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Public Corruption and Organizational Performance: Evidence from Highway Transportation

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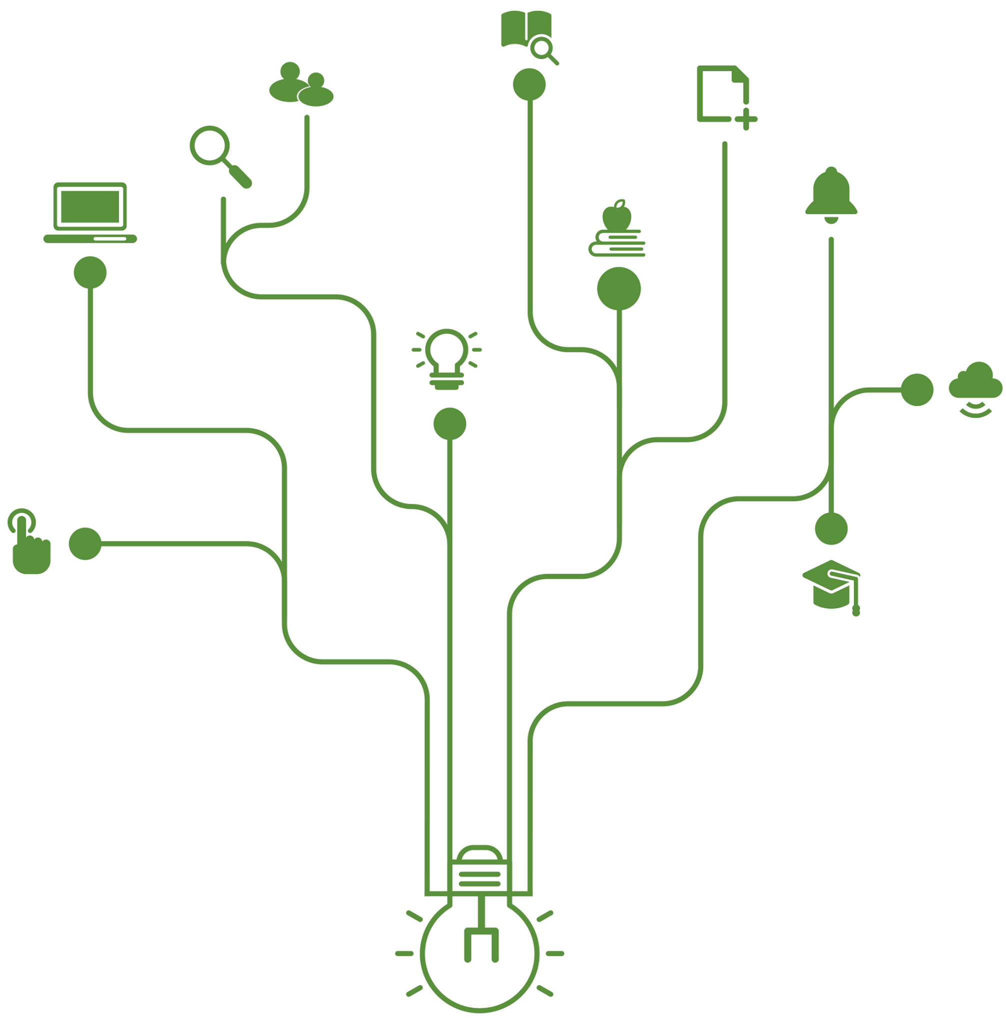

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Public Corruption and Organizational Performance: Evidence from Highway Transportation

Running title: Corruption and infrastructure

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Abstract

Public corruption has significant negative effects on the performance of public agencies in both developing and developed countries. In this paper, we propose a theoretical approach to understanding the potential impact of public corruption on the performance of public organizations. We constructed multiple indexes for capturing the sectoral and overall performance of US state highway transportation agencies based on road quality, the status of bridges, traffic congestion, traffic fatalities, and overall highway performance. Using state panel data for the period from 2002 to 2008, we found that public corruption had a negative impact on the quality of state roads and bridges and on traffic congestion and was associated with increases in traffic fatalities. Overall, we confirmed that corruption has the potential to diminish significantly the performance of US highway transportation agencies.

Keywords

Corruption, infrastructure, organizational performance, transportation agencies

INTRODUCTION

Numerous cross-country studies have documented the deleterious effects of corruption in terms of government spending, economic growth, and social equality in the context of transition and developing countries. Relatively little research has been conducted, however, on the impact of corruption on the performance of public organizations in the developed world. This study was designed to help fill this gap in the literature by looking at the issue in the context of US transportation agencies.

Transportation was selected as the focus of this study for a combination of theoretical and methodological reasons. To begin with, transportation is one of the more corruption-prone sectors—Kottasova (2014) ranked it among the top three in this regard—in large part because it involves large and complex construction projects on which it can be difficult to impose adequate and consistent quality control, management, and evaluation measures. Further, because most infrastructure projects require official government approval and therefore facilitate rent-seeking behaviors, the sector tends to be dominated by a small number of monopolistic firms that are closely linked to government officials. As with the study of other forms of corruption, most existing studies of the impact of corruption on infrastructure and transportation have dealt with transition and developing countries (Kenny, 2009a, 2009b; Tanzi & Davoodi, 1998). Transportation infrastructure is also obviously important for the developed world, where this sector has also been shown to be corruption-prone. Thus there is ample anecdotal evidence of corruption in the various departments of transportation (DOTs) in the US states. In one recent case, an employee of the Georgia DOT was charged with accepting bribes (US Department of Justice, 2015); in another, three former employees of the South Carolina DOT and a contractor were charged as part of a six-year corruption and kickback scheme that cost taxpayers more than $400,000 (Flach & Cope, 2016). These anecdotes invite more systemic research into the impact of public corruption on these agencies of the kind conducted for this study. Moreover, the relative uniformity of DOTs across the United States in terms of funding, financing, and management (Goetz, 2007; Neshkova & Guo, 2012) facilitates their study as a group.

Literature on the subject has generally defined corruption as the misuse of a public office for private gain (Mauro, 1995). Having familiarized ourselves with the existing literature on the consequences of corruption and the determinants of organizational performance, we framed the following research questions:

- Does public corruption affect organizational performance in the public sector generally?
- In what ways does public corruption affect the organizational performance of state highway transportation agencies specifically?
- Which of the various dimensions of the organizational performance of state transportation agencies are vulnerable to public corruption?

LITERATURE REVIEW, CONCEPTUAL FRAMEWORK, AND HYPOTHESES

Organizational Performance Literature

Measuring and improving organizational performance has been a key concern of public management scholars (e.g., Boyne, 2003; Brewer & Selden, 2000; Lee & Whitford, 2013; Moynihan & Pandey, 2005; Nielsen, 2013; O'Toole & Meier, 2015; Rainey & Steinbauer, 1999; Walker & Andrews, 2015). Generally speaking, the body of research on public organizational performance literature consists of two major strands. The first has focused on the conceptualization and measurement of organizational performance in the public sector (e.g., Ammons, Coe, & Lombardo, 2001; Martin & Smith, 2005; Selden & Sowa, 2004). Taken together, this work treats organizational performance as a multi-dimensional concept that can be viewed from the perspectives of diverse stakeholders (e.g., Amirkhanyan, Kim, & Lambright, 2014; Martin & Smith, 2005; Selden & Sowa, 2004). The second strand of research, in particular studies in the field of public management, has focused on factors affecting organizational performance.

