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Corruption and Tax Structure in American States

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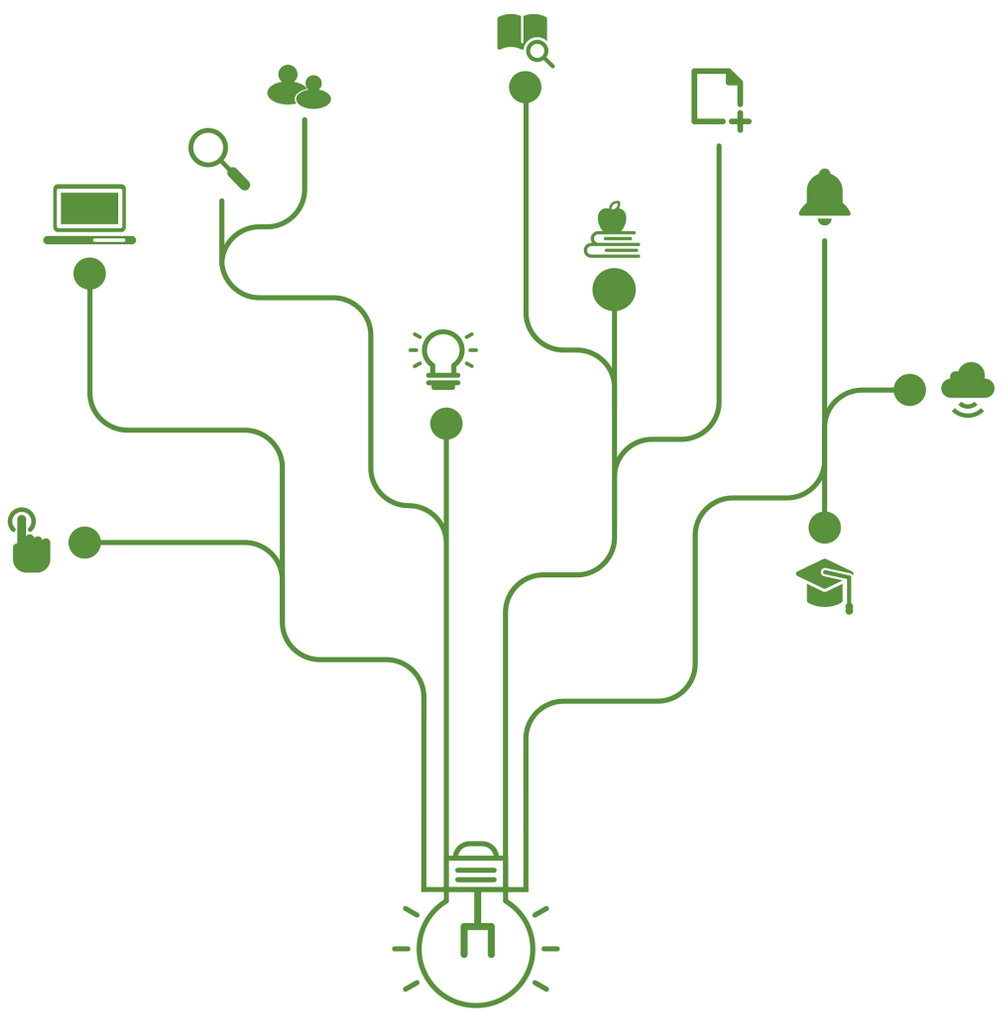

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Corruption and Tax Structure in American States

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Summary

We examine the extent to which public corruption influences the tax structure of American states. After controlling for other tax structure influences, we find that states with greater measured public corruption have more complex tax systems, have higher tax burdens, rely more heavily on regressive indirect taxes, and have smaller shares of their tax burdens with initial impact on business.These are significant structural impacts on the tax systems.

Introduction

Kaufmann (2010) provocatively asks "whether corruption may adversely affect public finances in industrialized countries?[1)]" An abundant literature has focused on corruption impacts in developing and transition countries (Bauhr 2016; Börzel and van Hüllen 2014; Engvall 2015; Fjeldstad and Tungodden 2003; Ghura 1988; Hopkin and Rodríguez-Pose 2007; Persson et al. 2013; Sarman and Chaikin 2009; Tanzi and Davoodi 1997; Zhu and Zhang 2016) and a new literature is finding impacts of corruption on American state finances (Bayoumi et al. 1995; Butler et al. 2009; Depken and LaFountain 2006; Moldogaziev et al. forthcoming). This paper extends this examination of corruption impacts by considering whether corruption in American states might impact the structures used to raise tax revenue.

Corruption means "misuse of public office for private gain" (Mauro1995) and, given the capacity of a tax system to distribute costs among private entities, it would not be surprising to find an impact of corruption on that system of distribution. Corrupt officials may be susceptible to illegal inducements from private entities interested in changing the tax structure to their advantage. Although a number of scholars have investigated the causes, consequences, and cures of corruption, corruption impacts on tax systems have not been investigated[2)]. Furthermore, the challenges of governance and corruption in the industrialized world have been less-examined than has its impact in developing countries (Kaufman 2010). If government finance systems can be distorted for private gain, there is ample reason to examine whether public corruption might impact the structures used to raise revenue for public programs. Moving the cost of government to others can be of considerable economic advantage.

Developed countries likely have a higher level of tax compliance and tax morale than do developing ones. However, evidence of the impact of corruption on other elements of the fiscal system raises a suspicion that tax systems might be influenced as well. It is a question not previously examined. This paper fills this gap by examining how corruption affects the level and composition of tax revenue in the U.S. state and local governments over the period of 1997-2013[3)]. We examine how public corruption is associated with the level of tax burden, the extent of tax progressivity, and the level of tax evasion by businesses.

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1) Daniel Kaufman (2010) of the Brookings Institute asks this question and encourages academic efforts to answer this question from various aspects. He predicts several possible ways how corruption can adversely affect public finances of the industrialized countries. Particularly, he examines the impact of corruption on budget deficits in EU and OECD member countries.

2) Liu (2016) surveys the existing literature about the causes, consequences, and cures of corruption.

3) We chose this period because a consistent database of gross state products (GSP) which are the major tax bases of the U.S. state and local governments is available from the U.S. Bureau of Economic Analysis (BEA) in this period. The detail is explained in the section of model, methodology, and data following.

Literature Review and the Logic of Corruption Influence

Businesses and individuals may reduce their tax obligations by three general approaches. First, they may take illegal and intentional actions to reduce their tax obligations. They may evade "by underreporting incomes; by overstating deductions, exemptions, or credits; by failing to file appropriate tax returns; or even by engaging in barter to avoid taxes (Alm et al. 2016)." Traditional tax evasion theory is often utilized to explain the corruption effects on the tax structure of the developing countries and the transition economies (Fjeldstad and Tungodden 2003; Ghura 1988; Tanzi and Davoodi 1997).

Second, they may structure their operations to reduce their tax liabilities through legal means. That includes taking advantages of deductions, exemptions, or credits provided in the law; by timing transactions to reduce liabilities; by structuring transactions to take advantage of lower tax rates provided in the law; and so on. These avoidance actions reduce tax obligations but, in contrast to the evasion tactics, are legal within the existing law. Avoidance activities are recognized as acceptable in a Supreme Court case: "The legal right of a taxpayer to decrease the amount of what otherwise would be his [or her] taxes, or altogether avoid them, by means which the law permits, cannot be doubted." [Gregory v. Helvering, 293 U.S. 465 (1935).]

