THE CAUSAL RELATIONSHIP BETWEEN CORRUPTION AND POVERTY IN ASEAN: A GENERAL METHOD OF MOMENTS/ DYNAMIC PANEL DATA ANALYSIS

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ABSTRACT

It has been noted by public that corruption is a practice that can be considered an extra ordinary crime that has happened in developing countries. Such a common misuse of public affair is conducted for private gain, including but not limited to: corruption, nepotism, bribery, extortion, influence peddling and fraud. In Indonesia, corruption has been around for years and increased dramatically in recent years. It distorts markets and the allocation of resources. This research examines the Granger causal relationship between corruption and poverty with panel data of 9 ASEAN countries during the period of observation 2005-2009. It uses the generalized method of moments/dynamic panel data (GMM/DPD) and focuses on capability poverty using human development index (HDI). The major results show that poverty does not affect corruption meanwhile corruption causes poverty. There is unidirectional causality, from corruption to poverty.

Key words: Corruption, Poverty, Panel Data Analysis, Causality.

HUBUNGAN KAUSALITAS ANTARA KORUPSI DAN KEMISKINAN DI ASEAN: *GENERALIZED METHOD OF MOMENTS/ DYNAMIC PANEL DATA*

ABSTRAK

Telah menjadi kenyataan bagi masyarakat bahwa korupsi adalah praktik yang dapat dianggap sebagai kejahatan luar biasa yang telah terjadi di negara-negara berkembang. Seperti penyalahgunaan urusan dinas bagi publik dilakukan untuk kepentingan pribadi, termasuk dan tidak terbatas pada: korupsi, nepotisme, suap, pemerasan menjajakan, pengaruh dan penipuan. Di Indonesia, korupsi telah ada selama bertahun-tahun dan meningkat secara dramatis dalam beberapa tahun terakhir. Kondisi seperti ini bisa merusak pasar dan alokasi sumber daya. Penelitian ini menguji hubungan kausal Granger antara korupsi dan kemiskinan dengan data dari 9 negara ASEAN selama periode pengamatan 2005-2009. Penelitian ini menggunakan the generalized method of moments/dynamic panel data (GMM/DPD) dan berfokus pada capability poverty dengan menggunakan indeks pembangunan manusia (IPM). Hasil openelitian ini enunjukkan bahwa kemiskinan tidak mempengaruhi korupsi sementara korupsilah yang menyebabkan kemiskinan. Ada hubungan kausalitas satu arah, dari korupsi terhadap kemiskinan.

Kata Kunci: Korupsi, Kemiskinan, Analisis Data Panel, Kausalitas.

INTRODUCTION

Corruption, an extra ordinary crime, is a kind of everlasting developing countries' problem. It is commonly defined as the misuse of public affair for private gain, including but not limited to: corruption, nepotism, bribery, extortion, influence peddling and fraud (Chetwynd et al. 2003). In Indonesia, corruption has been around for years and increased dramatically in recent years. It distorts markets and the allocation of resources (Tanzi 1998). A simple question is sometimes addressed: who is the poor? The answers to this question are still debatable.

There are some definitions of poor people. However, defining poverty is a matter of social convention (Pradhan 2000:2). An accepted definition of poverty, unlike the presence of its real problem, is somehow hard to define. There are a lot of definitions of poverty which can be used to different countries or regions and at all times, independent of the social structure and level of development (Meier 1995:26). Some would go into a pragmatic conclusion by looking at poverty as merely contextual and cannot be conceptualized since the notion of 'being poor' or 'feeling poor' can be very subjective. However, for analytical and policy purposes, a rigorous definition is necessary.

In Indonesia, there have been at least three definitions of poverty in most highly publicized research. The first one was the official measurement from the Indonesian Central Statistics Agency (*Badan Pusat Statistik*, BPS). The second one was a measurement proposed by the International Labor Organization (ILO) and the United Nations Development Program (UNDP). The third measurement was published by the World Bank, SMERU – a non-governmental organization funded by the World Bank – and a joint study by RAND Graduate School and Demographic Institute, Faculty of Economics, University of Indonesia.