Boyne (2003) identified five sets of factors with the potential to affect the performance of agencies charged with delivering public services, namely resources, regulations, market structure (competition), size and structure, and capacity and practices. Further work has identified the following among the sets of factors that exert significant effects on organizational performance: resources (in keeping with resource-dependency theory; e.g., Andersen & Mortensen, 2010; Lee & Whitford, 2013), size and structure (Andrews, et al. 2009), and public management practices and capacity (Heckman, 2012, Meier & O'Toole, 2003; Meier, O'Toole, Boyne, & Walker, 2007; Nicholson-Crotty & O'Toole, 2004; Nielsen, 2013; O'Toole & Meier, 1999; Walker, Damanpour, & Devece, 2010). The present study is intended as a contribution mainly to this latter strand of research.

Organizational Performance and Corruption

Our work, then, builds on the existing organizational performance literature by examining how corruption can affect the performance of public agencies. Resource dependency theory suggests that the amount of resources available influences the delivery of a public service; thus Boyne (2003) has argued that "more resources will lead to better results is perhaps the simplest theory of public service improvement" (p. 369). If, for example, an official pockets a payment intended for the government (i.e., embezzles public funds for personal use), the amount of resources allocated to the delivery of the service that the payment would have funded is effectively reduced, and thereby the performance of the agency responsible for the service.

Beyond depriving public services of funding in this way, corruption also decreases the efficiency with which resources are utilized in the public sector. This perspective is consistent with both principal agent theory and the bureaucratic inefficiency model. The former views government officials as agents working on behalf of the interests of the public—the principals—in order to implement public policies and manage public service programs. The problem of agent opportunism may arise, however; that is, the agents may pursue their own interests in preference to those of the principals. Corrupt public agents violate the ideal principal-agent relationship, and in so doing they become less accountable to the citizens whom they are meant to serve and less likely to use resources efficiently.

Turning now to the bureaucratic inefficiency model (Niskanen, 1971, 1975), the idea here is that bureaucrats are interested in maximizing their own utilities. The utility function of bureaucrats generally includes such aspects as salary, staff size, power, patronage, outputs of the bureau, ease of managing it, and so on, all of which are positively related to the size of the budget. According to Niskanen (1975), bureaucrats pursue the maximum discretionary budget, which amounts to the difference between the total revenue received (the budget) and the minimum feasible cost of producing the output demanded by the political authorities. Access to a discretionary budget makes possible various non-productive activities, such as expanding staff unnecessarily (Williamson, 1964), reducing the efforts of individual staff (Wyckoff, 1990), excessive risk aversion (Peltzman, 1973), and corruption (Wintrobe, 1997). Under the model of a maximized discretionary budget, public officials may be inclined to gratify their selfishness through corrupt practices and to waste public funds on unproductive activities. In sum, inefficient utilization of public resources can diminish the performance of government agencies (Filmer & Pritchett, 1999; Gupta, Verhoeven, & Tiongson, 2002; Rajkumar & Swaroop, 2008; Reinikka & Svensson, 2005).

Third, public officials' corruption has the potential to diminish the capacity of public management and thereby the performance of public agencies. Public management scholars have increasingly emphasized the importance of management capacity in the achievement of the core goal of public organizations, which is of course the efficient and effective delivery of public services (e.g., Boyne, 2003; O' Toole & Meier, 1999, 2015). Public management capacity refers to a public agency's "intrinsic ability to marshal, develop, direct, and control its human, physical and information capital to support the discharge of its policy directions" (Ingraham & Donahue, 2000, p. 294). Thus public management capacity includes the managerial abilities of public managers to recruit productive employees, to award reliable contractors, to generate and spend financial resources wisely, to communicate effectively and make informed decisions, and to build and maintain capital infrastructure prudently. All of these managerial capacities can be directly related to the efficiency and effectiveness of public agencies (Andrews & Entwistle, 2015).

Public corruption has a negative impact on all four of the components of public management capacity mentioned above. Thus, with regard to human resource management, corruption distorts recruitment and promotion patterns in the public sector through patronage and nepotism that sideline efficient employees, prevent the most qualified job candidates from being hired, and in general compromise the productivity of public bureaucrats. Corruption may likewise undermine financial management when, for example, contracts are awarded to less efficient and lower quality contractors on the basis of bribes (Gould and Amaro-Reyes, 1983; Rose-Ackerman, 1978). In the management of information, corruption can reduce the transparency of public agencies and the amount and quality of information that they disclose as bureaucrats seek to shield corrupt activities from public scrutiny (Alt, Lassen, & Rose, 2006), and organizational performance can suffer when public officials are subject to less monitoring and oversight by the citizens whom they are meant to serve. Corruption also degrades infrastructure management practices, for corrupt public officials support capital projects characterized by higher levels of rent-seeking and secrecy and decreased competitiveness (Kenny, 2007; Blinded, 2014; Mauro, 2004). In addition, high-level corruption may create a bias against new capital investment and result in failure to tend to regular maintenance needs (Tanzi & Davoodi, 1997). This kind of mismanagement can, again, result in poor performance by public agencies. In sum, corruption can diminish the overall management capacity and therefore the performance of government organizations. We accordingly hypothesized that public corruption is negatively associated with the performance of public agencies.

- *Hypothesis 1: Public corruption diminishes the performance of public agencies.*

The Impact of Corruption on the Performance of Public Organizations Involved with Infrastructure

Bribery, embezzlement, policy capture, influence peddling, and abuse of functions are among the more common corrupt acts associated with government-financed infrastructure projects. Contributing factors to these types of corruption include the involvement of large sums of money, extensive discretion on the part of public officials over investment decisions, and the need to deal with multiple stakeholders and stages. The existing literature has implicated corruption in decreases in expenditures on operations and maintenance in comparison with new capital investments, decreases in rates of return (owing to the squandering of resources) on infrastructure, diminished capacity and quality of infrastructure, and generally reduced quality of life within a society.

Tanzi and Davoodi (1998) provided empirical evidence that corruption finds more fertile ground in new infrastructure projects than in those already in place and that it results in diminished operational and maintenance expenditures. They likewise demonstrated that the quality of existing infrastructure tends to deteriorate, with roads, railways, and power grids being particularly vulnerable to the pernicious effects of corruption. Kenny (2007, 2009a, 2009b) has focused specifically on the various forms of corruption associated with transport construction, including everything "from bribes designed to manipulate budgeting decisions, project selection, tender specifications, procurement outcomes, or contract negotiations and renegotiations, through bribes designed to cover collusion or poor-quality construction practices and outcomes, to the theft of materials" (Kenny 2009b, p. 23). The result has been roads that cost more, yield fewer economic benefits, have low traffic capacity, and require more but receive less funding for operations and maintenance. Kenny (2007) also observed that bribes to regulators led to lenient monitoring and enforcement of regulations, again diminishing the quality of infrastructure and therefore its safety.

