IMF Working Paper

Corruption, Growth, and Public Finances

Vito Tanzi and Hamid R. Davoodi

INTERNATIONAL MONETARY FUND

IMF Working Paper

Fiscal Affairs Department

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Prepared by Vito Tanzi and Hamid R. Davoodi

November 2000

Abstract

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

The paper discusses some channels through which corruption affects growth such as the impact of corruption on enterprises, on the allocation of talent, and on investment. It also discusses the impact of corruption on some aspects of public finance.

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I. INTRODUCTION

In the last decade corruption has received a great deal of attention from a broad spectrum of the public. The study of corruption is no longer regarded as a subject of inquiry exclusively by students of politics and sociology. It now occupies the attention of many other fields such as political economy, public administration and law. Many international and regional organizations now regard corruption and poor governance as major obstacles to good policy-making. The current interest in corruption probably reflects an increase in the scope of corruption over the years, and is in part fueled by a better understanding of the economic costs of corruption. Thus it does not just reflect a greater awareness of an age-old problem.

Until recently segments of the economic literature had presented a romantic view of corruption. This view made corruption seem an almost virtuous activity and possibly good for growth in a world stifled by bad governments. For example, in various theoretical studies it was argued that corruption removes or relaxes government-imposed rigidities; greases the wheels of commerce; allocates investment and time to the most efficient users; keeps wages low; and may even act as a political glue that holds a country together.[2] The romantic view of corruption has been replaced, in more recent years, by a more realistic and much less favorable view. According to this new view, the payment of bribes is not a panacea for overcoming red tape and cumbersome government regulations; the highest bribes are paid by rent seekers and not by the most efficient individuals; a comprehensive civil service reform is better at reducing corruption than simply raising wages; corruption is subject to increasing returns which perpetuate it; and corruption creates an environment that, in time, can lead to the collapse of political regimes.

This paper elaborates on these contrasting views of corruption and, from this perspective, analyzes the conceptual and empirical links between corruption, economic growth, and public finances. There are many indirect channels through which corruption lowers growth, and recently some formal models have been developed that link corruption directly to growth. By contrast, there are papers in the public finance literature, and particularly on the tax side, which systematically investigate corruption, tax evasion and the incentive structure of tax inspectors and the public. This paper discusses some related issues.

II. CORRUPTION AND GROWTH

As a point of departure, it is important to describe two associations which have appeared prominently in the recent empirical literature on corruption. First, there is a negative association between corruption perception indexes and levels of economic development

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[2] For a concise survey of this literature, see Tanzi (1998).

measured by real per capita GDP.[3] Figure 1 shows, for a sample of 97 countries in 1997, that countries with higher perceived corruption tend to have lower real per capita GDP. Or, putting it differently, countries with low per capita income tend to have higher corruption. The correlation coefficient is −0.80 which is statistically significant with a t-ratio of −13.2.[4] Second, there is a negative association between corruption perception indexes and economic growth as measured by growth in real per capita GDP.

**Figure 1. Corruption and Development
in 97 Countries**
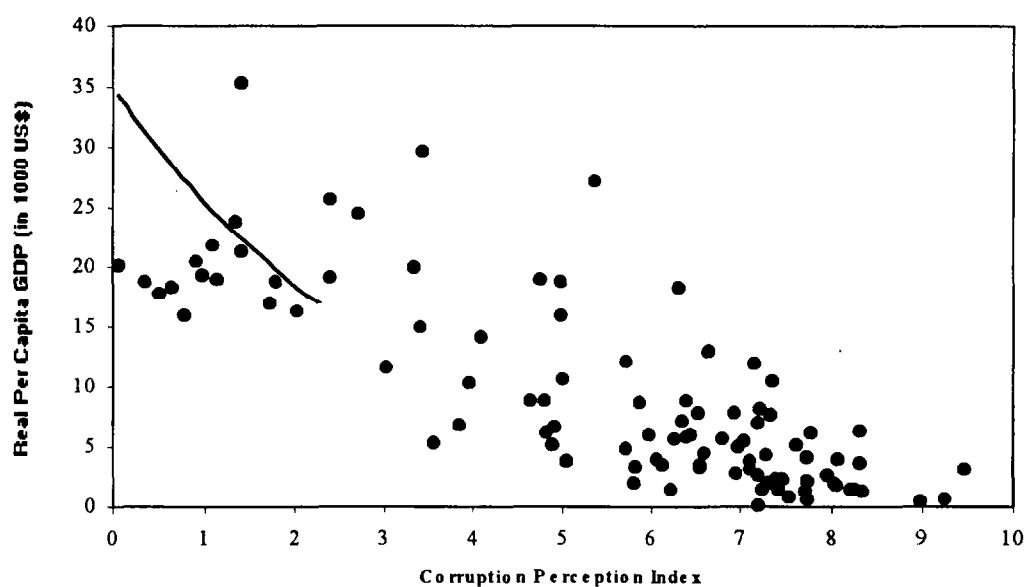
[3] The corruption perception index is the extended Transparency International index and is taken from Lambsdorff (1998) and real per capita GDP is in purchasing power parity U.S. Dollars and is taken from International Monetary Fund's World Economic Outlook database. The original index which ranges from 0 (highly corrupt) to 10 (highly clean) has been rescaled (i.e., adjusted index=10-original index) so that higher values of the adjusted index represent higher perceptions of corruption.

[4] Similar results are obtained using other corruption indexes. Recent studies of causes of corruption interpret this correlation as causation running from per capita GDP to corruption; see Treisman (2000).

