white unemployment by opening up jobs for less-skilled black labor,⁸⁵ the data do not support such a claim (see chapter 3, figs. 3.3 and 3.4). Nor is there evidence suggesting that a repeal would increase the proportion of minorities in the construction labor force. In 1990, the percentage of minority construction workers among all construction workers was virtually the same in the 32 states with prevailing wage laws compared to the 18 states without prevailing wage laws.

Thus, repeal means that minority workers will begin construction work in unskilled jobs and get their training, if at all, on a catch-as-catch-can basis. Furthermore, minorities will enter an industry that is less able to provide a secure blue-collar, middle-class income. Repealing prevailing wage laws has therefore cut off an important road for minorities into the middle class. Without skills training, workers are less productive; without safety training, they are at greater risk of injury in an already dangerous profession.

Increased work-related injury rates. All construction workers in the nine repeal states have been put at increased physical risk by the repeal of the several state prevailing wage laws. Injury rates in construction in the nine repeal states have risen by 15 percent after repeal, even controlling for other factors such as unemployment, trends in construction safety, and differences in work safety experiences by region. The decline in apprenticeship training and the rise in construction career turnover are probable causes of this increased injury rate. Other research has found this to be so. The Department of Labor found that the rate of injuries "decreases substantially as length of service increases."⁸⁶ Construction firms in Utah (and perhaps elsewhere) have sought to stem the tide of increased injuries by reducing firm turnover at least for key workers. This may have dampened the deleterious effects of less formal training and increased career turnover, but on net, injuries are still rising.

If the experience in these states can be extended to the nation, a repeal of Davis-Bacon would result in 76,000 additional construction workplace injuries annually. About 30,000 of these injuries would be serious, requiring time off to recover. More than 675,000 work days would be lost. These new injuries would occur because workers would be less well-trained and because they would have fewer on-the-job protections against contractors who are in a hurry.

Workers, of course, suffer directly from these occupational injuries — in their physical well-being and in their wallets. Increased injury rates also lead to increased costs for contractors, who must pay higher worker's compensation premiums. And, as consumers of construction services, local, state, and federal governments pay a share of those higher worker's compensation premiums.

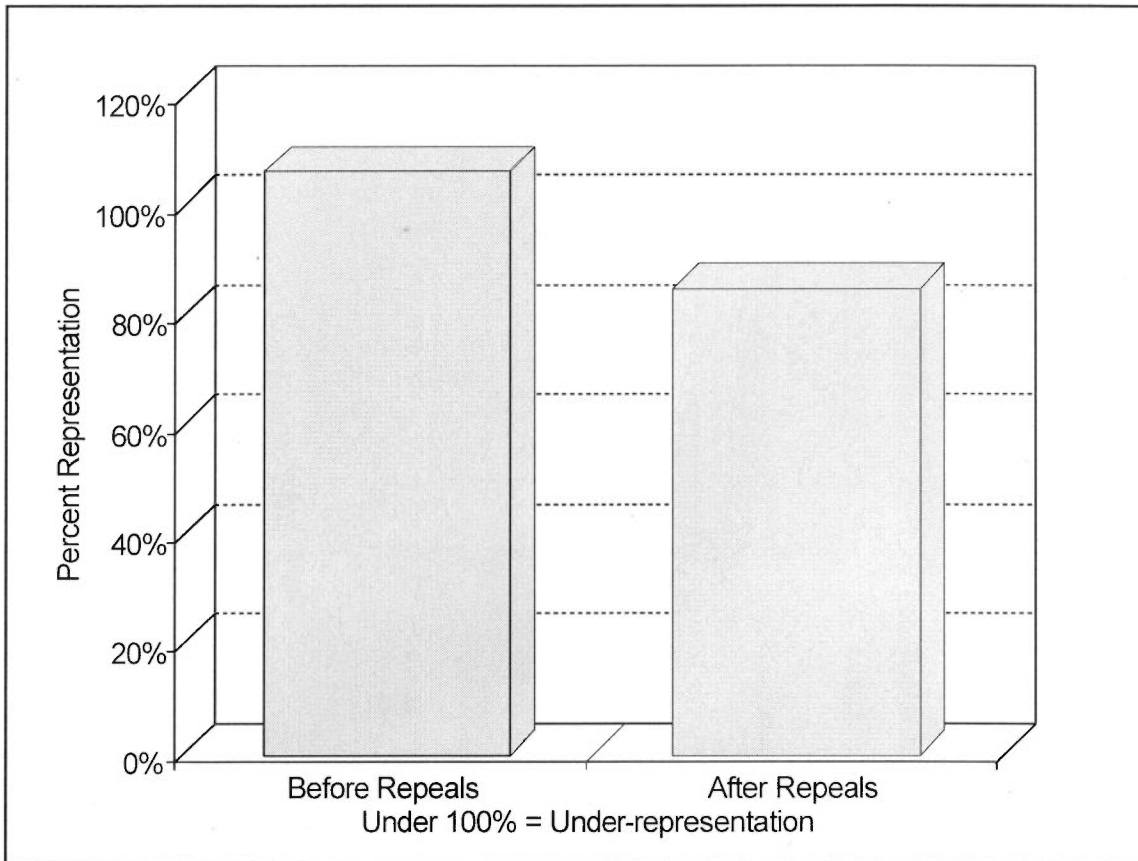


Figure 5.2 The percentage of minority construction apprentices, divided by the percentage of minority state population state--the minority reflection percentage--for nine repeal states

In the nine repeal states where separate data were available on minority populations, in the decade before repeal, minority apprentices were slightly over-represented relative to their proportion of the state population. The minority reflection percentage was 107 percent. In the decade after the repeals, the minority reflection percentage fell to 85 percent, indicating significantly under-represented minorities. Source: Figure 3.10.

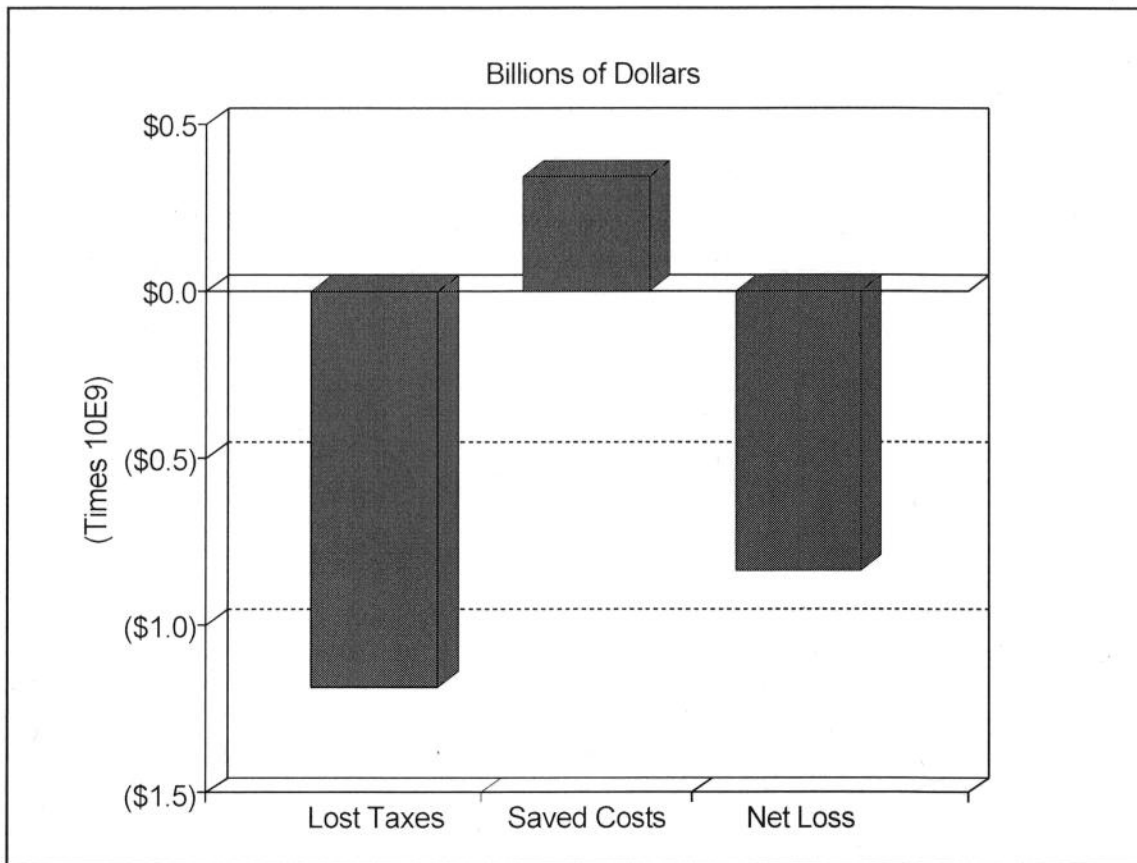


Figure 5.3 Estimated effect of a repeal of the Davis-Bacon Act on income-tax revenues, construction costs and total budget
 Source: Table 2.7.

The Congressional Budget Office estimates that the federal government would save a total of 1.7 percent in construction costs from a repeal of Davis-Bacon. This chart uses the more conservative cost savings estimate of 3 percent. At a 3 percent construction cost savings, with a marginal income tax rate of 20 percent and federal construction expenditures at their 1991 level (in 1994 dollars), a repeal of Davis-Bacon would cost the federal government \$1.2 billion in income tax revenues. The federal government would save \$346 million in construction costs and the federal budget would lose, on net, \$838 million.

Estimated Effect of A Davis-Bacon Repeal

Democracy's workshop has given us an opportunity. The nine states that repealed their "little" Davis-Bacon Acts offer a chance to estimate the likely consequences of the repeal of the federal Davis-Bacon Act. Based on this study, we project the following.

First, construction earnings would drop if the federal law was repealed. Collectively, for all construction workers, this would mean a loss of almost \$5 billion per year in real terms every year. As a result of lower wages in construction, federal income tax collections would fall by roughly \$1 billion per year. Projected cost savings on federally purchased construction almost certainly would be less. (fig. 5.3).

Second, we estimate that formal training in construction could fall by 40 percent. The industry would move from one of skilled blue-collar workers earning a middle-class income to a much-less-skilled labor force earning substantially lower wages. Minority access to good training likely would fall even farther than overall training rates. Contractors would be using more construction workers and paying less for them, but the less-skilled workers would be building less and adding less value to building projects. Purchasers of construction services would not necessarily profit from lower-wage labor if that labor is also less skilled. This is a potential lose-lose situation.

Utah was able to patch together a large-enough construction labor force after its repeal of prevailing wage law. Contractors in Utah rode freely on the training systems in place in California. But the country as a whole cannot go on a similar free ride. If Davis-Bacon is repealed and construction training nationally declines sharply, the United States will not be a small state like Utah turning to California for its rescue. Nationally, there will be no place to turn. Is the federal government prepared to spend the money to establish its own apprenticeship programs in construction? Alternately, will the government induce or require contractors to join into cooperative training programs? If prevailing wage legislation is repealed, it is likely that some additional measures will be needed to ensure occupational training for the construction industry.

Last, but not least, we estimate that the construction job site would produce 30,000 additional serious injuries yearly. These injuries would add a large but still-undetermined financial cost to the ultimate price of repeal.

It goes without saying that the public benefits from a bidding process that lowers construction costs. But the bidding process must be kept within certain bounds, to prevent consequences that could lead to increased — rather than decreased — public and societal costs. Competitive pressures tempt contractors to cut corners on quality. States and communities employ building inspectors to assure that quality is maintained. Historically, unions have assumed the role of "building inspector" for safety and training in the construction industry.

The role of unions. Employment in construction is inherently unstable because the industry fluctuates cyclically and seasonally. Firms expand and contract employment as they win and lose job bids. A worker rarely has a long-term attachment to one employer in the industry, and the construction union may be the only stable, work-related institution the worker knows. Construction unions act like a flywheel in the industry, creating career opportunities out of a casual labor market. Unions do this by facilitating the movement of journeymen from employer to employer and minimizing the employers' transaction and screening costs.

Unions lower training turnover by providing a way for employers and journeymen to rationally invest in the human capital of apprentices. Collectively bargained agreements create wage incentives for apprentices to stay with training programs, and also cause their employers to promote the workers' passage to journeyman status. Unions also encourage the career attachment of trained

journeymen by providing relatively high wages and health and retirement insurance, which is increasingly attractive to workers as they age. By creating career jobs in a casual labor market, unions create the institutions needed to make human capital investment a rational market activity.

With the lowering of construction wages, young construction workers will limit the amount of human capital they invest in themselves. With a lower stake in construction skills and the disappearance of wages in the form of health and old-age insurance, it becomes more reasonable for many journeyman construction workers to abandon construction work entirely when they start families. This is an additional loss of built-up human capital.

The loss of a career. Contractors have attempted to minimize the effect of this increased skill volatility in the industry by encouraging attachment of workers to their firms. Still, despite initiatives such as profit-sharing, 401K plans, and health insurance to bind key workers to the firm, construction firm turnover remains high. It appears that the decline of unions has been associated with the decline of the career worker in construction, a diminution in incentives to invest in construction skills, and an increasing loss of accumulated human capital as apprentices and journeymen leave the trades.

The loss of human capital and career jobs in this industry does not appear as a private cost on the ledgers of any single contractor. Nonetheless, the industry and society at large pay a price for the loss of middle-class occupations in construction. Not only is quality in the industry at risk when human capital stocks are allowed to dwindle, but the quality of our society is imperiled when we dismantle the institutions that generate stable employment out of unstable working conditions.

* * *

The construction industry is turbulent. Caught in a perennial boom-bust cycle, characterized by fleeting relationships between small contractors and subcontractors, and driven by short-term strategies of free-riding on the training of others, the construction industry is a market failure waiting to happen. The turmoil in the construction labor market has traditionally been tempered by prevailing wage legislation and labor unions. Absent these institutions, it is unclear how — or whether — the market will regularly and carefully train workers, or assure safety and health on the job site, or provide training opportunities for minority workers, or offer the incomes needed to make construction an attractive career. Government purchases account for 20 percent of all construction in the United States. For the last six decades and more, the government has contributed to the stability in construction labor markets by requiring contractors to pay the wage rates that already prevail in a local areas. Today, voices are urging the government to use its purchasing powers to reduce construction costs at the expense of worker incomes. Such a strategy has a very real cost for workers, the industry, and the government. When nine states chose this path, the results were significantly lower construction wages, slightly higher construction employment, a tripling of cost overruns on public works, an across-the-board 15-percent increase in construction injuries, a 40 percent decrease in apprenticeship training, and an even further decline in minority apprenticeship training. All this was sacrificed to save an estimated 1.7 percent in state construction costs. Even that savings was squandered by the loss in state tax revenues from an impoverished construction labor force — a poor bargain indeed.

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Chapter III

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1. *Topeka State Journal*, February 24, 1891, col.4, p. 4.
2. *Topeka Daily Capital*, February 25, 1891, p.1.
3. *Topeka State Journal*, February 25, 1891, col. 3-4, p.1.
4. *Sixth Annual Report of the Bureau of Labor and Industrial Statistics*, 126.
5. *Sixth Annual*, 215.
6. *Sixth Annual*, 124.
7. L. 1891 Ch. 114 p.192-193.
8. In reply to the question of needed legislation, most workers polled by the Kansas Bureau of Labor and Industry, cited a lack of enforcement of the eight-hour law or complained of long hours. (*Twelfth Annual Report of the Kansas Bureau of Labor and Industrial Statistics*, 1896, 88-89.) Similarly, the Kansas Bureau of Labor and Industrial Statistics reported complaints of noncompliance with the eight-hour law. P.E. Cook, of the A.R.U. Local No.57, stated that the "[eight hour] law is being openly violated by the corporate and private parties on public work...." (*Fourteenth Annual Report of the Kansas Bureau of Labor and Industrial Statistics*, 1898, 204.)
9. *Sixteenth Annual Report*, 272-78. From July 1900 to June 1901, 33 cases were won upholding the law.
10. *Thirteenth Annual Report of the Bureau of Labor Statistics of the State of New York*, 1895, 515-37; *Fourteenth Annual Report of the Bureau of Labor Statistics of the State of New York*, 1896, 802.
11. U.S. Congress, 1927. Although it has recently been asserted that the Alabama workers were black, there is no direct evidence supporting this claim. Evidence to support this claim comes from third-hand sources, several years after the fact and not referring directly to this incident at all. (See George F. Will, "It's time to repeal the Davis-Bacon Act," *Deseret News*, Feb. 5, 1995.) In Alabama, in 1930, only 34 percent of all brick and tile layers, carpenters, electricians, painters, plasterers, cement masons, plumbers and construction laborers were black. Thus, absent direct evidence to the contrary, the odds are that these Alabama workers were primarily white. U.S., Bureau of the Census, *Fifteenth Census of the United States, Population Volume IV "Occupations by States"*, G.P.O., 1933, Table 12, p. 121.
12. *Hearings Before the Committee on Labor, House of Representatives-Seventy-First Congress*. January 31, 1931. Bacons proposal was re-introduced in 1930 as H.R. 9232 by Congressman Elliot W. Sproul from Illinois, while Bacon proposed a complementary bill.
13. Armand J. Thieblot Jr., *Prevailing Wage Legislation: The Davis-Bacon Act, State "Little Davis-Bacon Acts," The Walsh-Healey Act, and The Service Contract Act*. Philadelphia: The Wharton School, 1986, p. 8.
14. Laws of Florida 1979 ch79-14 HB730.
15. Thieblot, 163.
16. Laws of Alabama 1979 Act no. 79-123 H362 Letson.
17. Thieblot, 151.

18. Mark Erlich, *Labor at the Ballot Box: The Massachusetts Prevailing Wage Campaign of 1988* (Philadelphia: Temple University Press, 1989), 33.
19. Nelson, Richard R. "State labor legislation enacted in 1981" U.S. Department of Labor Employment Standards Administration Division of State Employment Standards, p. 1 (office memo).
20. *Salt Lake City Tribune*, Jan. 23, 1981, B2.
21. *Salt Lake City Tribune* January 23, 1981 B2.
22. *Salt Lake City Tribune* Jan. 16, 1981, A6, col 1.
23. *Salt Lake City Tribune*, January 16, 1981 (A6, col 1).
24. Arizona laws 1984 S.C.R. No.1001.
25. *The Phoenix Gazette*, "Little Davis-Bacon Act is Ruled Unconstitutional," Sept. 12, 1979, p. A-1.
26. Thieblot, 12.
27. Idaho Session Laws Ch 3 HB7.
28. Thieblot, 165.
29. Colorado Revised Statutes 1985 Article 16,8-16-101.
30. Thieblot, 159-60.
31. New Hampshire Ch 117(SB71).
32. Thieblot, 184.
33. Kansas Ch 186 S.B.112.
34. Louisiana Act No.18 H.B.2.
35. Erlich, 4 and 6.
36. Erlich, 7.
37. Regional Information Group of Data Resources, "Executive Summary of the Study of the Economic Impact of Repeal of the Massachusetts Prevailing Wage Law" Lexington, MA, August 1988.
38. The Massachusetts Foundation for Economic Research, *The Peculiar Prevailing Wage Law* (111 Cabot Street Needham, MA 02194), March 1988.
39. Massachusetts Foundation for Economic Research, 10.
40. Data Resources, 1.
41. Data Resources, 4.

42. Erlich, 101, 111, and 112..

43. Senator Harrison Williams, United State Senate Hearing Before the Subcommittee on Housing and Urban Affairs, *First Session on Oversight to Examine the Administration of the Davis-Bacon Act*, Washington:GPO,1979, 1-2.

44. With the increasing prevalence of market-recovery agreements between unions and contractors, more often there are multiple union wage rates for a single occupation in a local labor market. This means that, even when unionization rates are above 50 percent, there is not always a single union wage rate that counts for 50 percent of workers in the market. Thus it is even less likely that the union rate will be the prevailing rate.

45. Steven Allen, "Declining Unionization in Construction: The Facts and the Reasons," *Industrial and Labor Relations Review*, 41, No. 3 (April 1988), 343-59.

46. Further research in this area is required. We will not know for certain that the Utah repeal of its prevailing wage law was the cause of the subsequent cost overruns until road construction costs in other repeal states are studied. Then the regression modeling that is used elsewhere in this study can be applied to the issue of cost overruns.

47. *Current Population Survey*.

48. Let us first investigate this issue using an example. Assume that union wages are \$16.30 per hour and non-union wages are \$10 per hour. When average wages decline by 7.5 percent, and if non-union wages remain the same, what is the percentage decline in union wages?

W_u	r_u	W_n	r_n	W_{avg}	7.5% overall decline in W_{avg}	Union Wage Percent Decline	Non-Union Wage Percent Decline
\$16.30	0.13	\$10.00	0.87	\$10.82	\$10.00		
\$10.00	0.13	\$10.00	0.87	\$10.00		38.7%	0%

Here W_u is the union wage, r_u is the percentage of the construction workforce that is unionized, W_n is the non-union wage, r_n is the percentage of the construction workforce that is not unionized, and W_{avg} is the average wage in construction. This table shows that the percentage decline in union wages must be almost 40 percent.

49. Assume that non-union wages are \$10 per hour and there is initially a wage differential of 20 percent between the union and non-union workers. This implies that the union wages are \$12 per hour. If unions represent 13 percent of the construction labor force, average wages decline by 7.5 percent, and the wage differential is eradicated, what is the percentage decline in non-union wages?

W_u	r_u	W_n	r_n	W_{avg}	7.5% decline in W_{avg}	Percent Decline in Union Wage	Percent Decline in Non-Union W.
\$12.00	0.13	\$10.00	0.87	\$10.26	\$9.49		
\$10.00	0.13	\$10.00	0.87	\$10.00			
\$9.49	0.13	\$9.49	0.87	\$9.49		21%	5.1%

The percentage decline in union wages must be 5 percent (from \$10 per hour to \$9.49 per hour).

50. Assume there is an initial wage differential of 20 percent between the union and non-union sectors. After the repeal of a prevailing wage law, assume the union–non-union wage differential decreases to 10 percent. Now let us investigate the effect of a 7.5 percent overall fall in wages. Assume that non-union wages are \$10 per hour and the wage differential between the union and non-union workers falls to 10 percent. This means that the union wages are about \$11 per hour. If average wages decline by 7.5 percent and the wage differential remains unchanged, what is the percentage decline in union and non-union wages?

W_u	r_u	W_n	r_n	W_{avg}	7.5% decline in W_{avg}	Percent Decline in Union Wage	Percent Decline in Non-Union W.
\$12.00	0.13	\$10.00	0.87	\$10.26	\$9.49		
\$11.00	0.13	\$10.00	0.87	\$10.13			
\$10.31	0.13	\$9.37	0.87	\$9.49		14.1%	6.3%

The percentage decline in union wages is 14 percent (from \$12 per hour to \$10.31 per hour), and the percentage decline in non-union wages is 6 percent (from \$10 per hour to \$9.37 per hour).

51. Unless described differently, figures are given in 1991 dollar amounts.

52. The data are provided in four-digit detail of the Standard Industrial Classification (SIC) code. Data are from U.S. Department of Labor, Bureau of Labor Statistics, Office of Earnings and Employment Statistics, Data Analysis Section, Special Tape XC4057, provided by Darrell E. Carr.

53. "Secular" trends refers to trends in earnings that are not due to fluctuations in the business cycle nor due to the state repeals of prevailing wage laws.

54. Controlling for contractor type is a conservative procedure. Overall construction earnings may decline as a result of a shift in the mix of construction worker type. We are focusing on the decline of earnings within trades instead of any decline resulting from a shift in the mix of trades. Additional earnings losses may be calculated associated with a shift to a mix of less skilled workers. This is one reason why the regression estimate of earnings decline is lower than the simple estimate which does include the effect of changing crew mixes within the states construction industries. Unemployment rates are for each state for each year.

55. This is an annual earnings average by SIC group. When earnings are weighted by the number of workers in each group, earnings fall to slightly below \$25,000.

56. *Technical details:* This regression model was tested on 27,778 observations. Control (dummy) variables for 26 detailed 4-digit standard industry code (SIC) classifications were included in the regression model but not reported in the table. Each coefficient reported in column (2) of the table is statistically significant except the control for the mountain states region. (This means that the estimated regional effect on annual construction earnings for the mountain region of -\$79 is small and probably not different from zero.) The unemployment rates for 1991 for the example states shown in table 2.3 were 4.9 for Utah, 5.0 for Georgia, and 5.9 for Maryland. The model is a generalized least-squares weighted regression with the weight being the square root of the annual average employment in each SIC industry for that year. The R^2 is 0.73, which means the model is a good fit of the data.

57. The model also estimates a negative effect on annual earnings of \$1173 associated with raising the threshold for construction contracts covered by a prevailing wage law to \$500,000 or more. This suggests that at some point raising the threshold has a similar effect to repealing the law altogether. However, this result is based on experience from only two states, Maryland with a \$500,000 threshold and Oklahoma with a \$600,000 threshold. We could not find negative effects on earnings from lower thresholds in the \$100,000 to \$400,000 range which leads us to be cautious about this result. A conservative interpretation of this result may be that thresholds below \$500,000 have a minimum impact on construction earnings while thresholds above \$500,000 have progressively more negative effects on earnings.

58. The Standard Industrial Classification (SIC) code for construction consists of detailed categories of general contractors such as commercial and residential general contractors, detailed categories of heavy and highway contractors, and detailed categories of specialty subcontractors such as masonry and carpentry.

59. Robert D. Reischauer, Congressional Budget Office Testimony, before the Subcommittee on Labor Standards, Occupational Health and Safety, Committee on Education and Labor, U.S. House of Representatives, May 4, 1993, p. 4.

60. Robert D. Reischauer, Congressional Budget Office Testimony, before the Subcommittee on Labor Standards, Occupational Health and Safety, Committee on Education and Labor, U.S. House of Representatives, May 4, 1993, p. 4-5.

61. U.S. Department of Labor, Bureau of Statistics, Employment and Earnings, December, 1994, Table B-3 for November 1994, p. 55.

62. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, Government Finances, 1990-91, Series GF/91-5, Table 8, column 6, p. 9.

63. Some of the material in this chapter concerning the Utah case originally appeared in Hamid Azari-Rad, Peter Philips and Anne Yeagle, "The Effects of the Repeal of Utah's Prevailing Wage Law on the Labor Market in Construction," in Sheldon Friedman, et al., eds., *Restoring the Promise of American Labor Law*, Cornell University, ILR Press, Ithaca, New York, 1994, 207-22.

64. These data are based on quarterly per capita dues contributions to the Utah AFL-CIO Building and Construction Trades Council. These payments underestimate union membership because of under-reporting of membership from participating locals as well as other exemptions and withdrawals of locals.

65. George F. Will, "It's time to repeal the Davis-Bacon Act", *Deseret News*, February 5, 1995.

66. Indeed, an unreported multiple linear regression model tested whether changes in the male black-white unemployment ratio could be associated with state repeals of prevailing wage laws or the fact that a state never had such a law. This model controlled for time trends in the male black-to-white unemployment ratio, regional differences in unemployment ratios, and changes in the level of unemployment. While the model found a strong time trend in the black-to-white unemployment ratio and significant regional differences in the ratio, there was no statistically significant relationship between either the repeal of prevailing wage laws or the complete absence of prevailing wage laws and the black-to-white unemployment ratio. In short, there is no statistical connection one way or the other between the status of prevailing wage laws and the relative unemployment of blacks and whites.

67. These state demographic unemployment rates are from U.S. Department of Labor, Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment*, 1974 to 1992.

68. U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population, Detailed Population Characteristics and General Population Characteristics, GPO, 1992.

69. Data available on request.

70. Utah Department of Employment Security, Labor Market Information and Research, *Annual Report of Labor Market Information*, 1993, table 5, Salt Lake City, 1994.

71. Hamid Azari-Rad, Peter Philips and Anne Yeagle, "The Effects of the Repeal of Utah's Prevailing Wage Law on the Labor Market in Construction," in Sheldon Friedman et al., eds., *Restoring the Promise of American Labor Law*. Cornell University, ILR Press, 1994, 207-22.

72. U.S. Bureau of the Census, 1970 *Census of Population*.

73. U.S. Bureau of the Census, 1970 *Census of Population*.

74. Figures 3.7 and 3.8 include all states for which any data are available, except California, Delaware, the District of Columbia, Hawaii, and Rhode Island – for which there are no Bureau of Apprenticeship Training data for the second period. We exclude these states and the District of Columbia (for the same reason).

12. We do not know what accounts for the unusually high training rate for "never-had" states in 1976. This anomaly disappears when average training rates by decades are compared.

76. This transformation into the log of an odds ratio meets the normality assumptions of linear regression analysis. The technique used is generalized least-squares regression, with the regression weighted by the square root of (percent trained) times (one minus percent trained) times (state employment).

77. Latent illnesses resulting from exposure to toxic materials are responsible for an uncounted and thus undetermined additional number of injuries and illnesses – the costs of which are borne as reduced productivity, ruined lives for workers and their families, and burdens on workers' compensation and other social security systems. For a mix of reasons, there are no reliable estimates on the number of such illnesses.

78. C. Culver, M. Marshall, and C. Connolly, *Construction Accidents: The Workers' Compensation Data Base, 1985-1988*, Washington, DC, OSHA Office of Construction Engineering, 1992.

79. In figure 4.1, n refers to the number of observations in each state-law category. For instance, there were 230 state-year combinations for states that had prevailing wage laws throughout the period.

80. In the case of lost workdays per injury, the reported result is of the expected sign, but not statistically significant.

81. Jimmie Hinze, *Indirect Costs of Construction Accidents*, Seattle: The University of Washington, 1992, 14.

82. Because of small numbers, there are no reliable estimates on how repeal would affect death rates. Thus, we cannot calculate the projected increase in fatalities due to repeal. If, however, they were to be affected at the same magnitude as are injuries, we would expect an increase of 130 to 150 fatalities per year.

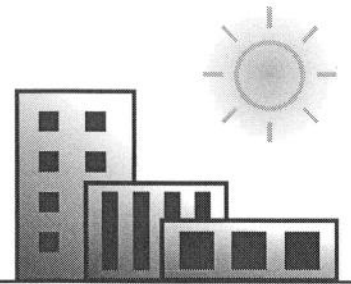
83. Utah, Department of Transportation, "Final Estimates Processed for Payments, 1970-74 data published in 1985 and 1994 reports.

84. The savings are so small because labor costs on public works are only roughly 25 percent of total costs. If you cut those labor costs by 10 percent, you have cut total costs by only 2.5 percent.

85. George F. Will, "It's time to repeal the Davis-Bacon Act", *Deseret News*, February 5, 1995.

86 Charles Culver, Michael Marshall, and Constance Connolly, *Construction Accidents: The Workers' Compensation Data Base, 1985-1988*. Office of Construction and Engineering, OSHA, 1992.