In a recent survey of the extant literature about the effects of corruption on infrastructure, the Organisation for Economic Co-operation and Development (OECD; 2015) listed the misallocation of state revenue, squandering of resources, inflation of costs, diminishment of infrastructure quality, scarcity, inequitable allocation of benefits, and risks to the environment and human health and safety among the consequences for the transportation sector. The misallocation of state revenue is related to over-investment and mis-investment in infrastructure as bloated subsidies and costs promote the wasting of resources, while bribes for access to infrastructure inflate costs. Simply put, corruption reduces the quality of roads and other public works as service on infrastructure is neglected (scarcity) and or allocated unfairly across jurisdictions. Low-quality construction and maintenance damages the environment, threatens safety, and even claims lives (OECD, 2015).

Drawing on previous work addressing the performance of public infrastructure (Guo & Neshkova, 2013; Heckman, 2012; Neshkova & Guo, 2012; Poister, 2004), we used four indicators to measure the performance of the US state transportation departments and highway infrastructure outcomes. These indicators included the quality of state-administered highways, the status of state-owned bridges, congestion on state-administered highways, and highway traffic fatalities. We accordingly developed four further hypotheses as follows.

- *Hypothesis 2. Public corruption is negatively associated with the quality of state-administered roads.*
- *Hypothesis 3. Public corruption is negatively associated with the status of state-owned bridges.*
- *Hypothesis 4. Public corruption is positively associated with traffic congestion on state-administered highways.*
- *Hypothesis 5. Public corruption is positively associated with the numbers of fatalities on state-administered highways.*

METHODOLOGY AND DATA

Model Specification

We modeled organizational performance as a function of public corruption, which served as our main test variable, and a number of control variables. In keeping with previous studies of organizational performance (e.g., Meier & O'Toole, 2003; Neshkova & Guo, 2012; O'Toole & Meier, 1999), we controlled for task difficulty and agency resources. Our testing model was

$$StateHwyAgnPerform_{it}=\alpha+\beta C_{it}+\gamma T_{it}+\theta R_{it}+\varepsilon_{it} \qquad (1)$$

where is the observed state highway transportation agency performance indicator in state i in year t; Cit is the public corruption variable; is a set of variables capturing task difficulty for state highway transportation services; is a vector of resources available to the state highway transportation agencies; and refers to errors. Our benchmark model thus took the form of a fixed effect panel regression with Driscoll-Kraay standard errors.

SHAP= f[corruption; heavy truck share of annual VMT; % of state population living in urban areas; % of drivers and front-seat passengers wearing safety belts; log of state-administered highway lane miles; log of federal highway obligations (aids) to states per capita; log of state own-resource for highways (per capita); log of nominal state fuel tax rate; log of state refiner/reseller gasoline price (excluding fuel taxes); years (2002-2008); errors]

where SHAP refers to the five dependent variables that capture the sectoral and overall performance levels of the various state highway transportation agencies, as explained below.

Dependent Variables

Drawing again on previous literature addressing the performance of transportation infrastructure (e.g. Guo & Neshkova, 2013; Heckman, 2012; Neshkova & Guo, 2012; Poister, 2004), we selected five dependent variables for this study. Four of these variables captured the sectoral performance of the state highway transportation departments in terms of, in turn, the quality of state-administered highways, the status of state-owned bridges, congestion on state-administered highways, and traffic fatalities. The last dependent variable was a composite performance index integrating the four sectoral performance indexes.

The first variable, road quality (*GoodRoads*), was defined as the percentage of acceptable roads in state-administered highway systems. Roads are considered to be in acceptable condition when their International Roughness Index (IRI) falls below 170 (US DOT, 2010). The IRI is a widely used civil engineering measurement; lower IRI values are associated with higher ride and road quality. The quality of roads is considered acceptable below an IRI value of 170; specifically, road quality is considered good when IRI values fall below 95, and IRI values between 95 and 170 define fair roads (Blinded, 2014; US DOT, 2010).

The second variable, state-owned bridge conditions (*GoodBridges*), was defined as the percentage of state-owned bridges that were neither structurally nor functionally deficient (Blinded, 2016). According to the US DOT (2010), a structurally deficient bridge is one that, owing to deterioration and/or damage, is in need of significant maintenance and rehabilitation. A bridge is considered functionally deficient (obsolete, outdated) when its design is insufficient for its current use. Both structural and functional deficiencies of bridges can impede traffic flow and thereby impose costs on business and personal travelers.

The third variable, state-administered highway traffic congestion (*RoadCongestion*), was defined as the percentage of state-administered highway miles that were congested. There are many ways of measuring road congestion. Thus, for instance, the Texas A&M Transportation Institute has relied on a travel time index and annual hours of delay per capita to measure road congestion, though these measures track the problem only at the urban metropolitan level. State mean travel time is another such measure, with increased travel times obviously correlating with increased road congestion. However, annual data for state mean travel times are limited. In order to derive a statewide measure, we relied on the road congestion measure of traffic volume/service flow (V/SF) ratio. Congestion occurs when traffic exceeds the maximum amount that the road system can carry, and the V/SF ratio measures the actual flow of traffic relative to a theoretical maximum road carrying capacity: roads are congested when their traffic V/SF ratios exceed 0.80 (Blinded, 2016) and heavily congested with ratios in excess of 1.0.

The fourth dependent variable, state highway transportation traffic fatalities (*HwyFatality*), was measured as the highway fatality rate per 1,000 million vehicle miles traveled in each state. The number of highway fatalities is widely used as a performance indicator by state transportation departments (Blinded, 2014; Neshkova & Guo, 2012).

The performance of highway transportation agencies is a multi-dimensional construct (Amirkhanyan, Kim, & Lambright, 2014; Martin & Smith, 2005; Selden & Sowa, 2004). The four sectoral performance indicators just discussed reflect various aspects of state transportation performance, and we also developed a composite index (HwyAgyPerformInde) based on them to serve as an accurate and rigorous evaluation of the various aspects of performance. In order to do so, we applied principal component analysis (PCA) to the four sectoral performance indexes. PCA is a commonly used tool for reducing data in order to identify patterns of inter-correlations among variables (Blinded, 2014; Mertler & Reinhart, 2013; Tata & Schultz, 1988; Vyas & Kumaranayake, 2006). This form of analysis extracts each principal component (factor) from a set of original variables as a linear, weighted combination of the original variables and accounts for much of the variance among them. Our PCA-based highway service performance index thus combines multiple measures of highway performance into a new underlying construct that accounts for the widest possible range of variations in overall highway transportation performance.

