Development and Corruption in Asia: A Substantive Econometric Analysis for Practical Policy Use

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Abstract

The foundation of corruption is personal gain, tangible or intangible, by illegal or amoral, unethical or unfair means, at the expense of others. Transparency International, the world's most influential anti-corruption non-governmental organization (NGO), and the leaders of many Western governments have observed that there is a high correlation between corruption and low economic development (Peng, 2008, p. 70). Is this true? The paper uses a simple corruption-development model and recent Transparency International data to test this hypothesis and its causality for 15 countries and areas in Asia and 20 developed countries evolving during two periods, 2001 and 2008. The direction and intensity of corruption causality are then established, and anti-corruption and pro-economic development policy recommended to governmental and NGO decision-makers in order to help minimize the incidence of corruption. It is aimed therefore at promoting better government and corporate governance to enhance economic growth and social harmony in the developing countries of Asia.

Keywords: *Corruption, Asia, causality detection analysis*

1. Introduction

The foundation of corruption is personal gain, tangible or intangible, by illegal or amoral, unethical or unfair means, at the expense of others in a system or community. In this context, corruption reflects a dark side of human nature. It has been in existence since primordial times and at the different levels of intensity everywhere and for everybody, rich or poor. In recent years, in the practical area of development economics and business administration, Transparency International (TI, 2009), the world's most influential anti-corruption non-governmental organization (NGO), and numerous Western government and corporate leaders, through their often-quoted public comments, have observed that there is a high correlation between corruption and low economic development. More specifically, they have observed that corruption distorts the basics of competition by misallocating resources and slowing economic development (see Peng, 2008, p. 70). From a social and cultural perspective, the question of what causes corruption has also been addressed by some previous studies (see, for example, Khoman, 2008). Several research questions are addressed in this paper, which comprise the target region of our interest: Is this corruption-development nexus true for developing Asian countries and areas? If it is true, how can we identify the problems and develop appropriate policy to improve what is essentially corporate, business and government governance in the current context of globalization, international competitiveness, international cooperation and poverty reduction in order to attain common prosperity?

The paper is an empirical study with testable or verifiable hypotheses to carry out rigorous research and to provide substantive and credible answers to these important questions. The findings and their policy implications are useful for informed debate and pro-growth and anti-corruption policy analysis. The plan of the paper is as follows: in section 2, a simple corruption model with testable hypotheses is constructed and, using recent data, the corruption-development causality hypothesis is tested for 15 major Asian countries and areas and 20 developed economies for comparison and for capturing the evolution of anti-corruption progress during two key periods, 2001 and 2008, for which data are available. Corruption causality direction

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is then statistically verified and established in section 3. Based on these findings, policy implications for anti-corruption and pro-economic development are recommended in section 4 in order to assist corporate, governmental and NGO decision-makers to minimize the incidence of corruption, if possible. It is aimed therefore at promoting policy to enhance growth and reduce poverty in the developing countries of Asia. Section 5 provides a summary and conclusion.

2. A Corruption-Development Model

2.1 The Model

The simple corruption-development causality model we propose for our empirical study has four conceptual parts or testable causality hypotheses. *First,* if the general perception and that of Transparency International of corruption (denoted, say, by a corruption perception index, or CPI) as an impediment to development or economic growth (proxied respectively by, say, real income or GDP growth or real per capita GDP, and their annual rates of change) in Asia is true, then in implicit function form (denoted by f1), GDP=f1(CPI), its first derivative) is f1' > 0. *Second,* if reverse causality is true, then similarly CPI=f2(GDP) where f2' > 0. The hypothesis here is that as a country attains a higher income level it is likely to have a lower corruption level. *Third,* as the countries in the sample progress to higher levels of development and higher growth in their national development program or reform policy through time, their level of corruption must decline (higher CPI scores). Then, f2' for a previous period (say 2001) is greater than f2' for a later period (say 2008). *Fourth,* for high-income but low-growth economies (countries in the Organisation for Economic Co-operation and Development (OECD) in recent years), the hypotheses are null. The empirical study below focuses on estimating and testing these four hypotheses.