EXHIBIT 3



SmartCitiesPrevail.org

Building community value with prevailing wage

Rebuilding California: The Golden State's Housing Workforce Reckoning

By **SCOTT LITTLEHALE**

JANUARY 2019

“...[W]hen commercial and heavy construction are active in the context of a high employment economy, shortages are likely to be particularly severe for home builders.”

— DUNLOP AND MILLS, THE PRESIDENT’S COMMITTEE ON URBAN HOUSING, 1968

“It’s not so simple as to say, ‘Oh, we have a shortage of construction workers.’ We have a shortage of construction workers at the price people want to pay. The simple way to solve shortages is to pay people more.”

— GARY PAINTER, UNIVERSITY OF SOUTHERN CALIFORNIA, 2018

About the Author

SCOTT LITTLEHALE received his Bachelor of Arts degree with honors from Stanford University and passed Ph.D. candidacy qualifying examinations at the Department of Political Science at the University of North Carolina at Chapel Hill. Littlehale has researched the U.S. political economy and labor-related U.S. public policy since 1993, with a focus on development and construction since 2003. He is the author of “Revisiting the Costs of Developing New Subsidized Housing: The Relative Import of Construction Wage Standards and Nonprofit Development,” a statistical analysis of drivers of costs of California low-income housing developments that was published in the Berkeley Planning Journal. Littlehale has given numerous research presentations at national academic and professional conferences, including those convened by the Labor and Employment Research Association, the National Alliance for Fair Contracting, the Economic Analysis and Research Network, and a Living Wage Symposium convened by the Robert M. La Follette Institute of Public Affairs at the University of Wisconsin-Madison. He served on the technical committee of CASA – The Committee to House the Bay Area – between 2017 and 2018. A California native, Littlehale lives in a house that was built in 1942 for shipbuilding workers in the city of Richmond, CA.

About the Report

“REBUILDING CALIFORNIA: THE GOLDEN STATE’S HOUSING WORKFORCE RECKONING by Scott Littlehale is an excellent analysis of the issues facing the state’s housing industry with respect to its workforce. Littlehale develops strong arguments that following its current trajectory, there will not be sufficient craft workers available to the industry in the near future. The paper provides a strong argument that developing an adequate workforce will require restoration of middle class wages and working conditions and training programs, and that these depend on strengthening the application of labor and employment law in residential housing and of construction unions. The study is remarkable in the depth of its documentation and deft use of available data. It is a terrific example of developing solidly based policy arguments.”

JANUARY 3, 2018

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REBUILDING CALIFORNIA: The Golden State's Housing Workforce Reckoning



EXECUTIVE SUMMARY, JANUARY 2019

To address California's historic housing affordability crisis, policymakers increasingly agree that housing production must increase dramatically and quickly.

However, to produce enough new housing to keep the crisis from getting worse, California needs to recruit at least 100,000 new residential construction workers. And to produce enough new housing to start making housing more affordable — production levels not seen since the 1970s and 1980s — California needs at least 200,000 new construction workers.

This study examines the underlying industry and workforce dynamics standing in the way of meeting these ambitious goals, while outlining cooperative strategies that could boost the labor market competitiveness and productive capacity of California's housing construction sector.

The construction labor market is tight and job vacancies are rising

- California non-supervisory construction workers' unemployment rate was lower in 2017 than it was in 2006, when statewide construction employment hit a historic peak.
- Since 2011, publicly posted vacancies for Construction Supervisors and the four trades central to housing production (carpentry, laborers, electricians, and plumbers) have jumped as much as 75%.

Housing industry productivity lags behind public works construction and non-construction sectors

- Real Gross State Product per job for construction declined 18% between 1998 and 2017.
- According to the BLS, nationwide construction sector output per unit of labor declined by almost 13% between 1987-2016, while productivity in other business sectors increased by 31%.
- Construction industry-wide, the specialty trades that supply labor for residential builders had the lowest productivity and the most negative productivity growth between 2002 and 2012.
- The prefabricated manufacturing industry shed 40% of its workforce between 2005 and 2016, and large scale adoption of standardization technologies is uncertain.
- For more than a decade, residential contractors have sought to meet rising demand for housing with increased employment instead of increased productivity.

Wages and compensation in the housing construction industry are not competitive

- Adjusted for cost of living, median California construction trades pay ranks 46th in the United States.
- On average, residential construction workers earn 24% less per year than other jobs; less than half have health insurance coverage at work.
- On average, residential construction workers earn 33% less per year than non-residential construction workers. The gap has widened since 1990.
- Nonresidential subcontractors' contributions for fringe benefits are more than triple those made by residential contractors.
- When California housing production peaked during the 1970s and 1980s, average hourly pay rates for most residential and non-residential construction workers were practically equal.
- The share of construction workers facing some form of wage theft is up 400% since 1972.

Construction jobs are physically demanding and economically risky

- On average, construction jobs require considerably longer commutes and more flexibility in work hours than other jobs.
- Among all major industrial sectors, construction jobs have the third highest occupational fatal injury rate and a lifetime risk of a lost-time injury of 78%.
- Construction work is seasonal and vulnerable to economic downturns. Workers face twice the earnings volatility of other jobs.
- More than 365,000 California construction trades jobs were eliminated during the last recession (2006-2011). Construction trades employment in 2017 remained 25% lower than 2006 levels.

The housing industry is older and its traditional labor pools are shrinking:

- The construction labor force is getting older. Workers under the age of 35 went from being nearly 60% of all male construction employees in 2016 to being only 36% in 2017.
- While 6% of Americans work in construction, a 2016 NAHB survey found only 3% of Americans aged 18-25 planned to pursue a career in the construction trades.
- California's stock of male workers with a high school degree or less has shrunk since 2005.
- Net flows of unauthorized immigrants turned negative in 2007, and there are 350,000 fewer young, non-naturalized immigrants in California's labor force in 2016 vs. 2005.
- Housing construction wages are not competitive enough to lure young workers away from other states or industries.

The housing industry has not invested in apprenticeship training

- Apprenticeship training attaches workers to the industry and increases their lifetime earnings.
- Construction ranks with agriculture and the retail sectors as having the worst rates of skills training of all U.S. industry sectors.
- While prevailing wages and collective bargaining agreements include apprenticeship funding mechanisms, these investments are "voluntary" in the largely non-unionized residential sector.
- Joint Labor-Management programs funded by prevailing wage and collective bargaining agreements train 10 times more workers than voluntary "Employer Only" programs.
- Data shows that career technology education, Job Corps, and government initiatives are neither scalable nor sufficient to meet the industry's needs.

Prevailing wage and collective bargaining boost labor market competitiveness and productivity

- The housing industry currently lacks the wage competitiveness and career training pipeline needed to offset the physical and economic risks of construction. This is hindering its ability to attract and retain the workers needed to increase production of new units.
- Prevailing Wage standards and collective bargaining agreements are consistently associated with higher wages, increased apprenticeship enrollment, more production efficiency, and fewer workplace safety problems.
- Most peer reviewed studies have concluded prevailing wage has no significant effect on overall project costs.

Housing builders' reservoir of low-wage, less-skilled labor is not refilling itself. Background regulations that promote labor-management cooperation around the vital elements of skilled construction workforce development can play a vital role in restoring California residential building to the production engine that it once was.

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1

OVERVIEW

California has under-produced new housing to meet the growth of jobs and households in the Golden State. The shortfall has exacerbated housing cost burdens for California residents. Recognizing that housing costs have depressed living standards, California policy makers increasingly agree with academic and professional analysts that production must increase dramatically and quickly to avoid even greater gaps between typical California incomes and housing costs.

To simply tread water and meet projected jobs and household growth, California must supply over 210,000 new units of housing per year over the next seven consecutive years, according to the California's Housing and Community Development Department (HCD). That rate is more than double the average annual number of housing units permitted in California between 2013 and 2017.

Production of epic proportions and duration will be necessary to actually alleviate California's affordability crisis. California needs to supply 3.4 – 3.5 million new units of housing – more than 15 percent of California's existing housing stock – in order to reduce the costs that burden over forty percent of California households.¹ Production on this scale did occur over the two decades of the 1970s and 1980s, when California permitted the construction of about 3.9 million new units of housing. To accomplish this on the timeframe proposed by Governor-elect Newsom, builders would have to develop and deliver 500,000 units per year between 2018 and 2025.²

Construction of 100,000 units of new housing requires roughly 90,000 – 100,000 building trades workers.³ To meet HCD's goal of not losing additional ground, the construction workforce for new residential building needs to nearly double. But California housing contractors would need to attract, train and retain well over 200,000 additional workers to meet an accelerated production timetable.

More than doubling the housing production workforce is a daunting challenge under current conditions, which include near record-low unemployment. Housing market analysts started as early as 2013 to warn that increasing percentages of contractors were finding it difficult to recruit workers to meet demand for residential construction, and that labor shortages lead to delays in housing starts, prolong the number of months of construction, and raise the prices of finished houses. Those reports highlight particularly high shortages of carpentry subcontractors, who

To simply tread water and meet projected jobs and household growth, California must supply over 210,000 new units of housing per year over the next seven consecutive years

The most obvious ways to increase the size and productive capacity of the workforce are the inverse of the traits listed above that have dogged housing construction:

- Smooth out housing production cycles over the seasons and across the years;
- Improve the working conditions under which housing trades workers labor relative to other occupations;
- Attach skilled workers to the industry through fringe benefit plans that are portable from contractor to contractor.
- Invest in apprentice and skills-upgrade training;
- Increase the efficiency with which land, capital and labor are combined in order to increase the output of finished housing relative to total cost inputs;
- Attract more skilled workers with increased pay

HOUSING CONSTRUCTION WORKFORCE DEVELOPMENT IS A COLLECTIVE ACTION PROBLEM

Investments in recruitment, training, and in retention-oriented compensation plans can only come from workers, housing project budgets, or taxpayers. In an environment of volatile demand and cut-throat

competitiveness, “the long-term costs of maintaining the health and skills of the [construction] labor force are put off or never paid at all.”⁵

In an environment of volatile demand and cut-throat competitiveness, “The long-term costs of maintaining the health and skills of the [construction] labor force are put off or never paid at all.”

Major players in the construction industry have long recognized the risks of under-investment in workers’ skills, and have called for project owners and contractors to commit resources to train and retain a quality workforce. The fact that reports appear every business cycle that decry underinvestment by contractors in workforce development highlights the fact that employers’ voluntary coordination efforts to meet these challenges have been inadequate or unsuccessful.

The temptation to gain competitive advantage or increase profit margins during good times of unpredictable duration by not making long-run investments in training and fringe benefits

overwhelms the potential rewards of cooperation. Until the rules of housing production are revised, the record of residential construction contractors voluntarily implementing any of the above strategies will continue to fall short.

PUBLIC INTERVENTION IS NECESSARY

Prevailing wage laws that apply to contracts for construction with state and local government agencies address the collective action challenge for recruitment, training, and retention for the workforce that builds public infrastructure.* The laws buttress a nearly century-old workforce development innovation that was generated through private collective bargaining: the “joint apprenticeship committee.”⁷

Building trades unions and employers who are party to craft-specific collective bargaining agreements jointly administer training benefit plans that provide both classroom and on-the-job training to aspiring journeyman across all skilled construction crafts. Industry coordination has been extended through collective bargaining to the creation of multi-employer health care and retirement fringe benefit plans. Taken together, these plans, funded out of the construction worker labor compensation package, promote recruitment, training, and “attachment” of skilled workers to the industry, reducing turnover, and thereby increasing workforce productivity.⁸

Public works’ labor standards apply to a significant percentage of construction work – roughly \$1 out of every \$5 spent statewide on construction – but the standards are largely relegated to nonresidential construction.⁹ Collective bargaining agreements influence a significant percentage of privately owned nonresidential construction projects in California.

Residential building is largely divorced from prevailing wage and/or collectively bargained labor standards. In fact, the residential construction sub-sector has become a major center of “underground” economic activity, including wage theft, tax fraud, and the shifting of costs onto taxpayers.¹⁰

Transitioning housing builders from a “low road” workforce strategy to the “high road” of a better compensated, more stable and productive workforce will entail private sector adjustments and public sector investments in counter-cyclical finance for housing construction during private sector building recessions. Evidence from the realm of public works construction indicates that owners and contractors adjust to the introduction of prevailing wage laws within a relatively short period of time.¹¹

The State of California needs a plan for bridging the period of transition. The experience of three decades has demonstrated that residential developers will not commit to even transitory costs voluntarily and unilaterally. Absent a clear system of incentives for workers, contractors, and private

Additional state policies to enforce wage, workers compensation insurance, and tax laws would help to disincentivize continued residential construction dependence on “underground economy” practices.

*The law sets uniform standards and ensures that a portion of pay for construction workers on public works projects is withheld and allocated to building trades training programs. The wage standards also provide funds sufficient for health and retirement benefits, which reward workers who attach themselves to the construction industry over extended periods of time.

developers, it is practically assured that California will fall far short of new housing production needs.

It is beyond the scope of this study to flesh out specific terms of a package of incentives and disincentives. Research on the impacts of government regulation of land use, density, parking, development impact fees, building code provisions is extensive and ongoing, and can assist policy makers in their efforts to design a package of reforms.¹²

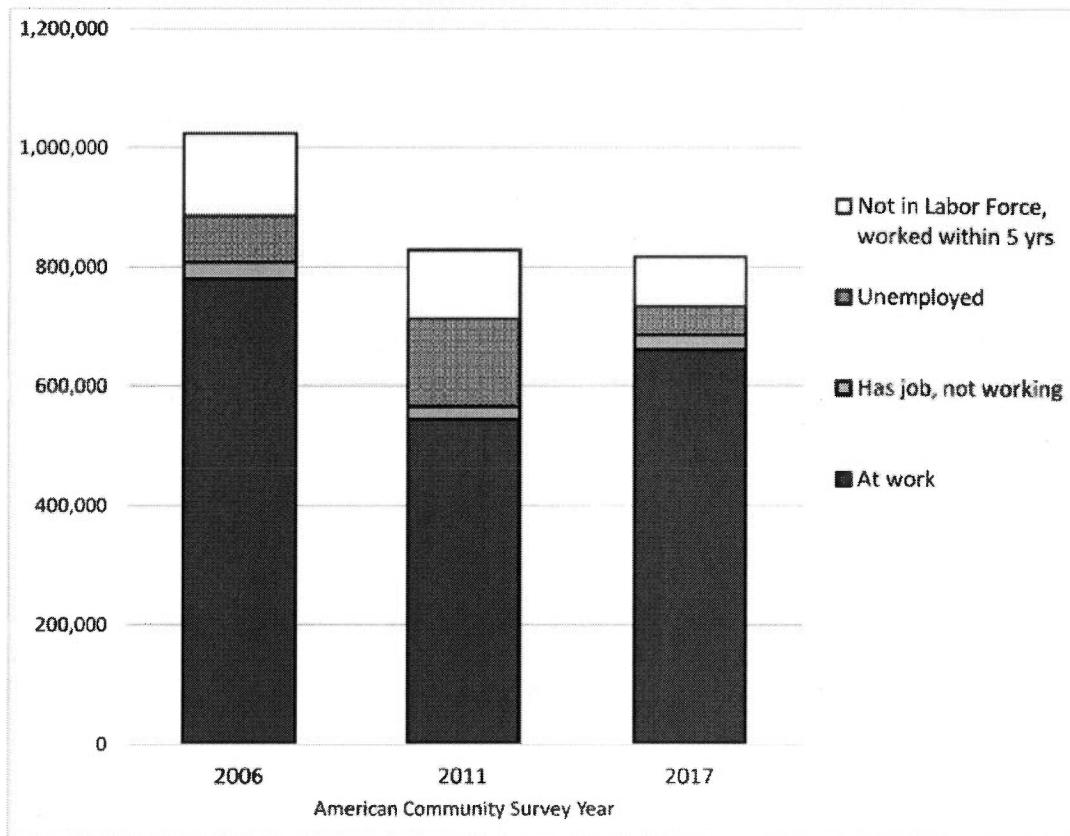
It is clear, however, that California's elected leaders must decide to require apprentice utilization and payment of prevailing wages for projects that benefit from state funding or state regulatory reforms that balance housing project costs with project value. Additional state policies to enforce wage, workers compensation insurance, and tax laws would help to disincentivize continued residential construction dependence on "underground economy" practices.

2

Building Trades Labor: less slack, more search, flat wages

California construction sector gross domestic product is below that of the expansion of the 2000s, but the state's construction labor market is now tighter than ever. California non-supervisory construction workers' unemployment rate was lower in 2017 than it was in 2006, when statewide construction employment hit a historic peak. If construction employment is to return to previous heights of employment, contractors will need to attract workers who are not already building trades workers.

Figure 1 | Less slack in the supply of California building and construction trades workers



Notes: Includes all non-supervisory construction industry building trades workers

Source: IPUMS-USA, University of Minnesota, www.ipums.org

Contractors have had to search harder to fill building trades vacancies since the Great Recession. Job vacancy postings data from The Conference Board Help Wanted Online™ Data Series indicate that

California construction employers' building trades vacancy postings in 2017 equaled one-fifth of the total building and construction trades work force at the beginning of the year, with higher percentages of online job vacancy postings for specific trades (FIGURE 2).

Construction supervisors are in highest demand: On a base of under 50,000 supervisors employed statewide, 28,000 vacancies were posted in 2017, up 75 percent from 2011's volume. The publicly posted job vacancy rate increased from 38 percent in 2011 to 58 percent in 2017. The jumps in the vacancy rates between 2011 and 2017 for four construction trades that are essential to housing construction also are notable.¹³

Figure 2 | California Help Wanted Online™ construction vacancy rates

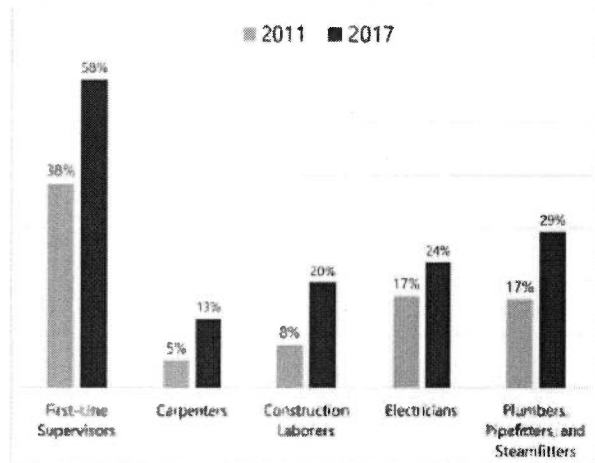
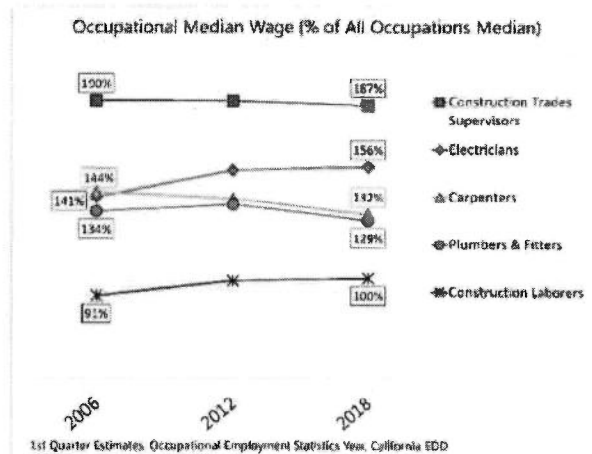


Figure 3 | Relative wages, selected California occupations



Annual postings as % of same-year, first quarter employment

Source: California Employment Development Department

An occupation-specific labor shortage generally is expected to drive employers to increase an hourly wage relative to other wages. Wage behavior for California construction trades workers, however, has not followed any clear, simple pattern.

Since 2006, the wages of construction laborers and electricians, relative to wages of all other occupations, have risen. Electricians are perhaps the most trained, best paid, and regulated of all the major California building trades.¹⁴ Construction laborers are at the other end of the spectrum. The relative wages of carpenters and plumbers have declined and construction supervisors' relative wages have been flat. More complex dynamics for relative wage trends clearly are in play.

3

Young Americans are skeptical about the construction trades

While only 5 percent of the population works in construction occupations, an even smaller percentage of young Americans aim to have a career in the building trades. The National Association of Home Builders (NAHB) surveyed young adults age 18 to 25 in 2016 and found that only 3 percent of those who know what they want to do will pursue the construction trades.¹⁵ Roughly one-quarter of the young adult survey respondents were undecided about their future career.

Among young adults who had not identified a preferred career, nearly two in three said that they had zero or little likelihood of opting to work in the building trades. The preferences that led undecided young adults to discount construction trades work as a possible career are depicted in TABLE 1:

Table 1 | Why not the trades?

Too physically demanding	48%
Too difficult	32%
Not an office job	26%
Pay is below respondent's goal	19%
Not a career that requires a college degree	18%
Seasonal work	18%
Outdoor work exposed to elements	17%
# of survey respondents	328

Table 2 | Beliefs re: construction trades annual pay

Under \$25,000	9%
\$25,000 - \$50,999	34%
\$51,000 - \$75,999	34%
\$76,000 - \$100,000	11%
Over \$100,000	2%
Don't know	10%
# of survey respondents	2,001

Source: NAHB (2017)

Levels of compensation and chances to advance are important factors that motivate pursuit of a career. The NAHB asked survey respondents to estimate the annual earnings levels of the building trades. Most respondents thought that building trades incomes ranged between \$25,000 up to \$76,000 (TABLE 2).

More than 60 percent of the NAHB survey respondents who were undecided about a career preference said that chances were slim to none that they would consider a career in the trades. Of those, 25% said that *no amount of money would attract them to the trades*. One-fifth of the young construction skeptics said that \$75,000 – \$100,000 would make them reconsider; another fifth said that it would take at least \$100,000 to change their minds.

In sum, young people believe that building trades careers involve strenuous and difficult working conditions and also believe that annual pay in the trades falls short of attractive levels. The next sections validate these perceptions, *particularly when it comes to work in the housing construction industry.*

4

Building trades jobs' unattractive requirements and risks

Building trades work under status quo conditions is attractive to the few, not the many, as the 2017 National Association Home Builders survey of young adults considering future careers revealed. The job requirements are difficult or undesirable for many working people. SECTIONS 4.1 AND 4.2 below summarize the major differences in requirements between construction trades jobs and all jobs.

The factors that weigh against choosing to work in construction do not end with job requirements. Labor market participants assess both potential rewards from investing their time or money in a particular opportunity and risks. Building trades work entails risks to earnings and to health that are two-to-three times greater than average risks faced by all workers, as summarized in SECTION 4.3.

4.1 REQUIREMENTS: PREPARATION, MOBILITY & SCHEDULE FLEXIBILITY¹⁶

Construction work has reduced status and appeal for workers with higher levels of educational attainment, yet often requires workers to come to a job with skills. It also requires flexibility with respect to travel and work hours, which is often difficult for dual-earner households with children.

Most housing-related construction jobs do not require educational credentials in excess of a high school diploma or its equivalent. Educational attainment levels within California's blue-collar construction workforce have shifted over recent decades. The percentage of male employees of general building contractors and specialty trade contractors who have less than a high school education rose from 22 percent to 27 percent between 1992 and 2017. The share of the California construction industry's non-supervisory workforce with an 8th grade education or less has risen to 20 percent.¹⁷

In contrast to educational prerequisites, higher percentages of construction trades jobs require greater pre-employment training. The average number of days that construction workers have received pre-employment training is 700, five times greater than the 140-average number of days of training received by all workers.¹⁸

Key requirements for many construction trades workers revolve around mobility and flexibility with regard to hours of work, factors that deter people interested in work-life balance:¹⁹

- 80 percent of building trades jobs require workers to work at least four different locations over the course of a year versus less than 25 percent of all U.S. jobs.
- Unscheduled overtime, unexpected weekend hours, and unexpectedly shortened work days all are more common for construction workers than for workers overall.

- The typical California construction worker's departure time for work is 45 minutes earlier in the day than for all other male workers.
- Average reported time spent traveling to work by male California construction workers exceeds that of all other male California employees by 33 percent.

4.2 PHYSICAL REQUIREMENTS, ENVIRONMENTAL CONDITIONS, AND COSTS TO HEALTH

Physical and environmental job requirements and conditions factored heavily into the high percentage of young Americans surveyed by the NAHB who were uncertain about their future career, but fairly certain that they do not want to work in construction.

Construction workers are in fact exposed to a range of demanding physical and environmental working conditions. TABLE 3 summarizes the degree to which unattractive requirements or conditions apply to construction workers compared to the overall civilian workforce: The conditions summarized

Table 3 | Construction occupational requirements

Requirement/Condition	Incidence Rate/Estimate	Rate/Estimate compared to All Occupations
Climbing ladders, ropes, or scaffolds	87 - 97%	5 times greater
Work in high, exposed places	78 - 91%	6 - 7 times greater
Kneeling	89%	2 times greater
Level of strength: heavy or very heavy	55%	over 3 times greater
Exposure to extreme heat	21%	2 times greater rate
Exposure to heavy vibration	41%	over 8 times greater
Exposure to loud noise intensity level	50%	almost 4 times greater
Proximity to moving mechanical parts	75%	3.5 times greater
Exposure to hazardous contaminants	48%	Over 3 times greater
Lift or carry maximum weight of ...	50 - 65 lbs. (median)	20 - 35 lbs greater
Exposure to hazardous contaminants	48%	Over 3 times greater
Lift or carry maximum weight of ...	50 - 65 lbs. (median)	20 - 35 lbs greater

Source: U.S. BLS Occupational Requirements Survey, 2017

above contribute to construction occupations' high ranking for workplace injuries and fatalities. In 2017, construction occupations' incidence rate for accidents that required days away from work was over 2.4 times greater than the overall rate in California and ranked second-worst out of all major occupational groups.²⁰

One of every five serious workers' compensation insurance claims – which involve death, permanent total disability or major permanent partial disability – is related to a construction trades employee, despite the fact that construction trades jobs account for less than one out of every 25 California jobs.²¹

Construction has the third highest occupational fatal injury rate of major industry sectors in California, a rate that is more than two and one-half times greater than the rate for all sectors. The industry accounts for about 6 percent of total workers, but 16 percent of fatal workplace injuries.²² During the building boom of 2003-2006, 106 construction workers died on California residential job sites, an average of over 26 workers per year.²³ Ten times that number suffered reportable injuries. A total of 294 California construction industry trades workers died in occupational incidents from 2011-2016.²⁴

Risks of fatal and nonfatal injury accumulate over a working lifetime. For a working life in construction, the risk of fatal injury was approximately *one death per 200 full-time-equivalent employees (FTEs) according to a recent study in the American Journal of Industrial Medicine. The adjusted lifetime risk of nonfatal injury resulting in days away from work was an astoundingly high 78 per 100 FTEs.*²⁵

Risks of fatal and nonfatal injury accumulate over a working lifetime. For a working life in construction, the risk of fatal injury was approximately one death per 200 full-time-equivalent employees...

4.3 CONSTRUCTION CAREERS ARE ECONOMICALLY RISKY

Volatility of employment and earnings factor into Californians' calculations of whether or not to dedicate their labor toward housing production. Construction sector employment is unstable, both over the course of years-long business cycles and within a year's seasons.

Construction workers, most of whom are male, face two times greater-than-average earnings volatility than do all male workers economy-wide.²⁶ Even in years when demand for construction is high, the irregularity of construction labor demand results in construction employees working – and getting paid for – fewer total annual hours than men in all other jobs, on average.²⁷

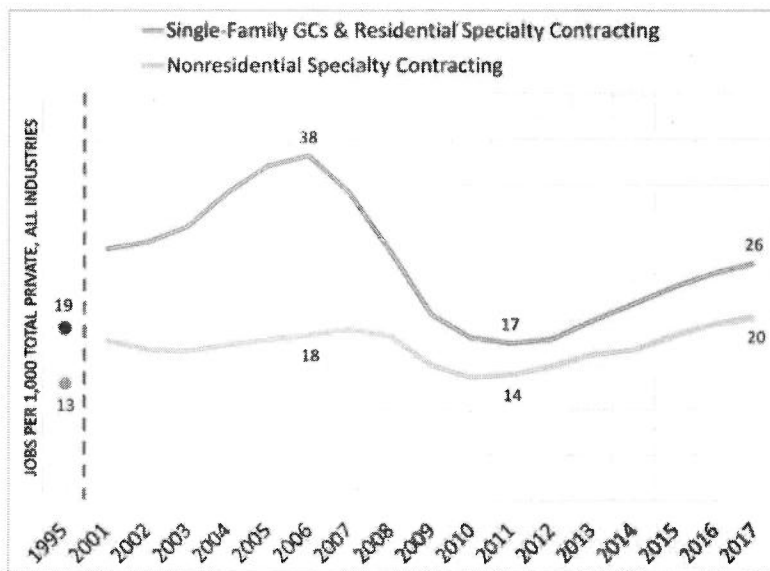
Employment and earnings risks for construction workers have been particularly high in California. California statewide construction sector employment as a percentage of total employment is close to the average for the past five decades,²⁸ but workers only have to think about the roller coaster of the past 25 years to be reminded that construction is an extraordinarily turbulent industry.

The Census Bureau estimates that construction employment of men without four-year college degrees nearly doubled – an increase of about 300,000 jobs – between 1993 and 2006. Within 4 years, 250,000 of those jobs were gone. Construction employment of men without bachelor's degrees in 2017 remained 13 percent lower than 2006 levels.²⁹ Many construction workers cannot count on the sector to employ them consistently for the span of a career.

Residential building accounts for a large part of the construction sector's instability. FIGURE 4 reflects employment in two distinct construction sub-sectors relative to total private employment.³⁰ The residential construction industries' employment rate relative to total private sector employment doubled between 1995 and 2006, only to crash by more than 50 percent in the five years between 2006 and 2011. By 2017, total employment for single-family general contractors and residential specialty contracting firms had recovered ground, but still had not recovered in relative terms to even 2001 levels.