The Key Independent Variable: Corruption of Public Officials

In order to measure the extent of public corruption across US states, we relied on the Report to Congress on the Activities and Operations of the Public Integrity Section (PIS) published by the US Department of Justice. The report includes the number of public officials convicted of violating federal corruption laws annually by state. All federal, state, and local governors, legislators, judges, and other public employees are subject to investigation. Multi-year panel data are available for the 50 states, from which data for the period from 2002 to 2008 were selected for inclusion in this study. These data were appropriate for this study because the report defines public corruption as "crimes involving abuses of the public trust by government officials," which is consistent with the academic definition of corruption—misuse of public office for private gain (US DOJ, 2002)—and because they cover most corruption cases across the US.[1]

We tested the relevance and validity of the methodology used by Blined (2014), though for the sake of brevity this test is not reported in this paper.[2] A number of studies have questioned the reliability, relevance, correctness, and validity of the PIS data (Alt & Lassen, 2014; Cordis & Milyo, 2016; Maass, 1987; Zhang & Kim, 2017), but many others have used the data to capture the extent of public corruption across states (Butler, Fauver, & Mortal, 2009; Depken & LaFountain, 2006; Glaeser & Saks, 2006; Goel & Nelson, 2011; Blinded, 2018; Meier & Holbrook, 1992; see also Cordis & Milyo, 2016; Zhang & Kim, 2017).

We ranked the 50 states according to our indexes of corruption by averaging state corruption for the 2002-2008 period according to the number of convictions per 10,000 public employees and per 100,000 members of the general population. According to the first measure, or the corruption variable in our benchmark model, the ten most corrupt states were, in order, Louisiana, Mississippi, North Dakota, Kentucky, Florida, Illinois, Missouri, South Dakota, Pennsylvania, and Alabama, and the ten least corrupt were Nebraska, Oregon, New Hampshire, Minnesota, Iowa, Colorado, Utah, Kansas, Washington, and Wisconsin. Table 1 shows the detailed corruption rankings by state.

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1) The forms of corruption documented in the data include accepting bribes, awarding government contracts to vendors without competitive bidding, accepting kickbacks from private entities engaged in or pursuing business with the government, overstating travel expenses or hours worked, selling information on criminal histories and law enforcement information to private companies, mail fraud, using government credit cards for personal purchases, sexual conduct, falsifying official documents, theft of government computer equipment for an international computer piracy group, extortion, robbery, and soliciting bribes by police officers, possessions with intent to distribute narcotics, and smuggling illegal aliens (DOJ, 2002). The PIS does not provide sector-by-sector information, e.g., the numbers of convictions related to malfeasance associated infrastructure alone.

2) The baseline measure aggregated state-, federal-, and local- level officials and "others involved." This step added noise, at least to the extent that the accountability logic on which we focused pertained most directly to state governments. At the same time, though, it added much relevant information, both because state officials represented only a fraction of those implicated in corruption at the level of state politics and because a culture of corruption arising at that level would naturally spill over into other domains of government in the state (Campante & Do, 2014, p. 6).

Table 1 Ranking of U. S. States (on Average, 2002-2008)

Ranking	Corruption (Population)	Corruption (Employee)	Ranng	Corruption (Population)	Corruption (Employee)
1	Oregon	Nebraska	26	Texas	Connecticut
2	New Hampshire	Oregon	27	Georgia	Oklahoma
3	Nebraska	New Hampshire	28	Massachusetts	Rhode Island
4	Colorado	Minnesota	29	Oklahoma	Maryland
5	Minnesota	Iowa	30	Wyoming	Massachusetts
6	Utah	Colorado	31	West Virginia	West Virginia
7	Iowa	Utah	32	Virginia	Virginia
8	Kansas	Kansas	33	Pennsylvania	New York
9	Washington	Washington	34	Tennessee	Hawaii
10	Nevada	Wisconsin	35	New York	Montana
11	Wisconsin	North Carolina	36	Hawaii	New Jersey
12	North Carolina	Vermont	37	New Jersey	Tennessee
13	Michigan	New Mexico	38	Ohio	Alaska
14	Indiana	Wyoming	39	Florida	Ohio
15	New Mexico	Michigan	40	Delaware	Delaware
16	Vermont	Nevada	41	Montana	Alabama
17	South Carolina	Indiana	42	Illinois	Pennsylvania
18	Arkansas	Arkansas	43	Alabama	South Dakota
19	Arizona	South Carolina	44	Missouri	Missouri
20	California	Idaho	45	Kentucky	Illinois
21	Rhode Island	Maine	46	South Dakota	Florida
22	Idaho	Georgia	47	Alaska	Kentucky
23	Maryland	Arizona	48	Mississippi	North Dakota
24	Connecticut	Texas	49	Louisiana	Mississippi
25	Maine	California	50	North Dakota	Louisiana

Sources: U.S. Department of Justice, *Reports to Congress on the Activities and Operations of the Public Integrity Section* (2002-2008).

Empirical Controls

Again following the lead of previous studies of organizational performance (e.g., Meier & O'Toole, 2003; O'Toole & Meier, 1999; Neshkova & Guo, 2012), we controlled for the level of task difficulty and agency resources in the various state transportation departments, including four variables to capture the effects of task difficulty. The first variable

(HighwaySize) was measured as the natural log of the number of highway lane miles in state-administered highway systems and thus estimated the workloads of state transportation agencies. The second variable (TruckVMT) accounted for the share of annual VMT attributable to heavy trucks on state-administered highway systems; in this case, larger values correlated with higher levels of road damage. The third variable (Urbanization) was measured as the share of a state's population living in urban areas; we controlled for this variable because urban areas have greater demands for transportation services and more traffic flows than rural areas. The fourth variable (SeatBelt) was measured as the percentage of drivers and front-seat passengers wearing safety belts; our expectation was that seat belt use would be associated with lower highway traffic fatalities and that this variable would also capture civic awareness of transportation safety. Thus we reasoned that a state with a relatively high level of civic awareness of transportation safety would be more attentive to highway transportation performance, which would improve as a consequence (Egilmez & McAvoy, 2013; Neshkova & Guo, 2012).

Another series of variables controlled for the effect of the amount of resources available for state highway transportation on performance. In general, better-funded agencies tend to demonstrate better performance than less well-funded agencies. The opposite interpretation of funding is also possible; that is, states with relatively low-quality highway infrastructure may be required to expend considerable amounts of resources in order to maintain their low levels of highway service. Once more, we followed the lead of previous studies (Guo & Neshkova, 2013; Neshkova & Guo, 2012) and included four variables in the estimation model. The first variable was measured as the log of real state-owned highway resources per capita (HwyOwnRev). The second was the log of the real federal highway obligation (aid) to states per capita (FedHwyAid). The third was the log of the nominal state fuel tax rate (FuelTax). State fuel taxes are an especially important source of state highway infrastructure financing because the tax revenue is generally earmarked for highway operations and maintenance. The fourth variable (GasPrice) was measured as the log of refiner/reseller gasoline price (excluding fuel taxes); a higher gasoline price may discourage automobile travel and reduce traffic volumes on state highway systems, thereby improving highway quality and performance. Table 2 describes the sources of data for the variables and the manner in which they were calculated.

