The Beacon Hill Institute

Project Labor Agreements and the Cost of School Construction in Ohio

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A project labor agreement (PLA) is an agreement between construction unions and contractors employed on a building project under which the firms adhere to specified work rules and hiring procedures. Typically, PLAs require that all workers be hired through union halls, that nonunion workers join a union and/or pay dues for the length of the project and that union rules apply to work conditions and dispute resolution. Seeking to gain a competitive advantage for signatory contractors during the procurement of contracts for construction services, labor unions actively lobby governments to require PLAs in order to secure work for their members represented by approximately 20 different construction trade unions on a typical school project funded by taxpayer dollars.

The Beacon Hill Institute has completed an extensive statistical analysis of the effects on school construction bids and costs of PLAs in Massachusetts, Connecticut and the state of New York. In both the Massachusetts and Connecticut studies, our analysis found final construction costs to be significantly higher when a school construction project was executed under a PLA. In the New York study, we found that final bids for construction projects were higher under a PLA.[1]

This report applies a similar analysis to school construction projects in the state of Ohio. We have applied the methodology and procedures used in our earlier studies to school construction projects undertaken in Ohio since 2000. We based our findings on a sample of 88 schools.

We find that the presence of a PLA increases the final base construction costs of a school in our sample by $23.12 per square foot (in 2016 prices) relative to non-PLA projects. Because the average cost per square foot of construction is $176.23, PLAs raise the base construction cost of building schools by 13.12 percent.

We adjust for inflation by using the U.S. Department of Labor's Bureau of Labor Statistics index for "New School Building Construction."[2] In order to separate the effects of PLAs on

construction costs from other factors affecting construction costs, we use several control variables to obtain our results. In this study, our control variables are: the size of the project (in square feet), the number of stories above grade and variables that indicate whether the school includes a gym, theater, auditorium or multiple cafeterias, whether the school is an elementary school or not and whether the school was built new or renovated.[3]

Our findings show that the potential savings from not utilizing a PLA on a school project range from $2.31 million for a 100,000-square-foot structure to $6.94 million for a 300,000-square-foot structure. Given ongoing budget constraints and the uncertainties of revenue forecasts, Ohio policymakers and taxpayers should carefully consider these substantial additional costs when determining whether PLAs are best for school construction projects in their towns or school districts.

Introduction

PLAs are a form of a "pre-hire" collective bargaining agreement between contractors and labor unions pertaining to a specific project, contract or work location. They are unique to the construction industry. The terms of a PLA generally recognize the participating unions as the sole bargaining representatives for the workers covered by the agreements, regardless of their current union membership status. They require all workers to be hired by general contractors and subcontractors through the union hall referral system. Nonunion workers must join the signatory union of their respective craft and/or pay dues for the length of the project. The workers' wages, working hours, dispute resolution process and other work rules are also prescribed in the agreement. PLAs supersede all other collective bargaining agreements and prohibit strikes, slowdowns and lockouts for the duration of the project.[4]

PLAs can be mandatory, that is, required by a government entity such as a school board, as a condition of bidding and winning a contract to perform construction services on a project, or agreed to voluntarily by contractors participating in an open and competitive bidding process. Mandatory PLAs are anti-competitive insofar as they discourage open shop contractors from bidding on projects to which the PLAs are attached. Voluntary PLAs are less likely to raise costs insofar as winning bidders would not agree to follow union rules and hiring procedures unless it was cost effective to do so and unless it therefore made bidders more efficient by negotiating the terms and conditions of the PLA directly with unions.

Three studies by the Beacon Hill Institute (BHI), found that the presence of PLAs increased construction bid costs over non-PLA projects in Massachusetts, Connecticut and New York.[5] Of the three, the studies of Massachusetts and Connecticut showed that they increased final construction costs as well. Other researchers have found similar results.

A study conducted by the New Jersey Department of Labor found that the "cost per square foot for all PLA projects was $260.00, or 30.5 percent higher than for non-PLA projects, which

averaged $199.19 per square foot" on school construction projects in New Jersey.[6] A study by National University on school construction projects in California found that costs were "13 to 15 percent higher when school districts construct a school under a PLA."[7]

The current study extends our research of PLAs to school construction projects that took place in the state of Ohio since 2000. Our methodology is similar to that used in our earlier studies.

Historical Background on PLAs

PLAs in the United States originated in the public works projects of the Great Depression, which included the Grand Coulee Dam in Washington State in 1938 and the Shasta Dam in California in 1940. Since World War II, PLAs have continued to be used on a limited basis for some large construction projects procured by government entities, from the construction of the Cape Canaveral Space Center in Florida to the Central Artery project (the "Big Dig") in Boston. PLAs used on prominent private sector projects include the Alaskan Pipeline and Disney World in Florida.