Nonresidential construction employment, Figure 4 shows, has grown to twenty-plus-year record heights

Figure 4 | Residential vs Nonresidential Employment per 1,000 Private Jobs



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

during the current construction business cycle. Relative to residential construction, employment in nonresidential construction has been far less volatile. California's **residential framing contractors and workers** have had the roughest of rides on the housing rollercoaster. In 2001, 728 residential framing

[†]The greater San Jose—San Francisco—Oakland Bay Area is an exception to the statewide rule. Construction sector-wide employment for Bay Area metropolitan statistical areas that report construction employment surpassed their prior 2001 peak in the mid-2018. U.S. Bureau of Labor Statistics total industry employment data available via <https://fred.stlouisfed.org/graph/?q=IXW5>.

specialty contractor establishments did business in California and employed over 25,000 workers. By 2006, the housing bubble's peak, 100 firms and over 50 percent more employees had been added to the state's framing subcontractor supply. By 2011, 80 percent of the framing workforce had been wiped out. By 2013, California had over 300 fewer residential framing contractor establishments than it had had in 2006. By 2017, after six years of recovery, the residential framing industry's inflation-adjusted total payroll and the number of all employees were still more than 20 percent lower than 2001 levels.

Turning to occupational employment, **carpenters and laborers** have been subjected to the most extreme swings over the past 20 years (TABLE 4). Employment for both trades remain one-third below the mid-2000s housing bubble peak. The number of construction supervisors employed in 2017 was also significantly lower than during the previous decade. Employment of electricians and plumbers (the building equipment trades), on the other hand, has recovered. Building equipment trades workers enjoy more options for employment, including performing alterations and maintenance as well as work for utilities, the entertainment industries, and government agencies.

Table 4 | California occupational employment, selected trades in selected years

	All Construction	First-Line Supervisors	Carpenters	Laborers	Electricians	Plumbers
2006	816,000	65,000	145,000	142,000	60,000	49,000
2011	449,000	38,000	57,000	84,000	42,000	30,000
2017	613,000	52,000	97,000	97,000	63,000	48,000
2006-2011 (#)	(367,000)	(27,000)	(88,000)	(58,000)	(18,000)	(19,000)
2006-2011 (%)	-45%	-42%	-61%	-41%	-30%	-39%
2011-2017 (#)	164,000	14,000	40,000	12,000	21,000	18,000
2011-2017 (%)	37%	37%	71%	14%	50%	60%
2006-2017 (#)	(203,000)	(13,000)	(48,000)	(46,000)	3,000	(1,000)
2006-2017 (%)	-25%	-20%	-33%	-32%	5%	-2%

Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics. Estimates rounded to the nearest thousand.³¹

5

Housing trades' compensation is decreasingly competitive

Three facts about compensation (pay and benefits) help explain why residential builders and subcontractors in 2017 find it difficult to attract and retain productive workers:³²

1. The construction sector no longer delivers a compensating differential in pay and benefits that offsets the trades' less attractive requirements and risks.
2. A compensation gap separates relatively low-paying residential construction work and higher-paying nonresidential construction work.
3. The residential pay penalty has increased, not shrunk, despite strong demand for residential construction services.

5.1 THE BUILDING TRADES' "COMPENSATING DIFFERENTIAL" HAS SHRUNK

Construction work delivered substantial hourly wage premiums to blue collar building trades workers during much of the post-World War II era. Economists explained that the premium was a "compensating differential" for the working conditions and risks discussed in Section 4.³³

The construction wage differential has declined significantly since the 1970s. One study traced the income differential for male employees of the U.S. construction industry versus the services sector and found that the differential, after accounting for various earnings control variables, had declined by 2008 to only one-third of early 1970s peak levels.³⁴ The decline is attributable primarily to falling construction wages rather than rising wages of other workers.³⁵

Pay differentials have vanished for employees of building subcontractors, but not for employees of contractors influenced by prevailing wage laws and collective bargaining, nationwide data indicate. A recent academic study included analysis of three construction sub-sectors: building construction (general contractors); heavy and highway construction; and specialty trade contractors (usually building subcontractors). Housing contractors fall within the building construction and specialty trades categories, whereas heavy construction includes more public works projects, which often are subject to prevailing wage requirements. The authors' statistical analysis of data spanning 1990 to 2001 found a negligible overall industry wage differential for U.S. specialty trade contractors but a substantial industry wage differential of nearly 20 percent for heavy construction. The overall industry wage differential for general contractors was less than five percent.³⁶

The changes to labor markets and compensating differentials are apparent in California earnings data.

The typical annual full-time, year-round pay of California construction trades workers in 2017 was equal to that of the typical comparable California male: about \$40,000 in 2017 dollars (TABLE 5).³⁷

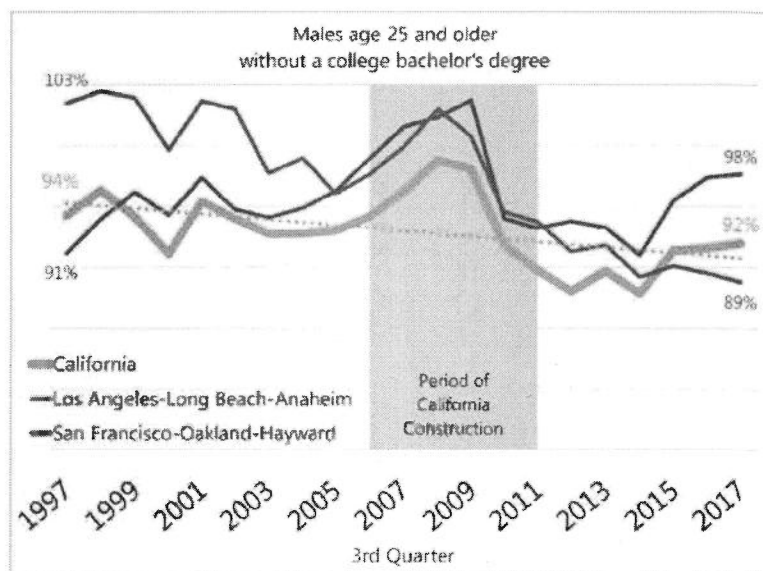
Table 5 | California 12-month earnings of male workers without a four-year college degree

Full-time, year-round private & public employees & the self-employed					
	Average	25th Percentile	Median	75th Percentile	No. of workers
All workers exc. Construction Industry Building Trades	\$53,395	\$26,000	\$40,000	\$65,000	4,091,117
Construction Industry Building Trades Workers	\$48,343	\$25,000	\$40,000	\$60,000	536,223
Total	\$52,809	\$26,000	\$40,000	\$65,000	4,627,340

Source: Analysis of U.S. Census, American Community Survey 2017 1-Yr PUMS file

The construction wage differential has turned negative in certain California regions where demand for construction workers has risen the most. In the San Francisco – Oakland metropolitan area, as shown in FIGURE 5, a gap has appeared and grown between the average monthly earnings of male workers without a four-year college degree who are employed by building foundation, structure, exterior, and finishing specialty contractors versus the average for all male workers without a degree.³⁸

Figure 5 | Relative average earnings of building structure and finishing specialty trade workers



Source: QWI Explorer application, U.S. Census Bureau, qwexplorer.ces.census.gov

Fringe benefits for construction workers have also become less competitive. Nationwide, according to one recent study, the overall uninsured rate for the prime working age population with full-time jobs, was about 12 percent. Carpenters and construction laborers were uninsured at about triple that rate. Half of roofers, drywall workers, plasterers, and stucco masons reported not having insurance.³⁹

California contractors offer fringe benefits at low rates to building trades workers, echoing the national statistics. Only one third of construction industry trades workers are policyholders for employment-based health insurance, compared to over half of all other employed male civilian workers, according to data from the Annual Social and Economic Supplement of the U.S. Bureau of Labor Statistics' Current Population Survey (CPS).⁴⁰ California construction workers' rate of coverage under any employer- or union-provided health care insurance ranks 35th out of all of the United States, proximate in rank to Alabama, Colorado, Louisiana, Nevada, and Virginia.⁴¹

5.2 HOUSING CONSTRUCTION COMPENSATION IS BELOW AVERAGE

Nationally, residential builders and their specialty trade subcontractors have tended, in the words of nationally renowned labor economists writing in 1968, to stand "at the end of the line for manpower."

*This largely because in some localities wages and benefits are lower in homebuilding than elsewhere in construction, and overtime opportunities are fewer. ... [W]hen commercial and heavy construction are active in the context of a high employment economy, shortages are likely to be particularly severe for home builders.*⁴²

FIGURE 6 shows that, nationally, **residential specialty trade contractors'** total compensation (wages plus voluntary fringe benefits) is substantially below the economy-wide average. Average hourly wages for **nonresidential specialty contractors** are *more than 30 percent greater* than those for residential specialty contractor employees. In all, *nonresidential specialty contractors' average voluntary hourly compensation costs are almost 50 percent higher than average voluntary compensation costs for residential specialty contractors.* Nonresidential contractors' contributions for voluntary fringe benefits are more than triple those made by residential contractors.[‡]

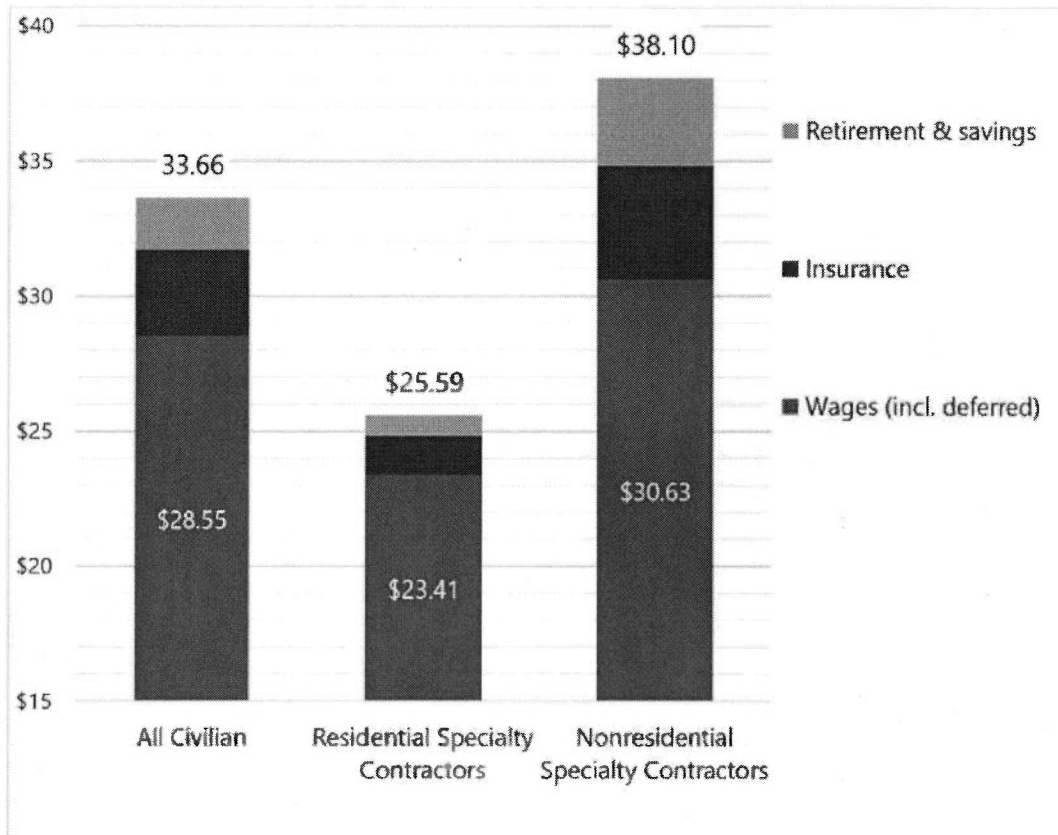
Differentials in fringe benefits between residential and nonresidential specialty trades employees help to explain residential contractors' difficulty attaching skilled crafts people to careers building housing. A peer-reviewed study in 2010 found that only 35 percent of blue-collar construction workers who are not covered by collective bargaining had health insurance that was paid for at least in part by an employer. This same study found that health insurance funded through collectively bargained employer contributions to plans that are portable within the construction industry increased industry-retention

[‡]All average wage statistics intentionally focus on the specialty trades industries. White-collar employees as a share of total industry employment is much higher percentages in NAICS 236 "building contractor" industries.

rates by up to 40 percent, compared to baseline retention rates of construction workers without any health insurance coverage.⁴³

During the 1970's and 1980s, when California produced more than 200,000 units of housing annually, urban coastal California had been an exception to the general rule that residential contractors paid much

Figure 6 | Average employer costs for employee compensation per hour worked, March 2018



Source: U.S. Bureau of Labor Statistics, National Compensation Survey unpublished estimates

less than nonresidential employers. A 1973 U.S. BLS construction wage survey found that average hourly pay rates for carpenters, cement masons, electricians, plumbers, roofers, and sheet metal workers in the metropolitan areas of Los Angeles-Long Beach and the San Francisco Bay Area were *practically equal* across the major types of construction, including residential buildings under five-stories.⁴⁴

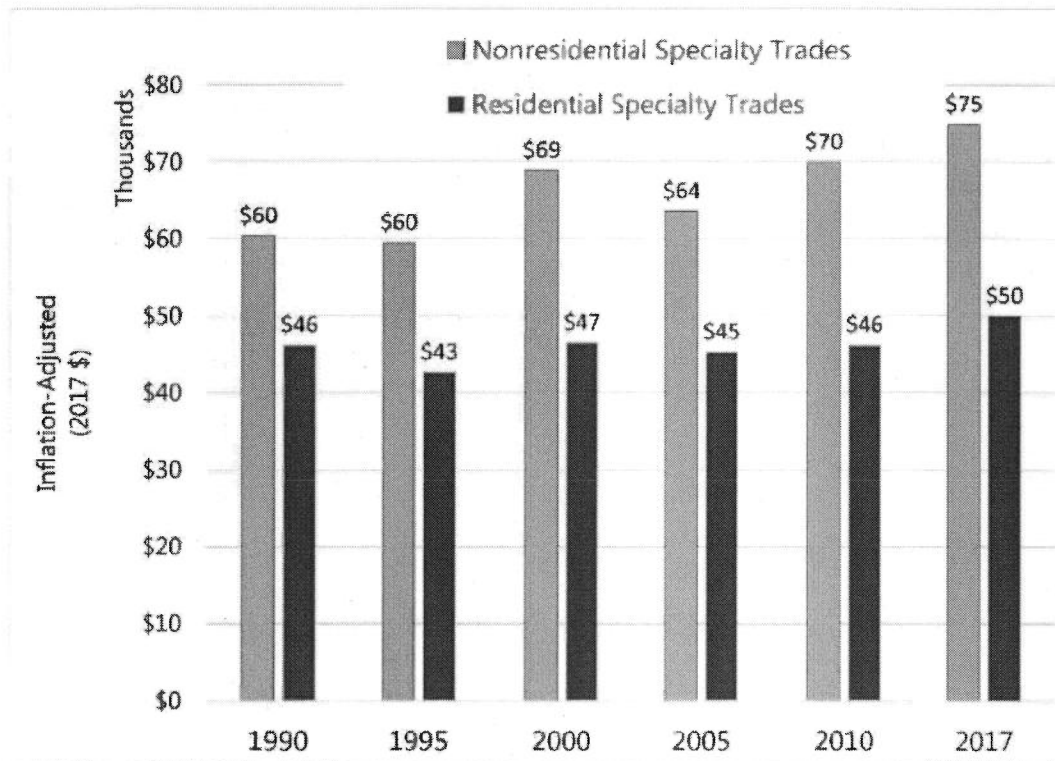
De-unionization of residential building between 1970 and 1990 transformed the structure of construction wages in California. By 1990 the statewide average annual pay for employees of *nonresidential specialty trade contractors* was 31 percent higher than the average for residential specialty trade contractor employees.⁴⁶ That pay gap grew over the next 27 years.

5.3 CALIFORNIA'S HOUSING COMPENSATION GAP HAS INCREASED, NOT SHRUNK

A wage penalty for California residential construction work grew markedly between 1990 and 2000. FIGURE 7 shows that inflation-adjusted, average annual pay for all employees of residential specialty contractors was essentially flat between 1990 and 2000, while average pay for nonresidential subcontractors rose more than 13 percent.

Wage growth for *all* specialty trade contractors, however, was less than the growth of average annual wages economy-wide between 1990 and 2005. FIGURE 8 shows that during this period, annual pay per employee for both residential and nonresidential building contractors fell *relative* to average statewide pay across all industries – though the decline was much more significant in the residential sector.[§]

Figure 7 | California average annual pay per job, all employees, by industry

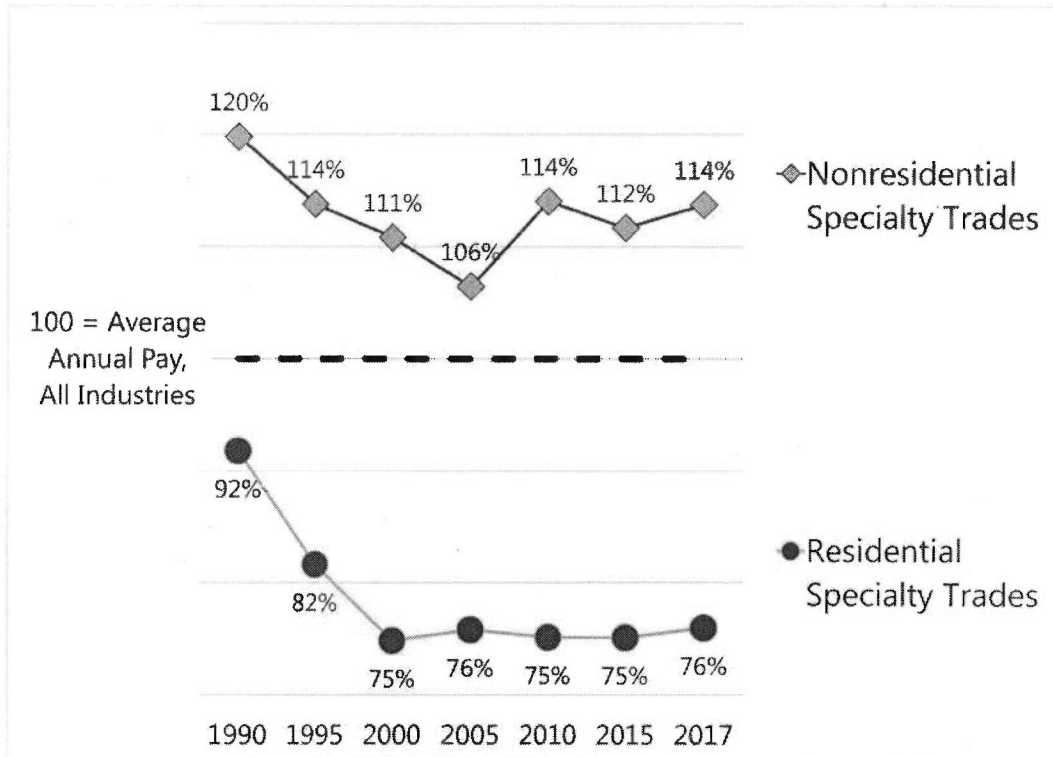


Note: Includes white-collar employees.

Nonresidential: NAICS 238nn2; Residential: NAICS 238nn1

Source: California Employment Development Department, Quarterly Census of Employment and Wages

[§]The Quarterly Census of Employment and Wages "serves as a near census of monthly employment and quarterly wage information ... at the national, state, and county levels." Wages accounted for by the QCEW include all compensation that is subject to employment taxes, including overtime, sales commissions, bonuses, vacation pay, meal & lodging stipends, and reported tips. The only pay and employment excluded from the QCEW is that of workers not covered by either state or federal unemployment insurance.

Figure 8 | California statewide average annual pay per job (as % of average pay of all industries)

Note: Includes white-collar employees.

Nonresidential: NAICS 238nn2; Residential: NAICS 238nn1

Source: California Employment Development Department, Quarterly Census of Employment and Wages

FIGURES 7 AND 8 show that relatively high hourly wages for construction do not necessarily aggregate into relatively high annual income, at least not for residential construction workers. As will be recalled from FIGURE 3, the estimated typical hourly **Carpenter** wage in early 2018 was nearly one-third higher than the median hourly wage of workers across all occupations. However, the 2017 average annual pay for residential framing subcontractors, which predominantly employ carpenters, was \$39,700 or 40 percent below the average for all of California's industries. Average annual pay for all employees of residential framing contractors, after adjustment for inflation, increased only 2 percent between 1990 and 2017, a compound annual growth rate less than 0.1 percent.⁴⁷

In sum, housing construction pay is low relative to other construction work and relative to economy-wide average pay. Residential contractor average hourly payments for health insurance and retirement benefit plans are even further below par.

The loss of competitiveness of residential construction wages puts the housing industry in a poor position. Private and public sector demand for nonresidential construction is healthy. The State of

California has committed to invest billions annually in transportation infrastructure. The information sector has fueled strong demand for commercial office buildings. Evolution in goods supply chains has motivated major investments in warehouse and distribution center construction. Utilities require new or overhauled power generation and water-related infrastructure. California contractors who build new housing will be challenged to recruit large numbers of additional workers until they are able to substantially reduce the residential pay penalty.

6

Failure to adequately invest in craft skills training

Job skills training costs time and money, triggering workers and employers to do a cost-benefit analysis before they make a commitment. Rather than pay to train workers, residential construction contractors often rely on poaching already-skilled employees from other firms to fill key positions. Residential building crews are filled out with lower-wage workers, as evidenced by the data in SECTION 5.2. Training occurs with much higher frequency, on the other hand, when employers are influenced by collective bargaining and/or government regulation.⁴⁸

While construction leaders and experts have sounded the alarm for four decades about inadequate contractor investment in craft training (see **text box below**), the failure of the residential building industry’s reliance on voluntary private action to train construction workers is clear in national data. Construction ranks with agriculture and the retail sectors as having the worst rates of skills training of all U.S. industry sectors.⁴⁹

Four decades of appeals for voluntary industry commitment to training	
1982	“Current [construction industry] training levels are not adequate to meet the shortfall of close to 2 million workers in the construction industry projected by 1990. A significant increase in craft training within the open shop [non-union] sector is essential. ... If the open shop sector of construction remains at the present level of 60 percent [market share] without a significant increase in its training, there could be a long-term deterioration in the quality and productivity of the construction work force. (Business Roundtable)” ⁵⁰
1997	“The open [non-union] shop, as a whole, has not supported formal craft training to the extent necessary. They have succeeded by attracting skilled workers from the union sector as market share shifted and recruiting skilled workers from competitors as individual workload changed. As the well begins to dry up, the ability to use these methods decreases ... (Business Roundtable)” ⁵¹
2004	“... [T]he open-shop sector as a whole has not supported formal craft training and assessment to the extent necessary to effect real, meaningful, and lasting change. The lack of standardized training in the majority of the open-shop sector has been taking its toll. (Construction Users Roundtable)” ⁵²
2018	“Owners need to require contractors to invest in training and improve the skill sets of their workforce. Moreover, contractors must recognize the necessity and benefits of investing in their employees.” ⁵³

Source: Analysis of U.S. Census, American Community Survey 2017 1-Yr PUMS file

The biggest indicator of a construction craft worker receiving training is whether or not the worker was covered under the terms of a collective bargaining agreement. Collective bargaining agreements push training rates for covered craft workers up to the national average for other industries (TABLE 6).

Studies have found that **apprenticeship training** outperforms other workforce training programs in improving participants' earnings.⁵⁴ Apprenticeship training also has the added benefit of being largely

Table 6 | U.S. work related training, by collective bargaining coverage

Worker received employer, government or apprenticeship-paid training	CONSTRUCTION CRAFTS		OTHER INDUSTRIES	
	Covered	Not Covered	Covered	Not Covered
... in last 12 months	16%	6	19%	16%
... in the last 10 years	38%	17	38%	34%

Source: Waddoups (2014)

self-financing. Employers make training fund contributions based on the number of hours worked by trades persons who are covered by either a collective bargaining agreement or by California's prevailing wage law. Collective bargaining agreements, apprenticeship program standards, and California's prevailing wage laws also require contractors to employ apprentices in order to provide them with on-the-job training.

California residential builders in the greater Los Angeles and San Francisco Bay Area regions utilized apprentices during the 1970s every bit as much (and in the case of San Francisco-Oakland, even more) as commercial builders, the Bureau of Labor Statistics found (TABLE 7). The development of a healthy stock of trained residential trades people assured that the high levels of housing construction could continue through the 1980s.

Table 7 | California carpenter apprentices' share of craft employment, 1973

	Los Angeles – Long Beach	San Francisco – Oakland
Apprentice Carpenters (% of Total Carpenters)	10%	14%
Residential apprentice carpenters (% of Residential Carpenters)	10%	20%

Source: U.S. Bureau of Labor Statistics (1976)⁵⁵

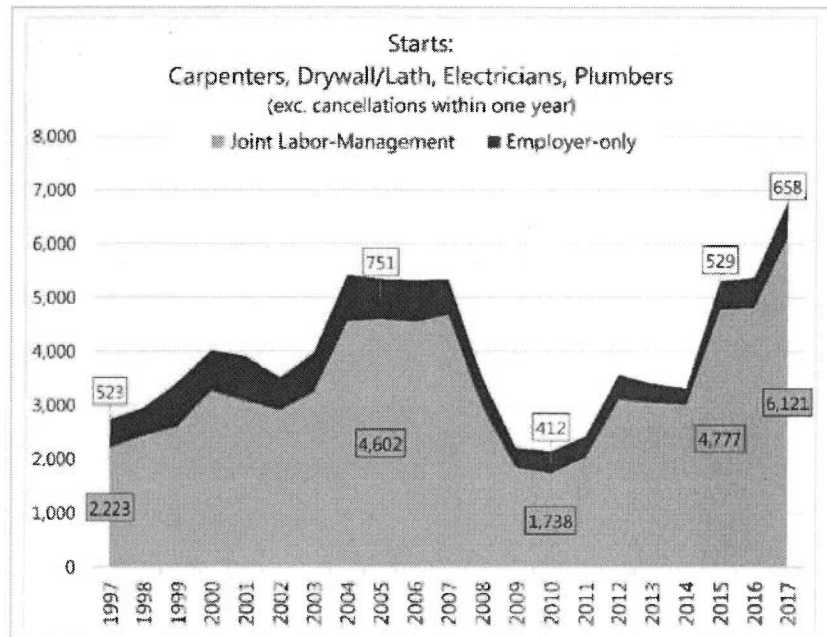
During the 1970s, when California was producing housing at the average annual rate of 200,000 units, the state reported an average of 9,000 state-registered carpenter apprentices. Between 1973 and 1982, more than 11,000 carpenter apprentices statewide completed their programs.⁵⁶ These carpenters were the core of California's trained and skilled residential construction workforce through the 1980s, when housing production continued at a strong pace.

De-unionization of California's residential building contractors in the mid- to late-1980s and the recession of the early 1990s led to sharply reduced demand for apprentices from the residential contractors. Carpenter apprenticeship completions fell by 50 percent between 1996 and 2005 compared to the 10 year period between 1973 and 1982.⁵⁷

Residential contractors have not institutionalized any craft training programs of significant scale that operate outside of the collective bargaining framework. In 2017, over 20,000 California workers were actively enrolled in joint apprenticeship programs for carpenters, drywall installers, electricians and non-maintenance plumbers, which is about 10 percent of those trades' estimated 2017 total construction sector employment of 206,000. Employer-only ("unilateral") programs, by contrast, enrolled only 2,100 active apprentices, or about 1 percent of the selected crafts' total employed workforce.⁵⁸

Demand for both new housing and nonresidential construction has gathered momentum since 2012 and has already absorbed unemployed residential workers who did not leave the industry or the

Figure 9 | California apprentices, selected trades, by year and program sponsor type



Note: Start counts exclude apprentice agreements with terms less than or equal to 6 months

Source: California Department of Industrial Relations, Division of Apprenticeship Standards

labor force (FIGURE 1). Programs undergirded by a jointly administered set of standards opened their training pipelines in response to post-Great Recession infrastructure investment and demand growth for nonresidential and heavy and civil construction. Joint programs more than tripled individual apprenticeship starts – from 1,700 to 6,100 – between 2010 and 2017, rising to levels that topped the prior building cycle’s heights by 33 percent. Voluntary, employer-only programs, in contrast, managed to increase apprentice starts by only 246 workers (FIGURE 9).**

Carpenter apprenticeship starts have *increased* in proportion to total carpenter employment during the current construction business cycle. Whereas carpenter apprentice starts during the mid-2000s boom were less than 4 percent of total carpenter employment, they were 7 percent of total 2017 carpenter employment, due entirely to increased starts in the joint labor-management programs. Most carpenter apprentices, however, work on nonresidential public works projects.

Housing contractors by-and-large are institutionally disconnected from the recent increase in the supply of construction apprentices because most housing contractors are not parties to collective bargaining agreements nor required to comply with prevailing wage standards. In northern California, unionized contractors with businesses concentrated in residential building employed only a small minority of all union-member carpenter apprentices.

Career Technology Education provided by community colleges and private colleges, paid for either with taxpayer funds, trainees’ personal funds, or by sponsoring employers have not trained craft workers essential to new housing construction at a scale commensurate with the need.

- Only 1,350 Californians received post-secondary education awards for carpentry, drywall & insulation, electrical/electrician, or plumbing training on average over the 2014-2015 and 2015-2016 academic years.^{††}
- Over half of construction-related awards were for electrician coursework, which leaves gaps in support for building foundation, structure, exterior, and finishing-related crafts.
- Only 132 career technology education awards statewide in 2015-2016 were for carpentry and drywall.

Government funding for other, non-apprenticeship training programs similarly provide training at a scale that falls far short of the level of demand. **Job Corps** has annual slots in carpentry and home building-related *pre-apprenticeship* training programs for 8,250 trainees at dozens of different centers *nationwide*.⁶¹ The programs are geared to train 16 – 24 year olds for between 8-12 months, *readying* them for – but not substituting for – registered apprenticeships or training-related jobs.

** Apprentices who canceled their agreements within the first year are considered “false starts” and are excluded from these and subsequent statistics.

†† “Awards” include non-credit awards that require as little as 144 hours of instruction and as much as an associate’s degree. An apprentice award in the selected crafts requires 4 to 5 years of training, including 576 to 720 hours of relevant and supplemental instruction.

The Home Builders Institute (HBI), a non-profit organization created by the National Association of Home Builders (NAHB), relies primarily on government funding rather than its own base of for-profit developers. A U.S. Department of Labor grant titled "President's High Growth Job Training Initiative" allows HBI to work in 10 states with high schools, community colleges, employers and the public workforce investment system to reach and train more than 3,000 young people in the residential construction industry trades. The HBI's *total* annual revenues in 2016 were \$25 million, or roughly 2.5 percent of the \$1 billion in approximate total annual revenues of apprenticeship programs nationwide.⁶²

The data are clear: construction contractors that are unorganized either around multi-employer collective bargaining or through the requirements established in government public works contracts under-invest in training. Deficits in training for new construction trades workers have been compounding over three decades. Career technology education programs and government pre-apprenticeship programs are neither sufficient to meet labor force needs across all crafts, nor an adequate substitute for full apprenticeship programs registered with state and federal agencies.

