Tulane Economics Working Paper Series

Corruption, Taxation, and Tax Evasion

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Working Paper 1802
March 2018

Abstract

In this paper, we examine the relationships between corruption, taxation, and tax evasion. We examine three specific questions. First, on a general level, what do simple empirical analyses suggest about some of the causes and the consequences of corruption? Second, on a more specific level, what do similar empirical analyses indicate about the relationship between corruption and taxation? Third, on an even more specific level, what is the relationship between corruption, taxation, and tax evasion? We conclude with a discussion of how this evidence can be used to control corruption, making use of a different if related body of work on tax evasion.

Keywords: Corruption, tax evasion, behavioral economics, controlled field experiments, laboratory experiments
JEL codes: H2, H26, D73

Corruption, taxation, and tax evasion

James Alm[1] and Yongzheng Liu[2]

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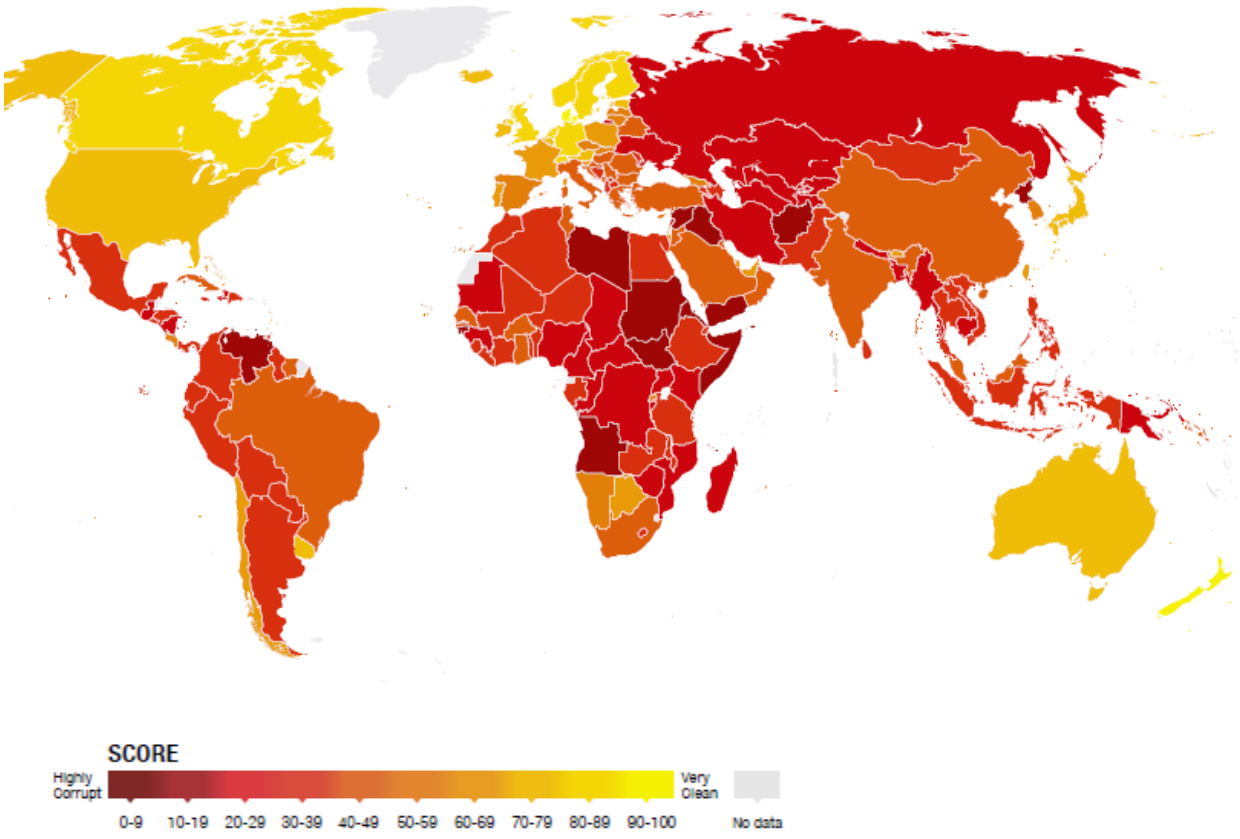
1. INTRODUCTION

It is commonplace but nevertheless true to assert that corruption plagues virtually all countries, developing and developed alike. "Corruption" is typically defined as the use of public office for private gain in ways that violate declared rules. Corruption can range from "grand corruption" (e.g., corruption at the highest levels of government) to "petty corruption" (e.g., small scale corruption between the public and government officials), and the methods of corruption include such activities as bribery, embezzlement, theft, fraud, extortion, blackmail, collusion, and abuse of discretion (International Monetary Fund, 2016). The available evidence, even if somewhat imprecise, indicates that corruption is widespread. See Figure 1 for a map of the world that presents estimates of the extent of corruption for 2016 using the Corruption Perception Index (CPI) of Transparency International, where darker colors represent higher levels of corruption. See also Table 1, which presents country averages for the period 1995-2009 using the International Country Risk Guide (ICRG) Index of The Political Risk Services (PRS) Group, scaled from 0 (or a country that has very little corruption) to 1 (or a country that is highly corrupt).

Figure 1: Corruption Around the World, CPI (2016)



Source: Transparency International (2017).

Table 1: Corruption Around the World, ICRG Index (Country Averages for 1995-2009)

Rank	Country	ICRG Index	Rank	Country	ICRG Index	Rank	Country	ICRG Index
1	Congo, Democratic Republic	0.848	41	Mexico	0.605	81	Korea	0.471
2	Zimbabwe	0.821	42	Cameroon	0.601	82	Poland	0.464
3	Niger	0.819	43	Colombia	0.596	83	Sri Lanka	0.459
4	Sudan	0.812	44	Turkey	0.596	84	Czech Republic	0.456
5	Myanmar	0.803	45	Philippines	0.593	85	Slovenia	0.453
6	Lebanon	0.789	46	Bolivia	0.584	86	Jordan	0.450
7	Paraguay	0.752	47	Tunisia	0.584	87	Nicaragua	0.438
8	Moldova	0.726	48	Argentina	0.584	88	Ireland	0.435
9	Armenia	0.726	49	Trinidad and Tobago	0.582	89	Israel	0.432
10	Bangladesh	0.715	50	Lithuania	0.581	90	Japan	0.426
11	Russia	0.704	51	Namibia	0.579	91	Estonia	0.410
12	Togo	0.703	52	India	0.578	92	France	0.405
13	Kazakhstan	0.699	53	Guatemala	0.575	93	Costa Rica	0.403
14	Azerbaijan	0.697	54	Belarus	0.573	94	Malta	0.399
15	Indonesia	0.689	55	Bahrain	0.572	95	Greece	0.396
16	Ukraine	0.684	56	Kuwait	0.569	96	Belgium	0.376
17	Papua New Guinea	0.682	57	Brazil	0.558	97	Hong Kong	0.357
18	Algeria	0.679	58	Oman	0.545	98	Chile	0.357
19	Serbia	0.678	59	Croatia	0.542	99	Hungary	0.356
20	China, People's Republic	0.677	60	Senegal	0.542	100	Madagascar	0.337
21	Kenya	0.676	61	Peru	0.540	101	Bahamas	0.333
22	Egypt	0.671	62	Romania	0.539	102	Spain	0.330
23	Pakistan	0.670	63	Zambia	0.539	103	Singapore	0.291
24	Thailand	0.669	64	Syrian Arab Republic	0.538	104	United States	0.289
25	United Arab Emirates	0.667	65	Mongolia	0.535	105	Cyprus	0.288
26	Ethiopia	0.667	66	Bulgaria	0.533	106	Portugal	0.284
27	Panama	0.667	67	Dominican Republic	0.524	107	United Kingdom	0.231
28	Albania	0.655	68	Congo, Republic	0.523	108	Austria	0.215
29	Honduras	0.652	69	Gambia	0.522	109	Germany	0.205
30	Uganda	0.649	70	Italy	0.516	110	Australia	0.201
31	Qatar	0.643	71	Iran	0.512	111	Switzerland	0.192
32	Vietnam	0.637	72	Guinea	0.512	112	Norway	0.149
33	Burkina Faso	0.637	73	Ecuador	0.509	113	Luxembourg	0.141
34	Venezuela	0.637	74	Morocco	0.507	114	Canada	0.107
35	Jamaica	0.634	75	Uruguay	0.500	115	New Zealand	0.106
36	Sierra Leone	0.629	76	Malaysia	0.496	116	Netherlands	0.085
37	Ghana	0.620	77	El Salvador	0.489	117	Iceland	0.072
38	Latvia	0.619	78	Slovak Republic	0.488	118	Sweden	0.072
39	Mali	0.616	79	Botswana	0.475	119	Denmark	0.049
40	Cote d'Ivoire	0.611	80	South Africa	0.475	120	Finland	0.000

