DO PUBLIC–PRIVATE PARTNERSHIP ENABLING LAWS INCREASE PRIVATE INVESTMENT IN INFRASTRUCTURE?

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ABSTRACT

An important development in the delivery of U.S. infrastructure is the growing use of public-private partnerships, or PPPs. PPPs are of economic interest because they represent a middle ground between pure public delivery of projects and privatization. As of late 2012, thirty-four U.S. states had enacted PPP enabling laws. Such legislation defines the broad institutional framework surrounding a PPP agreement. It typically addresses such questions as the mixing of public- and private-sector funds, the treatment of unsolicited PPP proposals, and need for prior legislative approval of PPP contracts, among other key issues. We examine the effect of PPP enabling laws on a state’s reliance on private infrastructure investment. We first analyze the overall effect of having a PPP enabling law while controlling for a variety of factors, including the state’s level of indebtedness, its broad political disposition, union membership, and per capita income. We then assess the impact of thirteen individual PPP enabling law provisions. To do so, we develop an expert-informed weighted index reflecting the degree to which a state’s law is encouraging or discouraging of private investment. We find that more favorable PPP enabling laws increase private investment. That effect is economically significant: when our favorability index increases by one-tenth, the proportion of infrastructure investment delivered under PPP in a state increases by 0.5. We also find that PPP enabling law provisions allowing unsolicited proposals and those allowing for the comingling of public and private funds are particularly helpful in facilitating private investment in infrastructure. We use a two-pronged approach to address the potential endogeneity problem of states passing enabling laws in response to possible preexisting PPP agreements, rather than to encourage them.
1. Introduction

The confluence of at least three forces is placing severe stress on U.S. transportation infrastructure: rising traffic demand, aging facilities, and depleted state and local transportation budgets. Although U.S. vehicle-miles traveled (VMT) declined over 7 percent between 2005 and 2013 (Geddes and Wassink 2014), VMT in the United States increased by more than 350 percent between 1957 and the mid-2000’s. Total available highway mileage grew by only 15 percent over that period (Fischer 2005). Urbanization also increased rapidly, disproportionately impacting municipal facilities.

Unsurprisingly, traffic congestion has intensified. According to the Texas Transportation Institute’s 2012 *Urban Mobility Report*, annual hours wasted per auto-commuter rose 174 percent between 1982 and 2011 in the nation’s fifteen largest urban areas. Vehicle emissions also increase significantly during congested periods, causing environmental harm. Wells (2006) places the annual overall cost of congestion to the economy at about $168 billion. Meanwhile, U.S. transportation infrastructure is deteriorating. According to the American Society of Civil Engineers, in 2009 about one in four bridges in the United States were structurally deficient or functionally obsolete, and about one-third of the country’s major roads were in poor or mediocre condition.

Traditional funding sources for transportation infrastructure construction and renovation are proving inadequate. This is largely due to reliance on gasoline and diesel taxes to fund infrastructure. Inflation and more fuel-efficient vehicles reduce the purchasing power of fuel tax revenues. Other national policies, such as higher corporate average fuel economy (CAFE) standards, conflict directly with a fuel-tax-based funding approach (Geddes 2011). General tax revenue is an increasingly unreliable funding source as transportation funding must compete with other spending priorities.

Those trends are causing states and localities to consider new approaches to maintaining, renovating, expanding, and financing transportation infrastructure. One is to incorporate greater private participation in those activities through public-private partnerships, or PPPs. PPPs have
evolved to encompass a broad range of contractual arrangements between a public project sponsor and a private partner.¹

When governments and legislators have decided to consider private participation in infrastructure projects, appropriate laws and regulations surrounding PPP use are widely viewed as important tools for governments to enhance political and regulatory stability, which in turn fosters private participation in infrastructure (World Economic Forum, 2015, p. 11). Observers have suggested that PPPs in the United States are hindered by a lack of adequate state-level enabling legislation (Fishman, 2009; Reinhardt, 2011). Indeed, the stated purpose of many such laws is to attract private infrastructure investment. The laws clarify important issues such as acceptability of unsolicited PPP proposals, whether a PPP may be used on existing as well as new transportation facilities, whether agreements may include the sharing of revenue with public sponsors, and whether the agreement may include non-compete clauses, among others.² From the private partner’s perspective, it is risky to expend time, money, and effort developing infrastructure projects that may ultimately fail to receive the authorization necessary. Enabling legislation provides a framework for contracting while clarifying the risk allocation between the public sponsor and the private partner (Iseki et al, 2009). Doing so reduces overall contractual uncertainty and thus the transaction costs associated with private infrastructure investment.

Despite their pervasiveness, growing number, and emphasis placed on them, there has been little empirical examination of PPP enabling laws’ effects. To our knowledge, we are the first to empirically analyze the impact of state PPP enabling laws and their provisions. Our inquiry indicates that, when controlling for numerous exogenous factors, PPP enabling laws facilitate private investment in infrastructure.³ Although growing, private investment in U.S.

² A list of key provisions is provided in Table 1 below.
³ Geddes and Wagner (2013) examine the drivers of a state’s decision to adopt a PPP enabling law. They find that states with higher levels of traffic congestion as measured by the travel time index (TTI) are more likely to pass a PPP enabling law. We are sensitive to the possibility that the laws may be endogenous to the amount of investment. However, we were unable to detect an effect of completed private infrastructure investment on the travel time index.
transportation infrastructure remains low by international standards, and controversy surrounding the use of PPPs to finance and operate transportation infrastructure remains.⁴

We assess the effect of both having a law and the impact of varying degrees of legal favorability to private investment. We develop an enabling law favorability index by considering thirteen key provisions of each law. Rather than weighting each provision equally, we survey U.S. PPP experts to assign appropriate weights to various provisions.