The relation shown in Figure 2 for the same countries as in Figure 1 indicates that countries with higher corruption tend to have a lower growth rate. The correlation coefficient is −0.32 which is statistically significant with a t-ratio of −3.2. Although, this association is consistent with causation running in both directions, some studies have used econometric techniques, such as instrumental variable techniques (Mauro, 1995), to argue that the causality is from corruption to economic growth. Nevertheless, regardless of the position taken on the direction of causality, the simple negative association between corruption and growth is supported by the data. This paper presents some arguments to explain why this relation exists. It analyzes some direct and indirect channels through which corruption may affect economic growth. No attempt is made to formalize these channels in an explicit framework. The channels analyzed are: (a) the impact of corruption on enterprises and

**Figure 2. Corruption and Growth
in 97 Countries**
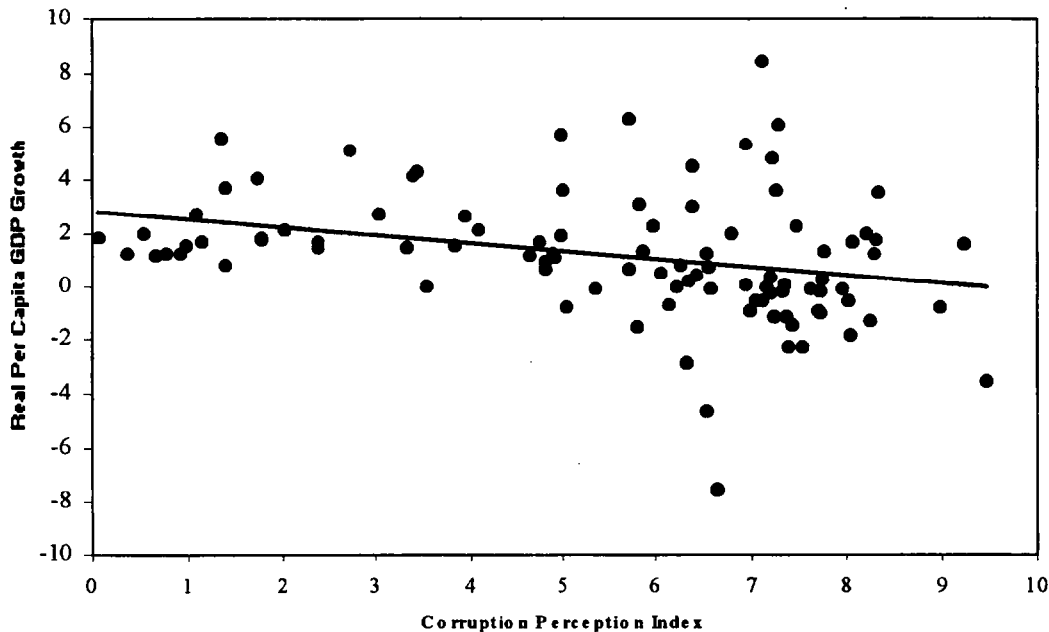
especially on small enterprises and especially its differentiated effect between large and small enterprises; (b) the impact of corruption on investment; and (c) the impact of corruption on the allocation of talent. In Section III, we will investigate some relationships between corruption and the composition of taxes and spending.

A. Corruption and Enterprise Growth

The growth of enterprises as a building block of growth (at industry and national level) is an old and respected topic in economics, dating back to Adam Smith's notion of scale economies, Alfred Marshall's description of industrial evolution of small firms, and

Schumpeterian forces of creative destruction and entrepreneurship. Historically, large enterprises had been viewed as the most important source of jobs, innovation and growth. However, in recent years, public policy has increasingly focused on the contributions of small and medium size enterprises (SMEs) to these objectives. Considerable empirical research conducted on OECD countries over the last decade has established a number of interesting facts which lie behind the changing perception of the role of SMEs in the economy. These are:[5]

- SMEs may comprise a smaller share of value added in the economy than large enterprises, but they employ the bulk of the labor force and create most of the new jobs;

- SMEs tend to be less capital intensive, consistent with their importance in the employment share;

- SMEs tend to be product-innovative whereas large firms tend to be process-innovative;[6]

- SMEs are more financially constrained than large enterprises which have easier access to the capital market; in the United States, for example, SMEs make up half of the value added in the economy, but represent only 6 percent of total business finance;

- SMEs contribute to growth in normal as well as recession times in ways that large firms don't. In a study of 12 European countries during the first half of 1990s, a greater increase in the smaller firm sales, compared to large firm sales, led to more growth in the national GNP in the following year.[7] During the deep recession of 1990-93 in Sweden, the SME's share of job gains was larger than the SME's share of job losses and as a result SMEs performed better than large firms.

- The survival of SMEs depends on access to finance, but also on competent entrepreneurship and talented management. It also depends on the environment that they face.

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[5] See Acs, Carlsson and Karlsson (1999) and Acs and Yeung (1999).

[6] Large enterprises tend to dominate in process innovations because they have the capacity to appropriate the returns to research and development.

[7] See Acs and Yeung (1999).

The above description of the role of SME is not limited to OECD countries but it covers also transition economies and developing countries. Thus, if corruption were to be more damaging to small and new enterprises than to large enterprises, it would imply that corruption would be putting breaks on the forces that promote growth. We will argue that, in fact, the effect of corruption is differentiated among the enterprises and is particularly pronounced on the small enterprises.

