



DETERMINANTS OF CORRUPTION IN ASIA

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ARTICLE INFORMATION

ARTICLE HISTORY

Received
26 July 2013

Revised
6 December 2013

Accepted to be published
9 December 2013

KEYWORDS:

Corruption,
Asia,
panel data,
FGLS

ABSTRACT

This paper tried to build empirical models for investigating factors triggering corruption in Asia. The method of feasible generalized least squares (FGLS) was put on choice because both the auto correlation and heteroskedasticity were frequently found on data panel. Four different models were employed to discover the causes of the corruption. The result of the research indicated that the corruption occurring in Asia was triggered by economic and institutional factors. Economics variables mostly gave impact on corruption while the institutional variables provide more varied impacts.

Paper ini mencoba membangun model-model empirik untuk menyelidiki faktor-faktor yang menyebabkan korupsi di Asia. Metode estimasi feasible generalized least squares (FGLS) dipilih karena autokorelasi dan heteroskedasticity sering ditemukan di panel data. Empat model yang berbeda digunakan untuk mengetahui penyebab korupsi. Hasil penelitian menunjukkan bahwa korupsi di Asia disebabkan oleh faktor-faktor ekonomi dan kelembagaan. Variabel-variabel ekonomi hampir selalu mempengaruhi korupsi, sedangkan efek dari variabel-variabel kelembagaan bervariasi.

1. INTRODUCTION

Corruption is the abuse of public authority and discretion for private gain. No country or region in the world is free from the damages of public sector corruption (Transparency International, 2011). Corruption occurs in all countries whether a country is a developed or a developing one, whether it is located in North America or in Asia. The difference is in the magnitude. Corruption is the single greatest obstacle to economic and social development because it undermines development by distorting the rule of law and weakening the institutional foundation on which economic growth depends (World Bank, 1997). Transparency International (2009) considers corruption as "...one of the greatest challenges of the contemporary world. It undermines good government, fundamentally distorts public policy, leads to the misallocation of resources, harms the private sector and private sector development and particularly hurts the poor."

This paper attempted to build empirical models to investigate determinants of corruption in Asia. Corruption in Asia seems to be a cultural phenomenon since in some countries and societies in Asia, giving commissions or gifts and paying bribes is neither uncommon nor considered inappropriate. However, as there are no direct ways to measure actual corruption due to its secretive nature, then writer used the perceptions of corruption through some corruption survey indices. Over time, perceptions

have proved to be a dependable estimate of corruption (Transparency International, 2011: 3).

As variation in corruption levels across countries is argued to be due mainly to differences in economic factors and institutional quality, therefore, writer included economic and institutional variables. In assessing the level of economic development, writer focused on GDP growth rate. As the incentive to engage in corrupt practices increased with the availability of rents, writer utilized government expenditures per capita, openness, and endowment of natural resources. Institutional variables was added progressively, starting with economic freedom, then civil rights and level of democracy.

2. LITERATURE REVIEW

2.1. Definitions of Corruption

There are many definitions of corruption.¹ Shleifer and Vishny (1993: 599) define government corruption as "the sale by government officials of government property for personal gain". For instance, government officers often take bribes for providing permits and licenses or for restricting entry of a competitor into a market. A bribe sometimes must be given for passage through checkpoint officers. In all those cases, government officers charge personally for goods that the government officially owns (ibid). De Jong and Udo (2006: 4) define corruption as "the

¹In this paper, corruption is defined as government corruption or

misuse of public power for private benefit (or much alike)". Misuse would be deviating from the formal duties of a public role or a code of conduct. Corrupt officers extort bribes from a client, who otherwise will not receive assured services, or will receive inferior service.

Macrae (1982: 678) defines corruption as an "arrangement that involves a private exchange between two parties (the demander and the supplier)". The arrangement has an influence on the allocation of resources, either immediately or in the future, and involves the use or abuse of public or collective responsibility for private ends (ibid). Political scientist Joseph Nye (1967: 419) defines corruption as "the behavior which deviates from formal duties of a public role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence". So, basically Nye (1967) says that corruption is the deviation from the duties of a formal public role for private gain.² The World Bank economist, Daniel Kaufmann (1997: 114) defines corruption as "the misuse of public office for private gain". He is followed by political scientists Daniel Treisman (2000: 399), Wayne Sandholtz and William Koetzle (2000: 31) and many others who define corruption the same way as he does. Aidt (2003: F623) defines "corruption is an act in which the power of public office is used for personal gain in a manner that contravenes the rules of the game". Susan Rose-Ackerman (1999: 9) takes a slightly different perspective, as she specifically defines government corruption as "payments illegally made to public agents with the goal of obtaining a benefit or avoiding a cost".

Jain (2001) argues that while it is not easy to be in agreement on the definition of corruption, there is a consensus that corruption refers to actions where public office is used for personal gain in a manner that violates the rules of the game and the code of conduct. He also claims that there are three necessary conditions for corruption to occur as follows:

1. The government officer must have monopoly power over the regulation or delivery of the government good or service.
2. The government officer must be able and willing to misuse that power.
3. The government officer must have an economic incentive to do so.

In this paper writer will use a simple and straightforward definition by the World Bank (1997: 7-8), which defines corruption as the abuse of public office for private gain. Corruption occurs when an official accepts, solicits, or extorts a bribe. It is a corruption too when private agents actively offer

bribes to circumvent public policies and processes for competitive advantage and profit. Corruption can take place even if no bribery occurs, through patronage and nepotism, the theft of state assets, or the diversion of state revenues.