Source: Calculations by authors from The Political Risk Services (PRS) Group International Country Risk Guide (IRCG) Index (2016). The ICRG Index is the average value of the corruption index over the period 1995-2009 of each country's ICRG Index.

Corruption is important for many reasons (Rose-Ackerman, 1975). Its existence creates misallocations in resource use, with possible effects on investment, unemployment, and economic growth. Its presence requires that government expend resources to detect it, to measure its magnitude, and to penalize its practitioners. Corruption alters the distribution of income in arbitrary, unpredictable, and unfair ways, thereby affecting the poverty and inequality in a country. It may contribute to feelings of unjust treatment and disrespect for the law. More broadly, corruption reduces the ability of government to provide for its citizens, with especially pernicious effects on those individuals most dependent on government services.

In this paper we examine several questions about corruption. First, on a general level, what do simple empirical analyses suggest about some of the causes and the consequences of corruption? Second, on a more specific level, what do similar empirical analyses indicate about the relationship between corruption and taxation? Third, on an even more specific level, what is the relationship between corruption, taxation, and tax evasion?

We attempt to answer these questions. Starting with the first question, we look at some simple empirics that attempt to explain the causes and consequences of corruption. On the second question, we look in detail at the relationship between corruption and taxation, again using some simple empirics. We conclude with an examination of the third question, in which we present a detailed case study based on some of our own previous empirical work in which we analyze how corruption, taxation, and tax evasion of a firm are linked; that is, how does corruption affect a firm's tax evasion decision when bribery is an option for the firm?

On the simple empirics, we find many relationships between corruption and various indicators, based on simple correlations between corruption and these indicators. On the relationship between corruption and taxation, we again find many significant correlations. On the linkages between corruption, taxation, and tax evasion, we find that corruption is a statistically and economically significant causal determinant of tax evasion. Specifically, we find that engaging in bribery reduces reported sales of a firm by 4 to 10 percentage points, and that each percentage point of sales paid in bribes reduces reported sales by about 2 percentage points. We also find strong empirical evidence that audits matter; that is, more audits reduce firm tax evasion.

In the next section, we discuss some general aspects of corruption: What is corruption, how is it measured, and what does theory say about the causes and consequences of corruption? We then present some simple empirics on corruption (e.g., its causes and consequences), followed by a similar analysis on the ways in which corruption and taxation interact, and finally followed by a detailed case study on the interactions between corruption, taxation, and tax evasion. We conclude with a discussion of how this evidence can be used to control corruption, making use of a different if related body of work on tax evasion.

2. A BRIEF REVIEW OF SOME CONCEPTS ON CORRUPTION

In this section we review some basic concepts on corruption: its definition, its measurement (including empirical work based on its measurement), and the "theory" of corruption.[1]

2.1 Definition

There are several competing definitions of "corruption", but the most widely used one define corruption as the use of public office for private gain in ways that violate declared rules (International Monetary Fund, 2016). Corrupt can range from "grand corruption" (e.g., corruption at the highest levels of government) to "petty corruption" (e.g., small scale corruption between the public and government officials). It can also occur as political corruption, police corruption, or judicial corruption. Specific activities include bribery, embezzlement, theft, fraud, extortion, blackmail, collusion, and abuse of discretion (e.g., favoritism, nepotism, clientelism). For example, common forms of petty corruption are activities like: demanding a bribe to issue a government license, to award a contract, or to give a subsidy or incentive; stealing directly from the government treasury; selling government commodities at black market prices; hiring family members or friends in government positions; and simply shirking one's official duties. Grand corruption typically involves theft, fraud, or collusion by high government officials, often leading to the transfer of massive amounts of money to overseas accounts. At its essence, corruption involves the trade of activities that should not be for sale.

2.2 Measurement

Evidence on corruption is very hard to find, for obvious reasons. After all, corruption is illegal, and individuals have strong incentives to conceal their corrupt activities, given financial and other penalties that are imposed on individuals who are found engaging in corrupt activities. Even so, recent research has utilized a range of innovative approaches to examine corruption.

Many efforts to measure corruption have been based on "perception surveys", in which various types of individuals (e.g., villagers, business people, "experts") are asked their "perception" of the extent of corruption and the results are compiled in an index. The best known of these perception surveys has been conducted by Transparency International, with its CPI. There are also other perception surveys that have been generated by The PRS Group (International Country Risk Guide, or ICRG, Index), The World Bank (Business Environment and Enterprise Performance Survey, or BEEPS, Index), or the Worldwide Government Indicators Index. These indices differ in the details of their construction, but they are all based in some way on perceptions of corruption. Note that these indices do not generate estimates of the amount of corruption in a country. Rather, they generate rankings of countries based on perceptions of the extent of corruption in the countries. Figure 1 (CPI) and Table 1 (ICRG Index) are based upon these perception surveys.

[1] See Banerjee, Hanna, and Mullainathan (2012) for a recent survey on corruption. For earlier but still relevant surveys, see Bardhan (1997), Rose-Ackerman (1999), Jain (2001), and Aidt (2003).

More recently, researchers have become increasingly creative in generating estimates of corruption in specific settings.[2] These methods have involved direct estimates of bribes based on specific field observations or records, so-called "subtraction" estimates in which comparisons are made of officially recorded transactions versus actually received amounts or of records of exports/imports of the exporting country versus the importing country, estimates based on market inferences, and even official government corruption audits. Such methods produce estimates of the extent of corruption in these settings; they do not of course generate estimates of corruption beyond their specific circumstances.

All of these approaches have limitations. Indeed, there are to our knowledge no reliable country-level estimates of the magnitude of corruption.[3] This is not to say that it is not in principal possible to generate such estimates. However, to date such estimates do not exist.

2.2 Theory

There are many approaches to modeling corruption (Jain, 2001). Most all models are based on the assumption that individuals are rational, controlled, and self-interested: an individual engages in corruption if the expected benefits of successful corruption are greater than the expected costs of detection and punishment. This framework draws heavily upon the tax evasion framework of Allingham and Sandmo (1972), which in turn is largely derived from the economics-of-crime model of Becker (1968).[4]

A simple and illustrative example is based on Becker and Stigler (1974). Consider a government official who is paid a public sector wage of W_G. If he does not engage in any corrupt acts, his income is simply W_G. However, the official may engage in corrupt acts C each of which generates benefits B per act. If caught with probability p, the official will be fired, lose the public sector wage W_G, face a fine F, and be forced to pursue private sector employment that pays a private sector wage of W_P. His income I_C if caught equals $[W_P - F]$. If not caught with probability $(1-p)$, the income I_N of the government official equals $[C \times B + W_G]$. The official chooses the number of corrupt acts C to maximize expected income $\mathscr{E}I$ (or, in a more extended version, expected utility $\mathscr{E}U$):

$$\mathscr{E}I = p\,[W_P - F] + (1-p)\,[C \times B + W_G].$$

where $\mathscr{E}$ is the expectation operator. This simple framework suggests that a government official will only engage in corrupt activities if expected income $\mathscr{E}I$ with corrupt acts is greater than the certain public sector wage W_G with no corrupt acts:

$$\mathscr{E}I = p\,[W_P - F] + (1-p)\,[C \times B + W_G] > W_G\,.$$

[2] See Olken and Pande (2012) for a survey on empirical work on corruption, especially the use of controlled field experiments to examine corruption. Also, see Abbink and Serra (2012) for a survey of laboratory experiments on corruption.