In a survey of 3,000 enterprises across 20 transition economies, conducted jointly for the European Bank for Reconstruction and Development (EBRD) and the World Bank—referred to as the Business Environment and Enterprise Performance Survey (BEEPS)—enterprises were asked to assess the major impediments in their business environment in terms of the extent of competition, corruption, taxes and regulations, inflation, financing and infrastructure. The results of the survey show the differential impact of corruption on firm size. Across all regions, corruption and anti-competitive practices were perceived as the most difficult obstacles by start-up firms with both barriers being ranked on average as 13 percent greater by start-ups, which tend to be largely SMEs, than by SOEs which tend to be older and large enterprises.[8]

A detailed breakdown of other impediments have shown that it is the access to essential business services, rather than the cost of finance per se, that is the greatest problem for start-ups. These findings seem to be consistent with other survey-based studies. For example, in a study of 84 wholesale trade enterprises in the city of Moscow in 1993, a dummy variable representing connection of the head of the enterprise to the relevant city government officials was a good predictor of which enterprises got soft credit. This dummy was a better predictor than the profit of the enterprise or other economic factors (Triesman, 1995).

The role of connections in the allocation of credit is, of course, not unique to transition economies. In a study of Japanese firms of varying size, investment in physical capital by firms with close ties to banks was found to be much less sensitive to their liquidity than for firms raising their capital through arms' length transactions (Hoshi, Kashyap, and Scharfstein, 1991). Although this finding is consistent with the role of financial intermediaries as monitoring agents that are in the business of reducing incentive problems and solving asymmetric information problems, it is also consistent with the observation that the allocation of credit based on arms' length relationship is perhaps good for growth in the long run, given the subsequent state of financial and enterprise restructuring in Japan in the 1990s and the long recession.

These findings from the experience of OECD countries and transition economies have important public policy implications. In general, the lessons are that factors that impede the growth of SMEs and stifle the entry of new firms, which tend to be small and important to a dynamic economy, will also tend to slow down the growth rate of the economy.

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[8] See EBRD (1999).

The conceptual link between corruption, size of enterprises and growth runs along the following lines. Large enterprises are known to find it easier to protect themselves from corrupt officials; they have specialized departments; they can use "facilitators"-individuals with skills to bypass the regulations and tax laws; their size protects them from petty bureaucrats; and they can use political power to further their rent-seeing corruption to their advantage. For large enterprises corruption is often of a cost-reducing kind as it allows them to enjoy monopoly rents and scale economies; whereas for SMEs it is often of a cost-increasing kind because they have to make payments which do not contribute to the productivity or profitability of the firm but that are necessary for their survivability. SMEs are normally preyed upon by petty bureaucrats and corrupt tax inspectors and are forced into making substantial payments and abiding by cumbersome regulations. Bribes may be required to obtain various authorizations or freedom from bureaucratic harassment. Bribe payments may amount to a substantial portion of SMEs' operating costs which can drive them out of business since they tend to operate in more competitive environments than large enterprises. In a study it was reported that in Indonesia these payments may have been as high as 20 percent of the sales of shops on small enterprises.

A growing number of surveys provides empirical support for the conceptual link presented above:

- In a sample of 176 Ugandan firms in 1997, the median firm paid bribes equivalent to 28 percent of its investment in machinery and equipment; and there was no evidence that firms that paid higher bribes on average received more beneficial government favors (Sevnsson, 2000). In Uganda, SMEs represent 50 percent of total employment and 96 percent of business establishments.

- Ugandan firms that are involved in exports and receive tax exemptions have a higher probability of facing corrupt bureaucrats and having to pay bribes ((Sevnsson, 2000). The implications of this finding are that (a) corruption does not grease the wheels of commerce; (b) those who can afford to pay more will be asked to pay more; and (c) trade liberalization and tax reform can reduce the opportunities for corruption. However, trade liberalization, though good for the economy as a whole, are more likely to benefit larger firms than smaller firms since traditionally the tradable sector has been dominated by large firms.

- In a survey of some 3000 enterprises in 20 transition economies, conducted by the EBRD and the World Bank, bribes are found to act like a regressive tax (EBRD, 1999); the bribes paid by smaller firms amount to about 5 percent of their annual revenue compared with 4 percent for medium-size firms, and slightly less than 3 percent for large firms.[9]

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[9] EBRD defines smaller firms as having less than 49 employees; medium size firms as having between 50 and 499 employees and large firms as having more than 500 employees.

- Smaller firms pay bribes more frequently than medium size and large firms; so do the new entrants and newly privatized state enterprises (EBRD, 1999). And enterprises that pay bribes more frequently also tend to pay a higher bribe per unit of revenues, i.e., a higher tax in addition to other taxes; see Figure 3.

- The evidence on the length of time spent by senior management of firms of different sizes with government bureaucrats seems to be mixed at best. This is a widely used indicator in the literature on corruption which may represent various costs of doing business with a government bureaucracy. The cost may involve forgone valuable time