2.2. Previous Studies

The classic empirical examples of the determinants of corruption are papers by Treisman (2000) and Adis and Di Tella (1999, 1997a, 1997b). Treisman (2000) uses indices of corruption (68 countries) from Business International for the early 1980s and for 1996, and from Transparency International for 1996 (54 countries), 1997 (52 countries), and 1998 (85 countries) to investigate the causes of corruption. He tests 12 hypotheses commonly found in the literature to be the causes of corruption and finds that more developed economies, countries with Protestant traditions, histories of British rule, and higher imports were less corrupt.³ On the other hand, higher levels of corruption exist in federal states and in those that are not democratic. In particular, there are strong associations between the level of development and corruption and between exposure to democracy and corruption. However, the correlation between openness and corruption is "surprisingly small" and not always significant regardless of the direction of causality between openness and corruption. For dummy regions, Treisman (2000) discovers, not surprisingly, that Africa, Asia, Eastern Europe, Latin America, and the Middle East are more corrupt than North America and Western Europe. Moreover, controlling for the level of economic development, he finds that only Eastern Europe and Latin America are significantly more corrupt. However, the effect of dummy regions vanishes once he introduces political system variables into the model. The level of economic development and exposure to democracy explain almost all of the variation in corruption.

However, Treisman (2000) is not without drawbacks. Knack and Azfar (2003) study the choice and composition of indices and whether they affect the result. They argue that Treisman (2000) suffers from selection bias. For example, the fact that Treisman (2000) cannot find a correlation between openness and the Transparency International corruption index in 1998 may be due to increased country coverage in that year, including more small countries with higher corruption levels.

In their paper series, based on a theoretical framework of rent seeking behavior, Ades and Di Tella (1999, 1997a, 1997b) claim that the incentive to engage in corrupt practices increases with the

²Nye (1967: 419) states that corruption includes behavior such as bribery (use of rewards to alter the judgment of a person in a position of trust), nepotism (bestowal of patronage by reason of involved relationship rather than merit), and misappropriation (illegal appropriation of public resources for private uses).

³La Porta et al. (1998) also find that countries that are less developed, close to the equator, ethnolinguistically heterogeneous, use French or socialist law, have high Catholics or Muslims populations tend to have inferior measures of government performance, including higher corruption. Gupta, Davoodi, and Tiongson (2001) find that corruption is highly associated with the share of Protestants in the population, GDP per capita, and exposure to democracy.

availability of rents. Corruption can be explained by a low level of competition. Competition is argued to lessen the rents of economic activities, and therefore, reduce the motive of public servants and politicians to grab parts of these rents by means of corruption and extortion. Ades and Di Tella (1997a), using corruption data from Business International for 68 countries for period 1980-1983, regress corruption on GDP per capita, openness that is proxied by share of imports to GDP, average years of total schooling, political rights, the judiciary system and an interaction term between openness and the judiciary system. They find that corruption is high in countries that are closed to foreign competition (measured by low share of import in GDP). They also find that corruption is higher in countries in which the degree of independence of the judiciary system is not fully developed. There is also a significantly negative effect of openness on corruption. The interaction term of judiciary and openness is positive and significant. In their conclusion, they suggest that opening up an economy to foreign trade (more exposure to foreign competition) is indispensable in a country where institutions are not well developed because it can curb corruption more robustly than in a country where institutions are already sophisticated.

Ades and Di Tella (1997b) shows that active industrial policies are positively correlated with corruption. Their regressions are done for a sample of 32 countries for the period of 1989-1992. They regress corruption on level of development (GDP per capita), average years of total schooling, political competition (political rights), security (the extent to which there is general crime prevention against property and person), openness (share of imports to GDP), and industrial policy. The corruption data are from World Competitiveness Report and Impulse, a German business publication, compiled by Neumann (1994). The indicators of industrial policy are from World Competitiveness Report: a procurement index that measures the extent to which public procurement is open to foreign bidders and a fiscal index that measures the extent to which there is equal fiscal treatment of all enterprises. Their results show that domestic industrial policy significantly increases corruption but the degree of openness significantly decreases corruption. However, other variables such as GDP per capita and political rights do not show a significant relationship with the level of corruption.

Ades and Di Tella (1999) test the hypothesis that the levels of natural resources and rents induced by the lack of product market competition determine the level of corruption in an economy. Using corruption data from Business International (1984) for the time period 1980-1983 and World Competitiveness Report (1990 and 1991) for 1989 and 1990, they model corruption as dependent on four factors: average years of total schooling, income per capita, political rights, and variables capturing the level of rents and the market structure of competition: (1) openness that is share of imports in GDP; (2) the importance of

fuels, minerals, and metals in the composition of total exports, and; (3) the distance to the world's major exporters. They use a cross section analysis of 52 countries and control for country and time fixed effects. For the time period 1980-1983, schooling, GDP per capita and political rights have negative effects on corruption, although schooling and political rights are only significant at the 10 percent level. The extent to which domestic firms enjoy rents: openness is negative and significant, the proportion of total exports accounted for fuels, minerals, and metals, and the distance to the world's major exporters are all positive and significant. For 1989 and 1990, schooling, GDP per capita and political rights have negative effects on corruption, although schooling and GDP per capita are not significant at conventional levels. The extent to which domestic firms enjoy rents: openness is negative and significant, the proportion of total exports accounted for fuels, mineral, and metal is negative and insignificant, and the distance to the world's major exporters are all positive and insignificant at standard levels.

