Corruption and the Rate of Investment: A Panel Study 2005-2020[*]

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December 2022

Abstract

Corruption is deemed responsible for distorting market incentives, propagating misallocation of scarce resources, and thus imposing costs on the most vulnerable members of society by curtailing welfare-enhancing growth. This study uses the Ordinary Least Squares (OLS) regression method to estimate the effect of corruption on the rate of Investment as a channel that plays an important role for economic growth. The effects of corruption, which can increase or decrease investment, were tested using a panel of 114 countries over a 15-year period from 2005 - 2020. The results showed that improvements in addressing corruption can significantly contribute to increasing the rate of investment, which is an important determinant of transitional economic growth.

I.   Introduction

In the field of economics, there are few areas in which economists can come to a general consensus. Surprisingly, corruption is not one of those areas. Looking at anecdotal examples of grand-scale corruption such as Nigerian dictator Sani Abacha diverting 2 Billion USD from state oil refineries to his personal bank account or former President of Zaire Mobutu Sese Seko stealing an entire gold mining operation spanning 32,000 square miles with reserves of 100 tons of gold (Easterly, 2001) it can be difficult to imagine that corruption can have a positive effect on investment and or growth. However, because of the complex social-political, cultural, and even philosophical dimensions of corruption, that determination can only be made empirically. (Mashali, 2012)

By definition, corruption is considered to be the "misuse or abuse of public office for private gains" by the World Bank (1997) and "the misuse of entrusted power for private gain" by Transparency International[§]

Corruption takes many forms, such as acceptance of money and other rewards for awarding contracts, violation of procedures to advance personal interests, kickbacks from developmental programs or multinational corporations, pay-offs for legislative support, diversion of public resources for private use, overlooking illegal activities,

judicial interference, common theft, over- pricing, establishing non-existing projects, and tax collection and tax assessment frauds. (United Nations, 1990)

The debate concerning the role of corruption has centered around the dichotomy of "sanding the wheels" versus "greasing the wheels". The former argues that corruption clogs the system and prevents productive economic activity, while the latter theory posits that in the context of a slow bureaucracy, corruption facilitates faster action by public sector employees, enhancing economic efficiency. (Malanski & Povoa 2021).

In order to contribute to the seminal debate highlighted above, this paper follows the path of recent work that moves beyond simply analyzing the direct effects of corruption and attempts to investigate the processes by which corruption affects growth. (D'Agostino, Dunne & Pieroni, 2016). To achieve this, we have pursued the specific channel of investment. This research intends to provide evidence on more recent characteristics of the relationship between corruption and investment during the period from 2005 to 2020.

This Introduction will be followed by six subsequent sections. The second section covers the topic-specific literature that was surveyed for this research. The third section explains the methodology and the rationale for the models being estimated. The Fourth Section provides descriptions of the variables, as well as the useful features of the data and the sources of data collection. The Sixth Section describes and explains the results, and our conclusions are contained in the Final Section.

II.   Literature Review

Countries around the world have been subjected to the detrimental effects of corruption on their overall economic performance, which undermine growth and development. To address the question of whether corruption leads to favorable or unfavorable levels of growth, economists have used multiple lenses to assess the causal effect of corruption on economic activity. Existing literature shows that levels of corruption differ in affluent countries as compared to poor countries at various stages of growth, as well as vary according to levels of political stability, quality of institutions, and bureaucratic efficiency–all of which mediate how corruption may affect investment and economic growth.

Using cross-sectional data from 67 countries for the period between 1980 and 1983, Mauro (1995) presents a statistically significant, negative relationship between corruption and investment rate. He states that this relationship can be "partially" explained by political instability in countries, suggesting that higher rates of instability lead to higher levels of corruption and hence lower levels of investment and growth. He goes on to analyze the relationship between political instability and government spending and shows that in countries with high levels of corruption, government spending in areas such as education is considerably low. Evidently, poor countries are more prone to having weak institutions and thereby low levels of growth.

Looking at the relationship between foreign direct investment (FDI) and corruption, Krifa-Schneider, Matei & Sattar (2022) use data from 80 countries over the period 2003 to 2019 and find a non-linear relationship between corruption and FDI; Despite the fact that countries with low levels of corruption can be linked to more FDI, countries that have higher levels of corruption are also able to attract FDI.

Ahmed, et al (2012) support a similar, non-linear relationship between corruption and growth in a study that distinguishes between growth-enhancing and growth-reducing forms of corruption. They conclude that the relationship between corruption and economic growth is an inverted U-shaped curve–at early stages of economic growth, corruption is low and it increases as countries grow, before gradually decreasing. This finding justifies our earlier reflection on the complex and nuanced characteristics of the mechanisms through which and the conditions in which corruption may affect growth.