Figure 3.
Bribes Paid and Their Frequency
in 20 Transition Economies
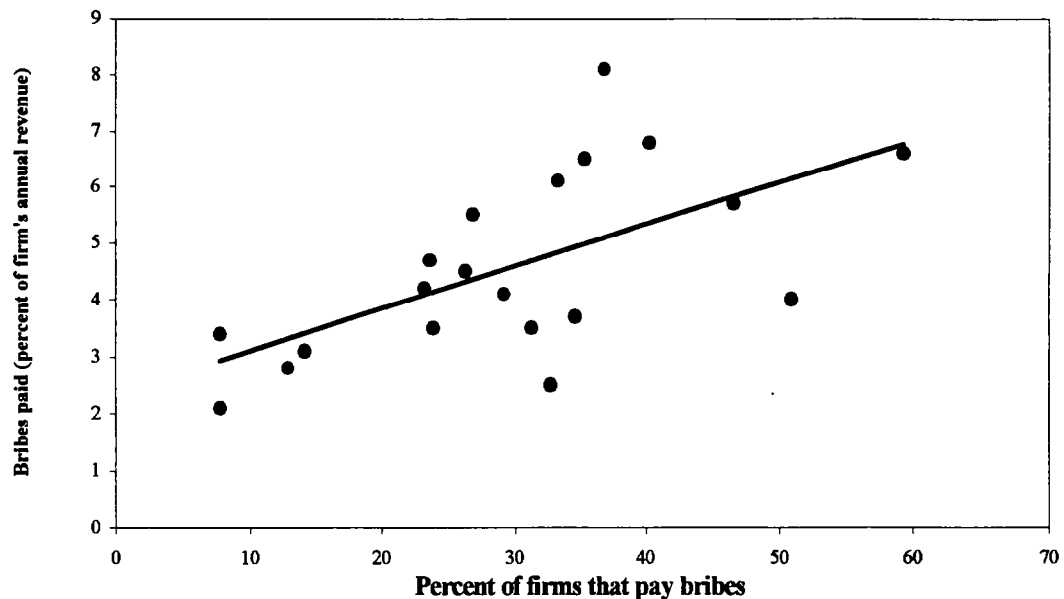
of a manager and may represent the time spent complying with regulations, lobbying for benefits, negotiating tax payments or bribes. The evidence based on Global Competitive Report data indicates that large firms waste less time with government bureaucrats. See Kaufmann and Wei, (1999, Table 5). However, the BEEPS survey for the EBRD and the World Bank shows that senior management of state enterprises, which tend to be large, spend more time with government bureaucrats (about 12 percent of their time) than senior management of privatized and new entrants (10 percent each) which tend to be small firms.[10] The evidence from Ukraine is consistent

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[10] See Hellman, Jones, Kaufmann and Schankerman (2000).

with that of Kaufmann and Wei (1999, Table 5); management of new private entrants spend about 37 percent of their time with government bureaucracy, followed by 29 percent by privatized firms and 21 percent by state enterprises. (Kaufmann, 1997).

- Corruption can reduce the rates of return on capital of small firms by more than those of large firms. It has been estimated that public sector bureaucratic corruption in Argentina reduce the expected rates of return on invested capital by 1 to 2.5 percentage points for large firms, 2 to 2.5 percentage points for medium-sized firms and 3 to 3.6 percentage points for small enterprises (Buscaglia, and Ratliff, forthcoming). The effect is attributed by the authors to high regulatory fees and taxes. Corruption may not be expected to explain the entire difference. For example, in a different, but related study of rate of return on 1,163 World Bank-funded investment projects in 61 developing countries, it was found that poor quality of economic policy can reduce the rate of return by some 10 percentage points (Isham and Kaufmann, 1999). However, corruption may also reduce the quality of economic policy.

In conclusion, although the evidence is often indirect and not as clear as one would wish, it is consistent with the hypothesis that corruption increases the costs of enterprises and reduces their rates of return. Furthermore, it tends to have more damaging effects on small enterprises than on large enterprises.

B. Corruption and Investment

Most economists and much economic theory assume a positive relationship between investment and growth. [11] Therefore, if corruption affects investment, it must also affect growth.

Corruption may affect investment in different ways. It may affect (a) total investment, (b) the size and composition of foreign direct investment, (c) the size of public investment, and (d) the quality of the investment decisions and of investment projects.

In several papers, Paolo Mauro (1995, 1996) has shown that corruption can have a significant negative impact on *the ratio of investment to GDP*. Regressing the investment ratio on a constant, the corruption index, GDP per capita in an earlier period (1960), secondary education in 1960, and population growth, he has shown that an improvement in the corruption index (i.e., a reduction in corruption) can significantly increase the investment-GDP ratio. The fall in investment-GDP ratio caused by corruption is shown to have an

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[11] This by no means represents a unanimous view as argued in Tanzi and Davoodi (1997). See also Devarajan, Easterly and Pack (1999), Easterly (1999) and Easterly and Levine (2000) for new international evidence in the case of Africa, and a large sample of developed and developing countries.

important effect on growth. Mauro estimates that a reduction in corruption equivalent to two points in the corruption index, through its positive effect on the investment-GDP ratio, could raise the growth rate by about 0.5 percent. In this relationship, the impact of corruption on the quality of investment is ignored. If the reduction in investment improved the quality of investment, the positive impact on growth could be higher.

In a recent study of transition economies, Abed and Davoodi (forthcoming) show that the impact of corruption on growth is reduced once one controls for structural reforms. These authors argue and provide evidence that structural reforms are perhaps the driving force behind the impact of corruption on growth. This interpretation and the findings have not been tested for other countries besides the transition economies and they depend on specific assessments of structural changes.

In a paper focusing on *Foreign Direct Investment* (FDI), Shang Jin Wei (1997a) has shown that while a one percentage point increase in the marginal tax rate on foreign direct investment (FDI) reduces incoming FDI by about 3.3 percent, an increase in the corruption index by one point reduces the flow of FDI into a country by about 11 percent. This would be equivalent to a 3.6 percentage points increase in the marginal tax rate. He has calculated that an increase in the corruption index, from the Singapore level to the Mexican level, would have an impact similar to that of 21-24 percentage points increase in the marginal tax rate. There is evidence in the literature that higher FDI leads to higher growth through several channels: transfer of technology, improving productivity of domestic investment and providing the necessary capital to work with complementary skilled labor (Borensztein, De Gregorio, and Lee, 1998) . Hence, by increasing FDI, lower corruption will lead to higher growth.

New evidence indicates that corruption also affects the composition of FDI. Using firm-level data, Smarzynska and Wei (2000), show that higher corruption in a host country shifts the composition of inward FDI towards joint ventures and away from wholly owned subsidiary of foreign enterprises. Although the authors do not investigate the growth implications of this shift, growth is likely to be higher if such a shift re-enforces the channels identified by Borensztein, De Gregorio, and Lee (1998).