The Arguments Against and For PLAs

Government-mandated PLAs on publicly-financed construction projects are typically issued after lobbying campaigns from labor unions to help them regain lost market share. The logic of mandating PLAs is, however, increasingly dubious in view of the decline of union membership across the workforce and particularly in the construction sector. Only 13.9 percent of the U.S. private construction workforce currently belongs to unions.[8]

PLAs typically require that general contractors and subcontractors must hire all construction trade labor via union halls and union apprenticeship programs, pay union dues, contribute to union-sponsored retirement plans and follow union work rules. PLAs force contractors to hire union workers in place of most, if not all, of their own workforce. The contractors and any

existing employees are required to contribute to union benefit plans even if they cover their own workers under their own plans. The work rules restrict the contractors from using their own, often more flexible, operating rules and multiskilling procedures across multiple trades with their own nonunion employees. These restrictive conditions cause costs to rise for a project subject to a government-mandated PLA.

Merit shop (nonunion or open shop) contractors contend that their competitive advantages are nullified by a PLA even as they comply with other mandates such as prevailing wage laws. The result is that in practice, if not in principle, they are unable to bid competitively on jobs that have a PLA requirement. In turn, the absence of open shop bidders for PLA projects results in fewer bidders for the project, and with fewer bidders, the lowest bids come in higher than if open shop contractors had participated. Therefore, the cost of the project will be higher, with fewer bidders attempting to under-bid each other for the contract. Some opponents also argue that requiring a PLA violates state competitive bidding laws that require a free and open bidding process.

Proponents of PLAs counter with the argument that PLAs keep projects on time and on budget and that they help assure the use of qualified, skilled workers on a project. They argue that the agreements provide for work conditions that are harmonious by eliminating inefficiencies in existing union collective bargaining agreements and that they guarantee predictable wage costs for the life of the contract. They contend that the combination of work rules and provisions that prohibit strikes, slowdowns and lockouts keeps the project on time and prevents cost overruns due to delays. They argue, furthermore, that the wage stipulations allow firms to accurately estimate labor costs for the life of the project and to thus keep the project on budget.[9]

Proponents also argue that the work rules, such as overtime and vacation pay under PLAs are often less generous than the collective bargaining agreements for some trades. Thus, if a PLA stipulates that overtime pay begins only after 40 hours per week, and not after eight hours per

day, as in some collective bargaining agreements, then the PLA will produce savings on overtime costs.

Advocates insist that the union rules allow for a safer work environment, thereby reducing accidents and thus lowering the number of workers' compensation claims. In addition, they claim workers' union certifications and apprenticeship training programs ensure the quality of the work and save money by avoiding costly mistakes. These features, they argue, save money in the long run by keeping projects on budget by reducing cost overruns. In addition, proponents assert that through union apprenticeship programs PLAs help assure local workers are hired and trained.

Such claims, against and for PLAs, are, however, merely anecdotal. It is the owner's responsibility, in awarding and soliciting bids for a project, to specify the terms of the contract, including completion time and the expected quality of the work to be performed. When the owner is a public entity that is responsible for several or many construction projects over a long-time horizon, that entity should turn to the data to determine whether the practice of mandating a PLA does, in fact, reduce costs as the unions claim. This study provides data aimed at answering that question.

Legal Background

The controversy over the use of PLAs in public construction projects has become more intense over the past three decades, with the filing of a myriad of court challenges from both sides of the argument.

In 1993, the United States Supreme Court's *Boston Harbor* decision raised the stakes over the use of government-mandated PLAs on public projects. In 1988, a federal court ordered the Massachusetts Water Resources Authority to fund the cleanup of Boston Harbor. The Authority's project management firm, IFC Kaiser, negotiated a PLA with the local construction

unions for the multibillion-dollar cleanup effort funded by taxpayer dollars. In a move that set precedent, IFC Kaiser mandated a PLA as part of the project's bid specifications.[10] As a result, a nonunion trade group filed a lawsuit contending that the PLA requirement in the bid specification violated the National Labor Relations Act (NLRA). However, the United States Supreme Court held that a state authority, acting as the owner of a construction project and as a market participant purchasing construction services, was legally permitted to enforce a pre-hire collective bargaining agreement negotiated by private parties.[11] Since the *Boston Harbor* decision, most PLA litigation has centered on the competitive bidding requirements of state and local law.

