CORRUPTION AND DEVELOPMENT:

A Cross-Country Analysis

OLEH

MUHYIDDIN
6604011169

TESIS

Diajukan sebagai salah satu syarat guna memperoleh gelar
Magister Sains Ekonomi
pada Program Studi Ilmu Ekonomi
Program Pascasarjana Fakultas Ekonomi Universitas Indonesia

DEPOK, 2007

PERSETUJUAN TESIS

Nama	: MUHYIDDIN
N.P.M.	: 6604011169
Kekhususan	: Ekonomi Pembangunan
Judul tesis	: CORRUPTION AND DEVELOPMENT: The Cross-Country Analysis
Pembimbing tesis	: Dr. Remco Oostendorp
Penguji tesis	: Dr Chris Elbers

Depok, 20 Januari 2007

Ketua Program Studi,

Dr. ARINDRA A. ZAINAL
NIP. 131473822

Abstrak
(Versi Bahasa Indonesia)

Corruption and Development: A Cross-Country Analysis

Muhyiddin*
6604011169
Pasca Sarjana Ilmu Ekonomi
Facultas Economi Universitas Indonesia
2007

Klasifikasi JEL: O10, O11, O12, O47, O57, C23
Kata kunci:
1. Korupsi
2. Pembangunan
3. Growth
4. GDP Per kapita
5. Model Panel Data
6. OLS, TSLS, dan Fixed Effects

Karya tulis ini mencoba menyelidiki dan menjelaskan dampak korupsi terhadap GDP per kapita pada panel data 105 negara. Kekhususan paper ini jika dibandingkan dengan studi-studi terdahulu adalah mencoba menyelidiki bahwa dampak korupsi terhadap pembangunan berbeda antar Negara dengan menambahkan variabel dummy negara maju dan negara berkembang serta pengelompokan dummy berdasarkan wilayah geografi (yaitu negara barat dan maju, Negara berkembang di Asia, Afrika, Amerika Latin dan Karibia, serta Eropa Timur dan bekas Uni Soviet). Metode yang dipakai adalah OLS panel, 2SLS, dan fixed effects regressions. Hasilnya menunjukkan bahwa *pertama*, dengan menggunakan OLS dan 2SLS, dampak korupsi terhadap GDP per kapita adalah negatif dan signifikan. Dengan memakai fixed effects, hasilnya menunjukkan bahwa dampak tersebut tidak signifikan dikarenakan adanya kemungkinan data panel yang terlalu pendek (hanya 6 tahun durasi data) serta measurement error (kesalahan pengukuran variabel korupsi). *Kedua*, dampak negatif korupsi dirasakan lebih besar di negara berkembang dibandingkan di negara maju. *Ketiga*, jika dilihat dari wilayah geografi, dampak negatif korupsi terhadap pembangunan dirasakan paling besar di negara berkembang di Eropa Timur dan bekas Uni Soviet, lalu berturut-turut di Asia, Afrika, Negara Barat dan Maju, serta paling kecil dampaknya di Negara berkembang di Amerika Latin dan Karibia.

Abstract
(English Version)

Corruption and Development: A Cross-Country Analysis

Muhyiddin*
6604011169
Graduate Program in Economics
Faculty of Economics University of Indonesia
2007

JEL Classifications: O10, O11, O12, O47, O57, C23
Key words: 1. Corruption
2. Development
3. Growth
4. Per capita GDP
5. Panel Data Model
6. OLS, TSLS, and Fixed Effects

This paper tries to investigate and explain the impact of corruption on per capita GDP across 105 countries. The distinction of this paper comparing to earlier studies is to investigate that the impact of corruption on development is different among countries by involving dummy developed and developing countries and cluster geographical areas (Western and developed countries, Developing countries in Asia, Africa, South America and Caribbean, and Eastern Europe and Ex Soviet Union). The methods used are OLS, 2SLS, and fixed effects regressions. The results show that first, by using OLS and 2SLS, the impact of corruption on per capita GDP is negatively significant. Fixed effects estimation show no impact of corruption on per capita GDP but this is probably due to the short panel as well as measurement error. Second, developing countries have higher impact of corruption on per capita GDP rather than developed countries. Third, looking on across geographical areas, developing countries in Eastern Europe and Ex Soviet Union have the highest negative impact, and then in Asia, Africa, Western and developed countries, and the lowest is in developing countries in South America and Caribbean.

untuk belahan jiwaku.....

Melati dan Shabrina

Udin thanks to.....

Supervisor saya Prof. Remco Oostendorp. Tentunya yang paling berjasa atas tesis saya. Saya sendiri nggak nyangka juga menyusun tesis serumit ini. Benar-benar nggak saya bayangkan sebelumnya. Prof. Kees Burger, supervisor waktu research project, sangat membantu dalam meletakkan desain awal dari tesis ini. Dosen penguji Prof. Chris Elbers, terima kasih banyak atas masukan2nya (Eh, mustinya pake bahasa Inggris kan. Kali ada yang ngerti. Ah biarin deh)

Buat Pak Dedi S. Priatna. Mungkin beliau awalnya overestimate terhadap kemampuan saya, sehingga mengirim saya belajar ilmu ekonomi. Untungnya, walaupun jungkir balik, alhamdulillah bisa selesai juga. Saya yakin Pak Dedi juga lega mendengar saya lulus. Tenang aja Pak Dedi, habis ini saya minta sekolah lagi kok.... (eits, jangan pingsan karena kaget ya Pak). Pak Anwar Sodiq Santoso, direktur saya yang selalu mendorong untuk maju. Terima kasih.

Pak Suahazil Nazara, trims Pak. Mohon maaf kalau sikap saya nggak berkenan, terlalu keras dan selebor (ngomong2 masih ingat gak saya manggil bapak Pak Suan, singkatan dari Pak Sua dan Pak Sapuan, sekretaris program. Sori, gak sengaja itu pak). Saya juga maklum, mungkin di UI demonstrannya terlalu gemulai, sementara saya terobsesi gaya Maradona, Eric Cantona, dalam hal memprotes wasit. Yang penting kan fair, ya kan pak? Saya kan birokrat, selama jadi birokrat rasanya saya gak pernah mempersulit orang, makanya kalau birokrasi di pasca FEUI mempersulit saya, ya maaf kalau saya marah. Ini kan demi kemajuan buat UI juga yang pengen jadi salah satu world class universities.

Untuk Pak Nachrowi. Salah seorang yang membuat saya mengerti ekonomi secara natural. Memang pendidik sejati. Kayaknya, econometrician di UI juga makin langka, kalau nggak mau dikatakan punah. Ilmunya susah sih. (Tapi, temen saya Dhanil Ilyas yang staf LPEM pas di Belanda ngambil ekonometrik pak, tolong anak itu dibina. Atau ditangkarkan aja, biar banyak. Kepalanya sempat kena bola pas maen futsal, mudah-mudahan ilmu ekonometriknya gak ilang)

Pak Arindra. Saya nggak begitu mengenal bapak, karena baru sekali ketemu pas mau berangkat ke Belanda. Tapi, ya saya tetap berterima kasih karena bagaimanapun bapak yang mengurus kelulusan saya. Dosen-dosen Pasca FEUI. Terima kasih banyak. Terutama atas cerita-ceritanya. Pak Acho, Pak Heidi, Pak Rino, Pak Has, Pak Bambang Brodjo, Pak Sugeng, Pak Mustafa, dll. Serta pasukan pasca FEUI: Mbak Ria, Mbak Tanti, Mbak Asti, Mbak Mirna, Mbak Yati, Pak Wasdi, Firdaus, Pak Satpam, dll, trims berat.

Temen2 Double Degree UI-Vrije Universiteit Amsterdam dan yang ke ANU tahun 2004. Saya absen mulai dari yang paling tua: Peyok..., eh salah, Nathalie, Athoy, Mas Firdaus, Dedi Hasnan, Cak Soleh, mbak Tatik, Rini BI, Hasan, Jack, Nalvira, Erli BI, Yudi Erot, Irsal, Diana, Yanuar, Anton'g', Wempy, Jabrik, Yuke, Dwiva, Peyok, Kadek, Riva, dan Dian 'Wastro'.