In a related work, using data from the Global Competitiveness Report, Wei (1997b) has shown that the *predictability of corruption is also important*. The less predictable is the level of corruption (the higher the dispersion of individual ratings of corruption level of host countries), the greater is the impact of corruption on FDI. A higher level of dispersion makes corruption behave like an unpredictable and random tax. "The effect of uncertainty on FDI is negative, statistically significant and... large. An increase in uncertainly from the level of Singapore to that of Mexico... is equivalent to raising the tax rate on multinational firms by 32 percentage points." The evidence presented by Wei (1997b) has also been corroborated using the private sector survey carried out for the World Bank's 1997 *World Development Report* (Campos, Lien, and Pradhan, 1999).

Tanzi and Davoodi (1997) have argued that corruption is likely to *increase public investment but to reduce its productivity*. They have argued that public investment is easily manipulated by powerful political or bureaucratic personalities. They have tested the hypothesis that, other things being equal, higher corruption is associated with higher public investment. Regressing public investment (as a share of GDP) against a constant, the corruption index, real per capita GDP, and the share of government revenue in GDP, Tanzi and Davoodi show that the corruption index is highly significant (at the one percent level) and that the more corruption there is, the more *public* investment.

Subject to the caveat expressed earlier, the reduction in the investment-GDP ratio and in the FDI-GDP ratios can be assumed to have a clear, negative impact on growth. However, the increase in the share of public investment in GDP has a more questionable impact on growth. Some related evidence is provided by Tanzi and Davoodi (1997), Reinikka and Svensson (1999), and Ades and Di Tella (1997).

Although the difficulties in getting good data are great, Tanzi and Davoodi have presented evidence that other things being equal, (a) *high corruption is associated with low operation and maintenance expenditure*; and (b) *high corruption is associated with poor quality of infrastructure*. Thus, while corruption is likely to increase public investment by distorting the composition of that investment and by causing a deterioration of a country's infrastructure, it is likely to reduce a country's growth prospects. Poor public infrastructure reduces private productivity or forces private investment to compensate for the poor infrastructure. In terms of statistical significance, the impact of corruption on the quality of infrastructure is strongest on the quality of roads (paved roads in good condition), on power outages, and on railway diesels in use. Most of these relationships survive when real per capita GDP is added to the equation as an independent variable. Thus:

> "...the costs of corruption should also be measured in terms of the
> deterioration in the quality of the existing infrastructure. These costs can be
> very high in terms of their impact on growth (Tanzi and Davoodi, 1997)."

Studies at the micro, country level also confirm the above evidence. In a study of 243 Ugandan firms observed during the period 1995-97, Reinikka and Svensson (1999) show that poor public capital, proxied by unreliable and inadequate power supply, significantly reduced productive private investment. This evidence is consistent with responses from managers of the Ugandan firms who had cited poor utility services as well as corruption as major constraints to investment; the evidence is also consistent with inefficiency in investments observed across a large cross-section of countries in Africa (Devarajan, Easterly and Pack, 1999).

Ades and Di Tella (1997) have tried to estimate the impact of industrial policies (identified with procurement preferences to "national champions" and unequal fiscal treatment to enterprises). They find that corruption is higher in countries pursuing active industrial policy. In the presence of corruption, the total effect of industrial policy on investment ranges between 84 and 56 percent of the direct effect.

In conclusion, the above evidence supports a strong presumption that the net impact of corruption on investment is to reduce its size and its quality. As a consequence, growth must also be reduced.

C. Corruption and the Allocation of Talent

Corruption and rent seeking may have a negative impact on growth if they create incentives for highly talented individuals to go toward rent-seeking and other unproductive activities rather than toward productive activities. This connection was also seen as important in the discussion of SMEs and their growth potential. In these enterprises, managers spent much time dealing with rent seeking or trying to defend their enterprises from corrupt bureaucrats. This was surely an unproductive use of their time.

The hypothesis of a connection between rent-seeking and the allocation of talent was first suggested by Baumol (1990), and by Murphy, Shleifer, and Vishny (1991). Recently it has been given a more rigorous treatment by Ehrlich and Lui (1999). Unfortunately, data on use of talent and growth by firm size are not available. Therefore, only data at the aggregate level are used to investigate the issue. These data are only suggestive of a possible relationship.

We follow the approach of Murphy, Shleifer, and Vishny (1991) that one way in which rent-seeking and corruption may influence growth is by pushing able individuals towards law rather than toward more directly productive activities such as engineering. Using data from UNESCO for 53 countries on enrollment in law and in engineering, we found the following result:

$$\text{Corr} = 18.50 + 0.60 \text{ Laweng} - 1.64 \text{ GDP}$$
$$(5.79 \quad (3.07) \quad\quad (-4.47)$$
$$R^2 = 0.50 \quad \text{No. of countries} = 53$$

(numbers in parenthesis denote t-ratios). Here Laweng is the ratio of college enrollment in law to college enrollment in engineering in 1980; corr refers to the corruption perception index (averaged over the period 1989-97); and GDP refers to real per capita GDP in early 1960s. The latter has been found to be a robust determinant of corruption (Treisman, 2000). The regression shows that countries with high corruption tend to have a low per capita GDP and a high ratio of lawyers to engineers. *Ceteris paribus*, it would seem that a more corrupt society needs more lawyers.

Separating lawyers from engineers gives:

$$\text{Corr} = 18.00 + 0.18 \text{ Law} + 0.02 \text{ Eng} - 1.70 \text{ GDP}$$
$$(5.89) \ (3.59) \quad\quad (0.82) \quad\quad (-5.00)$$
$$R^2 = 0.56 \quad \text{No. of countries} = 53$$

(numbers in parenthesis denote t-ratios). Thus, the correlation is between corruption and the number of lawyers. The higher the index of corruption, the more individuals are attracted to degrees in law.