New York State Chapter ABC, Inc. v. *New York State Thruway Authority* provided another significant ruling that affected the use of PLAs. The court ruled that PLAs are "neither absolutely prohibited nor absolutely permitted" on public construction projects in New York and that they should be considered on a case-by-case basis. The court ruled that the public owner of a construction project in New York must demonstrate that a PLA upholds the principles of the state's competitive bidding statutes and protects the public's interest by obtaining the lowest price for the highest quality work, and prevents "favoritism, improvidence, fraud and corruption in the awarding of public contracts."[12]

PLAs at the Federal Level

President George H.W. Bush's October 23, 1992, Executive Order 12818, "Open Bidding on Federally Funded Construction Projects" was the first serve in a ping pong match that ensued after the *Boston Harbor* court case. The executive order prohibited federal agencies from requiring PLAs on federal construction projects.[13]

Then, on February 1, 1993, President Clinton issued Executive Order 12836, "Revocation of Certain Executive Orders Concerning Federal Contracting," rescinding President H.W. Bush's Executive Order 12818.[14]

After his reelection, President Clinton attempted to implement a pro-PLA executive order that ordered federal agencies to determine if a PLA would "advance the government's procurement interest[s]" on federal construction projects and then implement them on a project-by-project basis. However, that executive order was never signed.[15] After extensive political pressure from the Republican controlled U.S. Senate, President Clinton instead issued a June 5, 1997 memorandum that merely encouraged the use of PLAs on contracts over $5 million for construction projects, including renovation and repair work, for federally owned facilities.[16]

Subsequently, few projects were conducted under government mandated PLAs because the regulatory process that established the rules in which the federal government could require and use PLAs delayed implementation of the Clinton memo. In addition, few federal agencies opted to mandate PLAs on federal construction projects, as documented in a May 5, 1998, *U.S.* Government Accounting Office (GAO) report: *Project Labor Agreements: The Extent of Their Use and Related Information*. The GAO report found that it is nearly impossible to show any savings or increased quality derived from the use of government-mandated PLAs.[17]

In a February 17, 2001, under Executive Order 13202, President George W. Bush canceled the Clinton order by effectively prohibiting government-mandated PLAs on federal and federally assisted construction projects. The executive order declared that neither the federal government, nor any agency acting with federal assistance should require or prohibit construction contractors to sign union agreements as a condition of performing work on government contraction project.[18]

On April 6, 2001, the Bush Administration amended Executive Order No. 13202 with Executive Order No. 13208, which exempts any project that has had at least one contract awarded with a PLA from Executive Order 13202.[19]

Some of largest unions in the country, including the AFL-CIO, insisted that the order illegally interfered with their collective bargaining rights under the NLRA. They filed suit in federal court (*Building & Construction Trades* v. *Allbaugh*), and on November 7, 2001, a United States

District Court Judge issued an injunction blocking the President's order. The Justice Department appealed and, the U. S. Court of Appeals for the District of Columbia overturned the lower court decision and ordered the judge to lift the injunction on July 12, 2002. In handing down its decision, the appeals court found that the NLRA did not preempt the executive order as the AFL-CIO argued.[20] The unions disagreed and filed to have the case reviewed by the United States Supreme Court. In April 2003, the Supreme Court declined to review the case, and the President's 2001 executive order remained in place.[21]

On February 6, 2009, shortly after entering office, President Obama issued Executive Order 13502, which changed federal government's policy to one that encouraged executive agencies to consider requiring, on a case-by-case basis, the use of PLAs related to large-scale construction projects (projects where the federal cost exceeded $25 million).[22] The executive order claimed that, without a PLA, large-scale construction projects are likely to experience (1) labor "disputes," (2) difficulties in predicting labor costs and in avoiding interruptions in labor supply, (3) a lack of coordination on construction projects and (4) uncertainty about the terms and conditions of employment of workers – all of which ostensibly lead to delays and cost overruns.[23] If this were true, then federal construction projects initiated during the George W. Bush Administration's ban on PLAs should have been rife with labor disputes leading to cost overruns and delays.