Marloes dan Youdi Schipper (sori coy, gue terpaksa ngomel2).

Teman2 di Amsterdam: Chauf, Dhanil, Iman, Shifa, Farid, Yasin, Moris Rotterdam, de Moris, Palupi, Agung, Nevri, Mas Toni Denhaag, dll. Anak2 DD tahun 2005 yang sempat nemenin saya ngasih sentuhan akhir di tesis sekaligus ngasih tumpangan: Bimah, Prita, Iman, Insan, Kurnia, Edi, Zainal, dll. Temen Trans TV yang sempat ngeliput di Belanda, Aryanav dan Dian Anggraini. Untuk semuanya, saya hanya bisa terima kasih. Saya gak bisa ngasih apa2, hanya cinta dan .... (eit, ini mah buat istri)

Sebenarnya saya mau nyebutin semuanya disini, tapi apa mau dikata, waktu dan tempat yang membatasinya. Yang pasti, semua makhluk di bumi dan di langit juga saya ucapkan terima kasih semuanya.

Terakhir...,

Terima kasih khusus yang ...., saya nggak tau cara mengatakannya, buat istri saya Melati Dian Novita atas segalanya. Yah, beginilah nasib jadi istri birokrat gaul (red.: definisi birokrat gaul lihat di kata pengantar). Nggak ada yang bisa saya persembahkan kepadanya, yang bisa saya berikan hanya cinta dan kesetiaan...(puihh, gue sampe malu sendiri pas nulis ini. Suer. Kalo ada yang ngeliat, pasti muka gue jadi pucat dan berwarna biru, soalnya aslinya item. He he he. Kata temen2 gue: haree genee makan cinta dan kesetiaan????). Waktu lagi senang-senang di Belanda, gak bisa nyusul gara-gara kerepotan sama si Shabrina (waktu itu masih 1,5 tahun). Nah ini anak saya yang paling.....paling semuanya deh. Mudah-mudahan di lain waktu bapakmu ini bisa membahagiakan kamu dan mamamu. (Kalau mau mobil nanti saya bawain pulang..... brosurnya dulu...)

Orang tua saya di Batu. Abah KH. Muh. Martain Karim dan Ibu Muslihah. Keduanya selalu siap jadi penyangga bagaimanapun keadaan saya. Kedua mertua saya, Papa H. Abusopah Ibrahim dan Mama Cik Udah. Terima kasih telah menjaga anak dan istri yang terpaksa saya 'kembalikan' selama saya di Belanda. Adik-adik saya yang juga memberi inspirasi: Opik, Umi Hanik, Habib, Ayun, Cempaka, Firman, Fathony, dan Fathir.

Allas SWT. Mudah2an dengan gelar master ini hambamu yang mudah pongah ini selalu dijauhkan dari sombong. Terus terang, yang paling berat adalah menekan rasa arogan setelah kita memperoleh sesuatu. Mudah2an saya takut melakukannya, karena akan membuat saya melupakan-Mu.

Kata Pengantar:
Kampanye Birokrat Gaul

Pada suatu hari pada tanggal 17 Agustus 2006 lalu, tepat di hari kemerdekaan Indonesia yang ke 61, dan itu terjadi di negeri Belanda, negara yang lebih dari 350 tahun menjajah bangsa Indonesia, tesis ini dinyatakan selesai oleh supervisor saya (Prof. Remco Oostendorp). Tidak sedikit pengorbanan untuk mendapat predikat itu. Semua daya, fisik, mental, dan spiritual, dikerahkan untuk mencapainya. Usai meninggalkan Amsterdam, 4 bulan kemudian, alhamdulillah tesis ini disahkan oleh Universitas Indonesia.

Saya mengambil tema korupsi karena memang terobsesi oleh segala sesuatu yang terjadi di negeri yang saya cintai. Negeri yang pernah saya tinggal selama setahun.

Sungguh banyak sekali kebetulan yang terjadi. Kebetulan saya ada di kelas yang mayoritas birokrat, dari pemda maupun pemerintah pusat, plus beberapa dosen muda FEUI. Kebetulan punya hobi dan kebiasaan yang sama dengan teman2 se angkatan, mulai dari main bola, nongkrong, ngobrol ngalor-ngidul, main band, bersepeda keliling Amsterdam, kerja ngeloper koran dan jadi DJ (cuman yang diputar2 piring, alias tukang cuci piring), serta sama2 tidak suka belajar tapi mau lulus. (Nama2 mereka cari aja di ucapan terima kasih, hampir semua anak2 double degree 2004 terlibat)

Dari hobi ngobrol ngalor-ngidul, seperti biasa mengarah pada berbagai hal mulai dari yang sangat santai sampai sangat3x serius. Dari ngobrolin cewek (padahal kebanyakan sudah bapak2), sampai bagaimana mengkudeta generasi di atas yang bobrok dalam menjalankan negara ini. Karena kita di birokrasi, otomatis timbul pula obrolan yang mengarah pada obsesi tentang 'birokrasi masa depan yang gimanaaaaaa'. Lha kok idenya sama, kita sama2 benci birokrat koruptor. Meskipun agak was2 juga, jangan2 kita sama dengan mereka, tapi kitanya nggak nyadar. Atau, kita belum rusak kayak yang lain, kalau diumpamain hard disk komputer belum banyak bad sectornya. Atau kita belum tau enak dan caranya korupsi. Dll.

Saya senang dengan 'kebencian' teman2 terhadap koruptor. Karena di luar sana, cap terhadap birokrat benar2 gak ada yang positif. Tukang palak lah, tukang pungut, tukang kutip, kalau bisa dipersulit ngapain dipermudah, kerja lambat, banyak nganggurnya, dan segala predikat 'merah' lainnya.

Sementara kalau kita berkenalan dengan orang yang suka berkecimpung dalam proyek pemerintah, lalu kita bilang posisi kita di birokrasi yang strategis, pandangan orang tersebut matanya jadi nanar seolah-olah ngeliat kita seperti Sophia Latjuba. Wah, kerjaan nih. Dan yang pasti KKN.

Kalau kita di birokrasi tidak dapat memanfaatkan posisi kita untuk keuntungan pribadi yang besar, kita dibilang goblok. Kalu ada birokrat hidupnya sederhana, bersahaja, sekali lagi kita dibilang dungu. Lalu birokrat yang bener atau 'birokrat gaul' adalah yang mentereng handphone-nya, mobil kelas menegah keluaran terbaru (sekelas Innova lah),

rumah di kompleks elit, dll. Tongkrongan birokrat seperti itulah yang sangat diidam2kan para orang tua yang ingin sekali anaknya jadi birokrat, bukan untuk mengabdi pada bangsa dan negara, tapi untuk jadi koruptor. Biar kayak si A yang di pajak, si B yang di bea cukai, si C yang di imigrasi, si D yang bina marga, perhubungan, departemen keuangan, dll. Intinya pengen jadi birokrat gaul. Parahnya, anak2 fresh graduate dari berbagai perguruan tinggi ternama di tanah air berlomba2 jadi birokrat. Lalu birokrat2 muda itu langsung belajar cara korupsi dari pertama kali bekerja, tanpa mendahulukan gimana bekerja secara benar. Ditambah lagi oleh ketimpangan kesejahteraan birokrat, maka makin lengkaplah alasan 'menghalalkan' korupsi.

Korupsi begitu dibenci, tapi sangat dirindukan. Mereka yang benci dipandang sinis, mungkin karena gak bisa ikut menikmati, coba kalau mereka yang benci dapat posisi yang empuk, pasti jadi 'kapal keruk' juga...., begitu pandangan orang di luar. Sementara para birokrat koruptor tersebut makin tersanjung oleh budaya materialistis masyarakat Indonesia yang suka mengukur sukses seseorang dengan hitung2an kepribadian.... mobil pribadi, rumah pribadi.....