Poverty is obviously about more than insufficient income. It is also related to the access to and quality of public services vital to the poor such as health, education, water, infrastructures and sanitation. It is also about lack of opportunities, lack of access to information, lack of voice and lack of representation. The relationship between corruption and poverty is complex. In macroeconomic level, corruption affects poverty through lowering, economic growth, reducing foreign and domestic investment, distorting market, hindering competition, and increasing income inequalities (Chetwynd et al. 2003).

Corruption is likely to increase poverty because it reduces the potential income earning of the poor. Therefore, eradicating corruption is a crucial issue in the poverty reduction process. Alternatively, poverty which is usually indicated by low income, low education and health, vulnerability and powerlessness, invites corruption. Social and income inequalities in poor countries make greater imbalances in the distribution of power and encourage corruption (Ndikumana 2006). A rational agent will be corrupt as long as the private income gained from corruption is equal or outweighs its private cost, because it will improve his/her welfare (Yaru and Aminu 2009).

While many studies have examined the relationship between corruption and poverty, the question of whether a causal relationship exist between corruption and poverty based on panel data models, has received less attention. Thus, the policy recommendation for combating poverty and corruption can simply be wrong. Taking it into the limit, particularly for ASEAN countries, how good they try to decrease corruption by implementing anti poverty strategies if the high poverty level simply caused by high corruption and not the other way around. As we know, most of countries joined in ASEAN (Association of the South East Asia Nations) are developing countries. Based on the Survey of Transparency International Corruption Perception Index (CPI) in 2009, the ASEAN countries except Singapore, Brunei Darussalam and Malaysia, placed on the group of worst level of the corrupted countries in the world. This paper intends to examine the Granger causal

relationship between corruption and poverty by a panel data of 9 ASEAN countries from 2005 to 2009, the period of ASEAN-Free Trade Area (AFTA).

THEORETICAL FRAMEWORK AND HYPOTHESIS

Poverty is not the same as inequality. Whereas poverty is related to the absolute standard of living of a part of society of the poor, inequality refers to relative living standard across the whole society. At maximum inequality, poverty is high. In contrast, minimum inequality is possible with zero poverty (where no one is poor) as well as with maximum poverty (where all are poor). The perception of poverty has changed tremendously and evolved historically from culture to culture. Criteria for determining poor and non-poor tend to express particular national priorities and normative concepts of welfare and rights. It is common that as countries become wealthier, their perception of the acceptable poverty line changes.

What is poverty? A simple definition of poverty is the inability to attain a minimal standard of living (Meier 1995:26). Similarly, it is the inability of an individual or a family to command sufficient resources to satisfy basic needs (Fields 1993: 88). It delivers a commonly shared idea of poverty as a state of deprivation. Despite giving a general idea, such definition also provides more issues to explore. This opens the room for some possible approaches in discussing poverty.

Studies on the causal relationship between corruption and poverty have been carried out intensively. Basically, there are two competing theories in exploring such a linkage. The first theory argues that corruption affects poverty but not the other way around. There is unidirectional causality from corruption to poverty. Corruption affects the poor directly since it increases the cost of public services, lowers quality of public services and often restricts poor people's access to public services (health, education, etc).

Corruption also indirectly affects the poor because corruption is an impediment to economic growth, distorts public expenditure allocation, etc. In contrast to the first theory, the second theory points out that corruption and poverty go together, with bidirectional causality. Study by Gupta et al. (1998) provides some theoretical framework showing that corruption increases income inequality and poverty such as reduced economic growth; biased tax systems favoring the rich and well connected; poor targeting of social programs; the use of wealth by the well to do to lobby government for favorable policies that perpetuate inequality in asset ownership and lower social spending.

The relationship between corruption and income inequality also arises from rent-seeking theory and the ideas of Rose-Ackerman (1978). Lambsdorff (1999) argues that the benefits from corruption are likely to accrue to the well-connected at the expense of the poor. According to Gupta et al. (1998), corruption increases income inequality, as measured by the Gini coefficient. In a cross section of 37 countries, a significant positive impact of corruption on inequality was found, while taking into account various other exogenous variables. When controlling GDP per head, this impact remains significant at 10% level. It was concluded that deterioration in a country's corruption index of 2.5 points on a scale of 0 to 10 is associated to the same increase in the Gini coefficient as a reduction in average secondary schooling of 2.3 years.

