Project Labor Agreements and Public Construction Costs in New York State

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April 2006

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EXECUTIVE SUMMARY

Project Labor Agreements (PLAs) are agreements between construction clients (such as municipalities and private corporations) and labor unions that establish certain rules on construction projects for which bidders and unions pledge to honor. Typically, PLAs require that all workers be hired though union halls, that non-union workers pay dues for the length of the project and that union rules on work conditions and dispute resolution be followed. Seeking to gain a competitive advantage during the bid process, labor unions actively seek PLAs as a way to secure work for their members in the construction trades.

The Beacon Hill Institute has completed an extensive statistical analysis of the effects of Project Labor Agreements in Massachusetts and Connecticut. In both the Massachusetts and Connecticut studies our analysis of school construction projects found bid costs to be significantly higher when a school construction project was executed under a PLA.[1]

This report applies a similar analysis to public school construction projects in the state of New York. We have applied the methodology and procedures used in our Massachusetts and Connecticut studies to public school construction projects undertaken in New York since 1996. We based our findings on a sample of 117 schools.

We find that the presence of a PLA increases a project's base construction *bids* by $27 per square foot (in 2004 prices) relative to non-PLA projects. We obtain this figure after adjusting the data for inflation (using an index that includes the trend in both construction wages and in materials costs) differences in construction costs between the 68 counties in New York (using the regional cost factors from the New York State Education Department's Facilities Planning Office). At the same time, we controlled both the size of projects (both in square feet and number of stories) for the type of school (elementary versus middle, junior and senior high schools). Since the average cost per square foot of construction is $134.71, PLAs raise the base construction bids of building schools by 20%.

Our findings show that the potential savings from not entering into a PLA on a school construction project range from $2.7 million for a 100,000-square-foot structure to $8.1 million for a 300,000-square-foot structure. Given ongoing budget constraints and the uncertainties of revenue forecasts, New York 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 PLAs 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 through the union hall referral system. Non-union workers must join the signatory union of their respective craft and 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.[2]

It is widely believed that construction projects are more expensive when a PLA is in effect because the competitive pressure that holds down prices in other industries is eroded. "Open shop" construction firms -- facing the huge obstacles required by PLAs -- are often discouraged from bidding on publicly financed projects.

Two studies from he Beacon Hill Institute (BHI), found that the presence of PLAs increased construction bids over non-PLA projects in the greater Boston metropolitan area and the state of Connecticut.[3] .

The current study extends our research of PLAs to school construction projects in the state of New York using the same methodology as the previous BHI studies. Preliminary results find statistical evidence of a difference in cost per square-foot between PLA and non-PLA projects. This measure is based on an examination of the cost of school construction projects in the state of New York since 1996.

HISTORICAL BACKGROUND TO 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. PLAs have continued to be used for large construction projects since World War II, from the construction of the Cape Canaveral Space Center in Florida to the current Central Artery program (the "Big Dig") in Boston.

The private sector has likewise utilized PLAs for certain projects, including the Alaskan Pipeline and Disney World in Florida.

THE ARGUMENTS FOR AND AGAINST PLAs

The use of PLAs is increasingly common on publicly financed construction projects. But in the current context they are controversial particularly in an age when union membership is declining and non-union construction firms are expanding. Critics charge, that by using PLAs and their cumbersome requirements, construction trade unions engage in rent-seeking by asking local government to intervene by setting union rules as the benchmark that must be followed by all employers. Moreover opponents of PLAs argue:

1. that PLAs raise the cost of undertaking projects, and
2. that non-union contractors are discouraged from bidding on jobs that have PLAs.

Opponents cite the PLA requirements that all employees must be hired in union halls, pay union dues, contribute to union-sponsored retirement plans, and follow union work rules. They argue that the use of a union hiring hall can force contractors to hire union workers over their own work force. The contractors and their employees are required to pay union wages, dues and contributions into union benefit plans even if they are covered by their own plans. The work rules restrict the contractors from using their own more flexible operating rules and procedures. These restrictive conditions cause costs to rise for a project that requires a PLA.