Pusing? Yah pusing buanget. Kok bisa bangsa kita begitu keroposnya.

Usul punya usul, temen2 di Amsterdam mulai berpikir yang 'bukan2' dan 'aneh2'. Mumpung di Belanda, kali kita bisa menciptakan gerakan yang bakal mempengaruhi perjalanan bangsa ini. Berembug kita lama sekali. Makin lama makin intens, yang akhirnya kita mendeklarasikan panji Forum Mahasiswa Birokrat Indonesia di Belanda (FMBI-Belanda) pada tanggal 26 Mei 2006.

Beberapa teman dosen dan dan praktisi yang lagi kuliah di Belanda ikutan mendukung dan memberikan masukan2. Dari FEUI ada Kadek, Chauf, dan Dhanil yang ikut sumbang saran, baru saran doang, belum bisa sumbang duit. Juga ada Romo Sunu (Univ. Sanata Dharma), Mas Hari (Univ. Satya Wacana), Iman (FMIPA UGM), Kang Hernandi Affandi (Hukum Unpad), Farid, Nowo dan Bona (praktisi hukum yang lagi kuliah di Amsterdam dan Utrecht) serta teman2 PPI Amsterdam. Cukup mengharukan sekali ketika saya sendiri memimpin menyayikan lagu Indonesia Raya (karena 2 minggu setelah itu di Piala Dunia 2006 kita berualng kali mendengarkan lagu kebangsaan negara lain berkumandang)

Cita-cita kita tinggi, sangat tinggi sekali, yaitu ingin mewujudkan 'birokrat gaul' versi baru melalui gerakan moral di internal birokrasi. Kita terinspirasi oleh Slank ketika mengkampanyekan profil 'anak gaul' yang jauh narkoba. Kata Slank "Loe gak gaul kalo eloe masih make. Anak gaul itu bersih dari narkoba" kata Bimbim Slank sambil terhuyung-huyung (untung sembuh). Nah, **birokrat gaul adalah birokrat yang jauh dari korupsi, melayani kepentingan masyarakat dan berjuang secara positif untuk menjadi sejahtera.**

Kita ingin mengajak semua birokrat untuk sadar bahwa profesi mereka layaknya para pejuang kemerdekaan yang ingin menegakkan Indonesia. Birokrat ada di derap terdepan. Sayangnya ajakan ini seperti teriakan di padang sunyi, gak ada tanggapan. Sampai2 SBY

kampanye anti korupsi di anak2 SD. Langkah bagusnya jika SBY mengumpulkan menteri (gak peduli dari partai politik, birokrasi, maupun praktisi dan akademisi) dan berkata: "Saya nggak mau kalian jadi koruptor, masa lalu kalian yang korup jangan diteruskan. Kalau kalian ketauan korup, awas! Saya pecat! Karena kalian sudah sejahtera. Gaji kamu besar sekali. Saya juga akan mengundurkan diri kalau saya korupsi. Katakan itu pada bawahan kamu!".

Lalu para menteri itu mengumpulkan jajaran birokrasi bawahannya. Lalu membuat kontrak. "Jangan sekali-kali korupsi selama saya menjadi menteri. Kalau dulu kalian korup dan gak ketahuan, silakan tobat. Tapi ke depan, tanpa ampun. Kesejahteraan saya yang akan memikirkan. Kita bisa melakukan manajemen proyek, dan itu akan meningkatkan sedikit kesejahteraan. Tapi, semua birokrat harus giat. Jangan diteruskan kebiasaan enak2an, yang kerja konsultan, birokrat malas2an, penghasilan besar. Gak ada kamus itu"

Waktu itu di Belanda kita maunya sih semua birokrat yang lagi belajar di Belanda bisa dikumpulin untuk mendukung, tapi gak semua bisa. Teman2 birokrat yang belajar di Rotterdam diwakili Yulius (Pemda Boyolali) dan Rizki (Pemda Tegal), sementara dari Groningen cuman titip salam. Hitung-hitungannya sebenarnya sangat masuk akal. Stuned mengalokasikan setengah dari sekitar 160 beasiswa master tiap tahunnya kepada birokrat. Jika setiap tahun katakan ada 60 mahasiswa yang berprofesi jadi birokrat belajar di Belanda, maka dalam 5 tahun akan terkumpul 300 birokrat.

Karena lulusan luar negeri, peluang birokrat2 ini untuk menjadi pejabat sangat tinggi. Yang mengkhawatirkan, kalau mereka tidak mempunyai visi untuk memajukan birokrasi (yang bersih), maka kemakmuran Indonesia akan sangat jauh panggang dari api. Kita hanya mimpi. Jadi pejabat berarti memegang kekuasaan, dan kekuasaan itu memabukkan. Dalam tesis ini disebutkan, bahwa negara yang pembangunannya masih tergantung pada anggaran pemerintah (termasuk Indonesia), akan sukses jika korupsi bisa ditekan. Kalau nggak, sebaliknya yang terjadi, jangan berharap akan ada pembangunan. Dan kayaknya Indonesia musti berkaca. Bencana yang terjadi akhir2 ini kebanyakan kesalahan manusia, lebih khusus lagi pembangunan yang compang-camping karena korupsi. Mulai dari hutan, jalan, jembatan, pengairan, perhubungan, pertambangan (lumpur Lapindo), dll.

Memang gak gampang kalo mau membangun Indonesia. Cita-cita birokrasi yang bersih dan bebas KKN masih panjang dilalui. FMBI-Belanda sendiri mati suri. Bahkan kuliah saya 'amburadul', meski untung masih bisa bernafas dan selamat.

Mudah-mudahan gerakan birokrat gaul bisa hidup dan berkembang. Amin

Birokrat juga manusia. Punya mata punya hati. Jangan samakan dengan pegawai BI.....

Hue he he he

Jakarta, Januari 2007

Daftar Isi

Chapter 1
Introduction

1.1. Background

Corruption has two sides of impacts on development that are positive and negative. Wei (2000) makes an analogue to those relationships as "grease or sand?". Each side has opponents with not only strong theoretical arguments but also a number of empirical evidences. The first side is that corruption is 'grease'. It means that corruption is fine for development. A very common argument for this situation is that with corruption, (such as bribes) economy keeps growing by speeding up the wheels of commerce and passing a stagnant bureaucracy. According to the political scientists such as Leff (1964) and Huntington (1968) quoted by Mauro (1995), corruption is able to create raising economic growth through two types of channel. First, corrupt can generate growth as "speed money" meaning that individual can avoid a delaying bureaucracy. This argument supports the historian Hofstaedter (1948) quoted by Paldam (2002) who claims that in a century ago, corruption in the US made faster their economic growth. For the slowly bureaucracy, corruption can be a stimulant to make it faster, then investment can keep going without official procedure problems, so growth of economy is still upward. The second argument is government officials allowed to get bribes would have more spirit to work. It relates to incentives for officials to be more productive.

The second side is that corruption is 'sand' for development. The World Bank has identified corruption as the single greatest obstacle to economic and social development. It undermines development by distorting the rule of law and weakening the institutional foundation on which economic growth depends. Some recent studies give the results that corruption has negative consequences on development. Corruption is not solution for slowly bureaucracy, but corruption makes development suffered. Investment is slowdown, and then growth is growing slowly. Recent studies indicate that relationship as well. Mauro (1995) shows that corruption has negative impact to growth involving about 68 countries. Wei (1997) finds that corruption is negatively associated with foreign investment. Another study written by Ehrlich and

Lui (1999) conclude that corruption has negative significant effect on the level of per capita GDP (positive sign means adverse effect that the higher corruption, lower the level of per capita GDP). Another study by Del Monte and Papagni (2001), they use a dynamic panel data based on data of 20 regions in Italy and estimate the effect of corruption on growth. They find that the effect is negative and significant.

