Understanding the international trade-corruption linkage: taking stock and moving forward

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Abstract
The impact of trade on corruption has been well documented in the literature. While many studies have shown that greater trade openness mitigates corruption among trading partners, there are studies that has raised doubts against this claim. In this paper, I explore this claim for a large sample of developing countries and find that the effect of trade openness on the level of corruption is largely insignificant. The claim however is general and is not indicative of the undesirability of trade openness and globalization. However, it does call for some precaution and monitoring as trade openness alone is not the panacea for controlling corruption.

"It's just as difficult to detect an official's dishonesty as it is to discover how much water is drunk by the swimming fish." Chanakya, (c. 340-293 BC, Arthaśāstra)

1. Introduction

Corruption has been identified by researchers as the greatest obstacle for socio-economic development of a country. A high level of corruption is detrimental to poverty reduction, distorts rule of law and weakens countries' institutional foundation. In 2008, the World Bank allocated around 18.8 percent of its total lending budget for improving public sector governance in various countries and projects across the world. Yet the Bank's corruption indicators reveal that corruption still prevail to be the most compelling factor plaguing developmental initiatives in developing and poor nations.

Since the 1960s, scholars have been trying to enumerate the costs and benefits of corruption on development. Earlier notions advanced by Leff (1964) and Huntington (1968) held that corruption can be efficiency-enhancing because it removes government-imposed rigidities that impede investment and interfere with other economic decisions favorable to growth. This view is succinctly captured in the notion that corruption "greases the wheels of trade." As Huntington states "In terms of economic growth, the only thing worse than a society with a rigid, overcentralised, dishonest bureaucracy is one with a rigid, overcentralised, honest bureaucracy." However, the consensus on the negative effects of corruption prevailed in the literature.

Researchers agree that though corruption may be beneficial in isolation, its cumulative effect in the long run is destructive. Corruption has been shown to reduce economic growth (Mauro 1995), distort governmental expenditures (Mauro, 1998), retard foreign investment (Wei, 2000) and reduce the effectiveness of foreign aid (PSRA 2003). The importance of combating corruption has increased along with globalization. Post globalization, corruption is more of trans-national nature and calls for new and strengthened international responses to deal with it. Seldadyo and Haan (2006) in a detailed analysis find welfare level to be an important determinant of corruption levels in a country. They also find that quality of the government, military and institutions (like political freedom, judiciary, information etc) are robust determinants of corruption level.

While the significance of corruption in the broader developmental context has been studied extensively, a particular strand of literature focuses specifically on the connection between corruption and international trade. Considering that trade openness has been the major outcome of

globalization, it is interesting and important to investigate how corruption and international trade impact each other.

Researchers have looked into the problem from either side; how corruption impacts trade and vice versa. Olson (1965) argues that given the endogenous nature of trade policy, the government often chooses policies of protectionism under lobbying pressures from special interest groups. Similarly, the "protection for sale" model propounded by Grossman and Helpman (1994) elucidates on the strategic interactions between the government and special interest groups. Along the same line Bandyopadhyay and Roy (2007) finds that corruption coupled with lack of contract enforcement reduces trade openness in countries. While the above mentioned works concentrate on how corruption affects trade, some other works look at the interesting issue of how international trade in turn affect levels of corruption. Wei (2000) argues that countries that are smaller in size and have a "natural" propensity to trade, invest more in improving institutions and thus have lower levels of corruption. Ades and Di Tella (1999) point out that competition from foreign firms reduce rent seeking possibilities of domestic firms and thus reduce corrupt behavior of government officials. Knack and Azfar (2003) however argues that such results are driven strongly by sample selection bias. We reinvestigate this association for a large sample of developed and developing countries and reach conclusions which support Knack and Azfar's findings.

The findings show that there is no significant association between trade openness and corruption. I test this result with alternate specifications and inclusion of various controls. The results remain robust to all these alternate specifications. In what follows, Section 2 elaborates on the previous literature in the corruption-trade-development context. Section 3 explains our data and methodology. Section 4 explains our empirical results and Section 5 concludes the study.

2. Determinants of Corruption: Extant Literature Revisited

The adverse effects of corruption have been widely recognized both among the policymakers as well as among the academic researchers. Mauro (1995) shows that corruption leads to low growth rates and is further associated with distorting the composition of government expenditure. In the same line, Kauffman et al (1999) elucidate that corruption hampers the distributional efficiency since it disproportionately hurts the poor. Thus governments across a range of countries have devised strategies to fight against this social, political and economic malice.

