Control of corruption, international investment, and economic growth – Evidence from panel data

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A B S T R A C T

In this paper we study the effects of corruption using an open economy version of the endogenous growth model with international capital mobility. In particular, the model predicts that corruption negatively affects the stock of international investment in the host country. In addition, the model predicts that growth should be impaired by the uncertainty caused by corruption. Bribes, unlike taxes, involve unpredictable distortion in the discretionary and uncertain use of the government power. This results in additional costs to businesses and alongside with resources allocated to unproductive activities impose an extra burden on the economy. We test empirically the predictions of the theory using a sample of 142 countries for the period 1994–2014 and GMM methods. Using indicators of control of corruption from the World Bank, the lack of corruption is found to have a positive and statistically significant effect on the growth rate of real per capital GDP and increased the investment ratio. Hence, the empirical results suggest that corruption directly hinders economic growth by hampering investment. The estimated effects are robust to changes in specifications and estimation methods. Thus, it can be concluded that richer countries with better access to international financing should be growing faster and be less prone to the adverse effects of corruption than the emerging economies.

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1. Introduction

Corruption is a phenomenon that plagues many emerging economies and is generally regarded as an important obstacle to economic development. The economics literature has identified numerous transmission channels through which corruption may influence economic growth.[1] Most frequently, it has been argued that corruption can negatively affect growth through its impact on the accumulation of physical capital (Mauro, 1995; Wei, 2000).[2] Corruption adds uncertainty regarding returns on investment and diminishes individuals' incentive to invest. In an environment with widespread corruption, for each monetary unit invested, a sizable share is wasted, implying less investment. Thus, corruption can be viewed as a burden on a nation's wealth and economic growth by discouraging new investment and creating uncertainties regarding private and social rights.

Corruption can also affect growth through its impact on the accumulation of human capital.[3] (Mauro, 1997; Mauro, 1998; Tanzi, Davoodi, & Hamid, 2002). Corruption could also encourage increased and inefficient allocation of government resources as corrupt officials seek to maximize their rent-extracting potential (d'Agostino, Dunne, & Pieroni, 2016a; d'Agostino, Dunne, & Pieroni, 2016b; Montinola & Jackman, 2002). However, the empirical literature remains inconclusive about the impact of corruption on investment and economic growth. Although there is some empirical evidence that supports the notion that corruption increases public

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[1] See Hodge, Shankar, Rao, and Duhs (2011) for a detailed survey of these channels and Blackburn & Forgues-Puccio, 2010) for an application.

[2] Many studies have shown physical capital investment to be one of the most robust determinants of economic growth (e.g. Levine & Renelt, 1992; Sala-i-Martin, Doppelhofer, & Miller, 2004).

[3] Mankiw, Romer, and Weil (1992) and Hanushek and Woessmann (2012), among others, have shown that human capital positively impacts growth. The cited studies link corruption to human capital via four mechanisms. First, by distorting tax administration, it diminishes the resources available for funding public services, including education and health. Second, it adds to the operating cost of the government and therefore reduces the resources available for other uses. Third, it affects the composition of government expenditures towards types of expenditures that allow for the collection of undetected bribes. Finally, it decreases the share of recurrent expenditures devoted to operations and maintenance, lowering the quality of educational infrastructure.

investment ([Tanzi et al., 2002](); [Haque & Kneller, 2015]()), the results regarding private or total investment are lacking.

Moreover, the previous theoretical and empirical studies devoted to corruption are generally based on closed economy frameworks that do not allow for international capital movements.[4] The potential effects of corruption in an open economy framework are rarely discussed, and there is a clear need to fill this gap. In particular, little attention has been paid to the fact that if corruption were an emerging market phenomenon, capital would tend to stay in countries without such a risk, reducing the net investment. Even no country is free from corruption, international investment would respond to differences in the expected frequency of bribery across countries. The question why corruption may have a large effect on the economy, even if it is a minor part of the total economic risk, has not received enough attention in the economic literature.

In this paper, we develop an open economy version of an endogenous growth model based on the simple observation that a predictable economic environment is important for international investors; that is, when investors are assured that the returns on investment accrue to the investor, investment is more likely to ensue. A business environment in which corruption is prevalent creates a situation in which investment returns are difficult to predict. This situation has two primary effects on private investment decisions: first, expected returns are decreased because of the increased costs of dealing with corrupt officials; and second, the dispersion of outcomes is larger. Risk-averse investors will stay away from such threat and withdraw from their investment decisions in countries in which these risks are elevated. We show that this may be an important consideration in an open economy setting. Rather than attempting to capture all of the channels through which corruption can affect economic outcomes, the model emphasizes that the diversification opportunities that arise in a globalized world economy can significantly amplify the negative impact of corruption.