We analyze detailed data on 117 U.S. transportation PPP projects completed between 1998 and 2012 using information gleaned from the Public Works Financing newsletter. Public Works Financing reports information on all North American PPP projects, allowing a thorough analysis of PPP enabling laws’ effect. We utilize the entire period for which we have data to examine how varying exposure to PPP enabling laws across time, and to their differing components, affects the cumulative number of PPPs as well as overall PPP investment. We focus on the proportion of PPP investment relative to total investment in a state’s roads and highways in a cross-sectional setting. We describe our data set and empirical methods in detail. We use a fractional response model and address possible endogeneity problems using two stage least squares estimation.

We find that PPP enabling laws increase the number of PPPs undertaken in a state and that more favorable laws result in more PPPs. We find a similar effect on PPP investment per capita and on the proportion of PPP investment relative to total investment, suggesting that the growth of that percentage comes mainly from attracting added investment.

We proceed as follows. We next discuss the current context and basic structure of PPP enabling laws in the U.S. transportation sector. In Section 3 we describe the dataset, variables and our main predictions regarding the role of PPP enabling laws in encouraging projects and the growth of that percentage comes mainly from attracting added investment.

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⁴ Regarding low U.S. use of private investment in infrastructure, see Istrate and Puentes (2011, p. 4, Figure 1). Critics argue that PPPs do not create net social value, merely hide debt from the government’s balance sheet, raise the social cost of capital, and help protect the interests of private parties who are likely to exploit market power and superior bargaining skills relative to the public sector (e.g. Quiggin 2004, Dannin 2011, Roin 2011). Others argue that PPPs generate net social value through improved incentives to innovate, additional sources of capital, greater contractual transparency, and clearer linking of project returns to performance (e.g. Gilroy 2009, Poole 1993, National Surface Transportation Infrastructure Financing Commission 2009). Rather than joining that debate directly, our analysis focuses on PPP enabling laws’ impact on private investment, and why states may pass laws explicitly inviting private investment in transportation infrastructure.
2. Public-Private Partnerships in Transportation

Private participation through a PPP may include the management, operation, and renovation of an existing transportation facility (known as a brownfield project), as well as the design, construction, financing and operation of a new facility (known as a greenfield project). Both are extensions of existing (or “traditional”) U.S. procurement methods that rely on private participation in more limited ways. For both brownfield and greenfield PPPs that include an operational component, the public project sponsor contractually specifies how the facility is to be renovated, maintained and, if necessary, expanded. The contract also specifies the setting of tolls and concession length. Key performance metrics are included, such as safety standards and pavement quality, with clear financial and operational performance incentives. According to Public Works Financing data, PPPs have been used to help finance and build at least 117 transportation projects worth a total of US$69.5 billion between 1988 and 2012 in the United States, almost all greenfields.

Although investment in transportation infrastructure through PPPs accounts for about 11 percent of all national capital investment in new highway capacity in 2011, its importance is rising in the United States. From 2001 through 2010, five states on average started a new transportation PPP each year (Reinhardt 2011).

The failed attempt to lease the Pennsylvania Turnpike illustrates the key role of enabling laws in attracting investment. In May 2008, Pennsylvania’s government announced that a partnership of Citi Infrastructure Investors and the Spanish firm Abertis Infraestructuras was the concessionaire chosen for a 75-year lease of the Pennsylvania Turnpike with a winning bid of $12.8 billion. The state’s legislature, however, allowed the bid to expire by not passing the requisite enabling legislation. Substantial costs were incurred in generating bids for which there

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5 Traditional procurement in the United States includes use of a design-bid-build (DBB) contract, under which project design is placed out for bid, and the construction of that design is then bid out separately. The public sector typically finances the project using tax-exempt municipal bonds, while operating and maintaining the project over its life span. Smaller traditionally delivered projects may not be bid out at all.
was ultimately no return, even for the winning bidder.\textsuperscript{6} Costs include holding in place commitments on $12.8 billion in financing, which forestalled other uses for those funds. Partly as a result of the events in Pennsylvania, \textit{ex post} legislative approval of individual PPP agreements concluded by other state units is a major disincentive to private-sector investment (Rall, Reed, & Farber, 2010).\textsuperscript{7} PPP enabling laws reduce the risk of political uncertainty by granting \textit{ex ante} legislative approval.

PPP enabling laws may be helpful in attracting private capital into infrastructure construction, renovation, and operation. When properly designed, they reduce uncertainty, establish pre-set guidelines, and lower the transaction costs associated with public-private partnerships. Commentators suggest that PPP legislation provides an important foundation for private-sector involvement in U.S. transportation infrastructure (Fishman, 2009).\textsuperscript{8} Others have noted that states with the most attractive models of PPP legislation are receiving the greatest private-sector attention (Gilroy, 2009). Moreover, sixty percent of all PPP projects between 1989 and 2012 have occurred in only six states. All of those states have PPP enabling legislation.\textsuperscript{9} We expect that both passing a law and enacting a more favorable law will increase PPP investment over time.\textsuperscript{10}

\textsuperscript{6} Commentators consider such unrecovered bidding costs to be a major deterrent to private participation. John Durbin, former executive director of the Pennsylvania Turnpike Commission, noted that “[t]here will not be another consortium that will proceed in any state where they have to put their bids in first and then gain legislative approval to lease the asset” (Pew Center on the States 2009, p.18). The lack of enabling legislation was dispositive for the investors in this case. Samuel (2008) states that, “The Abertis-Citi current offer of $12.8 billion for a 75 year lease/concession of the Pennsylvania Turnpike expires next Tuesday Sept 30, and signs are it won’t be extended. Last week a senior officer of the two companies was saying that without movement on enabling legislation this month, they were done.” See Geddes and Wagner (2013) for further discussion of the importance of PPP enabling laws.

\textsuperscript{7} Several states nevertheless have provisions in their enabling legislation requiring legislative approval. Addressing the disincentive to invest created by legislative approval requirements, one commentator claims that, “[i]n those states whose PPP enabling acts required legislative approval of negotiated deals no such deals were ever proposed.” Poole (2009).

\textsuperscript{8} Istrate and Puentes (2011) suggest PPP enabling laws as one of their three key recommendations to attract private investment to U.S. infrastructure.