[3] For example, a frequently cited estimate of the world-wide costs of corruption by the International Monetary Fund (2016) is that the annual costs of bribery alone are $1.5-2.0 billion, or 2 percent of global GDP. However, this estimate is simply an "extrapolation" of an earlier estimate by Kaufmann (2005), which in turn is based on surveys (including online surveys), estimates of the "shadow economy", and estimates of "money laundering", all of which are subject to much uncertainty.

[4] See Shleifer and Vishny (1993) for an especially influential approach to modeling corruption.

It is straightforward to show that the official will be more likely to engage in corrupt activities the lower is the probability of being caught, the smaller is the fine if caught, the lower is the public sector wage, the larger is the private sector wage, and the larger is the benefit from the corrupt act. Indeed, this framework forms the basis for many anti-corruption strategies, which rely on reducing the financial benefits of corrupt acts by increasing the likelihood of detection, increasing the penalty, and making public sector employment more attractive.

However, this framework is too simple because it does not always recognize that with corruption there is someone who is offering the bribe, there is someone who is accepting the bribe, and there is "someone" (e.g., the government or the public) who has an interest in the transaction. A more complicated framework is needed, one that incorporates interactions between all of the "players". There is now work that models corruption as a "game" between the players.

This framework is also too simple because it does not recognize that an individual may not behave as assumed by the underlying framework. The individual may have a utility function that differs from the standard one in terms of what is valued and how it is valued. Also, the individual may be motivated not simply by self-interest (narrowly defined) but by group notions like social norms, trust, intrinsic motivation, fairness, reciprocity, tax morale, and also by individual notions stemming in part from group factors like guilt, morality, and altruism.

These limitations may be addressed by extending the analysis of corruption to incorporate behavioral economics, in two broad (and somewhat overlapping) dimensions. One extension keeps its focus on *individual* factors, utilizing non-expected utility theories in the analysis of individual behavior. The other extension emphasizes *group* considerations, recognizing that individuals are influenced by the social context in which, and the process by which, decisions are made; that is, the individual may be motivated by factors that go well beyond financial self-interest to include a wide range of additional factors that indicate that one's own individual behavior is strongly influenced by the behavior of the group to which one identifies. Theoretical extensions that rely upon behavioral economics are now starting to be applied to the analysis of corruption, although these efforts are still in their early stages.

3. SOME SIMPLE EMPIRICS ON THE CAUSES AND CONSEQUENCES OF CORRUPTION

In this section, we examine two questions. First, what are some of the causes of corruption? Second, what are some of the consequences of corruption?[5]

In each case we present mainly suggestive evidence, based on simple correlations between corruption (the ICRG index) and various indicators. Our data come from 120 countries for the period 1995 to 2009, and we use average values of variables to reduce short-run variations and to allow us to examine the long-run relationships. We focus on

[5] See Dindt and Tosato (2017) for a recent survey on empirical work on corruption. For an earlier survey, see Treisman (2000).

cross-country regressions using these averages. To be clear, these simple correlations do not establish a causal relationship between (say) GDP per capita and corruption because we do not control in these regressions for other variables and because we also do not control for possible endogeneity issues. Even so, our simple results are almost always consistent with more sophisticated analyses that establish more clearly a causal relationship between the variables. We have also examined the robustness of our results to the use of different perception surveys (e.g., CPI, BEEPS Index), and we find that our results are generally unaffected. Table 2 presents some definitions and sources for the variables that we use, although we do not present all of the results for all of the possible correlations.

3.1 Some Causes of Corruption

Corruption is widely thought to be causes by many factors. Figure 2 presents the results of simple linear regressions in which a cause (e.g., GDP per capita) is associated with corruption, as measured by the ICRG Index. The individual charts demonstrate that:

- A higher GDP per capita is associated with less corruption.
- A more open economy is associated with less corruption.
- A more urbanized economy is associated with less corruption.
- A greater level of education is associated with less corruption.
- Greater internet use is associated with less corruption.
- A larger government is associated with less corruption.
- There is consistent relationship between the composition of government spending and corruption, with the exceptions that more social protection spending is associated with less corruption and that more defense spending is associated with more corruption.
- A more decentralized government is associated with less corruption.
- A more stable government is weakly associated with less corruption.
- A higher quality of government bureaucracy is associated with less corruption.
- Stronger government regulations and enforcement are associated with less corruption.
- Stronger anti-corruption measures are associated with less corruption.
- More political rights are associated with less corruption.
- More press freedom is associated with less corruption.
- More economic freedom is associated with less corruption.
- More ethnic diversity is associated with more corruption.

Also, a country with a British colonial heritage has more corruption, and a country with a presidential system has more corruption.

Again, it is important to emphasize that these results demonstrate only a correlation, positive or negative, between the variables and not necessarily a causal relationship. It is also important to note the “outliers” in these results; that is, even when there is a strong correlation between the variables, there may be many specific country examples in which the correlation does not in fact hold.

3.2 Some Consequences of Corruption

Figure 3 presents the results of simple linear regressions in which corruption is associated with some consequence (e.g., FDI). As with Figure 2, these results are mainly suggestive. They do not establish a causal relationship between corruption and (say) economic growth because we do not control in these regressions for other variables and we also do not control for possible endogeneity issues.

The individual charts demonstrate that:

- Corruption is negatively if weakly associated with fixed capital formation.
- Corruption is negatively associated with FDI.
- Corruption is positively if weakly associated with unemployment.
- Corruption is positively if weakly associated with economic growth.
- Corruption is positively associated with income inequality
- Corruption is positively associated with the poverty rate.

The only somewhat surprising result is the positive association between corruption and growth. A more common result is for corruption to be negatively associated with economic growth (Mauro, 1995; Fisman and Svensson, 2007); however, there are also several studies that find a positive relationship between corruption and growth (Egger and Winner, 2005; Aidt, Dutta, and Sena, 2008).

4. Some Simple Empirics on the Relationship between Corruption and Taxation

As for the possible relationships between corruption and taxation, we examine whether the level of taxation or the specific form of taxation affects – or is affected by – corruption.[6] Again, we present mainly suggestive evidence, based on simple correlations between corruption and various tax indicators. These results are presented in Figure 4, in which the individual charts demonstrate that:

- A government with more total revenues is associated with less corruption.
- A government with more total tax revenues is associated with less corruption.
- A larger deficit is weakly associated with less corruption.
- Greater reliance on direct taxes is associated with less corruption.
- Greater tax complexity is associated with more corruption.
- Greater reliance on resource taxes is associated with more corruption.
- Greater reliance on corporate income taxes is associated with less corruption.
- Greater reliance on personal income taxes is associated with less corruption.
- Greater reliance on sales taxes is associated with less corruption.
- Greater reliance on property taxes is associated with less corruption.
- Higher "tax morale" is weakly associated with less corruption.
- Corruption is positively associated with the size of the "shadow economy".

For the most part, these results are expected.

[6] Again, see Dindt and Tosato (2017) for a recent survey on empirical work on corruption.