The theoretical literature and anecdotal evidence suggests a set of determinants that influences the level of corruption. A substantial body of research has pointed out that the degree of trade openness, income and income distribution, and size of the public sector as the key economic factors that change the corruption level in a country. Krueger's (1974) seminal paper showed that quantitative trade restrictions shift resources from directly productive activities to unproductive rent seeking activities. Bhagwati and Srinivasan (1980) further expand the analysis to revenue seeking, where economic agents try to get a slice of the tariff revenue resulting from the adoption of a protectionist tariff. Bhagwati (1982) provides a brief literature review of the effect that trade restrictions have on what he calls directly unproductive, profit seeking activities.

Although there has been a proliferation of research in this area from a conceptual perspective, only a handful of studies have examined the impact of trade openness on corruption until recently. Ades and Di Tella (1997) find that the implementation of industrial policies favoring certain industries increases corruption. Studies like Gurgur and Shah (2005), Brunetti and Weder (2003) and Knack and Azfar (2003) support the finding of Ades and Di Tella (1997) and exhibit a negative relationship between trade openness and corruption.

The majority of the empirical evidence supports a negative relationship between corruption and openness, but the relationship does not always hold when using large data sets. There is a negative and moderately significant correlation between the corruption data and a measure of trade intervention put forth by Leamer (1988). There exists a scanty literature (Graeff and Mehlkop (2003); Paldam (2001)) that finds a positive relation between trade openness and corruption. Therefore,

despite the strong presumption in the theoretical literature that trade openness decrease corruption, the empirical evidence is inconclusive.

Among the socio demographic factors, schooling and population are closely associated with corruption. Economies with high human capital (proxied by years of schooling) have low levels of corruption (Ali and Isse (2003); Brunetti and Weder (2003); Van Rijckeghem and Weder (1997)). However, a counter-intuitive finding can be noted in Frechette (2001) who, using panel data models with fixed effects finds that schooling aggravates corruption levels. Similar conflicting evidence is found for a country's population. Knack and Azfar (2003) show that as population increases, corruption also rises, while Tavares (2003) reports that population negatively affects corruption.

There is a general consensus that democracy reduces corruption since it mitigates corruption by making the political parties more accountable to the electorate and/or by enabling the press to operate freely (Kunicova and Rose-Ackerman, 2005; Brunetti and Weder, 2003). However, there are aspects in democratic elections that may create opportunities for corruption as noted by Kunicova and Rose-Ackerman (2005) and Persson and Tabellini (2003). Political instability on the other hand is generally accepted to have increase corruption (Park, 2003; Leite and Wiedmann, 1999).

It is pertinent to note that bureaucracy and regulatory framework plays a key part in controlling corruption (Becker, 1968). The role of the legal system and the rule of law have featured prominently in many recent studies on the quality of governance and its consequences for development (Easterly and Levine, 1997; North, 1990). Strong legal foundations and efficient legal systems with well-specified entry deterrents protect property rights and provide a stable framework for economic activity. But legal systems may differ in the degree to which property rights are protected and in the quality of government they provide. The extant empirical literature suggests that the common law system, mostly found in the former colonies of Britain, appear to have better protection of property rights compared with the civil law system typically associated with the former colonies of continental Europe (La Porta et. al., 1998).

Qualitative attributes of a society like the major religion and the cultural origin are also crucial in explaining corruption. Studies like Chang et al. (2004), Bonaglia et al. (2001), Treisman (2000), La Porta et al. (1999) observe that Countries with many Protestants tend to have lower corruption levels. Paldam (2001) observes that countries dominated by two religions, namely Reform Christianity (e.g., Protestant and Anglican) and Tribal religions, tend to have lower levels of corruption compared to countries in which other religions dominate.

Among cultural variables, colonial heritage that captures 'command and control habits and institutions and the divisive nature of the society left behind by colonial masters' (Gurgur and Shah, 2005, p. 18) also found to be associated with corruption. The evidence on the significance of this variable is, however, mixed. Countries that are former colonies tend to suffer from corruption (Gurgur and Shah, 2005; Tavares, 2003). Persson et al. (2003) measure the influence of colonial history by dividing all former colonies into three groups, namely British, Spanish-Portuguese, and other colonial origin, and define three binary indicator variables for these groups. They find that former British colonies tend to have a lower current propensity for corruption. The observation is further supported by Herzfeld and Weiss (2003) who find that former British colonies have lower levels of corruption.