The causes of corruption itself are different among countries. Treisman (2000) states several hypotheses of those causes that are weakness of legal system, not having religion (protestant) tradition, and less developing countries. Interestingly, Treisman concludes that the process of economic development has significant contribution to reduce corruption. He provides an argument by describing the case of Peru. The positive change of level of per capita GDP has implication in reducing its level of corruption. The other hand, he also suggests that corruption is not the main determinant of development (growth or level GDP per capita). He gives 3 example countries that had high level of corruption but also had high growth that are Zaire, Indonesia, and Thailand during 1980s.

The Schelling diagram (Andvig, 1991 on Bardhan, 1997) describes that developing countries having initial economy condition with high level of corruption tend to be worse with stable equilibrium in high corrupt condition. On the other hand, developed countries will move to the honest equilibrium, and developing countries that have initial condition with low level of corruption tend to become honest equilibrium.

There are three types of countries representing their behaviors in doing corruption. According to Shleifer & Vishny (1993), the first type is corruption in monarchies such as the old-time Communist regimes that a single power has a dominant action in government. It is clear by how much an agent has to pay a bribe to an official. The bribe is then distributed to the all relevant bureaucrats, so there are no bribes further needed. The second type is corruption in some African countries. In most African and developing countries, the sellers of the complimentary government goods take action independently. This problem is made much worse in many countries by free entry into the collection of bribes. Local government, officials, and bureaucrats have the opportunity to create laws and regulations that enable them to become providers of

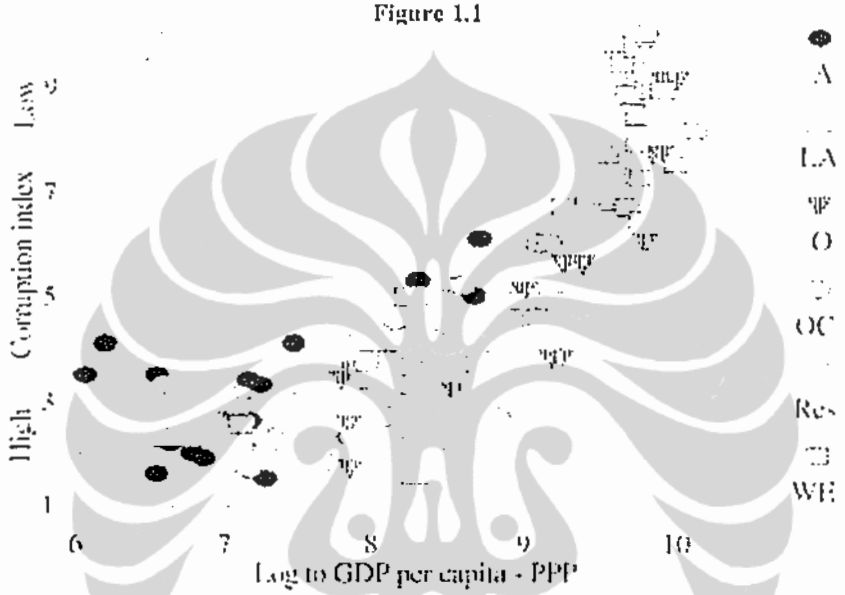
additional required of government goods. The third type is such as United States and other western countries (or developed countries) where at least two government agencies can supply in term of issuing passport or a driver's license each one of the several complementary government goods. The reason why bribe is very small (maybe zero) in this type is because if an official want to collect a bribe, the citizen can go to other officials or other cities. Collusion between several agents is difficult, so bribe competition between the providers will drive the level of bribes down to zero. The first and second types are common for developing countries, and the third type is very typical for developed countries.

In transition of development economic, corruption is seen as a characteristic of poor and middle income countries (Paldam, 2002). Paldam has an opinion that developing countries (middle and low-income countries) have high corruption as a characteristic that will disappear when those countries become high-income countries. He provides a diagram (see figure 1.1. below) that analyzes the correlation between GDP per capita and corruption and the diagram shows a strong relationship (almost linear) between them. Paldam concludes that rich countries tend to be transparent countries (low corruption). In the diagram, he also shows the differences among cultural areas in that relationship. African and Old Communist countries mostly have low GDP per capita and high corruption, while Western European countries mostly have high GDP per capita and low corruption. The signs of clusters also show that countries in the same groups have a close path. Comparing among areas, Africa is the highest, Old Communist is second, Latin America is third, Oriental is fourth, and Western is the lowest.

Paldam uses dummy variables based on cultural patterns in defining the interaction of culture and corruption. The cultural groups are Western Europe, Latin America, Old Communist (East Europe and Central Asia), Africa, Oriental (East and South East Asia), and Residual (not include to those groups). In this paper, I modify these dummy variables slightly with some adjustments based on geographical areas, not on cultural patterns.

One interesting feature from Paldam's paper is that there are cultural patterns among countries in transition of economic development. He shows that there is convergence of corruption that occurs for similar countries, and it is no wonder that countries in the same cultural groups cluster in GDP levels. However, countries in the level of corruption in the same cultural area do not always have a similar level in GDP. In term of corruption, he concludes that if corruption is culturally determined (by dividing it into mostly regional area), it will cause countries in the same cultural group to have similar levels of corruption.

Figure 1.1



Note: The correlation is between Corruption and the level of GDP per capita (average 1994–1996 PPP method). The data are from IBRD Data (World Development Indicators CD-Rom). The initials are: A is Africa, LA is Latin America, O is Oriental, OC is Old Communist, WE is West European and Res is the residual group. (Paldam, 2002).

From the data of Corruption Perception Index (CPI) provided by Transparency International and Gross Domestic Product per capita (GDP per capita) provided by World Bank database, in 2003, there are some interesting features. First, out of 105 countries in the world, the top 20 countries (the highest of index and the lowest of corruption) are developed countries (mostly are West European countries, plus Australia, Singapore, Canada, Uruguay, and Chile) with the GDP per capita more than $20.000 per year (except for 3 countries less than $20.000 that are New Zealand, Chile, and Uruguay). Conversely, the bottom 20 countries (the lowest of index and the highest of corruption) are developing countries (mostly Asia, Latin America, Africa,

ex Russia, and East European) with the GDP per capita less than $1.500 per year (except Macedonia).

Ehrlich and Lui (1999) develop a model analyzing the stages of development regarding to interaction between political and human capital. The model predicts a negative relationship between the steady-state levels of investment in political capital (hence corruption) and human capital (hence per capita income). The incidence of corruption and its deadweight costs are estimated to be highest in developing countries and lowest in countries having the benefit of persistent per capita income growth or developed countries.

However, there is rarely or might be no empirical studies about the impacts of corruption on development that differ across country. If there is different impact of corruption on development, it challenges one of Mauro's conclusions. The conclusion is that if one of developing countries, Philippines for example, could reduce its level of corruption as the same as one of developed countries such as Singapore, its investment rate would be higher 6.6 percent. It means that between Singapore and Philippines have the same impacts of corruption on investment rate.

1.2. Objectives

From the background, it has already presented that there are several earlier studies determining the impact of corruption on development such as growth, per capita GDP, investment, etc. Most of empirical studies conclude that corruption has negative impact on development, but only few studies try to investigate the heterogeneity of the impact of corruption among countries by including interaction of dummy such as developing, developed countries, and geographical areas variables with corruption variable.

From description above, it is interesting to know the impacts of corruption on development, and to know the impacts of corruption on development in developing and developed countries. It is also interesting to know those impacts in 5 geographical areas, namely (i) Western (Europe North America, and Australia) and developed

countries, (ii) Developing countries in, Asia, (iii) Africa, (iv) South America (including Central America and Caribbean), and (v) Eastern Europe and Ex Soviet Union.

The objectives of this paper are to answer the following questions:

- What are the effects of corruption on per capita GDP in general?
- . How are the consequences of corruption on per capita GDP in developing and developed countries?
- How are the effects of corruption on per capita GDP in different geographical areas?

1.3. Hypotheses

On the subject of those questions the background of this paper, I propose several hypotheses.