Table 2: Variable Definitions and Sources

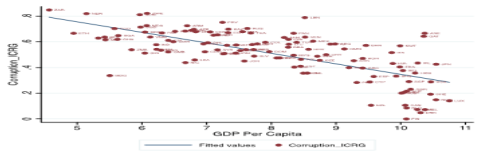
Variables	Description	Source	Years
Corruption_ICRG	Corruption index, originally ranging from 0 to 6, with 6 indicating the lowest corruption and rescaled to take values between 0 and 1 with 0 indicating the least corruption	International Country Risk Guide (ICRG)	1995-2008
Tax Mix	Direct (personal and corporate income tax, payroll tax, social security contributions) to indirect (property tax, general taxes on goods and services, excise taxes, custom duties) tax ratio	Government Finance Statistics (GFS), OECD Revenue Statistics	1995-2009
Tax Complexity	Time to prepare, file and pay corporate, sales, labor, and other taxes	World Bank Doing Business	2006-2009
Natural Resource Tax	Share of reported tax revenue that is from natural resource sources, most often corporate taxation of resource firms in GDP (%)	ICTD UNU-WIDER Government Revenue Dataset	1995-2009
Corporate Income Tax	Share of corporate income tax in GDP (%)	GFS	1995-2009
Personal Income Tax	Share of personal income tax in GDP (%)	GFS	1995-2009
Property Tax	Share of property tax in GDP (%)	GFS	1995-2009
Sales Tax	Share of general sales tax in GDP (%)	GFS	1995-2009
Top Statutory CIT Rate	Top statutory tax rate of corporate income tax (%)	World Tax Indicators	1995-2003
Top Statutory PIT Rate	Top statutory tax rate of personal income tax, %)	World Tax Indicators	1995-2005
VAT Tax Rate	Standard statutory VAT rate (%)	World Tax Indicators	1995-2009
Total Revenue/GDP	Share total revenue in GDP (%)	GFS	1995-2009
Total Tax Revenue/GDP	Share total tax revenue in GDP (%)	GFS	1995-2009
Deficit	[Total expenditure-Total revenue]/GDP (%)	GFS	1995-2009
Public Services	Share of general public services expenditures in total expenditure (%)	GFS	1995-2009
Environment	Share of environmental expenditures in total expenditure (%)	GFS	1995-2009
Safety	Share of public order and safety expenditures in total expenditure (%)	GFS	1995-2009
Economic Affairs	Share of economic affair expenditures in total expenditure (%)	GFS	1995-2009
Housing	Share of housing expenditures in total expenditure (%)	GFS	1995-2009
Health	Share of health expenditures in total expenditure (%)	GFS	1995-2009
Recreation	Share of recreational, cultural and religious affairs expenditures in total expenditure (%)	GFS	1995-2009
Education	Share of educational expenditure in total expenditure (%)	GFS	1995-2009
Social Protection	Share of social protection expenditure in total expenditure (%)	GFS	1995-2009

Defense	Share of defense expenditure in total expenditure (%)	GFS	1995-2009
Government Size	Share of government expenditure in GDP (%)	GFS	1995-2009
Decentralization	Subnational share of total government spending (%)	World Bank's Decentralization Indicators	1995-2009
Government Stability	Index of government stability, ranging from 0 to 12, with 12 indicating the highest levels of stability	ICRG	1995-2008
Bureaucracy Quality	Index of bureaucracy quality, ranging from 0 to 4, with 4 indicating the highest levels of quality	ICRG	1995-2008
Regulations	Index of law and order, ranging from 0 to 6, with 6 indicating the highest levels of law enforcement	ICRG	1995-2008
Anti-Corruption	This category examines a country's anti-corruption laws, the country's anti-corruption agency, citizen access to justice, and law enforcement accountability		2006-2009
Rule-based Governance	Index of the extent to which private economic activity is facilitated by an effective legal system and rule-based governance structure in which rights are reliably respected and enforced		2005-2009
Tax Morale	Respondents' view on whether the cheating on tax can always be justified or never be justified, and rescaled to take values between 0 and 1 with 0 indicating least tax morale		1995-2008
Political Right	Index of political right, originally ranging from 1 to 7, with 1 indicating the highest levels of political right, and rescaled to take values between 0 and 1 with 0 indicating least political right	Freedom House	1995-2009
Press Freedom	Score of freedom of the Press, originally ranging from 5 to 100, with 5 indicating the highest levels of freedom, and rescaled to take values between 0 and 1 with 0 indicating least freedom	Freedom House	1995-2009
Economic Freedom	Economic Freedom Index	Freedom House	1995-2009
GDP Per Capita	GDP per capita (log)	World Development Indicators (WDI)	1995-2009
Ethnic Diversity	Probability that two random selected individuals within the country belong to the same religious and ethnic group, a continuous variable between 0 and 1	Quality of Government Dataset (QGD)	1995-2009
Legal origin	Dummy variable equal to 1 if legal origin of English Common Law, 0 otherwise	QGD	1995-2009
Colonial dummy	Dummy variable equal to 1 If country was a British colony, 0 otherwise	QGD	1995-2009
Political System	Dummy variable equal to 1 if country is presidential, 0 otherwise	QGD	1995-2009
Openness	Imports of goods and services (% of GDP)	WDI	1995-2009
Urbanization	Urban population as percent of total population (%)	WDI	1995-2009
Internet	Number of Internet users per 100 people (log)	WDI	1995-2009

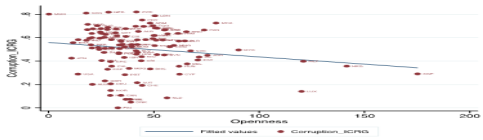
Education	Years of schooling of 25 years old and over people (years)	Barro and Lee (2010)	1995-2009
Economic Growth	GDP growth rate (%)	WDI	1995-2009
Fixed Capital Formation	Gross fixed capital formation (% of GDP)	WDI	1995-2009
Foreign Direct Investment	Foreign direct investment, net inflows (% of GDP)	WDI	1995-2009
Unemployment	Unemployment rate (%)	WDI	1995-2009
Income Inequality	Gini coefficient	UNU-WDIER World Income Inequality Database	1995-2006
Poverty	Poverty headcount ratio at national poverty lines (% of population)	WDI	1995-2009
Tax Evasion	Tax evasion index, originally ranging from 0 to 10, with 10 indicating the lowest tax evasion, and rescaled to take values between 0 and 1 with 0 indicated the lowest tax evasion	IMD World Competitiveness Yearbook 2017	1997-2009
Shadow Economy	Shadow economy as percentage of official GDP (average)	Buehn and Schneider (2012)	1995-2007

Figure 2: Some Causes of Corruption

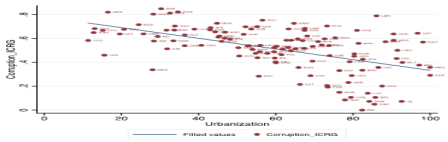
GDP per capita (as log):
A higher GDP per capita is associated with less corruption.



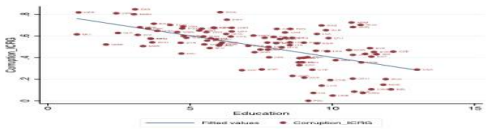
Openness (imports as percent of GDP):
A more open economy is associated with less corruption.



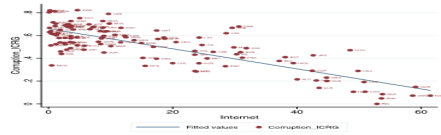
Urbanization (urban population as percent of total population):
More urbanization is associated with less corruption.



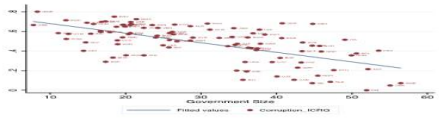
Education (years of schooling for people 25 years and older):
A greater level of education is associated with less corruption.



Internet use (log of internet users per 100 people):
Greater internet use is associated with less corruption.

