

Does quality of openness affect corruption?

“A rotten apple spoils the barrel.” (English proverb)

“If you go with the lame, you will learn to limp.” (Italian proverb)

“Whoever sleeps with a blind-man wakes up crossed-eyed.” (Turkish proverb)

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Abstract

We propose and construct a quality of openness index, and demonstrate its impact on corruption. The results indicate that the quality, as well as the level of openness, can have a significant impact on corruption.

Key Words: Openness; Corruption

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1 Introduction

Corruption, i.e., using public office for private gain, undermines economic development and damages social stability.¹ Currently, the IMF and the World Bank are pushing for various reforms and international agreements aimed at eradicating corruption. Meanwhile, the causes and consequences of corruption are enjoying an unprecedented level of attention from researchers. A typical cross-country analysis of corruption refers to one simple question: why do countries have different degrees of corruption?² A reliable and accurate answer to this question would aid greatly in designing policy to reduce corruption. One of the proposed answers is the following: Countries which are more open—with a higher ratio of total trade (exports and imports) to GDP, may have lower levels of corruption.³ In essence, this answer focuses on the quantity of trade, or level of openness. In this paper, we hypothesize that the “quality of openness” as well as the “level of openness” matters. That is, although an increased level of openness reduces corruption, corruption is reduced even further when the same amount of trade is conducted with a less corrupt trading partner.

In this paper, we are analyzing short-run behavior. First, companies choose to have trade relationships with particular foreign partners based purely on “economic factors” such as costs, prices, convenience, availability, and quality. In other words, in this matching game, concern for corruption is not paramount. For instance, an Indian company that imports apples will choose its foreign supplier based on cost. Therefore, if it costs less to import the same apples from Bangladesh instead of Finland, then the company will pick the Bangladeshi apple exporter. Once

¹ For details, see Bardhan, (1991), Gupta, Davoodi, and Alonso-Terme (1998), Klitgaard (1998), Mauro (1997); Rose-Ackerman (1999); Tanzi and Davoodi (1997), and World Bank (2000).

² For recent explanations, see Chowdhury (2004) on democracy and political freedom; Tavares (2003) on foreign aid; Dollar, Fishman and Gatti (2001) and Mukherjee and Gokcekus (2004) on gender.

³ According to Benaglia, de Macedo, and Bussolo, 2001, there are three identified channels through which the level of economic openness reduces corruption: (i) fewer and less stringent trade restrictions (e.g., Krueger, 1974 and Gatti, 1999); (ii) increased foreign competition (e.g., Ades and di Tella, 1999); and more international investors (e.g., Wei, 2000).

the matching is completed, Indian and Bangladeshi partners will start working together—interacting with each other—to deliver the apples they agreed upon. It is during this interaction that companies’ corrupt (or perhaps non-corrupt) behavior will surface and eventually influence their partners’ behavior. Consequently, the quality of openness depends on how corrupt the trading partners are.

2 Quality of openness index

Accordingly, two components are required to calculate the proposed quality of openness index—i.e., IQO: (1) quality of exposure—the levels of corruption of a country’s trading partners; and (2) quantity of exposure—each trading partner’s importance to a specific country in relation to other trading partners. Thereby, it is assumed that the larger the percentage of trade a country has with an individual trading partner, the more exposed it will be to that trading partner’s corruption. Thus, the IQO is determined by the following:

$$IQO_i = \frac{\sum_{j=1}^N CI_j (EX_j + IM_j)}{\sum_{j=1}^N (EX_j + IM_j)},$$

where IQO_i is the quality of openness index for country- i ; CI_j is the level of corruption in country- j ; EX_j is the value of exports to country- j from country- i ; and IM_j is the imports from country- j to country- i . In constructing the IQO indices, we use Transparency International’s Corruption Perceptions Index (CPI) as our level of corruption indicator. The CPI measures levels of perceived corruption in different countries on a scale from 0 to 10, with a larger number indicating a lower degree of corruption. (For details, see Lambsdorff, 2004, 282-287). EX_j and IM_j for these 133 countries are in U.S. dollars.⁴

⁴ For further information on this variable, see <http://unstats.un.org/unsd/comtrade/help/FirstTimeUser.aspx> --which was accessed at December 5, 2004; and for the description, source and range of these and other variables, see Appendix, Table A 1.

3 Quality of openness versus corruption: Results

Does the quality of openness affect corruption? To answer this question, we employ regression analysis and conduct a series of robustness checks. Our sample includes all 133 countries in Transparency International's CPI. Table 1, Column 1 reports the OLS regression of the CPI for 2003 on IQO. It suggests that quality of openness has a significant impact on corruption.