\textsuperscript{9} Those states are Florida, California, Texas, Virginia, North Carolina, and Colorado.

\textsuperscript{10} Indeed, it would be odd for a state to incur the transaction costs associated with PPP enabling law passage with the intent of discouraging private investment. We thus maintain the hypothesis that PPP enabling laws increase investment.
We utilized the Federal Highway Administration (FHWA) website and several other sources to determine which states have enacted PPP enabling laws.\textsuperscript{11} All information was verified through examination of state PPP statutes and traced back to its passage using LexisNexis. Figure 1 displays the evolution of PPP enabling laws in the United States. Since the passing of the first modern law in 1988, the number of states steadily increased over time until 2000.\textsuperscript{12} From 2000 to 2005 the number of States remained constant. Law adoption restarted in 2006 with the passing of an enabling law in Indiana, followed by several other states. By December 2012 thirty-four states (plus Puerto Rico) had legislation giving explicit authority to an agent of the state (such as the state Department of Transportation), to enter into a PPP agreement.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Number of U.S. States with PPP enabling law (1988-2012).}
\end{figure}


\textsuperscript{12} Modern PPP legislation began with Virginia’s Highway Corporation Act, which was passed in 1988. New Jersey had an enabling law passed by mid 1990s, but it ceased to be effective in 2003. The District of Columbia City Council voted unanimously to enact Bill 20-595 on December 2, 2014.
Figure 2 shows total annual PPP investment from 1988 to 2012. Figures are presented in constant year 2000 U.S. dollars. Although generally increasing, U.S. PPP growth is uneven.


3. **PPP enabling laws and the favorability index.**

We next describe key variables used to evaluate the impact of state-level PPP laws and their provisions on private infrastructure investment. Our dataset indicates the year in which a state first passed a PPP enabling law, and the provisions included in the legislation. Our time frame begins with the passage of the first modern PPP law, Virginia’s Highway Corporation Act of 1988, and ends in 2012, which is the last year for which we have complete data on independent variables. Our data are a state-by-year panel from 1988 to 2012 forming a sample of 1,250 observations.

In addition to evaluating the effect of having an enabling law (or not) on PPP investment we address a second empirical question: how important are particular PPP law provisions in attracting private investment? This important issue provides guidance to states about their PPP enabling law’s structure.
Our first step in evaluating enabling law provisions was to examine the broader literature on state legislation to assess which provisions are generally viewed as important. Poole (1993) and Hedlund and Chase (2005) provided valuable initial guidance. Using those and several additional sources, we selected thirteen enabling law provisions to form our basic PPP law favorability index. We then conducted a survey of PPP experts to assign favorability weights to each provision. We asked respondents to rank each provision on a five-point Likert scale from “very discouraging” to “very encouraging” of private investment. We then assigned each rank an integer value as follows:

-2 = Very discouraging of private investment
-1 = Somewhat discouraging of private investment
0 = No effect on private investment
1 = Somewhat encouraging of private investment
2 = Very encouraging of private investment

We calculated the mean value for each provision and divided it by two to produce a favorability score for each provision between -1 and 1. Table 1 reports the resulting “survey-weighted enabling score” for each provision relevant to our empirical analysis. Values below 0.50 indicate provisions that, on average, experts believe discourage private investment while values above 0.50 encourage investment.

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13 This includes the so-called “secondary literature,” which is composed of government reports, working papers, white papers, etc.
14 See Geddes and Wagner (2013) for a detailed discussion of the development of our PPP enabling law index. Additional sources include Fishman (2009); Iseki et al (2009); and Rall, Reed, & Farber (2010). An important research question involves creating and analyzing a similar ranking for all states, not only those with enabling laws.
15 Fifteen experts answered the survey. Table 6 reports the distribution of experts across ten major organizational types, such as federal and state government, think tanks and academia. Experts are well-distributed across organizational types, with the exception of law firms and toll road operators. We thus do not view our survey weightings as systematically biased.
We catalogued the provisions contained in each state’s enabling law to determine which provisions each law contained. We then divided the total by 13 (the total number of possible provisions in any given law) to generate an overall favorability index for each state’s law.\textsuperscript{16} Some states replaced older PPP laws with newer ones during our study period. We used LexisNexis to track changes in those laws since their inception, which we incorporate into the favorability index. This provides a time-varying favorability score for each state that varies between zero and ten. States without laws received favorability index scores of zero. Scores for each state are reported in Table 2.

\textsuperscript{16} We scale the favorability index to be between zero and ten to aid interpretation of regression coefficients.

\begin{table}[h]
\centering
\small
\begin{tabular}{|l|l|l|}
\hline
\textbf{Concept} & \textbf{Provision} & \textbf{Survey-Weighted Enabling Score} \\
\hline
Fundmix & The law allows both public and private sector money to be combined in the financing of a PPP project. & 0.90 \\
\hline
Eligibility & Road and highways are not eligible for PPPs under the statute & -0.84 \\
\hline
Avail & The law explicitly permits the state to make payments to the private entity in lieu of direct user fees (e.g. availability payments, shadow tolls). & 0.82 \\
\hline
Unlimitedpro & The law does not put a limit on the number of projects that can be developed under the PPP approach. & 0.79 \\
\hline
Confident & The law protects the confidentiality of proprietary information contained in a private entity’s proposal. & 0.79 \\
\hline
Priorleg & The law does not include a provision that allows the state legislature (or another public body) to reject a PPP agreement. & 0.77 \\
\hline
Brown & The law allows existing transportation facilities, as well as new transportation facilities, to be PPP-eligible. & 0.77 \\
\hline
Others & The law explicitly grants authority to entities other than the state DOT (i.e. counties, municipalities) to enter into PPP agreements (assuming that the state DOT also has authority). & 0.67 \\
\hline
Exemptpro & The statute exempts PPPs from the state’s procurement laws. & 0.61 \\
\hline
Revenue & The law permits revenue sharing in PPP agreements. & 0.60 \\
\hline
Noncomp & The law allows PPP agreements to contain non-compete clauses or compensation clauses. & 0.57 \\
\hline
Unsolic & The law allows the responsible public entity to receive both solicited and unsolicited PPP proposals. & 0.54 \\
\hline
Proptax & The law exempts the private entity from paying property taxes on the land required to operate the facility. & 0.47 \\
\hline
\end{tabular}
\caption{Description of provisions and corresponding scores}
\end{table}
### TABLE 2 - Dates of First Passage of PPP Laws and 2012 Favorability Scores