The residential building industry only benefits from apprenticeship programs' supply of trained workers when strong demand for residential construction coincides with a decline in nonresidential construction. An ambitious, sustained drive to more than double annual California housing production ought not to rely on the occurrence of such a coincidence.

7

Construction productivity lags behind the rest of the economy

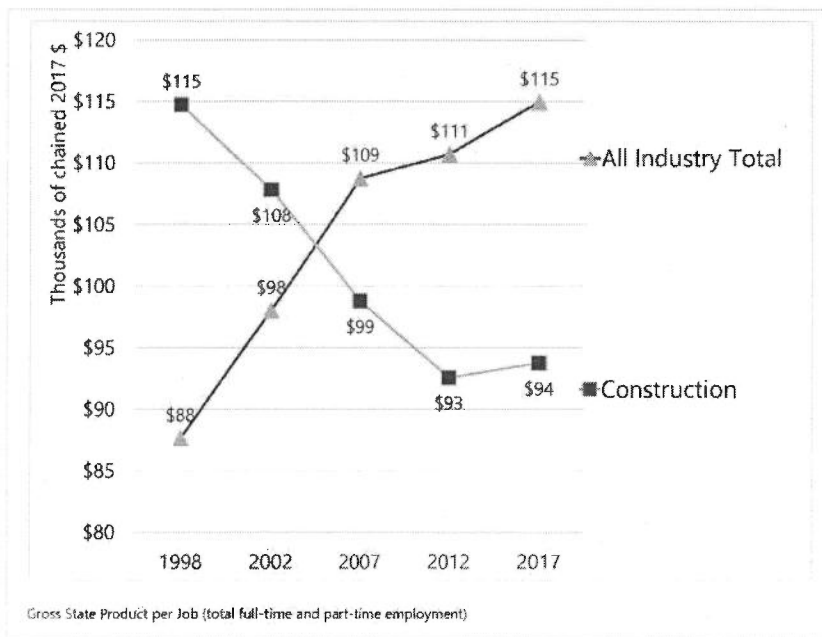
California housing productivity growth is crucial to increasing housing supply. As summarized by the McKinsey Global Institute,

*[A productivity] increase means that higher value can be provided to customers with the same or fewer resources, which translates into a desirable mix of higher-quality structures at lower cost for owners, higher profitability for contractors, and higher wages for workers.*⁶³

Productivity growth across the entire U.S. construction sector has lagged economy-wide growth for decades. The U.S. Bureau of Labor Statistics estimates that nationwide construction sector output per unit of labor declined by almost 13 percent between 1987-2016,⁶⁴ while productivity in the nonfarm business sector increased 31 percent during the same period.⁶⁵

Construction’s industrial building and heavy and civil sub-sectors both have productivity levels and productivity growth that exceed sector-wide averages. In contrast, the specialty trades that supply much of the labor for residential builders — such as framing and drywall subcontractors — have the lowest levels of productivity and the most negative productivity growth rates between 2002 and 2012

Figure 10 | California real gross state product per job, chained 2017 dollars



Source: U.S. Bureau of Economic Analysis

out of all of the construction industries.⁶⁶ For 10 years or more, subcontractors, when pushed to meet growth in demand, have relied on increasing employment rather than increasing productivity.

Productivity in California has matched the national pattern. Real Gross State Product per job for construction declined 18 percent between 1998 and 2017 (FIGURE 10).

California’s construction productivity gap has three serious implications for meeting the challenge of doubling

California's output of new housing:

1. Employers need more employees in order to increase output precisely when builders already are running into tight labor markets, especially in high-demand urban coastal markets;
2. Wage increases are important for attracting more workers to construction, and it is more difficult to raise wages sustainably when productivity growth is stagnant.
3. Industries with greater productivity have an advantage in competing for productive workers in a tight labor market.

For decades, observers have commented on potential productivity gains from standardization and offsite manufacturing of construction components or virtually complete modules. However relatively little progress has been made on this front.

Statistics from the prefabricated wood building manufacturing industry indicate the fits and starts of technological change in housing construction. Nationwide capital expenditures by wood building manufacturers, a mere \$75 million in 2005, had shrunk to \$45 million in 2016. Nationwide, in 2005 the small prefabricated wood build industry employed 26,050 production workers. By 2016, the industry had shed 40 percent of this workforce and employed only 15,600 workers. Industry shipments totaled only \$3.2 billion (current 2016 dollars). These numbers pale in comparison to employment with new housing builders and framing subcontractors, which, combined, employed 393,000 in 2016.⁶⁷

While recent investments in factory-built housing technologies in California signals a new wave of interest in significant technological change in housing production,⁶⁸ large-scale adoption is uncertain. Factory investors and managers still need to reckon with risky, high-amplitude cycles of demand. If factory-built housing proves to be able to deliver on hoped-for production efficiencies and successfully ride out a construction industry recession, investment in factory-built housing modules may grow by orders of magnitude.

Until radical transformation of housing production technology occurs, however, poor productivity will weigh on housing production schedules, costs, and excess demands for labor. The Turner Center for Housing Innovation at UC Berkeley reported in 2018 that housing industry interviewees from San Francisco claim that *supervisory expertise lost since the prior business cycle's peak has reduced housing construction productivity, driving up total labor costs (distinct from average hourly wage rates) by 10 to 20 percent.*⁶⁹

...supervisory expertise lost since the prior business cycle's peak has reduced housing construction productivity, driving up total labor costs (distinct from average hourly wage rates) by 10 to 20 percent.

Given current historic low unemployment – and labor supply dynamics to be discussed below in SECTION 10 – construction labor productivity must improve if California is to dramatically increase its housing output without dramatically raising costs of production.

8

Housing's traditional labor pools are shrinking

The housing industry cannot expect to replicate its workforce growth experience of the mid-1990s through the mid-2000s. Spiking demand for new housing during that period coincided with three important developments: (1) the cresting of a wave of less-educated immigrants; (2) decline of nonresidential construction employment in the wake of the “Dot Com” bubble; and (3) weak growth of male employment outside of the construction sector. There was a substantial reserve of workers, and, for many men living in California with few formal credentials, housing was the growth industry during the early 2000s.

Housing production depends more than most industries on workers who are (a) male (b) young and (c) have lower levels of formal education. This sub-set of the labor force constitutes the “traditional” labor pool for housing construction trades.

Only 2 percent of the California construction industry’s building trades workers are female, a statistic that has remained essentially unchanged for at least four decades.⁷⁰ While construction working conditions deter most men from choosing the construction trades as a career, women confront additional barriers.⁷¹ While women have better chances of joining the high-skill construction workforce if they enroll in joint labor-management apprenticeship programs as opposed to unilateral, employer-only-managed programs, women’s participation levels in apprenticeship remain at very low levels.⁷² Public agencies recently have started to partner with construction labor unions to leverage infrastructure capital improvement programs to increase employment of women and other traditionally under-represented groups,⁷³ but this model has not been replicated by housing developers.

Table 8 | California males aged 25 — 44, by educational attainment

	2005	2017	Change
High School or less	2,361,000	2,159,000	-202,000
Less than High School	1,131,000	833,000	-298,000
High School Diploma or GED	1,230,000	1,326,000	96,000
Some college, including Associates degree	1,386,000	1,665,000	279,000
Four-year+ college degree	1,517,000	1,910,000	393,000

Source: U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates, Table B15001

In 2001, more than half of all male employees of California building foundation, structure, exterior, and building finishing contractors (NAICS 2381 and 2383) were non-college-educated. Twenty percent were under the age of 25. Across all sectors, only 37 percent of all male workers had a high school degree or less, and only 13 percent were under age 25.⁷⁴

California's stock of men without any college education has shrunk since the last housing production boom (TABLE 8). The supply of men without college education ready and willing to work construction jobs is unlikely to be inflated in the foreseeable future by any of the major potential sources for increased labor supply: (1) California population growth; (2) Young workers from other industry sectors; (3) Young, less-educated immigrants; or (4) Non-college-educated workers from other states.

8.1 CALIFORNIA POPULATION GROWTH

California's State Department of Finance estimates that California's population between the ages of 20 and 54 will grow only modestly at an average annual rate of 58,000 between 2018 and 2025.⁷⁵ The current labor employment rate of people between the ages of 20 and 54 is 75 percent, which reduces the average annual growth of employed Californians aged 20 – 54 to 43,000.

If residential construction contractors succeed in attracting an unprecedentedly high ratio of 40 out of 1,000 total employees (see FIGURE 4), then we can expect population growth to increase residential construction employment by about 1,700 employees per year. Of that, we should expect at least 30 percent of the residential contractor employees to work in non-building trades occupations, consistent with current occupational distribution patterns. It therefore is reasonable to estimate the upper-limit of annual increases in housing construction employment from population growth alone to around **1,200 workers per year** – a tiny fraction of the 100,000 – 200,000 new workers that are needed to stabilize or reduce housing costs.

8.2 YOUNG WORKERS FROM OTHER SECTORS

Construction's workforce for basic specialty trades has aged more rapidly than the rest of the economy due to low hiring rates of young workers. As a result of the disproportionate blows to young building specialty contractor employment during the Great Recession, and greater rates of hiring older workers since recovery began in 2012, workers under the age of 35 have fallen from being nearly 60 percent of all male construction employees to being only 36 percent.⁷⁶

It is unlikely that housing builders will be able to attract more young workers away from other industries under a "business as usual" scenario because the subcontractor industries do not pay the premiums that are needed to motivate large numbers of young workers to switch jobs and attach themselves to building foundation, structure, exterior, and finishing contractors.

The U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program helps to illustrate why young workers probably will not be won over by current wages to the building specialty trades that are critical to large-scale housing production. LEHD "Job-to-Job Flows" data track worker movements across sectors of the economy.⁷⁷ In 2016, male workers between the age of 25 and 34 who moved from continuous employment in a non-construction sector (the "origin" sector) *into* the construction sector (the "destination" sector) had average monthly earnings of \$3,250 *before* changing employment and \$3,920 *after* becoming a construction sector employee. The average monthly earnings of *stable* (full-quarter) new hires of *residential building* contractors and the building foundation, structure, exterior and finishing *specialty trades* contractors for males age 25-34 was only \$3,150, less than the average earnings in the origin sector (TABLE 9).

Table 9 | California average monthly earnings differentials from job-to-job flows vs. stable new hires, 2016

	Job-to-Job: Origin All exc. Construction Avg Origin Earnings⁷⁸	Job-to-Job: Origin All exc. Construction Avg Construction Earnings	New hires: Residential Building, Foundation, Structure & Finishing Avg Earnings⁷⁹	Pay differential: Construction vs Origin Sector Avg Earnings (%)	Pay differential: Residential & subcontracto vs origin earnings (%)
Age 22-24	\$2,200	\$3,020	\$2,510	36%	13%
Age 25-34	\$3,250	\$3,920	\$3,150	20%	-3%

Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics program data.

8.3 YOUNG IMMIGRANT WORKERS

California's construction industry has been a major destination for foreign-born male workers since the 1980s. Construction contractors have relied on this labor pool, paying them average wages that are significantly lower than those paid to U.S.-born workers. Using U.S. Census nationwide household survey data, researchers have estimated that undocumented immigrant construction workers on average are paid 47 percent less than U.S.-born construction industry workers.⁸⁰

Based on estimates calculated from US Census American Community Survey data, foreign-born, non-naturalized workers constituted almost half of all non-supervisory, non-college-educated California construction trades workers in 2005. After construction employment plummeted during the Great Recession, the non-supervisory construction trades labor force contracted, but immigrant, non-citizen

workers' share of the total remained essentially unchanged.⁸¹ Research into California's construction workforce found a concurrent increase in the employment of undocumented immigrant workers and "informal" or "underground" construction employment, in which employers do not pay workers legally required fringe benefits or withhold federal and state taxes. The share of California workers unreported by contractors on payrolls or misclassified as independent contractors increased by 400 percent from 1972 to 2012.⁸²

Housing builders should not expect to be able to continue to depend on recently arrived immigrants for the bulk of construction workforce renewal and expansion. Net flows to California of all unauthorized immigrants turned negative around 2007. In 2009, the number of unauthorized immigrants in California contracted by 108,000, by one study's estimate.⁸³

Housing builders should not expect to be able to continue to depend on recently arrived immigrants for the bulk of construction workforce renewal and expansion.

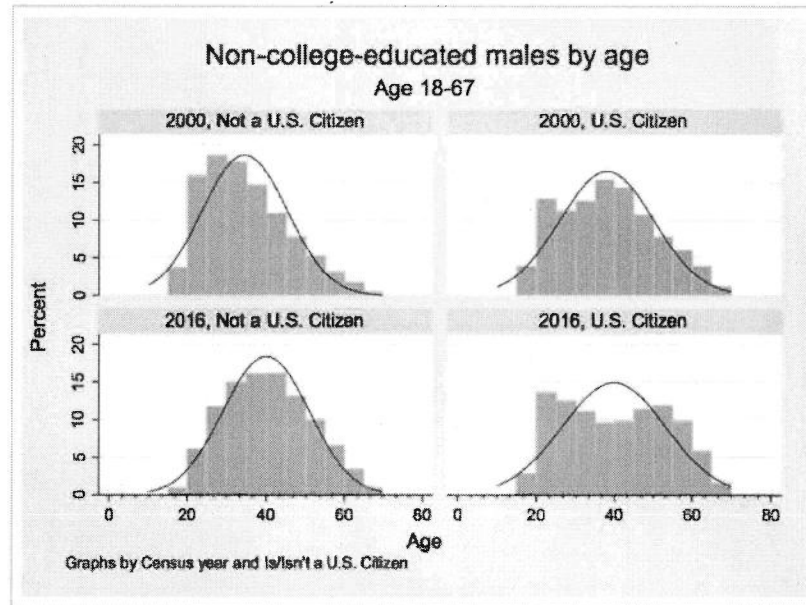
Less-skilled young immigrants are far less abundant in California's total labor force now than they were during the housing construction boom of the 2000s. Census household survey data suggest that the number of young adult (age 18-34), non-naturalized, non-college-educated male immigrant workers in California dropped nearly 60 percent between 2006 and 2017. By comparison, young adult, non-college-educated male citizen workers in California decreased in number by less than 10 percent.⁸⁴ By 2016, the demographic bulge of young, less-educated immigrant workers that existed in California's labor force before the last housing boom had moved into the middle of the prime working age range (FIGURE 11).

Young adult male non-college-educated immigrants still frequently work in the construction industry's building trades occupations. But the turning of the immigration tide has significant implications for California's construction workforce:

- The number of young (18-34), non-college-educated, non-citizens in California's construction trades dropped by two-thirds — or about 130,000 workers — between 2006 and 2017.⁸⁵
- The median age of non-citizen, non-college-educated construction workers increased from 33 in 2006 to 41 in 2017, and now equals the median age of non-college-educated construction industry building trades workers who were born in the United States.⁸⁶

Mexico still ranks as California's single greatest external source for inflows of male, non-college-educated members of the labor force, but California is unlikely to receive a surge of young, less-educated immigrant males in the decade ahead. Inflows to the United States of less-educated foreign-born immigrants peaked more than 10 years ago. The nationwide stock of less-educated young (age 15-40)

Figure 11 | Age distribution of California's non-college-educated male labor force, by citizenship



Source: Author's analysis of U.S. Census Bureau data accessed via IPUMS-USA

immigrants from Mexico is projected to drop to less than half of its current level by the year 2040.⁸⁷

Housing builders' go-to pool of labor has shrunk, and contractors will need to look elsewhere in order to expand its workforce in sufficient numbers to meet demand for new housing output.

8.4 WORKERS FROM OTHER STATES

If California builders should not expect inflows of foreign-born workers to meet greatly expanded demand for construction labor, might they instead entice domestic migration from other states to fill jobs building housing?

As was the case with young California workers, analysis of relative wage incentives suggests that the answer is no, at least under status quo conditions. The purchasing power of typical California construction annual earnings is too low relative to the purchasing power of typical earnings in other states to reasonably expect migration of construction workers in numbers that would make a dent in the need for at least 100,000 more workers focused on new housing construction.

California median (50th percentile) nominal earnings for full-time, year-round construction trades workers were just under \$40,000, as measured by the 2017 American Community Survey. Median earnings fall to \$35,200 when all part-time, part-year workers are included. These earnings rank 32nd and 35th, respectively, among all states.

Cross-state comparisons of construction trades workers' nominal annual earnings are poor indicators of the monetary incentives for skilled construction workers from other states to move to California. California's consumer prices, including housing costs, are 14 percent higher than nationwide price averages.⁸⁸

TABLE 10 shows 2016 median building trades worker earnings that have been adjusted by a federal government regional purchasing parity (RPP) index. These adjustments make for better “apples to apples” comparisons of the purchasing power of median earnings across states and help to clarify and quantify how typical earnings for workers in California – including construction workers – rank low in the United States after adjustment for California's high rents and higher-than-average prices.

- California's full-time, year-round building trades median income, after state purchasing power adjustment, is 12 percent *below* that of nationwide median building trades earnings.
- Purchasing-power-adjusted California median building and construction trades earnings rank 46th among all states.⁸⁹

Table 10 | Comparable 12-month earnings of full-time year-round workers by state, 2016 RPP-adjusted dollars

Geography	RPP-Adjusted Median earnings for civilian employed population	State Rank: all Civilians with earnings	RPP-adjusted Median earnings Construction and extraction occupations	State Rank: Construction Occupations
United States	\$44,900	--	\$40,600	--
Arkansas	\$42,100	44	\$38,000	41
Virginia	\$49,200	8	\$37,800	42
Arizona	\$43,400	38	\$37,300	43
Tennessee	\$43,800	33	\$37,000	44
South Carolina	\$43,400	38	\$36,000	45
California	\$42,600	42	\$35,900	46
Texas	\$43,500	37	\$35,300	47
North Carolina	\$44,600	31	\$35,000	48
Georgia	\$45,100	29	\$34,600	49
Florida	\$39,000	49	\$31,500	50

Source: U.S. Census Bureau, American Community Survey, 2012–2016 5-year estimates, Table B24021, and U.S. BEA 2016 Regional Price Parities by State.

Note: RPP-adjusted earnings were rounded to the nearest \$100. The margin of error for the California median construction earnings estimate was \$230.

Universal: The full-time, year-round civilian employed population 16 years and over with earnings.

Texas and several western states do rank after Mexico as other top sources for gross inflows of non-college-educated men into California's labor force. But domestic migration estimates from the U.S. Census American Community Survey (2012-2016 5-year PUMS) indicate that total outflows of such workers from California outnumber the total inflows:

- Outflows of non-college-educated men from California to Texas, Nevada and Oregon outnumbered inflows by 2:1
- Outflows from California to Washington State, Arizona, and North Carolina outnumbered inflows by over 40 percent.
- Inflows to California of non-college-educated men from Florida and Illinois were cancelled out by outflows.
- California had small net inflows of non-college-educated men in the labor force from New York and Alaska.⁹⁰

California's producers of new housing should not expect that workers most likely to be or become construction workers will migrate from other states in large numbers to take part in a California homebuilding blitz under business-as-usual conditions.

California needs to solve its housing labor supply problem by looking for ways to recruit, train, and retain *Californians* for the risky work of construction by making the work more rewarding.

9

Recruiting, training & retaining productive labor

Residential builders and subcontractors have exhausted the easy and unilateral strategies for accessing more labor to meet higher levels of market demand. They have increased advertising of job openings;⁹¹ increased average weekly hours per worker and full-quarter employment;⁹² increased utilization of workers with low levels of educational attainment; and readily employed unauthorized immigrants.⁹³ The industry still finds itself confronting shortages of skilled labor.

The “hard” workforce growth strategies that remain are subject to collective action problems and the challenge of product market demand turbulence. The previous sections of this research paper provide ample evidence that housing construction contractors, acting voluntarily, have not coordinated voluntarily to:

- Improve working conditions and lower risks of occupational injury and death
- Re-establish an attractive “compensating differential” for construction pay
- Invest in training programs
- Re-organize construction work to employ high productivity technologies

Two non-market institutions – collective bargaining and government-regulated labor standards for construction workers employed on public works projects – are associated with these necessary changes. This section summarizes key features of both institutional arrangements and evidence of their association with outcomes for labor that could bolster supply if extended to housing construction.

9.1 CONSTRUCTION TRADES COLLECTIVE BARGAINING

Collective bargaining between construction contractors and building trades unions has features that are distinct from those found in other sectors. Contractors who believe that they need to tap the labor of craft union members agree to sign an *existing* multi-employer “master” labor agreement that covers the workforces of numerous other contractors. Because contractors’ needs for labor vary widely over time and geography, the union dispatches craft workers to the contractor only in response to a request. When the employer no longer has as much demand for labor or has need for a different skill set, the union member is laid off and rejoins the hiring hall list of trades people who are available for work.

Throughout the time that a union member is employed, the signatory contractor pays an hourly wage to the worker and makes *pro rata* payments into fringe benefit trust funds that are administered jointly by labor and management representatives. The trusts direct money for the benefit of union members

to health insurers, investment firms, and training programs, among other benefit providers. A union member's benefits increase or are sustained as a function of total work performed for any master labor agreement-signatory contractors rather than of continuous employment by a single firm.

Under collective bargaining, the welfare of both workers and contractors is tied to whether or not *together* they manage to successfully win a strong share of the volume of work in the targeted construction sub-market. With strong market share, signatory contractors can more safely bet that the workforce-related costs that they have to put into their bids for construction projects *also* will be in the bids of their competitors.

In the words of construction labor economist Peter Philips, taking long-run costs of developing a stable, skilled workforce out of competition "cuts through this Gordian knot of free-rider problems and overcomes the failures of the market" to adequately train the labor force, improve working conditions, provide a compensating pay differential, and invest in retention-promoting deferred health and retirement benefit plans.⁹⁴ The field of competition shifts away from minimizing training and deferred compensation toward efficient management of overhead, materials, labor, and capital. That competition drives increased utilization of efficient technologies and incentivizes employers to expand and deepen workers' skills.

9.2 PUBLIC WORKS PREVAILING WAGE AND APPRENTICESHIP STANDARDS

Prevailing wages laws are region- and craft-specific minimum wage standards that apply to construction workers employed by private construction firms performing work paid for with public funds.

California's law originally was created in 1931. All public works contractors are required by statute to pay workers prevailing wages, make payments to construction workforce training funds, and request and utilize available apprentices.⁹⁵ Tax laws incentivize employers to direct a portion of total compensation into deferred compensation fringe benefit plans.

Contractors that wish to bid on public works projects incorporate into their bids the costs of prevailing wages. Bidders that are party to multi-employer labor agreements pay workers a specified base wage and direct additional hourly fringe benefit amounts to benefit trusts as prescribed by their agreement(s). Bidders that are not bound to any labor agreement pay workers the base wage but may choose to pay the fringe benefit balance either by making contributions to qualified plans, by "putting it all on the check," or by some combination. Payments to qualified benefit plans are tax-advantaged, as federal and state payroll taxes are levied on wages up to certain limits.

California public works-related labor laws also promote utilization of apprentices. First, contractors must formally request apprentices from local apprenticeship programs and are subject to state penalties if they fail to do so. Second, apprentices are subject to separate, reduced-rate schedules of wages and hourly fringe benefit payments. *Firms that effectively train apprentices can actually save on labor costs.*

If 60 percent of all 96,000 new taxpayer subsidized low-income housing units that were developed over the decade of the 2000s were subject to the standards, that amounts to 60,500 units, or less than five percent of all 1.36 million new California housing units permitted...

California's prevailing wage laws apply to construction of new housing projects that are financed at least in part with grants, certain loans, and/or discounted land from State and local public agencies. A sample of low-income housing projects in California from between 2001 and 2010 indicates that approximately 60 percent of projects were subject to either a federal or state requirement to pay prevailing wages.⁹⁶

The relative scale of the impact of prevailing wage standards on California's housing industry, however, has been small. If 60 percent of all 96,000 new taxpayer subsidized low-income housing units that were developed over the decade of the 2000s were subject to the standards, that amounts to 60,500 units, or less than five percent of all 1.36 million new California housing units permitted that decade. We can safely

assume that prevailing wage standards have to this point exerted little influence on average and median labor standards for residential builders and subcontractors.

9.3 PREVAILING WAGE LAWS, COLLECTIVE BARGAINING, AND RISKS OF INJURY AND DEATH

Prevailing wage laws do not regulate worksite safety. Prevailing wage standards, however, indirectly reinforce training through mandates for contractors to make payments to training funds based on the number of building trades work hours performed on State of California public works projects. Similarly, collective bargaining agreements promote training that educates workers about preventing occupational injuries and illnesses. Labor-management agreements contain provisions that empower workers to voice concerns with jobsite practices or conditions that endanger worker safety, offering protections against employer retaliation that are stronger than anti-retaliation protections under general labor laws. Greater unionization of an industry "increases the probability and stringency" of inspections by government occupational health and safety agents, studies have found repeatedly.⁹⁷

Numerous academic researchers have linked collective bargaining and prevailing wage laws with positive construction worker occupational health outcomes. One study showed that construction fatality incidence rates in states with strong prevailing wage laws were one-third lower than in states with weak or no laws. A second study found lower reports by construction workers of disabilities in prevailing wage law states versus no-law states. An academic economist employed peer-reviewed statistical analysis techniques and found that non-fatal injuries occurred at significantly lower rates in prevailing wage law states compared to states without such laws.⁹⁸ A recent replication of an academic study of construction fatal injury risks found a 26 percent difference in incidence rates between states with weak or no prevailing wage laws versus states with strong or average prevailing wage laws.⁹⁹

9.4 PREVAILING WAGE LAWS, COLLECTIVE BARGAINING AND TRAINING

Construction workers who are covered by collective bargaining agreements receive training at higher rates, as summarized SECTION 6. The relationship between collective bargaining and greater incidence rates of training holds up even after controlling for traits of workers and employers that hypothetically are related to the likelihood of training irrespective of collective bargaining coverage status.¹⁰⁰

Prevailing wage laws similarly have been found to increase construction worker training. One statistical study found that states in the U.S. with prevailing wage laws covering state-funded public works projects had apprenticeship enrollment rates that were 6 to 8 percent higher than states without such laws.¹⁰¹ A novel, but preliminary study of apprenticeship program assets nationwide found that states without prevailing wage laws account for only 15% of all construction training assets, despite containing almost one third of the nationwide total blue-collar construction workforce. The study found that doubling of states' construction unionization rate is associated with an average of 65% higher apprenticeship training investment per construction worker.¹⁰²

Apprenticeship *completion* rates were significantly higher in states with prevailing wage laws. States that *repealed* their prevailing wage laws in the 1970s and 1980s experienced decreases of 40 percent in the utilization of apprentices relative to employment of journey-level workers.¹⁰³

Apprenticeship completion is highly meaningful. Apprenticeship program completers were found to have a dramatically higher lifetime *earnings differential* of \$240,000 compared to nonparticipants in apprenticeship with similar demographic traits.¹⁰⁴ If workers had greater knowledge of such outcomes *and* confidence that contractor demand for apprentice labor will be sufficient to enable program completion, then recruitment and retention rates for the construction trades would most likely improve.

California's housing construction industry desperately needs more supervisory-caliber workers and deeper pools of contractors. Joint labor-management training programs historically have served as programs for developing both future supervisors and future contractors. A mid-20th century California study found that of apprentices who completed apprenticeship training programs, nearly 3 in 10 had become foremen or supervisors within 5 years. Another 13 percent became contractors.

9.5 PREVAILING WAGE LAWS, COLLECTIVE BARGAINING AND "COMPENSATING DIFFERENTIALS"

As shown in SECTION 5, compensation differentials in pay for risky construction work have been on the decline, relative to pay for other, less risky work. Differentials in employer-paid fringe benefits, in fact, are negative. The absence of a compensating reward for higher risk is particularly prevalent for societally marginalized groups, like unauthorized foreign-born workers.¹⁰⁵

Collective bargaining agreements and prevailing wage laws set wages for construction workers who tend

to be concentrated in specialized construction sub-sectors at levels higher than the median of wages of construction trades workers *across all industries*, a fact that frequently draws critics. One academic journal-published study found that in the union/nonunion wage differential for construction workers in California in 2000 was nearly 50 percent. Another study of prevailing wages in California in the early 2000s found similar unadjusted differentials. What the academic study recognized and subsequently controlled for is the fact that wage differentials are influenced by employer and individual worker traits.

Multi-employer collective bargaining agreements provide for health care benefits that benefit construction workers in two respects. First and unsurprisingly, collective bargaining delivers health insurance coverage to workers at dramatically higher rates than is the case for workers employed by non-union contractors. Second, collectively bargained and administered multi-employer health and welfare trusts design insurance plans to smooth out some of the risks to workers' finances from industry economic turbulence. As a result, an empirical, academic peer-reviewed study found that "there does not appear to be a cyclical pattern in health insurance prevalence among union workers."¹⁰⁶

Investment in fringe benefits for construction workers also induce *complementary* training effects.¹⁰⁷ Increases in fringe benefits as a ratio of wages leads to a *larger* increase in training assets in proportion to construction labor indicators.¹⁰⁸ This is consistent with a "high road" workforce development logic: contractors who devote a larger portion of total compensation to fringe benefits also invest in training because they expect to reap productivity returns through higher rates of retention of trained workers (and vice versa).

Prevailing wage laws help to keep average incomes and fringe benefits at levels that are more competitive with other industries in the labor market. More than a dozen different studies of cross-state variation of construction worker incomes found that prevailing wage laws are associated with positive wage differentials between 2 percent and 17 percent (TABLE 1).¹⁰⁹ The differentials may be understated due to the fact that in most states prevailing wages directly influence about 20 percent of construction spending. A journal-published 2018 study found that states that repealed prevailing wage laws negatively *impacted voluntary fringe benefit payments* by construction contractors.¹¹⁰

Housing builders and subcontractors will not sustainably win over between 100,000 and 200,000 new workers into the residential building trades without raising wages and increasing the health and retirement security of construction workers. If made to apply to a critical mass of new housing construction, prevailing wage standards could be instrumental to meeting workforce expansion needs.

9.6 PREVAILING WAGE LAWS, COLLECTIVE BARGAINING AND GREATER EFFICIENCY OF PRODUCTION

Analysis of construction productivity at the national, sectoral level is difficult. Analysis of productivity at the sub-national, sub-sectoral level is fraught with definitional and measurement challenges.

Nonetheless, evidence suggests that prevailing wage laws and/or collective bargaining are positively associated with changes that increase construction labor productivity.