Furthermore, the higher the ratio of lawyers to engineers, the lower the rate of growth.

$$\text{Growth} = 21.10 - 0.36\ \text{Corr} - 0.22\ \text{Laweng} - 2.04\ \text{GDP} + 1.39\ \text{Schooling}$$
$$(4.47)\ (-3.00)\quad (-1.86)\quad\quad (-4.06)\quad\quad (3.04)$$
$$\text{Adjusted } R^2 = 0.39\quad \text{Number of countries} = 50$$

(Numbers in parenthesis denote t-statistics) where

Growth	=	Average real per capita GDP over the 1980-97 period (Source: World Economic Outlook)
Corr	=	Index of corruption, the same as used in previous regressions.
laweng	=	as defined previously.
GDP	=	Real per capita GDP in 1980 (Source: World Economic Outlook).
Schooling	=	Mean years of secondary schooling in 1980 (Source: Barro and Lee, 1996)

The above regression suggests a negative impact on growth of a higher allocation of talent to law as opposed to engineering. Along with the previous regression, it shows that the allocation of talent has an indirect impact on growth and that corruption allocates talent in a growth reducing fashion. The equation suggests that growth will be lower by 0.4 percentage point as a result of the combined direct and indirect impact of allocation of talent to law.

III. CORRUPTION AND PUBLIC FINANCES

In the above section, corruption and some aspects of public finance such as public investment were discussed. In the remainder of this section, additional public finance considerations are taken into account which might have growth effects, but the discussion is less directly linked to growth.

A. Corruption and the Composition of Public Spending

Corruption may have additional effects beyond those identified above. Some of these have been identified in recent papers; and some may have an impact on growth.

Mauro (1998) has shown that corruption may have no impact on total government spending. [12] He has also shown that *corrupt countries spend less for education and health*. This result has been confirmed by Gupta, Davoodi, and Alonso-Terme (1998). Because social spending is assumed to promote growth, it must be concluded that this might be another channel through which corruption may to affect growth negatively.

Gupta, de Mello and Sharan (2000) have shown that corruption also leads to higher military spending, expressed either as a share of GDP or of total government expenditure, given other determinants of military spending. There is also some evidence that cuts in military spending can lead to higher growth (Knight, Loayza, and Villanueva, 1996). Therefore, higher corruption can reduce growth through higher military spending.

B. Corruption and The Tax Structure

The impact of corruption, and of tax evasion on tax collection is not new in the public finance literature. See Tanzi (1999). A recent theoretical paper (Hindricks, Keen and Muthoo, 1999) has shown that in addition to loss in tax collection, the more bribes are collected, the more a tax inspector can resort to extortion in order to collect even more.[13] The existing tax system may be regressive if tax inspectors tend to go after poorer taxpayers rather than rich ones. An implication of this paper is that collecting progressive taxes without inducing evasion or corruption may require commissions to be paid to tax inspectors when they report high revenue; and there will be a trade off between enhancing equity and efficiency in pursuing a progressive tax system.

Hindricks, Keen and Muthoo (1999) do not investigate the growth implications of the trade off between equity and efficiency. However, the presence of such a trade off implies that lowering corruption through the payment of commissions to tax inspectors has an ambiguous impact on growth since enhancing equity is good for growth, as demonstrated by Persson and Tabellini (1994) and Alesina and Rodrik (1994), but efficiency losses from a progressive tax system is bad for growth. It is not clear, however, whether such a trade off is quantitatively important for growth.

In a series of papers, Tanzi and Davoodi (1997), Johnson, Kaufmann and Zoido-Lobaton (1999) and Friedman, Johnson, Kaufmann and Zoido-Lobaton (2000) have provided evidence that countries with high levels of corruption tend to have lower collection of tax revenues in relation to GDP, given other factors. This finding implies that some of the taxes paid by taxpayers are diverted towards the pockets of the tax administrators. Thus, the true

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[12] However by reducing government tax revenue, it may reduce spending or increase the fiscal deficit.

[13] See also Shliefer and Vishny (1993).

burden of taxation on the taxpayers may not fall as much as the fall in the tax receipts of the government; and as a result, the tax system in practice may become less progressive.[14] Also some taxes are not collected from some taxpayers leading to less neutrality of the tax system. These arguments demonstrate that a distinction needs to be made between taxes collected by the administrators and taxes received by the treasury. Low level of taxation may lead to a sub-optimal level of public spending, which may reduce its productivity and lead to higher fiscal deficits. Higher deficits may in turn lower the growth rate (Fischer, 1993). Therefore, corruption may also affect growth through its effect on fiscal deficits.

Previous studies of corruption and tax collection have addressed the effect of corruption on the level of taxation and not on its composition. One may expect that different types of taxes respond differently to corruption since payment of some taxes, but not of others, may be negotiated; some taxes are self-assessed in some countries (e.g., income taxes); some are assessed by tax inspectors; hence, they are subject to opportunistic behavior and extortion on the part of tax inspectors; and some are easier to administer than others (e.g., international trade taxes). Recent surveys eliciting respondents' views on the prevalence of corruption in different occupations often cite customs as an area rampant with corruption and kickbacks. Does corruption reduce taxes received from customs more than other types of taxes? Are weaknesses in the administration of certain taxes systematically related to corruption? Should one expect corruption to affect value added taxes (VAT) less than other taxes because VATs, in principle, require better book keeping and tax records and because an overwhelming share of VAT revenue is collected from a few large enterprises? An understanding of the basic facts of the tax structure is needed to understand the impact of corruption on the tax structure. The analysis that follows should be seen as only suggestive.