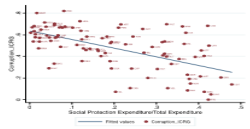


Size of government (government spending as percent of GDP):
A larger government is associated with less corruption.

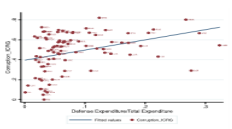


Composition of government spending (government spending by category as proportion of total government spending, for public services, environment, public order, economic affairs, housing, health, recreation/culture/religion, education, social protection, defense):
There are no consistent results.

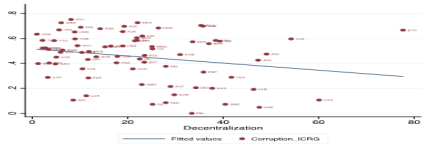
More social protection spending is associated with less corruption.



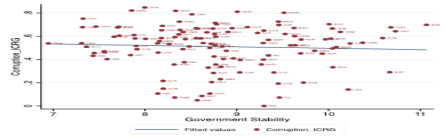
More defense spending is associated with more corruption.



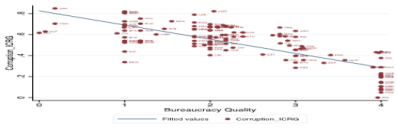
Decentralization (subnational government spending as percent of GDP):
A more decentralized government is associated with less corruption.



Government stability (index from 0-12, with 12 the highest stability): A more stable government is weakly associated with less corruption.

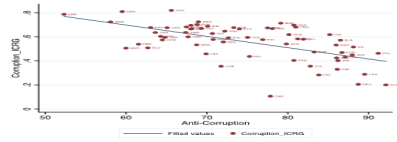


Quality of government bureaucracy (index from 0-4, with the highest quality): A higher quality of government bureaucracy is associated with less corruption.

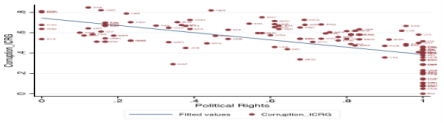


Strength of government regulations and enforcement (index from 0-6, with 6 the strongest): Stronger government regulations and enforcement are associated with less corruption.

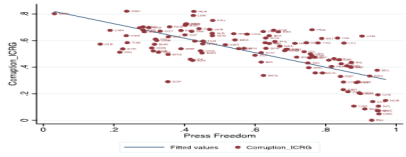
Anti-corruption measures (index from 0-1, with 1 the strongest): Stronger anti-corruption measures are associated with less corruption.



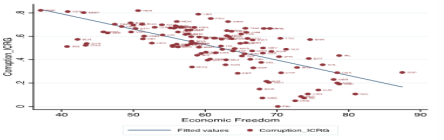
Political rights (index from 0-1, with 1 the highest level of political rights): More political rights are associated with less corruption.



Press freedom (index from 0-1, with 1 the most press freedom): More press freedom is associated with less corruption.



Economic freedom (index from 0-100, with 100 the most economic freedom): More economic freedom is associated with less corruption.



Ethnic diversity (index from 0-1, with 1 the highest ethnic diversity): More ethnic diversity is associated with more corruption.

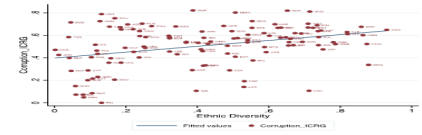
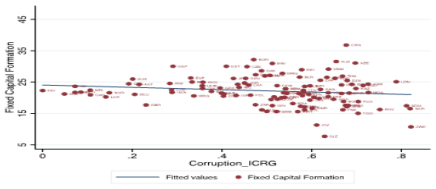
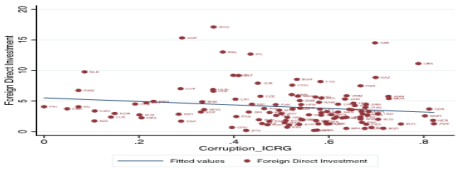


Figure 3: Some Consequences of Corruption

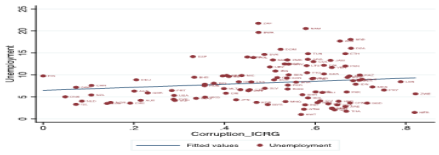
Fixed capital formation (gross fixed capital formation as percent of GDP): Corruption is negatively if weakly associated with fixed capital formation.



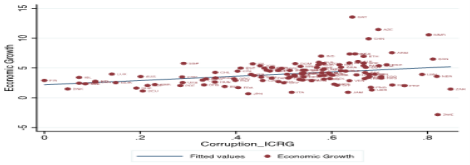
FDI (FDI as percent of GDP): Corruption is negatively associated with FDI.



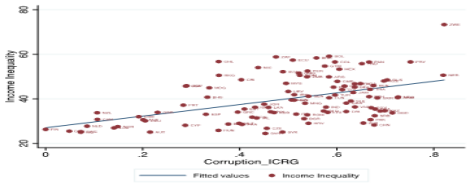
Unemployment (unemployment rate): Corruption is positively if weakly associated with unemployment.



Economic growth (percentage growth rate of GDP per capita): Corruption is positively if weakly associated with economic growth.



Income inequality (Gini coefficient): Corruption is positively associated with income inequality.



Poverty (percent of population below national poverty line): Corruption is positively associated with the poverty rate.

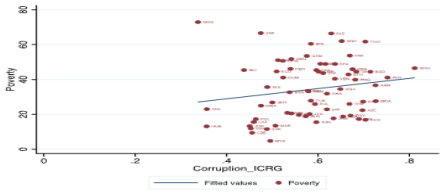
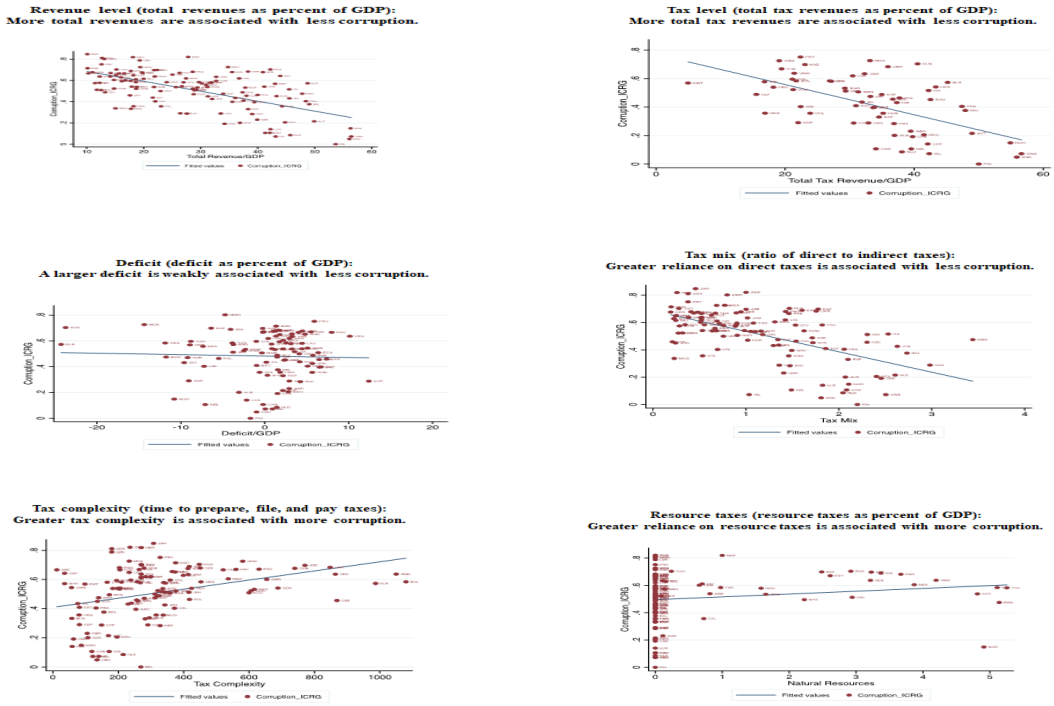
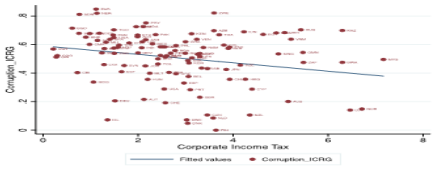