A cross-state examination of various productivity and efficiency measures found that higher statewide construction industry unionization rates are associated with more capital-intensive technologies and greater production efficiencies.¹¹¹ For example, doubling states' rate of unionization is associated with higher ratios of capital-per-worker and materials put-in-place per construction worker for the specialty

Table 11 | Summary of studies estimated prevailing wage law total sector earnings effects

Study	Authors	Year	Geography	Effect Range	Best Estimate (or Average)
1	Frank Manzo IV; Kevin Duncan	2018	7-state region, with Minnesota at center	--	--
2	Frank Manzo IV; Robert Bruno; Jill Manzo	2018	United States	8.8%–27.1%	15.0%
3	Ari Fenn; Zhi Li; Gabriel Pleites; Chimedlkham Zorigtbaatar; Peter Philips	2018	United States	1.9%–4.2%	3.1%*
4	Frank Manzo IV; Kevin Duncan	2018	Indiana and 3 states with prevailing wage (Illinois, Ohio, Michigan)	7.0%–15.1%	8.5%
5	Lameck Onsarigo; Alan Atalah; Frank Manzo IV; Kevin Duncan	2017	9-state region, with Ohio at center	--	16.1%
6	Kevin Duncan; Frank Manzo IV	2016	10-state region, with Kentucky at center	--	10.3%
7	Frank Manzo IV; Robert Bruno; Kevin Duncan	2016	United States (*veterans)	7.0%–10.7%	8.9%
8	Frank Manzo IV; Alex Lantsberg; Kevin Duncan	2016	United States	15.7%–17.2%	17.2%
9	Kevin Duncan; Stephen Herzenberg; Alex Lantsberg; Frank Manzo IV	2016	New England (6 states)	12.2%–31.8%	16.2%
10	Kevin Duncan; Alex Lantsberg	2015	United States	--	14%
11	Frank Manzo IV; Robert Bruno; Scott Littlehale	2014	Indiana	4.5%–10.7%	8.4%
12	Frank Manzo IV; Robert Bruno	2014	United States	1.6%–1.7%	1.6%
13	Peter Philips	2014	Kentucky	4%–8%	6%*
14	Michael Kelsay; L. Randall Wray; Kelly Pinkham	2004	10 states repealing laws from 1979–1995	--	3.4%
15	Daniel Kessler; Lawrence Katz	2001 ¹	United States	2.0%–4.0%	3.4%
16	Peter Philips; Garth Mangum; Norm Waitzman; Anne Yeagle	1995	9 states repealing laws from 1979–1988	--	7.5%
Average of 16 Studies					9.0%

*Average of effect range. ¹Peer-reviewed in an academic journal.

trades and the heavy construction sub-sectors. Subsequent studies consistently found that value added per construction worker is higher in states with prevailing wage laws. States with prevailing wage laws have a ratio of volume of materials to hours of construction labor that is greater on average than states without laws.¹¹² This suggests that better compensated workers install materials at greater rates of efficiency.

9.7 PREVAILING WAGE LAWS AND HOUSING PROJECT COSTS

There is consensus that prevailing wage laws and collective bargaining raise worker earnings and improve health and retirement fringe benefits. Studies disagree, however, whether increased construction hourly labor compensation costs necessarily translate into significantly higher project costs.

The preponderance of methodologically rigorous studies of the effect of prevailing wage laws on construction costs find no statistically significant effect.¹¹³ Several studies have attempted statistical analysis of cost effects of prevailing wage standards on California low income housing rental housing projects. Unfortunately, estimation of regulatory policy impacts is difficult across a state as diverse as California. One frequently cited cost estimate, for example, is the product of a two-stage statistical model that failed in its first stage to attain conventionally accepted levels of statistical robustness.¹¹⁴ A re-analysis of data collected for the State of California from over 300 apartment projects initiated between 2001 and 2010, found that public policy choices around the scale of housing projects, parking standards, and approval delays, among other things, have greater influences on costs than paying construction workers prevailing wages.¹¹⁵

One critical test of the impact of prevailing wage standards on housing project costs has not occurred. Can and will project developers and contractors *adjust* to higher hourly labor costs by increasing total productivity? It is plausible that a floor for worker wages and benefits could incentivize the discovery and/or implementation of efficient housing production technology, from start to finish.



Duncan *et al.* studied the dynamics of efficiency of school construction before and after introduction of a prevailing wage law for public works projects in the Canadian province of British Columbia. The authors found that “in a relatively short period, the construction industry adjusted to wage requirements by increasing overall efficiency.”¹¹⁶

Construction labor standards versus free-rider dynamics

Professor Peter Philips of the University of Utah, who has explored the complexity of construction trades' labor markets and institutions for over three decades, put the central problem—and potential solution—of construction skilled workforce needs succinctly in his book chapter, “Dual worlds: the two growth paths of US construction”:

The future development of US construction presents a contest between a contractor strategy that relies upon a crew of career craft workers and a contractor strategy that relies upon a handful of key workers backed by a majority of casual and cheaper labor. The presence or absence of government regulation on the wages of construction workers on public works proves to be key to the choice between the high-wage, high-skill path and the low-wage, low-skill path for construction.¹¹⁷

For California's critical housing supply needs, the low-wage, low-skill path has come to a dead end, and has revealed itself as an unsustainable solution to the residential construction industry's long-term workforce and productivity growth needs. Challenging work requirements, combined with extraordinary physical and economic occupational risks, deter many who might overlook societal biases that diminish the status of manual craft work from even considering working in the residential building trades. For those who are open to such work, negligible compensating pay differentials and sub-par employer-paid fringe benefits results in weak worker attachment to the societally crucial work of building new housing.

Weak worker attachment to either specific housing construction employers or to the housing construction industry leads to paltry employer and worker investments in training and skills development. Contractors that specialize in building housing subdivisions or apartments assume that the construction worker will either depart to work for another firm or another industry. Hence, contractors invest minimally in deepening workers' skills. For their part, workers in the residential foundation, structure, exterior, and finishing trades recognize that the next housing bust could leave up to forty percent of them jobless. They rationally decide not to invest their own time and money in the career technical education offerings of community colleges.

Housing industry productivity is hampered by low rates of training, compensation that fails to attract or retain skilled and ambitious people when commercial construction opportunities are available, and vicious economic fluctuations that lead to rapid hiring then firing of hundreds of thousands of workers and the rise and fall of thousands of construction contracting business establishments.

Taking together (1) occupational demands and risks; (2) relatively unattractive total compensation;

and (3) extraordinarily low training expenditures, it is not surprising that residential construction contractors' hires have tended increasingly to be entrants to California's labor market who have low levels of education and who often are the most vulnerable members of society.

But California housing builders' reservoir of casual, less-skilled labor is not refilling itself. California cannot wait for the economic stars to align, as they did in the mid-2000s, so that housing builders can find sufficient "cheap labor" to build new housing that is urgently needed in the immediate future.

California policy makers should not expect housing construction's lead private players to end the vicious circle described above through voluntary action. Residential construction's highly decentralized form of industrial organization makes free-rider problems too insidious. The incentive and temptation to wait for others to shoulder the burdens that must be born to recruit, train, and encourage the retention of a more skilled and productive workforce will lead only to protracted collective *inaction*.

Paraphrasing Professor Philips: The abundant and destructive free-rider strategies found in housing construction need to be brought under control through appropriate regulations. While direct regulation of training, health and pension arrangements is not necessarily required for a healthy housing construction industry, background regulations that *promote* labor-management cooperation around these vital elements of skilled construction workforce development are needed to restore California residential building to the production engine that it once was.¹¹⁸

What was true in 2003, when Philips analyzed the U.S. construction industry, is every bit as much true in California today. What has changed for California is the urgency of the need to heed his analysis and recommendation.

¹Two distinct reports reached similar conclusions: McKinsey Global Institute, "A tool kit to close California's housing gap: 3.5 million homes by 2025," McKinsey & Company, October 2016, accessed via <https://www.mckinsey.com/featured-insights/urbanization/closing-californias-housing-gap>; Up for Growth National Coalition, "Housing underproduction in California." Washington, D.C.: Up for Growth National Coalition, 2018.

²Dillon, Liam. "How California's candidates for governor want to fix the state's housing problems," *Los Angeles Times*, May 10, 2018 <http://www.latimes.com/politics/la-pol-ca-governor-housing-roundup-20180510-htmlstory.html>

³This estimate is necessarily more illustrative than precise. The quantity of labor required to build a unit of housing varies with a myriad of variables specific to the housing itself and its site. Nonetheless, two different estimation methods support this rule of thumb. The National Association of Home Builders estimated that 100 units of new single-family housing or multi-family housing in a typical state is associated with 176 or 68 construction jobs, respectively. See National Association of Home Builders, Housing Policy Department. April 2015. "The Economic Impact of Home Building in a Typical State," downloaded and available via <https://www.nahb.org>. I adjusted the NAHB estimates for three factors: first, only two-thirds of all residential building and specialty trades jobs are construction trades jobs, according to U.S. Bureau of Labor Statistics Occupational Employment Statistics estimates; second, construction workers typically work almost 10 percent fewer hours than that of a full-time-equivalent employee; third, new construction trades workers are needed to replace approximately 10 percent of the construction workforce that exits the trades every year. These calculations, when applied to the current California mix of housing types, which is nearly evenly divided between single-family and multi-family units, yields the estimate that 95 new construction trades workers are needed to build 100 units of new housing. The second method is based on calculations using U.S. Census Bureau Economic Census 2007 data and methods of estimating requisite units of labor input described by Sveikauskas et al. January 2018. "Measuring productivity growth in construction," *Monthly Labor Review*. <https://www.bls.gov/opub/mlr/2018/article/measuring-productivity-growth-in-construction.htm>. Details are available from the author upon request.

⁴Early reports of shortages: Caulfield, John. "Where is the Labor?" *Builder Magazine*, posted on August 15, 2013, downloaded via <https://www.builderonline.com/building/where-is-the-labor-o>. Homebuilder survey trends as reported on the National Association of Home Builders "Eye on Housing" blog: Paul Emrath, "Reported shortage of rough carpentry contractors hits record 90 percent," posted September 6, 2018 via <http://eyeonhousing.org/2018/09/reported-shortage-of-rough-carpentry-contractors-hits-record-90-percent/>; Paul Emrath, "Labor and subcontractor costs outpacing inflation, raising home prices," posted September 10, 2018 via <http://eyeonhousing.org/2018/09/labor-and-subcontractor-costs-outpacing-inflation-raising-home-prices/>.

⁵Philips, Peter. 2003. "Dual worlds: the two growth paths in US construction." In *Building Chaos: An international comparison of deregulation in the construction industry*, by Gerhard Bosch and Peter Philips, 161-187. New York: Routledge, page 185.

⁶See text box and associated footnotes in Section 6.

⁷For a historical survey of apprenticeship committees during their nascence in several cities, see Bulletin of the *U.S. Bureau of Labor Statistics*, No. 459, April, 1928. Digitized for FRASER, <http://fraser.stlouisfed.org/> Federal Reserve Bank of St. Louis. For a discussion

of multi-employer pensions, see Weinberg, Edgar, "Reducing skill shortages in construction," 92 *Monthly Lab. Rev.* 3 (1969)

⁸Philips, *Ibid.*, pp 175-179.

⁹In 2007, public works receipts were 17 percent of total California construction receipts; in 2012 they were 22.5 percent, according to U.S. Census Bureau, Economic Census 2007 and 2012 Tables EC0723SG01 and EC1223SG01, downloaded via <https://factfinder.census.gov/>, California construction trades union membership as a percentage of private employment in the trades, excluding the self-employed, is between 20 percent and 25 percent, according to the author's analysis of Center for Economic Policy Research, CEPR CPS ORG Uniform Extracts version 2.3 data files for 2015-2017.

¹⁰See "News and Resources" at <https://www.stopwagetheftca.org/>

¹¹Duncan, Kevin. 2009. "The Effects of Prevailing Wage Regulations on Construction Efficiency in British Columbia," *International Journal of Construction Education and Research*, Vol.5, No. 1, pp. 63-78.

¹²For a sampling of research, see Gyourko, J. and R. Molloy. 2014. "Regulation and Housing Supply," Working Paper 20536, Cambridge, MA: National Bureau of Economic Research. Littlehale analyzed correlates of costs for low-income housing tax credit (LIHTC) projects in California between 2001 and 2010 in Littlehale, S. 2017. "Revisiting the Costs of Developing New Subsidized Housing: The Relative Import of Construction Wage Standards and Nonprofit Development," *Berkeley Planning Journal*, Vol. 29, Issue 1. The Turner Center for Housing Innovation is conducting ongoing research on housing development costs and feasibility, <http://turnercenter.berkeley.edu/>

¹³Vacancy rates for the workers that are essential for housing construction shown in Fig. 3 are complicated by the fact that construction contractors often recruit their workforces through informal, non-public channels, especially when it comes to carpenters and laborers. It is not known, however, whether the increases are attributable workers choosing to leave a firm for a better offer made by a different contractor or are due to expansion-driven searches for workers.

¹⁴Certain other trades, such as elevator and fire sprinkler installers, are more regulated, but employ far fewer workers.

¹⁵Rose Quint, "Young adults & the Construction Trades," National Association of Home Builders, March 1, 2017. Building trades share of total employment: U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates.

¹⁶Unless otherwise noted, statistics in this section are based on the author's analysis of data from the U.S. Bureau of Labor Statistics 2017 Occupational Requirements Survey (ORS) and the U.S. Census Bureau American Community Survey Occupational Requirements Survey publications and data were accessed via <https://www.bls.gov/ncs/ors/home.htm>. IPUMS-USA processes and harmonizes Public Use Microdata Sample (PUMS) data from U.S. Census Bureau's American Community Survey and makes them available via <https://usa.ipums.org/usa/>

¹⁷QWI Explorer application, U.S. Census Bureau, qwexplorer.ces.census.gov and American Community Survey and decennial Census Public Use Microdata Sample data reprocessed and distributed by IPUMS-USA, University of Minnesota, www.ipums.org

¹⁸Published Occupational Requirements Survey data do not disaggregate construction jobs into nonresidential versus residential work. It is possible that the relatively high average masks disparate requirements between the two sub-sectors. Published ORS data include the estimate that the 75th percentile

of construction and extraction jobs require 1,460 days of pre-employment training, versus 90 days for all jobs for the 75th percentile across all occupations. Employers require pre-employment training for 40 percent of carpenters, according to the U.S. BLS estimates from the 2017 survey data.

¹⁹Travel time to work estimates: Author's analysis of U.S. Census American Community Survey 1-year 2017 Public Use Microdata Sample.

²⁰California Department of Industrial Relations, Office of Policy, Research, and Legislation. 2018. "2017 nonfatal occupational injuries and illnesses in California - case and demographic tables." Table 18. Available via <https://www.dir.ca.gov/opri/Injuries/Demographics/2017/Menu.htm#pvt>. Only "Building and grounds cleaning and maintenance occupations" ranked worse than "construction and extraction" occupations.

²¹Author's estimates, based on the U.S. Bureau of Labor Statistics Occupational Employment Statistics, 2017 and the California Workers Compensation Insurance Rating Bureau, "Classification Relativities" Excel spreadsheet for the 2019, published in 2018, downloaded via <https://www.wcirb.com/document/22586> and documented in <https://www.wcirb.com/document/22596>

²²State of California, Department of Industrial Relations, "Fatal Occupational Injuries in California, 2013-2016," December 19, 2017, downloaded via <https://www.dir.ca.gov/DOSH/CFOI/Fatalities-Report-2013-2016.pdf>

²³U.S. Department of Labor, Occupational Safety & Health Administration, OSHA Accident data file downloaded via https://enforcadata.dol.gov/views/data_summary.php, November 2018.

²⁴The major proximate causes of the construction fatal accidents break down as follows: 146 died from falls, slips or trips, including 139 deaths from falls to a lower level; 45 died from exposure to harmful substances or environments; 30 were struck by an object or equipment; 26 died from exposure to electricity. The remainder died from other causes.

²⁵Dong, XS, K Ringen, L Welch and J Dement. 2014. "Risks of a lifetime in construction part I: traumatic injuries." *American Journal of Industrial Medicine*. 57:973-983.

²⁶Guvonen, Fatih, Sam Schulhofer-Wohl, Jae Song, and Motohiro Yogo. 2017. "Worker Betas: Five Facts about Systematic Earnings Risk." *American Economic Review*, 107 (5): 398-403. Available for download via <https://www.aeaweb.org/articles?id=10.1257/aer.p20171094>. For earnings volatility estimates by industry sector, see appendix Tables B1 and B2 via <https://assets.aeaweb.org/assets/production/files/4380.pdf>

²⁷Using American Community Survey 2016 and 2017 one-year PUMS data, I estimate that private construction industry trades employees averaged 1,861 hours per year, while all other privately employed men worked an average of 1,988 hours. The difference in means, 6 percent, is primarily attributable to smaller percentages of year-round employment for construction workers.

²⁸U.S. Bureau of Economic Analysis, Employment Series 25 and 25N, 1969-2001 and 1998-2017.

²⁹U.S. Census Bureau, QWI Explorer application (qwexplorer.ces.census.gov). California's Beginning of Quarter Employment. qwexplorer.ces.census.gov/exp-r/45ed.html, generated December 11, 2018. Data filtered to include all employed men in the construction sector except those with college degrees.

³⁰The measure discussed is based on the U.S. Bureau of Labor Statistics' Quarterly Census of Employment and Wages, which captures employment numbers from establishments that are covered by unemployment insurance laws.

³¹The U.S. Bureau of Labor Statistics cautions users of its data that OES estimates over years may be complicated by various measurement and methodological changes over years (see https://www.bls.gov/oes/oes_ques.htm). The selected occupations and years are unlikely to be impacted by the major changes identified by BLS. The direction and rough magnitude of changes depicted in Table ought to be reliable. Specific numeric or percentage change estimates are subject to error.

³²Pay motivates people choosing how and where they work. For pay to attract a person to a particular job, the important metric is expected total annual compensation relative to expected total compensation of other jobs. An occupation's average hourly wage is important information, but provides an incomplete picture of the relative competitiveness of an occupation in the labor market. Workers will consider whether a job's compensation package includes employer-paid health care benefits, paid time-off. Can a worker expect that this month's pay will not be matched necessarily in future months due to seasonal or cyclical volatility? Finally, a job's rewards, to be competitive relative to other potential jobs, are adjusted in workers' rough calculations to account for elevated risk exposure and significant opportunity costs (e.g., work-life balance considerations) that accompany the job.

³³Dunlop and Mills wrote in 1968: "Probably the most important characteristic of employment in construction for most workers is its intermittency. In addition, working conditions are frequently less favorable than elsewhere. Construction work is often physically difficult, and in adverse weather may be unpleasant (certainly more so than in-plant maintenance work, for example). Building tradesmen employed by contractors must be prepared to move considerable distances and, sometimes, to be away from home for long periods. The pace of work is often hard, with relatively high accident rates. There are, of course, wide variations among crafts and sites in the nature of working conditions. The wage rate in the building trades should be expected to include, in the long run, a differential reflecting these characteristics of employment in the industry." (Dunlop & Mills 1968, p. 258)

³⁴Ricuarde, Migue. August 2009. "Interindustry wage differences: an empirical review." Central Bank of Chile Working Papers No. 525, Figure 4.4. Retrieved via <http://si2.bcentral.cl/public/pdf/documentos-trabajo/pdf/dtbc525.pdf>. The author included dummy control variables for female workers, African-American workers, living in a metropolitan area, division of residence, age group, and educational attainment.

³⁵The University of Texas at Austin-based Construction Industry Institute summarized national average hourly earnings trends: "The gap of [construction vs other sectors] real wages almost shrunk by half in 2014 when compared to 1974. The construction industry's workers in 2014 earned \$5.53/hr. less real income than in 1974, while the total private industries' workers in 2014 earned \$0.67/hr. less real income value as in 1974. Construction Industry Institute, "Is there a Demographic Craft Labor Cliff that Will Affect Project Performance," RT-318 Topic Summary, available via https://www.construction-institute.org/resources/knowledgebase/knowledge_areas/human-resource-management/topics/rt-318

³⁶Abowd, John, Francis Kramarz, Paul Lengermann, Kevin McKinney and Sebastien Roux (2012), "Persistent inter-industry wage differences: rent sharing and opportunity costs," IZA Journal of Labor Economics, 1:7. See online Appendix Table A1, retrieved via

³⁷Author's analysis of U.S. Census, 2017 American Community

Survey 1-year Public Use Microdata Sample (PUMS), downloaded via <https://www.census.gov/programs-surveys/acs/data/pums.html>. The comparison group of workers without four-year college degrees is limited to males because 98 percent of the building trades workforce is male. The nationwide PUMS includes over 60,000 individual respondents employed as building trades workers within the construction sector. The California PUMS for the 2017 ACS includes over 6,500 construction industry building trades respondents. The Census Bureau statistically allocated 30 percent of the California construction trades respondents' earnings. Results do not change substantially when respondents with allocated earnings are excluded. Analysis of a sub-sample that included workers who work less than full-time, year-round yielded similar results, though 12-month average and median earnings levels were about 15 percent lower.

³⁸The construction wage differential story is more complex when one uses multiple regression statistical models to control for individual worker traits and analyze regions within California. Utilizing 2012-2016 American Community Survey PUMS data to model male earnings, I controlled for a variety of typical individual traits such as age, race, education, citizenship status, and region of residence. Construction workers who live on the outskirts of the San Francisco Bay "megaregion," including Stockton and Modesto and the less densely populated counties to the north of the San Francisco Bay, enjoy earnings premiums on average of ten percent or more compared to similar male workers from their counties. Southland California counties of Los Angeles, Orange, Riverside, San Bernardino enjoy similar premiums. Controlling for individual traits, the model estimated that construction workers from the three core Bay Area metropolitan areas of Oakland, San Francisco, San Jose have earnings that are 4 percent lower than earnings of comparable male workers.

³⁹Kolmar, Chris. 2018. "These are the jobs with the highest rate of uninsured workers," downloaded via <https://www.zippia.com/advice/jobs-with-highest-uninsured-rate/>

⁴⁰Author's analysis of data provided via IPUMS-CPS, University of Minnesota, www.ipums.org. The reader will notice that the base rate of coverage of all non-construction workers is different from the zippia.com analysis of American Community Survey health insurance coverage rates. While zippia analyzed simply whether the worker was covered by *any* health insurance plan, the CPS-ASEC focused in on a narrower question: was the respondent a policyholder for group health insurance that was related to current or past employment. Persons who are covered by a family health insurance policy held by another person are not included in the CPS-ASEC coverage rate.

⁴¹Author's analysis of American Community Survey 2012-2016 data processed and distributed by IPUMS-USA, University of Minnesota, www.ipums.org. The sample was limited to employees of private for-profit firms age 26 and older who reported that they usually worked 30 hours or more per week and did not attend school or college.

⁴²Dunlop, J.T. and D.Q. Mills. 1968. "Manpower in Construction: A Profile of the Industry and Projections to 1975," in United States. President's Committee on Urban Housing, 1968 *Technical Studies Volume II*. Accessed via www.michaelcarliner.com/files/Pres.com-Kaiser-68Technical-v2.pdf

⁴³Kim, Jaewhan and Peter Philips. 2010. "Health Insurance and Worker Retention in the Construction Industry," *Journal of Labor Research* 31:20-38.

⁴⁴U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 1911. "Industry Wage Survey: Contract Construction September 1973." Washington, D.C.: 1976. See Tables 28 & 46. Downloaded

via <http://fraser.stlouisfed.org>. The BLS surveyed 530 California construction establishments that employed over 20,000 nonsupervisory workers (Table A-1). Over 90 percent of the California workers were covered by collective bargaining agreements (Text table 3).

⁴⁵Union density in construction nationally decreased by half between 1970 and 1990. Huang, Allison L., Robert E. Chapman, and David T. Butry. September 2009. "Metrics and Tools for Measuring Construction Productivity: Technical and Empirical Considerations," U.S. Department of Commerce, National Institute of Standards and Technology, NIST Special Publication 1101, Figure 3.3. For a dissertation-length treatment of the history of business' strategy to reduce the influence of unions in construction, see Linder, Marc. 2000. *Wars of Attrition: Vietnam, the Business Roundtable, and the Decline of Construction Unions* (2d Rev. Ed). Downloaded via https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2221464

⁴⁶Author's analysis of California Employment Development Department Quarterly Census of Employment and Wages data for Specialty Trade Contractors, disaggregated into residential contractors (NAICS codes 238nn1) and nonresidential contractors (NAICS 238nn2). Data downloaded via <https://www.labormarketinfo.edd.ca.gov/qcew/qcew-select.asp>

⁴⁷Author's analysis of data for NAICS industry 238131 accessed and downloaded from State of California, Employment Development Department, Quarterly Census of Employment and Wages via https://www.labormarketinfo.edd.ca.gov/data/QuarterlyCensus_of_Employment_and_Wages.html

⁴⁸Philips, Peter. 2003. "Dual worlds: the two growth paths in US construction." In *Building Chaos: An international comparison of deregulation in the construction industry*, by Gerhard Bosch and Peter Philips. New York: Routledge, p. 168. Philips explained that the combination of industry turbulence, short-term employer-employee relationships, and one-shot bidding wars for construction contracts lower the risk-adjusted short-run returns of investments in the development of construction craft skills. Workers and the private players who influence construction budgets rationally under-invest "today" in training that will only pay uncertain dividends "tomorrow."

⁴⁹C. Jeffrey Waddoups. 2014. "Union Coverage and Work-Related Training in the Construction Industry." *Industrial & Labor Relations Review*, 67:2 (532-555)

⁵⁰The Business Roundtable, "Training Problems in Open Shop Construction: A construction industry cost effectiveness project report," Report D-4, September, 1982, reprinted October, 1990, p. 4. At the time the report was written, the Business Roundtable estimated that non-union contractors accounted for 60 percent of the value of construction business. Non-union construction workers account roughly for 80 percent of the nationwide workforce in the late 2010s.

⁵¹Quoted in Philips, Peter. 2003. "Dual worlds: the two growth paths in US construction." In *Building Chaos: An international comparison of deregulation in the construction industry*, by Gerhard Bosch and Peter Philips. New York: Routledge, p. 169.

⁵²Construction Users Roundtable, "Confronting the Skilled Construction Workforce Shortage," WP-401, June 2004, p. 3.

⁵³Construction Industry Institute Research Team 335. July 2018. "Improving the Workforce Development System." Final Report 335, CII Annual Conference 2018 Edition, p. 77. Downloaded via https://www.construction-institute.org/CII/media/Publications/publications/r-335_ac18.pdf

⁵⁴Exiting [California Division of Apprenticeship Standards]

participants employed in Construction earned a median quarterly wage more than twice that sector's average wage statewide." "Participants who earned a certificate fared significantly better than participants who did not in terms of both post-exit employment and earnings. Participants who attained a certificate were employed four quarters after exit at a rate nearly 30 percentage points higher than those who did not attain a certificate. Certificate-earning participants had a median quarterly wage more than two times that of participants who exited without earning a certificate." See California Workforce Development Board, "Workforce Metrics Dashboard Report 2018 AB 2148 Legislative Report," <https://cwdb.ca.gov/wp-content/uploads/sites/43/2018/05/2148-Report-FINAL.pdf>, p. 34.

For strong state-registered apprenticeship program results in the state of Washington, see Hollenbeck, Kevin, and Wei-Jang Huang. 2016. "Net Impact and Benefit-Cost Estimates of the Workforce Development System in Washington State." Upjohn Institute Technical Report No. 16-033. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

For a multi-state study, see Reed, Debbie et al. 2012. "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States." Final report submitted to the U.S. Department of Labor Employment and Training Administration. Per the study abstract, "The study found program participants had substantially higher earnings than nonparticipants, and program social benefits were much larger than costs. Retrieved via https://wdr.doleta.gov/research/FullText_Documents/EIAOP_2012_10.pdf

⁵⁸U.S. Department of Labor, Bureau of Labor Statistics. 1976. Op.cit. supra note 2.

⁵⁹California Statistical Abstract. 1974 – 2008. Published by 1961-1981 by the Economic Development Agency of the State of California; 1982 – 2008 by the California Department of Finance. Various volumes available for download via Internet Archive, www.archive.org. For 1973 data in the 1974 volume, see Table C-22.

⁶⁰Author's analysis of State of California, Department of Industrial Relations, Division of Apprenticeship Standards data.

⁶¹California Department of Industrial Relations, Division of Apprenticeship Standards. I am grateful to DAS for providing a copy of the full apprentice and apprentice sponsor database that had data current as of early May 2018.

⁶²The Carpenters Training Committee of Northern California received 9,500 notifications between October 2016 and October 2018 from contractors – including 4,000 from non-union contractors – of projects that potentially could employ carpentry and allied craft apprentices. Of those, only about 230 (less than 3 percent) were for projects where the word "housing" or "apartments" appeared in the project title.

⁶³Author's analysis of private data for May 2017 reported by construction employers that are signatory to the Carpenters Master Agreement for Northern California.

⁶⁴See <https://epnh.jobcorps.gov/Appendices/Forms/AllItems.aspx>, specifically for Memorandums of Understanding with the Home Builders Institute and various other entities related to building trades unions. Curriculum development and instruction is provided under contract. Non-instructional program costs (including facilities, equipment, and residential and social services for trainees) are provided by Job Corps center around the country and are not enumerated in the MOUs.

⁶⁵Home Builders Institute IRS Form 990, 2016, retrieved via <http://foundat.oncenter.org/find-funding/990-finder>. Brent Booker, Secretary-Treasurer, North America's Building Trades

Unions. October 11, 2017. Statement Before the Subcommittee on Highways and Transit Committee on Transportation and Infrastructure, United States House of Representatives. https://transportation.house.gov/uploadedfiles/2017-10-11_-_booker_testimony.pdf.

⁶⁶Barbosa, Felipe et al. February 2017. "Reinventing construction: a route to higher productivity." McKinsey Global Institute, Box E1, p. 4. Available via <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/reinventing-construction-through-a-productivity-revolution>

⁶⁷U.S. BLS. 1987-2016 Nonmanufacturing Multifactor Productivity. Downloaded in 2018 via <https://www.bls.gov/mfp/mpdload.htm>. BLS cautions users that measuring output and input for nonmanufacturing industries often is difficult and can produce productivity measures of inconsistent quality. A team of BLS economists has attempted to disaggregate the construction sector and measure productivity, using several different output price deflators. They estimate that productivity growth for single-family and multi-family housing production between has been positive, albeit it at rates that still lag total and manufacturing sector average productivity growth. The construction housing productivity estimates take into account a rough estimate of the influence of housing business cycles on housing cycles.

⁶⁸U.S. Bureau of Labor Statistics, Nonfarm Business Sector: Real Output Per Hour of All Persons (OPHNFB), retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/OPHNFB>, July 17, 2018.