Table 1 presents the average value of each tax revenue (expressed as a fraction of GDP) and the determinants of the tax structure for a sample of up to 90 countries, and two sub-samples of developing and developed countries. Developing countries tend to rely more on indirect taxes (trade taxes and taxes on domestic goods and services); they tend to have a high share of agriculture in GDP, a low tax-GDP ratio, and a high non-tax-GDP ratio. Can corruption explain any of these differences?

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[14] Gupta, Davoodi and Alonso-Terme (1998) provide evidence that corruption increases income inequality by reducing the progressivity of the tax system.

Table 1. Average of Measures of Tax Structure and their Determinants, 1980-1997

Variable	World	Developed countries	Developing countries
Total revenue	26.00	33.30	24.40
Tax revenue	20.60	29.70	18.70
Income, profit, capital gains taxes	6.80	9.70	6.10
Individual	3.12	7.57	2.13
Corporate	3.38	2.36	3.61
Social security tax	3.74	7.97	2.55
Payroll tax	0.31	0.32	0.30
Property tax	0.42	0.65	0.37
Domestic taxes on goods and services	6.65	9.68	6.01
Sales, VAT, Turnover	3.97	5.77	3.57
Excise	2.07	2.97	1.86
Trade taxes	3.65	0.83	4.28
Import	3.18	0.80	3.73
Export	0.44	0.01	0.53
Non-tax revenue	5.33	3.47	5.72
Determinants of tax structure:			
Real capita GDP (PPP$)	5,120	14,100	3,780
Agriculture share of GDP	20.90	4.51	22.90
Trade share of GDP	81.20	66.10	83.50
Corruption index	4.26	1.21	4.95

Notes: All variables are measured as fraction of GDP except for the corruption index. The measure of corruption is based on ICRG and BI indexes; see Tanzi and Davoodi (1997) for details. It ranges from 0 to 10 where higher values of the corruption index refer to higher values of corruption. Averages are unweighted.

Relying on the empirical models of tax structure à la Tanzi (1987), each type of tax revenue, expressed as a fraction of GDP, is regressed on the same set of regressors. These are: a constant, share of agriculture in GDP, real per capita GDP, share of international trade in GDP; and the corruption perception index.[15] The results are shown in Table 2 and can be summarized as follows.[16]

- *Level and composition effects*: A one point increase in the corruption index is associated with 1.5 percentage point decline in total revenue-GDP ratio, 2.7 percent decline in tax-GDP ratio, and 1.3 percentage point increase in non-tax revenue-GDP ratio.

- Higher corruption is associated with lower revenues of all types, except for non-tax revenues. The latter finding is consistent with the fact that non-tax revenues are dominated by revenues from natural resources (at least for developing countries). Some studies have shown that natural resource abundance is an important determinant of corruption (Leite and Weidmann, 1999).

- Corruption has a statistically significant correlation with individual income taxes, a finding that is consistent with individuals negotiating their tax liability with corrupt tax inspectors. It is in the mutual interests of the individual taxpayer as well as the tax inspector who would conduct business as usual by living with underreporting and collecting bribes on a sustained basis. The point estimate shows that a one point increase in corruption is associated with a 0.63 percent of GDP decline in individual income taxes received.

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[15] The corruption perception index is based on Business International data and International Country Risk Guide data, used previously by Tanzi and Davoodi (1997). A higher value of the index represents a higher perception of corruption.

[16] The Table represents the estimated coefficient on the corruption index only. Results for other variables included in the regression are identical to what are found in the literature. Tax revenues increase with per capita GDP, and openness, but fall with agriculture share of GDP.

Table 2. Determinants of Tax Structure

Dependent variable	Corruption	Adjusted R-squared	Number of countries
Total revenue	-1.47***	0.41	90
	(-1.90)		
Tax revenue	-2.73***	0.42	89
	(-4.05)		
Income, profit, capital gains taxes	-0.79**	0.24	89
	(-2.25)		
Individual	-0.63**	0.46	86
	(-2.29)		
Corporate	-0.16	0.08	86
	(-0.71)		
Social security tax	-0.92***	0.39	74
	(-3.25)		
Payroll tax	-0.04	-0.02	75
	(-1.16)		
Property tax	-0.05**	0.37	85
	(-1.84)		
Domestic taxes on goods and services	-1.08***	0.29	90
	(-4.47)		
Sales, VAT, Turnover	-0.79***	0.24	86
	(-4.40)		
Excise	-0.23**	0.11	88
	(-1.98)		
Trade taxes	-0.06	0.41	90
	(-0.52)		
Import	0.03	0.33	90
	(0.23)		
Export	-0.07*	0.12	89
	(-1.43)		
Non-tax revenue	1.27	0.16	89
	(1.21)		

Notes: Regression includes an intercept, real per capita GDP, agriculture share of GDP and trade share of GDP.
It is estimated on a cross-section of countries over the period 1980-97. The corruption perception index is
taken from Tanzi ans Davoodi (1997) who based it on data from International Country Risk Guide and Business
International. The index has been rescaled so that higher values of the index represents higher
perception of corruption. Only the coefficient on the corruption perception index is shown. Numbers in
parenthesis denote t-ratios based on heteroscedastic-consistent standard errors.

*** Significant at 1 percent level;   ** significant at 5 percent level;   and * significant at 1 percent level.

- A one point increase in corruption reduces the ratio of direct taxes to GDP by more than the drop in the ratio of indirect taxes to GDP (1.8 percentage point vs. 1.2 percentage point, respectively).[17] Given the higher level of corruption in developing countries, corruption has therefore a larger impact on direct taxes in developing countries than in developed countries. This finding helps explain the predominance of indirect taxes in developing countries compared to developed countries. It is also consistent with the prevalence of tax evasion from income taxes in developing countries. By reducing corruption, developing countries could help correct the imbalance between direct and indirect taxes. A four point reduction in corruption, which is the average difference in corruption between developed and developing countries, can increase direct taxes for the developing country as a group by 7.2 percent of GDP, bringing their ratio of direct taxes to GDP within 2 percent of GDP of developed countries.