Furthermore, open-shop (non-union) contractors contend that their competitive advantages are nullified by the PLA even as they comply with other mandates such as the prevailing wage law. 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 provide an equal number of counter-arguments:

1. that PLAs keep projects on time and on budget, and
2. that PLAs help assure the use of qualified skilled labor.

PLA supporters argue that the agreements provide for work conditions that are harmonious, and that they guarantee wage costs for the life of the contract. They contend that the combination of work rules and provisions that prohibit strikes, slowdowns and lockouts keep the project on time and prevent 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 thus have more accurate bids that will keep the project on budget.

Advocates insist that the union rules allow for a safer work environment, thereby reducing accidents and thus lowering the number of workmen's compensation claims. In addition, workers' union certifications and employer apprenticeship 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.

PLAs BACKGROUND

The controversy over the use of PLAs in public construction projects has become more intense over the past decade including 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 PLAs on public projects. In 1988, a federal court ordered the Massachusetts Water Resources Authority (MWRA) to fund the clean up of Boston Harbor. The Authority's project management firm, IFC Kaiser, negotiated a PLA with the local construction unions for the multibillion dollar clean up effort. In a move that set precedent, IFC Kaiser mandated a PLA as part of the project's bid specifications.[4] As a result, a non-union trade group filed a lawsuit contending that 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, was legally permitted to enforce a pre-hire collective bargaining agreement negotiated by private parties.[5] Since the *Boston Harbor* decision, most PLA litigation has centered on the competitive bidding requirements of state and local law.

PLAs AT THE FEDERAL LEVEL

The executive branch of the federal government has been involved in the PLA debate for over a decade. In 1992, President George H. W. Bush issued an Executive Order forbidding the use of PLAs on federally funded projects.[6] However, in February 1993, a month after taking office, President William J. Clinton rescinded that order. Later, in 1997, the Clinton administration took one more step when it planned to issue an executive order requiring all federal agencies to use PLAs on their construction projects. However, after extensive lobbying, President Clinton instead issued a memorandum encouraging the use of PLAs on contracts over $5 million for construction projects, including renovation and repair work, for federally owned facilities.[7] In a February 17, 2001 Executive Order, President George W. Bush canceled the Clinton order by effectively prohibiting PLAs on federally funded and assisted construction projects.[8]

Some of largest unions in the country, including the AFL-CIO, insisted that the order illegally interfered with their collective bargaining rights under National Labor Relations Act. 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 the case, the appeals court found that the National Labor Relations Act did not preempt the executive order as the AFL-CIO argued.[9] 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 remains in place today.[10]

PLAs in New York

The *Boston Harbor* decision opened the door for PLAs on public construction projects throughout the country, including the state of New York. The expansion of the Roswell Park Cancer Center represented the first major PLA on a public construction project in New York. The Roswell Park project was unique because some construction contracts were awarded prior to the implementation of the PLA. While, New York's highest court, the Court of Appeals, invalidated the use of a PLA on the project, the situation provided an opportunity to compare constructions bids under a PLA and without a PLA. A subsequent analysis indicated that the bids were 26% higher with the PLA than without.[11]

In 1994, the New York State Thruway Authority invited firms to bid on a project to renovate the Tappen Zee Bridge under a PLA. However, in this case the Court of Appeals upheld the PLA citing a report prepared by the Thruway Authority's consultant, Hill International, estimating that the PLA would save $6 million in labor costs.[12]

In both cases, the court majority acknowledged that PLA's anti-competitive effect on the bidding process and that the public owner must show that the PLA advances "the interests embodied in the competitive bidding process." They also describe the interests as the "protection of the public fisc [sic] by obtaining the best work at the lowest possible price." [13]