N'zue and N'Guessan (2006) also investigated the direction of causality between poverty and corruption by using a panel of 18 countries during the 1996-2001 time periods. The empirical evidence shows that poverty measured by Human Development Index (HDI) does not cause corruption and corruption does not cause poverty. When the poverty measured by income inequality, the results show uni-directional causality. That is, inequality does not cause corruption but corruption causes inequality. On the opposite, Negin et al. (2010) investigate the Granger causal relationship between corrup-

tion and poverty.

Based on a sample of 97 developing countries during 1997-2006, their empirical findings reveal that corruption and poverty are along together, with bidirectional causality. In their study, the poverty was measured by Human Poverty Index (HPI). You and Khagram (2005) provide evidence that income inequality also raises the level of material corruption, as well as normative mechanisms. Their analysis of 129 countries using 2-SLS methods with difference of 3 instrumental variables supports their hypotheses using different measures of corruption. Because income inequality also contributes to corruption, societies often fall into vicious circles of inequality and corruption.

RESEARCH METHOD
This research uses the generalized method of moments (GMM) estimator to examine the Granger causality between corruption and poverty by controlling the potential bias that may come from endogeneity of some repressors, including the lagged dependent variable. Our basic specification is in the following form:

$$y_{it} = \alpha +$$

$$\sum_{j=1}^{m} \delta_j y_{i,t-j} + \sum_{l=1}^{n} \beta_l x_{i,t-1} + \sum_{k=1}^{r} \gamma_k z_{i,t-1} + u_{it} \quad (1)$$

In such model, the causality-based variables comprise x and y in which each corruption and poverty. Major control variables (z) act as mediator between corruption and poverty namely inflation and gender. Then, u_{it} is an error term. In panel estimation, neither the Generalized Least Squares (GLS) estimator nor the Fixed Effect (FE) estimator will produce consistent estimates in the presence of endogenous and dynamics regressors (Baltagi 1995). Arellano and Bond (1991) have proposed a dynamic panel General Method of Moments (GMM) estimator with an instrument variable (IV) estimator that uses all past values of endogenous regressors as well as current values of strictly exogenous regressors. Estimates can be based on first difference, or on orthogonal

deviations.

Arellano-Bond estimation takes the first step by transforming all regressors, usually through differentiation and uses the Generalized Method of Moments to be called as difference GMM. The Arellano-Bover/Blundell-Bond estimator augments Arellano-Bond by making an additional assumption, that first differences of instrument variables are uncorrelated with the fixed effects. This allows the introduction of more instruments, and can dramatically improve efficiency. It builds a system of two equations-the original equation as well as the transformed one- and is known as system GMM. It is preferred to difference GMM since finite sample bias problem caused by weak instruments in first differenced GMM will be addressed by using system GMM. It also offers forward orthogonal deviations, an alternative to differencing that preserves sample size in panels with gaps. It allows finer control over the instrument matrix.

Data and Variable Definitions
The researcher analyzes the link between corruption and poverty based on a panel of 9 ASEAN countries for the 2005 to 2009 time periods. The data were obtained from the Transparency International, United Nations Development Program (UNDP), World Bank and United Nations Conference on Trade and Development (UNCTAD). To measure corruption, this study uses the Transparency International corruption perception index (CPI). The data is yearly and scored from 0 to 10, where zero means higher corruption. Ten refers to a corruption-free country. Table 1 shows the CPI scores of 9 ASEAN countries for 2005-2009 provided by Transparency International.

To measure poverty, the researcher used the Human Development Index (HDI) published by UNDP. This HDI represents indicators such as education and adult literacy, life expectancy and household income to come up with an indexed score to show where moreover 150 countries fall on the development spectrum (high, medium or

Table 1
Corruption Perception Index

Countries	2005	2006	2007	2008	2009
Cambodia	1.5	2.3	2.1	2	1.8
Indonesia	2.2	2.4	2.3	2.6	2.8
Lao PDR	3.4	3.3	2.6	1.9	2.0
Malaysia	5.1	5.0	5.1	5.1	4.5
Myanmar	1.7	1.8	1.9	1.4	1.3
Philippines	2.6	2.5	2.5	2.5	2.3
Singapore	9.3	9.2	9.3	9.2	9.2
Thailand	3.8	3.6	3.3	3.5	3.4
Vietnam	2.6	2.6	2.6	2.6	2.7

Source: Transparency International.

low). Moreover, the data on consumption and income could not truly capture the state of poverty in the countries being studied. We focus on capability poverty using Human Development Index (HDI) since it portrays in a more accurate way the state of poverty.