The non-linear relationships illustrated above are augmented to some degree by Malanski & Povoa (2021) who suggest that the assessment of additional factors is necessary to determine the level of corruption and its favorability for a particular country or context. Particularly, their study investigates the effect of corruption on levels of economic freedom in emerging markets as a determinant of growth. Using data from emerging economies in Latin America and Pacific Asia, the research concludes that high levels of economic freedom tend to curb corruption while lower levels of economic freedom have patterns that suggest that corruption may favor growth. Therefore, the suggestion by this evidence that a country's status of economic freedom can have varying effects on corruption exemplifies the conditions within which corruption may enhance growth.

Corruption leads to misallocation of investment capital, reducing both returns to investment and the likelihood of future investment. Growing evidence in the literature supports the notion that these losses in public investment weaken the ability of national institutions to curb inequality. For example, Olken (2006) examines the effect of corruption on redistribution in Indonesia by assessing an anti-poverty program. According to Olken's research, the program, which was designed to distribute subsidized rice to poor households, was unable to deliver efficient results as 18 percent of the rice never reached the deserving households. This example shows that corruption not only restricts the efforts of governments to reach out to the poor, hence limiting their ability to foster growth by reducing poverty and inequality, but also reduces public investment in areas including education and health.

Another example of misallocation leading to inefficient distribution of resources has been illustrated by Reinikka & Svensson (2004) in their study on public expenditure on education in Uganda. The authors find that budget allocation between schools is not according to regulations but according to the bargaining powers of schools. This subverts the benefits from 'targeted' public investment resulting in lower returns which complicates the mobilization of future resources for investment.

III. Methodology

We shall use the Ordinary Least Squares (OLS) Method of Regression to estimate the following models:

Model 1: This is a simplistic model, as a starting point that seeks to establish a direct relationship between Corruption and Investment controlling for the Initial Income and Initial Education considered key influencers for the observed rate of investment.

$$Y = \beta 0 \ + \ \beta corruption \ + \ \beta income \ + \ \beta educ \ + \varepsilon$$

Where;
Y-Rate of Total Investment (% of GDP)
βcorruption-effect of corruption on the total rate of investment
βincome-effect of Initial GDP per capita,2005 on the total rate of investment
βeduc-effect of Initial level of education (secondary), 2005 on Investment

Model 2: Estimate the Effect of Corruption on Total Investment controlling for other determinants of Investment i.e, Initial Education-2005, Initial Income-2005, Infrastructure Development, Credit Restrictions, Exchange Rate Controls

$$Y = \beta 0 + \beta corruption \ + \ \beta income \ + \beta educ \ + \ \beta infrastructure$$
$$+ \ \beta creditcontrol \ + \ \beta exchangecontrol \ + \ \varepsilon$$

Where;
βinfrastructure-effect of the level of digital infrastructure on investment
βcreditcontrols-effect of credit controls on investment
βexchangecontrols-effect of exchange controls on investment

Model 3: Estimate the Effect of Corruption on Total Investment controlling for other determinants of Investment using Country Dummy Variables to control for Country fixed effects which are factors that may differ across countries but which are fixed over time within a country constant across time, and, using Year Dummy Variables to control for Time fixed effects which are factors that change across time in the same way for all countries

$$Y = \ \beta 0 \ + \ \beta corruption \ + \ \beta income \ + \ \beta educ \ + \ \beta infrastructure$$
$$+ \ \beta creditcontrol \ + \ \beta exchangecontrol \ + \ \beta countrydummy$$
$$+ \ \beta yeardummy +$$

III.   Variables and Data Description

Magnitude of Corruption
"Corrupt politicians make the other ten percent look bad." - Henry Kissinger. With this statement, the famous diplomat was making a normative estimate of the degree of corruption among Politicians. This illustrates a fundamental weakness in the estimation of the magnitude of corruption i.e., we cannot have precise information on the amount of funds lost to corruption when trying to measure it at scale. As such, we rely on perceptions, as a proxy but which is still correlated strongly with actual corruption.

The Corruption Perceptions Index is compiled by Transparency International. It is a comprehensive measure of Corruption Perception of the Public Sector in 180 countries combining data from 3 reputable sources, using many surveys and assessments. Each country receives a score from 0 - 100, 0 means highly corrupt and 100 means very clean.

Rate of Investment
The total annual rate of investment was developed by summing the domestic investment, given by the Gross Capital Formation, and the Foreign Direct Investment, given by the Net Capital Inflows; each as a percentage of GDP. Gross Capital Formation consists of outlays on additions to the fixed assets of the economy, plus net changes in the level of inventories, while Net Capital Inflows are simply net inflows of investment by foreign investors. These are both World Development Indicators from the World Bank.

Education
World Development Indicator from the World Bank showing educational attainment, at least completed lower secondary, population 25+, total (%) which is the percentage of the population aged 25 years and above who have completed lower secondary education. Completion of lower secondary education has an implication for the productivity of the labor force which is a consideration to attract investment.