Following the lead of the New York courts, Governor George Pataki has taken steps to encourage the use of PLAs. In 1997, Governor Pataki signed an executive order directing state agencies to establish protocols for the consideration of PLAs with respect to individual projects. While the order does caution that courts have struck down PLAs where the owner could not show a "proper business purpose" for entering into the agreement, it is widely understood to be responsible for the expansion of government-mandated PLAs, along with the expansion of litigation over their legitimacy.[14]

The judicial and executive actions described above resulted in the proliferation of feasibility studies underwritten by public project owners considering a PLA. One of the biggest public construction projects in the New York State to require a PLA calls for the renovation of the New York City public schools from 2005 to 2009. Under the Department of Education's $13.1 billion capital plan, a wide-ranging one-size-fits-all PLA will cover all renovation projects valued at over $1 million, translating into approximately $4 billion. The New York City Department of Education claims it will save $500 million by using a PLA. However, Hill International, the same consultant used by the New York State Thruway Authority, estimates $400 million in savings in school construction.[15] A post construction analysis would be needed to validate either claim to cost savings.

Other construction projects in New York state built under a PLA include the I-287 corridor/Cross Westchester Expressway project, the Whitehall Ferry Terminal, the Buffalo-Niagara International Airport and the construction of several schools, courthouses, and public safety facilities throughout the state. The

City of Syracuse is currently considering a PLA requirement for its 10-year, $660 million school construction program.[16]

In New York City, and likely elsewhere in the state, trade union leaders appear to view PLAs as a way to stem the declining market share of union contractors. According to Ray McGuire, Managing Director of the Contractors Association of Greater NewYork, "PLAs are absolutely necessary for organized labor to survive. There are too many costly, inefficient practices."[17] Paul Fernandes, Chief of Staff at New York City's Trade Council states that, "PLAs would not only stem the slide in union market share…They'd enhance opportunities for developers to do their jobs."[18]

EVIDENCE ON PLAs

The evidence on whether PLAs drive up construction costs or not has, until recently, been largely anecdotal. The claims outlined above, fall into two categories: one, they depend on the estimate of 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, the cost analysis was restricted to only one project as in the Roswell case. Neither of these analyses 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 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

Like many states, municipalities in New York are embarking upon a process of upgrading or replacing older, obsolete schools. The central database of the New York State Education Department's Facilities Planning office lists public school construction projects receiving reimbursement from the state. Unfortunately, this database does not contain all the information necessary for building the BHI model.[19] Nonetheless, it serves as a good starting point to identify projects suitable for our study. To complement the state data source, we obtained data on school construction projects from F.W. Dodge, McGraw-Hill Construction Information Group, a division of the McGraw-Hill companies, in Lexington, Massachusetts. Dodge provides information on school construction projects in New York for the period 1996 though

2005, including contact information for town and school district officials, construction companies, and architectural firms.

The information provided by the State Education Department and Dodge serves as a tool to screen the data set for projects that are over $1 million dollars, under the assumption that projects below $1 million would not attract the interest of union contractors. These small projects were not included in our study.

Using the Dodge and other information we began our own data collection. We contacted town and city officials, architects and contractors requesting 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, the nature of the construction work (new versus addition or renovation.[20] Almost all of the information is in writing (e-mails, faxes, etc.), and all the sources and dates have been fully recorded.

ADJUSTING FOR INFLATION AND LOCATION

Our sample covers the period 1996 to the present. In order to compare the construction costs of PLA with non-PLA schools, it was first necessary to correct for the fact that construction costs rose during this period. Specifically, we constructed a cost index that included both the trend in construction wages and the trend in materials costs between 1996 and 2004. Using 2004 as the base year, we first constructed a wage index, which was based on total wages and salaries for construction workers in New York divided by the total number of construction workers in that sector.[21]

In order to account for the changes in materials costs, we constructed a price index based on the producer price index for the "other" subcomponent of *intermediate materials, supplies, and components*, as reported in *The Economic Report of the President, February 2005.*[22] To construct the final cost index used in our analysis, we weighted the wage index and the adjusted producer price index equally, to reflect the relative importance of wages and materials costs in a typical construction project.