⁶⁹Barbosa, Felipe et al. February 2017. *supra note* 45, Exhibit E3, p. 5

⁷⁰U.S. Census Bureau, Annual Survey of Manufactures: General Statistics: Statistics for Industry Groups and Industries, Table AM0631GSI01. Accessed via factfinder.census.gov. Figures are in current dollars, unadjusted for inflation.

⁷¹Doherty, Conor. 2018. "Piece by Piece, a Factory-Made Answer for a Housing Squeeze." *New York Times*, June 7, 2018.

⁷²Reid, Carolina and Hayley Raetz. January 2018. "Perspectives: Practitioners Weigh in on Drivers of Rising Housing Construction Costs in San Francisco," p. 7. Available via http://turnercenter.berkeley.edu/uploads/San_Francisco_Construction_Cost_Brief_-_Turner_Center_January_2018.pdf

⁷³Author's analysis of U.S. Census Bureau Public Use Microdata Sample data processed and distributed by IPUMS-USA.

⁷⁴See, for example, National Women's Law Center. 2014. "Women in construction: still breaking ground." https://www.nwlc.org/sites/default/files/pdfs/final_nwlc_womeninconstruction_report.pdf

⁷⁵Günsel Berik, Cihan Bilginsoy, (2006) "Still a wedge in the door: women training for the construction trades in the USA", *International Journal of Manpower*, Vol. 27 Issue: 4, pp.321-341

⁷⁶See, for example, "LA Metro looks to increase hiring of women for construction jobs," December 5, 2017. <http://www.metro-magazine.com/management-operations/news/726594/la-metro-looks-to-increase-hiring-of-women-for-transportation-construction-jobs>

⁷⁷Author's analysis of data downloaded via U.S., QWI Explorer application qwexplorer.ces.census.gov/exp-r/10583d.html. Rates for nonresidential building contractors and building equipment contractors (NAICS 2382, which includes electrical and plumbing contractors) fall between the all sector rate and the other two subcontractor groups' rates.

⁷⁸California Department of Finance. "Population Projections (Baseline 2016): P-1 State Population Projections (2010-2060),

Total Population by Age." <http://dof.ca.gov/Forecasting/Demographics/Projections/>

⁷⁹Basic building specialty trades are defined here to include building foundation, structure, exterior and finishing contractors (NAICS 2381 and 2383). Workers below the age of 35 experienced the largest drop in total male employment between 2006 and 2011, the nadir of the recession for the construction sector recession, accounting for nearly two-thirds of all net male employment loss. Workers under the age of 35 accounted for only 30 percent of the net male employment gains between 2011 and 2017.html. Author's calculations based on data obtained via the QWI Explorer application. U.S. Census Bureau. qwexplorer.ces.census.gov/exp-r/10b9f7.

⁸⁰U.S. Census Bureau, Longitudinal Employer-Household Dynamics (LEHD) program. <https://lehd.ces.census.gov/data/>

⁸¹Excludes average earnings of construction sector-origin job-to-job switchers. All ownership; limited to male workers.

⁸²Residential Building and Structure & Building Finishing contractors (NAICS industries 2361, 2381 and 2383) "new hire" earnings include workers who came from other construction firms and include only workers who were hired into stable (full-quarter) employment.

⁸³Edwards, R and F Ortega. 2017. "The economic contribution of unauthorized workers: An industry analysis," *Regional Science and Urban Economics*, 67:119-134. This estimate may be upwardly biased by the inclusion of all occupations within the construction industry. U.S.-born employees are more concentrated in higher paying white-collar construction industry occupations, while unauthorized immigrants are.

⁸⁴Author's analysis of 2005-2016 1-year U.S. Census Bureau American Community Survey (ACS) Public-Use Microdata Sample, processed and distributed by IPUMS-USA, University of Minnesota, www.ipums.org

⁸⁵Yvonne Yen Lieu, Daniel Flaming, Patrick Burns. 2014. "Sinking underground: the growing informal economy in California construction." Economic Roundtable. Available via <http://www.economicrct.org>

⁸⁶Warren, R and J.R Warren. 2013. "Unauthorized immigration to the United States: Annual estimates and components of change, by state, 1990 to 2010." *International Migration Review*, 47(2): 296-329.

⁸⁷Author's estimate based on U.S. Census American Community Survey Public Use Microdata Sample data processed and distributed by IPUMS-USA, University of Minnesota, www.ipums.org. Census household survey estimates likely undercount immigrants living in the United States without authorization.

⁸⁸Ibid.

⁸⁹Ibid.

⁹⁰For a review and original data analysis, see Hanson, G, C Liu, and C McIntosh. Spring 2017. "Along the watchtower: The rise and fall of US low-skilled immigration." *Brookings Papers on Economic Activity*.

⁹¹U.S. Department of Commerce, Bureau of Economic Analysis. Methodology: https://www.bea.gov/sites/default/files/methodologies/RPP2016_methodology.pdf; Data may be downloaded via <https://apps.bea.gov/itable/itable.cfm?ReqID=70&step=1>

⁹²Prices and earnings vary regionally within California. While median construction worker 12-month earnings are 19 percent higher than the national median, overall price levels in the San Jose-San Francisco-Oakland Bay Area are almost 25 percent

higher than national average prices. Hence the median Bay Area construction worker's purchasing power is lower than typical construction workers who live in average-price areas. See U.S. Census Bureau 2017 American Community Survey 1-Year Estimates, Tables B24011, B24012 and B24022 and U.S. Bureau of Economic Analysis 2016 Regional Price Parities by Metro Area.

⁹⁰Author's analysis of 2012-2016 5-year U.S. Census Bureau American Community Survey Public-Use Microdata Sample, processed and available for download via IPUMS-USA, University of Minnesota, www.ipums.org

⁹¹See section 2 but note that construction industry employers nationwide, according to an index of "recruitment intensity," have recruited with less intensity per job vacancy on average between 2011 and 2017 than they did during the expansionary period between 2002 and 2006. The recruitment intensity index, its creators say, captures relative changes in advertising expenditures, screening methods, hiring standards, and the attractiveness of compensation packages. See DHI Group, Inc., DHI-DFH Index of Recruiting Intensity per Vacancy by Industry: Construction (DISCONTINUED) [DHIDFHRVIC], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/DHIDFHRVIC>, October 9, 2018. Index values for dates between January 2001 and April 2018 are publicly accessible; the data series has since been discontinued.

⁹²Turnover of construction employees remains high relative to other major sectors. See ADP Research Institute. 2018. "Revelations from workforce turnover: A closer look through predictive analytics." Accessed via https://www.adp.com/-/media/R1/pdf/ADP_PredictingTurnOver_White_Paper.ashx

⁹³Employer strategies for addressing labor shortages are listed and discussed in Barnow, Burt s., John Trutko and Jaclyn Schede Piatak, Occupational Labor Shortages: *Concepts, Causes, Consequences, and Cures*. Kalamzoo: W.E. Upjohn Institute for Employment Research, 2013.

⁹⁴Philips, Peter. 2003. *Op. cit.* p. 169

⁹⁵California's requirements for private contractors seeking to provide construction services on public works projects are accessed via <https://www.dir.ca.gov/Public-Works/Contractors.html>

⁹⁶Littlehale, S. 2017. Revisiting the Costs of Developing New

Subsidized Housing: The Relative Import of Construction Wage Standards and Nonprofit Development. *Berkeley Planning Journal*, 29(1). Retrieved from <https://escholarship.org/uc/item/9js5d61m>

⁹⁷Morantz, Alison. 2009. "The Elusive Union Safety Effect: Toward a New Empirical Research Agenda." *LERA 61st Annual Proceedings*. Retrieved via <http://www.lerachapters.org/OJS/ojs-2.4.4-1/index.php/LERAMR/article/view/1322>

⁹⁸*Ibid.*, p. 19.

⁹⁹Manzo, Jill. May 2017. "The \$5 Billion Cost of Construction Fatalities in the United States: A 50 State Comparison." Midwest Economic Policy Institute. Retrieved via <https://midwestepi.files.wordpress.com/2017/05/mepi-construction-fatalities-nationwide-final.pdf>

¹⁰⁰Waddoups. 2014. *Op. cit.* Table 3 at p. 545. Control variables included race, ethnicity, age, worker tenure with current employer, nativity, and firm size.

¹⁰¹Bilginsky, Chihan. 2003. "Wage Regulation and Training: The Impact of State Prevailing Wage Laws on Apprenticeship." Working Paper No: 2003-08. University of Utah Department of Economics.

¹⁰²Haxhiu, Elird and Peter Philips. 2017. The Role of Collective Bargaining, Remuneration Strategies and Regulations in Fostering Apprenticeship Training in US Construction. Unpublished manuscript.

¹⁰³Duncan, Kevin and Russell Ormiston. 2017. "Prevailing wage laws: what do we know?" Institute for Construction Economic Research, pp. 16-19. Retrieved via <http://iceres.org/wp-content/uploads/2014/10/prevailing-wage-review-duncan-ormiston.pdf>

¹⁰⁴Reed, D., et al. 2012. *Op cit.*

¹⁰⁵Hall et al. found that "undocumented workers are rewarded less for employment in hazardous settings, receiving low or no compensating differential for working in jobs with high fatality, toxic materials, or exposure to heights." Hall M, Greenman E. 2015. The occupational cost of being illegal in the United States: legal status, job hazards, and compensating differentials. *Social Forces*. 49(2):406-42

¹⁰⁶Kim, Jaehan and Peter Philips. 2010. "Effect of Multiemployer Collective Bargaining on Employer-Provided Health Insurance

in the Construction Industry." *Journal of Labor Research*. 31:322-331.

¹⁰⁷Ghilarducci, Teresa and Michael Reich. 1998. "Training and Pensions: Substitutes or Complements?" IRLE Working Paper No. 68-98. <http://irle.berkeley.edu/workingpapers/68-98.pdf>

¹⁰⁸Haxhiu, E. and P. Philips. 2017. *Supra* at note 82.

¹⁰⁹More detailed citations are available upon request.

¹¹⁰Ari Fenn, Zhi Li, Gabriel Pleites, Chimedkham Zorigtbaatar, & Peter Philips. 2018. "The Effect of Prevailing Wage Repeals on Construction Income and Benefits." *Public Works Management and Policy* 1-19.

¹¹¹Philips. 2003. *Op. cit.*

¹¹²Author's analysis of state-level 2012 Economic Census data for heavy and civil construction industries (NAICS 237) excluding land subdivision and excluding the states of Alaska and Hawaii. The comparison of materials per hour was narrowed to the heavy and civil construction sector due to that sector being most dependent on public works contracts. States were divided into "weak and no law" states and "average and strong law state" as illustrated in Manzo, J. 2018, *supra* at note 80.

¹¹³Duncan and Ormiston. 2017. *Supra* note 96.

¹¹⁴See discussion of issues that compromise the estimates of a study by Dunn, Quigley and Rosenthal in Littlehale, S. 2017. Revisiting the Costs of Developing New Subsidized Housing: The Relative Import of Construction Wage Standards and Nonprofit Development. *Berkeley Planning Journal*, 29(1). Retrieved from <https://escholarship.org/uc/item/9js5d61m>

¹¹⁵*Ibid.* The revised multivariate regression models provided a superior fit to the California low income housing project cost data than the model that informed the official State of California affordable housing cost study published in 2014.

¹¹⁶Duncan, Kevin, Peter Philips & Mark Prus. 2009. "The Effects of Prevailing Wage Regulations on Construction Efficiency in British Columbia," *International Journal of Construction Education and Research*, 5:2, 63-78

¹¹⁷Philips, P. 2003. *Supra* at note 4.

¹¹⁸*Ibid.*, p. 185.

EXHIBIT 4

The Effect of Prevailing Wage Law Repeals and Enactments on Injuries and Disabilities in the Construction Industry

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Abstract

State prevailing wage law repeals have been shown to lower wages and benefits—including benefits providing safety training and associated with worker retention in construction. This study tests whether prevailing wage repeals affect construction injury rates and/or the prevalence of disabilities among construction workers. Controlling for time trends in injuries and disabilities, differences between construction industry subsectors, the business cycle, and time-invariant differences between states, we find that repealing state prevailing wage laws increase construction injury rates across various types of injuries from 11.6% to 13.1% as the seriousness of injuries increases. Disabilities increase by 7.5% to 8.2% depending on the model specification. Conjoining an analysis of the effects of prevailing wage law repeals on injury rates with disability rates in construction provides alternative measures of the effects of prevailing wage laws on construction workplace safety, which addresses a well-known problem of underreporting construction injuries.

Keywords

prevailing wage, repeal, injuries, disabilities, construction

Introduction

Prevailing wage laws regulate the payment of wages and benefits on public works. Prevailing wage regulations set wages and, in most cases, benefits by blue-collar

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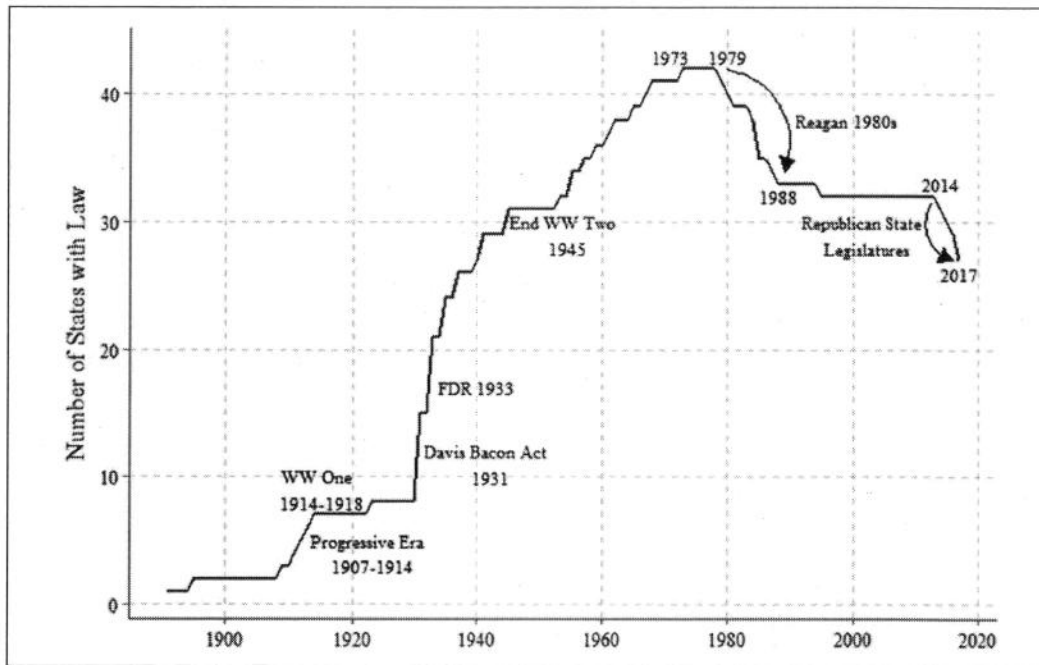


Figure 1. Number of states with prevailing wage laws, 1891 to 2017.

Note. WW = World War; FDR = Franklin D. Roosevelt.

construction craft for journey workers and apprentices. Federal projects are governed by the Davis Bacon Act (1931), while currently 27 states plus the District of Columbia have prevailing wage laws regulating state and local government projects (U.S. Department of Labor, 2018). The first state law was enacted in Kansas in 1891; eight states had adopted prevailing wage laws prior to the Great Depression. By 1945, 30 states and the District of Columbia had prevailing wage laws, and at the peak in 1973, all but nine states primarily in the South and upper plains states had prevailing wage laws (Figure 1). Starting in 1979 and through the Reagan presidency, nine states repealed their prevailing wage laws. Oklahoma's Supreme Court invalidated that state's law in 1995 while Vermont enacted a prevailing wage law in 1998 (Philips, Mangum, Waitzman, & Yeagle, 1995). Since the increased Republican control of various state legislatures after 2010, five states have repealed their prevailing wage laws. These legal changes have kept prevailing wage laws at the forefront of public works construction policy debates for several decades.¹

Research has shown that the repeal of state prevailing wage laws leads to lower construction wages in those repeal states (Belman & Voos, 1995; Clark, 2005; Harris, Mukhopadhyay, & Wiseman, 2017; Kelsay, 2015; Kessler & Katz, 2001; Manzo, Bruno, & Littlehale, 2014; Petersen, 2000; Philips, 1998; Philips et al., 1995; Price, 2005) and reduces voluntary benefits (Fenn, Li, Pleites, Zorigtbaatar, & Philips, 2018). Voluntary benefits comprise employer-provided health insurance, employer contributions to pensions, holiday/vacation pay, and other benefits including collectively bargained contributions to apprenticeship training (Bilginsoy, 2003), OSHA10, OSHA30, and other training programs.²

But, the loss of voluntary benefits can also lead to a loss of industry-specific experience in construction. Previous research (Andrietti & Hildebrand, 2016; Dorsey, 1995; Gustman & Steinmeier, 1993; Kim & Philips, 2010) has shown that decreases in employer-provided health insurance, and a fortiori, portable, union/multi-employer-provided portable health insurance, decreases worker attachment to the construction industry with a consequent loss of construction industry-specific worker experience. Apprenticeship training, safety training, and the accumulation of industry-specific human capital through work experience are channels through which construction worksites become safer (X. Dong, Entzel, Men, Chowdhury, & Schneider, 2004; Sokas, Jorgensen, Nickels, Gao, & Gittleman, 2009).

The potential loss of safety training associated with the repeal of prevailing wage laws has led others to propose a link between prevailing wage repeals and construction injury rates (Belman & Voos, 1995; Kelsay, 2015; Philips, 1998; Philips et al., 1995). Azari-Rad (2005) was the first study to systematically estimate this potential effect finding that the presence of prevailing wage laws reduces total construction injuries by 8.25%. We extend Azari-Rad's 1976 to 1999 data by 17 years finding comparable effects on injuries from repealing prevailing wage laws. In addition, this study is the first to estimate a link between prevailing wage law repeals and the prevalence of disabilities in construction.

Data

Injuries

The Bureau of Labor Statistics (BLS) provides annual injury rate data for construction by industry subsector, state, and year over the years 1976 to 1995 in mimeo and 1996 to 2016 digitally (U.S. BLS, 2018). We have selected seven construction subindustries that have remained definitionally similar when the BLS switched from Standard Industry Codes (SIC) to the North American Industry Code System (NAICS) in 2003. Our subindustries include residential building construction (NAICS 2361), masonry contractors (NAICS 23814), roofing contractors (NAICS 23816), electrical contractors (NAICS 23821), plumbing and HVAC contractors (NAICS 23822), painting and wall covering contractors (NAICS 23832), and carpentry contractors (NAICS 23835).

For each of these industries, the BLS reports a total injury rate and component rates based on increasing injury severity. We analyze (a) total injury rates; (b) injuries that resulted in no lost work; (c) days away, restricted or job transfer (DART); and (d) injuries resulting in lost work-days when an injury compelled the worker to be absent from work for one or more days (a subset of DART injuries).

Injury rates in construction tend to be counter cyclical (X. S. Dong, Wang, & Herleikson, 2010). As the economy turns down and contractors shed workers, contractors tend to retain their more valued employees who, overall, are more experienced, better trained, and less likely to become injured. Furthermore, as work becomes scarce and the press to finish projects relaxes, the pace of work slows making construction worksites safer. In addition, during periods of high unemployment, workers

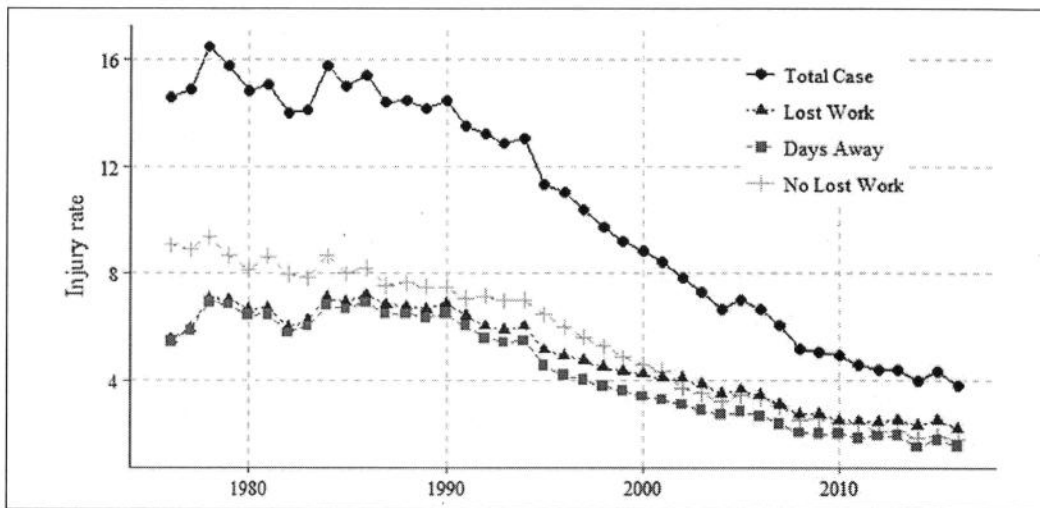


Figure 2. Trends in injury rates, 1976 to 2016.

are sometimes reluctant to report injuries that might risk dismissal. To control for these effects in our regression models, we use the state unemployment rate to capture the construction business cycle.

It is well documented that overall, in the United States, workplace injuries have declined over time (U.S. BLS, 2017) subsequent to the enactment of OSHA regulations and coincident advances in knowledge regarding workplace safety technologies and management (Conway & Svenson, 1998; Friedman & Forst, 2007). This is also true in construction (National Research Council, 2009). Figure 2 shows the long-term decline in construction injuries by injury type. Much of this decline in reported injuries is real, associated with the establishment of OSHA in 1970 and the rise in medical costs since the early 1970 driving up worker compensation premiums and incentivizing safety (Lengagne, 2016). However, some of this decline may be due to injury costs incentivizing the underreporting of workplace injuries.

Research shows that injuries are substantially underreported in construction (X. S. Dong et al., 2011). Workers may fail to report their injuries because they perceive the injury to be minor, an expected outcome of construction work, or the worker may fear of the consequences that may ensue from reporting an injury (Taylor Moore, Cigularov, Sampson, Rosecrance, & Chen, 2013). Reasons employers fail to report a workplace injury include a range of record keeping problems and failures, the view that the injury was not work related, and/or a willful failure to report (Rappin, Wuellner, & Bonauto, 2016). A study of union carpenter apprentices found that safety programs that incentivize safety and/or penalize injury incidences result in workers underreporting their injuries (Lipscomb, Nolan, Patterson, Sticca, & Myers, 2013). State variation in the generosity of worker compensation insurance programs may affect the behavior of both workers and employers. Longer waiting periods before receiving worker compensation benefits may discourage, and better benefits may encourage, workers in reporting injuries. Higher worker compensation premiums may incentivize employers

to suppress injury reporting, but higher premiums may also encourage safety innovations at the jobsite (Mendeloff & Burns, 2013). Thus, there is both noise and a downward bias in the measurement of workplace injuries.

However, for our purposes, once controlling for the overall downward trend in reported injuries, these reporting biases may not be problematic if the underreporting of injuries is not correlated with the passage or repeal of prevailing wage laws. In this case, underreporting simply adds noise to the data that may deter finding underlying statistically significant relationships.

It is possible that injury underreporting is correlated with an enactment or repeal of prevailing wage laws. It may be that repealing prevailing wage laws encourages injury underreporting by reducing the prevalence of collective bargaining and worker contractual protections. Or it may be that repealing prevailing wage laws by lowering wages reduces the costs of worker compensation and reduces contractor incentives to underreport. One of the advantages of examining the relationship between self-reported disabilities and prevailing wage repeals is that this provides an alternative test of the effects of prevailing wages on construction worksite safety relatively independent from the BLS injury-underreporting puzzle.

Disabilities

The U.S. Census provides decennial self-reported responses to questions regarding disability from 1970 to 2000 and annual disability data from the American Communities Survey thereafter (Ruggles, Genadek, Goeken, Grover, & Sobek, 2017). The disability question changes over time with the primary survey change occurring in 2000. This basic change was an increase in the types of disabilities the survey suggested that the individual might have. This raises the possibility that more disabilities might be reported due to more possibilities being identified in the survey question. Therefore, in our regression analysis, we enter a dummy variable equaling one for all years from 2000 onward. While our injury data are annual, our disability data are decennial until 2000. So, for the sake of comparability, we limit our post-2000 disability data to the years 2010 and 2016.

Workers in the construction industry that report a disability need not have acquired that disability while working construction. However, because construction is a physically demanding industry, it is unlikely that workers who have become disabled elsewhere are subsequently attracted to construction work. Presumably, most disabled construction workers became disabled while participating in the construction industry, but their disability might not have come from the construction work itself.

We calculate a disability rate by counting within each state for each year the number of construction workers reporting any kind of disability and dividing by the number of persons in the construction industry (in units of 100 workers) for that state and year. This calculation differs from the BLS injury rate which is injuries per 100 full-time equivalent workers—that is, per 100 units of 2,080 hr worked. So our injury rate is benchmarked against hours worked while our disability rate is benchmarked against a headcount.

The same channels that link injuries to the business cycle may also link unemployment to reported disabilities (Autor & Duggan, 2006). Fewer injuries in a year of high unemployment may mean fewer disabilities occurring during that year. However, in contrast to injuries which are an occurrence within a year, disabilities in our data are a health status that may last for multiple years and not first occur in the census year in which the disability is reported. Furthermore, high rates of unemployment may incentivize workers to claim disability benefits. So, the relationship between unemployment and reported disabilities may be either positive or negative. And the connection between past disabilities and the contemporary unemployment rate may be attenuated leading to no statistically significant relationship. Consequently, we provide two disability models—one including the state unemployment rate (U.S. BLS) and one excluding unemployment.

Self-reported disabilities to the U.S. Census Bureau are not caught up in the web of incentives associated with worker compensation premia and worksite safety programs. Thus, some of the puzzles associated with interpreting BLS injury rate data are less present in the interpretation of disability data. It is possible that more generous worker compensation programs may encourage more worker disability claims (Meyer, Viscusi, & Durbin, 1995). So there remains the possibility that the repeals of prevailing wage laws are positively correlated with increasing the generosity of worker compensation benefits leading to an artificial increase in disabilities. However, the politics of prevailing wage repeals are not typically associated with a movement to improve worker compensation benefits making this potential measurement problem less likely. For instance, Indiana, which repealed its prevailing wage law in 2015, implemented worker compensation cost containment measures in 2014 (Jones, 2014). According to ProPublica, of the seven states that repealed their prevailing wage laws between 2013 and 2018 (Arkansas, Indiana, Kentucky, Michigan, Tennessee—building construction but not roads, West Virginia, Wisconsin), five had lower worker compensation benefits in 2014 relative to the previous decade, one remained the same and one raised their benefits. There is little evidence that prevailing wage repeals go hand in hand with improved worker compensation benefits. Thus, a test of the relationship between prevailing wage repeals and the prevalence of disabilities in construction probably provides results that are independent of concerns regarding reporting error (Qui & Grabell, 2017; U.S. Department of Labor, 2018).

Assuming a linkage between workplace injuries and disabilities, and assuming that the decline in reported construction injuries is real and not simply an artifact of incentives to underreport injuries, then we would expect a consequent decline in self-reported disabilities among construction workers. We therefore enter a time trend into both our injury and disability models hypothesizing that, all other things being equal, if actual injury rates trend downward in construction, then disabilities will follow suit.

State Prevailing Wage Regulations

Between 1970 and 2016, there have been 13 state prevailing wage law repeals, nine between 1979 and 1988—primarily in Southern, Plains, and Mountain states—and four from 1995 to 2016 primarily in the upper South and Midwest. There have been

Table 1. Descriptive Statistics.

Injury type/disability	Total injury	No lost work	Lost work	Days away	Disability
Cases/100 people	10.79 (5.86)	5.94 (3.59)	5.05 (2.92)	4.58 (2.93)	7.29 (2.28)
Repeal	0.14	0.14	0.14	0.14	0.15
Enact	0.004	0.004	0.004	0.004	0.026
Unemployment rate	6.11 (2.03)	6.09 (2.03)	6.11 (2.03)	6.1 (2.02)	5.92 (2.22)
<i>n</i>	5,920	5,683	5,914	5,784	306

Note. No state-level unemployment rate for 1970 reduces the disability sample when unemployment is included.

two enactments: Minnesota in 1973 and Vermont in 1998 (Philips et al., 1995; U.S. Department of Labor, 2018). Two states repealed their laws in 2017 (Wisconsin and Kentucky) and 2018 (Michigan), outside our period of analysis.

Descriptive Statistics

Table 1 shows injuries are lower as the measure of injury severity increases. The disability rate is not directly comparable to the injury rates because the measure of exposure to possible injuries is employment and not hours worked. While 14% of the injury observations entail repeals, only 0.4% involve enactments; in the case of disabilities that are based on decennial data, 15% of observations entail repeals and 2.6% enactments. The average unemployment rate is about 6.1% but varies slightly with the varying sample sizes for different injury types. The injury sample sizes vary slightly with different measures of severity due to some states and industry subsectors reporting only aggregate injuries. The sample for disabilities is about 10% of the size of the injury samples because the disability data are decennial and for the entire construction industry while the annual injury data include construction subsectors.

Figure 3 illustrates our test strategy by showing the average total injury rates for electrical and plumbing contractors in Kansas from 1976 to 1986 prior to the repeal of Kansas's prevailing wage law in 1987 comparing it to the average total injury rates from 1987 to 2016 after Kansas repealed its law. Figure 3 benchmarks this change by showing the average total injury rates for the adjacent states of Iowa (which never had a prevailing wage law) and Missouri (which during our time period always had a prevailing wage law). While these two states did not change their policies over our entire period of analysis, we nonetheless break their average injury rates into the time before and after Kansas repealed its law. In all three states for both electricians and plumbers, total injury rates fell, but the fall in Kansas was smaller than in either of the two states that maintained their prevailing wage policy during this period. This suggests that repealing Kansas's prevailing wage law slowed the decline in their total injury rate compared with adjoining states. Our injury models test whether this pattern for three states is generalizable across all states controlling

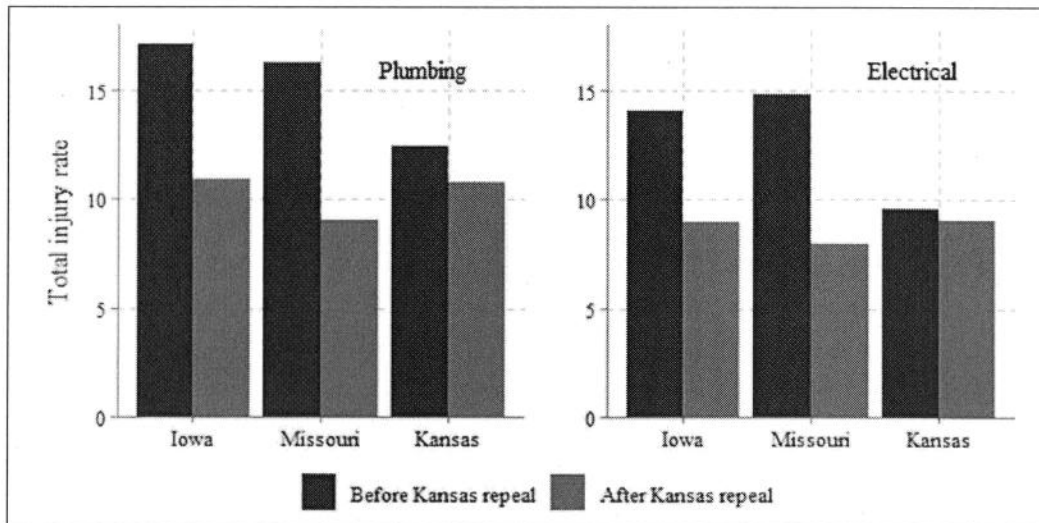


Figure 3. Average total injury rate for electricians and plumbers before and after Kansas repealed its prevailing wage law in 1987.