<table>
<thead>
<tr>
<th>State</th>
<th>Year</th>
<th>PPP Index</th>
<th>Rank</th>
<th>State</th>
<th>Year</th>
<th>PPP Index</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>1996</td>
<td>4.3</td>
<td>18</td>
<td>Montana</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alaska</td>
<td>2006</td>
<td>1.7</td>
<td>33</td>
<td>Nebraska</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Arizona</td>
<td>1991</td>
<td>5.2</td>
<td>8</td>
<td>Nevada</td>
<td>2003</td>
<td>2.7</td>
<td>29</td>
</tr>
<tr>
<td>Arkansas</td>
<td>2011</td>
<td>3.4</td>
<td>22</td>
<td>New Hampshire</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>California</td>
<td>1989</td>
<td>3.0</td>
<td>28</td>
<td>New Jersey</td>
<td>1997</td>
<td>^</td>
<td>^</td>
</tr>
<tr>
<td>Colorado</td>
<td>1995</td>
<td>6.3</td>
<td>1</td>
<td>New Mexico</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Connecticut</td>
<td>2011</td>
<td>4.1</td>
<td>20</td>
<td>New York</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Delaware</td>
<td>1995</td>
<td>4.2</td>
<td>19</td>
<td>North Carolina</td>
<td>2000</td>
<td>3.4</td>
<td>22</td>
</tr>
<tr>
<td>Florida</td>
<td>1991</td>
<td>4.7</td>
<td>13</td>
<td>North Dakota</td>
<td>1993</td>
<td>4.5</td>
<td>16</td>
</tr>
<tr>
<td>Georgia</td>
<td>1998</td>
<td>6.3</td>
<td>1</td>
<td>Ohio</td>
<td>2011</td>
<td>5.4</td>
<td>7</td>
</tr>
<tr>
<td>Hawaii</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Oklahoma</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Idaho</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Oregon</td>
<td>1995</td>
<td>6.1</td>
<td>4</td>
</tr>
<tr>
<td>Illinois</td>
<td>2011</td>
<td>4.4</td>
<td>17</td>
<td>Pennsylvania</td>
<td>2012</td>
<td>4.7</td>
<td>13</td>
</tr>
<tr>
<td>Indiana</td>
<td>2006</td>
<td>4.1</td>
<td>20</td>
<td>Rhode Island</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iowa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>South Carolina</td>
<td>1994</td>
<td>3.4</td>
<td>22</td>
</tr>
<tr>
<td>Kansas</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>South Dakota</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kentucky</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Tennessee</td>
<td>2007</td>
<td>1.1</td>
<td>34</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1997</td>
<td>5.7</td>
<td>6</td>
<td>Texas</td>
<td>1991</td>
<td>5.8</td>
<td>5</td>
</tr>
<tr>
<td>Maine</td>
<td>2010</td>
<td>3.1</td>
<td>26</td>
<td>Utah</td>
<td>1997</td>
<td>5.2</td>
<td>8</td>
</tr>
<tr>
<td>Maryland</td>
<td>1997</td>
<td>3.1</td>
<td>26</td>
<td>Vermont</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>2009</td>
<td>5.0</td>
<td>11</td>
<td>Virginia</td>
<td>1988</td>
<td>6.3</td>
<td>1</td>
</tr>
<tr>
<td>Michigan</td>
<td>2010</td>
<td>5.1</td>
<td>10</td>
<td>Washington</td>
<td>1993</td>
<td>2.7</td>
<td>29</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1993</td>
<td>2.1</td>
<td>32</td>
<td>West Virginia</td>
<td>2008</td>
<td>5.0</td>
<td>11</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2007</td>
<td>4.6</td>
<td>15</td>
<td>Wisconsin</td>
<td>1997</td>
<td>3.4</td>
<td>22</td>
</tr>
<tr>
<td>Missouri</td>
<td>2006</td>
<td>2.4</td>
<td>31</td>
<td>Wyoming</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: Dash indicates that no law was ever passed. ^: Enabling law in New Jersey expired in 2003.
Source: Author’s compilation.

Over time, amendments have made enabling laws more favorable to PPPs over time, Figure 3 indicates that the average value of our favorability index has increased significantly since 1988, reaching its peak in the last year of our analysis, 2012.
Our index is consistent with views regarding which states are generally viewed as receptive to private investment. For example, Texas, Virginia, Georgia, and Florida are often cited as examples of states with a favorable climate.\textsuperscript{17}

4. Empirical Strategies and Estimates

We next empirically examine PPP enabling laws’ impact on private infrastructure investment. We utilized data on all PPP projects as reported in the “U.S. Transportation Projects Scorecard” in the \textit{Public Works Financing} newsletter to measure investment. We evaluate the effect of PPP laws on the completion of PPP projects, the amount of PPP investment and on the share of PPP investment relative to total infrastructure investment in the state.

We next describe dependent and independent variables. Our dependent variable is the proportion of PPP expenditure relative to total expenditure on roads and highways. It is important to consider this proportion because states with larger total spending (public and private) could receive more PPP investment even if this is limited in terms of its amounts and percentages, thus

\textsuperscript{17} Consistent with our hypothesis that PPP enabling laws in those states facilitate investment, Gilroy (2009, p. 14) notes “[s]tates like Texas, Virginia, Georgia, and Florida are generally regarded as offering the best models [of PPP legislation], as evidenced by the fact that they are reaping the most private sector interest and investment.”
biasing estimates. To compute the percentage of PPP investments we use data on “Total State Investments in Roads and Highways” from the U.S. Census Bureau (Annual Survey of State Government Finances).