Table 2 Variables, Definitions, and Data Sources

Variables	Description	Data Sources
Dependent Variable— Highway Infrastructure Outcomes (Infrastructure Quality and Performance)		
Good Roads	% of acceptable roads in state highway systems (International Roughness Index (IRI) is < 170)	Highway Statistics
Good Bridges	% of non- structurally and functionally deficient bridges in state highway systems	National Bridge Inventory
Traffic Congestion	% of road miles of the state highway system that are congested (traffic Volume/Service Flow (V/SF) ratio >0.80).	Highway Statistics
Traffic Fatality	Highway fatality rate per 1,000 million vehicle miles traveled in each state	Highway Statistics
Highway Agency Performance Index	PCA-based index to capture the overall performance of state highway transportation agencies	Authors' Construction
Key Independent Variables		
Public Corruption		
Corruption (per 10,000 public employees	(Number of convictions / number of state public employees) *10,000	US Department of Justice
Corruption (per 100,000 population	(Number of convictions / number of state population)*100,000	US Department of Justice
Task Difficulty		
Highway Size	Log of the state-administered highway lane miles	Highway Statistics
Truck VMT	Heavy truck share of annual VMT	Highway Statistics
Urbanization	% of state population living in urban areas	US Census Bureau
Seat Belt	% of drivers and front-seat passengers wearing safety belts	Highway Statistics
Agency Resources		
State own-resource for highways	Log of state-own highway resource per capita	Highway Statistics
Federal aids for state highways	Log of per capita federal highway obligation to states	Highway Statistics
State fuel tax rate	Log of nominal state fuels tax rate	Highway Statistics
Gas price	Log of Refiner/reseller gas price (excluding fuel taxes)	Statistical Abstract of the United States

Table 3. shows the descriptive statistics of the variables, including means, standard deviations, and maximum and minimum values of them.

Variable	**N**	**Mean**	**Std. Dev.**	**Min**	**Max**
Good Roads	350	0.82	0.11	0.48	1
Good Bridges	350	0.73	0.09	0.44	0.9
Traffic Congestion	350	0.04	0.03	0	0.18
Traffic Fatality	350	1.48	0.4	0.67	2.59
Highway Agency Performance Index	350	-2.21	1.36	-4.54	2.63
Corruption (employee)	350	0.52	0.41	0	2.63
Corruption (population)	350	0.36	0.32	0	2.5
Truck VMT	350	0.11	0.04	0.03	0.24
Urbanization	350	67.95	15.27	37.8	99.1
Ln(Highway Size)	350	5.10	0.39	3.97	5.83
Seat Belt	350	80.18	9.11	50	97.6
Ln(Federal Highway Aids)	350	2.12	0.20	1.81	2.88
Ln(State Own-resource for Highways)	350	2.48	0.16	2.06	3.12
Ln(State Fuel Tax)	350	1.30	0.13	0.88	1.57
Ln(State Gasoline Price)	350	2.21	0.16	1.90	2.52

EMPIRICAL RESULTS

Performance of State Highway Transportation Agencies

Figure 1 plots the overall performance index of the various state highway transportation agencies for the 2002-2008 period. The composite performance indexes were consistently low in some states, such as Massachusetts and New Jersey, indicating relatively low levels of overall highway transportation performance. Other states, such as Montana and Mississippi, had consistently higher levels of overall state highway transportation performance than their peer states.

Figure 1. The Composite Performance Index of US State Highway Transportation Departments (2002-2008)

Table 4 presents the US state rankings based on the multiple performance indexes for the period under study; again, higher rankings indicated better performance. According to the first index—regarding the overall performance of state highway agencies—the ten best-performing states were Montana, Arizona, Wyoming, Nevada, South Dakota, South Carolina, Georgia, North Dakota, Mississippi, and Alabama and the bottom ten New Jersey, Massachusetts, Rhode Island, Hawaii, California, New York, Maryland, Connecticut, Pennsylvania, and Vermont.

Table 4. US State Rankings: State Highway Transportation Agencies' Performance (on Average, 2002-2008)