Nevertheless, Ades and Di Tella's (1999, 1997a, and 1997b) results have also been criticized by several authors. For example, Torrez (2002) argues that although most of the empirical evidence corroborates a negative relationship between corruption and openness, this does not hold for his dataset. In his paper (Torrez 2002), he finds a significant relationship between trade volumes and the Transparency International (TI) corruption index in the 1980s, but not with the International Country Risk Group (ICRG) corruption index (1982-1992). He claims that the results depend on the choice of the corruption index. According to him, Ades and Di Tella's (1999, 1997a, and 1997b) cases are theoretically robust but empirically weak.

3. DATA AND METODOLOGY

3.1. Country Sample and Time Period

Asian countries for which a dataset for all variables is available over the period 1996-2010 were included in the regression. There were 17 countries included in the observation as follows: China, Hong Kong SAR, India, Indonesia, Jordan, Kuwait, Malaysia, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, South Korea, Thailand, Turkey, and Vietnam.⁴The starting year of 1996 was chosen

⁴Classification of countries follows United Nations Conference on Trade and Development (UNCTAD) guidelines. UNCTAD (2011) classifies developing countries based on region: Africa, Latin America and the Caribbean, Asia and Oceania (except for Japan and Israel, which are considered as developed countries), and Southeast Europe and the Commonwealth of Independent States (Kazakhstan, Uzbekistan, etc.). Hong Kong Special Administrative Region (SAR) is categorized as a stand alone country, separated from mainland China. Middle East countries (including Turkey but not Egypt, which is geographically located in North Africa) are classified into Asia and Oceania region too.

because Transparency International suggested that its corruption index been used from 1996 and after.⁵

3.2. Independent and Explanatory Variables

Corruption. There are no direct ways to measure corruption because of its secretive nature. Tanzi (1998: 576) argues that “if corruption could be measured, it could probably be eliminated”. If one simply measures bribes paid this would disregard many corrupt acts that are not accompanied by the payment of bribes. Nonetheless, an effort to quantify acts of corruption rather than the amounts of bribes paid would need to count many relatively insignificant actions and to identify each act of corruption; information that is simply impossible to obtain. Thus, there are no direct ways of measuring corruption. Yet, there are several indirect methods of getting information about the existence of corruption in a country or in an institution. The most viable indirect method for getting practical information on the seriousness of corruption in a country is by using surveys of experts or firms in that country. These surveys are measures of perceptions of corruption rather than quantitative measures of actual corruption because “like pornography, corruption is difficult to quantify, but you know it when you see it” (Wei 1999: 4). Perceptions are employed because corruption, whether frequency or amount, is generally a hideous activity that is hard to measure.⁶

Writer used the Corruption Perceptions Index from Transparency International (TI index) for the main reason that it is free; others may require some fees or subscription. Nevertheless, the index is relatively reliable and powerful.⁷ The Corruption Perceptions Index (TI index) ranks countries according to the perception of corruption in the public sector. The TI index is an aggregate indicator that combines different sources of information about corruption, so that it is possible to compare countries. It draws on different assessments and business opinion surveys undertaken by independent and reputable institutions. Therefore, the TI index is a “poll of polls” or “survey of surveys”, representing the average scores based on several different expert and business surveys.

TI index ranges from 0 to 10, in which the lowest score (0) suggests that a high level of corruption prevails, whereas the highest score (10) implies the

cleanest. To avoid confusion, the index is rescaled, so 0 means very clean and 10 represents highly corrupt, instead of less corrupt as on the original scale. Nowadays, the TI corruption index is a relatively common institutional measure in the literature, for example, among others Wei (2000), Gyimah-Brempong (2002), Ng and Yeats (1999), Sandholtz and Koetzle (2000), and Torrez (2002).

GDP growth rate. Countries with weak economic performance tend to experience growing levels of corruption (Gyimah-Brempong, 2001). Gyimah-Brempong (2001) argues that the goal of economic development is to improve the standard of living and well-being of citizens within a country. Thus, anything that impedes the chance of improving the standard of living may retard economic growth, and thus, increase corruption. The economic performance of a country can be linked to its institutions and quality of governance. There is a strong association between GDP and government performance because government performance improves as better institutions can be afforded (North, 1990). There are also direct and significant statistical relationships between economic development and corruption (Larain and Tavarez, 2007; Kaufmann, Kraay, and Zoido-Lobaton, 1999; Mauro, 1995). Strong economic performance also alters the incentives for public officers to engage in corrupt activities by reducing the value of their expected financial gains and increasing the costs of penalties (Lipset and Lenz, 2000). It is expected that the better a country's economic performance as represented by higher GDP growth rate, the lower the level of corruption would be.

Government expenditures per capita. Tanzi and Davoodi (1997, 1998) argue that large, complex, and expensive government projects are favored by corrupt public officials. This may take place because public investment can be simply manipulated by powerful politicians or bureaucrats, and often gives rise to the payment of larger kickbacks by those who undertake the project (ibid). Tanzi and Davoodi (1997, 1998), utilizing cross-country data, find that increased public investment is positively and significantly associated with corruption. Work by Ali and Isse (2003) find the same result.