Our two key independent variables are PPP Act and PPP Index. Each will display a positive coefficient if enabling laws increase investment. Our choice of other time-varying regressors was based on a detailed review of extant literature examining both privatization and contracting out. Researchers there argue that governments utilize private investment in response to constraints on traditional financing sources for public service provision. Capital constraints, rather than a quest for efficiency (e.g. Bel and Fageda, 2007), thus drive private-sector participation. We include proxies for a state’s general fiscal health and its access to traditional sources of infrastructure financing (which we call “traditional finance”). Those are measured by the state’s debt outstanding per capita (Debt_pc), gas tax receipts per capita (Gastax_pc) and federal aid for highways per capita (Fedaid_pc).

Measures of political interests and pressure groups are typically introduced in PPP empirical analysis. However, Albalate, Bel and Geddes (2013, 2015) find that political ideology is irrelevant. Our attempts to consider the percentage of democrats in the state legislature or the political party of the Governor produce similar results (i.e. lack of significance), which justifies not including them in our final specification. Albalate, Bel and Geddes (2013) find that the relative wage differential between the private and the public sectors is significant in PPP choice in the U.S. water industry. If unions (perhaps to protect salaries and jobs), oppose PPPs in favor of an approach more likely to involve union labor, then the union variable will negatively impact PPP utilization. Similarly, if privately operated roadways are more likely to employ electronic tolling, then toll-collector unions may oppose PPPs. We include unionization rate as a control variable.

Other basic controls are real per-capita income and the state’s population. It is difficult to predict ex ante the impact either variable will have on the percentage of PPP investments relative to total State investments in roads and highways. Summary statistics for all variables are reported in Table 3 below. We next describe our empirical approach and estimating equations.

---

18 We were unable to locate adequate state-level data for our time period that measures the condition of transportation infrastructure. Available measures were highly incomplete.

We use two complementary empirical strategies to assess the impact of PPP enabling laws on private investment in infrastructure. We first exploit the panel features of our data to examine the effect of a law and its favorability on PPP investment. We utilize data from the 1988-2012 period to estimate how exposure to evolving legal frameworks impacts the cumulative number of PPPs and cumulative private investment. This allows us to evaluate the long-term effects of favorable laws and to assess the role of specific provisions that may, by themselves, have only a short-term impact on annual investment.

Our key dependent variable is the proportion of private investment relative to investment in roads and highways overall. We thus generalize the maximum likelihood optimization of the fractional-response model to obtain parameter estimates within our panel data setting. This is possible by applying a population-averaged, panel-data model with a within-group correlation structure. We estimate the following equations:

\[ \text{Percentage}_{it} = \alpha + \beta_1 \text{D}^{\text{PPP, Act}}_{it} + \beta_2 \text{Real\_income\_pc}_{it} + \beta_3 \text{Fedaid\_pc}_{it} + \beta_4 \text{Debt\_pc}_{it} + \beta_5 \text{Pop}_{it} + \beta_6 \text{Unionm}_{it} + \beta_7 \text{Year}_t + s_i + \epsilon_{it} \]  

\[ \text{Percentage}_{it} = \alpha + \beta_1 \text{D}^{\text{PPP, Index}}_{it} + \beta_2 \text{Real\_income\_pc}_{it} + \beta_3 \text{Fedaid\_pc}_{it} + \beta_4 \text{Debt\_pc}_{it} + \beta_5 \text{Pop}_{it} + \beta_6 \text{Unionm}_{it} + \beta_7 \text{Year}_t + s_i + \epsilon_{it} \]  

(1)

(2)

where each variable is defined below. The two equations differ only in the use of the binary Act dummy versus the continuous Index variable to capture the impact of PPP enabling laws. The dependent variable, Percentage, is the percentage of PPP investments in roads and highways divided by total investment in roads and highways in state \( i \) in year \( t \), while \( s \) denotes state-specific fixed effects, and \( \epsilon \) is the error term. OLS estimates are presented in Table 4 below.
TABLE 3. Summary Statistics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>Source</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>Percentage of PPP investments over Total State Investments (in roads and highways)</td>
<td>See Sections 3 and 4.</td>
<td>0.0026</td>
<td>0.0004</td>
<td>0</td>
<td>0.317</td>
</tr>
<tr>
<td>PPP Act</td>
<td>Binary variable taking value 1 a PPP enabling law is present; 0 Otherwise.</td>
<td>See Section 3</td>
<td>0.344</td>
<td>0.013</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PPP Index</td>
<td>PPP favorability index presented describe in Section 3.</td>
<td>See Section 3</td>
<td>1.216</td>
<td>0.054</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Real Income pc</td>
<td>State real income per capita</td>
<td>U.S. Census Bureau</td>
<td>164.23</td>
<td>196.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fedaidpc</td>
<td>Federal aid to highways per capita to the state</td>
<td>U.S. Census Bureau</td>
<td>114.61</td>
<td>81.78</td>
<td>28</td>
<td>615</td>
</tr>
<tr>
<td>Gastaxpc</td>
<td>State gasoline tax receipts per capita</td>
<td>FHWA Highway Statistics Series</td>
<td>118.57</td>
<td>35.67</td>
<td>0</td>
<td>287</td>
</tr>
<tr>
<td>Debtpc</td>
<td>State’s only Debt outstanding per capita</td>
<td>U.S. Census Bureau</td>
<td>2,539</td>
<td>1,909</td>
<td>124</td>
<td>12,094</td>
</tr>
<tr>
<td>Pop</td>
<td>State population (000s)</td>
<td>U.S. Census Bureau</td>
<td>5,600</td>
<td>6,158</td>
<td>454</td>
<td>38,041</td>
</tr>
<tr>
<td>Unionm</td>
<td>Percent of working population in a union in the state</td>
<td>unionstats.com(from CPS)</td>
<td>12.70</td>
<td>5.96</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>Year</td>
<td>Variables that denotes the year of the observation</td>
<td>-</td>
<td>2000</td>
<td>7.21</td>
<td>1988</td>
<td>2012</td>
</tr>
</tbody>
</table>
Our estimates indicate that the **PPP Act** binary variable (model 1) and the favorability index of the state’s legislation (model 2) are important determinants of a state’s proportion of PPP investment. Both display a positive, statistically significant impact on the fractional response variable. This is consistent with our predictions regarding the positive role of PPP legislation in attracting private investment. By computing marginal effects we find that the elasticity for the percentage of PPP investments with respect to the PPP Index values is 0.5.