Rank	State	Performance Index (Overall)	Rank	State	Road Quality	Rank	State	Bridge Quality	Rank	State	Traffic Congestion	Rank	State	Traffic Fatality
1	Montana	2.401	1	Georgia	0.971	1	Arizona	0.8958	1	South Dakota	0.00117	1	Massachusetts	0.800
2	Arizona	1.871	2	Florida	0.963	2	Nevada	0.8747	2	North Dakota	0.00146	2	Connecticut	0.916
3	Wyoming	1.825	3	Kentucky	0.952	3	Minnesota	0.8745	3	Montana	0.00173	3	Vermont	0.973
4	Nevada	1.622	4	Tennessee	0.943	4	Delaware	0.8471	4	Wyoming	0.00500	4	Rhode Island	0.981
5	South Dakota	1.305	5	Wyoming	0.937	5	Wisconsin	0.8321	5	Oklahoma	0.00509	5	Minnesota	0.987
6	South Carolina	1.273	6	Oregon	0.930	6	Colorado	0.8304	6	Maine	0.00600	6	New Jersey	0.993
7	Georgia	1.264	7	Montana	0.927	7	Illinois	0.8303	7	Iowa	0.00659	7	New York	1.041
8	North Dakota	1.127	8	Utah	0.925	8	Utah	0.8223	8	Nebraska	0.00754	8	New Hampshire	1.066
9	Mississippi	1.088	9	Ohio	0.918	9	Florida	0.8216	9	Kansas	0.00763	9	Washington	1.074
10	Alabama	0.952	10	Arizona	0.916	10	New Mexico	0.8141	10	Idaho	0.01377	10	Michigan	1.114
11	Kentucky	0.857	11	Nevada	0.913	11	Idaho	0.8130	11	Vermont	0.01496	11	Maryland	1.141
12	Minnesota	0.823	12	Virginia	0.913	12	Georgia	0.7934	12	Mississippi	0.01536	12	Ohio	1.169
13	Tennessee	0.821	13	North Dakota	0.908	13	Texas	0.7934	13	Alabama	0.01669	13	Virginia	1.171
14	New Mexico	0.757	14	Minnesota	0.899	14	Montana	0.7923	14	Alaska	0.01743	14	Utah	1.176
15	Florida	0.756	15	North Carolina	0.883	15	Wyoming	0.7908	15	Arkansas	0.01867	15	Illinois	1.217
16	Nebraska	0.721	16	Alabama	0.877	16	Tennessee	0.7787	16	New Mexico	0.02076	16	Indiana	1.217
17	Oregon	0.716	17	Nebraska	0.872	17	Kansas	0.7765	17	Missouri	0.02566	17	California	1.240
18	Wisconsin	0.654	18	Washington	0.870	18	Indiana	0.7765	18	Georgia	0.02580	18	Maine	1.260
19	Colorado	0.637	19	Texas	0.865	19	South Carolina	0.7737	19	Oregon	0.02643	19	Wisconsin	1.286
20	Arkansas	0.626	20	South Carolina	0.865	20	North Dakota	0.7683	20	Virginia	0.02650	20	Oregon	1.324
21	Texas	0.614	21	Iowa	0.860	21	Oregon	0.7583	21	Wisconsin	0.02749	21	Colorado	1.324
22	Iowa	0.541	22	Colorado	0.859	22	Arkansas	0.7530	22	Minnesota	0.02963	22	Iowa	1.369
23	Utah	0.540	23	Connecticut	0.843	23	Ohio	0.7504	23	South Carolina	0.03367	23	Hawaii	1.370
24	Idaho	0.449	24	Indiana	0.840	24	Nebraska	0.7455	24	Ohio	0.03466	24	Nebraska	1.390
25	Illinois	0.363	25	Wisconsin	0.835	25	Virginia	0.7418	25	West Virginia	0.03493	25	North Dakota	1.404
26	Virginia	0.360	26	Illinois	0.832	26	South Dakota	0.7418	26	Colorado	0.03821	26	Delaware	1.424
27	Ohio	0.313	27	Delaware	0.831	27	Washington	0.7318	27	Washington	0.03961	27	Pennsylvania	1.434
28	Delaware	0.248	28	South Dakota	0.831	28	Mississippi	0.7278	28	Illinois	0.04050	28	Georgia	1.453
29	Kansas	0.186	29	New Hampshire	0.829	29	Iowa	0.7254	29	Texas	0.04313	29	Kansas	1.524
30	Alaska	0.136	30	New York	0.802	30	Maryland	0.7214	30	Pennsylvania	0.04376	30	Texas	1.527
31	Indiana	0.019	31	Mississippi	0.800	31	Michigan	0.7184	31	Indiana	0.04440	31	North Carolina	1.576
32	Louisiana	-0.071	32	Maine	0.795	32	Alabama	0.7170	32	Kentucky	0.04441	32	Oklahoma	1.593
33	Washington	-0.197	33	Michigan	0.774	33	California	0.7154	33	Michigan	0.04639	33	Missouri	1.640
34	Missouri	-0.207	34	Missouri	0.766	34	Alaska	0.7144	34	Arizona	0.04644	34	Alaska	1.654
35	Maine	-0.308	35	Massachusetts	0.751	35	North Carolina	0.7057	35	Utah	0.05071	35	Florida	1.657
36	West Virginia	-0.333	36	Alaska	0.749	36	Kentucky	0.6919	36	Louisiana	0.05071	36	Tennessee	1.726
37	Oklahoma	-0.441	37	Pennsylvania	0.738	37	Louisiana	0.6857	37	Nevada	0.05203	37	Idaho	1.773
38	North Carolina	-0.701	38	Louisiana	0.737	38	New Hampshire	0.6756	38	New Hampshire	0.05394	38	Wyoming	1.820
39	Michigan	-0.772	39	West Virginia	0.733	39	Connecticut	0.6707	39	Hawaii	0.05779	39	Alabama	1.829
40	New Hampshire	-0.937	40	Rhode Island	0.730	40	Missouri	0.6659	40	Rhode Island	0.05781	40	New Mexico	1.846
41	Vermont	-1.108	41	Vermont	0.728	41	Maine	0.6523	41	Tennessee	0.06314	41	Nevada	1.907
42	Pennsylvania	-1.421	42	New Mexico	0.719	42	Vermont	0.6473	42	Delaware	0.07107	42	Kentucky	1.930
43	Connecticut	-1.497	43	Arkansas	0.716	43	Oklahoma	0.6454	43	Maryland	0.07883	43	Arizona	1.934
44	Maryland	-1.690	44	Oklahoma	0.688	44	New Jersey	0.6433	44	Connecticut	0.08286	44	West Virginia	1.983
45	New York	-1.870	45	Hawaii	0.688	45	West Virginia	0.6263	45	New York	0.08574	45	South Dakota	1.997
46	California	-2.091	46	Kansas	0.682	46	New York	0.6214	46	Florida	0.08574	46	Arkansas	2.030
47	Hawaii	-2.092	47	Maryland	0.666	47	Pennsylvania	0.5674	47	Massachusetts	0.08766	47	South Carolina	2.081
48	Rhode Island	-2.816	48	Idaho	0.650	48	Hawaii	0.5395	48	California	0.08896	48	Louisiana	2.087
49	Massachusetts	-3.213	49	California	0.594	49	Massachusetts	0.4859	49	North Carolina	0.10721	49	Mississippi	2.181
50	New Jersey	-4.101	50	New Jersey	0.537	50	Rhode Island	0.4598	50	New Jersey	0.16027	50	Montana	2.314

Effects of Corruption on the Performance of State Highway Transportation Agencies

We expected to find a time lag between the occurrence of public corruption and its effect on the performance of public agencies for three reasons. First, federal prosecution of public corruption cases usually begins several years after the corrupt activities took place. Second, capital construction projects typically require several years to be complete. Third, the use of lagged values of public corruption avoided the potential endogeneity between corruption and the performance of public agencies: on the one hand, corruption can compromise the performance of state agencies; on the other, poorly-performing public agencies tend to be vulnerable to corruption. In order to address these concerns, we used lagged values of our corruption variable. Table 5 summarizes the regression results of our benchmark models.

State Highway Transportation Agency Performance Index (Overall)

Model I-1 in Table 5 estimates the effects of public corruption on the overall performance index of state highway transportation agencies. The variable of public corruption showed a negative association with the overall state highway agency performance index and significance at a 0.1% confidence level. Consistent with Hypothesis 1, public corruption decreased the overall performance of state highway transportation agencies.

Regarding the control variables for organizational constraints, we found, first, that the size of a state's highways was negatively associated with the overall performance of that state's highway transportation agencies. Thus, on average, larger workloads owing to larger highway size were associated with lower levels of highway transportation performance. Second, we found seat belt use to be associated with relatively high overall performance levels; that is, civic awareness of transportation safety correlated positively with the performance of state transportation agencies. Regarding the control variables relating to organizational resources, we found that federal aid to state highways, the state fuel tax rate, and gasoline prices in the state were associated positively with the overall performance of state highway transportation agencies. Thus states that made relatively large amounts of resources available for highway transportation tended to enjoy relatively high levels of performance in terms of highway transportation, just as resource dependency theory predicts.

State-Administered Road Quality

Model I-2 in Table 5 presents the effects of public corruption on the condition of state-administered highways (again, those with IRI values under 170 were considered to be in acceptable condition). As predicted by Hypothesis 2, the variable of public corruption was found to be associated negatively with the road quality variable (*GoodRoads*), being significant at a 0.1% confidence level. This finding confirms the negative impact of public corruption on road quality, which can be explained in terms of the inefficiency resulting from public corruption and is consistent with the existing literature on corruption in the transportation sector.

We found that highway size correlated negatively with road quality. This result can be explained in terms of the large amount of maintenance associated with large highway networks. Again, seat belt use was associated with road quality, indicating that states in which civic awareness of transportation safety is high pay considerable attention to road quality. Further, the level of federal aid to state highways correlated positively with road quality for the simple reason that resources were available to maintain and improve road quality in those states.