To assess the correlation between corruption and poverty, the researcher puts Z_i variables which consist of inflation rate and gender. Inflation, as one of the aspects of macroeconomic instability, is a regressive tax, which its burden is especially carried by those in lower income groups since the poor tend to hold most of their wealth in the form of cash, and also they are commonly less able than the rich to secure the real value of their incomes and wealth from inflation (Negin et al. 2010). Therefore, price increases generally erode the real wages and assets of the poor more than those that belong to the rich.

Higher cost of monitoring the agent is generated by agent behavior in inflating the price of goals which is required to start an investment project. So it causes higher corruption and lower investment (Braun and Di Tella 2000). Gender is considered as one of control variables. Women's participation in public sector reduces corruption in business and government. Several studies show that in countries whit high gender equality, the level of corruption is lower (Dollar and Gatti 1999). Those aspects conform to the comparative studies the comparative study among countries with the same civil liber-

ties, education, legal institutions, and GDP. Then, in order to lower the level of corruption, it may be better to design policies to improve the role of women in public life. Gender disparities are not only inequitable but also have economic consequences such as slowing down growth and increasing poverty. Evidences show that growth and social development significantly affects poverty outcomes. It means that for ultra-poor households, women have crucial role to prevent increasing their poverty (Negin et al. 2010).

Alatas et al. (2007) also explores behavioral differences by gender across countries and find that there are larger variations in women's behavior towards corruption than in men's across the countries in our sample. Bowman and Giligan (2008) examine the possible relationship between gender and perceptions of corruption within Australia. Their study suggests that, in general, Australian women appear to be less tolerant of corrupt scenarios than their male counterparts, although gender difference was not automatic across all scenarios. The results suggest that it seems gender dimension with respect to perceptions of corruption.

DATA ANALYSIS AND DISCUSSION
The Granger causality between corruption and poverty is explored by using two steps GMM method with t-values and test statistics that are asymptotically robust to general heteroscedasticity and corrected for a small

Table 2
The Estimated Results from the Two Step Dynamic Panel GMM-SYS
(Effects of Corruption on Poverty)

Dependent log(HDI)$_t$	Model (1)	Model (2)	Model (3)
log(HDI)$_{t-1}$	1.227	1.411	1.66
	(7.13)***	(13.86)***	(10.44)***
log(CPI)$_t$	-0.057	-0.052	0.13
	(-1.38)	(-2.19)**	(1.48)*
log(CPI)$_{t-1}$	0.138	0.016	-0.019
	(2.07)**	(0.45)	(-0.57)
log(CPI)$_{t-2}$	-0.122	-0.013	0.025
	(-2.15)**	(-0.55)	(1.37)
log($Gender$)$_t$		3.201	4.13
		(4.35)***	(2.40)**
Inflation			-82.38
			(-3.01)***
*dummy*2005			
*dummy*2006			
*dummy*2007			
*Dummy*2008	-3937.085	-5122.649	-4653.215
	(15.03)***	(-15.96)***	(-6.62)***
*Dummy*2009	701.3394	1517.382	1957.230
	(2.41)**	(7.08)***	(2.69)**
No. Observation	100	100	100
Sargan test, (p value)	4.906	3.138	2.628
Instrument rank	11	11	11

Notes: All models are estimated Arellano and Bond dynamic panel system GMM estimations. Figures in the parentheses are t-statistics. *** Significant at the 1 percent level, ** significant at the 5 percent level and * significant at the 10 percent level.

sample bias. To investigate Granger causality relationship between corruption and poverty, two cases are considered: (i) corruption does not Granger-cause poverty, and (ii) poverty does not Granger-cause corruption.