Before carrying out our research, we noted that there is a large number of theories with strong assumptions of causality direction and numerous practical empirical approaches in the literature on explaining economic development and growth in developed and developing countries (see, for example, Levine & Renelt, 1992; Easterly, 2007; Krueger, 2007). We also noted that f1 and f2 above can be non-linear in their relationships (see Tran Van Hoa, 1992; Minier, 2007; Baier & Berstrand, 2008, for non-linearity issues in economic policy modeling and analysis of non-linear functions). However, for pragmatic reasons and for ease of interpretation, a simple bivariate linear model is assumed in this paper. Thus, the four testable hypotheses in a model representing the corruption-development causality nexus can be written more concisely mathematically as follows:

2.2 Four Testable Hypotheses

$$GDP = a1 + a2CPI + u1 \quad \text{with } a2 > 0 \qquad (1)$$

$$CPI = b1 + b2GDP + u2 \quad \text{with } b2 > 0 \qquad (2)$$

$$b2 \text{ (at } T) > b2 \text{ (at } T+c) \text{ where } T \text{ and } c \text{ are two distinct time periods and } c > 0. \qquad (3)$$

All three hypotheses above are null for developed countries (4)

2.3 The Data and their Epistemological Issues

The CPI cross-country data with scores ranging from 1.0 (more corrupt) to 10.0 (less corrupt) for the 15 Asian countries and areas and 20 developed economies were obtained from Transparency International (2009) surveys for 2001 (beginning) and 2008 (most recent). The list of the countries and areas and their CPI scores in our sample are given in the Appendix at the end of this paper. In 2001, Transparency International had CPI data for a total of 91 countries. In 2008, the number of countries surveyed had increased to 180. We concentrate only on the countries that are included in both Transparency International surveys. To accommodate a country's development stage and level of growth (see Levine & Renelt, 1992 and Minier, 2007, for their theoretical and empirical relevance in the literature) and their possible causal association with corruption, the GDP data are divided into two groups: real per capita income or GDP (in thousands of 2005 US dollars) to reflect what is essentially a country's

development stage or living standard, and real GDP growth (annual) in order to represent on the other hand a country's dynamic economic achievement. The real per capita GDP and growth data are also given in the Appendix. These macroeconomic data were obtained from the online databases of the United States Department of Agriculture – Economic Research Service (USDA-ERS, 2009).

3. Empirical Findings from the Corruption-Development Model

In our study, a number of what Kydland (2006) called "computational experiments" for the four basic hypotheses of the models above were carried out, extensively, estimated and subjected to conventional and new testing procedures. The testing procedures included the usual significance test, the conventional summary goodness of fit, and the observation-by-observation data-model consistency criterion proposed earlier by Friedman (1953) and advocated more recently by Kydland (2006). The test for a possible improvement (or a lack of it) in corruption behavior and activity (due probably to anti-corruption policy) of the 15 Asian countries and areas in focus during the 2001 and 2008 periods in the form of a structural break (or Chow test) is also adopted. The final findings and their summary associated statistical diagnostics are reported collectively in Table 1 for 15 countries and areas in Asia. The models have also been estimated and their causality hypotheses tested for the 20 developed economies; however, as all the hypotheses were found to be statistically null, the findings are not shown in this paper. The country-by-country modeling performance of the estimated models for the 15 Asian countries, and areas, as judged by the Friedman-Kydland criterion, has also been calculated but not reported here. White-heteroskedasticity seems absent in all the 2001 and 2008 models. Judged by these tests, the estimated models and their parameters are regarded as good representations for the data under study.