Note. This graph compares average total injury rate for plumbing and electrical contractors in Iowa, Missouri, and Kansas before and after Kansas repealed the law. Kansas repealed the law in the year 1987.

for the unemployment rate, differences between construction industry subsectors, and the general decline in reported injuries. In our models, we select three samples: all states, repeal and always-had-law states, and repeal and never-had-law states. This is analogous in Table 3 to comparing Kansas to both states, then Kansas to Missouri, then Kansas to Iowa.

In a similar manner, Figure 4 looks at total disability rates before and after repeal. Because the disability data are decennial, our example test comprises the six states that repealed their prevailing wage laws after 1980 and before 1990. For these states (Arizona, Colorado, Idaho, Kansas, New Hampshire, and Utah), we report average disability rates before repeals (1970 and 1980) and after repeals (decennially 1990 to 2010 plus 2016). For comparison, we present the average disability rates for those states that never had a prevailing wage law throughout our period and states that always had a prevailing wage law over our period. In Figure 4, we exclude states that repealed their law prior to 1981 or after 1989. While disability rates fell for states with unchanging legal regimes, disability rates for construction workers in states that repealed their prevailing wage laws rose. Our disability model tests whether this pattern holds once all states are included and time trends and state unemployment rates are controlled for.

Model and Results

Our data are a long panel data set. Following Fenn et al. (2018), we use Feasible Generalized Least Squares (FGLS) estimation which allows the use of first-order autoregressive processes and permits the error terms in the model to be heteroskedastic

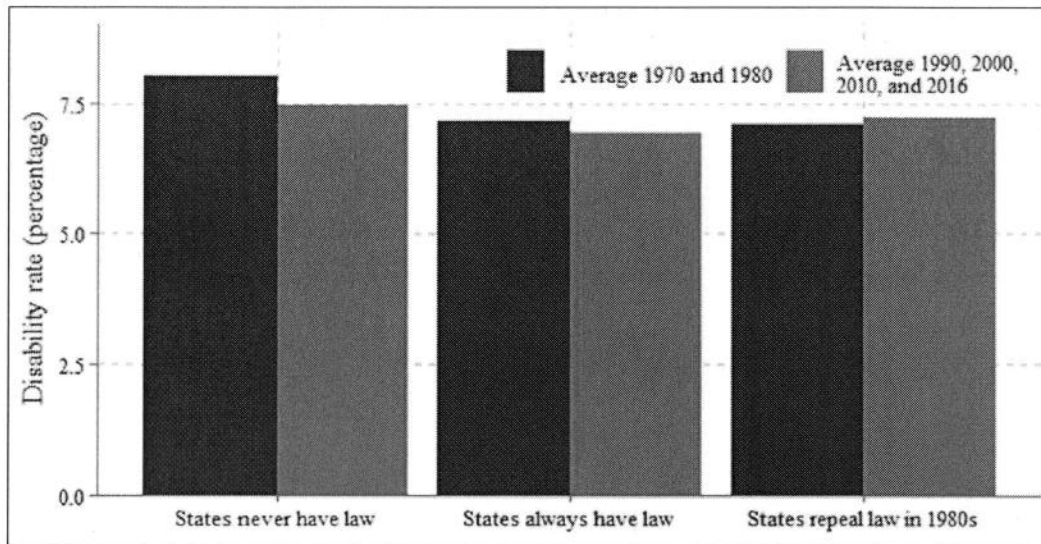


Figure 4. Average disability rates for states that always had, never had, and repealed their prevailing wage laws before and after the repeals.

Note. This graph compares the average disability rate of three groups of states. The three groups include states who never have the law during the whole period, states who always have the law during the whole period, and the states who repeal the law in the 1980s, which include Colorado, Idaho, Kansas, Louisiana, New Hampshire, and Utah.

(Cameron & Trivedi, 2010). More specifically, this method produces panel and cross-section corrected standard errors specifying the error terms to be independent with a variance of $E(u_{it}^2) = \sigma_i^2$ that can be different for each state over time. As error terms are possibly correlated and observations could very well depend on previous periods in a longitudinal data, the use of FGLS estimations with heteroskedastic disturbances will address these distributional issues of cross-sectional correlations and variances as well as time series autocorrelations.

We estimate the effect of prevailing wage law repeals on injury rates by state and year for seven construction industry subsectors, the prevalence of disabilities among all construction employees in the construction industry by state and year controlling for long-term trends in these health measures, differences among states using state dummy variables, long-term trends in injuries and disabilities using a year trend, an indicator variable marking when the Census expanded its list of disability questions, and a dummy variable indicating if and when a state repealed its prevailing wage law.

The equation for the FGLS is as follows:

$$Y_{it} = \alpha + B_1 X_{it}^1 + \dots + B_k X_{it}^k + u_{it},$$

where Y_{it} is the injury or disability rate in a construction subindustry in the case of injuries and overall construction in the case of disabilities in a state i and year t ; $X_{it}^1 = 1$ in a state i and year t if that state i had currently or previously repealed its prevailing

wage law, otherwise zero; $X_{it}^2 = 1$ in a state and year if state i had currently or previously enacted a prevailing wage law, otherwise zero; $X_{it}^3 =$ state i overall unemployment rate in year t ; $X_{it}^4 = 1$ in the disability model for all states and years after 1999 when the Census expanded its list of disability questions; $X_{it}^5 =$ indicator of year t ; and u_{it} is an error term for state i in time t .

Following the literature on the effect of prevailing wage repeals on blue-collar construction worker income, we include in all our models, but do not report, time-invariant state dummy variables to capture relevant differences in state construction industries that are unchanging across the 1972 to 2016 period of analysis.

Results

Repeals. Table 2 shows the results for our models predicting injuries and disabilities tested against our full sample of years and states. Table 3 shows the same models but limits the sample to states that kept their prevailing wage laws and states that repealed their laws. Table 4 shows the injury models tested against a sample of states that never had the law and repeal states. Table 4 omits the disability models because in this subsample, the disability observations are too few.

All the injury models include a time trend, dummy variables for industry subsectors, unreported state dummy variables and the state unemployment rates. The disability models are for construction as a whole with no subindustries, have unreported state dummy variables, include a time trend, and, in one model, include and, in one model, exclude state unemployment rates. When included, across all models, the state unemployment rates are always negatively related to injuries and disabilities. These results are statistically significant and substantial. A doubling of the unemployment rate leads to a roughly 25% decline in injury and disability rates. Both injury and disability rates decline over time at rates of 2% to 5% per year.

The time trends in the injury models are all negative and statistically significant, as one would expect from examining Figure 2. However, if all the decline in reported injuries in Figure 2 were artifacts of increased incentives overtime to underreport injuries (say due to rising worker compensation costs), then there would be no expectation that construction worker disabilities would trend downward over time. In both the disability models, we, in fact, find statistically significant negative time trends in reported disabilities. These downward trends of about 2% per year are roughly similar to the 4% per year decline in reported injury rates. This suggests that despite well-known underreporting issues and moral hazard incentives in injury rates, the downward trend in construction injuries over decades is real and not an artifact of reporting problems.

Table 5 provides a summary of results for injury rates while comparing our results to Azari-Rad³ (Azari-Rad, 2005). In all of our samples, the increase of injury rates associated with prevailing wage repeals rises with the severity of the injury measure. Azari-Rad finds this as well suggesting that repeals increase the overall danger of construction work as well as increasing injury rates.

Table 2. FGLS Regression Models Predicting Injury and Disability Rates (Full Sample).

	(1)	(2)	(3)	(4)	(5)	(6)
	Total injury	No lost work related injury	Lost work related injury	Injury results in absence from work	Disability	Disability
Repeal	0.102*** (3.04)	0.110*** (2.80)	0.123*** (3.31)	0.123*** (3.06)	0.0722*** (2.82)	0.0789*** (4.18)
Enact	-0.163 (-1.48)	-0.0983 (-0.70)	-0.113 (-0.95)	-0.303** (-2.18)	0.0841 (0.95)	-0.0267 (-0.38)
Year	-0.0413*** (-71.64)	-0.0486*** (-69.58)	-0.0339*** (-55.17)	-0.0442*** (-63.10)	-0.0259*** (-27.80)	-0.0226*** (-27.00)
Unemployment	-0.250*** (-13.33)	-0.266*** (-11.58)	-0.246*** (-11.72)	-0.241*** (-10.42)		-0.229*** (-13.69)
Masonry	0.279*** (12.26)	0.260*** (9.88)	0.347*** (14.37)	0.353*** (13.42)		
Roofing	0.521*** (20.81)	0.442*** (14.53)	0.600*** (22.71)	0.606*** (21.60)		
Electrical	0.106*** (5.13)	0.299*** (12.44)	-0.117*** (-5.20)	-0.164*** (-6.50)		
Plumbing	0.338*** (17.40)	0.526*** (22.94)	0.151*** (7.31)	0.116*** (5.10)		
Painting and wall	-0.158*** (-4.55)	-0.174*** (-4.32)	-0.135*** (-3.63)	-0.0624 (-1.62)		
Finish carpentry	0.309*** (9.75)	0.333*** (9.43)	0.314*** (9.71)	0.355*** (10.04)		
Data change					0.897*** (30.96)	0.823*** (38.05)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	84.73*** (73.56)	98.49*** (70.71)	69.29*** (56.41)	89.61*** (64.02)	53.18*** (28.94)	47.14*** (28.54)
<i>n</i>	5,901	5,663	5,895	5,763	306	255
Wald χ^2	8,391	7,399	5,564	6,528	1,622	3,089
$p > \chi^2$	0	0	0	0	0	0

Note. *t* statistics in parentheses. In this set of regression, we include all states. All the dependent variables and unemployment rate are the logged value. Injury data are annual from 1976 to 2016. Disability data are 1970, 1980, 1990, 2000, 2010, and 2016, but in regression (6), because of the absence of state-level unemployment rates, 1970 is omitted. Minnesota enacted the law in 1973, so in regression (6), this state does not have an enact effect. Florida repealed the law in 1979, so in regression (6), this state does not have a repeal effect. Disability measures the number of persons who report having any kind of disability among 100 persons in the construction industry. Data change refers to 2000 change in the Census American Community Survey disability questions. The omitted occupation is workers employed by residential building contractors. FGLS = Feasible Generalized Least Squares.

* $p < .1$. ** $p < .05$. *** $p < .01$.

Results for our full sample and the sample that excludes never-had states are similar to each other and modestly higher than Azari-Rad's estimated effects. However, our sample that excludes always-had states using never-had states as the lone benchmark yields substantially higher repeal effects on injuries.

This is so for two related reasons. In comparison with the sample with always-had-law states as the benchmark (Table 3), the results for all injury rate models using the sample with never-had states as the benchmark (Table 4) systematically have larger constants and more steeply declining injury rate time trends. This means that the never-had states begin

Table 3. FGLS Regression Models Predicting Injury and Disability Rates (Sample Excludes States That Never Had the Law).

	(1)	(2)	(3)	(4)	(5)	(6)
	Total injury	No lost work related injury	Lost work related injury	Injury results in absence from work	Disability	Disability
Repeal	0.0926*** (2.76)	0.0939** (2.37)	0.120*** (3.21)	0.118*** (2.92)	0.0659** (2.50)	0.0747*** (3.91)
Year	-0.0406*** (-65.51)	-0.0472*** (-62.39)	-0.0339*** (-50.93)	-0.0440*** (-57.51)	-0.0251*** (-23.78)	-0.0221*** (-23.81)
Unemployment	-0.258*** (-12.75)	-0.275*** (-11.03)	-0.266*** (-11.65)	-0.253*** (-9.99)		-0.232*** (-11.85)
Masonry	0.278*** (11.43)	0.269*** (9.60)	0.352*** (13.57)	0.364*** (12.90)		
Roofing	0.523*** (19.37)	0.429*** (12.87)	0.618*** (21.56)	0.615*** (19.91)		
Electrical	0.0706*** (3.19)	0.275*** (10.67)	-0.150*** (-6.16)	-0.195*** (-7.15)		
Plumbing	0.308*** (14.81)	0.495*** (20.07)	0.131*** (5.84)	0.101*** (4.05)		
Painting and wall	-0.163*** (-4.43)	-0.173*** (-4.11)	-0.140*** (-3.48)	-0.0592 (-1.44)		
Finish carpentry	0.315*** (9.19)	0.341*** (8.76)	0.330*** (9.20)	0.382*** (9.59)		
Data change					0.878*** (26.95)	0.813*** (34.44)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	83.24*** (67.31)	95.85*** (63.43)	69.30*** (52.08)	89.18*** (58.35)	51.71*** (24.79)	46.20*** (25.19)
<i>n</i>	4,945	4,736	4,944	4,828	246	205
Wald χ^2	7,957	6,266	4,856	5,512	1,282	2,505
$p > \chi^2$	0	0	0	0	0	0

Note. *t* statistics in parentheses. In this set of models, the states which repealed their law during the regression period and the states that always have the law are included. For model (6), there is no repeal effect for Florida because it repealed its law in 1979 (see also notes in Table 2). FGLS = Feasible Generalized Least Squares.

* $p < .1$. ** $p < .05$. *** $p < .01$.

with higher injury rates but these are declining faster than the always-had states which begin with lower injury rates, but these rates decline more slowly. Thus, the repeal effect on injuries appears sharper when measured against the set of never-had states experiencing faster declines from higher initial rate levels.

Underreporting could confound our injury results if the repeal of prevailing wage laws discourages under-reporting. However, to the extent that repealing prevailing wage laws reduces the practice of collective bargaining, repeals are likely to lead to greater underreporting of injuries. The loss of union protections is likely to discourage workers from reporting injuries while encouraging contractors to ignore or informally

Table 4. FGLS Regression Models Predicting Injury and Disability Rates (Sample Excludes States That Always Had the Law).

	(1)	(2)	(3)	(4)
	Total injury	No lost work related injury	Lost work related injury	Injury results in absence from work
Repeal	0.158*** (4.49)	0.194*** (4.70)	0.169*** (4.37)	0.194*** (4.63)
Year	-0.0449*** (-46.49)	-0.0543*** (-47.65)	-0.0362*** (-35.37)	-0.0486*** (-41.29)
Unemployment	-0.174*** (-6.02)	-0.184*** (-5.30)	-0.156*** (-4.81)	-0.144*** (-4.04)
Masonry	0.317*** (8.98)	0.292*** (7.19)	0.384*** (10.42)	0.364*** (8.72)
Roofing	0.548*** (14.96)	0.505*** (11.43)	0.647*** (17.06)	0.664*** (16.47)
Electrical	0.232*** (7.09)	0.410*** (10.86)	0.0207 (0.59)	-0.0781* (-1.95)
Plumbing	0.419*** (13.34)	0.607*** (16.63)	0.250*** (7.91)	0.196*** (5.49)
Painting and wall	-0.0816 (-1.62)	-0.0903 (-1.61)	-0.0338 (-0.60)	0.0228 (0.38)
Finish carpentry	0.384*** (7.64)	0.349*** (6.35)	0.426*** (8.58)	0.447*** (8.29)
State dummies	Yes	Yes	Yes	Yes
Constant	91.56*** (47.62)	109.6*** (48.34)	73.40*** (36.05)	98.10*** (41.81)
<i>n</i>	2,358	2,285	2,357	2,303
Wald χ^2	3,548	3,493	2,316	2,838
$p > \chi^2$	0	0	0	0

Note. *t* statistics in parentheses. In this set of regressions, only the states which repealed the law during the regression period and the states that never had the law are included. Disability regressions excluded due to limited sample size. (see also notes in Table 2). FGLS = Feasible Generalized Least Squares.

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 5. Summary Injury Results and Comparison With Azari-Rad.

	Total	No lost work	Total lost work	Days away from work
Total sample	10.7	11.6	13.1	13.1
Excludes never-had states	9.7	9.8	12.7	12.5
Excludes always-had states	17.1	21.4	18.4	21.4
Azari-Rad (1976 to 1999 data)	8.3	7.1	9.8	10.2

treat injuries workers do report. Thus, if repeals reduce collective bargaining, and if reduced collective bargaining encourages the underreporting of injuries, then, absent any real effect of repeals on injuries, we would expect to find repeals associated with a decline in reported injuries. The fact that we find repeals associated with an increase in reported injuries suggests that either (a) underreporting is not associated with repeals or (b) our estimated effect of repeals on the increase in actual injuries is underestimated by the amount that underreporting has hypothetically increased after repeals.

In the case of disabilities, in our full sample, controlling for time trends and a change in how disability questions were asked, repeals raised self-reported disabilities by 7.5% when not controlling for the unemployment rate and 8.2% controlling for unemployment. When the sample is restricted to repeal and always-had states, repeals raised disabilities by 6.5% not controlling for unemployment, and 7.5% controlling for unemployment. In the case of disabilities, the sample that excludes always-had states is too small for model estimation.

Enactments. Our injury data spanning the years 1976 to 2016 include only one prevailing wage enactment (Vermont in 1998) while our disability data spanning 1970 to 2016 include a second enactment (Minnesota 1973). With these limited legal changes, we were unable to discover statistically significant relationships except for lost days away from work where enactment reduced this injury rate by a statistically significant and meaningful 26%.⁴ These results held whether or not the unemployment rate was included in the model.

Conclusion

Prevailing wage policies are the current focus of an intense public policy debate. The scientific literature on prevailing wage policy has focused on the effects of repeals on wages, benefits, and the direct cost of public construction. Following Azari-Rad, this article expands the analysis of the effects of repealing prevailing wage laws to workplace safety.

Prevailing wage repeals have been shown to reduce construction worker wages and benefits. Because the financing of worker safety training is among these reduced benefits, and the loss of health care benefits have been shown to reduce worker retention within the industry, we are not surprised that our empirical results are consistent with the hypothesis that prevailing wage repeals also increase construction workplace dangers. Our finding that injury rates rise from 11% to 13% as the severity of injuries increases is consistent with Azari-Rad and suggests that prevailing wage repeals increase not only the prevalence of injuries but their severity. Our finding that subsequent to repeals disability rates rise from 7.5% to 8.2% depending on model specification is consistent with the finding that prevailing wage repeals increase actual injuries and that these results are not an artifact of underreporting driven by moral hazard incentives within the worker compensation system and worker safety programs. These workplace safety issues are an additional consideration when evaluating the advisability of enacting or repealing state prevailing wage policies.

Declaration of Conflicting Interests

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Notes

1. For a fuller review of the economic effects of prevailing wage laws, see Duncan and Ormiston (2018).
2. The 2012 Economic Census questionnaire for construction states: "Employer's cost for fringe benefits: Voluntarily provided fringe benefits (Include such items as payments for life insurance, medical insurance, pensions, welfare benefits, and union-negotiated benefits)" <https://www2.census.gov/programs-surveys/economic-census/2012/questionnaires/forms/cc23601.pdf> (Form CC-23601).
3. The percentages shown in Table 5 differ slightly from the coefficients shown in the regression tables due to the transformation of the estimated coefficients into percentages using the formula $\text{percent} = (\exp(b) - 1) \times 100$.
4. For consistency, we retain Feasible Generalized Least Squares (FGLS) in Models 5 and 6 despite having only six time periods separated by decades (five when we include unemployment). In unreported regressions, we replicate Models 5 and 6 using fixed-effect regressions with clustered robust errors. The results are comparable with FGLS estimating a 10% increase in disabilities with prevailing wage repeals. The estimate for the effect of enacting prevailing wage laws is again statistically insignificant.

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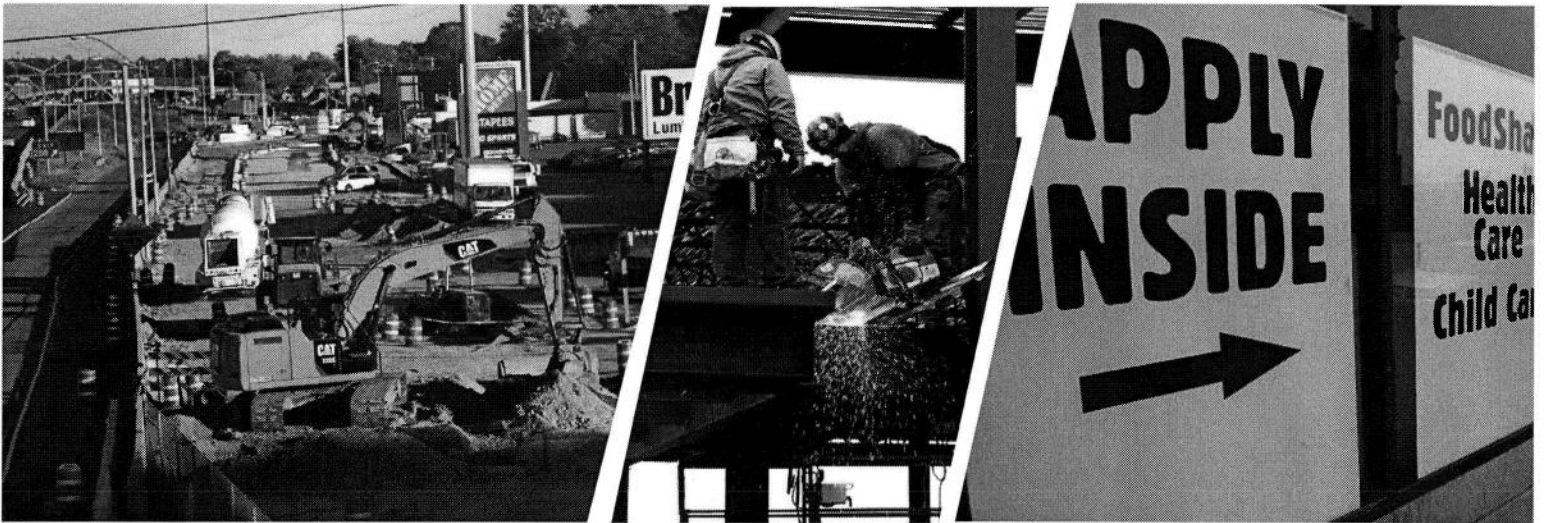
EXHIBIT 5

The Social Costs of Repealing Wisconsin's Prevailing Wage Law

GOVERNMENT AID APPLICATION

Personal Information

Name (Last)	First	Initial	Phone Number	Home	Cell
Address (Billing Address)					
E-Mail Address					
Amount needed					



June 19, 2017

A Higher Road for a Better Tomorrow

**MIDWEST ECONOMIC
POLICY INSTITUTE**

Frank Manzo IV, MPP

Jill Manzo

Executive Summary¹

The social costs of repealing prevailing wage must be considered by elected officials. While critics of Wisconsin's prevailing wage law claim that the state would save money on public construction projects from repealing the policy, they do not take into account the negative tax and government assistance consequences of repeal. This report primarily uses the assumptions made by critics of Wisconsin's prevailing wage law to demonstrate, as a "thought experiment," the potential social costs of repeal.

Wisconsin State Senator Duey Stroebel (R-Saukville), for instance, has cited the Wisconsin Taxpayers Alliance and said that "there is on average 44 percent savings" from potentially repealing prevailing wage. While a 44 percent wage cut would be exorbitant and is not supported by the preponderance of peer-reviewed economic research on prevailing wage, this worst-case scenario for Wisconsin would result in the average construction worker earning \$28,896 annually. With a 44 percent wage cut, the state could potentially lose \$18.2 million in forgone income tax revenues, face \$6.3 million more in Earned Income Tax Credit (EITC) costs, and spend \$38.1 million more in FoodShare assistance for blue-collar construction workers.

The Wisconsin Department of Revenue (DOR) has estimated repeal of prevailing wage would reduce construction worker earnings by a more modest 14.1 percent on average. A 14.1 percent average wage cut in Wisconsin would result in the average construction worker earning \$44,324 annually and the state potentially losing \$5.8 million in forgone income tax revenues, providing \$1.7 million more in Earned Income Tax Credit (EITC) benefits, and spending tens of millions of dollars more in FoodShare assistance for blue-collar construction workers.

Repealing Wisconsin's prevailing wage law would substantially increase social costs. The worst-case potential social costs of repealing prevailing wage range from \$224 million to \$337 million every year. When worker wages are cut, they contribute less in state and federal income taxes. At the same time, more workers qualify for and rely on government assistance. This results in less money in the state economy and less money in the pockets of hardworking citizens.

The bottom 25 percent of construction workers in families of four are most at-risk of requiring government assistance. Between 4 percent and 12 percent of construction workers in Wisconsin would newly qualify for government assistance if prevailing wage were repealed, depending on the severity of the wage cut. This is *in addition to* the 14.5 percent who already qualify for government assistance in the state.

Furthermore, peer-reviewed economic research has found that repealing prevailing wage and lowering construction worker wages has no statistical impact on total construction costs. Instead, repeal results in less-productive individuals replacing skilled workers, an influx of out-of-state contractors flooding the local market, and higher materials, fuels, and equipment costs. Peer-reviewed studies conclude that these changes offset any initial labor cost savings associated with cutting worker wages and benefits.

Potential tax revenue losses and government assistance expenditure increases must be accounted for in any cost-benefit analysis in the prevailing wage debate. Scaled up to the macroeconomic level, the social costs of repealing prevailing wage are in the millions of dollars. Though precise estimates on the overall social cost are difficult to project, one takeaway is clear: Repeal of prevailing wage is a bad deal for taxpayers. Taxpayers do not save from repeal of prevailing wage, they subsidize.

¹ The authors wish to acknowledge and thank Professor Robert Bruno, Ph.D., for his review and edits of this report. Professor Bruno is the Director of the Project for Middle Class Renewal at the University of Illinois at Urbana-Champaign.

Introduction

Wisconsin's prevailing wage law requires that certain laborers, workers, mechanics, and truck drivers employed on state-funded public works projects be paid wage rates that reflect competitive local market standards. Prevailing wage is essentially a minimum wage for blue-collar workers employed on public construction projects. The policy levels the playing field for contractors, ensuring that all contractors pay the local market rate and compete over all other factors in the public bid process— including productivity, materials costs, and technological efficiencies.

On January 1, 2017, significant changes were made when Wisconsin repealed prevailing wage for local governmental units. The state prevailing wage law now only applies to state agency and state highway projects and applicable rates are those issued by the U.S. Department of Labor under the federal Davis-Bacon Act (Department of Workforce Development, 2017). However, the State Senate is currently considering a full repeal the state's prevailing wage law.

The preponderance of the economic research finds no evidence that prevailing wage increases costs to taxpayers and 75 percent of peer-reviewed economic studies indicate that project costs are not impacted by prevailing wages (Manzo et al., 2016). This is primarily because blue-collar labor costs (i.e., construction worker wages plus fringe benefits) account for a low and historically declining share of total project costs on public works. For example, data from the 2012 *Economic Census* report that labor costs account for just 21 percent of net construction value for the highway, street, and bridge construction sector in Wisconsin (U.S. Census Bureau, 2015). On the other hand, materials, fuels, and equipment costs account for an estimated 43 percent of total construction costs on average (Manzo et al, 2016).

A 2015 Wisconsin Legislative Fiscal Bureau analysis summarized the economic research on costs by stating that:

“the evidence on prevailing wage effects generally range from relatively small effects to no statistically significant effects.... These findings echo a 2007 report prepared by the nonpartisan Minnesota Office of the Legislative Auditor which, in a review of the literature that measured the relationship between prevailing wage laws and the cost of construction, concluded that while some studies found a small impact on costs, more comprehensive studies have found that the impact is not statistically significant. These findings are further corroborated in a comprehensive review of research related to prevailing wages and government contracting costs by Mahalia (2008) (Horton, 2015).”

Despite this conclusion, lawmakers are considering full repeal of prevailing wage in the state. Advocates of repealing prevailing wage often state that the law inflates construction worker wages. The primary study cited by advocates of repeal is a 2015 report by the Wisconsin Taxpayers Alliance, which claimed that prevailing wage “forces taxpayers” to pay 44 percent more than the market wage rate based on hypothetical comparisons using *Occupational Employment Statistics* (OES) data from the Bureau of Labor Statistics (BLS) at the U.S. Department of Labor (Wisconsin Taxpayers Alliance, 2015). For instance, State Senator Duey Stroebel (R-Saukville) has said that “there is on average 44 percent savings” from potentially repealing prevailing wage (*The Wheeler Report*, 2016).

If it is true that repealing prevailing wage would lower blue-collar wages by 44 percent an hour on public projects, then middle-class construction workers would suffer a significant wage cut. When construction worker wages are cut, they become more likely to rely on government assistance programs (Duncan & Lantsberg, 2015). In fact, a recent 2016 report estimates that repealing prevailing wage increases the likelihood that any given construction worker receives food stamps by 3 percentage points and receives Earned Income Tax Credits by 1 percentage point (Manzo et al., 2016). Additionally, under Wisconsin's

graduated income tax system, a large reduction in a construction worker's earnings would, by definition, reduce his or her state income tax liability.

There have been estimates that are more modest on the decrease in worker wages. The Wisconsin Department of Revenue (DOR) projected in 2015 that worker wages would be reduced by 14.1 percent with prevailing wage repeal. The DOR found that the state would not see any fiscal effect of repealing wages, although workers would experience a negative impact from the decrease in annual wages and an increased chance of qualifying for government assistance programs.