However, if some of the government expenditures are spent on measures to curb corruption, for instance funding the establishment of a strong and independent anti-corruption agency, then there will be a negative correlation between government expenditure and corruption. More funding for democratic elections to ensure more fairness and more efforts to increase fair competition in the market could also help lower corruption. Increasing the salary of public officials could also curb corruption. Lindbeck (1998) attributes the low corruption in Sweden partly to the fact that high-level administrators earn 12–15 times the salary of an average industrial worker. Low corruption rates in Hong Kong and Singapore perhaps is partly because of

⁵TI recommends that conclusions regarding time trends should be based on comparison between the 1996 score and the historical data. Comparisons with the 1995 ranking may be less precise because the 1995 ranking is out of date. For complete reasons, please see http://www.icgg.org/corruption.cpi_olderindices_1995.html.

⁶ Wei (1999) argues that while perceptions may differ from real life, it may be the case that perceptions of corruption that in fact make the difference in investment decisions.

⁷ Wei (2000) finds that the Transparency International (TI) index and the Business International (BI) index, which is used by Mauro (1995), are highly correlated with a coefficient equal to 0.89. Therefore, estimation results using one of these corruption indices can be easily extended to either the BI or TI index.

the high salaries of public officials. Empirical studies by Fisman and Gatti (2002) and Bonaglia, de Macedo, and Bussolo (2001) find a negative impact of government expenditures on corruption. Writer expected higher government expenditures per capita lead to higher or lower corruption.

Openness. Openness measures the degree to which host economies are open to the rest of the world. Krueger (1974) argues that more open economies tend to be less corrupt than their more closed counterparts. Ades and Di Tella (1999, 1997a, 1997b) explain that the incentive to engage in corrupt practices increases with the availability of rents. Corruption can be explained by a low level of competition. Competition is argued to reduce the rents of economic activities and therefore reduce the motive of public servants and politicians to grab part of these rents by means of corruption and extortion. A domestic market with less foreign competition (lower import volume) will increase rents enjoyed by domestic firms, thus promoting corruption. Ades and Di Tella (1999, 1997a, 1997b), Herzfeld and Weiss (2003), Fisman and Gatti (2002), Frechete (2001) find that openness, defined as a share of imports to GDP, is significantly and negatively correlated with corruption. However, Treisman (2000) and Gatti (2004), using the same measure of openness as Ades and Di Tella (1999, 1997a, 1997b), find that the correlation between openness and corruption is actually small and weak.

Openness is defined as the sum of imports and exports as a percentage of GDP, which can also be thought of as representing the extent of global economic integration. This measure of openness is a better fit because rents can be extracted not only from imports but also from exports. Several scholars have used the same measure of openness, for instance Neeman, Paserman, and Simhon (2008), Rock (2007), Sandholtz and Koetzle (2000), Larrain and Tavarez (2007), and Bonaglia et al. (2001). They all find that corruption is high in countries that are closed to foreign competition (measured by a low share of imports and exports in GDP). Writer expected a negative relationship between openness and corruption, in which the more open a country is, the lower the level of corruption will be.

Natural resources. Ades and Di Tella (1999)

argue that in countries with large endowments of precious raw materials— such as oil, natural gas, minerals, and forests— corruption may offer greater potential gain to public officials who distribute rights to exploit such resources. To proxy for countries' raw materials endowments and associated rents, writer use total natural resources rents as a percent of GDP. Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents and forest rents (World Bank, 2011). This basically measures natural resources contribution to GDP. Writer expected corruption will be higher in countries with greater endowments of valuable natural resources.

Economic freedom. Lambsdorff (1999) argues that one government activity suspected of promoting corruption is restriction on economic freedom. By restricting economic freedom, the government is actually discouraging competition. Competition is generally assumed to reduce the rents of economic activities, and therefore, reduce the motive of public officials to seize part of these rents by means of extortion and corruption (ibid). Carden and Verdon (2010), Goel and Nelson (2005), Shen and Williamson (2005), Graeff and Mehlkop (2003), Paldam (2002), Chafuen and Guzman (2000) all find that corruption is negatively correlated with different indicators of economic freedom. The more economic freedom a country has, the lower the corruption will be.

Writer used an economic freedom index from the Heritage Foundation. The index measures ten components of economic freedom, such as business freedom, trade freedom, fiscal freedom, monetary freedom, investment freedom, financial freedom, and labor freedom. They assign a grade in each using a scale from 0 to 100, where 100 represent maximum freedom. The ten component scores were then averaged to give an overall economic freedom score for each country. It was expected that more economic freedom (higher score) leads to less corruption.

Civil liberties. Researchers usually assume a negative relationship between corruption and civil liberties, in which the more free civil liberties are present in a country, the lower the level of corruption there will be. Civil liberties with emphasis on accountability may dampen the illicit behavior of public officials engaging in corruption. The personal

Table 1. Summary of Data Sources

Variables	Data Series	Unit	Source*
Economic	GDP growth rate	percentage point	WDI 2011
	Openness	N/A	PWT 7.0
	Gov. expenditures pc	US\$, 2000 US\$	WDI 2011
	Natural resources	percent of GDP	WDI 2011
Institutional	Corruption	N/A	TI
	Economic freedom	N/A	Heritage Foundation
	Civil liberties	N/A	Freedom House
	Democracy	N/A	Polity IV Database

*WDI = World Development Indicators; PWT = Penn World Table; TI = Transparency International; N/A = Not Available. All data in current U.S. dollars is adjusted to constant U.S. dollars using a deflator available from WDI 2011.

cost of corruption for public officials is job loss and incarceration if caught and prosecuted. Emerson (2006) finds the coefficient estimates on civil liberties are all negative and significant at the 1% level meaning that the higher the level of civil liberties in a country, the lower the level of corruption. Goel and Nelson (2005) also discover that corruption declines when civil liberties get better. Writer will use the index of civil liberties from Freedom House. Several researchers have utilized the same index (Emerson, 2006; Goel and Nelson, 2005; Bengoa and Sanchez-Robles, 2003; Fisman and Gatti, 2002; Ades and Di Tella, 1999; Scully, 1988).