Table 1. Corruption and Development in 15 Asian Countries and Areas – 2001 and 2008, Empirical Causal Findings

	Const	CPI	Growth	GDPH	R^2	White
2001						
Growth	3.897**	-0.588*			0.245*	0.744
CPI	5.012**		-0.417*		0.245*	0.926
GDPH	-8.008**	4.024**			0.807**	1.618
CPI	2.487**			0.201**	0.807**	1.654
2008						
Growth	5.896**	-0.421**			0.283**	0.438
CPI	7.247**		-0.673**		0.283**	0.618
GDPH	-14.015**	5.496**			0.916**	3.211
CPI	2.741**			0.167**	0.916**	1.950
2001-2008						
	Const	**CPI**	**Growth**	**GDPH**	**R^2**	**Chow**
Growth	4.761**	-0.472**			0.170**	5.319**
CPI	5.578**		-0.360**		0.170**	1.710
GDPH	-10.750**	4.722**			0.851**	2.230
CPI	2.631**			0.180**	0.851**	0.718

Notes: Growth = per capita real GDP growth, CPI = corruption perception index, GDPH = per capita real GDP (an income level), R^2 = R-squared, White = White-heteroskedasticity test statistic, Chow = Chow structural break test statistic. ** = significant at the 5% critical level. * = significant at the 10% critical level.

4. Policy Implications: Does Corruption Hamper Development Growth in Asia and in Developed Countries?

The empirical findings for the four hypotheses proposed earlier and reported in Table 1 reveal a number of interesting and important implications for the corruption-development stage and growth nexus for Asian economies. In an economic-theoretic context they are also relevant to corporate, business and government governance policy and NGO anti-corruption programs in the 15 major Asian economies.

First, when development is defined as real GDP growth, then both for 2001 and 2008, higher growth is found to be attributed to a higher level of corruption (lower Transparency International scores). The impact of corruption is weaker (in magnitude) on growth in 2008 by

up to 28 per cent compared with that in 2001, reflecting an improvement in anti-corruption policy outcomes. This evidence is also statistically stronger in 2008 than in 2001. *Second,* in terms of reverse causality, higher growth in these countries seems to have significantly increased their level of corruption (lower Transparency International scores) by up to 16.14 per cent between 2001 and 2008. Again, this evidence is found to be statistically stronger in 2008 than in 2001. We note that, while the test for the modeling performance of the estimated models shows that they are statistically significant, this finding is mitigated somewhat by their relatively low summary goodness of fit for both 2001 and 2008.

However, when development is measured by real income or GDP per capita, reflecting the living standard or the development stage (Levine & Renelt, 1992) of the 15 Asian economies in our study, the findings are starkly different, theoretically and statistically. First, for both periods, less corruption (higher Transparency International scores) is found to be significantly associated with higher living standards or advanced development stages. Again, the impact in 2008 is much stronger (in magnitude) than that in 2001, reflecting to some extent an improvement in anti-corruption policy outcomes. Second, in reverse causality, in both periods, higher real income per capita is found to be significantly promoting more transparency (higher Transparency International scores). The promotion is weaker in 2008 than in 2001. We note that, for both periods, the estimated models are characterized by statistically significant and very high goodness of fit.

We have estimated the models for 2001 and 2008 using real per capita GDP, real GDP growth and CPI data for 20 developed countries. As all individual and overall parameter hypotheses were found to be statistically null, the findings are not reported here. However, a number of interesting findings can be described. First, the signs of all (except two) estimated parameters in the developed economy models mirror those of the 15 Asian economies. The difference in sign is in the two CPI-to-growth and growth-to-CPI models in 2008, where a positive impact was found instead. These differences mean that higher CPI induces higher growth and higher growth promotes more transparency (less corruption) in developed economies. Second, contrary to the findings for the 15 Asian economies, when development is measured by real per capita GDP or living standards, the effects of anti-corruption policy on development and its reverse causality in the developed economies in 2008 are weaker or less effective (in magnitude) than those in 2001. Research on the causality of these relationships would be an interesting study in the future.