Third, businesses and individuals may reduce their tax obligations by changing the tax law so that liabilities are reduced within the scope of that law. That approach requires influence on lawmakers and tax administrators and that opens the door for use of corrupt practices. If corrupt entities can induce a tax structure favorable to their interests, they can reduce their own tax burden as long as the tax structure stays in place and they are freed from the need to aggressively practice avoidance or evasion. When there are corrupt public officials, this approach may be the most efficient for entities working to reduce tax burdens. This impact of corruption is examined here.

While there is a paucity of analysis of the impact of public corruption on tax structure, there are many studies on the association between corruption and tax evasion. These studies focus on public officials' "self-seeking" behaviors from taxpayers who have the intent to avoid taxation. They follow the household income tax evasion model of Allingham and Sandmo (1976): corruption and high tax rates (Chander and Wilde 1992); wage incentives system to curb corruption (Besley and McLaren 1993); optimal design of tax collection schemes (Hindricks et al. 1999); and size of bribe and tax evasion (Akdede 2006). Others focus on evasion efforts by firms evade their tax obligations by

under-reporting their income and sales, by overstating deductions, and by failing to file their tax returns: under-reporting of profits and sales (Rice 1992; Wang and Conant 1988); audit selection rules and firm compliance (Murray 1995; Alm et al. 2004); contractual relationship between shareholders and tax managers (Crocker and Slemrod 2005); market distortion due to tax evasion by firms (Goerke and Runkel 2006); corruption activities by firms (Goerke 2008); corruption and tax compliance in the transition economies (Uslaner 2010); and the association between the size of bribes and corporate income tax evasion (Alm et al. 2016; Wu 2005).

Another group of evasion studies focus on the macroeconomic consequences of corruption on taxation, often connecting corrupt activities by public officials with the various aspects of their fiscal and tax policies. Allowing tax auditors to accept bribe can decrease the amount of revenue collected (Chander and Wilde 1992). Corruption reduces the tax collection of governments when corruption contributes to tax evasion, improper tax exemptions, or poor tax administration (Alm et al. 1991; Friedman et al. 2000; Gupta 2007; Ivanyna et al. 2016; Johnson et al. 1999; Sanyal et al. 2000; Tanzi and Davoodi 1997). In contrast, some studies argue that corruption can reduce tax evasion and increase tax revenue as a consequence. When expected benefit from corruption, e.g. bribes, is high, a tax collector has incentives to monitor taxpayers more intensively. This increases the expected cost to taxpayers of evading taxes, which results in a lower level of tax evasion and a higher level of tax collection. This positive effect of corruption on tax revenue actually happened in the developing countries (Mookherjee 1997; Chand and Moene 1999), although Fjeldstad and Tungodden (2003) conclude that this is a short-term phenomenon, at best, and disappears in the long run.

Most of these macroeconomic analyses examine the association between corruption and the level of government tax revenue in developing and transition economies, not developed economies. The contexts of the developing and the transition economies differ from that of the developed countries. The average tax revenue to GDP ratio in the developed world, approximately 35%, is much higher than the developing countries in which the ratios range from 12% to 15% (Cobham 2005), possibly because of lower tax evasion in the developed societies. Often more than half of the taxes that should be collected cannot be traced by the government treasuries due to corruption and tax evasion (Fjeldstad and Tungodden 2003). Tanzi (1996) notes that corruption may be more common at local than at the national level, although less severe in developed countries.

The links between corruption and tax evasion found in developing countries cannot be

directly transferred to the United States. The tax morale of Americans, meaning "the intrinsic motivation to pay taxes", is found to be higher than even that of Europeans[4], which is expected to result in high tax compliance rates in the United States (Alm and Torgler 2006). The National Research Program (NRP), a program of research audits conducted by the Inland Revenue Service (IRS), estimated that the overall noncompliance rate of the U.S. federal individual income tax was around 18 percent in 2001 (IRS 2006), which is much lower than that of people residing in the developing countries. Even with a lower level of tax evasion and higher tax morale, we believe that public corruption may have an impact on taxation through influence on public officials that works to shape the tax structure in advantageous ways. Thus, illegal evasion (or even legal avoidance) is not necessary if the legal framework for the tax has itself been attractively constructed.

Hypotheses

Corruption and Fiscal Illusion

We extend the fiscal illusion literature to hypothesize how corruption affects the tax structure of the U.S. state governments[5]. Fiscal illusion implies "systematic, persistent, recurring and consistent" misperception of key fiscal parameters by the citizenry due to the fact that most significant elements of the fiscal system become largely hidden to the citizenry. The idea focuses particularly on significant and regular underestimation of the costs of government programs by the citizenry. Public officials are presumed to be "self-seeking." They will design and manipulate fiscal systems to create a fiscal illusion so that they may make taxpayers underestimate the actual fiscal burden and support large public revenue and outlay in the end and they will be receptive to efforts of private entities to shape the tax structure. Fiscal illusion results in a public sector of excessive size from this perspective. The literature identifies multiple hypotheses regarding fiscal illusion[6] (Dell'Anno and Dollery 2014; Oates 1988).

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4) Alm and Torgler (2006) compare the extent of tax morale of Americans with that of people residing in 15 European countries, including Belgium, Portugal, Finland, Norway, Netherlands, France, Ireland, Britain, Germany, Italy, Spain, Sweden, Denmark, Austria, and Switzerland.

5) The intellectual genesis of fiscal illusion is traced back to McCulloch (1845), followed by Puviani (1903), Buchanan (1967) and Wagner (1976). A number of studies also have written in the same tradition (Berry and Lowery 1987; Craig and Heins 1980; Garand 1988; Misiolek and Elder 1988; Pommerehne and Schneider 1978; Van Wagstaff 1965).

6) They are the complex tax hypothesis, the indirect tax hypothesis (Mill's hypothesis), the income-elasticity hypothesis, the flypaper effect hypothesis, the renter illusion hypothesis, the debt illusion hypothesis, the inflation rate hypothesis, and the withholding hypothesis (Dell'Anno and Dollery 2014; Oates 1988)

Fiscal illusion creates misperceptions about tax structures and that misperception could be useful for corrupt public officials. The officials can pursue their interests (or interests of their "clients") more easily if the public does not accurately perceive the tax structure. The fiscal illusion literature concludes that illusion-inducing fiscal structures are "deliberate" choices by public officials seeking their own utility. Corrupt officials who are highly motivated to maximize their interests are more likely to attempt to create a fiscal illusion. A fiscal system creating a greater fiscal illusion is beneficial for their individual utility-maximization. Considering detection and punishment, corrupt officials have a strong incentive to make the fiscal system more complex and less transparent. This helps them hide their corruption.

Corruption, Tax Complexity, and Tax Revenue

The complex tax illusion hypothesis predicts a potential corruption effect on the level of tax revenue. Buchanan (1967: 135) argues that "… to the extent that the total tax load on an individual can be fragmented so that he confronts numerous small levies rather than a few significant ones, illusionary effects may be created." Thus, the more complicated a tax system, the more difficult it is for a taxpayer to determine the tax-price of public outputs, the more likely it is that he will underestimate the tax burden associated with public programs, and the larger will be the level of tax collection ceteris paribus. Corrupt officials can pursue their utility by exploiting the complex tax illusion. We predict that a corrupt government has a more complex tax system than a less corrupt government, which helps her raise tax revenue in the end.