Therefore, this paper's main hypothesis is that the mobility of productive factors in an open economy can account for much of the difference between the direct effect and the total effect of corruption on the economy of the host country. More specifically, our model predicts that corruption negatively affects the stock of international investment in the host country. Furthermore, the model predicts that growth is impaired by the uncertainty caused by corruption. Using the theoretical model as a guide for an empirical study, it is possible to test whether countries with higher levels of corruption indeed have lower investment rates and exhibit lower rates of growth. For the purpose of this study, a new dataset is created from a sample of 142 countries from 1994 to 2014. In this panel, the hypotheses – derived from the model – are tested using various panel estimation methods. Our results are shown to be robust to the choice of estimation and instrumentation methods, country sample, and corruption variable selection.

The paper is structured as follows. In the next section, the relevant literature is reviewed. Then, the theoretical model is developed. The subsequent section discusses the properties of the dataset and estimation methods. The next section reports the estimation results for the growth and investment equations. The final section concludes the paper with policy implications and directions for further studies.

2. Literature review

The theoretical model developed in this paper belongs to a strand in the literature that concentrates on the effect of uncertainty on the rate of economic growth. The origins of this approach can be traced back to the early studies of [Phelps (1962)]() and [Levhari and Srinivasan (1969)](), who use different versions of the stochastic consumption-saving problem similar to the linear technology versions of endogenous growth models.[5] Our approach is closest to that of [Obstfeld (1994)]() and [Devereux and Smith (1994)](), who study the effects of risk sharing in open economy models of growth. [Obstfeld (1994)]() constructs a model in which agents can choose between two types of investment: one is more efficient but is characterized by an idiosyncratic risk, whereas the other is less efficient but completely safe. Using these hypotheses, he showed that in an open economy framework, when a larger number of projects are available, investors can diversify away the idiosyncratic risk associated with more efficient investments. Therefore, they devote a smaller share of their savings to financing safe investments, achieving an equilibrium with a higher long-run rate of growth. In contrast, [Devereux and Smith (1994)]() consider only the possibility of investing in risky projects and reach the opposite conclusion: international risk sharing makes it possible to diversify away country-specific income risk, but reduces the incentive for precautionary saving, thus negatively affecting capital accumulation and growth.

We adapt the approach in [Abadie and Gardeazabal (2008)]() and [Turnovsky (2000)](), who study risk and economic growth in a stochastic setting, in an extended model by [Obstfeld (1994)]() and introduce corruption as a stochastic Poisson process that moves random amounts of capital into an unproductive administrative sector. Therefore, like [Devereux and Smith (1994)]() and [Sennewald and Waelde (2006)](), only risky projects are considered. This framework enables us to study the following two effects of corruption: i) a reduction in the expected return on investment; and ii) an increase in the uncertainty of acquiring the return. As a result, although changes in the frequency of corruption have an ambiguous effect on the overall world's investment position (investments over wealth), they might cause large movements of capital across countries if the world economy is sufficiently open and international investors are diversified against other types of country risks ([Raddatz & Schmukler, 2012]()).

Although at first sight these effects seem quite intuitive, their formal analysis is still lacking in the theoretical literature on corruption. The main idea that corruption might negatively affect the stock of international investment in a given economy and consequently lower its rate of growth can be illustrated in an open economy version of the *AK* model of endogenous growth with perfect capital markets.[6] This framework allows for a much simpler exposition of the problem in a stochastic environment compared

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[4] The major exception is the line of research that suggests the potential for corruption to counteract movements towards greater trade openness. For example, [Southgate, Slazar-Canelos, Caracho-Saa, and Stewart (2000)]() argue that restrictions on trade, in the form of quotas or licenses, provide public officials substantial sources of rents. Moreover, foreign entrants often lack the sort of local knowledge that is needed to minimize bribe expenses, which in turn reduces the amount of foreign investment.

[5] [Leland (1974)]() studies a stochastic version of the AK model and shows that the impact of increased uncertainty on the consumption/output ratio depends on the size of the coefficient of risk aversion. Even in deterministic versions of models that allow for the possibility of endogenous growth, the existence of equilibriums (and even optimal allocations) requires strong assumptions about the fundamentals of the economy. In special cases, most authors provide conditions in which an equilibrium exists ([Aghion & Durlauf, 2005]()).

[6] There are many reasons for such a setup. In more general setups, for example, with non-constant interest rates (which are typical when modeling transitional dynamics or when considering macroeconomic models of growth for non-AK-type economies), closed-form solutions can be derived only if certain unrealistic parameter restriction are met; see, e.g., [Waelde (2005)]() and the references therein.