



How Does Corruption Affect Public Debt? An Empirical Analysis

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Summary. — This paper investigates the relationship between corruption, the shadow economy, and public debt. It additionally examines whether the shadow economy increases the adverse effects of corruption on public debt. The model is empirically tested for 126 countries over 1996–2012. Using Ordinary Least Squares (OLS), Fixed effects, system generalized method of moments (GMM) and instrumental variable estimation, and two measures of corruption—the Transparency International Corruption Perceptions Index and the Kaufmann *et al.* Corruption Index—results confirm that increased corruption and a larger shadow economy lead to an increase in public debt. Results additionally indicate that the shadow economy magnifies the effect of corruption on public debt suggesting that they act as complements. Results also suggest that a larger shadow economy reduces tax revenues and thus increases public debt, similarly, higher government expenditure enhances the effects of corruption on government debt. Hence reducing corruption should be a primary policy goal of governments. Given the complementarity detected between corruption and the shadow economy, reducing corruption would also lead to a fall in the size of the shadow economy and public debt. Reducing corruption will also minimize the adverse effects of corruption on government debt through government expenditure.

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1. INTRODUCTION

This study aims to investigate whether corruption and the shadow economy affect the level of public debt and if the shadow economy magnifies the effect of corruption on public debt.¹ By establishing this relationship, this paper seeks to demonstrate the existence of another channel through which corruption adversely affects the economic performance of a country. Evidence has shown that, in general, corruption can be damaging for an economy. In particular, corruption has been found to reduce growth (Mauro, 1995; Mo, 2001; Tanzi & Davoodi, 2002), discourage investment (Brunetti, Kisunko, & Weder, 1998; Campos, Lien, & Pradhan, 1999; Mauro, 1996); reduce foreign direct investment (Abed & Davoodi, 2002; Wei, 2000), and limit productivity (Lambsdorff, 2003). Studies also show that more corrupt countries face higher inflation Al-Marhubi (2000), increase the size of the shadow economy (Friedman, Johnson, Kaufmann, & Zoido-Lobaton, 2000; Johnson, Kaufmann, & Shleifer, 1997; Schneider, Buehn, & Montenegro, 2010), affect state bond ratings (Depken & Lafountain, 2006), lower expenditure on education and health (Mauro, 1998) and adversely affect the poor (Justesen & Bjornskov, 2014). Studies at the firm-level also indicate that corruption can adversely affect the performance of firms and growth, in general. For example, Lau, Yang, Zhang, and Leung (2015) find that corruption discourages innovation and economic growth. Van Vu, Tran, Van Nguyen, and Lim (2016) find that the intensity of bribery and corruption have negative impacts on firms' financial performance, while Petrou (2014) finds that corruption has a negative influence on the financial performance of foreign bank affiliates.

It also should be noted that the literature dubbed “grease on the wheel” suggests that corruption can be efficiency improving. For example, Leff (1964) suggests that corruption by reducing bureaucratic red tape, can be beneficial for economic growth. Similar views are shared by Huntington (1968), Nye

(1967), Johnson (1975), Wedeman (1997) and Liu (1985, 1996). Lau, Demir, and Bilgin (2013) find that corruption may reduce uncertainty about government policy by becoming more predictable due to increased bribery. To this end, the existing theoretical findings and empirical evidence indicate that the growth effect of corruption depends on the institutional environment (Aidt, 2009; De Rosa, Goo-roochurn, & Gorg, 2010; Méon & Weill, 2010, Meon and Sekkat, 2005; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999; Shleifer & Vishny, 1993). Dzhumashev (2014a) shows that the interaction between corruption and governance shapes the efficiency of public spending, which in turn, determines the growth effects of corruption. In any case, a corrupt bureaucracy distorts the purpose and functionality of the public sector, and alters the burden it creates and the structure of spending.

Closely related to the concept of corruption, is the shadow economy. “The shadow economy is an unobservable economic phenomenon, and no consensus exists as to the definition of the shadow economy” (Buehn & Schneider, 2009). Smith for example, defines it as; “market-based production of goods and services, whether legal or illegal, that escapes detection in official estimates of GDP” (Smith, 1994). The shadow economy, similar to corruption, involves illegal activity. Traditionally, there are two schools of thought on the relationship between the shadow economy and corruption. According to one school of thought (Tanzi, 1982), those who evade taxes are driven out of the official economy and become part of the shadow economy. According to the other school of thought, the absence of proper institutions including high corruption, results in a larger shadow economy.

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Corruption and the shadow economy can thus act as substitutes or complements. [Rose-Ackerman \(1997\)](#) suggests that individuals can attempt to avoid corruption by going underground. Here, the shadow economy and corruption act as substitutes. Similarly, [Dreher, Kotsogiannis, and McCorrison \(2009\)](#) show that corruption and the shadow economy are substitutes, as a larger shadow economy reduces the ability of bureaucrats to demand bribes from agents. Thus, if agents go underground in order to avoid bribe payments, with corruption and the shadow economy acting as substitutes, then there will be no causal relation between them. [Friedman *et al.* \(2000\)](#) on the other hand, show that corruption and the shadow economy can act as complements. Weak institutions and high corruption drive agents underground. If corruption in tax collection becomes more widespread, the size of the shadow economy rises and the effective penalty for tax evasion falls. Here, the relation between the shadow economy and corruption could be uni-directional. If however, the size of the shadow economy rises with corruption, leading to greater rents captured by bureaucrats in tax evasion and higher levels of corruption, there could be bi-directional causality between the two variables with one reinforcing the other.