That was not the case, however. A 2009 study by the Beacon Hill Institute found no evidence of any labor disputes or delays on the $57 billion of federal construction projects with a price over $25 million during George W. Bush's presidency.[24]

The U.S. Department of Labor selected Manchester, New Hampshire to build a new Jobs Corps Center in 2009, with a PLA mandate. However, nonunion contractors complained that many New Hampshire construction contractors were nonunion and that the PLA would favor contractors from out of state. A nonunion contractor filed a bid protest with the GAO against the PLA mandate, and in the face of political pressure and an unfavorable ruling against the

Labor Department, the PLA was eventually dropped and the project rebid without a PLA. This produced three times as many bidders and bid prices that were 16 percent lower, ultimately saving taxpayers $6.2 million and allowing a local company to deliver the award-winning project on-time and on budget. [25]

Similar successful protests against proposed PLA mandates on federal projects resulted in relatively few PLAs being mandated on large-scale federal projects during the Obama administration. Roughly 12 large-scale federal contracts (totaling $1.256 billion) were subject to PLA mandates or preferences compared to 1,173 contracts (totaling $64.99 billion) without government-mandated PLAs. However, an unknown number of PLA mandates have proliferated on federally assisted projects procured by state and local governments. For example, according to a February 2017 report by the U.S. Department of Transportation's Federal Highway Administration (FHWA), over the last seven years, state and local government authorities mandated PLAs on 382 similar state and local contracts (totaling $8.7 billion) receiving federal assistance from the FHWA.[26] To date, the Trump administration has not taken any action on PLAs.

State governments also have enacted legislation on the use of PLAs. A total of 23 states have enacted measures restricting the use of government-mandated PLAs on state, state-assisted and local construction projects to some degree. Since 2011, 21 states enacted measures following the Obama administration's pro-PLA policy. Roughly eight states have enacted measures encouraging the use of PLAs on a case-by-case basis.

PLAs in Ohio

The *Boston Harbor* decision opened the door for PLAs on public construction projects throughout the country, including the state of Ohio. PLAs were implemented on public construction projects in Ohio cities and towns, including City of Steubenville Joint Jail Facilities (1996), first responder facilities in Parma Heights (2003), North Olmstead (2005), Maple Heights

(2005), Parma (2006) and Madison (2012) and several courthouses, libraries, schools and the Cleveland Hopkins Airport in 2011. Private sector construction owners have also utilized PLAs on projects, such as MBNA, Keycorp, University Hospitals Research Institute, Cleveland Museum of Art and the Cleveland Clinic. [27]

The debate over PLAs has gone on for decades in Ohio. As the percentage of private construction workers covered by a union contract fell from 35 percent in 1983 to 23.2 percent in 2016, PLAs have become less and less easy to justify.[28]

In 1999, Ohio House Bill (H.B.) 101, which included provisions that banned PLA requirements on public construction projects in Ohio, passed both branches of the Ohio Legislature and was set to become law. The Cuyahoga County Board of Commissioners and local union affiliates sued to block the law. The Ohio Supreme Court struck the law as unconstitutional.[29]

The use of PLAs in Ohio became more controversial with the appointment of Richard Murray, a member of Local 423 of the Laborers' International Union of North America, as Executive Director of the Ohio School Facilities Commission (OSFC), by Governor Strickland. Murray advocated for PLAs and approved one for the Ohio State School for the Blind and the Ohio School for the Deaf. However, initial construction bids for the project came in 40 percent over budget. Murray subsequently removed the PLA requirement, and construction bids fell by 22 percent below the previous bids. Murray's promotion of PLAs raised much more controversy.[30]

Murray used his position to pressure school districts into requiring PLAs on school projects. However, towns, such as Clay, complained about strong-arm tactics by local union organizers. In addition, the school superintendent of the town of New Boston accused the OSFC of stalling on "a school construction project after the board ignored the former director's (Murray) urging it to adopt a PLA."[31]

As a result, the Ohio Inspector General's Office (IGO) investigated and issued a report in 2010. The IGO report stated that Murray's behavior included "repeated displays of misfeasance in carrying out his duties." Under the current Kasich administration, the OSFC has banned local officials from mandating a PLA on school construction projects that use commission funding. [32]

The town of Lorain held a public hearing on whether it would utilize PLAs on construction projects. The city council approved a measure requiring PLAs in 2011. However, in 2013, the City Council met again and adopted a measure scrapping the PLAs, as they found that the PLAs weren't honoring the promises of local labor leaders. After the vote, Safety-Service Director Robert Fowler said a rule mandating PLAs was "bad public policy and needed to be repealed." Councilman Brian Gates, who supported the PLAs and voted against the measure, registered his "disappointment."[33]

Members of the Ohio Legislature attempted to ban government mandated PLAs on public construction projects in both 2015 and 2016. In 2015, House Bill 64 initially contained amendments that prohibited state and local governments PLAs, but the final version did not contain that provision.[34]

In 2016, Senate Bill 152 would have prohibited cities from establishing residency requirements for local construction projects and included an amendment that banned government mandated PLAs. House Minority Leader Fred Strahorn (D-Dayton) said Senate Bill 152 would likely be unconstitutional and violate cities' home rule authority. The measure passed the Ohio House of Representatives in May but failed in the Senate.[35]

The Ohio Prevailing Wage Statute affects the use of PLAs on Ohio public school construction projects because these projects have been exempt from paying the state prevailing wage since 1997.