Status of State-Owned Bridges

Model I-3 in Table 5 illustrates the effects of public corruption on the condition of state-administered bridges. As predicted by Hypothesis 3, the variable of public corruption was negatively associated with the bridge status variable (*GoodBridges*), being significant at a 0.1% confidence level. This finding also confirmed the negative impact of public corruption on bridge quality, which can be explained in terms of the inefficiency associated with public corruption and is again consistent with the existing literature on corruption in the transportation sector.

We found a statistically significant negative association between the level of urbanization variable (Urbanization) and bridge quality. This result was expected; use means wear and tear. Further, seat belt use, again a proxy for civic awareness of transportation safety, was positively associated with bridge quality. Most of the associations between bridge quality and most highway-related resource variables, however, were not statistically significant, the exception being a significant negative association between bridge quality and state fuel tax rates. This result may be explicable in terms of states with poor bridge quality increasing the state fuel tax in order to raise revenue to deal with the problem. Alternatively, higher fuel tax rates may discourage automobile travel and thereby reduce federal highway grants, which take interstate highway traffic volume into account.

Traffic Congestion

Model I-4 in Table 5 illustrates the effects of public corruption on the congestion of state-administered highways. As predicted by Hypothesis 4, we found a positive association between corruption and congestion, though it was not significant at conventional levels; however, with application a generalized-method-moments (GMM) regression, this result proved to be significant at 0.1% level. We used GMM regressions to assess the robustness of the regression results from our benchmark models, as shown in Table 6.

We found a statistically significant negative association between highway traffic congestion and the variable of the share of annual VMT attributable to heavy trucks on state-administered highway systems. We also found a statistically significant negative association between highway traffic congestion and the extent of urbanization, presumably because states with relatively large urban populations tend to have significant public transportation systems (e.g., inter-city transportation systems), which may reduce traffic flow on state-administered highway systems (in particular interstate highway systems) and therefore relieve or prevent traffic congestion. We found a positive association between state-owned highway resources and highway traffic congestion, perhaps because well-funded state transportation agencies tend to engage in projects that produce construction delays (Downs, 1962; Duranton & Turner, 2011). We further found a statistically significant negative association between state fuel tax rates and congestion, indicating that higher fuel tax rates may discourage travel on state highways and thereby reduce opportunities for congestion.

Traffic Fatalities

Model I-5 in Table 5 illustrates the effects of public corruption on fatality rates on state-administered highways. As predicted by Hypothesis 5, the variable of public corruption was positively associated with the traffic fatality variable, being significant at a 1% confidence level.

We found a statistically significant negative association between state-administered highway lane miles and traffic fatalities; that is, on average, states with relatively larger highway sizes experienced relatively fewer traffic fatalities. The variable of Seatbelt did not show a statistically significant impact on fatalities. Two organizational resource variables, state-owned resources for highways and state fuel tax rates, did have statistically significant positive associations with traffic fatality rates. It may be the case that states that devote relatively large amounts of resources to highways are relatively more inclined to devote resources to the maintenance of and improvements in transportation infrastructure as well. Thus, while, on the one hand, good road conditions may promote automobile travel and thereby increase the incidence of traffic accidents, they may, on the other hand, also increase the propensity of drivers to exceed speed limits and thereby traffic fatality rates.

Table 5. Effects of Public Corruption on US State Highway Transportation Agencies' Performance (Fixed effect panel regression with Driscoll-Kraay standard errors, 2002-2008)

	Model I-1 Highway Agency Performance Index (composite)		Model I-2 Good Roads		Model I-3 Good Bridges		Model I-4 Traffic Congestion		Model I-5 Traffic Fatality	
	Coef. (sig.)	t-value	Coef. (sig.)	t-value	Coef. (sig.)	t-value	Coef. (sig.)	t-value	Coef.(sig.)	t-value
Corruption (public employee, lags)	-0.077***	-3.84	-0.012***	-4.76	-0.003***	-7.49	0.001	1.46	0.023**	2.95
Organizational constraints										
Truck share of annual VMT	1.022	1.45	-0.136	-1.78	0.109*	2.65	-0.06*	-2.66	0.046	0.09
Urbanization (% urban residents)	0.005	1.12	0.0001	0.14	-0.0004***	-4.85	-0.0003**	-3.56	0.002	1.32
Seat belt	0.011*	2.55	0.002***	5.04	0.0006***	10.16	0.0001	1.4	0.001	0.24
Ln(Highways size)	-4.581***	-4.02	-0.694**	-2.79	0.038	0.97	-0.001	-0.76	-1.456**	-2.88
Organizational resources										
Ln(Federal highway aids, per capita)	0.302**	3.34	0.048***	3.76	0.016	1.34	0.004	1.32	0.068	1.86
Ln(State own-resource for highways, per capita)	-0.074	-0.69	-0.035	-1.97	0.004	1.16	0.007*	2.38	0.145**	3.6
State fuel tax rate	1.306***	9.51	0.056	0.9	-0.104***	-5.91	-0.061***	-12.67	0.625**	2.72
State gasoline price	2.376*	2.03	0.162	1.47	0.045	0.98	-0.028	-0.99	0.82	1.81
State and year fixed effects										
Year 2002	15.404*	2.11	3.826*	2.67	0.516**	3.12	-0.006	-0.4	5.924**	2.98
Year 2003	14.983	2.01	3.789*	2.61	0.513**	3.16	-0.002	-0.22	5.771**	2.93
Year 2004	14.878	1.99	3.779*	2.6	0.514**	3.17	-0.002	-0.17	5.721**	2.91
Year 2005	14.684	1.94	3.769*	2.58	0.512**	3.19	0.0002	0.03	5.623**	2.86
Year 2006	14.471	1.88	3.758*	2.55	0.511**	3.21	0.003	0.93	5.529**	2.82
Year 2007	14.281	1.85	3.748*	2.54	0.513**	3.24	0.002	1.09	5.391**	2.76
Year 2008	14.023	1.80	3.728*	2.51	0.511**	3.24	0	omitted	5.226*	2.67
Constant	omitted		omitted		omitted		0.226	1.67	omitted	
State fixed effect	Yes		Yes		Yes		Yes		Yes	
Observation	340		340		340		339		341	
Number of groups	50		50		50		50		50	
F-statistics (p-value, sig.)	91.67***		54.50**		248.90***		98.06***		66.25***	
R-squared	0.117		0.077		0.405		0.158		0.469	

*, **, ***: significant at 5%, 1%, and 0.1%, respectively.

Robustness Checks of the Regression Results

As mentioned, we ran two-step difference GMM regressions to ensure the robustness of the empirical results from the benchmark models. One of the main advantages of using the GMM estimation was that doing so allowed us to control for a potential endogeneity issue regarding the corruption variable. GMM estimations employ appropriate lags of first-differences of the endogenous variable as valid instruments of it, thereby satisfying both relevance and exogeneity requirements (Blundell & Bond, 1998). Table 6 summarizes the GMM regression results. Before interpreting them, we checked the requirements for GMM model specifications noted by Roodman (2009). Thus we tested over-identification using the Sargan and Hansen tests and checked the exogeneity of the instruments using the difference-in-Hansen test and autocorrelation, or AR (1) and AR (2), using the Arellano-Bond test. As seen in Table 6, our model satisfied all of the requirements for GMM model specification.