3.1 Robustness analysis: Additional variables

First, we add 'actual' level of openness—ratio of total trade (exports and imports) to GDP. As Column 2 shows, an increased level of openness significantly reduces corruption. Yet, an increased quality of openness and its positive effect on reducing corruption remains statistically significant. Second, income per capita is taken into account. We do this despite potential identification problems associated with including income as an explanatory variable. (e.g., Chowdhury (2004), p.95). We use per capita income in constant 1995 dollars for the year 2000. As columns (3) and (4) show, an increase in per capita income significantly reduces corruption. Including income, however, does not change the earlier results. Although the estimated magnitude for IQO's effect on CPI diminishes, it remains statistically significant. The same holds for the level of openness. Third, we put a set of four demographic variables next to the IQO.⁵ These are (i) the ethno linguistic fragmentation index (ELF, higher numbers, indicate a more heterogeneous society); (ii) Press freedom (Freedom House's press freedom index in which higher numbers indicate low voter knowledge); (iii) Percent protestant—religious affiliation; and (iv) British colony—whether the country has a colonial past. As Column 5 indicates, high levels of ELF (very heterogeneous societies) and low levels of Press Freedom increase corruption, while possessing a colonial past and having a high percentage of Protestants reduce corruption. The

⁵ Obviously, there are unlimited number of variables influencing corruption and openness. However, we include the variables that are recently utilized in the empirical literature.

high quality of openness holds its favorable effects on corruption. In Column 6, when we include the level of openness in this set, the estimated coefficient of IQO is still statistically significant. Fourth, we control regional characteristics. We do this by using six regional dummies: EAP, ECA, LAC, MENA, SA, and SSA (based on World Bank Classification). Column 7 indicates that there are significant regional differences, income has a beneficial effect, and quality of openness significantly reduces the level of corruption. However, in Column 8, including the level of openness turns the estimated coefficient of IQO insignificant.

3.2 Robustness Analysis: functional form, corruption index and endogeneity

As is presented in Table 2, we conduct further robustness analysis to check the appropriateness of linear functional form, the sensitivity of the findings to the selection of CPI as the corruption indicator and the possible endogeneity and measurement errors. We rerun the regressions in Columns 1 and 2 and present them in Column 9 and Column 10. Imposing logarithmic functional form on the data does not change the result that both quality and level of openness have a significant effect on corruption. However, the goodness-of-fit in logarithmic models are not as good as in linear models: Adjusted R^2 s are lower when we use logarithmic functional form.

To check the sensitivity of our findings to the selected corruption index, we rerun the regressions in Columns 1 and 2 by replacing the CPI index with the International Country Risk Guide (ICRG) corruption index: As Column 11 and Column 12 show, the results hold with these specifications. However, the adjusted R^2 s diminish. Accordingly, we continue our analysis by using linear functional form and CPI.

To address endogeneity and measurement error issues, we separate the ‘actual’ from the ‘expected’ level of openness, and we use instrumental variables for press freedom and per capita income. First, we calculate fitted level of openness as a linear function of level of income and geography, i.e., distance from equator, and subtract these fitted values from actual levels of

openness. Second, as in Chowdhury (2004, p. 99) we use ELF and common law system as instruments for press freedom, and latitude and Colonial Past for income. Column 13 presents the results for quality and level of openness and instrumented press freedom. Both the quality of openness and press freedom have a significant impact on corruption but the level of openness does not. Column 14 indicates that the quality and level of openness as well as income have a positive impact on corruption. Finally, as Column 15 shows, as in the case of OLS regressions, the quality and level of openness, a free and open press, and high income levels all serve to reduce corruption.

4 Conclusions

Our findings suggest that both the quality and the level of openness have significant negative impacts on corruption. These findings are robust. The results do not depend on the choice of functional form, the index of corruption, or the addition of a number of other relevant variables. Although the findings in this paper are subject to usual endogeneity and measurement errors, they are still telling: interacting with less corrupt trade partners leads to lower corruption levels. On a policy level, we may say that since most of the world trade is instigated by businesses from developed countries, it is important that they exercise corporate responsibility both within the national borders of the developed countries and in the world markets.