The Ohio Prevailing Wage Statute sets the "rate of wages to be paid for a legal day's work to employees upon public works as not less than the collective bargaining rates in the applicable locality under collective bargaining agreements."[36] However, a PLA essentially supersedes the prevailing wage law exemption for school construction by setting the wage schedule to that of rates contained in the collective bargaining agreements of trade unions signatory to the PLA.

Under a 1997 law, the Legislative Service Commission (LSC) of Ohio issued a report in 2002 that found the prevailing wage exemption for public school construction reduced construction costs by 10.7 percent without compromising construction quality or construction wages. Subsequent researchers and union officials dispute the report findings. [37]

Evidence on PLAs

The evidence on whether PLAs drive up construction costs has, until recently, been largely anecdotal. The claims outlined above, fall into two categories: one, those that depend on the estimates by consultants that were made in the pre-bid stage of a project, with no attempt made to verify their cost saving claims after the fact; or, two, those for which the cost analysis was restricted to only one project as in the New Hampshire Jobs Center case. No "analysis" of that kind provides any quantitative evidence that PLAs increase or reduce construction costs.

However, it is possible statistically to test whether PLAs raise construction costs by using the approach taken in our previous studies. In this study, we present data that relates to Ohio public school building projects. In the next section, we review our variables, data sources and the methodology. We then report the results of our regression analysis and the cumulative effect of these results on the construction costs.

Data Sources

The central database of the Ohio Facilities Construction Commission (OFCC) lists public school construction projects receiving reimbursement from the state. Unfortunately, this database does not contain all the information necessary for estimating the effects of PLAs on construction costs.[38] It does provide information on district-wide school construction projects, including estimated cost, the size of the projects and contact information for town and school district officials, construction companies and architectural firms. Still, it does not break out the data by individual school projects, but rather includes data for multi-school projects broken out by municipality or school district.

Using the OFCC and other information, we began our own data collection and assembled our own database. We limited our search to construction projects over $1 million. To obtain data on these projects, we contacted municipal officials, architects and contractors and requested data for each school construction project, including the base construction bid, final actual base construction cost (if the project was completed), the size of the project measured in square feet, whether there was a PLA requirement for the project (and whether the requirement was mandatory or not), the nature of the construction work (new versus addition or renovation), the type of school (elementary, middle or high school, Pk-12), the number of stories above grade and the year construction was completed. We also asked if the school project contained features that might make the school more expensive, such as the presence of a gym, theater, auditorium, swimming pool, multiple cafeterias or other high-cost features.[39] Virtually all the information arrived as written responses (letters, e-mails, faxes, etc.). All the sources and dates have been recorded. (A copy of our letter is included in the Appendix.)

Adjusting for Inflation

Our sample covers the period 2000 to the present. To compare the construction costs of PLA with non-PLA schools, it was necessary to correct for the fact that construction costs rose during

this period. We used the U.S. Department of Labor's Bureau of Labor Statistics index for "New School Building Construction" to make the needed correction. Because the index begins in 2005, we used the compound annual growth rate (CAGR) of 3.8 percent for all years from 2005 to present as the growth rate for the years 2000-2004.

Comparing PLA to Non-PLA Projects

Table 1 compares the characteristics of the school construction projects in towns with a PLA ("PLA projects") with those where there was no such agreement ("non-PLA projects").

Table 1: Summary Statistics for Construction Projects by PLA Status

Variable	Final construction cost (2016 $ millions)	Size of project (square feet)	Construction final cost/square foot (2016 $) *	Number of stories
Mean				
PLA	$16.39	83,103	$199.49	1.93
Non-PLA	$16.60	98,226	$171.45	2.04
Standard Deviation				
PLA	$9.72	33,289	$47.55	0.26
Non-PLA	$9.79	54,520	$43.33	0.82
Minimum				
PLA	$2.51	11,000	$127.52	1
Non-PLA	$6.46	51,000	$89.67	1
Maximum				
PLA	$26.90	129,823	$267.11	2
Non-PLA	$46.91	253,931	$250.03	6

Total sample size is 88, with 15 PLA projects and 73 non-PLA projects. Costs are measured in 2016 dollars; see text for details.

A notable pattern in the data is that PLA projects, on average, cost $28.04 ($199.49 minus $171.45) more per square foot (in 2016 prices) than non-PLA projects.