- *Hypothesis I: A U.S. state government with a higher level of corruption is likely to have a more complex tax structure, all else being equal.*
- *Hypothesis II: A U.S. state government with a more complex tax structure is likely to collect a larger amount of tax revenue, all else being equal.*
- *Hypothesis III: A U.S. state government with a higher level of corruption is likely to collect a larger amount of tax revenue, all else being equal.*[7]

Corruption, Indirect Taxes, and Tax Regressivity

The Mill's fiscal illusion hypothesis maintains that "Taxpayers may systematically underestimate the tax burden from indirect taxes as compared to direct taxes because

7) Prior research finds that corruption increases state expenditure (Liu and Mikesell 2014). Therefore, it is not unreasonable to expect that corruption will increase tax revenue. Higher tax revenue provides more spoils to be distributed.

indirect taxes are incorporated into (and therefore 'hidden' in) the prices of goods" (Sausgruber and Tyran 2005). That illusion can be valuable to a corrupt official: the larger the portion of tax revenue from indirect taxes, i.e., taxes on purchase or sale of goods and services, the more difficult it is for a taxpayer to determine the tax-price of public outputs, the more likely it is that he will underestimate the tax burden associated with public programs[8]. Not only are these taxes generally invisible, they are also generally regressive. Because state and local governments rely heavily on these taxes, they serve to hide the cost of government and distribute that cost in a regressive fashion (Decoster et al. 2010). The average share of the sales and gross receipts tax revenue in total state tax revenue the period of 1997-2013 amounts to about 36 percent[9]. We hypothesize the association among corruption, a reliance on indirect taxes, and tax progressivity as follows.

- *Hypothesis IV: A U.S. state government with a higher level of corruption is more likely to rely on indirect taxes such as sales and gross receipt taxes, which makes her tax system less progressive as a consequence, all else being equal.*
- *Hypothesis V: A U.S. state government with a higher level of corruption is more likely to rely on indirect taxes because their burden is less visible to taxpayers, giving officials greater freedom to manipulate state finances, all else being equal.*

Corruption, Corporate Income Tax, and Tax Share by Business

An issue of contention in all state tax policy discussions is the balance between taxes on businesses and taxes on individuals. This is an artificial distinction because businesses act as a conduit of tax burden to individuals, either through higher prices for products sold, lower payments by the business for resources purchased from individuals, or reduced return to individual owners of the business. However, it has traction in tax structure discussions. There are three political reasons for this. First, the burden of tax with initial impact on business gets hidden as it is transmitted to individual taxpayers. That violation of transparency is attractive to many politicians. Second, a tax with initial impact on

8) For states and localities, the indirect taxes are included in classification C107 Sales and Gross Receipts Taxes by the Governments Division, U. S. Bureau of Census. The U.S. Census (2010) defines the category as "Taxes, including 'licenses' at more than nominal rates, based on volume or value of transfers of goods or services; upon gross receipts, or upon gross income; and related taxes based upon use, storage, production (other than severance of natural resources), importation, or consumption of goods. Dealer discounts of "commissions" allowed to merchants for collection of taxes from consumers are excluded."

9) The average share of indirect taxes to total revenues in the OECD countries was around 30 percent and that is heavily driven by use of national value added taxes in all the countries but the U.S. (Decoster et al. 2010). U.S. state governments have relied on indirect taxes more heavily than the OECD countries.

business appears to avoid placing tax burden on individual voters. That is also attractive to many politicians. Third, the chances tax a tax with initial impact on business will be exported to individuals residing in other states is high. That is likely if the tax gets embedded in prices charged by the firm or if the tax reduces the return to out-of-state owners of the business. In either case, the result is attractive to politicians.

Higher impact on business is not attractive to businesses and neither is heavier use of corporate income taxes. Therefore, it is reasonable to expect that businesses, organized and individually, would be interested in reducing the business share of state taxes and the share of tax from corporate income, even though such structures might be attractive to the population. In an environment of corrupt public officials, one approach could be the use of illegal inducements to structure the state tax system to the benefit of businesses. That approach to burden reduction could be an attractive option in comparison to the ordinary devices of evasion and avoidance[10]. That is the influence to be tested here. Following these arguments, we hypothesize on the association between corruption and business tax structure as follows.

- *Hypothesis VI: The share of the corporate income tax revenue in total tax revenue is likely to become smaller in a more corrupt U.S. state government, all else being equal.*
- *Hypothesis VII: The share of taxes levied by businesses in total tax revenue is likely to become smaller in a more corrupt U.S. state government, all else being equal.*

Model, Methodology, and Data

Model and Methodology

Our econometric approach to examining the effect of corruption on the tax structure of the U.S. state governments is a dynamic panel regression model, controlling for both state and year fixed effects with robust errors. Our data accommodate the period 1997-2013[11].

10) In return for bribes and lobby from entrepreneurs, corrupt officials are more likely to design tax preferences to the businesses (Belitski et al. 2016).

11) Our choice of the data period is not arbitrary. A consistent database of GSP and its subcategories across the states is just available from 1997 since the U.S. Bureau of Economic Analysis (BEA) changed her industry classification system from the Standard Industrial Classification (SIC) to the North American Industrial Classification System (NAICS) in 1997. The 2013 U.S. states tax revenue data across subcategories from the Census are the most recent datasets publicly available at the point of our analysis. Thus, we decided to answer our research questions with the data over the period 1997-2013.

The model controls for a multiple sets of covariates including corruption (the key test variable), state economic variables (Mahdavi 2013), state demographic variables, state political variables (Ho 2003; Merrifield 2000; Sauser 1993), and state fiscal institutional variables (Gade and Adkins 1990; Giertz and Giertz 2004; Joyce and Mullins 1991), which is as follows[12]:

> *TS = f (corruption; TS in the previous year; real per capita GSP; percent of GSP produced in agriculture, forestry, fishing, and hunting†; percent of GSP produced in education services, healthcare, and social assistance; percent of GSP produced in manufacturing†; percent of GSP produced in government†; percent of GSP produced in accommodation†; natural log of state total population; state population growth rate; share of state population of age 18-64; natural log of state population residing in urban areas; dummy of gubernatorial election years; dummy of governor's party affiliation ; extent of party competition in state legislature; dummy of the existence of governor's veto power; index of state TELs stringency; index of local TELs stringency; year dummies; errors), where TS =a measure of tax structure.*

The U.S. States Corruption and Its Measurement

To measure official corruption across the U.S. state governments, we use the U.S. Department of Justice (DOJ) publication entitled Report to Congress on the Activities and Operations of Public Integrity Section[13]. The DOJ publishes the annual numbers of federal, state, and local officials who are convicted of violations of federal corruption-related laws within and across the states. The report understands corruption as "crimes involving abuses of the public trust by government officials", which is consistent with the definition of corruption in the literature. The report provides a comprehensive record of corruption conducted by public officials in the executive, legislative, and judiciary branches[14]. The US state-level data in this study are measured and collected in

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12) All government finance variables in our model such as the total tax revenue and its subcategories are measured at the aggregate levels, i.e., the amounts from state plus local governments. †: To capture the amount of value-added in each industry, we just follow the BEA industry classification system, or NAICS. Their industry classification codes are Code 3, Code 68, Code 12, Code 82, and Code 78, respectively, which is available here: http://bea.gov/regional/index.htm.