This Midwest Economic Policy Institute (MEPI) Economic Commentary addresses the Wisconsin Taxpayers Alliance's claims, the Wisconsin Department of Revenue's claims, and the social impacts of repealing prevailing wage in the state. First, the report focuses on the exorbitant 44 percent cost savings claim made by the Wisconsin Taxpayers Alliance. While these claims are not supported by peer-reviewed economists who study the impact of prevailing wage laws on construction worker incomes, the effect of a 44 percent wage cut on increasing reliance on government assistance is worth reviewing—particularly given the frequency with which the Wisconsin Taxpayers Alliance figure has been cited by elected officials in Wisconsin. Second, the report focuses on the more realistic Wisconsin Department of Revenue's 14.1 percent reduction in construction worker wages and the impact that it would have on government assistance needs. Third, the report addresses the potential social and economic cost for workers, taxpayers, and the state due to repealing the law, focusing on construction workers in families of four. Finally, the report concludes by recapping key findings. Repeal of prevailing wage would have significant public finance and budgeting implications on both the microeconomic level (i.e., to an individual craft worker employed on state-funded construction projects) and macroeconomic level (i.e., to state tax revenues and public assistance expenditures).

The Tax and Government Assistance Implications of Assuming a 44 Percent Reduction in Wages

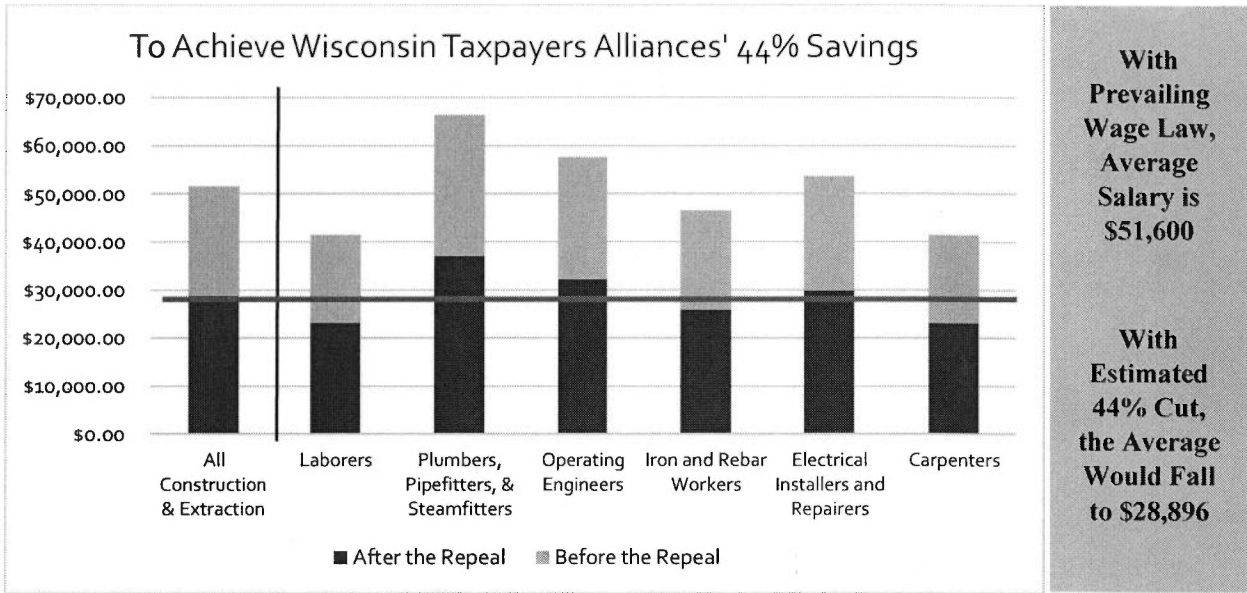
The Wisconsin Taxpayers Alliance claims that Wisconsin's prevailing wage law "forces taxpayers" to pay 44 percent more than the market wage rate on public construction projects (Gleason, 2015). The 2015 Wisconsin Taxpayers Alliance study assumes that the Occupational Employment Statistics (OES) dataset reported by Bureau of Labor Statistics (BLS) provides a better indicator of local construction market rates than prevailing wage rates. This assumption, which is the basis for the entire analysis, is incorrect. In fact, Erica Groshen, Commissioner of the Bureau of Labor Statistics, definitively concluded that the "BLS has no role in establishing prevailing wages or determining what data are appropriate for that purpose of prevailing wage determinations" (House Hearing, 113 Congress, 2013). Groshen states:

"The OES program does not gather information on all the attributes that might be of interest when examining occupational wages. For example, the OES does not have data on license requirements, skill level, or years of experience. ... And, the OES collects data from business establishments, not by worksites or construction project sites. A construction business may have multiple projects in same area or in different areas."

While the 44 percent wage inflation estimated by the Wisconsin Taxpayers Alliances is grossly overstated, the effect of a 44 percent wage cut on increasing reliance on government assistance is worth reviewing—particularly given the frequency with which the Wisconsin Taxpayers Alliance figure has been cited by elected officials in Wisconsin. This report thus asks the following question: Assuming the 44 percent estimate to be true, what would be the government revenue and government expenditure impacts of the projected wage cut?

According to the “May 2016 State Occupational Employment and Wage Estimates” for Wisconsin, the average construction and extraction worker in Wisconsin earns an annual mean wage of \$51,600 (BLS, 2017). If this annualized worker income was cut by 44 percent, total wages would fall to \$28,896 per worker, on average. Figure 1 illustrates a 44 percent wage cut to the average annual wages for workers in six construction trades and compares it to the new average earnings of all construction and extraction occupations.

Figure 1: Potential New Annual Wages Associated with 44 Percent Wage Cut, by Construction Trade



An annual income of \$28,896 (from the 44 percent wage cut) would result in a blue-collar construction worker from a family of four potentially qualifying for a number of government assistance programs in Wisconsin. Table 1 lists the programs based on maximum salary to qualify. These include, at the very least, the Affordable Care Act Health Insurance Marketplace (\$97,000) and the Earned Income Tax Credit (\$50,198) at the federal level and FoodShare Wisconsin (\$48,600), the State Earned Income Credit (\$50,198), and the Wisconsin Home Energy Assistance Program (\$50,336) at the state level (Kaiser Family Foundation, 2016; TaxAct, 2017; IRS, 2016; Benefits.gov, 2017 (a); University of Wisconsin-Extension, 2016; Benefits.gov, 2017 (b)).

Table 1: Annual Salary Threshold to Qualify for Select Government Assistance Programs, Family of Four

Government Assistance Program	Annual Salary Threshold to Qualify (Family of Four)
Affordable Care Act Health Insurance Marketplace	\$97,000
Federal Earned Income Tax Credit (EITC)	\$50,198
FoodShare Wisconsin	\$48,600
State Earned Income Credit (EIC)	\$50,198
Wisconsin Home Energy Assistance Program (WHEAP)	\$50,336

Table 2 presents estimates of the potential annual government assistance that a construction worker earning \$28,896 could receive if he or she was the household head in a family of four. At \$28,896 in household income for a family of four, a construction worker qualifies for \$13,403 in estimated financial help to purchase health insurance through the Health Insurance Marketplace (if the wage cut is also associated with a loss in health insurance coverage), \$2,976 in FoodShare assistance, \$4,491 in federal EITC relief, and \$494 in state EIC relief (Kaiser Family Foundation, 2016; TaxAct, 2017; Wisconsin Connections, 2014; Bankrate, 2017; University of Wisconsin-Extension, 2016). Based on filing state and federal income taxes under the “married filing jointly” designation, the construction worker would pay \$1,424 less in state income taxes and contribute \$3,406 less in federal income taxes annually (Tax-Brackets.org, 2017; U.S. Tax Center, 2017).

The construction worker’s household would also newly qualify for Wisconsin Home Energy Assistance Program (WHEAP) funds. In 2014, nearly 225,000 households in Wisconsin received federally-funded heating assistance and a similar amount received state-funded non-heating electric assistance (Wisconsin Legislative Fiscal Bureau, 2015). This equates to approximately 20.9 percent of all Wisconsin households with household income under \$50,000 (U.S. Census Bureau, 2015). Similarly, an estimated 3.0 percent of households earning less than \$50,000 receive WHEAP crisis assistance benefits. Multiplying these likelihoods of receiving benefits by the average assistance provided by each program to the typical household reveals that the expected value of WHEAP benefits received by a construction worker in a family of four with an income of \$28,896 would be \$63 in heating assistance, \$23 in non-heating assistance, and \$13 in crisis assistance (Wisconsin Legislative Fiscal Bureau, 2015). Cumulatively, the total microeconomic social cost of a 44 percent wage cut could *potentially* be a \$26,293 increase in public assistance costs and decreased tax revenue for one blue-collar construction worker in a family of four.

Table 2: Potential Annual Benefits from Government Programs Due to 44 Percent Wage Cut, Family of Four

A Family of 4 Making Under \$28,896 Qualifies for These Programs	Government Program		Annual Benefits
	Affordable Care Act Health Insurance Marketplace*		\$13,403
	FoodShare Wisconsin		\$2,976
	Federal Earned Income Tax Credit		\$4,491
	State Earned Income Credit		\$494
	Estimated State Taxes Not Paid ¹		\$1,424
	Estimated Federal Taxes Not Paid ²		\$3,406
	Wisconsin Home Energy Assistance Program (WHEAP) ³		
	Heating		\$63
	Non-heating		\$23
Crisis Assistance		\$13	
Individual Social Cost to Public Budgets		\$26,293	

*Individual costs for silver plan of Affordable Care Act Health Insurance Marketplace is \$589 per year.

¹At \$51,600, estimated state income tax contributions would be \$2,935. At \$28,896, estimated state income tax contributions would fall to \$1,511, a difference of \$1,424 annually.

²At \$51,600, estimated federal income tax contributions would be \$6,813. At \$28,896, estimated federal income tax contributions would fall to \$3,407, a difference of \$3,406 annually.

³WHEAP Benefits estimated from 20.9 percent of households that qualify for WHEAP benefits and receive the benefits; crisis assistance estimated from 3 percent of households that qualify and receive crisis assistance benefits.

Table 3 presents the total potential cost incurred to taxpayers based on the assumed 44 percent wage cut. Without prevailing wage repeal, the blue-collar construction worker earns a good middle-class income of \$51,600 on average, is contributing more in income taxes, and is not dependent upon government

assistance programs. After the policy change, under these assumptions, the average worker wage would fall to \$28,896. If he or she is the household head of a family of four, the construction worker may now cost taxpayers an additional \$26,293 in government assistance and lost tax revenue.

In the most recent Economic Census, which is conducted every five years, the U.S. Census Bureau reported \$4.3 billion in total state and local government construction in Wisconsin (U.S. Census Bureau, 2015). This represented 17.0 percent of total construction value (including private and federally-owned projects). Applying this share to the individual social cost and then multiplying that further by the total number of craft-based construction workers suggests that prevailing wage repeal could cost up to \$336.6 million in additional public assistance expenditures and forgone tax revenue every year. This worst-case potential additional cost, which is based on the 44 percent wage decrease assumed by the Wisconsin Taxpayers Alliance, reveals how costs that are formerly borne by employers become socialized at the expense of the taxpayers when prevailing wage is repealed.

Table 3: Total Government Assistance from 44 Percent Wage Cut, Family of Four

Total Cost Now Incurred to Wisconsin	
Individual Social Cost to Public Budget	\$26,293
State and Local Share of Public Construction	x 17.0%
Total Number of Craft Construction Workers	x 75,300
Potential Increase in Total Social Costs	\$336,576,693

The worst-case social costs to the State of Wisconsin (independent of federal costs) may also be of considerable interest. Multiplying the potential public benefits from the state in Table 2 by the state and local share of public construction and by the estimated number of workers on public projects reveals that:

- The state could lose \$18.2 million in forgone income tax revenue;
- The state could provide approximately \$6.3 million more in EITC benefits; and
- FoodShare spending could rise by \$38.1 million.

Ultimately, this worst-case scenario demonstrates that repealing prevailing wage could have significant costs to taxpayers.

The Tax and Government Assistance Implications of Assuming a More Modest 14.1 Percent Reduction in Wages

The Wisconsin Department of Revenue (DOR) estimated that the State would not experience a change in fiscal outcomes from repealing prevailing wage, but that workers would see a decrease in wages. According to the 2015 Wisconsin Legislative Fiscal Bureau analysis:

“The Department of Revenue (DOR) identified no state fiscal effect of repealing prevailing wage in Wisconsin. DOR’s fiscal estimate for local governments is marked indeterminate, although the Department did include a description of potential savings on local government construction projects which would no longer be subject to prevailing wage requirements. DOR’s calculation assumed \$1.32 billion in local government construction expenditures in Wisconsin subject to state prevailing wage requirements, 18.9% of the net value of construction being attributable to labor costs, a potential decrease in wages of 14.1% due to the absence of prevailing wage laws (derived by comparing a statewide U.S. Bureau of Labor Statistics sample of construction occupations to a weighted average of a sample of DWD prevailing wage determinations), and 50% of labor savings

being passed through from contractors to local governments as reduced construction bids (Horton, 2015).”

The DOR’s estimate of 14.1 percent is more aligned with academic research on prevailing wage than the Wisconsin Taxpayers Alliance’s 44 percent claim. Estimates of reduction in wages and cost savings range are typically around 16 percent or 17 percent (Manzo et al., 2016). This section asks the following question: Assuming the 14.1 percent estimate by the Department of Revenue to be true, what would be the government revenue and government expenditure impacts of the projected wage cut?

Figure 2: Potential New Annual Wages Associated with 14.1 Percent Wage Cut, by Construction Trade

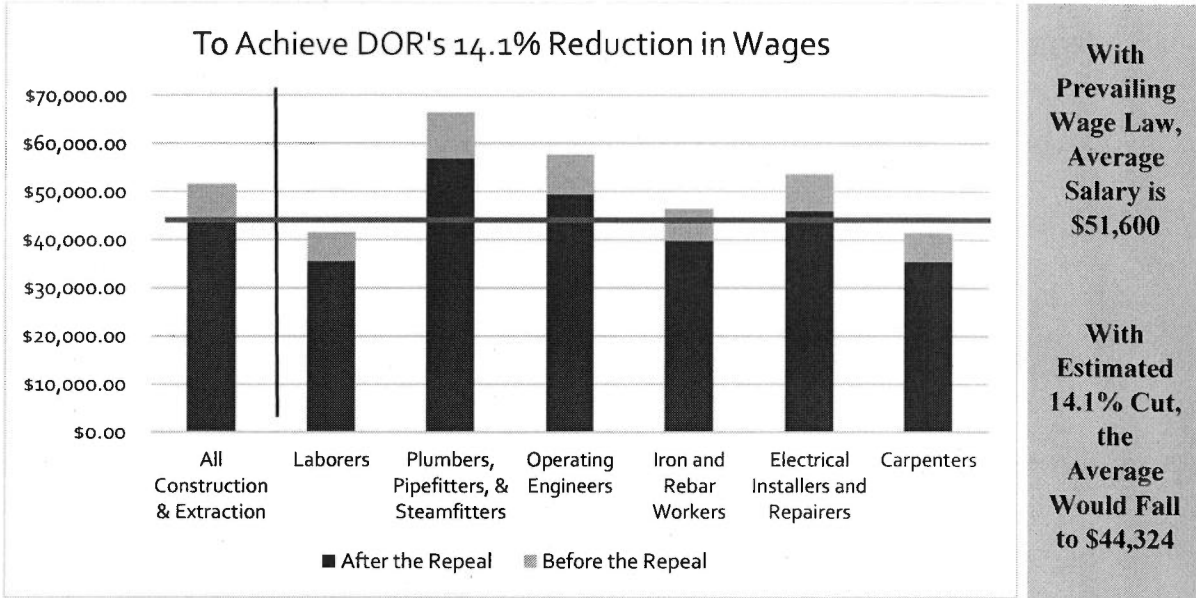


Figure 2 depicts a 14.1 percent average wage cut for workers in six construction trades and compares to the new earnings to the average for all construction and extraction occupations. Based on a \$51,600 average income, this wage cut would result in a new annual salary of \$44,324 per worker. An annual blue-collar salary of \$44,324 would result in a blue-collar construction worker from a family of four potentially qualifying for a number of government assistance programs, including all the previously-discussed programs. Note that Table 1 lists the programs and the maximum salary to qualify.

Table 4 presents estimates of the potential annual benefits that a construction worker earning \$44,324 could receive if he or she was the household head in a family of four. Note that the estimates in Table 4 are all derived from the same sources as those in the previous section of this report. At \$44,324 in household income for a family of four, a construction worker qualifies for \$11,507 in estimated financial help to purchase health insurance through the Health Insurance Marketplace (if the wage cut is also associated with a loss in health insurance coverage). The new income level also qualifies the worker and his or her family for \$2,976 in FoodShare assistance, \$1,237 in federal EITC relief, and \$136 in state EIC relief. Based on filing state and federal income taxes under the “married filing jointly” designation, the construction worker would pay \$456 less in state income taxes and contribute \$1,091 less in federal income taxes annually. Finally, the construction worker’s household would newly qualify for Wisconsin Home Energy Assistance Program (WHEAP) funds. As previously stated, the average WHEAP benefits received by a construction worker in a family of four with an income under the threshold is \$63 in heating assistance, \$23 in non-heating assistance, and \$13 in crisis assistance. Cumulatively, the total microeconomic social

cost of a 14.1 percent wage cut could potentially be \$17,502 in increased state and federal assistance expenditures and decreased tax revenues for one construction worker in a family of four.

Table 4: Potential Annual Benefits from Government Programs Due to 14.1 Percent Wage Cut, Family of Four

A Family of 4 Making Under \$44,324 Qualifies for These Programs	Government Program	Annual Benefits
	Affordable Care Act Health Insurance Marketplace*	\$11,507
	FoodShare Wisconsin	\$2,976
	Federal Earned Income Tax Credit	\$1,237
	State Earned Income Credit	\$136
	Estimated State Taxes Not Paid ¹	\$456
	Estimated Federal Taxes Not Paid ²	\$1,091
	Wisconsin Home Energy Assistance Program (WHEAP) ³	
	Heating	\$63
	Non-heating	\$23
Crisis Assistance	\$13	
Total Social Cost to Public Budgets		\$17,502

*Individual costs for silver plan of Affordable Care Act Health Insurance Marketplace is \$2,485 per year.

¹At \$51,600, estimated state income tax contributions would be \$2,935. At \$44,324, estimated state income tax contributions would fall to \$2,479, a difference of \$456 annually.

²At \$51,600, estimated federal income tax contributions would be \$6,813. At \$44,324, estimated federal income tax contributions would fall to \$5,722, a difference of \$1,091 annually.

³WHEAP Benefits estimated from 20.9 percent of households that qualify for WHEAP benefits and receive the benefits; crisis assistance estimated from 3 percent of households that qualify and receive crisis assistance benefits.

Table 5 depicts the total potential cost incurred to taxpayers based on the assumed 14.1 percent wage cut. Without prevailing wage repeal, a craft construction worker earns \$51,600 on average, pays more in taxes, and is self-sufficient. After the policy change, under these assumptions, the average worker wage would fall to \$44,324. If he or she is the household head of a family of four, the construction worker may now cost taxpayers an additional \$17,502 in government assistance and lost tax revenue.

Multiplying the individual social cost by the state and local share of public construction and by the total number of construction workers in Wisconsin, as demonstrated previously, indicates that prevailing wage repeal could cost up to \$224.0 million in additional public assistance costs and forgone tax revenue every year. This potential additional cost, which is based on the 14.1 percent wage decrease assumed by the Department of Revenue, once again shows how benefits costs are socialized onto taxpayers.

Table 5: Total Government Assistance and Lost Revenue from 14.1 Percent Wage Cut, Family of Four

Total Cost Now Incurred to Wisconsin	
Individual Social Cost to Public Budget	\$17,502
State and Local Share of Public Construction	x 17.0%
Total Number of Craft Construction Workers	x 75,300
Potential Increase in Total Social Costs	\$224,043,102

The potential social costs to the State of Wisconsin (independent of federal costs) can be estimated by multiplying the potential public benefits from the state in Table 4 by the state and local share of public construction and by the estimated number of workers. This yields the following results:

- The state could lose \$5.8 million in forgone income tax revenue;
- The state could provide approximately \$1.7 million more in EITC benefits; and
- FoodShare spending could rise by \$38.1 million.

Taxpayers do not save from repeal of prevailing wage, they *subsidize*.

Wisconsin Families At-Risk of Qualifying for Public Assistance Due to Prevailing Wage Repeal

This section applies the previous exercises to the actual construction workforce to estimate the increase in the number of Wisconsin families that would newly qualify for public assistance due to prevailing wage repeal. Recall that Wisconsin families of four qualify for FoodShare Wisconsin assistance with incomes at or below \$48,600 and for WHEAP assistance at or below \$50,336 (Table 1).

Table 6 presents a breakdown of family sizes for all men ages 25 to 54 in the construction labor force, including the employed and the unemployed. The analysis is limited to men because they account for over 97 percent of all individuals in the blue-collar construction labor force and to those ages 25 to 54 in order to provide estimates for able-bodied, working-age individuals. According to data from the 2015 *American Community Survey*, there are an estimated 20,221 men in the construction labor force who belong to families of four. Approximately 88.9 percent of these men are married and, of those, 80.5 percent of their spouses are employed in at least one job.

Table 6: Family Size and Incomes of Employed and Unemployed Male Construction Workers Ages 25-54, 2015

Family Size	Number of Men in Construction Labor Force	Married Men In Construction Labor Force	Share of Spouses Employed (If Married)	Average Construction Worker Income	Average Total Family Income*
1	29,521	2.8%	77.2%	\$37,942	\$41,049
2	21,935	69.2%	84.6%	\$44,804	\$77,218
3	19,208	69.8%	81.3%	\$46,443	\$89,073
4	20,221	88.9%	80.5%	\$48,811	\$90,664
5	9,294	88.5%	72.7%	\$48,408	\$86,958
6	2,904	83.0%	64.8%	\$49,076	\$81,746
7+	1,650	89.2%	51.2%	\$38,534	\$87,628

Source: 2015 *American Community Survey*, 5-Year Estimates (Ruggles et al., 2015).

*Total family income is pre-tax income or losses from all sources for the previous year and includes wage and salary income, business income, Social Security income, welfare and supplemental income, investment income, retirement income, and other forms of income.

**Female workers comprise just 2.3 percent of all construction workers ages 25 to 54 in Wisconsin. The estimated number of female construction workers between the ages of 25 and 54 is 2,457. Approximately 44.8 percent of these female workers are married and 91.3 percent of their spouses are employed. Their average household income is \$49,165 annually.

Table 7 further investigates these families of four, focusing only on employed male construction workers ages 25 to 54. Unemployed construction workers are not included in the Table 7 estimates. The data reveals that the average annual income for employed male construction workers is \$51,300 and their average total family income is \$90,867. Male construction workers in families of four on average account

for 56.5 percent of their total family incomes— which can include business and investment income, government assistance income, and other sources of income.

Table 7: Distribution of Incomes of Employed Male Construction Workers Ages 25-54 in Families of Four

Employed Construction Workers in Families of Four (Male Workers)	Total Family Income*	Construction Worker Income	Construction Worker Share of Family Income, Average
Bottom 5%	\$32,986	\$12,210	37.0%
Bottom 10%	\$39,684	\$21,077	53.1%
Bottom 25%	\$63,338	\$35,040	55.3%
Median Worker	\$84,000	\$50,000	59.5%
Top 25%	\$110,000	\$63,232	57.5%
Top 10%	\$139,402	\$80,000	57.4%
Top 5%	\$164,469	\$90,844	55.2%
Average	\$90,867	\$51,300	56.5%

Source: 2015 *American Community Survey*, 5-Year Estimates (Ruggles et al., 2015).

*Total family income is pre-tax income or losses from all sources for the previous year and includes wage and salary income, business income, Social Security income, welfare and supplemental income, investment income, retirement income, and other forms of income.

The bottom 25 percent of construction workers in families of four are most at-risk of requiring government assistance (Table 7). The bottom 25 percent by total family income take home \$63,338 annually or less, with the male construction worker earning \$35,040 per year or less (55.3 percent of the total family income). Currently, the bottom 10 percent of families of four with a construction worker earn \$39,684 per year or less and already qualify for government assistance programs.

If prevailing wage were repealed in Wisconsin, between 4.5 percent and 11.9 percent of all construction workers in families of four would newly qualify for public assistance (Table 8). This is *in addition to* the families who already qualify. Based on the modest 14.1 percent projected reduction in wages, families with incomes between \$48,600 and \$54,500 would be most at-risk of falling below the government assistance threshold levels. For example, if – consistent with Table 7 – a male construction worker accounts for 55 percent of his family income of \$54,500, then that means the construction worker annually earns \$29,975 while spousal earnings and other forms of income account for the remaining \$24,525. A 14.1 percent average reduction in the construction worker’s earnings would equate to a \$4,226 drop in income. As a result, total family income would fall to \$50,274 annually, low enough to qualify for WHEAP public assistance.

The wage cut would mean that hundreds of families currently earning \$48,600 to \$54,500 would qualify for WHEAP, the EIC, and FoodShare assistance. In fact, the data indicates that an estimated 787 Wisconsin families of four with a construction worker aged 25 to 54 would qualify for some form of government assistance, or 4.5 percent of all families of this type. The estimate is even larger if the 44 percent reduction by the Wisconsin Taxpayers Alliance is considered. Approximately 2,083 Wisconsin families of four would fall below thresholds necessary to receive public assistance, or 11.9 percent of all families in this category with an employed construction worker aged 25 to 54 (Table 8). Note that an estimated 14.5 percent of families of four with employed blue-collar construction workers earn less than \$48,600 and already qualify for the majority of public assistance programs.

This analysis focused on construction workers in families of four due to the complexity of the government assistance thresholds based on different family sizes. However, despite being limited to families of four, this example has broad implications because it provides government assistance estimates

that effectively control for other factors, such as gender, age, and family size (by analyzing male workers aged 25 to 54 in families of four). Using actual economic data on construction workers in Wisconsin, Table 8 suggests that between 4 percent and 12 percent of construction workers in Wisconsin would newly qualify for government assistance, depending on the severity of the wage cut associated with repealing prevailing wage. This is on top of the 14.5 percent of construction workers that already qualify for government assistance.

Table 8: Families of Four with Employed Male Construction Workers Ages 25-54 Qualifying for Public Assistance and those at Risk of Qualifying for Public Assistance due to Prevailing Wage Repeal

Families of Four with a Construction Worker that Qualify for or Will Qualify for Public Assistance	Number of Families	Share of Families
<i>14.1 Percent Wage Cut</i>		
Currently Qualify: Family Income Less than \$48,600	2,520	14.5%
At-Risk: Family Income of \$48,600 to \$54,500	787	4.5%
<i>44 Percent Wage Cut</i>		
Currently Qualify: Family Income Less than \$48,600	2,520	14.5%
At-Risk: Family Income of \$48,600 to \$66,000	2,083	11.9%

Source: 2015 *American Community Survey*, 5-Year Estimates (Ruggles et al., 2015).

The estimates generally align with previous peer-reviewed research on the impact of state prevailing wage laws (Manzo et al., 2016). Table 8 indicates that a 14.1 percent wage cut would increase the number of families *qualifying* for public assistance by 4.5 percent. Given that many people who qualify for public assistance do not actually receive it for a number of reasons, the share receiving assistance would be lower. In an advanced regression analysis using economic data on construction workers across the United States, researchers found that repeal of prevailing wage increases the number of construction workers below the official poverty line by 3 percentage points, reduces the share covered by a health insurance plan at work by 10 percentage points, increases the share actually receiving food stamps by 3 percentage points, and increases the share of construction workers actually getting EITC assistance by 1 percentage point.

Though precise estimates on the total social cost of repealing prevailing wage in Wisconsin are difficult to project, one takeaway is clear from the worst-case scenarios and from the case study of families of four: repeal of prevailing wage will cost taxpayers money.

Repeal of prevailing wage would result in a wage cut for working-class Wisconsin residents. That wage cut would reduce income tax revenue and—through decreased consumer spending—sales tax revenue contributed by blue-collar construction workers in the state. A significant share of construction workers, potentially between 4 percent and 12 percent, would newly qualify for government assistance programs. Some portion of new qualifiers will apply for and receive public assistance, raising costs to taxpayers while revenues to pay for those new expenditures simultaneously declines. Repealing prevailing wage would have substantial social costs.

Discussion and Conclusion

Much of this thought experiment is intuitive: When a worker's wages are cut, he or she tends to contribute less in state and federal income taxes. If his or her overall consumption declines as well, he or she will also pay less in sales taxes. At the same time, a worker becomes more likely to qualify for and rely on government assistance when wages are cut. The larger the income loss, the more likely the individual or family will be to receive public support. This explains why previous research finds that repealing prevailing

wage increases the likelihood that any given construction worker receives food stamps by 3 percentage points and receives Earned Income Tax Credits by 1 percentage point (Manzo et al., 2016).

If construction workers were to see their wages decrease by 14.1 percent to 44 percent, as assumed by critics of prevailing wage in Wisconsin, some would decide to leave their positions in the industry for better-paying jobs. Research indicates that when wages decrease in construction, less-skilled workers replace skilled workers. This helps explain why public construction workers are 21 to 33 percent more productive in states that have prevailing wage laws (Philips, 2014). In addition, when wages are higher, contractors reduce materials costs, rental equipment costs, and profit margins to keep bids competitive in the market. These changes help explain why economic research finds no evidence that prevailing wage increases construction costs (Manzo et al., 2016). If Wisconsin repeals its prevailing wage law, its public construction industry could be flooded with unskilled labor and out-of-state contractors at the same time the highly skilled Wisconsin workers leave the construction workforce or the state.

Potential tax revenue losses and government assistance expenditure increases must be accounted for in any cost-benefit analysis in the prevailing wage debate. If repeal of prevailing wage would result in an average wage cut of 14.1 percent to 44 percent for blue-collar construction workers employed on public projects, then more working-class Wisconsin residents will qualify for and receive public assistance. Results from this analysis indicate that a construction worker who is the household head of a family of four would cost public sector budgets thousands of dollars in new public assistance expenditures and forgone income tax revenues. Additionally, economic data suggests that, depending on the severity of the wage cut, between 4 percent and 12 percent of construction workers in Wisconsin would newly qualify for government assistance. Scaled up to the macroeconomic level, the social costs of repealing prevailing wage are undeniably in the millions of dollars.

With critics of Wisconsin's prevailing wage law emphasizing speculative taxpayer savings in their efforts to repeal the policy, the social cost of repealing prevailing wage must be considered by elected officials. Though precise estimates on the overall social cost are difficult to project, one takeaway is clear: Repeal of prevailing wage is a bad deal for taxpayers. Taxpayers do not save from repeal of prevailing wage, they subsidize.

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