Our binary variables may suffer from endogeneity, however. This could be the case if PPP laws are passed in response to a previously agreed-upon PPP project, or if the state has recently adopted a PPP that created concern and engendered legislative action. We use a two-pronged approach to address this potential problem. We first report estimates using a two-stage estimation procedure employing instrumental variables. Second, because PPPs are often large and controversial events covered by media reports, we report findings from an exhaustive

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Fixed Effects FR model PPP Percentage (1)</th>
<th>Fixed Effect FR model PPP Percentage (2)</th>
<th>IV 2SLS model PPP percentage (3)</th>
<th>IV 2SLS model PPP expenditure per capita (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPP Act</td>
<td>1.795***</td>
<td>-</td>
<td>0.0474**</td>
<td>0.1071**</td>
</tr>
<tr>
<td>PPP Index</td>
<td>-</td>
<td>0.3988***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Income pc</td>
<td>0.00575 (0.0057)</td>
<td>0.0059 (0.0053)</td>
<td>0.00007** (0.00003)</td>
<td>0.0001 (0.0001)</td>
</tr>
<tr>
<td>Fedaidpc</td>
<td>-0.0040 (0.0046)</td>
<td>-0.0040 (0.0067)</td>
<td>3.17e-06 (0.00001)</td>
<td>0.00008** (0.00004)</td>
</tr>
<tr>
<td>Gastaxpc</td>
<td>-0.0076 (0.0065)</td>
<td>-0.0048 (0.0079)</td>
<td>0.00004 (0.00003)</td>
<td>-0.00006 (0.00001)</td>
</tr>
<tr>
<td>Debtpc</td>
<td>0.00003 (0.0001)</td>
<td>0.000017 (0.0001)</td>
<td>7.29e-07 (7.39e-07)</td>
<td>1.18e-06 (2.05e-06)</td>
</tr>
<tr>
<td>Pop</td>
<td>-0.00019 (0.0002)</td>
<td>-0.00019 (0.0002)</td>
<td>-2.80e-06** (1.25e-06)</td>
<td>-6.10e-06* (3.51e-06)</td>
</tr>
<tr>
<td>Unionm</td>
<td>-0.0055 (0.0347)</td>
<td>0.01717 (0.0378)</td>
<td>0.00047* (0.00028)</td>
<td>0.00147* (0.0008)</td>
</tr>
<tr>
<td>Year</td>
<td>0.0251 (0.0298)</td>
<td>0.01102 (0.0294)</td>
<td>-0.0010** (0.00005)</td>
<td>-0.0019 (0.0014)</td>
</tr>
<tr>
<td>N. Observations</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>Wald-Chi2</td>
<td>41.79***</td>
<td>42.54***</td>
<td>13.65*</td>
<td>24.55***</td>
</tr>
</tbody>
</table>

Notes: ***, **, * significance levels at 1%, 5% and 10% respectively. Errors are robust to heteroskedasticity in Equations (1) and (2) and clustered allowing for arbitrary correlation by State in models (3) and (4). Instruments used in models (3) and (4) to predict PPP act are total vehicle miles per capita, travel-time index, republican agreement and democrat agreement. They are chosen according to statistical significance in estimates from Geddes and Wagner (2013) modeling PPP enabling law adoption and they satisfy standard tests of over identifying restrictions: Sargan-Hansen J statistic is 2.571; Chi-sq(3), P-value = 0.4627.
investigation into news reports surrounding the time of law adoption. Our prior is that state legislators adopting a PPP law in response to an impending transaction (perhaps due to pressure from investors) is newsworthy and would be reported.

Regarding 2SLS, we chose first-stage instruments to determine the adoption of a PPP enabling law from among the statistically significant variables reported in Geddes and Wagner (2013), who estimate the determinants of PPP law passage. Instruments include vehicle miles traveled per capita, the travel-time index and the democrat and republican agreement variables. The latter indicates whether there is party alignment between the governorship and legislature.

Estimates using this method are presented in model (3) of Table 4 for the percentage of PPP expenditures relative to total expenditures. This model is also replicated for PPP expenditures per capita as a complementary dependent variable. We show that the positive and statistically significant impacts of PPP Act remain after correcting for possible endogeneity.

The second strategy to address potential law endogeneity was to search for media evidence of a PPP law being passed in response to an impending agreement. That task would be onerous for all states with laws. We instead focused on five states that have exhibited high PPP activity: California, Florida, Texas, Virginia, and North Carolina. An exhaustive search into events surrounding PPP law passage in each state was conducted. The search revealed lobbying by numerous stakeholders prior to the passage of an enabling law, including by state Departments of Transportation, Associated Builders and Contractors, and construction companies among others. There were several instances where, consistent with our hypothesis, private groups lobbied for stronger PPP laws lest they move investment to more accommodating states. In no case did our investigation indicate that a PPP agreement had been concluded prior to the passage of the legislation, providing further comfort regarding possible law endogeneity.