13) The database is available here: https://www.justice.gov/criminal/pin.

14) The DOJ reports that the data encompass a wide array of crimes "involving abuses of the public trust by government officials": 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 misconduct, falsifying official documents, theft of government computer equipment for an international computer piracy group, extortion, robbery, and soliciting bribes by police officers, possession with intent to distribute narcotics, and smuggling illegal aliens. DOJ does not divide data by type of corruption.

homogenous and consistent ways, so they provide us with a panel database which is long and large enough to make our econometric models identified.

No available corruption index captures the extent of corruption completely and perfectly but convictions, representing a general sample of total corrupt activity in a jurisdiction, provide a reliable, relevant, and valid criterion. The DOJ is the most reliable and complete source of conviction data for U.S. public officials and it is generally accepted that the numbers of convictions are highly correlated with the extent of corruption across the states. According to Meier and Holbrook (1992) and Glaeser and Saks (2006), state corruption rankings based on the conviction measures match the perception of general Americans and professional reporters working in state legislatures. Regarding validity, we ran a number of regressions of the conviction measures on caseload, pending rate, U.S. attorney's working hours, the number of judges, and state judiciary expenditure[15]. The two corruption measures are the number of convictions per 10,000 public employees and the number of convictions per 100,000 persons of population[16]. Finding that none of these variables are significant determinants of our conviction measures over the period 1997-2013, we conclude that our convictions measures do not reflect prosecutorial efforts, law enforcement/slackness, or courts' resources but do capture the extent of corruption across the states[17].

Table I describes the rankings of the U.S. state governments based on multiple criteria in the period 1997-2013, on average. The corruption variable in our benchmark model indicates the number of convictions per 10,000 public employees. According to the index, the ten least corrupt state governments during the period are New Hampshire, Oregon, Nebraska, Minnesota, Iowa, Kansas, Utah, Washington, Colorado, and South Carolina. The ten most corrupt state governments, from the most corrupt one, are Louisiana, Kentucky, South Dakota, Mississippi, Montana, Alaska, Virginia, Florida, Alabama, and Pennsylvania[18].

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15) All these variables are generalized by the number of public employees and the number of state population before running regressions.

16) Compared to the second corruption index, the first one works better because we focus on public officials' corruption. Thus, we use the first index for our benchmark analyses.

17) Our conviction measures have a couple of comparative advantages compared to most corruption-related indexes. Most existing corruption indicators are measured based on the perception of corruption which should be subjective and inconsistent across individuals and societies. The DOJ applies the federal corruption laws, neither state nor local laws, and provides objective numbers of convictions which are consistent across states and years.

18) The corruption rankings of state governments based on the second corruption index are not remarkably different from those from the first index. The ten least corrupt states are Oregon, New Hampshire, Nebraska, Minnesota, Iowa, Washington, Utah, Colorado, South Carolina, and Kansas. The ten most corrupt state governments, from the most corrupt one, are Louisiana, Alaska, South Dakota, North Dakota, Mississippi, Kentucky, Montana, Alabama, Virginia, and Missouri.

Dependent Variables

Our dependent variable of the model examining Hypothesis I is measured by the generalized Herfindahl-Hirschman Index (HHI) with seven subcategories of tax revenues[19], which is the most-often used index of tax complexity across the state governments (Chapman and Gorina, 2012). The ten states with the least complex tax structure during the period are West Virginia, Oklahoma, Pennsylvania, Alabama, North Dakota, Kentucky, Minnesota, Idaho, North Carolina, and California. The ten states with the most complex tax structure over the period, from the highest, are New Hampshire, Alaska, Washington, Texas, South Dakota, Oregon, Tennessee, Wyoming, New Jersey, and Florida (See column Tax Complexity in Table I).

The dependent variable of the model testing Hypotheses II and III is measured by the ratio of total tax revenue to GSP, multiplied by 100, which indicates tax burden across the states. The ten states with the lightest tax burden during the period are Delaware, South Dakota, Nebraska, Minnesota, Iowa, Washington, Utah, Colorado, South Carolina, and Kansas. The ten states with the heaviest tax burden over the period, from the heaviest, are Maine, New York, Vermont, Alaska, West Virginia, Hawaii, Rhode Island, New Jersey, North Dakota, and Wisconsin (See column Tax Burden in Table I).

Our dependent variable of the models examining Hypotheses IV and V equals the share of sales and gross receipt taxes in total tax, an indication of tax visibility and regressivity of the state system. The ten states with the least regressive / most progressive / most visible tax structures during the period are Oregon, Alaska, Delaware, Montana, New Hampshire, Massachusetts, New Jersey, Maryland, New York, and Virginia. The ten states with the most regressive / least progressive / least visible tax structures over the period, from the highest, are Washington, Nevada, Tennessee, Louisiana, South Dakota, Hawaii, Arkansas, Florida, New Mexico, and Alabama (See column Indirect/ Regressive Tax in Table I).

19) We follow the U.S. Census classification of taxes. The seven subcategories are property taxes, general sales and gross receipts taxes, total selective sales taxes, individual income taxes, corporation net income taxes, total license taxes, and other taxes.

Two dependent variables capture the extent of tax burden levied by firms which are used to examine Hypotheses VI and VII. The one measures the share of corporation net income taxes in total tax, while the other measures the share of state and local taxes paid by businesses in state and local total taxes.[20] Businesses in states with high values for these variables have been less successful in shifting the balance of tax impact from business taxes to individual taxes. Those states offer fewer tax preferences to firms or levy structures affording higher impact rates on businesses. According to the Ernst & Young index, the ten states with highest business shares are Alaska, Wyoming, North Dakota, Texas, South Dakota, Louisiana, New Mexico, Delaware, Washington, and New Hampshire. The ten states with lowest business shares are Connecticut, Maryland, North Carolina, Oregon, Virginia, New Jersey, Massachusetts, Wisconsin, Utah, and Arkansas (See column Business Share in Table I)[21].

20) Ernst & Young LLD in conjunction with the Council On State Taxation (COST) reports detailed state-by-state estimates of the state and local taxes paid by businesses for each fiscal year. The estimates (available at http://www.ey.com/) include "business property taxes; sales and excise taxes paid by businesses on their input purchases and capital expenditures; gross receipts taxes; corporate income and franchise taxes; business and corporate license taxes; unemployment insurance taxes; individual income taxes paid by owners of non-corporate (pass-through) businesses; and other state and local taxes that are the statutory liability of business taxpayers" (Phillips et al. 2014).

21) According to the corporate income tax share index, the ten states with highest shares are Alaska, New Hampshire, Delaware, New York, West Virginia, Massachusetts, California, Tennessee, Michigan, and Illinois. The ten states with lowest shares are Washington, Nevada, Texas, Wyoming, Hawaii, Ohio, Missouri, South Carolina, South Dakota, and Colorado (See column CIT Share in Table I).