According to the Freedom House's *Economic Freedom of the World: 2011 Annual Report* civil liberty ratings depend on an evaluation of freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy and individual rights. The numerical rating is from 1 to 7, with 1 representing the most free and 7 is the least free. To avoid confusion, the index is rescaled, so 1 means the least free and 7 represents the most free. After rescaling, it was expected that there would be a negative association between civil liberties and corruption. The less free a country is (low score, after rescaling), the more corruption prevails.⁸

Democracy. Democratic institutions are related to better governance, which includes lower corruption (La Porta et al., 1998). Countries with more political competition have stronger public pressure against corruption, through democratic elections. The strength of the competitive political environment raises the stakes and lowers the likelihood of corruption, thus it can be a check on corruption (Rose-Ackerman, 1999). Democracy may also affect corruption because the risk of being caught and punished is high in a well-developed democratic society with a free press, rigorous citizen participations and competitive elections (Treisman, 2000). Chowdhury (2004) finds that corruption declines with democracy index, whereas Treisman (2000) discovers that long exposure to democracy, defined as the number of uninterrupted years in which a country is democratic significantly decreases corruption. Studies, which control for democracy, usually find a significant association with corruption levels (Svensson, 2000; Sandholtz and Koetzle, 2000; La Porta et al., 1998; Isham, Kaufmann, and Pritchett, 1997).

An index of the level of democracy from Polity IV database will be employed to explain corruption, following some researchers (Rock, 2007; Treisman, 2000; Svensson, 2000; Sandholtz and Koetzle, 2000; La Porta et al., 1998; Isham et al., 1997). The Polity IV

⁸Initially, I also wanted to include a political rights variable. Political rights are based on an evaluation of electoral process, political pluralism and participation and functioning of government. However civil and political liberties typically move in tandem (there is indeed a high collinearity between them). There is also somewhat a high collinearity between the political rights variable and the level of democracy variables. Thus, I opted to drop the political rights variable, but kept the civil rights and level of democracy variables.

score takes values between minus ten and plus ten. Scores in the range between minus ten and minus six can be regarded as autocracies. Polity scores between minus five and plus five are anocracies or partial democracies. Anocracies are states behind a democratic regime or otherwise malfunctioning democracies. Polity scores between plus six and plus ten can be interpreted as full democracies. To avoid confusion, the index is rescaled with the following formula: new polity score = original polity score + 11. Therefore, a completely autocratic country with an original polity score of minus 10 is equal to a new polity score of 1. Likewise, a fully democratic country with a score of 10 in the original polity index will transform to a score of 21 in the new polity index. It was expected that there would be a negative correlation between the level of democracy and corruption. A higher score, which means more democratic, was expected to induce less corruption. Moreover, the summary of data sources was presented in Table 1.

3.3. Methodology

This paper utilized panel data techniques because the data was a mix between cross sectional and time series data. A simple model that uses panel data takes the form as follows (Baltagi, 2008):

$$y_{it} = \alpha + X'_{it} \beta + u_{it} \text{ with } i = 1, \dots, N \text{ and } t = 1, \dots, T \dots (1)$$

where i denotes individuals, firms, countries, etc., and t denotes time. The i subscript denotes the cross section dimension, while the t subscript denotes the time series dimension. α is a constant term, β is $K \times 1$ and X_{it} is the i^{th} observation on K explanatory variables. Most panel data applications employ a one-way error component model for the disturbances with:

$$u_{it} = \mu_i + v_{it} \dots \dots \dots (2)$$

where μ_i is the unobservable individual specific effect and v_{it} is the remainder of the disturbance.

The multicollinearity problem is decided using simple pair-wise correlations among regressors.⁹ To simultaneously account for heteroskedasticity across panels and serial correlation within panels, writer use a three-step feasible generalized least squares (FGLS) estimator.¹⁰ The benefit of this estimator is that it

⁹As a rule of thumb, if the pair-wise or zero-order correlation coefficient between two regressors is higher than of 0.8, then multicollinearity is a serious problem (Gujarati, 2004: 359). However, Gujarati (2004: 359) argues that although high zero-order correlations may suggest collinearity, it is not necessary that they would be high to have collinearity in any specific case. High zero-order correlations are a sufficient but not a necessary condition for the existence of multicollinearity since it can present even though the pair-wise or zero-order correlations are relatively low, for instance less than 0.5 (ibid).

¹⁰Taylor (1980) finds that FGLS is more efficient than a Least Square Dummy Variable model or a fixed effects method for all but the fewer degrees of freedom. The variance of FGLS is also never more than 17 percent above the Cramer-Reo lower bound. He also discovers that more efficient estimators of the variance components do not necessarily produce more efficient FGLS estimators. Taylor's (1980) findings are confirmed by Baltagi (2008), who uses Monte Carlo experiments as performed in Maddala and Mount (1973).

allows estimation in the presence of autocorrelation of type AR (1) within panels, contemporaneous cross-sectional correlation, and heteroskedasticity across panels (Greene, 2008). FGLS also allows for a variety of patterns for missing data (Baltagi and Wu, 1999). The standard version of the FGLS estimator in the presence of both heteroskedasticity and autocorrelation is a three-step process as follows (Medvedev, 2006: 27):