From several recent studies, there are evidences that corruption suffers development such as Mauro (1995), Wei (1997), Ehrlich and Lui (1999), and Del Monte and Papagni (2001). In this paper, parameter of development that I am going to use is per capita GDP. Based on argument from several studies above, I propose the first hypothesis that:

H1: Generally, corruption has negative effect on the growth of per capita GDP.

Studies determining the impact of corruption on development by using dummy developing and developed countries and geographical area are rare. Mostly of literatures of empirical cross country provide a general finding.

Based on Ehrlich and Lui (1999) paper that there is a connection between corruption and the cost due to corruption that is different between developing and developed countries, I have a presumption that there is different impact of corruption on per capita GDP between developed and developing countries.

H2: The impact of corruption is higher in the developing countries than in developed countries.

Paldam (2002) tries to estimate the cause of corruption by including dummy variables based on cultural areas. He concludes that there is interaction among countries in the same cultural areas with the level of per capita GDP. Different geographical areas may possible have different impact of corruption on level of per capita GDP.

Western countries are typically developed countries, and the rest of the dummies are frequently developing countries. It is interesting to know the impact of corruption in developing countries across geographical areas.

H3: The impact of corruption on per capita GDP is highest in Africa, the second is in Eastern Europe and Ex Soviet Union, the third is in South America and Caribbean, the fourth is in Asia, and the lowest is in Western and developed countries.

Chapter 2
Economics of Corruption

This section describes about definition, economic modeling of corruption and earlier studies of empirical evidences about corruption and development.

2.1. What is Corruption?

In studying corruption, we face on wide terms of it that makes difficulties to measure and model it. Tanzi (1998) quotes from World Bank definition that corruption is the abuse of public power for private benefit. Shleifer and Vishny (1993) define corruption as the sale by government officials of government property for personal gain. Andvig (2006) states almost the same definition as them that mentions that corruption is about violating certain public rules of behavior for some form of private gain[1]. It is a simple term that can be made clearer by some extensions. Bardhan (1997) gives some extensions from those definitions that the word "corruption" is used to mean wide things in wide context. There are alternative denotations of economic corruption. Many of cases of corruption usually refer to the use of public office for private gains, where an official (the agent) delegates with carrying out a task by the public (the principal) uses in some sort of malfeasance for private enrichment that is cannot be monitored clearly by the principal.

Ehrlich and Lui (1999) describe corruption from the point of departure that any government intervention in the economy allocates some resource allocation that is responsible to a bureaucratic structure. Because there are shadows prices making to deviate from free-market prices, an incentive arises to close the gap by various bribes. Then the opportunity comes out for obtaining such arising rents that is what is here meant by corruption. Bureaucratic corruption is one aspect of government intervention in economy that is unavoidable.

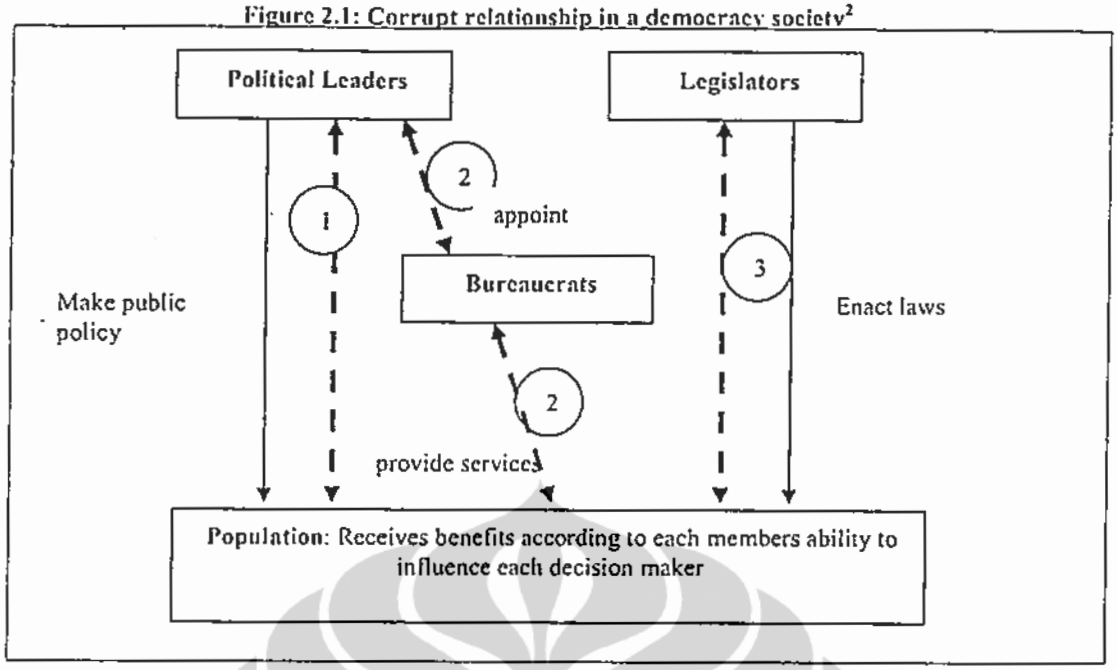
[1] Mishra (2006) is in line with those definitions that corruption is "behavior that deviates from formal duties because of private gains."

Dabla-Norris (2000) writes in his paper that corruption in many developing and transition countries results from a combination of opportunities and incentives. Opportunities for abuse of power are prevalent in discretionary areas of government policy. For instance, complex tax and customs systems, capital controls and financial market regulation, wide-ranging regulations on the private sector, privatization decisions, and discretion over allocation of public expenditure can create room for corruption.

The question rising from those definitions and their extensions is 'who are the corruptors?' Agents in many positions of public sector can act corrupt behavior. Jain (2001) provides the answer by pointing out the definition of corruption, then describing three types of corruption in democratic society's base on the question. The first type is grand corruption referring to the acts of the political elite by which they exploit their power to make economic policies. The second type is bureaucratic corruption referring to corrupt acts of appointed bureaucrats in their dealings with either their superiors (the political elite) or with the public. The third type is legislative corruption referring to the manner and the extent to which the voting behavior of legislators can be influenced. Those types can be seen as a figure as follows:

From some references above, we can describe precisely that corruption is something abuse in using power of public to get private gains. Corruption is generated by the opportunities rising because of lack of monitoring. The agents of corruption can be political leaders, legislators, bureaucrats, and other positions that have public power.

Figure 2.1: Corrupt relationship in a democracy society[2]



2.2. The Determinant of Corruption in Economics Terms

This section provides some review of literatures about the causes of corruption in term of economics.

Shleifer and Vishny (1993) analyze corruption by providing models containing theft cases, the behavior of agents, and the types of countries. In their paper, they provide a simple basic model where a government produces goods or services such as licenses, passports, or other rights. Generally, there are two assumptions that are first, the good is sold for government by an official who has the opportunity to limit the quantity of the good sold, and second, the official is able to supply good without any risk (such as punishment). The condition is that their bosses have the same habit as the official because of the weaknesses of public control and rule of law. The last assumption is the official is a monopolist in selling the good. The objective of the official is to maximize the collection of bribes from selling the government goods.

[2] In Jain (2001), we can see the types of corruption. The first relationship (shown by number 1) called 'grand corruption' generally refers to the act of the political elite by which they exploit their power to make economic policies. The second relationship (number 2) called bureaucratic corruption that refers to corrupt acts of the appointed bureaucrats in their dealings with either their superiors (the political elite) or with the public. The third relationship (number 3) refers to the manner and the extent to which the voting behavior of legislators can be influenced.