The empirical results of the poverty equations are presented in Table 2 where each column presents different specifications of the poverty equation. In all models the interest variable is corruption. In specification 1, there is no control variable; in specification 2, gender (female labor force participation rate) is used as a control variable. In specification 3, inflation is added to gender as the

other control variable. Since all other regressors in these models are not strictly exogenous, in all specification, year dummies and levels equation are used as instrument variables. For all specifications, the lags length of corruption is two and the lags length of dependent variable (poverty) is one. The results in all specifications suggest that there is a significant relationship between corruption and poverty.

In specification 2 and 3, the coefficient of gender is positive and significant (at 1% level and 5% level, respectively) indicating that women have crucial role either to pre-

Table 3
Granger Causality Tests Results

Hypotheses	Model
Corruption does not cause Poverty	4.801 $(0.01)^{***}$
Poverty does not cause Corruption	1.979 (0.15)

Numbers in parentheses are P-value of the statistics. A triple asterisk is an indication of significance at the 1% level.

vent poverty or to increase society welfare. The result is consistent to Subbarao and Ezemenari (1995) and Negin et al. (2010). The inflation has a statistically significant negative effect (1% level) on human development index in the specification 3 which is consistent with Ames et al. (2002) and Negin et al. (2010).

Two types of diagnostic test are used for validity of the empirical models; they are Sargan test and Instrument Rank. Those tests identify restrictions under the null hypothesis of the validity of the instruments (Arellano and Bond 1991). Based on the Sargan test statistic for all models, high p-value indicates that the null hypothesis of no over-identifying restrictions fails to reject. Therefore, the Sargan test statistics indicates that all specifications are well specified and that the instrument vector is appropriate. The instrument rank of 11 is greater than the number of estimated coefficients (6, 7 and 8) also give the same conclusion.

The researcher also investigates the direction of causality between poverty and corruption. If the null hypothesis of no causality is rejected, then one may conclude that corruption causes poverty. The empirical evidence in Table 2 shows that poverty does not cause corruption, meanwhile corruption causes poverty. Since the result confidently confirms that only corruption causes poverty, whereas poverty does not cause corruption, we do not need to test the corruption equation.

Corruption could affect directly the poor since it lead to increase the prices of public services, lower quantity and quality of public services, hamper poor people's access public services (health care, water, sanitation, education and other public services). It also might deform poor people's relationship with and trust for public officials, the police and people in authority who force bribes from them. Corruption also affects indirectly through lowering economic growth, reinforcing income inequality, distorting public expenditure allocation. In macro level, corruption has implications for a country's ability to attract investment, for the effectiveness of its institutions, for income generation through taxation and hence in the economic growth and poverty alleviation.

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS
As the focus of this study is on capability poverty using the HDI, it can be generalized that, empirically, corruption affects poverty, but poverty does not affect corruption. Hence, it is necessary to address the integrated strategies to alleviate poverty and corruption. In other words, the attempts to reduce poverty must be complemented by serious efforts to reduce corruption.

In addition to the finding above, this study suggests strategy to attempt to reducing corruption. If it is carefully crafted, anti-corruption programs might yield important poverty reduction, especially if they are followed by increasing economic growth, creating more equitable income distribution, strengthening governance institutions and capacity, improving government services especially in health and education, and also increasing public trust in government (Chetwynd et al. 2003).

Finally, to reduce corruption, the strategies also need action on at least four fronts (Tanzi 1998): (i) Honest and visible commitment by leadership to fight against corruption. The leadership must zero tolerance for it; (ii) Policy changes that reduce the demand for corruption by scaling down regulations and other policies such as tax incentives and by making those that are retained as transparent and as no-discretionary as possible. Discretion must be kept to the minimum; (iii) Reducing the supply of corruption by increasing public sector wages, by increasing incentives toward honest behavior, and by instituting effective controls and penalties on public servants; and (iv) Somehow solving the problem of the financing of political parties.

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APPENDICES

Table 4
Sources and Characteristics of Sample Data

Variables	Unit of Meas.	Abbreviation	Mean	SD	Min	Max	Data Source
Corruption Perception Index	0-10	*CPI*	3.57	2.15	1.3	9.3	TI
Inflation	%	*Inflation*	6.63	7.18	-0.8	35	World Bank
Female Labor Force Participation Rate	%	*Gender*	43.13	48.45	34.99	50.58	UNCTAD
Human Development Index	%	*HDI*	0.68	0.14	0.44	0.94	UNDP