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Corruption and economic development nexus: Variations across income levels in a non-linear framework☆

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ABSTRACT

This article investigates the relationship between income and corruption which provides an insight to the changes in the level of perceived corruption and economic development across countries. An existing shortcoming is that previous studies have focused only on detecting the linear effects of income on corruption. We therefore use the hierarchical polynomial regression to evaluate any existence of a non-linear relationship after controlling for socio-economic and institutional factors. Our results challenge some of the findings of a negative income–corruption association in the literature, and provide some new inferences. The findings indicate a quadratic function that best fits the data, and despite an upsurge of corruption among the low-to-medium income countries, the advanced stages of development eventually reduce corruption level substantially. The results persist when per capita income is instrumented for by latitude distance and life expectancy. The policy implications suggest a combination of economic, institutional and social policies that can effectively, in turn, reduce and lower the effects of corruption on the society, economy and development.

1. Introduction

It has been established that the impact of corruption is detrimental to all societies, which also explains poor economic performance especially in the context of developing economies.[1] Lambsdorff (2006) notes that cross-country empirical studies have explored the causes and effects of corruption since last decade, and some consensus has slowly emerged but a number of aspects still remain unresolved. Several studies highlight that prevalent corruption is negatively linked to the level of economic development of a country, hence rich countries (i.e. high per capita income nations) are perceived to be less corrupt than poor nations (i.e. low per capita income countries).[2] However, such a stability or reduction in the perceived level of corruption was accompanied by significant rise in real income per capita. But it remains unclear whether an increase in income consistently reduces corruption across regions and income categorisation of countries.

An important shortcoming has been that researchers' have focused only on detecting the linear effects of income on corruption. While the linear negative relationship between income level and corruption has been noted in the literature, however, the degree of the level of income impact on corruption is not uniform and straight forward. The overall long-term trend of the entire process may resemble the downward slope portrayed by a linear function, but the quadratic function can discriminate the experiences of less developed countries from that of the highly developed countries. Hence, a non-linear framework estimated in this paper explores the degree of responses of corrupt behaviour caused by the change in income level in a more systematic way. This focus provides an insight to the changes in the level of perceived corruption and economic development across countries. We question whether corruption levels increase or decrease in the course of a country's economic development and test the factors that determine the level and trends of perceived corruption.

In addressing the inquiry of what are the causes of corruption, with few exceptions, majority of the empirical studies have examined various country case-studies and/or by regions but cross-sectional comparative analysis has been lacking.[2] Recent studies, notably by Sandholtz and Koetzle (2000), Treisman (2000), Fisman and Gatti (2002), and Pellegrini and Gerlagh (2008), consider several aspects of the causes of corruption. However, with the complexity of corruption issues and use of different empirical methodologies, studies have separately or in combination of factors analysed the economic, political, historical and cultural traditions of the causes of corruption. But their findings show some inconclusive results on the relationship between corruption and political institutions, decentralisation and government policies.

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[1] These studies include Rose-Ackerman (1978), Klitgaard (1988), Mauro (1995), Knack and Keefer (1995), Bardhan (1997) and Brunetti et al. (1998).

[2] See Lambsdorff (2006) and the literature cited therein.

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To examine the causes of corruption we test the existence of a non-linearity corruption–income association and identify if an increase in income may increase corruption at the low- to medium level of economic development stage and reduce corruption at the advanced levels of development. If this is indeed the case, then an increase in income level may increase corruption during the early stages of development and once in the advanced development level corruption may decline. We use the hierarchical polynomial regression to evaluate this hypothesis after controlling for socio-economic and institutional factors by regions and income classification for 100 countries over the period 1995–2008. The study provides the first systematic cross-country non-linear analysis of income–corruption nexus, to the best of our knowledge. In addition, the threshold income levels are estimated at which corruption changes its direction, i.e. the turning points at which corruption level starts to decline. By also drawing attention to a non-monotonic relationship between income per capita and the level of corruption, a comparative analysis by income classification, i.e., categorising countries into low-income, middle-income and high-income groups demonstrates that a linear relationship might not reflect the true extent of corruption and economic development nexus.

The paper is structured as follows: the penultimate section reviews a brief theoretical overview of the non-linear income–corruption association. Section 3 presents the empirical models, data and methodologies. The estimated results are discussed in Section 4. We find the evidence of a non-linear relationship between income and corruption levels, which illustrates that an increase in income increases the level of corruption, and once past the threshold income level corruption decreases substantially. These results persist when per capita income is instrumented for by latitude distance and life expectancy. The findings are generally robust when an alternative measure of corruption is employed. Conclusions noted here provide that some policy implications are in the final section.