In sum, the association of trade openness and corruption is still very inconclusive in the relevant extant literature and I hypothesize the following:

Hypothesis: The causal effect of trade openness on corruption is relatively insignificant.

3. Data Description

Data for my analysis has been taken from different sources. The main dependent variable of the paper, corruption, has been taken from International Country Risk Guide (ICRG) database. This database is prepared by Political Risk Services (PRS). They have come up with several indexes which assess political, economic or social risk of a country. Corruption is one such index which falls under

the category of Political risk. In general for assessing the political stability of a country, risk points are assigned to pre-selected factors which are categorized as political risk components. Each index of political risk consists of several such components. Each component gets assigned a minimum and a maximum number – the minimum it can get is zero and the maximum number depends on the fixed weight that the component gets in the overall risk assessment. To summarize, lower points to a risk indicator implies greater risk and higher number denotes the opposite.

The corruption indicator aims to measure corruption within the political system. The ICRG database talks about the different types of corruption which has been considered while constructing the index. Financial corruption is mostly faced by business people and it takes the form of bribes to acquire import and export licenses, tax assessments, police protections or loans. ICRG takes all of these into account. But the other forms of corruption which are given more importance are 'corruption in the form of excessive patronage, nepotism, job reservations, 'favors-for-favors', secret party funding, and suspiciously close ties between politics and business. According to PRS, these potential forms of corruption are of greater threat to foreign business. The index varies from 0 to 6 with 0 representing a high risk situation and 6 representing the minimum risk situation.

The initial specifications empirically try to assess the impact of trade openness on corruption. The data source for trade openness is World Development Indicators (WDI), 2006. It is measures by the sum of imports and exports divided by gross domestic product (GDP). The other controls which are considered from WDI are GDP per capita, GDP growth, telephones mainlines per 1000 individuals and urban population. Among these, GDP is used as a measure of economic well being and GDP per capita and growth are used simultaneously to test for convergence. Telephone is used as a proxy for infrastructure. Better infrastructural facility might help to reduce corruption.

I use regional dummy variables as a set of controls in our specification. These will control for any regional biases. The classifications of countries which fall under the different regions have been taken from World Bank. The dummies considered are Sub-Saharan Africa (SSA), Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), East Asia and Pacific (EAP), Europe and Central Asia (EAC) and South Asia (SA). So countries in SSA might have higher levels of corruption, which, the particular regional dummy should take in to account.

Further, I consider legal origin dummies. Legal rules protecting investors' rights in countries have been shown to be crucial determinants of growth in countries. La Porta et.al (1998) recognized in this context that laws in different countries are not written down from scratch but are usually implanted. Thus I consider dummies for English Common Law, French Civil Law, Scandinavian Law and German Law. While the legal origin dummies are used as proxies of legal institutions, I use polity from Polity IV project as a proxy of political institutions or the extent of democracy/ autocracy of a nation. I also use religion affiliation variables additional controls in our specifications. These are taken from Shleifer et al. (2004) database. Finally, I include a dummy for ex-colony countries, the data for which is taken Acemoglu, Johnson and Robinson (2001) database.

4. Empirical Methodology and Results

The initial set of empirical specifications aims to explore the impact of trade openness on corruption. These specifications actually re-investigate the association between trade and corruption. As discussed extensively in the Section II, a wide range of studies have explored the association between these two variables. I revisit the robustness of the association by including a wide range of controls.

Ordinary least square (OLS) specifications will result in biased estimates. This is because of the presence of endogeneity in the specifications. While trade openness may affect corruption, corrupt countries may also end up trading more with each other and, thus, corruption in that case becomes a determinant of trade openness. Thus, there are possible chances of reverse causation in the specifications. To get rid of such bias, I run two-stage-least squares (2SLS) specifications. The main hurdle while running such specifications is that of finding efficient instruments. Efficient

instruments should be exogenous in nature – they should be correlated with trade openness but should be uncorrelated with corruption. Fortunately, the literature has identified some variables as instruments for trade openness. The variables are land area of a country and a dummy representing whether the country is a landlocked country.