- The larger impact of corruption on direct taxes compared to indirect taxes also implies that the progressivity of the income tax system is reduced.

- Surprisingly corruption has no statistically significant correlation with trade taxes even though surveys of the public indicate the significant presence of corruption in the customs.

- Higher corruption is also associated with lower revenues collected from VAT, sales tax and turnover tax .[18]

Many countries have adopted value added taxes to simplify their tax system and increase their revenue performance. Are corruption and VAT performance related? Specifically, is higher corruption associated with lower VAT productivity? A measure of VAT productivity is the so-called VAT efficiency ratio which is the ratio of VAT revenues received to GDP divided by the standard VAT rate. This measure is bounded between 1 and zero. The higher is the ratio, the more productive is the VAT system. The lower is the ratio, the more widespread is the extent of exemptions, zero rating, tax evasion or weak tax administration. The simple association between corruption and the VAT efficiency ratio for a sample of 83 countries shows that countries with high perception of corruption tend to have low VAT efficiency ratios (Figure 4). The correlation coefficient is -0.34 which is statistically

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[17] Direct taxes are assumed to consist of four taxes in Table 2: (income, profit and capital gains taxes), social security tax, payroll tax and property tax.

[18] Two caveats should be mentioned regarding the impact of corruption on VAT. First, the regression does not control for the nominal rate of the VAT; a higher rate can create greater incentives for corruption and tax evasion. Second, the available data do not allow a distinction of the revenues from VAT from those of turnover and sales taxes.

Figure 4. Corruption and VAT Productivity
in 83 Countries
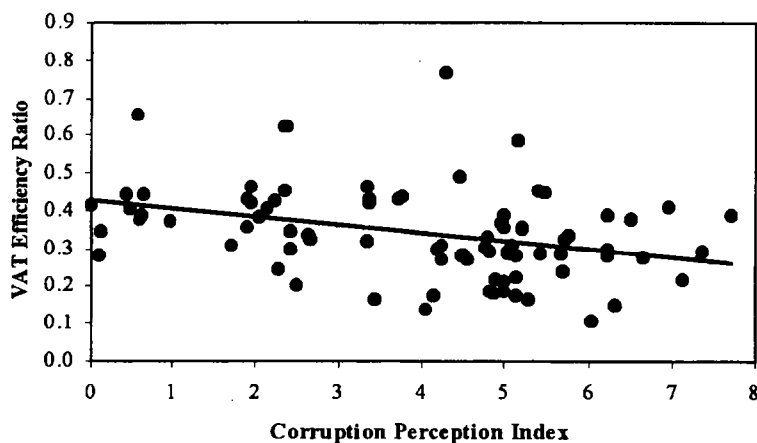
significant at the 1 percent level. This correlation does not imply that every exemption in the VAT system is necessarily the outcome of rent seeking activities or corruption. For example, basic food stuffs are routinely exempt from VAT in many countries; but then there are also many instances where VAT exemptions tend to grow when vested interests attempt to regain the exemptions that they used to enjoy under the previous sales taxes replaced by the VAT.

There is also some evidence that countries that introduced value added taxes earlier tend to have lower levels of corruption and higher VAT efficiency ratio. Specifically, the correlation coefficient for the same group of 83 countries, as in figure 4, between the date of adoption of the VAT and the subsequent level of corruption is 0.23 which is statistically significant at the 5 percent level. The correlation between the date of adoption of VAT and VAT efficiency ratio is -0.2 which is statistically significantly at the 10 percent level. It should be pointed out that these correlations might be suggestive of the role that the VAT system can play in improving book keeping record, and tax compliance, thus reducing corruption and increasing revenues.

IV. CONCLUSIONS

This paper has analyzed some conceptual as well as empirical direct and indirect links between corruption, growth and public finance. Apart from reviewing the channels discussed in the literature such as the impact of corruption on investment (public and private), and its composition, the paper has also discussed the role of small and medium size enterprises in OECD countries and has shown that this role is not unique to OECD countries; SMEs in

many developing and transition economies are also important contributors to growth. The paper has discussed the constraints facing SMEs and the regressive nature of bribery faced by them. It has argued that such constraints affect the allocation of time on the part of talented entrepreneurs, restrict the availability of finance to SMEs and, given their importance as engines of growth, ultimately reduce the national growth rate of the economy.

The paper provides some evidence that there is a positive and significant association between the allocation of talent to unproductive activities and corruption. Given that corruption has a negative impact on growth, this misallocation has negative direct and indirect effects on growth of about 0.4 percentage point.

The paper also provides new evidence that corruption affects the structure of taxes. The evidence shows that the presence of higher corruption in developing countries may in part explain the predominant share of indirect taxes in total tax revenues. Given the spread of VATs worldwide, the paper has also analyzed if its adoption bears any relationship to the prevalence and awareness of corruption. Some evidence is provided that countries that adopted the VAT earlier tend to have a lower level of corruption and higher VAT productivity subsequently. However, these conclusions must be considered as highly tentative. Also the direction of the causation is not obvious.

The last decade has seen a proliferation of surveys of firms and the public about costs of corruption and other obstacles of doing business worldwide. These surveys are qualitative in nature and do not replace more objective ways of measuring such costs, but they have nevertheless provided a wealth of information that are consistent with objective and hard evidence provided by earlier studies conducted by researchers such as De Soto and others. In conclusion, although much of the evidence available is only suggestive, it points to a probable negative relationship between corruption and the growth rate of countries.

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