The marginal cost can be different in two cases. First, in the case without theft, the official yields the official price of the good to the government. In this case, the marginal cost of providing the good to the official is this government price *p*. For example, every selling a license for a government, the price adds a bribe. An official gets the bribes but the amount p is still with the government, so the government still gets revenue. Thus, the marginal cost is *p*. Second, in the case with theft, the government does not get income anything, and the sale goes on. Therefore, the price that the buyer pays is only equal to the bribe, and might be even lower than the official price. In another word, officials steal government goods. In this case, the marginal cost to the official is zero. In the first case corruption always raises the total price of the good, whereas in the second case it might reduce it. Corruption with theft is more attractive to the buyers. The figures can be seen as follows:

Figure 2.2a. Corruption without Theft
Figure 2.2b. Corruption with Theft

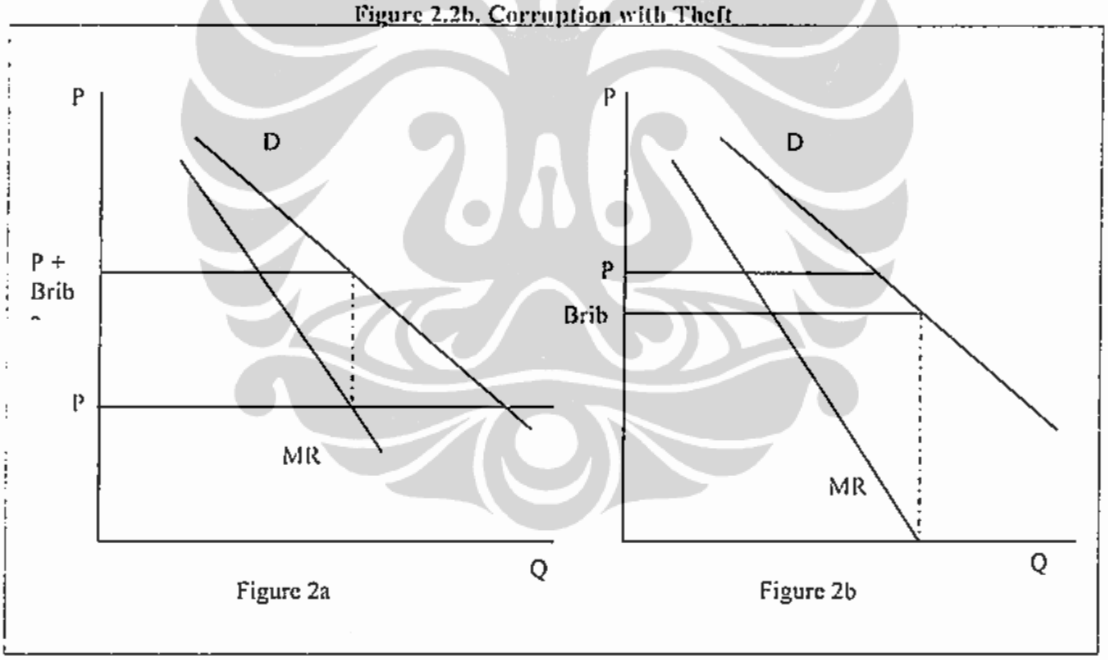


Figure 2a Figure 2b

The model above has two conditions. First, a buyer needs only one government good to conduct his business. Second, the official is a monopolist in the supply of this good. The first scenario is closer for understanding corruption in monarchies such as the old-time Communist regimes that a single power has a dominant action in government. It is clear by how much an agent has to pay a bribe to an official. The bribe is then distributed to the all relevant bureaucrats, and then there are no bribes further needed

There are two extreme alternatives to this monopoly corruption scheme. The first alternative or the second scenario is corruption in some African countries (or some developing countries). In most African and developing countries, the sellers of the complimentary government goods take action independently. This problem is made much worse in many countries by free entry into the collection of bribes. Local government, officials, and bureaucrats have the opportunity to create laws and regulations that enable them to become providers of additional required of government goods.

The second alternative or the third scenario is such as United States and other western countries (or developed countries) in term of issuing passport or a driver's license. In this scenario, each one of the several complementary government goods can be supplied by at least two government agencies. In US, a citizen can get a passport without paying a bribe and it also happen in other developed countries. The reason why there are no bribes is if an official want to collect a bribe, the citizen can go to other officials or other cities. Because collusion between several agents is difficult, bribe competition between the providers will drive the level of bribes down to zero.

The lowest level of bribes is in the third scenario, intermediate in the first, and the highest in the second. But the total amount of revenues collected is higher in the first scenario than in the second, since the independent monopolist suppliers drive the quantity sold so far down that the total revenues from corruption fall. This result is obvious, in the first scenario the suppliers of the complementary inputs collude to maximize the total value of bribes, but in the second, they do not.

How marginal benefit of corruption depends on how many officials do corrupt then how economy is effected by that relationship is described on Schelling. Andvig (1991) on Bardhan (1997) starts his idea that expected gain from corruption depends on the number of people expecting to be corrupt. In the diagram below, there are Curve M and N representing the marginal benefit for a corrupt and an honest official for different allocations. The horizontal axis is the distance representing a part of all officials who have corrupt behavior. If the point closes to zero, fewer officials do

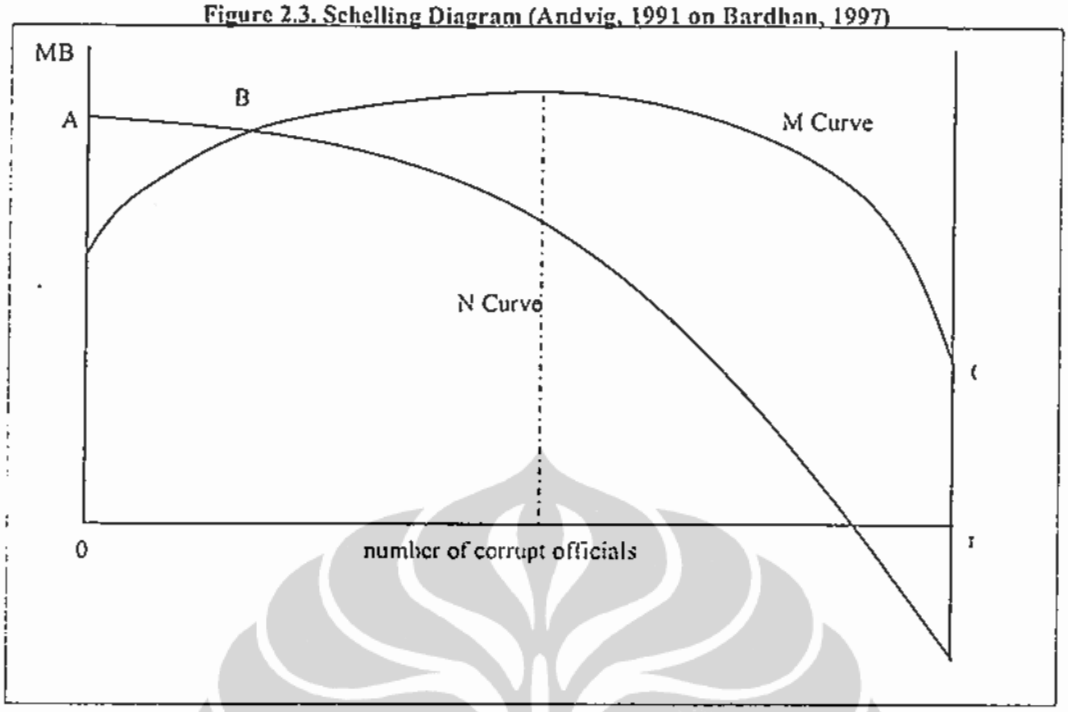
corrupt, on the other hand, if the point closes to n, more officials do corrupt. The vertical axis represents marginal benefit for any number of corrupt officials. Curve N describes that benefit of an honest official is higher than that of a corrupt official with the condition that there are few corrupt officials. The benefit will be lower for an honest official than that for a corrupt official when the corrupt officials increase. The M curve has different path comparing with the N curve. The different is that there is optimal path of marginal benefit for the number of corrupt officials. I add the break line in the diagram from original one that before the break line, the benefit increases for an honest official, then after break line, benefit goes down as the corrupt officials increase.

In that diagram, there are three equilibrium points, A, B, and C. At point A all officials are honest, there is no benefit for corrupt officials, and at point C those are corrupt, there is no benefit for honest officials. At point B, any given official is indifferent (between being corrupt and honest) but if only one more official is corrupt there is benefit to become corrupt, otherwise, if one fewer is corrupt, there is benefit to become honest.