Table I. The Rankings of the U.S. State Governments (1997-2013, on average)

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

†: ranks from the least to the highest, based on each index. ‡: ranks from the highest to the lowest, based on each index. Tax burden is measured by the tax (state+local) to GSP ratio. Tax complexity is measured by the generalized HHI. The extent of indirect taxes is measured by the share of sales and gross receipt taxes in total tax. The CIT share and Business Share capture the the extent of tax burden imposed on businesses.

Explanatory Covariates and Controls

Table II provides comprehensive information on the dependent and independent variables: how to measure them and where to collect them, including descriptive statistics of them. Note our regression models include the lagged value of their dependent variables as their independent variable. This is to control for one of the most characteristic features of government finance, i.e. incrementalism. Most taxes remain in place unless changed explicitly by legislative action, making past decisions critical for current law. This variable makes our models dynamic panel regressions.

We identify gross state product per capita, multiplied by 100, as a proxy for the major tax base of the U.S. state and local governments[22]. We expect that an expansion of tax base of a government will increase tax capacity and tax collections, all else being equal. Separate from the aggregate tax base effect, we also add the shares of several sub-categorical products in total GSP and examine the impact of economic structure on tax revenue. The subcategories are agriculture, education, manufacture, government, and accommodation[23]. We suspect that it is harder to tax the agricultural sector than other sectors including manufacturing because of profitability and compliance problems, but retail is easier. Value added in education and the government is mostly exempt from taxation. Values produced from accommodation may capture governments' ability to export tax burden through tourists.

Our regressions models include multiple demographic variables of the states. The natural log of the state population and the growth of population capture the extent of people's demand for government services, which implies fiscal burden on the governments. However, it is also understood as a proxy for economies of scale in publicly provided services. The variable named Age 1864 measures the share of the population aged 18 to 64. Young (younger than 18) and elderly (older than 64) residents demand more public provided services such as public education and health care, which implies a higher demand for government services. The natural log of the number of people residing in urban areas is a proxy for the extent of urbanization, which requires for a higher fiscal burden on the governments. It is noteworthy that the literature provides much conflicting evidence of the effect of demographic variables on government finance and summarizes that it is not a normative but empirical issue, which may depend on data and cases.

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22) In order to control for other economic factors, we also ran a number of regressions with personal income, unemployment, changes in debt, non-tax revenue, and intergovernmental grants. We do not find any remarkable changes in our regression results across the variations. Considering high collinearity between these variables and GSP, we decided not to include them into our benchmark models, which is also better for brevity of the result presentation.

23) To measure the share (%) of each category in GSP, we follow the GSP subcategory classification system of the U.S. Census, or NAICS. The categories are as follows: agriculture (agriculture, forestry, fishing, and hunting), education (education services, health care, and social assistance), manufacture (manufacturing), government, and accommodation.

The set of political and institutional variables includes a dummy of gubernatorial election years, a dummy of governor's party affiliation (1 = Democrats, 0 = the others), the extent of political competition in the state legislatures[24], a dummy of the existence of gubernatorial line-item veto, the stringency of state tax and expenditure limits (TELs), and the stringency of local TELs[25]. Politicians prefer expansionary fiscal policies when elections approach. Democrats are generally understood to be more generous to government expenditures. Political checks and balances make increasing taxes more difficult when there is greater political competition. It will be easier for a governor with veto power to reduce government spending as she is allowed to eliminate specific expenditures or tax proposals. A higher stringency of state and local TELs is expected to result in a more restrictive fiscal administration. As noted in Table III, we also control for state fixed effect and year effect.

Table II. Descriptive Statistics

Variable	Label	Obs	Mean	Std. Dev.	Min	Max	Source
Dependent variables							
Tax burden	Ratio of total tax revenue to GSP, multiplied by 100	750	8.70	1.27	5.92	18.35	U.S. Census
Tax complexity	Tax complexity, generalized HHI	750	0.87	0.05	0.56	1.01	
Indirect/regressive tax	Share of sales and gross receipt tax (%) in total tax revenue. Proxy for the extent of indirect/regressive taxes; the higher index, the less progressive system	750	35.68	12.35	5.62	64.83	
CIT share	Share of corporate income tax (%) in total tax revenue	750	3.66	2.55	0.00	22.42	
Business share	Share of tax revenue collected from businesses (%) in total tax revenue	500	47.33	10.13	28.90	100	Ernst & Young LLD
Independent variables							
Corruption (employee)	Number of convictions per 10,000 public employees	847	0.50	0.40	0.00	2.73	U.S. Department of Justice
Corruption (pop)	Number of convictions per 100,000 people of the state population	847	0.34	0.30	0.00	2.55	
GSP†	Gross state product, per capita, multiplied by 100	850	0.04	0.01	0.02	0.08	U.S. Bureau of Economic Analysis
Agriculture (%)†	Percent of GSP in agriculture, forestry, fishing, and hunting (NAICS)	850	1.68	1.91	0.12	12.99	
Education (%)†	Percent of GSP in education services, health care, and social assistance (NAICS)	850	7.75	1.83	3.21	13.54	
Manufacture (%)†	Percent of GSP in manufacturing (NAICS)	850	13.38	5.87	1.80	30.59	
Government (%)†	Percent of GSP in government (NAICS)	850	13.85	3.11	9.17	25.27	
Accommodation (%)†	Percent of GSP in accommodation (NAICS)	850	1.11	1.78	0.25	14.81	
LN(pop)	Natural log of state total population	850	15.11	1.01	13.10	17.46	Book of the States, U.S. Census
Pop growth	State population growth rate	850	0.92	0.78	-5.99	5.87	
Age1864	Share of state population of age 18-64	850	0.62	0.01	0.58	0.66	
Urbanization	Natural log of state population residing in urban areas	850	14.74	1.14	12.17	17.41	
Election	Dummy of years of gubernatorial election	850	0.25	0.43	0.00	1.00	
Party	Dummy of governor's party affiliation (1=Democrats)	850	0.43	0.50	0.00	1.00	
Competition	Extent of party competition in state legislature, 1 minus the average of proportions of Democrats in House and Senate (Clingermayer and Wood 1995)	850	0.50	0.17	0.09	1.00	
Veto	Dummy of governor's veto power (1=yes, 0=no)	850	0.87	0.33	0.00	1.00	
State TEL	Index of the stringency of state TELs	839	9.26	8.40	0.00	30.00	Amiel et al. (2009)
Local TEL	Index of the stringency of local TELs	842	15.78	10.62	0.00	38.00	

All government finance variables are measured by adding state and local values in total. †: We follow the industry classification system of the U.S. Census.

24) The extent of political competition is measured by "one minus the average of proportions of Democrats in House and Senate" (Clingermayer and Wood 1995). Although Klarner (2013) provides a number of other indexes of political competitiveness across the states, we adopt the method used by Clingermayer and Wood (1995) after checking that the regression results do not show remarkable differences across the variations and those indicators have high correlations. The main concern is that those Klarner's measures have not been updated since 2010.

25) Many empirical studies argue that the existence of TELs is not sufficient to exert significant influence on government finance, although it is different from the intent of the institutions. Instead, we use the measures of the strength of state and local TELs, updated by Amiel et al. (2009), which show substantial variations of the measures across the states and localities.