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19 Geddes and Wagner (2013) do not use this variable but use vehicle registrations instead. We believe that vehicle miles travelled is a better proxy of market demand for PPPs.
20 Democrat and republican agreement is a variable set to one if the governorship and the legislature in a state are from the same party, zero otherwise. This is a proxy for the ease with which legislation can be passed.
21 We do not replicate the analysis with the PPP index variable because of collinearity.
22 We are here grateful for Priya Mukherjee for her thorough research assistance. Details of her investigation are available upon request.
23 With regard to California’s PPP enabling law, Skanska noted that, “The danger for California is that many of its neighbor states not only have legislation in place to allow for PPPs, but have established processes that make these efforts easier for all stakeholders. Should California lag behind these states, private money will go elsewhere.” (see “To enable its growing economy, California needs to renew its design-build and PPP legislation,” September 4, 2013, available at: http://blog.usa.skanska.com/to-enable-its-growing-economy-california-needs-to-renew-its-design-build-and-ppp-legislation/ (accessed October 18, 2015).
4.b) Cumulative effects in a Cross-Sectional Setting: Exposure to PPP law’s provisions and PPP agreements.

We next use cross-sectional analysis to evaluate the impact of enabling law exposure on the cumulative number of projects and on overall PPP expenditures. We computed the cumulative number of PPPs and expenditures per capita between 1988 and 2012 in all fifty states. We also computed the percentage of PPP investment relative to total investment in roads and highways for the entire period. We define the number law-exposure years as the number of years within this time frame that a PPP enabling law was in place. We regress PPP outcomes on years of PPP law exposure. This cross section avoids year-to-year specific unobserved factors that may vary and explain overall investment and number of projects developed. Using this procedure, our estimates regarding the impact of PPP enabling laws, and particular legal provisions, in attracting private investment, are consistent with those above.

Figures 4-6 relate years of PPP act exposure to a variety of outcomes including cumulative number of PPPs (normalized by state population), PPP expenditure per capita, and percentage of cumulative PPP expenditures relative to total expenditures on roads and highways. All figures show a strong positive relationship between years exposed and all outcome variables. Similarly, figures 7-9 display a non-parametric median spline between the same variables, indicating a non-linear relationship similar to an inverted u-shape. This relationship appears closer to an exponential function for the first years of exposure, reaching the highest values between 10 and 13 years.24

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24 The Median Spline calculates cross medians and then uses the cross medians as knots to fit a cubic polynomial. The resulting spline is graphed as a line plot. This method does not need to assume a given particular and adhoc functional form of the relationship between the dependent and explanatory variables.
FIGURE 4. Scatter of linear prediction of years of PPP act exposure on Cumulative number of PPP projects per capita (p.c.)

FIGURE 5. Scatter of linear prediction of years of PPP act exposure on the percentage of the Cumulative PPP expenditures over total expenditures

FIGURE 6. Scatter of linear prediction of years of PPP act exposure on the Cumulative PPP expenditures p.c.
FIGURE 7. Median Spline between years of PPP act exposure and Cumulative number of PPP p.c.

FIGURE 8. Median Spline between years of PPP act exposure and Cumulative PPP expenditures per capita.

Figure 9. Median Spline between years of PPP act exposure and percentage of PPP expenditure over Total expenditure.
If we instead use the favorability index developed and described in Section 3, we find a non-parametric relationship in which states with the highest average value of the favorability index are those with the largest number of projects, investments and percentages of PPP investments (See figures 10-12).

Figure 10. Median Spline between average favorability index and Cumulative number of PPP p.c.

Figure 11. Median Spline between average favorability index and Percentage of PPP investments per capita over Total Investments.
We next examine those relationships within a multivariate regression framework. We control for exposure to all specific provisions using three alternative specifications and estimation methods. Years of exposure are computed as the number of years in which each provision has been in place in each of the 50 states from 1988 through 2012. Estimates using three types of regression methods applied to different dependent variables are presented in Table 5 below.

<table>
<thead>
<tr>
<th>Provisions</th>
<th>NB Cum. Number of PPP projects per capita (1)</th>
<th>NB Cum. PPP investments per capita (2)</th>
<th>FR Model Percentage of PPP investments over Total Investments (3)</th>
<th>NB Cum. Number of PPP projects (4)</th>
<th>NB Cum. PPP investments per capita (5)</th>
<th>FR Model Percentage of PPP investments over Total investments (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average of PPP Favorability Index</td>
<td>0.3574*** (0.1057)</td>
<td>0.4170*** (0.1437)</td>
<td>0.4887*** (0.1165)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Brown</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0569 (0.0492)</td>
<td>0.1202*** (0.0448)</td>
<td>0.0804 (0.0526)</td>
</tr>
<tr>
<td>Unsolic</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.1276*** (0.0368)</td>
<td>0.1609*** (0.0578)</td>
<td>0.0967** (0.0471)</td>
</tr>
<tr>
<td>Exemptpro</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.0214 (0.0349)</td>
<td>0.0747 (0.0745)</td>
<td>0.0403 (0.0519)</td>
</tr>
<tr>
<td>Revenue</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0023 (0.0349)</td>
<td>0.0435 (0.0841)</td>
<td>0.0505 (0.0607)</td>
</tr>
<tr>
<td>Avail</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.0245 (0.0755)</td>
<td>0.0923 (0.1095)</td>
<td>-0.0286 (0.0991)</td>
</tr>
<tr>
<td>Proptax</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.1110*** (0.0544)</td>
<td>0.1284*** (0.0676)</td>
<td>0.1064 (0.0685)</td>
</tr>
<tr>
<td>Noncomp</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.0776 (0.0507)</td>
<td>0.1324 (0.1051)</td>
<td>0.0445 (0.0853)</td>
</tr>
<tr>
<td>Fundmix</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.3120*** (0.0808)</td>
<td>0.3500*** (0.1020)</td>
<td>0.2477*** (0.0907)</td>
</tr>
<tr>
<td>Confident</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.1166*** (0.0384)</td>
<td>-0.2272*** (0.0553)</td>
<td>-0.0952 (0.0651)</td>
</tr>
<tr>
<td>Priorleg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0426*** (0.03047)</td>
<td>0.1240*** (0.0478)</td>
<td>0.0449 (0.0451)</td>
</tr>
<tr>
<td>Unlimitedpro</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.1482*** (0.0373)</td>
<td>-0.2439*** (0.0450)</td>
<td>-0.1088** (0.0484)</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0132 (0.0336)</td>
<td>-0.0778 (0.0596)</td>
<td>-0.0407 (0.0574)</td>
</tr>
<tr>
<td>N. Observations</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Wald-Chi2</td>
<td>14.89***</td>
<td>10.61***</td>
<td>-</td>
<td>288.72***</td>
<td>350.97***</td>
<td>-</td>
</tr>
<tr>
<td>Log pseudolikelihood</td>
<td>-0.1677</td>
<td>-26.16</td>
<td>-0.946</td>
<td>-71.71</td>
<td>-20.78</td>
<td>-0.9243</td>
</tr>
</tbody>
</table>