Gross Domestic Product (GDP) per capita, (PPP terms)
GDP is the sum of gross value added by all resident producers in the country plus any product taxes and minus any subsidies not included in the value of the product, using purchasing power parity rates. GDP per capita is the GDP divided by the total population of the country. The data was obtained from the World Bank - World Development Indicators.

Digital Infrastructure - Mobile Phone Subscriptions_per 100
Refers to the subscriptions to a public mobile telephone service and provides access to Public Switched Telephone Network (PSTN) using cellular technology. The infrastructure taxonomy has adopted digital infrastructure as a major component of infrastructure asset classification. As such, the sophistication of digital infrastructure

which can be demonstrated by the mobile phone penetration is measured by the mobile phone subscriptions per 100 people. The Data is from the World Bank - World Development Indicators.

Credit Controls

This refers to restrictions within the credit market either in form of caps. The data was gathered from the IMF database, and the indicator uses a qualitative measure with YES meaning that these controls are present in a country, and NO means they are not present in a country. We converted the measures to a quantitative standard by assigning the numerical value 1 to NO, and 0 to YES. The credit environment can influence the movement of capital and is therefore a consideration for investors seeking affordable and accessible credit markets.

Currency Controls

This refers to restrictions on Currency Exchange and/or multiple currency practices. The data was gathered from the IMF database, and the indicator uses a qualitative measure with YES meaning that these restrictions are present in a country, and NO means they are not present in a country. We converted the measures to a quantitative standard by assigning the numerical value 1 to NO, and 0 to YES. Multiple currency practices affect the predictability of returns to investment and thus influence the decision to invest by the private sector. (Klein, 2012)

IV.   Results

Table 1: The Effect of Corruption on the Investment rate

VARIABLES	(1) Total_Investment	(2) Total_Investment	(3) Total_Investment
Corruption_CPI	0.1125**	0.1011	0.4906***
	(0.0564)	(0.0617)	(0.1733)
GDP_percapitaPPP_2005	-0.0000	-0.0001	-0.0002
	(0.0001)	(0.0001)	(0.0002)
Initial_Education__2005	0.0497***	0.0490***	0.1903**
	(0.0172)	(0.0170)	(0.0761)
Credit_Controls		0.5125	-4.6064***
		(0.9524)	(1.0919)
currency_controls		2.4175**	2.3569*
		(0.9391)	(1.2880)
Mobile_subscriptions_per100		-0.0025	0.0256
		(0.0123)	(0.0182)
Constant	21.6320***	20.1455***	11.9009*
	(1.4744)	(1.6114)	(7.0807)
Observations	1,759	1,759	1,759
R-squared	0.0147	0.0167	0.4042
Country Effects	No	No	Yes
Year Effects	No	No	Yes

Robust standard errors in parentheses   *** $p<0.01$, ** $p<0.05$, * $p<0.1$

From the above Table, we note as follows:

Model 1 shows a statistically significant (at the 95% level) positive correlation between corruption and Investment estimating that 1 unit improvement in the CPI will result in 0.1125% increase in the rate of Investment.

Model 2 shows a statistically insignificant positive correlation between corruption and Investment estimating that 1 unit improvement in the CPI will result in 0.1011% increase in the rate of Investment.

Model 3 shows a statistically significant (at 99% level) positive correlation between the level of corruption and the rate of investment, estimating that a 1-unit improvement in the CPI, will result in a 0.4906% increase in the overall rate of investment.
The model also estimates a significant negative relationship between Currency Controls and Investment, showing that currency controls disincentivize investment.

The results of the third and final model are largely consistent with theoretical predictions based on previous literature that indicate that corruption hinders economic growth. This aligns with the most widely observed argument in media and other arenas of the public discourse. These results ultimately support the hypothesis of "sanding the wheels", or that high rates of corruption distort the economic system and reduces the growth of a country (Afonso & Rodrigues, 2021). Our research findings specify one form of distortion by demonstrating the negative effect that corruption has on the rate of investment.

Conclusion

Although economists have debated the direction and the scope of the relationship between corruption and economic growth, the results from this research primarily highlight that a possible mechanism of the observed reducing effect of corruption on growth is through the channel of reduced investment.

The findings imply that, across many countries in the world, efforts to reduce competition will be beneficial for increasing the rate of investment in a country. This can have a meaningful impact on growth that creates jobs, reduces poverty, and improves the quality of life. Indeed, corruption can be viewed as a growth constraint and must be combatted enthusiastically to enable countries to reap the economic benefits of increased investment.

However, the research is limited by the fact that the study did not make material distinctions between groups of countries that share substantially similar characteristics. Such an exercise may have aided in a more nuanced understanding of how other characteristics could be influencing corruption, investment, and their relationship.

Finally, this research gives rise to additional questions for further study that can enrich the debate on corruption. Particularly, there is a need for a more granular evaluation using country groups to examine what characteristics, besides the level, can make the effect of corruption on investment more or less impactful.

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