Empirical Results

Corruption vs. Tax Burden

Model I in Table III describes how corruption affects the extent of the tax complexity in the U.S. state governments in the period 1997-2013. Model II in Table III shows how tax complexity is associated with the tax collection of the U.S. state governments over the same period. Model III in Table III is our benchmark model examining the effect of corruption on state and local total tax burden over the period. In order to the potential reverse caulity and simultaniety issues, we use the lagged value of the corruption through our regressions[26].

Model I shows a negative association between corruption and the generalized HHI tax complexity index. The association is significant at the 0.1% level and means that a state government with a higher level of corruption is likely to have a more complex tax system (a lower generalized HHI index), thus supporting Hypothesis I. Model II also shows a negative association between the generalized HHI tax complexity index and total tax revenue. The impact is significant at the 0.1% level and implies that a state government with a more complex tax system is likely to collect more tax revenue. It shows that a U.S. state government can succeed in raising a larger amount of tax revenue by making its tax system more complex, supporting Hypothesis II. Model III shows that there is a significantly positive association between corruption and tax, which is also significant at the 0.1% level. This provides significant evidence in support of Hypothesis III.

The regression results of the models I through III are consistent with the fiscal illusion theory which argues that self-interested officials are motivated to make the fiscal system more complex in order to create fiscal illusion and make taxpayers underestimate their actual tax burden, which results in a larger amount of tax collection in the end. A government with more corrupt officials are expected to make more efforts to create a fiscal illusion, e.g. by making its tax system more complex. A U.S. state government with greater corruption is likely to have a more complex tax system and the fiscal illusion that results allows a higher tax burden. This implies that U.S. citizens residing in a state whose public officials are more corrupt should shoulder heavier tax burden due to public officials'

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26) One can suspect that the tax structure of a government causes a variation of the extent of corruption. We try to address the reverse causality and simultaneity issues by adopting a Granger causality style approach and used a lagged value of corruption, instead the contemporaneous level of corruption.

corruption.

The regression results of the covariates in our benchmark model, Model III, correspond to expectations from the literature. Other than the corruption variable, it appears that the significant determinants of tax collection are the first lag of the dependent variable, per capita GSP, the shares of products from agriculture, manufacturing, government, and accommodation, and the extent of political competition. We interpret the results one by one as follows. First, a higher level of tax revenue in a previous year is likely to have a positive impact on tax levels in the following year, which makes sense given the incremental nature of tax structures. Tax laws remain in place year after year, unless legislative action is taken to change them, and that is a relatively infrequent occurance. Second, it is natural that a bigger potential tax base, measured by per capita GSP, should produce more tax revenue. Third, the subcategories of GSP, i.e. agriculture, education, manufacturing, government, and accommodation, show a significantly negative association with tax collection. The results are open to diverse interpretations. One possible explanation is that a government can collect a larger amount of tax revenue through diversified revenue sources, rather than a heavy reliance on a specific revenue source. This is relevant to the regression result of Model II in Table III. Most demographic, political, and institutional variables other than the extent of political competitiveness in the state legislatures do not exert a significant influence on tax collection during the study period. The check and balance function of competitive state legislatures seems to restrain the state governments from increasing tax burden on their residents.

Table III. Regression Results and the Tests of Fitness
Corruption and the Level of State and Local Tax Revenues (1997-2013)

Variable		Model I		Model II		Model III	
		Tax Complexity		Tax / GSP		Tax / GSP	
Main		b.(sig.)	t-value	b.(sig.)	t-value	b.(sig.)	t-value
Dependent variable at (t-1)§		0.47***	15.7	0.26***	8.2	0.46***	13.24
Corruption (employee)		-0.01***	-4.12			0.27***	4.16
Tax complexity♠				-17.74***	-15.68		
GSP variables							
GSP♣		0.01**	3.21	10.22	0.99	36.11**	2.95
Agriculture†		-0.003	-0.6	-0.10**	-3.28	-0.12**	-3.42
Education†		-0.01	-0.94	0.03	0.4	0.09	1.15
Manufacture†		-0.003	-1.11	-0.06***	-4.67	-0.08***	-5.42
Government†		0.04***	5.89	-0.04	-0.96	-0.13**	-2.64
Accommodation†		-0.03*	-1.98	-0.35***	-3.72	-0.28*	-2.49
Demographic							
LN(pop)		0.02	1.06	-1.09	-1.23	-0.87	-0.82
Pop growth		0.002**	2.61	0.01	0.28	-0.06	-1.24
Age1864		-0.21	-1.6	-5.73	-1.2	-0.88	-0.16
Urbanization		-0.01	-0.61	0.22	0.39	0.17	0.26
Political & Institutional							
Election		0.001	0.93	-0.01	-0.19	-0.03	-0.47
Party		0.002	1.92	0.02	0.4	-0.06	-1.28
Competition		-0.01	-0.93	-1.01**	-3.18	-1.27**	-3.36
Veto		0.003	0.59	0.08	0.49	-0.03	-0.14
State TEL		0.001	1.08	0.02	1.23	0.02	0.9
Local TEL		-0.0002	-0.19	0.02	0.43	0.02	0.45
Constant		0.22	0.72	39.95**	3.41	17.55	1.26
Fixed effect		controlled		controlled		controlled	
Year effect		controlled		controlled		controlled	
Observations		637		589		587	
R-squre	within	0.65		0.65		0.50	
	between	0.49		0.08		0.40	
	overall	0.51		0.12		0.410	
F-statistic		34.72***		32.31***		17.49***	

§: Lagged values of the dependent variables of each model. ♠: Note, the larger the index, the less the extent of tax complexity. ♣: Per capita GSP, divided by one million, in the models II and III. The ratio of GSP to total state and local tax revenues in the model I. †: Added values of each categorical gross state product (%) in the models II and III. The ratio of each categorical gross state products to total state and local tax revenues in the model I. *,**,***: significant at 5%, 1%, and 0.1%, respectively.

Robustness Checks of the Results

We used several strategies to assess the robustness of our models and address the possible endogeneity of the empirical results in the benchmark model. Tables IV and V summarize the robustness check results. We start from Model IV, a simple dynamic panel regression model of tax-to-GSP ratios on corruption with controlling for the state fixed and year effects. We extend the model to accommodate GSP and the GSP relevant variables, Model V. We further added the sets of covariates, i.e. demographic (Model VI), political (Model VII), and institutional (Model VIII) factors, set by set. Table IX diplays that the positive association between corruption and tax burden remains substantively and statistically significant across all nested and non-nested re-specifications. Furthermore, instead of the number of convictions per 10,000 public employees, we used the number of convictions per 100,000 people in the population as a proxy for the state corruption at Model VIX in Table V. Table V also shows a significantly positive association between corruption and tax burden[27]. We also ran a number of generalized method of moments (GMM) regressions to control for the potential endogeneity problem of the corruption variable[28]. Model X in Table V is a two-step first difference GMM model. Model XI in Table V is a two-step system GMM model. Both models address the small sample bias problem. In sum, the significantly positive association between corruption and tax burden remains across a number of variations. The regression results of the other factors of the state tax burden also correspond with those of Model III in Table III. We conclude that the regression results of our benchmark model are consistent and robust.