However, this is not conclusive, because it is possible that PLA projects are systematically different – for instance larger, or concentrated on new buildings rather than renovations. A formal regression analysis allows us to determine whether the difference in PLA versus non-

PLA projects is robust to differences in project size and type. To capture the effect of economies of scale, we include a variable consisting of the square footage of construction, which ensures that the effect of additional size diminishes as the project becomes bigger. In addition, we include a measure of the number of stories, the presence of a gym, theater, auditorium, and multiple cafeterias. We also accounted for other features such as whether the project involved the construction of a new school or the renovation of an existing school and whether the project is an elementary school. In our regressions, the dependent variable is the final cost per square foot of construction (in 2016 prices). The most critical independent variable is a dummy variable that is set equal to 1 for PLA projects and to 0 otherwise. The ordinary least squares regression results are presented in Table 2.

Our results show that the PLA projects added $23.12 per square foot (in 2016 prices) to the final construction cost. The important point here is that this amount represents the effect of PLA projects after controlling for other measurable influences on costs; these other influences are important for explaining why construction costs differ from project to project. The estimates in Table 2 show that it matters whether the project is built under PLA arrangements.

Table 2: Ordinary Least Squares Estimation of Real Construction Costs Per Square Foot

Variable	Coefficient	Standard error	p-value (one-tailed test)
Constant	97.08	35.89	0.000
PLA	23.12	13.01	0.039
Gym	34.39	8.85	0.000
Theatre	38.10	43.05	0.118
Multiple cafeterias	-101.18	41.63	0.001
Square-feet squared	-1.02	1.04	0.241
Elementary	-0.557	10.63	0.479
Stories	8.54	7.21	0.120
Square-feet	0.0001	0.0002	0.382
Auditorium	6.22	16.07	0.350

New	8.02	22.97	0.364

Adjusted R^2 is .207. Sample size is 88.

A formal (one-tailed) test of the statistical significance of the PLA coefficient gives a p-value of .039, which means that there is less than a 4 percent chance that we have accidentally found that PLA projects are more expensive than non-PLA projects. Put another way, there is at least a 96.1 percent probability that PLA projects are more expensive than non-PLA projects, holding other measurable aspects of a project constant.

The equation also shows that projects with a gym are more expensive, as are schools with a theater. The negative coefficient for square feet squared captures the effect of economies of scale on cost. The one surprising result is that the inclusion of more than one cafeteria reduces cost per square foot. One explanation is that schools large enough to have more than one cafeteria are exhibiting the same economies-of-scale effect that is shown by the square-feet-squared variable.

With an adjusted $R^2 = 0.207$, the equation "explains" 20.7 percent of the variation in construction bid costs across projects. Clearly, other factors also influence the cost of construction – the exact nature of the site, the materials used for flooring and roofing, the outside finish and the like. But as a practical matter, it is impossible to collect data on every factor that increases or decreases cost. Our specification is no different from any other specification in recognizing this fact.

For the PLA effect shown here to be overstated, it would have to be the case that PLA projects systematically use more expensive materials, or add more enhancements and "bells and whistles," than non-PLA projects. Our conversations with builders, town officials and architects suggest that PLA projects are not systematically more upscale. This gives us confidence that the PLA effect shown here is real. Furthermore, we attempted to ascertain the prevalence of elements that might make a project more expensive in our data collection process.

Robustness

It is helpful to explore the robustness of our results. In other words, is there still a PLA effect if we look only at elementary school construction projects or at small, medium or large projects? The results of this exercise are summarized in Table 3.

Table 3: Regression Estimates of the "PLA Effect" For Different Sub-Samples and Model Specifications

Sub-sample	PLA effect ($/sq ft)	p-value	Other variables included	Sample size (# of PLA projects)	Adjusted R^2	Mean cost/sq ft	
						Non-PLA projects	PLA projects
Final costs (baseline)	23.12	0.039	Gym*, theater*, stories, sqrft, elementary, new, auditorium, multiple cafes*, sqrft squared	88(15)	.21	171.456	199.50
Project bid costs	25.058	.026	Gym*, theater*, stories*, sqrft*, elementary*, new, auditorium*, multiple cafes*, sqrft squared	84(15)	.55	160.56	172.10
Small projects only	33.58	.011	Gym*, theater*, stories*, sqrft*, elementary*, new, auditorium*, multiple cafes*, sqrft squared	56(9)	.41	177.32	202.21
Medium projects only	27.05	.022	Gym*, theater*, stories*, sqrft*, elementary, new*, auditorium, multiple cafes*, sqrft squared*	78(14)	.23	172.81	199.50
Large projects only	13.82	.336	Gym, theater*, stories, sqrft, elementary, new, auditorium, multiple cafes*, sqrft squared	33(6)	-.025	160.84	195.43
Elementary schools only	24.57	.046	Gym, theater*, stories, sqrft, elementary, new, auditorium, multiple cafes*, sqrft squared	53(15)	.49	176.34	198.62
Middle & HS only	13.91	.353	Gym, theater*, stories, sqrft, new, auditorium, multiple cafes* sqrft squared	35(7)	.06	163.19	208.62
Weighted by Sqrft	14.42	.000	Gym, theater, stories, sqrft, elementary, new, auditorium, multiple cafes, sqrft squared	88(15)	.19	168.54	197.21