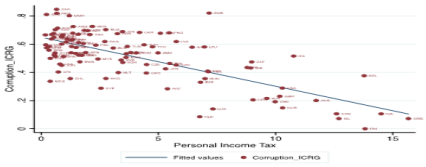
Figure 4: Some Simple Relationships between Corruption and Taxation



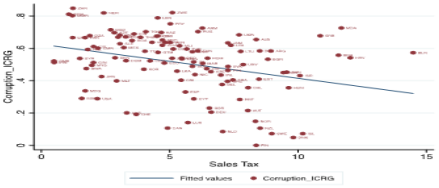
Corporate income taxes (corporate income taxes as percent of GDP): Greater reliance on corporate income taxes is associated with less corruption.



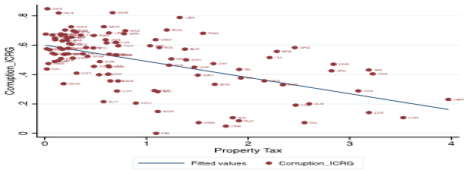
Personal income taxes (personal income taxes as percent of GDP): Greater reliance on personal income taxes is associated with less corruption.



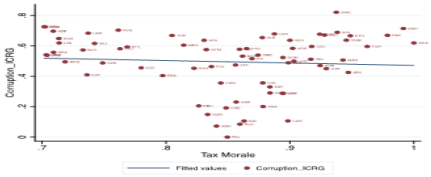
Sales taxes (sales taxes as percent of GDP): Greater reliance on sales taxes is associated with less corruption.



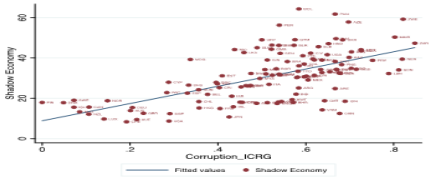
Property taxes (property taxes as percent of GDP): Greater reliance on property taxes is associated with less corruption.



"Tax morale" (index from 0–1, with 1 the highest level of tax morale): Higher tax morale is weakly associated with less corruption.



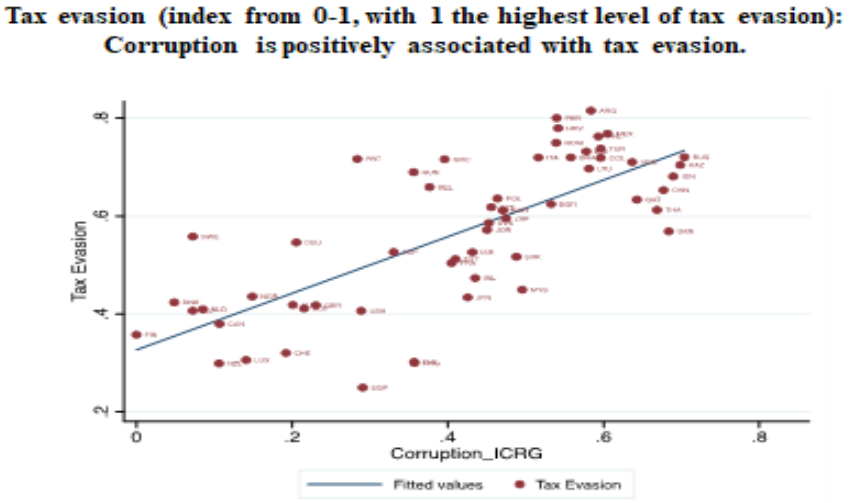
Shadow economy (shadow economy as percent of GDP): Corruption is positively associated with the size of the shadow economy.



5. CORRUPTION, TAXATION, AND TAX EVASION

In this section, we attempt to bring together the interrelationships between corruption, taxation, and tax evasion. Figure 5 suggests that there is a strong and positive relationship between tax evasion and corruption, but the relationship in Figure 5 is based only on a simple correlation between the two variables. Here we examine this relationship in more detail by presenting a recent case study based on some of our own previous work (Alm, Martinez-Vazquez, and McClellan, 2016), which examines in a rigorous manner the relationship between corruption, taxation, and tax evasion. This case study provides compelling empirical evidence that corruption is a causal determinant of firm tax evasion. The case study also provides strong evidence that more audits decrease firm tax evasion and that more stringent tax regulations and higher tax rates generally increase evasion.

Figure 5: Tax Evasion and Corruption



In Alm, Martinez-Vazquez, and McClellan (2016), we examine whether the potential for corruption (e.g., bribery of tax officials) affects a firm's tax reporting (e.g., tax evasion) decision. Specifically, we empirically estimate the relationship between firm reporting when bribery of tax officials is an option. See Alm, Martinez-Vazquez, and McClellan (2016) for a detailed discussion of methods, data, and results.

We examine this relationship with firm-level data for multiple countries and years and using both Instrumental Variable (IV) and Propensity Score Matching (PSM) approaches. We combine data from the World Enterprise Survey (WES) and the Business Environment and Enterprise Performance Survey (BEEPS), giving 8,000 firms across 33 countries for years 2000-2009.

We are interested in the impact of corruption on a firm's tax reporting decision. Our main dependent variable is a firm-level measure of firm tax evasion, or *PercentageReportedSales*. This variable is derived from a BEEPS question in which each firm is asked "What percentage of total annual sales would you estimate the typical firm in your area of business reports for tax purposes?" The response is a self-reported measure of firm tax evasion. However, it is a measure of what the respondent firm believe a "typical" firm reports, not the firm itself, so it is hoped that the resulting measure is unbiased and accurate.

The various explanatory variables include a dummy variable for the "typical" firm bribed government officials to deal with taxes (*BribeforTaxes*), another variable for total firm bribes of the "typical" firm as a percentage of sales (*BribesasPercentageofSales*), a dummy variable for whether the respondent firm was audited (*Audit*), variables to measure whether taxes or regulations were an obstacle to doing business (*RegulationsasObstacle*, *TaxRatesasObstacle*), firm sales (*Sales)*, and various firm-level control variables (*X*).

Our main empirical specification is then:

$$PercentageReportedSales_i = \beta_0 + \beta_1\, BribeforTaxes_i + \beta_2\, BribesasPercentageofSales_i + \beta_3\, Audit_i + \beta_4\, TaxRegulationsasObstacle_i + \beta_5\, TaxRatesasObstacle_i + \beta_6\, ln(Sales_i) + \beta_7\, X_i + \varepsilon_i$$

where ε is an error term. We are mainly interested in the coefficients on *BribeforTaxes* (β_1) and *BribesasPercentageofSales* (β_2). We are also interested in the impacts of *Audit* (β_3) and of taxes (*TaxRegulationsasObstacle* (β_4), *TaxRatesasObstacle* (β_5)).

Estimation of this specification is made challenging by the likelihood that corruption and tax evasion are jointly determined; that is, the possibility of corruption make induce a firm to engage in tax evasion, but the possibility of tax evasion creates opportunities for a firm to bribe tax officials. We deal with this endogeneity by using two alternative approaches.

In an IV approach, we use instrumental variables to control for potential endogeneity. The variable *BribeforTaxes* is instrumented by the firm's other bribery activities since a "culture of corruption" likely leads to a high correlation across bribery activities but it also seems likely that bribes for other non-tax-related activities do not affect tax reporting. Also, the variable *BribesasPercentageofSales* is instrumented by a firm's time spent on regulations since more red tape gives officials more bargaining power but it seems likely that red tape is unrelated to tax reporting. In a second PSM approach, we attempt to "match" firms that engage in bribery (e.g., "treated firms") with similar firms that do not engage in bribery (e.g., "control firms"), based on observable characteristics of the firms. A simple comparison of *PercentageReportedSales* for treated versus control firms then measures the impact of bribery activities on firm tax evasion.