Regarding the effects of public corruption on the performance of state highway transportation agencies, the GMM estimations showed a negative association between corruption and overall performance (significant at a 0.1% confidence level), a negative association between corruption and road quality (significant at a 0.1% confidence level), a negative association between corruption and bridge quality (significant at a 0.1% confidence level), a positive association between corruption and traffic congestion (significant at a 0.1% confidence level), and a positive association between corruption and traffic fatalities (significant at a 5% confidence level). The findings thus support our hypotheses and imply that the empirical results from our benchmark models are robust.

Table 6. Effects of Public Corruption on US State Highway Transportation Agencies' Performance (Two-step GMM, 2002-2008)

	Model I-1 Highway Agency Performance Index (composite)		Model I-2 Good Roads		Model I-3 Good Bridges		Model I-4 Traffic Congestion		Model I-5 Traffic Fatality	
	Coef.(sig.)	t-value	Coef.(sig.)	t-value	Coef.(sig.)	t-value	Coef.(sig.)	t-value	Coef.(sig.)	t-value
Dependent variable at (t-1)	0.905***	43.11	0.788***	24.08	0.977***	79.01	0.803***	26.34	0.858***	27.36
Corruption (public employee, lags)	-0.112***	-6.33	-0.010***	-5.4	-0.002***	-4.9	0.001***	3.79	0.016*	2.26
Organizational constraints										
Truck share of annual VMT	0.407	0.79	-0.071*	-2.1	0.031*	2.6	-0.004	-0.47	0.249	1.64
Urbanization (% urban residents)	-0.001	-1.9	0.0001	0.69	-0.0001***	-4.65	0.0001**	3.21	-0.001**	-3.24
Seat belt	-0.002	-1.07	-0.00001	-0.03	0.0001**	2.79	0.0002***	3.95	-0.001	-1.36
Ln(Highways size)	0.091	1.28	0.017**	2.91	0.002	1.88	-0.0005	-0.73	0.012	0.6
Organizational resources										
Ln(Federal highway aids, per capita)	0.164**	2.76	0.029***	4.45	-0.004**	-2.73	-0.007***	-4.59	0.01	0.38
Ln(State own-resource for higways, per capita)	-0.082	-1.1	-0.028**	-3.5	0.002	1.14	0.004*	2.18	0.064*	2.35
State fuel tax rate	0.142	1.33	0.027	1.42	-0.010***	-5.5	-0.006*	-2.25	-0.089	-1.88
State gasoline price	-1.256	-0.71	-0.196*	-2.21	0.008	0.62	0.003	0.29	-0.234	-0.35
State and year fixed effects										
Year 2002	0.000	omitted	0.000	omitted	0.000	omitted	0.000	omitted	0.000	omitted
Year 2003	-0.023	-0.53	-0.006*	-2.1	0.002*	2.48	0.007*	2.14	0.676	0.42
Year 2004	0.000	omitted	0.000	omitted	0.000	omitted	0.006	1.89	0.664	0.41
Year 2005	0.214	1.29	0.029**	3.37	-0.001	-0.83	0.005*	2.54	0.706	0.42
Year 2006	0.265	0.8	0.043*	2.57	-0.001	-0.22	0.005***	4.04	0.717	0.41
Year 2007	0.292	0.71	0.050*	2.37	-0.0004	-0.15	0.003***	4.47	0.668	0.38
Year 2008	0.361	0.66	0.058*	2.08	-0.002	-0.54	0	omitted	0.644	0.36
Constant	2.064	0.49	0.478*	2.2	0.005	0.19	-0.01	-0.32	0.000	omitted
State fixed effect	Yes		Yes		Yes			Yes		Yes
Observation	293		295		293		292		294	
Number of groups	50		50		50		50		50	
F-statistics (p-value, sig.)	3838.54***		837.82***		100340.70***		2173.38		111414.25***	
Over-identification tests	pass		pass		pass		pass		pass	
Instrument exogeneity tests	pass		pass		pass		pass		pass	
H0: AR(1) (p-value)	0.000		0.011		0.053		0.002		0.000	
H0: AR(2) (p-value)	0.099		0.179		0.951		0.68		0.165	

CONCLUSIONS AND IMPLICATIONS

The widespread corruption associated with the transportation infrastructure sector is at least in part explicable in terms of the large and complex activities involved. Moreover, the sector is dominated by a few monopolistic firms, and it is closely linked to various government agencies, which play major roles as clients, regulators, and even owners of construction companies. Thus it is not uncommon for governmental officials involved with bridge construction to alter contracts in order to circumvent regulations (Kenny, 2007). Most research on the subject, however, has focused on the impact of corruption on transition and developing countries, despite the fact that corruption is well documented in the developed world.

In this study, we investigated the effects of public corruption on the performance of the highway transportation agencies of the various states. From a theoretical perspective, we have observed that corrupt officials gratify their selfishness by wasting resources on unproductive activities, are not accountable to citizens and political leaders and therefore have less incentive to use resources efficiently, and tend to allocate resources inefficiently, in particular by directing them toward new capital investments rather than toward the maintenance and improvement of existing infrastructure. We accordingly hypothesized that the productive and allocative inefficiencies associated with public corruption would worsen the organizational performance of state highway transportation agencies. We presented strong empirical evidence to support our predictions in the specific developed world context of the US states. We elaborated five indexes to capture the sectoral and overall performance of state highway transportation agencies. Our findings indicate that government corruption had a negative impact on the quality of state roads and bridges, increased both traffic congestion and fatalities on state roads, and diminished the performance of state highway transportation agencies overall.

The findings presented here contribute to the public management literature in several significant respects. First, while the existing literature has devoted considerable attention to the political, social, and economic consequences of corruption, our research has focused instead on the relationship between government corruption and the performance of public organizations; as expected, we found that the former diminished the latter. Second, using multi-dimensional performance measurements, we demonstrated empirically the manner in which public corruption has this detrimental effect. Third, we have solidified the theoretical basis for understanding the determinants of organizational performance in the public sector.

Thus we have shown that public corruption may squander resources meant for the delivery of public services, compromise the quality of public management, and diminish the productivity and efficiency of public sector agencies, at least those in the transportation sector. Further research is needed to determine whether these findings can be generalized to other public agencies.

This study also has important policy implications. To begin with, since corruption diminishes the performance of public agencies, fighting and preventing it must be made a part of all efforts to improve performance. A variety of key anti-corruption strategies may be worth pursuing in the context of a given organization, including strengthening the ethics training of public officials, promoting transparency with respect to resource allocation, increasing public scrutiny of government contracts and procurement procedures, enforcing stricter penalties on corrupt practices, and limiting political influence on hiring and promotion decisions (Lewis, 2006; Piotrowski, 2004). The problem of corruption is age-old, and developed societies need to be reminded that it is not confined to the transition and developing world. In either context, continued vigilance is required—as is continued study—if corruption is not to compromise the agencies that are meant to serve the public.

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