1. The model assumes errors are homoskedastic errors calculates consistent estimates of the AR(1) parameters.
2. A groupwise heteroskedastic model is applied to the transformed data, which is now free of autocorrelation, with the purpose of accounting for the possibility of country-specific error terms that are not normally distributed.
3. The new moment matrix is used to solve the full FGLS system and to obtain the accurate asymptotic variance-covariance matrix for the estimates of the FGLS coefficients.¹¹

3.4. Empirical Model

Writer firstly examined the determinants of corruption based on economic variables only. The benchmark corruption equation in a linear form is as follows:

$$\text{Corruption}_{i,t} = \beta_1 + \beta_2 \text{GDP growth rate}_{i,t-1} + \beta_3 \text{Government expenditures per capita}_{i,t-1} + \beta_4 \text{Openness}_{i,t-1} + \beta_5 \text{Natural resources}_{i,t-1} + u_{i,t} \dots \dots (3)$$

where i is the country subscript, t is the time subscript, β s are parameters to be estimated and $u_{i,t}$ denotes the disturbance term. All explanatory variables are lagged one year to avoid simultaneity with the dependent variable and endogeneity problems associated with the causal relationship between corruption and some of the right-hand variables (Sun, Tong, and Yu, 2002; Wooldridge, 2002: 51; Hayashi, 2000: 139).

Institutional variables was added to the benchmark model gradually. The first institutional variable to be included was economic freedom. The institutional variable civil liberties follow. The last institutional variable to be taken into account was the level of democracy.

4. RESULTS

Corruption levels in Asia varies broadly among countries. As the top least corrupt country, there is Singapore. Singapore is actually the least corrupt country in the world with a score of 9.3 (original TI index, 10 being the cleanest), tied with Denmark and New Zealand (Transparency International, 2010). Hong Kong stands as thirteenth least corrupt country with a score of 8.4 (original TI index, 10 being the cleanest). Then there are several relatively corrupt

countries: Pakistan (143rd), the Philippines (134th), Vietnam (116th) and Indonesia (110th). The other countries are roughly in the middle of the pack. There is also a unique relationship between democracy and corruption in Asia. For instance, Indonesia has been a fairly democratic country over the last decade, yet remains fairly corrupt. However, a low level of democracy does not hold Singapore back from being ranked as the least corrupt country. The full results of the regressions are shown in Table 2.

Our benchmark model is model 1. It deals with economic variables only. The first economic variable, GDP growth rate, does not seem to affect the level of corruption at all. Perhaps, this can be attributed to economic variables being only the variables accounted for in the benchmark model. We will see the effect of adding institutional variables directly on the corruption level and indirectly through the effect of GDP growth rate on corruption.

Government expenditures per capita are negative and significant. More government expenditure does lower corruption. Some Asian governments asked for financial assistance from international donors in order to help combat corruption. Some used their own money. For example, in the ADB/OECD Anti-Corruption Initiative for Asia and the Pacific Report (2008), the Malaysian Government, in an effort to developing effective and transparent systems for public service, conducted a corruption survey without external funding and technical assistance, although they may require so. The result of the survey was submitted in a report that would help the Government of Malaysia to determine public perception of the level of corruption in Malaysia and to establish a corruption perception index applicable to the country. The Thai government did not ask for financial assistance from ADB in their project Legal System Development and Good Governance, whose purpose is to raise and strengthen public awareness about corruption as well as to build up a network countrywide. They used budgets proposed by all relevant agencies.

Moreover, based on 2002 revised constitutional law, the Indonesian government is mandated to spend at least 20 percent of the annual government budget on education or education-related spending. Education is a strong measure to control corruption since more educated individuals pay more attention to corruption and are better able to take action against it (Glaeser and Saks, 2006: 1056). It is known that salaries of government officials in Singapore and Hong Kong are far higher than those of their neighbors in order to dissuade them from leaving for private sector jobs and from engaging in corrupt activities. In Singapore, cabinet ministers are also handsomely paid. Lee KuanYew, the founder of Singapore and long-time prime minister, argues that cabinet ministers and political leaders should be paid top salaries in order to ensure a clean and honest government.

¹¹ The third step can be iterated to convergence. However, no asymptotic gains can be expected from iteration since the estimator is efficient at every step (Greene, 2008).

Table 2. Determinants of Corruption in Asia

Dependent variable: Corruption in Asia				
	Model 1	Model 2	Model 3	Model 4
GDP growth rate	-0.015 (0.017)	-0.043(0.015)***	-0.040(0.015)***	-0.039(0.015)***
Government expenditures per capita (US\$000)	-0.836 (0.082)***	-0.340(0.098)***	-0.347(0.096)***	-0.338(0.099)***
Openness	-0.011(0.001)***	-0.006 (0.001)***	-0.006 (0.001)***	-0.006 (0.001)***
Natural resources	0.033 (0.007)***	0.007 (0.007)	0.013 (0.007)*	0.013 (0.007)*
Economic freedom		-0.080 (0.011)***	-0.083(0.011)***	-0.083(0.011)***
Civil liberties			0.121(0.044)***	-0.097(0.074)
Democracy				0.007(0.017)
Intercept	7.662 (0.140)***	12.055 (0.600)***	11.687(0.603)***	11.682(0.603)***
R ²	0.8360	0.8686	0.8689	0.8698
R ² -adjusted	0.8206	0.8554	0.8550	0.8552
N	199	199	199	199

***significant at 1% level, **significant at 5% level, *significant at 10% level. All explanatory variables are lagged one year.