The relationship with economy is that initial conditions are important. If the economy starts with a high average level of corruption, it will be move toward the high-corruption stable equilibrium C. If the economy begins with a high level of corruption, it will go to the stable high corruption equilibrium in C. If the initial is low, the economy tends to move to the honest equilibrium A.

If applying this model in the real world, developing countries that have initial economy condition with high level of corruption tend to be worse with stable equilibrium in high corrupt condition. On the other hand, developed countries will move to the honest equilibrium, and developing countries that have initial condition with low level of corruption tend to become honest equilibrium.

Figure 2.3. Schelling Diagram (Andvig, 1991 on Bardhan, 1997)



Charap and Harm (1999) argue that corruption patterns are endogenous to political structures. Corruption can do systematically rather than decentralized and unexpectedly. A kleptocratic state possibly will take place as a predatory hierarchy from a state of pure anarchy. Corrupt bureaucracy is created by a dictator due to the establishment its position from revolution rising by contenders. The dictator can get loyalty and patronage from corrupt bureaucracy. Alternatively, competitive corruption patterns are associated with anarchy and weak dictators, while strong dictators implement a system of monopolistic corruption. Those patterns are common in developing countries, especially African countries and in communist countries (Shleifer and Vishny, 1993). Charap and Harm provide a table summarizing rent-seeking patterns of corruption and political regimes.

Table 2.1. Rent-Seeking Patterns of Corruption and Political Regimes

Political Regime	Rent-Seeking Patterns
Anarchy	Each Against All
Weak Dictatorship	Competitive Corruption
Strong Dictatorship	Monopolistic Corruption
Benevolent Monarchy	'True' Corruption
Weak Democracy	Political Corruption
Functioning Democracy	Interest-Group Rent-Seeking

2.3. Economics of Corruption and Development: A Model

The previous section already presented the limitation of corruption by defining corruption itself and who does corruption. In this section, I summarize a model written by Del Monte and Papagni (2001) about the economic of corruption and its impacts on growth of per capita GDP.

They start their analysis from a simple theoretical framework on a model of growth where corruption arises because of supply and demand rising from market relations between government and private agents. There are taxes that should be collected by the government from the community. The government also has task to provide public goods. The production of public goods needs inputs purchased from the private sector.

Suppose there are many agents producing and consuming a single good and there are two inputs: private capital and public goods. The agents are also members of community that have a part of role by collecting taxes and buying commodities from private producers for the production of public goods. Market activity is conducted by government and there is asymmetric information. Corruption is done by officials by using agreement with entrepreneurs. Probability P describes the possibility of punishment by government. To minimize the possibility of corruption, there is a cost for monitoring.

The model of economic growth with public spending follows the study by Barro (1990). The original function of g without any corruption is:

$$ty \equiv g \equiv \theta g + (1-\theta)g \qquad (2.1)$$

Per capita output y can be used as consumption c, as investment $\dot{k}$, and as a rival, excludable good provided by the government g. There is an assumption that is a one to one technology for public goods production with respect to private inputs. The resources of government are presented by taxes. When corruption affects public

expenditure, the private sector can count only on a share $(1-\theta)$ of public goods production, while corrupt agents take the rest θ.

The production technology is:

$$y = Af[k,(1-\theta)g] \qquad (2.2)$$

where A is the level of technology, and returns to scale are constant. In the following, a Cobb-Douglas production function replaces equation (*2.2*).

They formalize an economic activity of corruption following the one of microeconomic models of crime such as Becker (1968) and Ehrlich (1973). Each agent is risk neutral and to choose θ that is the quantity of public resources they steal to maximize the illegal expected net income. Entrepreneurs have two choices in doing activities that are goods production and corruption, those are assumed fully separate.

Corruption that is acted by agent is uncertain because there is monitoring by government. The probability of being successful is *1-P*, and entrepreneurs profits are: *θty*. The frequency of monitoring after public sector transactions is denoted by *P*. A cost per unit value of public expenditure is *S(P)* that increases with *P*

$$S_p \equiv \frac{\partial S}{\partial P} > 0; S_{pp} > 0$$

If there is a case that corruption is failed by monitoring, *θty* is taken by guilty agents but the agents are charged with a monetary penalty *Mty*. *Mty* can be as a direct consequence of punishment (as a fine), or indirect as income sufferers deriving from both imprisonment and the monetary value of losses in social status. $M(\theta)$ is a positive increasing function of θ, that fairly accurate crime weightiness, with:

$$M(0) = 0; M_\theta > 0; M_{\theta\theta} \geq 0$$

The agent expects a profit from corruption is:

$$E(\pi_c) = (1-P)\theta ty + P\theta ty - PM(\theta)ty = \theta ty - PM(\theta)ty \qquad (2.3)$$

Then agent maximizes equation (2.3) with respect to θ. The first order condition is:

$$\frac{\partial E(\pi_c)}{\partial \theta} = 1 - PM_\theta = 0 \qquad (2.4)$$

From equation (2.4), the optimal value of effort θ^* is an inverse function of the probability P:

$$M_\theta = \frac{1}{P}; \text{ and} \qquad (2.5)$$

$$\theta^* = \theta\left(\frac{1}{P}\right) \qquad (2.6)$$

with $\theta(1) = 0$.

We relax the assumption that the trend of legal system in most countries is set low penalty. Conversely, according to the equation (2.3) illegal activity always get high fine and is discouraged by law. The relax assumption more realistic to the real economy. The assumption is that there are costs in collecting penalties from guilty agents. The agents can avoid the higher fine by collaborating with the State, then they only pay the penalty in the fair value relative to the crime they do, so collection costs are low. These costs depend on that the fine is disproportionate with respect to the crime and fight against such an unfair penalty, and it can increase if agents consider that condition. The government can choose for each value of θ the penalty $M(\theta)$ that maximizes the revenue from fines net of costs. Given $M(\theta)$, the government fights against corruption monitoring bureaucrats' purchases, and wasting an amount of resources $PSty$. It is reasonable to assume that monitoring is paid out of fines collected from guilty agents:

$$PSty = PMty.$$

By how much the monitoring done by state is denoted by P is such that $M(\theta^*) = S(P)$, or

$$M[\theta(P)] = PMty \qquad (2.7)$$

On the left hand side of equation (2.7) P is decreasing function, and the function on the right hand side is increasing. Nothing prevents us from assuming that the functions involved in equation (2.7) are shaped so that an equilibrium value for P exists and is always lower than one.

The budget constraint of the government is obviously situated for the negative effect of corruption:

$$ty + PMty = \theta ty + (1-\theta)ty + PSty \qquad (2.8)$$

Private agents think that there is expected net revenue by $\theta ty - Pmty$, and it is the reason why corruption allows a reduction in the amount of taxes transferred to the government. This illegal revenue has a negative counterpart in terms of public goods and services offered to the private sector.

