THE BEACON HILL INSTITUTE AT SUFFOLK UNIVERSITY

The Beacon Hill Institute for Public Policy Research

June 21, 2011

The Honorable Elijah E. Cummings
2235 Rayburn House Office Building
United States House of Representatives
Washington, DC 20515

Dear Representative Cummings:

I am writing to follow up on the statement by Professor Peter Philips that you read prior to my testimony at the June 3rd hearing on H.R. 735 and Project Labor Agreements: Restoring Competition and Neutrality to Government Construction Projects, before the House Oversight and Government Reform Subcommittee on Technology, Information Policy, Intergovernmental Relations and Procurement Reform.

The statement, which Philips submitted as testimony, is as follows:

> Beacon Hill's work suffers from the basic statistical fallacy of spurious correlation. We know that PLA projects typically are more complex, involve more amenities, more extensive construction and tend to be built in urban settings. Beacon Hill conflates the effect of PLAs on school costs with the cost effects of the complexity of projects on which PLAs are used.
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> Statistically, one could easily show that pom-poms stunt teenage growth. All you have to do is go to a high school basketball game and put all those holding pom-poms on one side of the room and the remaining teenagers who just happen to be basketball players on the other. Lo and behold, all those holding pom-poms have stunted growth compared to the control group! Similarly, Beacon Hill put all the complex jobs on one side and all the simple jobs on the other. Lo and behold, because the simple jobs did not have PLAs and most of the complex jobs did, PLAs cost more money! This sort of simple minded statistics just does not pass muster.

This statement is an utterly false characterization of our work.

The "simple-minded statistics" to which Philips refers bear no resemblance to the methodology we used to construct our estimates of the effects of PLAs on construction costs. We did not, as he claims, separate construction projects into a "complex" group and a "simple" group and then compare the cost of each. By saying we followed this procedure, Philips reveals that (a) he did not read our work, (b) he is

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unqualified to judge it, or (c) he deliberately misrepresented it in his statement to the subcommittee.

What we did use to construct our estimate was regression analysis. We used this analysis precisely because it was our aim to account for the most important factors that affect construction costs, *including* factors that represent what one might call "complexity."

Regression analysis is used by statisticians to determine how some "independent variable" (such as the presence of a PLA) affects some "dependent variable" (such as cost per square foot of construction). Suppose, to take a different example, one wanted to identify the effect of education spending on student performance on a standardized test. One would use regression analysis and include as independent variables, not only school spending, but also measures of the socioeconomic conditions that affect student performance.

It works the same for determining the effect of PLAs on construction cost. An economist would use regression analysis and include as independent variables, not only a variable for the presence (or absence) of a PLA, but also measures of the "complexity" factors that affect costs. Thus it is possible to control for complexity, while identifying the cost effect of a PLA. And that is what we did in our studies.

To be sure, there are factors that fall under the rubric of complexity and that add to cost, and, to be sure, many arguably complex projects end up being performed under a PLA. Knowing this, we never considered the "simple-minded" idea of just comparing the costs of complex and simple projects (however they might be defined). No competent economist would. What we did was use regression analysis, which is the accepted way of teasing out the effect of some variable of interest – in this case, whether there was a PLA or not – while controlling for the effects of other variables, including variables that represent "complexity." That is why, when Philips charges that BHI naively or intentionally "conflated" the presence of a PLA with complexity, he is trying to sell you a bill of goods.

I have to be emphatic. This is no mere quibble over some fine point of theory by a couple of economists. Philips did not merely find fault with what we did. Rather, he sent you a piece of fiction about what we did for the purpose of discrediting our work. If there is anything "spurious" going on here, it is Philips' attempt to use his pom-pom story to illustrate our methodology.

As I said in my testimony, the Beacon Hill Institute published three studies in which it found that PLAs increased school construction costs in three states – Massachusetts, Connecticut and New York. (A summary of the Massachusetts study appears as a peer-reviewed article in the journal *Case Studies in Business, Industry and Government Statistics*.) Specifically, we found that PLAs added 12 percent to 18 percent to final construction costs in Massachusetts and Connecticut and 20 percent to final bids in New York.

For the three states, we reported 31 different regressions, each with a different combination of independent variables or on a different sample. Each regression showed that the presence of a PLA had a positive effect on cost and that there was less than a 10 percent chance that the real effect was zero (and thus that our results were "statistically significant").