Notes: sqrft = square footage for each project; stories is the number of stories above ground; elementary = 1 if elementary school, 0 if junior high or high school; gym =1 if school has a gym, 0 if not; theatre =1 if school has a theatre, 0 if not; auditorium = 1 if the school has an auditorium, 0 if not; multiple cafes = 1 if school has multiple cafeterias, 0 if not; new=1, if school is new construction, 0 if school is a renovation; sqrft squared is square footage for each project squared. * denotes statistical significance.

The first column indicates the sample, or sub-sample, used in estimating the regression equation. We performed this analysis by running separate regressions for the following samples:

1. the "baseline" sample, which consists of all the cases for which information was available on final construction costs; this was also used to give results weighted by project size ("weighted by sqrft");
2. small projects, medium size projects and large projects;
3. elementary and non-elementary schools; and
4. a sample consisting of the cases for which information was available on bid costs.[40]

The "PLA effect" column shows the estimate of the effect of having a PLA on the cost of construction (in dollars per square foot, in 2016 prices), and the corresponding "p-value" column measures the statistical significance of these coefficients. The PLA effect is statistically significant at the 5 percent level or better, except for large schools and middle schools and high schools. The size of the PLA effect differs, depending on the sample examined. The results of the "baseline" regression analysis presented in Table 2 are reproduced here in the first row of Table 3.

Following standard practice, our regressions use ordinary least squares (OLS), which means that each observation (here, a school building project) carries equal weight in the regression. However, we also estimated our preferred equation using weights, where each project is given a weight that is in proportion to the square footage that it represents. This means that a project of 150,000 square feet, for instance, would have twice as much weight in the equation as a

project of 75,000 square feet. The weighted regression shows a PLA effect of $14.42/sqrft, again statistically significant.

Conclusion

Based on data on construction costs and related variables for school projects in Ohio since 2000, we find the following:

(i) PLA projects added $23.12 per square foot (in 2016 prices) relative to non-PLA projects. Because the average cost per square foot of construction is $176.23, PLAs raised the base construction costs of building schools by 13.12 percent.

(ii) PLA projects have higher bid costs; again, we are more than 96.1 percent confident of this finding, based on the available data.

(iii) The finding that PLA projects have higher construction costs is robust, in that:

   a. The effect persists even when the data are subdivided, so that the effect is evident separately for mid-size projects, small projects, and elementary schools.

   b. A regression that weights observations by project size also shows the effect.

In sum, the evidence that PLAs have increased the cost of school construction in Ohio since 2000 is strong. Taken together, the 15 PLA projects in our sample accounted for 1.70 million square feet of construction with a combined cost of $240.8 million, based on the projects that we were able to include in our study. Our estimates show that taxpayers would have saved $39.3 million, or over $2.6 million per project, if PLAs had not been used.[41]

Appendix

Data Gathering Methodology

BHI utilized a multi-step data collection process. In the first step, we contacted the Ohio Facilities Construction Commission (OFCC) to obtain the most recent list all projects for public schools in Ohio since the year 2000. Specifically, we requested:

- Winning base construction bid (excluding insurance, bonds and other soft costs)
- Type of school, (elementary, middle or high school)
- Number of stories above grade
- Final base construction cost
- Whether the base construction bid include demolition/site work costs? If so how much?
- Whether there was a PLA (Project Labor Agreement) requirement on the project
- Whether the project was a new school or an addition/renovation?
- Number of square feet of new and/or renovated building space.
- Whether the project includes any of the following: auditorium, swimming pool, library, cafeteria, gymnasium, HVAC, kitchen, science labs, and other features that would add to the project cost.

The OFCC returned information on school projects, such as the name of the school district or municipality, the contact information, and estimated total project cost and square footage for all projects in the district. However, the data did not include a breakdown of individual school construction project data. BHI requested and received contact information for all the districts in Ohio. OFCC supplied contact information that included superintendent, treasurer, project manager and general contractor.