Notes: ***, **, * Significance levels at 1%, 5% and 10% respectively. Errors are robust to heteroskedasticity. Equation (1) is also corrected by the average population of the whole period in each State. NB: Negative Binomial; FR: Fractional response model (maximum likelihood).
TABLE 6: Distribution of PPP Experts Surveyed, by Organizational Type

<table>
<thead>
<tr>
<th>Organizational Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Government</td>
<td>4</td>
</tr>
<tr>
<td>State-level government</td>
<td>2</td>
</tr>
<tr>
<td>Bank or investment firm</td>
<td>1</td>
</tr>
<tr>
<td>Design and/or construction firm</td>
<td>2</td>
</tr>
<tr>
<td>Toll road operating firm</td>
<td>0</td>
</tr>
<tr>
<td>Consulting firm</td>
<td>3</td>
</tr>
<tr>
<td>Law firm</td>
<td>0</td>
</tr>
<tr>
<td>Academia</td>
<td>2</td>
</tr>
<tr>
<td>Think tank/Public-policy research firm</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

Note: To properly reflect backgrounds, experts were allowed to check more than one organizational type. The total number of survey respondents was 15.

Because the cumulative number of PPPs is a count, we adopted a Negative Binomial regression to evaluate the impact of a PPP enabling law - in model (1) - and its specific provisions - in model (4) - on the number of PPPs. Negative binomial models are similar to Poisson models but can account for the marked over-dispersion of a count outcome variable. Estimates indicate that being exposed to several provisions produced a statistically significant (at 5 percent) impact on the cumulative number of PPPs. Allowing for unsolicited PPP proposals and exempting the payment of property taxes increases the number of PPPs developed. Also, PPP projects increase where a combination of private and public money is allowed to fund the project and where it is necessary to receive the legislature’s authorization. On the contrary, we find a negative relationship between provisions that set a PPP limit and those that protect confidentiality. Exposure to the other provisions does not affect the cumulative PPP number.

Although PPP investments per capita is a continuous variable, we cannot evaluate the impact of the PPP law and its provisions under an OLS or Tobit regression model (censored at zero) because it follows a negative binomial distribution, failing to satisfy their normality assumption. We thus transformed this variable’s values into non-negative integers by rounding
up decimals and replicating the negative binomial regression using this new outcome variable. Estimates in columns (2) and (5) take this approach. The first evaluates the average PPP favorability index finding a positive and statistically significant effect. The second estimates provisions’ impacts and confirms the facilitating role of allowing for unsolicited proposals, exemption from property taxes, pre-approval from the state’s legislature, and allowing for a combination of public and private project funding. In addition, we find that cumulative PPP expenditures per capita increases where Brownfield projects are also allowed. Not limiting the number of PPP projects to pilot projects only, and the confidentiality provision, are negatively related to PPP expenditures per capita.

We have examined PPPs without considering whether they are undertaken in states with larger spending on roads and highways. A possible solution is computing the percentage of PPP investment relative to total investment. We therefore used a generalized linear model with fractional response variables to determine how being exposed to an average favorability index and to different provisions from 1988 to 2012 has affected the distribution of spending. Model (3) shows the positive impact of PPP favorability legislation while model (6) indicates that only the unsolicited proposals provision and the provision allowing for a combination of public and private funds have a positive and significant impact on the percentage of PPP investment relative to total investment. On the contrary, not limiting PPPs to pilot projects is related to lower values of this percentage, perhaps because limiting PPPs to pilot projects only usually happens where PPPs are underdeveloped, which suggests that the potential for PPP growth is larger ceteris paribus.

5. Summary and Conclusion

Many U.S. states and localities are facing major burdens in financing, maintaining, expanding and renovating their transportation infrastructure. Much transportation infrastructure is used intensively, but is well past its original design life. One approach used at the state level is to increase private participation through PPPs. Thirty-four states plus Puerto Rico had passed modern PPP enabling laws as of late 2012. Such laws provide the institutional arrangements within which PPPs can be undertaken, and thus lower PPP transaction costs. PPP enabling laws also clarify such important issues as whether or not PPPs can be used on both new and existing facilities, whether the state allows the mixing of public- and private-sector financing, whether or
not the government can share toll revenue, and whether or not state legislative approval is needed after the PPP agreement is concluded.

In addition to collecting data on PPP enabling laws, we created an expert-weighted index of PPP enabling law favorability by surveying PPP experts from a range of backgrounds. This allows us to attach carefully considered weights to thirteen critical elements of PPP enabling laws. We then studied state laws to see which contain the various provisions, which allowed us to generate an index of enabling law favorability. We find that not only are more states passing PPP enabling laws over time, but that the average favorability of a U.S. PPP enabling law is also rising over time. Our estimates indicate that better legal frameworks induce and attract private capital to transport infrastructure projects. We find a positive elasticity of 0.5 for the percentage of PPP investments with respect to our PPP index variable.

Our empirical estimates suggest several key conclusions regarding the proper structure of PPP enabling laws. In our “exposure to the law” estimates reported in Table 5, we find that allowing unsolicited proposals, allowing the mixing of public and private funds, and allowing some commercial information to remain confidential are the most important provisions in facilitating private investment. The above findings are invariant to the method of measuring private infrastructure investment via PPPs, and are significant at standard confidence levels. We are thus confident in stating that our findings can provide guidance to additional states and localities wishing to craft PPP enabling laws that effectively encourage additional private investment via PPPs.
References