Here is the list of independent variables, all aimed at capturing the effects of "complexity," from which we drew in different combinations in specifying our regression equations:

- The number of square feet for a construction project
- The logarithm of the number of square feet
- The square of the number of square feet
- A variable for whether the project was new construction or not
- The number of floors in the building being constructed
- Whether the school was an elementary school or not and
- The distance of the school from Boston (for our Massachusetts study)

We included these variables because (1) they can be expected to explain cost, quite separately from the PLA effect, (2) we had the data we needed in order to include them, and (3) we could use a sufficiently large sample to get robust results. The fact that we included these variables shows that, contrary to Philips' allegations, we endeavored to account for how "complexity" influences cost.

In order to make sure that our estimates were robust, we ran regressions for different samples, some including all schools, others including only elementary schools, and others including only middle schools and high schools. Some samples included only small projects, only mid-size projects or only large projects. *Again, in every instance, the PLA effect was positive and significant.*

Thus when we reported that the adoption of a PLA added $16.51 (or about 12 percent) per square foot to the cost of school construction projects in Massachusetts, we were citing the *regression coefficient* obtained from an equation that we estimated for Massachusetts. Our equation included as independent variables, the total number of square feet for each project, the square of the number of square feet and a variable that indicated whether the school was new construction or not – all of which we included in order to account for the effects of "complexity." We did *not* get the Massachusetts number by simply putting "all the complex jobs on one side and all the simple jobs on the other" and then comparing costs.

That Philips' account of our methodology is bogus can be seen from the results of our Connecticut study. In that study, we found that PLAs increased school construction costs by $30 per square foot for a sample of 71 projects. It also happens that, for this sample, the PLA projects were, on average, actually *less* costly than the non-PLA projects. If we had, as he alleges, computed cost differences by separating projects into complex and simple categories (and therefore, by his reasoning, into PLA and non-PLA categories), we would have come to the conclusion that the PLAs *reduced* costs. Of course, that is not what we did or what we concluded. We used regression analysis, which led us to the opposite conclusion.

PLA advocates like Philips like to use the word "complexity" because it can be stretched to mean anything and because it can therefore be used to rationalize putting any project under a PLA. But consider the fact that we found a positive PLA effect when we ran a regression on a sample of Massachusetts elementary schools. You might think that there is enough similarity between elementary schools to be able to separate the effect of a PLA from the effects of other factors.

In Philips' mindset, however, a project would never be more costly because it was conducted under a PLA. The explanation would always lie elsewhere. The project had a more complex roof. Or it included an auditorium. Or it had some other feature that increased the cost. Never mind if there were only a few bidders. Or if the contractor had to follow burdensome work rules. Or if the contractor had to hire union workers instead of his own workers. It just couldn't be the PLA that was at fault.

Philips' approach to the PLA question reflects a compulsion, unhappily all too common among social scientists (and even some physical scientists), to hold stubbornly to one's assumptions no matter what the data show. That, in and of itself, is a bad enough fault to exhibit in criticizing someone else's work. In this instance, however, Philips went beyond merely attempting to defend his assumptions against the data. He made up an entirely fictitious story to discredit the work of someone whose data challenge those assumptions.

Which prompts me to make a suggestion: Ask Philips to show you just where we applied the methodology he attributes to us in his statement. It should be easy for him to do this – if, that is, there is any truth to what he says. All he has to do is point out where we (1) identified one group of projects as "complex" and another as "simple" and then (2) reported that the effect of the PLAs was equal to the average cost per square foot for the complex group minus the average cost per square foot for the simple group. If he is not willing or able to do this, then I submit that his account of our work must be dismissed as a pure fabrication. Given that, I would likewise dismiss the rest of his comments about our work.

I appreciate your attention to my comments here and to my testimony on the 3rd. Please feel free to share this letter with anyone who, in your judgment, would be helpful in evaluating my remarks. I would be grateful to learn of your own reaction. I plan to make this letter part of the public record.

I reaffirm my support for H.R. 735, my opposition to government mandated PLA, and my testimony that PLAs raise construction costs. I also wholeheartedly recognize the legitimacy of the point you made at the hearing about the importance of an open and honest debate. It's just that the comments by Professor Philips have no value in furthering a debate of that kind.

Sincerely,

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Representative Jason Chaffetz
Representative Tim Walberg
Representative Raul Labrador
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