Our sample also covers the entire state of New York, which encompasses a large geographical area in which construction costs, namely wages, can vary significantly between different regions across the state. For example, construction costs are probably much higher in New York City and its surrounding suburbs than in the more rural towns of upstate. We need to account for these differences in order to compare construction cost between PLA and Non-PLA projects. Fortunately, the New York State Education

Department provides "regional cost factors" for each of New York's 68 counties.[23] The regional cost factors are used by school districts to calculate their state aid formula for construction projects. We applied the appropriate cost factor for the county in which the school is located to each data point for the year that construction began, effectively eliminating the differences in cost between construction projects due to their location in the state.

Our final step was to remove outlying data points, or those with the outermost values, from our sample. We define outlying data points as those projects with a bid cost per square foot that falls into the top and bottom 5% of our sample. This is done in order to obtain a sample of comparable projects and eliminate projects that for extraordinary reasons the cost was extremely high or low. For example, many school construction projects involve only "light" renovations, such as the replacement of electrical systems, asbestos abatements or cosmetic changes. Understandably, the cost per square foot for these projects was well below the sample average. On the other hand, some projects are quite small or involved unique circumstances, such as the preservation of an historic building or a crowded urban site that could substantially increase costs to extreme levels. As a result of our final screening process we removed 14 of a total of 131 data points in our original sample.[24]

COMPARING PLA TO NON-PLA PROJECTS

A comparison of the key characteristics of the school construction projects in towns with a PLA ("PLA projects") with those where there was no such agreement ("non-PLA projects") is shown in Table 1. A notable pattern in the data is that PLA projects, on average, cost $17.08 ($151.79 minus $134.71) more per square foot (in 2004 prices) than non-PLA projects.

Table 1: SUMMARY STATISTICS FOR CONSTRUCTION PROJECTS BY PLA STATUS

Variable	Winning construction bid (2004 $millions)	Size of project (square feet)	Construction bid cost/square foot (2004 dollars)*	Number of stories
Mean				
PLA	$15.70	94,372	$151.79	2.44
Non-PLA	$10.04	79,028	$134.71	1.91
Standard Deviation				
PLA	$14.10	90,547	$ 23.63	0.96
Non-PLA	$8.56	75,822	$ 64.17	0.87
Minimum				
PLA	$1.34	6,000	$110.42	1
Non-PLA	$1.08	5,087	$48.53	1
Maximum				
PLA	$59.78	400,282	$205.41	4
Non-PLA	$39.10	348,189	$309.16	5

Total sample size is 117, with 19 PLA projects and 98 non-PLA projects. Costs are measured in 2004 dollars and adjusted for differences in costs between counties; see text for details.

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 or not the difference in PLA versus non-PLA projects is robust to differences in project size and type. In our regressions, the dependent variable is the bid cost per square foot of construction (in 2004 prices). The most critical independent variable is a dummy variable that is set equal to 1 for PLA projects and to 0 otherwise. To capture the effect of economies of scale, we include a variable consisting of the log 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, and whether the project is an elementary school. The ordinary least squares regression results are presented in Table 2.

Our results show that the PLA projects add an estimated $26.98 per square foot (in 2004 prices) to the construction bid 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, but in explaining why construction costs differ from project to project. The estimates in Table 2 show that it also 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	473.71	13.73	0.00
PLA	26.98	5.80	0.03
Square Feet*	-33.11	-5.71	0.00
Story	18.61	6.19	0.00
Elementary	-41.11	10.99	0.00

Adjusted R^2 is .24. Sample size is 117. *Square footage is measured in logarithm of square feet.