Empirical studies however, tend to support the view that corruption is associated with a larger shadow economy (see [Dreher & Schneider, 2010](#); [Schneider, 2011](#); [Schneider & Enste, 2000](#)). In other words, they act as complements. The studies of [Schneider *et al.* \(2010\)](#) and [Kaufmann \(2010\)](#) show that a large shadow economy reduces the ability of a government to raise tax revenues. The study of [Friedman *et al.* \(2000\)](#) finds that corruption is associated with increased unofficial activity which in turn leads to a fall in tax revenues. Similar arguments are put forward by [Johnson *et al.* \(1997\)](#), who argue that tax evasion by the unofficial sector weakens a government's ability to provide public goods to the official sector. A government has to resort to borrowing to finance projects when there is a fall in tax revenues. Therefore the more corrupt a government, a larger proportion of tax revenues would go into bribe payments which can reduce revenues requiring more borrowing. This can lead to a vicious cycle of corruption and borrowing. However, there have been no studies to date, which have investigated how corruption affects the level of public debt through its impact on the size of the shadow economy.

In light of the above discussion, this study examines the influence of corruption and the shadow economy on government debt. Despite the large literature on the effects of corruption on government expenditure, there is little evidence on how corruption affects public debt by increasing public spending through the inefficiencies it creates and direct embezzlement. Corruption can affect government debt through a number of channels. [Tanzi and Davoodi \(2002\)](#) argue that corruption leads to an increase in public expenditure. Moreover, [Dzhumashev \(2014b\)](#) demonstrates that high levels of corruption and public spending can reinforce each other and thus result in perpetuation of large public expenditures. As observed by [Kaufmann \(2010\)](#) in order to maximize rent-seeking, government officials could be more inclined toward large capital investments at the cost of labor-intensive ones. The scale and magnitude of capital investments make it easier for corrupt officials to resort to bribe taking from capital-intensive projects compared to labor-intensive projects. Corruption not only increases the size of public expenditure, but also can change the composition of public expenditure away from vital sectors such as health and education ([Mauro, 1998](#); [Wei, 2001](#)) toward sectors which involve greater secrecy

and less transparency such as defence. For example, military expenditure may not be closely monitored by tax and customs authorities or be subject to the usual auditing and other legalities ([Gupta, De Mello, & Sharan, 2001](#)). In the event that large-scale investment projects and public expenditures such as defence are financed by borrowing, public debt and debt-servicing costs could increase ([Kaufmann, 2010](#)).

Let us summarize the theoretical predictions discussed above. Corruption encourages more public spending and borrowing. Borrowing is increased because tax revenue to finance the increased spending falls short due to larger shadow economies associated with greater incidence of corruption. Under these circumstances, it can be expected that a country would accumulate a larger public debt. We aim at finding empirical support for this hypothesis. In particular, we consider the effect of corruption on the level of public debt directly and indirectly through its interaction with the shadow economy. We hypothesize that: (1) corruption increases the ratio of public debt; (2) the shadow economy increases the ratio of public debt; (3) public debt leads to an increase in corruption through the shadow economy. These hypotheses are tested on 126 countries over the 1996–2012 period. To the best of our knowledge, this is the first paper which examines the relationship between corruption, the shadow economy, and public debt.

Results are tested for robustness in a number of ways: additional control variables to capture a range of possible influences on the public debt ratio, interaction terms, non-linearity in the relationship between corruption and public debt, different estimation methods including OLS, fixed effects estimation to account for country level time invariant unobservable influences on public debt, system GMM and instrumental variable (IV) estimation to correct for any potential endogeneity bias. Given the uncertainty and likely measurement errors in corruption, the robustness of the results are tested using two different data sets on corruption: the Transparency International Corruption Perceptions Index (TI hereafter) and [Kaufmann, Kraay, and Mastruzzi \(2013\)](#) data sets of Worldwide Governance Indicators. Finally, the estimation is carried out by replacing the dependent variable, the public debt to gross domestic product (GDP) ratio with the debt-servicing ratio to gross national income (GNI), and also by including only the low- and middle-income economies, and excluding the Heavily Indebted Poor Countries (HIPCs).

It is worth mentioning that the use of perception-based measures of corruption such as the TI and [Kaufmann *et al.*](#) indices, in general, should be treated with caution. It is because these measures of corruption are based on the perceptions of countries or conventional views about what institutions are contributing to corruption, and not actual experience. Especially, perception-based measures of corruption have been found to be less appropriate in analyzing the effect of corruption at the firm-level. In the literature, firm-specific effects of corruption, are measured using experienced-based measures of corruption constructed through firm-level surveys.² However, [Martin, Cullen, Johnson, and Parboteeah \(2007\)](#) argue that perception-based measures of corruption can be relevant when one analyses the effect of corruption from the perspective of involvement of public institutions. Since in this paper we are dealing with the effect of corruption on the debt accumulated by public institutions, using perception-based corruption measures can be justified.

The findings of this study can be summarized as follows. The results suggest that corruption measured by both the TI index and [Kaufmann *et al.*](#) index have a highly statistically significant impact on public debt in all regressions. This positive

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