If they were underpaid, they would give way readily to temptation and indulge in corrupt acts.

Openness variables are negative and significant. More open economies are indeed less corrupt than their more closed counterparts. A domestic market with more foreign competition (higher import and export volumes) will decrease rents enjoyed by domestic firms, thus lowering corruption. Some Asian countries have a high degree of openness. For example, during 1996-2010 the average openness score of Singapore is 376, meaning the amount of imports and exports combined is almost 4 times its GDP. For Hong Kong, during the same period, its openness score is 332. The average amount of imports and exports in Malaysia is almost twice its GDP (score of 194). Singapore and Hong Kong do not have natural resources to offer, thus they focus on being trade hubs and financial centers in Asia. Singapore and Hong Kong are important shipping and processing centers, so they are importing goods, processing them, then exporting the final product to other countries. Singapore offers better connections to Southeast Asia and its financial markets are highly developed. Hong Kong provides better connections to mainland China and is one of the world's leading financial centers.

The natural resources variable is positive and significant. In Asia, countries with large endowments of precious raw materials offer greater potential gain to public officials who distribute the rights to exploit such resources. Some rents are indeed natural instead of artificially created, but still stimulate a corrupt competition over their allocation (Treisman, 2000). The United Nations Development Programme (2011) reports that corruption involved in natural resources. The economic benefits natural resources produce are all too often squandered by government officials. In Indonesia alone, the United Nations estimates that \$1 billion a year disappears due to

informal payments and bribes in the logging industry (UNDP, 2011). Illegal logging and other corrupt practices in the management of natural resources are especially detrimental to the poor because small farmers and indigenous people are often driven into poverty as a result of land expropriations. The UNDP suggests a number of strategies that could help reduce such corruption, for example improving the quality of a merit-based civil service, raising civil servant salaries and enhancing press freedom and international cooperation (ibid).

In model 2, the effect of economic freedom is added. Economic freedom broadly measures the ability of citizens and companies within a country to carry out economic activities without being obstructed by the state. The coefficient of economic freedom is negative and significant, therefore, more economic freedom leads to less incentive for government officer to engage in corrupt activities. Now GDP growth rate is negative and significant. Strong economic growth help reduce corruption. Government expenditure and openness variables remain negative and significant. However, the natural resources variable turns out to be insignificant. Thus, it can be concluded that more economic freedom, in the sense of lower government regulation, is good for business. More economic freedom creates more economic opportunities in a free market economy and lessens the incentives for government officers to engage in corrupt behavior in the natural resource sector.

Sally (2012) argues that the unprecedented expansion of economic freedom is at the core of the Asia's genuine success. Economies have prospered most when governments have dismantled interventionist policies in favor of unleashing the animal spirits of common people. He states that China's greatest leaps forward had come when government instituted rural property rights and

opened up domestic and international trade, exposing the economy to international competition (ibid). Asian Tigers prospered because they maintained macroeconomic stability, had a low prevalence of price controls and subsidies, built necessary infrastructure, and were very open to international trade.

Some Asian countries are extremely free in terms of economic freedom. Hong Kong is actually the freest country in the world by some measures, followed by Singapore. Their objective of government regulation is to make firms able to do business comfortably. Hong Kong and Singapore grant private firms the most flexibility in hiring and firing workers. Most travelers from other countries are excluded from needing a visa for a 30-day visit. You can get a longer visa as a businessman or a private company executive relatively easily there. They also set the standards for clean and free government and benefit significantly from their transparent and straightforward business environments.

Model 3 adds economic freedom and civil liberties to the benchmark model. The coefficient of economic freedom is negative and significant. Deregulation does lower corruption. The impacts of GDP growth rate, government expenditure and openness are also negative and significant. The natural resources variable is positive and significant at the 10 percent level. This is perhaps because of the addition of civil liberties, which is positive and significant. More civil liberties lead to more corruption, including corruption in the natural resources sector. This seems contradictory until we find out that actually civil liberties in Asia are relatively repressed.

Greater civil liberty is argued to lead to higher levels of citizen involvement and political participation. High level of civil liberty reflects a citizen's ability to agitate and influence government behavior without negative repercussions, a mechanism that can plausibly lead to greater accountability and thus better choice and implementation of good governance (Isham et al., 1997). However, higher civil liberties are also strongly associated with higher levels of riots, demonstrations and political strikes (ibid). If civil actions are easily repressed by the law, then the ruling government could also ask police forces to shut down its political enemies or to silence the media. This creates more opportunity for the abuse of power and rent-seeking behavior.

Singapore and Malaysia both have Internal Security Acts that allow for indefinite detention without trial. Students in Malaysia are not permitted to join political parties. Malaysians must apply for a police permit for gatherings of more than five people. Under the new Peaceful Assembly Act, the government of Malaysia prohibits street protests and anyone under the age of 21 will not be permitted to organize an assembly. The Philippines has the Human Security Act, which allows suspects to be detained for

up to three days and allows their rendition to other countries. India and Indonesia have broadly-worded legislation that could be used against various expressions of dissent such as labor strikes and demonstrations. Moreover, the revised Indonesian Criminal Code allows looser rules of evidence than did the old one, including the use of intelligence reports. Although those reports need to be reviewed by a judge, the Indonesian court system is so weak and corrupt that judicial review barely constitutes a meaningful safeguard (Jones, 2002).