Some IV results are presented in Table 3 and Figure 6. Table 3 shows some selected IV estimation results, which indicate a strong negative relationship between *PercentageReportedSales* and the two measures of bribery (*BribeforTaxes* and *BribeasPercentageofSales*). Figure 6 presents the IV coefficient estimates for

BribeforTaxes (shown as bribe_tax) and *BribesasPercentageofSales* (shown as bribe_per) for a wide range of alternative specifications of the IV estimations. In virtually all cases, the estimated coefficient on the measure of bribery is negative and significant. Table 3 also indicates that audits have a positive (if insignificant) impact on reporting, and that more stringent tax regulations and higher tax rates generally reduce reporting.

Table 4 presents the PSM estimation results, which indicate that the treated group reports lower *PercentageReportedSales* than the control group by amounts that range from -4.402 percentage points to -6.466 percentage points, depending upon the specific way in which treated firms are matched with control firms. Regardless of the specific form of matching, firms that engage in bribery also engage in more tax evasion.

Table 3: IV Estimation Results

Variable	(1) Percent Reported Sales	(2) Percent Reported Sales
Bribe for Taxes	-3.609**	-4.973**
	(1.741)	(2.132)
Bribe as Percentage of Sales	-3.623***	-2.386**
	(0.821)	(1.135)
Audit	0.435	0.575
	(0.760)	(0.404)
Tax Regulations as Obstacle	0.006	-0.438*
	(0.360)	(0.237)
Tax Rates as Obstacle	-0.606**	0.020
	(0.308)	(0.230)
ln(Sales)	0.606***	0.632***
	(0.189)	(0.120)
Years Operating		0.000
		(0.008)
Listed		0.324
		(1.370)
Closed		-1.308
		(0.998)
Sole Proprietorship		-4.401***
		(1.003)
Partnership		-3.075***
		(1.023)
Public Sector		0.367
		(1.761)
Foreign Private		1.683***
		(0.537)
State		-0.713
		(1.685)
Constant	92.084***	97.842***
	(1.890)	(2.312)
Observations	7758	7749
R-squared	0.012	0.130
Underidentification LM Statistic	15.573	47.720
LM Statistic P-Value	0.001	0.000
Weak Identification F Statistic	10.580	11.900
Hansen's J	3.656	2.091

Hansen's P-value	0.1608	0.351
Industry Fixed Effects?		X
Country Fixed Effects?		X
Year Fixed Effects?		X

Notes: *** p<0.01, ** p<0.05, * p<0.10. Robust standard errors are in parentheses. Differences in observation numbers across specifications are due to incomplete data in the added controls at the country level.

Figure 6: IV Estimation Results

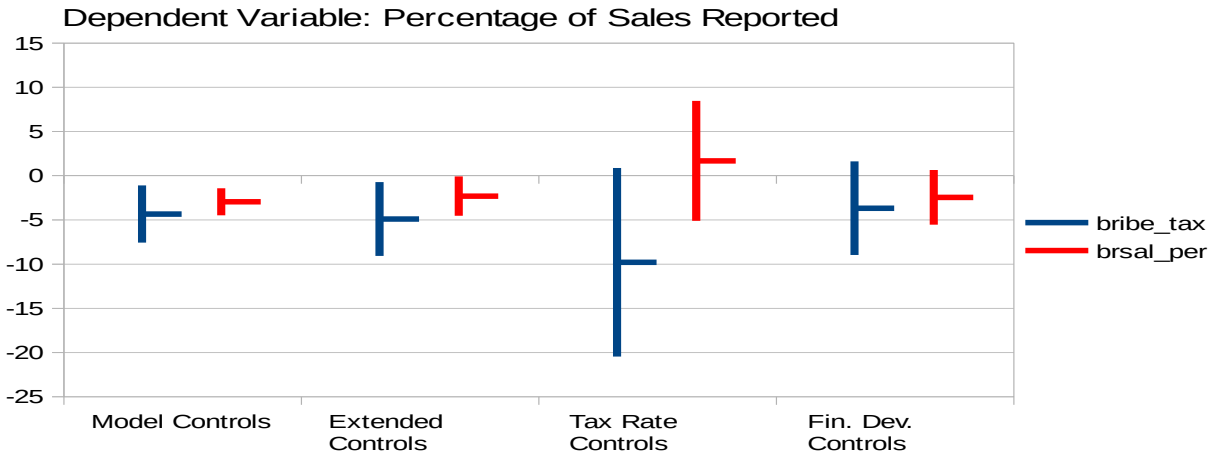


Table 4: PSM Estimation Results

	Unmatched	Nearest Neighbor	Kernel – Gaussian	Kernel – Epanechnikov
Treated	86.225	86.225	86.225	86.304
Controls	92.691	90.628	90.807	90.706
Difference	**-6.466**	**-4.402**	**-4.581**	**-4.402**
Standard Error	0.369	0.735	0.493	0.545
t-statistic	-17.5	-5.99	-9.29	-8.07
On-Support	8,855	8,855	8,855	8,831

Overall, the results clearly indicate that corruption is a statistically and economically significant determinant of tax evasion. Specifically, the results show that engaging in bribery reduces reported sales by 4 to 10 percentage points. The results also show that larger bribes lead to more evasion: each percentage point of sales paid in bribes reduces reported sales by about 2 percentage points. Finally, the results demonstrate that both tax regulations and tax rates affect these decisions, as do audit rates, in largely expected

ways.[7]

6. DEVISING POLICIES TO REDUCE CORRUPTION

What does all of this work suggest about devising government policies to improve compliance?

There are many standard remedies for combatting corruption, all of which follow from the basic and simple economics-of-crime model:

- Increase the costs of corruption by toughening the laws and their enforcement (e.g., increase penalties on corrupt activities, increase the likelihood of getting caught).
- Improve the incentives of officials to not engage in corrupt activities (e.g., increase public sector wages).
- Reduce the range and value of activities that can be exploited by corrupt officials (e.g., increase bureaucratic competition, improve transparency, increase information, reduce discretion).

Indeed, there is some evidence that these policies often (if not always) reduce corruption (United Nations, 2005).

Even so, we believe that there are lessons from the *tax evasion* literature that are also relevant for *corruption*; that is, there are lessons for how to reduce tax evasion that are also relevant for how to reduce corruption. Although work on corruption is distinct from work on tax evasion, there are some clear overlaps in these literatures. In both cases, measurement is difficult, even if increasingly creative approaches are now being developed and used. In both cases, theoretical analysis started by a simple extension of the economics-of-crime approach, even if more recent work has extended considerably this framework. In both cases, policy responses have largely focused on detection and punishment as the primary policy tools, even if there is now a growing recognition that

[7] Note that we (Alm, Liu, and Zhang, 2017) have also conducted an additional case study in which we examine a related but nevertheless different issue: Do financial constraints faced by a firm increase the likelihood that the firm will evade its taxes? The premise is that a firm that faces financial constraints is less able to access financial markets to fund its various activities. As a response, the firm may turn to tax evasion as a source of internally generated funds. Further, a firm that engages in tax evasion may seek to reduce its chances of detection and punishment by bribing tax officials, so we also examine the potential impact of financial constraints on bribery as a possible channel for the effects of financial constraints. Simple correlations using firm-level data for 15,000 firms in 27 countries across multiple years (2002, 2005) from the World Enterprise Survey and the Business Environment and Enterprise Performance survey indicate a clear negative relationship between the firm's reporting decision (measured as percentage reported sales) and two measures of financial constraints (difficulty of access to external finance and cost of external finance). However, these simple correlations do not control for other possible influences on the firm's reporting, including a possible endogenous relationship between reporting and financial constraints. Accordingly, we apply Instrumental Variable (IV) estimation methods to these data. Overall, we find that more financially constrained firms are more likely to be involved in tax evasion activities, largely because evasion helps them deal with financing issues created by financial market constraints; these effects are heterogeneous across firm ownerships, firm age, firm size, and industries. We also find that firm reporting with additional audits. Finally, we find that financial market constraints seem to operate by increasing bribe activities in exchange for tax evasion opportunities. See Alm, Liu, and Zhang (2017) for a detailed discussion of methods, data, and results.