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27) We also ran regressions with multiple time lags for convictions measures such as the conviction measures at time t-3, the average of the previous three years' conviction measures (at times t-2, t-1, and t), and the measures at time t, in addition to the measures at time t-1 in the benchmark model. The results are not reported for brevity.

28) One can suspect that a corruption variable in an empirical regression model is endogenous in a sense that the corruption variable might be correlated with the error terms of the model due to some omitted variables which are associated both with the corruption variable and the errors. One of the most effective ways to address this endogeneity is to find valid instruments of the endogenous variable. Utilizing the characteristic features of panel data, GMM methods use some appropriate lagged values of the endogenous variable as a valid "internal" instrument of the endogenous variable when valid "external" instruments are not available, as our case. Table V shows that models X and XI pass most of the required tests for an identified GMM model, i.e. the AR (2) test, the over-identification test, the number of instruments test, and the exogeneity test. Although these GMM models are expected to address the endogeneity problem, we do not present them as our benchmark model because GMM models work best when the panel data have many groups with a short time period, to which our panel data do not comply. Also, the system GMM model, Model XI, violates the number of instruments test. The number of instruments should not be larger than that of the states, or 50.

Table IV. Robustness Checks (I)
Corruption and the Level of State and Local Tax Revenues (1997-2013)

Variable	Model IV		Model V		Model VI		Model VII		Model VIII♠	
	Tax / GSP		Tax / GSP		Tax / GSP		Tax / GSP		Tax / GSP	
Main	b.(sig.)	t-value	b.(sig.)	t-value	b.(sig.)	t-value	b.(sig.)	t-value	b.(sig.)	t-value
Dependent variable at (t-1)§	0.57***	16.65	0.48***	13.81	0.48***	13.82	0.47***	0.03	0.46***	13.24
Corruption (employee)	0.25***	3.73	0.26***	3.98	0.26***	3.97	0.27***	0.06	0.27***	4.16
GSP variables										
GSP♣			47.89***	4.33	46.70***	4.02	36.87**	11.88	36.11**	2.95
Agriculture†			-0.09**	-2.65	-0.10**	-2.78	-0.11**	0.03	-0.12**	-3.42
Education†			0.22**	3.28	0.19**	2.64	0.11	0.08	0.09	1.15
Manufacture†			-0.06***	-4.41	-0.07***	-4.58	-0.08***	0.01	-0.08***	-5.42
Government†			-0.10*	-2.17	-0.11*	-2.26	-0.12*	0.05	-0.13**	-2.64
Accommodation†			-0.30**	-3.21	-0.29**	-2.68	-0.27*	0.11	-0.28*	-2.49
Demographic										
LN(pop)					-0.76	-0.73	-0.84	1.04	-0.87	-0.82
Pop growth					-0.06	-1.32	-0.06	0.05	-0.06	-1.24
Age1864					1.83	0.33	-0.96	5.57	-0.88	-0.16
Urbanization					0.24	0.36	0.07	0.66	0.17	0.26
Political & Institutional										
Election							-0.02	0.06	-0.03	-0.47
Party							-0.06	0.05	-0.06	-1.28
Competition							-1.28*	0.37	-1.27**	-3.36
Veto									-0.03	-0.14
State TEL									0.02	0.90
Local TEL									0.02	0.45
Constant	3.63***	12.37	2.83*	2.12	11.61	0.87	17.99	1.33	17.55	1.26
Fixed effect	controlled		controlled		controlled		controlled		controlled	
Year effect	controlled		controlled		controlled		controlled		controlled	
Observations	598		598		598		598		587	
R-squre within	0.416		0.490		0.490		0.490		0.50	
R-squre between	0.987		0.420		0.46		0.478		0.40	
R-squre overall	0.827		0.430		0.45		0.480		0.410	
F-statistic	29.35***		26.28***		21.75***		165.90***		17.49***	

♠: Model VIII is the same with Model III in table III, or the benchmark model. We display the model here again for comparison. §: Lagged values of the dependent variables of each model. ♣: Per capita GSP, divided by one million. †: Added values of each categorical gross state product (%). *,**,***: significant at 5%, 1%, and 0.1%, respectively.

Table V. Robustness Checks (II)
Corruption and the Level of State and Local Tax Revenues (1997-2013)

Variable		Model IX		Model X♠ Difference GMM		Model XI♠ System GMM	
		Tax / GSP		Tax / GSP		Tax / GSP	
Main		b.(sig.)	t-value	b.(sig.)	t-value	b.(sig.)	t-value
Dependent variable at (t-1)§		0.46***	13.27	0.26***	4.4	0.63***	11.74
Corruption (employee, pop)‡		0.47***	5.32	0.20*	2.37	0.26***	6.25
GSP variables							
GSP♣		35.46**	2.93	116.21**	2.89	34.91	1.46
Agriculture†		-0.16**	-3.44	-0.13***	-4	0.01	0.24
Education†		0.09	1.14	0.67**	3.13	0.14*	2.23
Manufacture†		-0.08***	-5.5	-0.10***	-4.6	-0.01	-0.45
Government†		-0.13**	-2.63	-0.07	-1.19	0.04	1.3
Accommodation†		-0.28*	-2.53	-0.07	-0.52	0.05	0.57
Demographic							
LN(pop)		-0.83	-0.79	3.38*	2.52	1.01*	2.11
Pop growth		-0.05	-1.18	0.01	0.23	-0.03	-1.08
Age1864		-0.79	-0.14	1.39	0.36	2.2	0.21
Urbanization		0.20	0.3	-0.53	-1.69	-0.96*	-2.25
Political & Institutional							
Election		-0.03	-0.49	0.01	0.4	0.02	0.57
Party		-0.07	-1.34	-0.01	-0.2	-0.21***	-3.74
Competition		-1.27**	-3.4	-0.56	-1.53	-0.04	-0.14
Veto		-0.03	-0.14	-0.02	-0.19	0.03	0.19
State TEL♥		0.02	0.9				
Local TEL		0.02	0.45	0.02*	2.66	0.01	1.27
Constant♥		16.52	0.29			-2.00	-0.36
Fixed effect		controlled		controlled		controlled	
Year effect		controlled		controlled		controlled	
Observations		587		487		590	
R-squre	within	0.51		n.a.		n.a.	
	between	0.41		n.a.		n.a.	
	overall	0.42		n.a.		n.a.	
F-statistic		18.23***		169.76**		1389.05***	
Tests related to GMM	AR 1 (p-value)	n.a.		0.10		0.17	
	AR 2 (p-value)	n.a.		0.26		0.27	
	Over-id.	n.a.		passed		passed	
	No. of instruments	n.a.		43		68	
	Exogeneity	n.a.		passed		passed	

§: Lagged values of the dependent variables of each model. ‡: The number of convictions per 100,000 people of state population in Model IX. The number of convictions per 10,000 public employees in models X and XI. ♣: Per capita GSP, divided by one million. †: Added values of each categorical gross state product (%). ♠: Model X is a difference GMM model and Model XI is a system GMM. Both are two-step GMM models and address small sample bias. ♥: Models X and XI drop state TEL variable automatically due to collinearity. Difference GMMs delete constants. *,**,***: significant at 5%, 1%, and 0.1%, respectively.