2. Income–corruption association: a brief theoretical overview

The theoretical models of corruption suggest a principal–agent relationship between public officials and society (see Becker and Stigler, 1974; Klitgaard, 1988, and the literature cited therein). Extending the level of corrupt practices in a country it has been noted that the core argument is linked to the nations' functioning institutions and their level of economic development. Studies by Treisman (2000), Graeff and Mehlkop (2003) note that prevalent corruption is negatively linked to the nations' economic development, thus rich countries (i.e. high per capita income nations) are perceived to be less corrupt than poor nations (i.e. low per capita income countries). However, it is likely that corruption responds differently to similar increases in income at various levels of economic development.

The real world evidence also supports the view that the relationship between levels of income and corruption is not uniform and straight forward. From the microeconomic point of view this may be due to income differences between nations that affect the cost of corruption differently and in turn corruption level, thus illegitimate transactions for private enrichment has been explained by the cost and benefit of a corrupt act. The public official infers to the expected cost of a corrupt act (i.e. moral, social and economic costs) against the expected benefit which may depend on the nations' economic, political and social systems. Also, short of prosecution, miscreants are likely to lose their jobs. The cost of this depends upon the benefit provided by the job, which is essentially the level of salaries in the public office (Becker and Stigler, 1974). As such, higher salaries of officials make corruption more costly.

Following the view that high incomes of officials increase the opportunity cost of acting corruptly, it is expected that poor countries will be more corrupt than rich countries. In this context, Sandholtz and Koetzle (2000, pp 36–37) point out that because of high marginal value of money in poor countries, any extra income highly affects both the givers and takers of bribes. Paying a bribe can be a beneficial expense if it creates opportunities for higher income gains. Likewise, receiving a bribe generates a direct boost in income for the public officials, such that the risk is judged as being worthwhile. Although it is expected that there is a linear negative relationship between income level and corruption, however, the degree of impact of income level on corruption is not uniform.

On the other hand, the debate in the literature argues whether corruption is detrimental or beneficial to the economic activity based on “grease” vs. the “sand the wheels” hypothesis (Beck and Maher, 1986; Brunetti and Weder, 1998; Huntington, 1968; Leff, 1964; Mauro, 1995; Mo, 2001). Grease the wheel argument suggests that bribe may act as a trouble saving device and that can raise investment and economic growth of a country. Following this argument it can be argued that low income countries produce insufficient level of income to pay for bribes but when income level increases people can afford to pay bribes and which in turn increases the level of corruption. Thus, corruption level may rise with an increase in income at the early stages of growth.

Furthermore, Leys (1965) argued that civil servants in low income countries receive insufficient wages, the existence of bribes may constitute a complement that may attract able civil servants to being corrupt. Sand the wheel argument claims that corruption can be deleterious to growth by making the bureaucratic process slow, costly, inefficient and by transferring the resources to unproductive activities (Mauro, 1998; Myrdal, 1989; Rose-Ackerman, 1997; Shleifer and Vishny, 1993; Tanzi and Davoodi, 1997). Recently Méon and Sekkat (2005) find that corruption slows growth even more in countries suffering from a weak rule of law and inefficient government.

From the above argument it is evident that at the early stages of development countries (low income countries) do not generate sufficient income however, when income level is moderately high (low- to medium-level of income), it can enhance corrupt activities by transferring resources to the non-productive sectors and where there is a high possibility of extracting large bribes. In contrast, at the advanced stages of development, a high level of income increases the cost of corruption to a level sufficiently higher to deter corruption significantly.

In addition, there is a cost involved in reducing corruption. Reducing corruption is mostly dependent on the building of a sound institutional framework of a country that can combat corruption effectively. However, a low level of income does not provide enough support to build the institutional structures in low-income countries and that makes the cost of reducing corruption very high. On the other hand, middle-income countries are more of a transitional stage that provokes a high level of corruption. But at the mature stages of development, a very high level of income makes it possible to build the institutional foundation and thereby increases the efficacy of anti-corruption reform and the cost of getting caught while corrupt and punished. Hence, the non-linearity in income–corruption relation is a valid possibility. The data descriptions below also highlight the theoretical arguments of the variables that enter the models.

3. Models, data and methodology

To explore the non-linear relationship we examine the three models of linear, quadratic and cubic specifications, using recent data covering 100 countries and by regions and income classification for the period 1995 to 2008. The linear model predicts a straight forward negative association between income and corruption. The quadratic equation hypothesizes that as development process progresses corruption level first increases and then decreases. The cubic model anticipates that as development progresses corruption levels first decrease, then increase and then decrease. Hence, if corruption levels increase or decrease at the early- to medium-stages of development at the mature stages of development the consolidation of advanced institutions eventually reduces corruption. Similar to most past empirical corruption literature