A formal (one-tailed) test of the statistical significance of the PLA coefficient gives a p-value of .03, which means that there is less than a 3% chance that we have accidentally found that PLA projects are more expensive than non-PLA projects. Put another way, there is at least a 97% probability that PLA projects really are more expensive than non-PLA projects, holding other measurable aspects of a project constant. The equation also shows that larger projects are indeed cheaper, as are elementary schools; and multi-story schools are more expensive.

With an adjusted $R^2 = 0.24$, the equation "explains" a respectable 24% 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, collecting viable information at this level of detail, for all projects, would be extremely difficult. Thus our equation necessarily excludes these unobservable variables. However, this does not undermine our finding of a substantial PLA effect. 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.

ROBUSTNESS

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

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 bid construction costs; this was also used to give results weighted by project size (row 7 of the results in Table 3);
2. small projects, medium size projects and large projects; and
3. elementary and non-elementary schools.[25]

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 2004 prices), and the adjoining "p-value" column measures the statistical significance of these coefficients. In every case the PLA effect is statistically significant at the 10% level or better. The size of the PLA effect differs slightly, depending on the sample examined and the other

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
Project bid costs (baseline)	**26.98**	**.026**	**lnsqrft[a] [b]stories, [c]elem**	**117(19)**	**.24**	**134.71**	**151.79**
Small projects only	26.10	.088	lnsqrft,stories,elem	81(13)	.19	142.39	156.37
Medium projects only	27.12	.049	lnsqrft, stories,elem	59(11)	.35	121.10	152.11
Large projects only	29.57	.046	lnsqrft, stories,elem	36(6)	.24	117.29	141.86
Elementary schools only	28.54	.046	lnsqrft, stories	45(11)	.32	118.16	143.31
Jr. Hi & Hi schools only	29.72	.091	lnsqrft, stories	72(8)	.14	143.50	163.44
Weighted by Sqrft	31.77	.002	lnsqrft,stories,elem	117(19)	.33	120.00	150.35

Notes: [a]lnsqrft = logarithm of the square footage for each project. [b]stories is the number of stories above ground. [d]elem = 1 if elementary school, 0 if junior high or high school, l.

variables that are included, and the consistency of the PLA coefficient confirms the magnitude of the PLA effect in our "baseline" outcome. 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, 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 $32.60/sq.ft, again statistically significant, and similar to the "baseline" regression.

CONCLUSION

Based on data on construction costs and related variables for school projects in New York since 1996, we find the following:

(i) PLA projects add an estimated $27 per square foot to the bid cost of construction (in 2004 prices), representing an almost 20% increase in costs over the average non-PLA project.[26] We are more than 97% confident of this finding, based on the available data.

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

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

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

(iii) PLA projects accounted for 1.79 million square feet of construction with a combined bid cost of $297.9 million (in 2004 prices), based on the projects that we were able to include in our study. Our estimates show that the bid cost for these projects was $48.4 million higher than it would have been if PLAs had not been used.[27]

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The authors would like to thank Sarah Glassman, Emily Hausman for their contributions to this study.

ENDNOTES

[1] 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 includes the demolition costs.

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

[3] Paul Bachman, Darlene C. Chisholm, Jonathan Haughton, and David G. Tuerck, *Project Labor Agreements and the Cost of School Construction in Massachusetts,* The Beacon Hill Institute at Suffolk University, September 2003. See also Paul Bachman, Jonathan Haughton and David G. Tuerck, *Project Labor Agreements and the Cost of School Construction in Connecticut,* The Beacon Hill Institute at Suffolk University, September 2004.

[4] Herbert R. Northrup and Linda E. Alario, "Government-Mandated Project Labor Agreements in Construction, The Institutional Facts and Issues and Key Litigation: Moving Toward Union Monopoly on Federal and State Financed Projects." *Government Union Review* 19, no. 3, (2000) 60.

[5] Ibid., 60.

[6] Ibid., 3.

[7] Ibid., 3.

[8] Worcester Municipal Research Bureau, "Project Labor Agreements on Public Construction Projects: The Case For and Against," Report No. 01-4, May 21, 2001. 7.