additional tools are needed. Even so, we believe that the tax evasion literature has advanced somewhat farther than the corruption literature in its measurement, theory, and policies. Accordingly, we believe that there are lessons from the tax evasion literature than can help inform the corruption literature.[8]

Indeed, our reading of the tax evasion literature suggests that people are motivated by many factors in their decisions, some of which are financial but many of which go far beyond the expected benefits and costs of evasion. More precisely, we believe that this evidence suggests that there are three "paradigms" for a tax administration that wishes to reduce tax evasion (Alm and Torgler, 2011). These paradigms start with a government compliance strategy based on detection and punishment. However, these paradigms also go well beyond a tax evasion strategy that emphasizes only enforcement to include a range of additional policies for which there is now emerging much theoretical and empirical support.

Under a first paradigm – what has been termed the traditional "*Enforcement Paradigm*" – the emphasis is exclusively on repression of illegal behavior through frequent audits and stiff penalties. This has been the conventional paradigm of tax administrations throughout history, and it fits well the standard portfolio model of tax evasion based upon the economics-of-crime theory.

However, research on tax evasion also suggests a second paradigm, one that acknowledges the role of enforcement but also recognizes the role of tax administration as a facilitator and a provider of services to taxpayer-citizens, in order to assist taxpayers in every step of their filing returns and paying taxes. This new "*Service Paradigm*" fits squarely with the perspective that emphasizes the role of government-provided services as a consideration in the individual tax compliance decision. Indeed, the most recent literature on tax administration reform has emphasized this new paradigm for tax administration, as a facilitator and a provider of services to taxpayer-citizens, and many recent administrative reforms around the world have embraced this new paradigm with great success.

A third paradigm is also suggested by recent work on tax evasion, especially the emerging work that sees the taxpayer as a member of a larger group, as a social creature whose behavior depends upon his or her own moral values (and those of others) and also upon his or her perception of the quality, credibility, and reliability of the tax administration. This third paradigm is called a "*Trust Paradigm*". It is consistent with the role of various behavioral economics factors like social norms broadly defined in the compliance decision. It is based on the notion that individuals are more likely to respond either to enforcement or to services if they believe that the government generally and the tax administration specifically are honest, and if they believe that other individuals are similarly motivated; that is, "trust" in the authorities – and in other individuals – can have a positive impact on compliance.

Given this discussion, designing strategies to control tax evasion fall into three main categories, each consistent with one of the three paradigms: increase the likelihood and

[8] See Alm (2017) for a recent and comprehensive discussion of what motivates tax compliance.

the threat of punishment, improve the provision of tax services, and change the tax culture. Specifically:

First, there is scope for an improvement in policies to increase detection and punishment (e.g., the Enforcement Paradigm). Traditionally, there are three main aspects of tax administration: taxpayer registration, taxpayer audit, and collections. Improvements in each of these areas are feasible, all of which would enhance detection and punishment. These policies include such obvious actions as increasing the number of audits, improving the quality of the audits (and of the auditors), using more systematic audit selection methods (e.g., "scoring" methods), improving information-sharing across governments, increasing penalties for tax cheating, applying these penalties often and consistently, publicizing tax evasion convictions in the media as an alternative type of non-financial penalty, relying more heavily on source-withholding whenever possible, facilitating payments through the banking system, granting additional power for collecting delinquent accounts, and increasing taxpayer registration and identification via better use of third-party information. These are all standard methods for increasing enforcement, and one consistent with a paradigm that views the taxpayer as a potential criminal who must be deterred from cheating.

Second, there is scope for an improvement in the services of the tax administration by becoming more "consumer-friendly", along the lines of the Service Paradigm. Such policies include promoting taxpayer education, providing taxpayer services to assist taxpayers in filing returns and paying taxes, improving phone advice service, improving the tax agency website, simplifying taxes and tax forms, and simplifying the payment of taxes. The basic thrust of these actions is to treat the taxpayer more as a client than as a potential criminal.

Third, there may be scope for a government-induced change in the culture of paying taxes, consistent with the Trust Paradigm, by using the mass media to reinforce tax compliance as the ethical form of behavior, publicizing cheaters, emphasizing the link between payment of taxes and the receipt of government services, targeting certain groups (e.g., new firms or employees) in order to introduce from the start the notion that paying taxes is "the right thing to do", enlisting other organizations to promote compliance, avoiding actions that lead individuals to think cheating is "okay" (e.g., a tax amnesty), addressing perceived inequities in the ways people feel that they are treated, and promoting a tax administrator – and a taxpayer – "code of ethics". It is this third paradigm that is, we believe, an essential but largely neglected strategy for improving compliance.

In short, there should be a "full house" of strategies to address the "full house" of tax evasion motivations.

How does this work on controlling *tax evasion* relate to government policies to control *corruption*? We believe that the lessons from tax compliance apply directly, even if differently, to corruption. Specifically, we believe that these three paradigms offer significant guidance for anti-corruption strategies.

First, detection and punishment must be present (the *Enforcement Paradigm*). However,

with corruption there are two sides to any "transaction". As a result, enforcement must be applied both to the individual accepting the bribe and to the individual offering the bribe. Other aspects of enforcement (e.g., increasing audit rates, increasing penalties) also apply. In short, the role of the private sector in abetting corruption must be considered in enforcement policies.

Second, government should improve its provision of services, including improving the incentives for government officials to provide higher quality services (the *Service Paradigm*). Doing so will again affect both the demand-side and supply-side of corruption. There are many standard public administration practices that can be applied to these efforts.

Third, the government must change the social norm of corruption, again on both sides of the transaction (the *Trust Paradigm*). This is probably the most difficult of government's full house of anti-corruption strategies, largely because the evidence on successful efforts to change norms is suggestive and promising but far from definitive.

In sum, we believe that the tax evasion paradigms provide a useful framework for thinking about the causes, the consequences, and the control of corruption: there should be a "full house" of strategies to address the "full house" of corruption motivations.

Even so, the actual evidence supporting these paradigms is not always compelling, either in the tax evasion domain or in the corruption domain. Clearly, additional research is required on the potential impacts of these three paradigms, which leads to our final and concluding comments on some suggestions on the direction in which future research on corruption should move.

We believe that there are three areas in which additional work is most obviously needed. First, there have been many suggested anti-corruption policies, but do any/all of the many proposed/enacted anti-corruption strategies actually work? Second, the focus has typically been on anti-corruption policies in the public sector, but what policies might work via the private sector? Third, it is common to say that it is essential to instill in public officials notions of "integrity" or "ethics" or "morality" in order to reduce corruption, but what are specific actions that can be taken to do this, so that people will "do the right thing"?

Answering these questions will require empirical strategies of some sophistication, including strategies that address both identification of causal effects (e.g., internal validity) and generalization of specific results to other settings (e.g., external validity). The use of controlled field experiments and laboratory experiments seems especially well-suited to these challenges, as does empirical work that uses administrative data of the most up-to-date vintage.

Devising research programs to answer these – and other – questions will help in the design of useful public policy advice on corruption. Such advice is unlikely to apply in all settings but it should be helpful in the specific setting that informed the research design.

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