To estimate the overall effect of trade openness on corruption, I begin with the following 2SLS model using our panel of 141 developing countries for the years from 1985-2003:

$$Trade_{it} = \alpha_0 + \alpha_1 land\ area_{it} + \alpha_2 landlockeddummy_i + \alpha_3 \mathbf{X}_{it} + \varepsilon_{it} \quad (1)$$

$$Corruption_{it} = \beta_0 + \beta_1 Trade_{it} + \beta_2 \mathbf{X}_{it} + \eta_{it} \quad (2)$$

Equation (1) is the first stage of the 2SLS procedure, where Equation (1) is the first stage of our 2SLS procedure, where $Trade_{it}$ is our regressand and measures country *i*'s Trade openness, which is imports + exports over GDP, time *t*. The independent variables in this equation are my instruments for trade discussed above, which include land area and a dummy for land locked countries. These are exogenous instruments. $\mathbf{X}_i$ is a vector of covariates that also affect countries' corruption levels, which includes regional dummies, legal origins of countries, GDP per capital, GDP growth, and number of telephones per 1000 individuals, urban population and years of schooling. ε_{it} is a random error term.

Equation (2) is the second stage of my 2SLS procedure. It uses instrumented trade from equation (1) to estimate trade's effect on corruption level of countries. $Corruption_{it}$ is my main explanatory variable, which measures the extent of corruption in country *i* at time *t*. Interpreting the coefficient on my variable of interest, β_1, is straightforward. If trade openness reduces corruption, this term should be positive and significant. If trade openness aggregates corruption, it should be negative and significant. $\mathbf{X}_i$ is a vector of covariates that includes regional dummies, legal origins of countries, GDP per capital, GDP growth, and number of telephones per 1000 individuals, urban population and years of schooling. η_{it} is a random error term.

Table 1: IV Regressions - The Impact of Trade Openness on Corruption
Dependent Variable: Corruption

Independent Variables	(1)	(2)	(3)	(4)
Trade Openness	0.00117	0.00248	0.00234	0.000619
	(0.00180)	(0.00168)	(0.00162)	(0.00127)
Legal Origin Dummies	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes
GDP per capita (in million)	85.7***	21.4***	23.7***	9.09
	(5.75)	(8.00)	(8.51)	(9.82)
GDP Growth	0.00614	0.00636	0.00642	0.0215***
	(0.00508)	(0.00526)	(0.00522)	(0.00625)
Telephone		0.00373***	0.00374***	0.00224***
		(0.000309)	(0.000307)	(0.000390)
Urban Population			-0.00159	0.00716***
			(0.00156)	(0.00166)
Years of Schooling				0.0719***
				(0.0192)
Intercept	2.758***	2.009***	2.082***	2.095***
	(0.256)	(0.241)	(0.228)	(0.244)
Observations	2218	2216	2216	1698

R-squared	0.513	0.538	0.539	0.618
Sargan Test	p = 0.44	p = 0.92	p = 0.80	p = 0.11
Basmann Test	p = 0.45	p = 0.92	p = 0.80	p = 0.11

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

Note: All specifications are run with year dummies. They have not been reported.

Table 1 presents the first set of results. I control for legal origins, regional dummies, Gross Domestic Product (GDP) per capita and GDP growth. These controls are included in the results specified in column (1). The coefficient of trade openness is positive but not significant. This is consistent with the findings of Knack and Azfar (2003) who claim that results of previous studies confirming the presence of significant association between trade openness and corruption are driven by sample selection bias. For the present study, as mentioned previously, a large sample set has been considered to minimize the sample selection bias. I find the association to be non-significant.

Most of the legal origin dummies and regional dummies are negative and significant. This seems reasonable because countries classified under various regional categories are usually corrupted and have poor institutions. Similarly, English common law of French civil law countries usually have corrupted climate. The coefficient of GDP per capita is positive and significant while that of growth is positive by not significant. Thus, higher level of economic development is associated with lower levels of corruption. In Columns (2), (3) and (4) of Table 1, we add the controls number of telephones per 1000 individuals, urban population and years of schooling. Higher years of schooling, which are indicative of high levels of education in a country, are positively associated with corruption. The proxy for infrastructure, telephone, also works towards lowering corruption. The R-squares of all the specifications are decent ranging from 0.51 to 0.62. Further, for all the specifications, I run over-identification tests which indicate the efficiency of the instruments used. The p values of Sargan and Basmann show that the over-identification restrictions cannot be rejected at well above conventional levels. In all specification we controls for year effects.