In model 4, the effects of economic freedom, civil liberties and democracy are added to the benchmark model. GDP growth rate, government expenditures per capita, openness, and economic freedom coefficients are all negative and significant. Robust economic growth, large but well-directed government spending, more international trade, and less governmental restriction all reduce corruption levels. However, the natural resources variable is positive and significant at the 10 percent level. Greater natural resources endowment does offer greater potential gain to government officials who distribute rights to exploit such resources (Ades and Di Tella, 1999).

The coefficients of civil liberties and democracy are not significant. This is not surprising since civil liberties and more democratic regimes are strongly connected as a certain degree of civil liberty is a precondition for democracy. What is surprising is that they are not significant for Asian countries. According to Diamond (2011), some countries in Asia are democracies such, as India—the largest democratic country in the world, South Korea, Indonesia, and the Philippines. Thailand is a recurrent and probable future democracy. Malaysia and Singapore will become real democracies within generations. China and Vietnam will become democracies faster if they rapidly modernize in one generation or two generations (he predicts within 20 years to 40 years from now). The diversity level of democracies in Asia is possibly what brings the democracy coefficient to be insignificant.

There are also two contrasting arguments about the effect of democracy on corruption, which probably contributes to the insignificance of the democracy coefficient (Isham et al., 1997). More democratic systems may lead to greater public investments in infrastructure, greater and more equitable investments in human capital, more open trade policies and better provision of a secure legal system and property rights (Clague et al., 1997; Tavares and Wacziarg, 2001). All those things, if well formulated and well-implemented, will eventually lead to a reduction in corruption. However, democratic arrangements may worsen corruption if government policies and actions are directed by vested interests lobbying for preferential treatment and against efficiency-enhancing reforms (Olson, 1982). Mauro (1995) states that in high-level corruption or rent seeking, high level officials are the decision makers for public investments concerning their scale and

composition. Government officials, in collusion with legislative members, may pick large scale public projects in accordance with their vested interests.

Some view the success of some Asian governments in pursuing sensible macroeconomic policies, leading to lower corruption, as because authoritarian leaders effectively insulated meritocratically selected government officials from direct popular pressures, such as in Singapore and Hong Kong, and perhaps Malaysia (World Bank, 1993). On the other hand, authoritarian leaders in other countries pursue vested interest macroeconomic policies, leading to higher corruption, for instance Indonesia during the New Order.¹²

5. CONCLUSION

Four different models for investigating the determinants of corruption are estimated. The benchmark model includes only economic variables: GDP growth rate, government expenditures per capita, openness, and natural resource endowments. The benchmark model shows that the GDP growth rate is not an important factor affecting corruption. Nonetheless, when we put together the institutional variables in subsequent models, the GDP growth rate is always significant and of the expected sign. Government expenditures per capita, openness, and natural resources (except for one model) variables are all significant and of the expected sign in all specifications. Institutional variable economic freedom is always significant and of the expected sign, civil liberties variable is only significant in one model, and democracy never influences corruption.

Overall, corruption in Asia is caused by both economic and institutional variables. Economic variables almost always affect corruption, whereas the effect of institutional variables is mixed. As in some Asian countries, giving gifts or commissions and paying bribes are common, there is perhaps a threshold for what is considered to be corruption, in terms of money or payback.

6. RECOMMENDATIONS AND LIMITATIONS

6.1. Recommendations

While it is difficult to provide specific guidance on national foreign anti-corruption policies, there are some guidelines out there on how to curb corruption provided by international organizations. For instance, the World Bank's *Helping Countries Combat Corruption: The Role of the World Bank* (1997), Organisation for Economic Cooperation and Development's *Convention on Combating Bribery of Foreign Public Officials in International Business*

¹²Excluding Hong Kong and Singapore, models 1 and 2 produce the same results in terms of the signs and significances of the coefficients. Models 3 and 4 differ only in the natural resources coefficient, which is not significant. Hong Kong and Singapore do not have natural resources to offer, thus excluding them minimizes the effect of natural resource rents for the sample countries.

Transactions (1997), and the United Nations' *Convention against Corruption* (2004) send clear instructions on how to implement a wide and detailed range of anti-corruption measures affecting their laws, institutions, and practices.

Based on the successful experiences of Hong Kong and Singapore in fighting corruption, we may as well take lessons from them. The civil service reforms and the establishment of an independent anti-corruption agency are the first two things to do. The professional civil service should be politically neutral, have security of tenure, have decent salary, be recruited and promoted based on merit, and not have property or business interests that conflict with the performance of its duties (Adamolekun, 1993). There should be an independent anti-corruption agency reporting only to the head of state, which is supposedly not corrupt. Officials in the agency should be paid more than other government officers in other agencies. The agency should also be able to recommend legal and administrative changes to lower corruption incentives and to engage in public education on anti-corruption campaigns.

Mechanisms for controlling the misuse of power must be strengthened. Governments should apply policy changes that reduce the demand for corruption by evaluating what regulations are being bypassed and then take action to simplify them (Tanzi, 1998). Those agencies that are susceptible to corrupt activities such as customs houses, tax offices or police forces should evaluate their standard operating procedures periodically. Their procedures should be clear and can be interpreted unambiguously. Penalties for misuse of power should also be included to introduce a deterrent effect.

6.2. Limitations

The estimates in this paper have to be interpreted with caution as the models do not control for all variables deemed essential in explaining corruption due to data availability. The time period chosen is also restricted because the data on corruption provided by Transparency International is limited.

Further research could include other variables the models fail to control for. One could also lengthen the time period by using a corruption index from Business International or the International Country Risk Guide. One can also perform a deeper analysis on a country by country basis using case studies

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