[9] "Bush Administration, Construction Unions in Fight Over Project Labor Agreements," *Bulletin Broadfaxing Network*, 5 December 2002.

[10] Halloran & Sage LLP "Union Activity Across the Country", *Connecticut Employment Law Letter*,11 ,(April 2003) by M. Lee Smith Publishers & Printers.

[11]"Project Labor Agreements: The Extent of Their Use and Related Information," U.S. General Accounting Office Report to Congressional Requesters (May 1998), p. 13.

[12] Al Heller, "Successful Bridge: Tappan Zee PLA Saved $6 million"; *New York Construction*, The McGraw-Hill Companies, 1 March, 2005, SP07, vol. 52 No.8.

[13] Northrup and Alario, "Government Mandated Project Labor Agreements", 72..

[14] Northrup and Alario, "Government Mandated Project Labor Agreements", 83.

[15] New York City Department of Education, "Mayor Michael R. Bloomberg, Schools Chancellor Joel I. Klein and BCTC President Edward Malloy announce landmark agreements between Department of Education and Building and Constructions Trades Council", Press Release, January 6, 205, Internet available at http://www.nycenet.edu/Administration/mediarelations/PressReleases/2004-2005/1-6-2005-15-27-51-496.htm; accessed November 14, 2006.

[16] "A Project Labor Agreement is the Best/Worst; (Choose One); Thing for Syracuse's School Renovation Plan"; *The Post-Standard*; Opinion, 5 February 2006, sec. D,p. 1.

[17] Al Heller, "PLAs Grow in Prominence Gain Critics; Unions, contractors, and developers across the region are bracing for what may be a rising trend – the use of project labor agreements on the biggest jobs on the horizon. A many-sided debate on whether PLAs are good for the industry is well under way," *New York Construction*, The McGraw-Hill Companies, March 1, 2005, p. SP03, Vol. 52 No 8.

[18] Ibid, SP03.

[19] 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.

[20] Municipalities with PLA projects include Albany, Copenhagen, Lockport, Marlboro, Morris, New City, New Rochelle, Newburgh, Niagara Falls, Pelham and Romulus.

[21] Wage and salary data is from the Bureau of Economic Analysis web site, www.bea.gov, accessed December 1, 2005. The series used was the SIC classification through 2004. We used the NAICS series for wages and salaries for 1997 through 2004 (BEA table SA05N), and employment through 2004 (BEA table SA25).

[22] The source of the producer price index is Table B-66, "Producer Price Indexes by Stage of Processing, Special Groups, 1974-2002," *The Economic Report of the President, February 2005.* We assume growth in this index between 2004 and 2005 of 2.6%, in line with recent historical experience; Internet; available at http://a257.g.akamaitech.net/7/257/2422/17feb20051700/www.gpoaccess.gov/eop/tables05.html; accessed December 1, 2005.

[23] New York State Education Department, School Operations and Management Services, Office of Facilities Planning, Internet; available at http://www.emsc.nysed.gov/facplan/Reports/RegCost.html; accessed on December 5, 2005.

[24] Six (6) non-PLA projects and one (1) PLA project were eliminated due to high bid cost per square foot and seven (7) non-PLA projects were removed due to low cost per square foot.

[25] Small projects are defined as those below the median of 94,175 square feet, while large projects are those above the median. Medium size projects are those falling between 50,000 and 250,000 square feet.

[26] PLA effect from sample 1 for bid costs ($27.00/sq.ft.) divided by average bid costs for this group ($134.71/sq.ft.).

[27] $48.4 million = 1.793 million sq ft. multiplied by $26.98 per sq ft.

The Beacon Hill Institute at Suffolk University in Boston focuses on federal, state and local economic policies as they affect citizens and businesses. The institute conducts research and educational programs to provide timely, concise and readable analyses that help voters, policymakers and opinion leaders understand today's leading public policy issues.

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