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Table 1

Quality of openness and corruption: OLS regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quality of openness	1.390 ^{***}	1.300 ^{***}	0.318 ^{**}	0.296 ^{**}	0.528 ^{***}	0.368 [*]	0.292 ^{**}	0.198
	(0.203)	(0.198)	(0.126)	(0.132)	(0.210)	(0.206)	(0.146)	(0.137)
Level of openness		1.247 ^{***}		0.752 ^{***}		1.324 ^{***}		1.176 ^{***}
		(0.405)		(0.242)		(0.371)		(0.259)
Press freedom					-0.037 ^{***}	-0.036 ^{***}		
					(0.007)	(0.007)		
ELF					-0.016 ^{***}	-0.019 ^{***}		
					(0.006)	(0.005)		
Percent Protestant					0.021 ^{***}	0.024 ^{***}		
					(0.008)	(0.008)		
British Colony					0.615 [*]	0.704 ^{***}		
					(0.338)	(0.338)		
Per capita income			0.155 ^{***}	0.155 ^{***}			0.126 ^{***}	0.111 ^{***}
			(0.010)	(0.009)			(0.015)	(0.014)
<i>Regional Dummies</i>								
EAP							-1.163 ^{**}	-2.127 ^{***}
							(0.483)	(0.495)
ECA							-1.023 [*]	-1.715 ^{***}
							(0.530)	(0.514)
LAC							-1.063 ^{**}	-1.357 ^{***}
							(0.513)	(0.479)
MENA							-0.520	-0.919 [*]
							(0.509)	(0.480)
SA							-1.797 ^{**}	-1.923 ^{***}
							(0.731)	(0.677)
SSA							-1.369 ^{**}	-1.791 ^{***}
							(0.537)	(0.506)
Constant	-4.161	-4.442	1.098	1.224	2.944	3.071	2.367	2.674
Adjusted R ²	0.262	0.307	0.758	0.773	0.483	0.528	0.770	0.803

Values in parentheses are the respective standard deviations. ^{***}, ^{**}, ^{*} indicate level of significance at 1% or better, 5% or better, or 10% level (two-tailed) or better respectively.

Table 2

Quality of openness and corruption: Different functional forms, corruption index, and IV estimates

	(9) ln	(10) ln	(11) ICRG	(12) ICRG	(13) IV	(14) IV	(15) IV
Quality of openness	1.647***	1.536***	0.806***	0.771***	0.931***	0.641***	0.408**
	(0.267)	(0.263)	(0.200)	(0.200)	(0.210)	(0.183)	(0.187)
Level of openness		0.180***		0.384*	0.564	0.748**	0.798**
		(0.065)		(0.230)	(0.427)	(0.341)	(0.355)
Press freedom					-0.039***		-0.027***
					(0.008)		(0.007)
Per capita income						0.130***	0.113***
						(0.015)	(0.015)
Constant	-1.635	-1.333	-0.188	-0.326	-1.435	0.389	1.752
Adjusted R ²	0.222	0.260	0.110	0.123	0.401	0.547	0.589
Instruments					ELF	Latitude	ELF
					Common Law	British Colony	Common Law
							Latitude
							British Colony

Values in parentheses are the respective standard deviations. ***, **, * indicate level of significance at 1% or better, 5% or better, or 10% level (two-tailed) or better respectively.

Appendix

Table A 1 Description of Variables and their Sources

Variable and [range]	Explanation and Source
<p>Corruption [0-10: the bigger the index the lower the corruption]</p>	<p>Corruption Perceptions Index 2003 or most recent available data. <i>Source: Transparency International; and International Country Risk Guide for corruption, March 2004.</i></p>
<p>Imports</p>	<p>Commodity imports to individual countries for the year 2000 (in U.S. dollars.). <i>Source: UN Comtrade Database.</i></p>
<p>Exports</p>	<p>Commodity exports from individual countries for the year 2000 (in U.S. dollars.). <i>Source: UN Comtrade Database.</i></p>
<p>GDP/Capita</p>	<p>GDP per capita, in constant 1995 US\$, for the year 2000. <i>Source: World Bank, World Development Indicators 2002.</i></p>
<p>Percentage Protestant [0-100]</p>	<p>Percentage of population that is Protestant in the year 2000. <i>Source: World Christian Encyclopedia 2001.</i></p>
<p>Former British Colony or United Kingdom [0,1: 1 if British colony, 0 otherwise]</p>	<p><i>Sources: Treisman, 2000, "The causes of corruption: a cross-national study;" and supplementary data from Grier, 1997, "The effect of religion on economic development: A cross national study of 63 former colonies;" as well as from http://flagspot.net/flags/gb-colon.html.</i></p>
<p>Ethno-linguistic Fractionalization [0-100: the bigger the index the bigger the ELF]</p>	<p>Likelihood that two people are members of the same ethno-linguistic group in the years prior to 2000. <i>Sources: Mauro, 1995, "Corruption and growth;" and supplemented with data from the World Christian Encyclopedia 2001.</i></p>
<p>Press Freedom [0-100: the bigger index the lower the freedom]</p>	<p>Degree of press freedom in a country. <i>Source: Freedom House, Press Freedom Survey 2000.</i></p>
<p>Regional Dummies</p>	<p>Regional classification introduced by the World Bank. <i>Source: http://www.worldbank.org/data/countryclass/classgroups.htm.</i></p>