Table 2: GMM Regressions - The Impact of Economic globalization on Corruption
Dependent Variable: Corruption

Independent Variables	(1)	(2)	(3)	(4)
Economic globalization	0.00120	0.00249	0.00235	0.00235
	(0.00180)	(0.00168)	(0.00162)	(0.00162)
Legal (UK)	-1.222***	-0.850***	-0.841***	-0.841***
	(0.0910)	(0.0825)	(0.0813)	(0.0813)
Legal (France)	-1.265***	-0.839***	-0.822***	-0.822***
	(0.0845)	(0.0835)	(0.0851)	(0.0851)
Legal (Scandinavian)	-0.613***	-0.213	-0.205	-0.205
	(0.133)	(0.132)	(0.132)	(0.132)
Legal (German)	-0.957***	-0.792***	-0.798***	-0.798***
	(0.0936)	(0.0952)	(0.0948)	(0.0948)
SSA	-0.0369	0.219*	0.190	0.190
	(0.133)	(0.125)	(0.121)	(0.121)
EAP	-0.347***	-0.196*	-0.207*	-0.207*
	(0.113)	(0.108)	(0.108)	(0.108)
ECA	-0.347***	-0.463***	-0.455***	-0.455***
	(0.125)	(0.125)	(0.126)	(0.126)
LAC	-0.171*	-0.0120	-0.00725	-0.00725
	(0.103)	(0.0978)	(0.0994)	(0.0994)

MENA	-0.00945	0.121	0.126	0.126
	(0.105)	(0.103)	(0.103)	(0.103)
SA	-0.405*	-0.105	-0.146	-0.146
	(0.208)	(0.199)	(0.190)	(0.190)
GDP per capita	8.55e-05***	2.13e-05***	2.35e-05***	2.35e-05***
	(5.74e-06)	(7.98e-06)	(8.50e-06)	(8.50e-06)
GDP Growth	0.00620	0.00636	0.00644	0.00644
	(0.00508)	(0.00526)	(0.00522)	(0.00522)
Telephone		0.00373***	0.00375***	0.00375***
		(0.000308)	(0.000306)	(0.000306)
Urban Population			-0.00161	-0.00161
			(0.00156)	(0.00156)
Years of Schooling	2.761***	2.009***	2.083***	2.083***
	(0.256)	(0.241)	(0.228)	(0.228)
Observations	2218	2216	2216	2216
R-squared	0.513	0.538	0.539	0.539
Hansen J Test	p = 0.43	p = 0.92	p = 0.80	p = 0.80

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

Note: All specifications are run with year dummies. They have not been reported.

It is quite likely that there can be presence of intra-group correlation. In that case, though IV estimators will be consistent the usual robust standard deviation may not be consistent. So in C Table (2), I run generalized method of moments (GMM) specifications. The conclusions remain unchanged. The coefficient of trade openness is positive and not significant for all the specifications.

5. Conclusion and Future Research

This paper investigates the impact of trade on corruption in the context of a cross-country setting. Results in the extant literature are still inconclusive. Using a panel data set of 141 countries from 1985-2003, I find that the hypothesis that greater trade openness reduces bureaucratic corruption is not empirically substantiated. My finding does not necessarily rule out the importance of engaging to a greater level of international trade flows from a developing country's perspective, it reflects that trade alone is unable to arrest the corruption that stems from complicated and hierarchical bureaucracy. High country level corruption linked to trade originated from bureaucratic or red tape controls. Greater openness means more trade as percentage of GDP. That is to say, the volume/value of trade must have increased. Number of traders may also have increased, implying that if the number of traders is large then profit from trading tends to competitive solutions. Then the rent available at some traders' disposal previously must fall and the level of bribes must fall too; sure the overall bribe payments may remain same due to large number of firms now operating. Even then, per firm bribe payment must fall. Well, for a large cross country sample the overall impact may not be visible since the impact on bureaucratic corruption is indirect. Hence, the paper calls for more micro level studies in analyzing the trade-corruption linkage.

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