From August 2016 through March 2017, BHI contacted each district by telephone and email explaining the type of information we were requesting. BHI followed up by mailing Freedom of Information Acts (FOIA) letters to the superintendents of each public-school district in Ohio (see example letter below). We made follow-up phone calls to every school district starting one

week after the letters were mailed. We made subsequent follow-up attempts with each district using telephone calls and emails at least three times.

We augmented the data collection process by conducting internet searches that included websites of the school districts, construction firms, construction management firms, architectural firms and other construction related websites. We obtained some information from these searches on the number of number of square feet, stories above grade and features, such as gymnasium. Independent internet searches also provided information as to the PLA status of some projects, but these projects were only added to the data base if the information was confirmed by the school district or other local officials.

We also asked whether the PLA was mandated by the government agency or not. We confirmed that local governments mandated the PLAs on 14 of the 15 PLA project and unable to confirm the status of the other project.

Sample FOIA Letter

Dear **[custodian of records]**:

Under the **Ohio Open Records Law, §149.43 et seq.**, I am requesting an opportunity to obtain copies of public records that pertain to the school construction projects in **[Ohio Municipality]**. More specifically, we need the following data for the following school projects:

- Winning base construction bid;
- Number of stories above grade;
- Final base construction cost (if available);
- Does the base construction bid include demolition/site-work costs? If so how much?
- Whether there was a PLA (Project Labor Agreement) * requirement on the project;
- Number of square feet of new building space; and

Does the school have any enhancements that would make the school more expensive than a comparable school: Auditorium, Swimming pool, Gymnasium, Theatre, T.V. studio, Multiple cafeterias, and Other features that would increase construction costs.

If there are any fees for searching or copying these records, please inform me if the cost will exceed $10. However, I would also like to request a waiver of all fees in that the disclosure of the requested information is in the public interest and will contribute significantly to the public's understanding of the cost of school construction projects. This information is not being sought for commercial purposes.

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Endnotes

[1]See http://www.beaconhill.org/PLAStudiesHomePage.htm for links to our prior work on PLAs. A bid cost is a project's base construction bid that includes site work and, for many projects, both Project Labor Agreements and non-Project Labor Agreements. The figure does not include the demolition costs.

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[3]Public school construction projects in Ohio have been exempt from paying the state prevailing wage since 1997. The Legislative Service Commission (LSC) of Ohio issued a report in 2002 as required by the 1997 legislation that found the prevailing wage exemption for public school construction reduced construction costs by 10.7 percent. Subsequent researchers and union officials dispute the report findings. The Ohio Prevailing Wage Statute sets the "rate of wages to be paid for a legal day's work to employees upon public works as not less than the collective bargaining rates in the applicable locality under collective bargaining agreements." However, a PLA essentially supersedes the Ohio Prevailing Wage law by setting the wage schedule to that of the signatory trade unions. If we use the Ohio LSC findings to isolate the PLA effect from the prevailing wage effect, our results would be reduced by 10.7 percent, or $2.31 to $20.81, or 11.81 percent.

[4]U.S. General Accounting Office, *Project Labor Agreements: The Extent of Their Use and Related Information*, Publication No. GAO/GGD-98-82, (Washington D.C.: 1998), http://www.gao.gov/achives/1998/gg98082.pdf.

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[11] Ibid., 60.

[12] New York State Chapter ABC, Inc. v. New York State Thruway Auth., 88 N.Y. 2d 56,643 NYS 2d 480,666 NE 2d 185 (1996).

[13] Northrup, 3.

[14] Exec. Order No. 12836, 3 C.F.R. (1993).

[15]Draft Executive Order on the Use of Project Labor Agreements, April 1997, http://thetruthaboutplas.com/wp-content/uploads/2009/06/draft-of-pro-pla-clinton-executive-order-never-happened-040197.pdf.

[16] Ibid.,3.

[17]U.S. Government Accountability Office, Project Labor Agreements: The Extent of Their Use and Related Information, GGD-98-82, (May 29, 1998), http://www.gao.gov/products/GGD-98-82.

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[38] Missing data includes the square-footage of the area of construction, stories above grade, whether there is a PLA requirement or not. More recent construction projects are often missing from the database.

[39] Municipalities with PLA projects include Akron, Berea, Cedar Cliff, Circleville City, Clay, Euclid, Parma City, Switzerland (bid cost only).

[40] Small projects are defined as those below the mean of 98,078 square feet, while large projects are those above the mean. Medium size projects are those falling between 48,078 and 148,078 square feet.

[41] $39.3 million = 1.7 million square ft. multiplied by $23.12 per square ft.

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