Corruption vs. Tax Composition

The corruption effect will not be the same across the different types of taxes. The Mill's hypothesis maintains that self-interested officials prefer indirect taxes to direct taxes because it is more difficult for taxpayers to assess their actual tax burden from those than these. Likewise, corrupt officials are more likely to create a fiscal illusion by designing an indirect-tax-oriented tax system and fool taxpayers to underestimate their actual tax burden. We use the share of tax revenue collected from Sales and Gross Receipt Taxes (C107, Census code) in total taxes as a proxy for the extent of indirect taxes across the states. Model XII in Table VI shows a significantly positive association between corruption and the share of sales and general receipt taxes in the state and local total taxes, which is significant at the 1% level[29]. A state government with a higher extent of corruption is more likely to collect her tax revenue from indirect taxes, which is in support of Hypotheses IV and V.

Many tax studies use the share of sales and gross receipts taxes in total taxes as a proxy for the extent of tax regressivity. A tax system which relies heavily on these taxes is presumed to be regressive, or less progressive. Consumption spending is higher as a share of household income for lower-income families than it is for higher-income families. This is true not just for total consumption but also for most categories of expenditure. The effective tax rates of these taxes are higher for low-income households than that for higher-income households. Thus, the distribution of the tax burden is regressive, which creates equity problem for the taxes (Mikesell 2014: 447). In this regard, the regression result of Model XII implies that public officials' corruption is associated with state tax regressivity; thus, the tax burden of lower-income households residing in a state whose government is more corrupt tends to become heavier than that of higher-income households.

We use the share of corporate income tax in the total tax and the share of taxes levied by businesses in the total tax as two proxies[30] for the tax burden imposed on

29) The result is consistent in a two-step first difference GMM regression which is expected to control for the endogeneity of the corruption variable and address the small sample bias, which is not reported for brevity.

30) There exist trade-offs between the two proxies. The coverage of the business share variable, measured by Ernst & Young LLP, is much wider than that of the corporate income tax share variable, so it can capture the extent of tax burden of businesses comprehensively. However, the corporate income tax share variable, measured by the U.S. Census, provides a longer panel database than the business share variable which is just available over the period 2004 to 2013. Table II finds that corporate income taxes have constituted around 4% of the total tax revenue collected by the U.S. state and local governments over the period 1997-2014, on average. Businesses have paid around 47% of the total tax in the period, on average.

businesses. Both models XIII and XIV show that there exist a significantly negative association between corruption and the tax burden levied by businesses, which are significant at the 5% and the 1% levels, respectively[31]. Businesses operating in a state whose government is more corrupt are likely to face a smaller share of total tax burden, compared to businesses operating in a state whose government is less corrupt. We interpret this that businesses operating in the states whose governments are more corrupt are more likely to find ways to evade their tax obligations and/or succeed in receiving a larger amount of tax preferences from their governments. The results support both Hypotheses VI and VII

Table VI. Regression Results and the Tests of Fitness
Corruption and the Composition of State and Local Tax Revenues

Variable	Model XII Sales and General Receipt Tax♠ (Indirect/Regressive Taxes)		Model XIII Corporate Income Tax♠ (Taxes levied by Businesses)		Model XIV Business Share♥ (Taxes levied by Businesses)	
Main	b.(sig.)	t-value	b.(sig.)	t-value	b.(sig.)	t-value
Dependent variable at (t-1)§	0.70***	24.82	0.64***	19.75	0.33***	6.47
Corruption (employee)	0.43**	2.84	-0.23*	-2.39	-0.90**	-2.79
GSP variables						
GSP†	0.47**	2.63	0.17	1.52	-0.13	-0.29
Agriculture†	-0.55	-0.89	-0.3	-0.76	-2.19	-1.61
Education†	1.56	1.25	-1.01	-1.28	-6.86*	-1.96
Manufacture†	-0.59*	-2.17	-0.18	-1	0.79	0.98
Government†	-0.12	-0.17	1.36**	2.92	-1.23	-0.59
Accommodation†	0.68	0.4	-1.54	-1.41	-5.52	-0.86
Demographic						
LN(pop)	-0.87	-0.82	0.42	0.29	27.70***	3.61
Pop growth	-0.06	-1.24	0.05	0.66	-0.26	-1.13
Age1864	-0.88	-0.16	8.8	1.08	69.71	1.17
Urbanization	0.17	0.26	-0.41	-0.45		
Political & Institutional						
Election	-0.03	-0.47	0.01	0.07	-0.24	-0.82
Party	-0.06	-1.28	0.05	0.05	0.01	0.05
Competition	-1.27**	-3.36	0.39	0.72	-0.01***	0
Veto	-0.03	-0.14	0.14	0.47	-4.55***	-4.35
State TEL	0.02	0.9	-0.03	-1.02		
Local TEL	0.02	0.45	-0.02	-0.29		
Constant	17.55	1.26	-6.92	-0.36	39.95**	3.41
Fixed effect	controlled		controlled		controlled	
Year effect	controlled		controlled		controlled	
Observations	587		638		439	
R-squre within	0.50		0.60		0.55	
R-squre between	0.40		0.81		0.14	
R-squre overall	0.410		0.77		0.12	
F-statistic	17.49***		27.23***		19.24***	

§: Lagged values of the dependent variables of each model. †: The ratio of each categorical gross state products to total state and local tax revenues. ♠: The share (%) of each tax revenue to total state and local tax revenues. ♣: The dependent variable captures the ratio of taxes collected from businesses to total state and local tax revenues. The values are measured by Earnst & Young LLP and available from 2004 to 2013. Model XIV droppes the variables of urbanization, state TEL, and local TEL automatically, due to collinearity. *,**,***: significant at 5%, 1%, and 0.1%, respectively.

A significantly negative association between corruption and the tax burden levied on businesses remain robust in a two-step first difference GMM regression again, which is not reported for brevity.

Conclusion

We extended the fiscal illusion theory to explain how corruption affects the tax structure of a developed country and examined empirically the effects through the case of the U.S. state and local governments. Most existent studies investigating the corruption effects on tax structure have focused on the experiences of the developing countries and the transition economies, so they adopted the tax evasion theory to explain the phenomena. There is room for an analysis of the corruption effects on the tax structure of the developed economies. The traditional tax evasion theory seems not to be applicable to the developed countries whose compliance tax rates and tax morale are much higher than those of the developing countries. Corrupt behavior may allow structuring of tax systems in an advantageous way, thus reducing the attractiveness of evasion or avoidance.

The United States is one of the most developed economies and it is found that the tax compliance and tax morale of Americans are higher than those of people in the other countries. Different from the existing tax evasion literature, we found that a U.S. state government with a higher level of corruption is likely to collect a larger amount of taxes. Consistent with the arguments of the fiscal illusion theory, a government whose officials are more corrupt is likely to design its tax system more complex and succeed in extracting more taxes from its citizens thanks to the illusory tax system. Moreover, this kind of governments prefer an indirect tax system to a direct one, which makes its tax system more regressive or less progressive as a consequence. However, businesses enjoy a larger amount tax preferences and evade their tax obligation thanks to corrupt governments. In sum, the corruption of the U.S. state governments results in a heavier tax burden on the general public, a more regressive and less transparent tax structure, and a smaller business share of the tax burden, at least in the period 1997-2013.

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