5. Summary and Conclusion

The paper uses a simple corruption-development econometric model to test the basic and sometimes "folklore" hypothesis that higher levels of corruption are associated with low levels of development in Asia. If this hypothesis is true, then *prima facie* and based on official published data, the high-growth countries in Asia should have a lower corruption level than low-growth countries. This would have profound implications for corporate, business and government governance policymakers, official development assistance donors and NGOs. Our findings indicate that, while development can be measured by output growth, development stages, living standards or other economic-theoretic and welfare indicators, it should be measured by real per capita income (a true welfare indicator), which is the top development priority of many developing countries worldwide. In this context, our findings lend strong empirical or evidence-based support to the hypothesis that lower corruption promotes higher development not only in developing economies in Asia but, significantly, also in developed economies, such as those in the OECD group. In addition, our findings indicate that tremendous progress has been made in many countries and areas in Asia to improve the effectiveness of anti-corruption policy and economic development between 2001 and 2008. On the other hand, high living standards in the developing economies of Asia are found to have

deep influence on reducing their corruption. While other political, social and cultural measures (see, for example, Khoman, 2008) can be good candidates to explain corruption, promoting and achieving high living standards for a country should be regarded as the most effective policy to fight corruption. Our findings also show that this policy and its impact in Asia are much stronger or more effective than that exerted in developed and rich economies in the same period.

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Appendix
CPI and GDP Data for 2001 and 2008

No.	Asia 15	CPI01	CPI08	YC01	YC08	YH01	YH08
1	Singapore	9.2	9.2	-4.08	3.25	23692	31387
2	Australia	8.5	8.7	2.58	1.34	32179	36758
3	Hong Kong	7.9	8.1	-0.35	2.84	21174	29078
4	Japan	7.1	7.3	-0.03	0.51	31697	35241
5	Taiwan	5.9	5.7	-2.84	2.62	13168	17482
6	Malaysia	5	5.1	-1.65	4.16	4891	6370
7	Republic of Korea	4.2	5.6	3.09	3.92	14915	20102
8	China	3.5	3.6	7.62	8.63	1235	2350
9	Thailand	3.2	3.5	1.39	4.57	2408	3318
10	Philippines	2.9	2.3	-0.54	2.33	1040	1279
11	India	2.7	3.4	3.32	5.8	566	849
12	Viet Nam	2.6	2.7	5.64	5.64	488	760
13	Pakistan	2.3	2.5	-0.85	3.58	603	787
14	Indonesia	1.9	2.6	2.34	4.74	1133	1495
15	Bangladesh	0.4	2.1	3.24	4.06	327	421

No.	Developed 20	CPI01D	CPI08D	YC01D	YC08D	YH01D	YH08D
1	Finland	9.9	9	0.84	2.23	33824	41940
2	Denmark	9.5	9.3	0.96	0.7	45670	50891
3	New Zealand	9.4	9.3	2.52	1	22562	25768
4	Iceland	9.2	8.9	1.24	-1.09	46601	53443
5	Singapore	9.2	9.2	-4.08	3.25	23692	31387
6	Sweden	9	9.3	0.86	0.87	36292	42878
7	Canada	8.9	8.7	1.02	-0.24	34580	38596
8	Netherlands	8.8	8.9	0.73	1.64	36669	39417
9	Luxembourg	8.7	8.3	0.18	1.41	69098	82593
10	Norway	8.6	7.9	2.21	2.06	61001	69120
11	Australia	8.5	8.7	2.58	1.34	32179	36758
12	Switzerland	8.4	9	0.43	1.67	48021	52392
13	United Kingdom	8.3	7.7	2.01	0.52	33982	39207
14	Hong Kong	7.9	8.1	-0.35	2.84	21174	29078
15	Austria	7.8	8.1	0.49	1.91	35558	40552
16	Israel	7.6	7.3	-2.44	1.92	18015	20100
17	United States	7.6	6	-0.2	0.4	39212	43512
18	Chile	7.5	6.9	2.19	2.84	6673	8482
19	Ireland	7.5	7.7	4.81	-2.09	42875	53033
20	Germany	7.4	7.9	1.25	1.34	33463	36387

Notes: CPI = corruption perception index, YC and YH = growth and income per capita (in thousands of US dollars),

01 and 08=2001 and 2008, D=developed countries

Sources: TI (2009), USDA-ERS (2009).