The assumption is that there is favor of corruption in this economy, so the allocation of resources to consumption and capital accumulation is affected by corruption. Utility function is derived from consumption and the utility is a simple constant elasticity:

$$U = \frac{c^{1-\sigma} - 1}{1-\sigma} \qquad (2.9)$$

Entrepreneurs obtain profits from his legal and illegal activities, and maximize utility over infinite time subject to a balance constraint. It can be written as

$$\underset{c}{Max}\int_0^{\infty} e^{-\rho t}U(c)d\tau$$

s.t.

$$\dot{k} = (1 - t + \theta t - PMt)y - c \qquad (2.10)$$

In order to get optimization, we have the Hamiltonian function:

$$H = e^{-\rho\tau}\frac{c^{1-\sigma}-1}{1-\sigma} + \lambda\left[(1-t)+\theta t - PMt)k^{1-\alpha}(1-\theta)^{\alpha}g^{\alpha} - c\right] \qquad (2.11)$$

where λ is a co state variable, c is control variable, and k is state variable. By maximization above, we get first order conditions:

$$\frac{\partial H}{\partial c} = 0 \rightarrow e^{-\rho t}c^{-\sigma} - \lambda = 0 \qquad (2.12a)$$

$$\frac{\partial H}{\partial k} = 0 \rightarrow \dot{\lambda} = -\lambda(1 - t + \theta t - PMt)(1-\alpha)k^{-\alpha}(1-\theta)^{\alpha}g^{\alpha} \qquad (2.12b)$$

By joining the equation (*2.12a*) and equation (*2.12b*), then we obtain the growth rate of consumption:

$$\gamma_c = \frac{1}{\sigma}\left[(1 - t + \theta t - PMt)(1-\alpha)k^{-\alpha}(1-\theta)^{\alpha}g^{\alpha} - \rho\right] \qquad (2.13)$$

Another expression for γ derives from considering that $(1-\theta)g=(1-\theta)ty$, and

$$\frac{(1-\theta)g}{k} = (1-\theta)^{\frac{t}{1-\alpha}}t^{\frac{t}{1-\alpha}} \qquad (2.14)$$

Then, replace equation (*2.14*) into the growth rate equation (*2.13*) for getting:

$$\gamma_c = \frac{1}{\sigma}\left[(1-t+\theta t-PMt)(1-\alpha)(1-\theta)^{\frac{\alpha}{1-\alpha}}t^{\frac{\alpha}{1-\alpha}}-\rho\right] \qquad (2.15)$$

This growth rate is common to the variables g and k, and the economy evolves along a balanced growth path without passing through any transitional dynamics.

Equation (*2.15*) shows two opposite consequences of corruption on the rate of growth. One side of the consequences is positive due to the reduction of taxes because of illegal profits *(0ty-PMty)*. The second is negative as a consequence of fewer public services to productive activities. If γ^0 is the growth rate when corruption is nil, then

$$\gamma = \gamma^0\psi + \frac{\rho}{\sigma}(\psi-1) < \gamma^0 \qquad \text{if } \psi < 1, \qquad (2.16)$$

where $\psi = (1-\theta)^{\frac{\alpha}{1-\alpha}}\left[1+\frac{t}{1-t}(\theta-PM)\right]$

This is final equation from Del Monte and Papagni model. From this equation, if we want to know the impact of corruption on growth, we have to derive the function of growth with respect to corruption. The hypothesis is that corruption has negative impact on growth, so the differentiation is expected less than zero.

$$\frac{\partial\gamma}{\partial\theta} < 0$$

$$\frac{\partial\gamma}{\partial\theta} = \left(\gamma^0+\frac{\rho}{\sigma}\right)\left\{\begin{array}{l}\left(\frac{\alpha}{1-\alpha}(1-\theta)^{\frac{2\alpha-1}{1-\alpha}}(-1)\right)\\ \left(1+\frac{t}{1-t}(\theta-PM)\right)+\\ \left((1-\theta)^{\frac{\alpha}{1-\alpha}}\left(\frac{t}{1-t}\right)\right)\end{array}\right\} < 0 \qquad (2.17)$$

The impact of corruption on growth is the function of growth when corruption is nil(γ^0), risk aversion(σ), productivity (α), tax (t), probability (P), monitoring (M) and

corruption itself (θ). The limitation of θ, α, ρ, σ, and P is between 0 and 1. $\left(\gamma^0 + \frac{\rho}{\sigma}\right)$ is positive, and then we should prove that $\left(\frac{\alpha}{1-\alpha}(1-\theta)^{\frac{2\alpha-1}{1-\alpha}}(-1)\right)\left(1+\frac{t}{1-t}(\theta - PM)\right) > (1-\theta)^{\frac{\alpha}{1-\alpha}}\frac{t}{1-t}$. By simplification, we get $\frac{t}{1-t}(\theta - PM) < -1$, so $\theta < PM$. Intuitively, negative impact of corruption on growth rate depends on frequency of monitoring and monetary penalty. If the frequency of monitoring and monetary penalty is smaller rather than corruption, the growth rate will fall. If we want to increase the growth rate, we should make the frequency of monitoring and monetary penalty is bigger rather than corruption. Higher efficiency of state monitoring (lower costs of monitoring), possibly will reason an enhancement in the probability P of corruption detection, that reduces θ and has a positive impact on the growth rate. Likewise an enhancement in public purchase regulation (relate to higher frequency of monitoring) could reduce the economic incentive for corruption. Actually, corruption finding becomes cheaper. Conversely, if the frequency of monitoring and monetary penalty is less rather than corruption, probability of detection becomes lower and the monitoring is inefficient.

Marginal impact of corruption differs across countries depends on two parameters which are α (productivity) and σ (risk aversion). The negative effect of corruption on growth rate could prevail when the productivity of g is high (α is high), and the tax rate t is low. A country which has high dependency on the effectiveness of government expenditure will have higher negative impact of corruption. Corruption makes the productivity of g falls off, so its growth will be suffered. On the other hand, a country that has less dependency on g will have less negative impact of corruption. These conditions appear commonly in developing countries where government expenditure takes the bigger role in their economy.

Parameter risk aversion of country also affects the negative impact of corruption. In micro level, poor people are more risk averse. In this model, poor countries are more risk averse. The channel of different impact of corruption from parameter risk aversion on growth is monitoring. Poor countries tend to avoid monitoring, because

monitoring is costly, and there is no guarantee that monitoring will be effective to reduce the danger of corruption. In this model, corruption with monitoring is less harmful than that without monitoring, so with the same level of corruption but different behavior in monitoring will lead different impact on growth. More risk aversion of the country, less monitoring on corruption, higher impact on growth. We can conclude that more risk aversion of the countries, more impact of corruption on growth rate. Poor countries are commonly developing countries which are more risk aversion than rich countries, so the impact is higher on developing countries.

2.4. Review of Empirical Evidences

There are several papers providing empirical evidence of the impacts of corruption on development. In this section, I summarize some earlier studies about the consequences of corruption on development such as growth, investment, income per capita and other terms that are part of development.

Corruption has significant impact on investment. Several empirical studies do not reject this hypothesis. One of them is a research by Paulo Mauro (1995), is one of the pioneers that studying corruption empirically by analyzing cross-countries data. He uses a data set with 67 countries from the Business International (BI) consisting of indices on corruption, red tape, and the efficiency of the judicial system for the period 1980-1983. From his paper, to illustrate the quantitative impact of corruption, he concludes that in a sample of 67 countries, corruption negatively influences the ratio of investment to GDP. He also provides an example that if Bangladesh could reduce its corruption to the level of that of Uruguay; its investment rate would increase by almost 5 per cent of GDP. Still from the same paper, Wei (2000) adds the argument that supports this finding. If Philippines could improve its bureaucracy to be more honest to the Singapore level, it would have been able to increase its investment rate by 6.6 percent.

Another related contribution about the consequence of corruption on investment is a study made by Tanzi and Davoodi (1997). They examine the impact of corruption on the quality of investments. The need of good quality of investments is associated with

role in the productivity of capital and, hence, GDP. They use panel data on corruption from PRS for 1980-95, and suggest that corruption makes harmful the quality of the infrastructure. They support their hypothesis by providing a high significance in their statistical results.

Corruption makes economic growth slowdown. Considering to another findings of Mauro's paper is that corruption is significantly associated with lower average per capita growth over 1960-1985. Despite of this result, he suggests that there is weak support for the hypothesis that corruption reduces growth by leading to inefficient investment choices. In line with this finding, Del Monte and Papagni (1997) find that in 20 regions in Italy, corruption also has a negative effect on economic growth.

Corruption is negatively associated with per capita GDP. Ehrlich and Lui (1999) use panel data of real per capita GDP from Summers and Heston (1991, 1995), and corruption data from Business International as well as Mauro's paper. Their study focusing on officialic corruption and endogenous economic growth find that although the coefficients are very small, corruption (in their paper defined as corrupt and red tape) has negative significant effect on the level of per capita GDP. Interestingly, they put dummy ex communist countries to their estimation, but the results show that the dummy is insignificant affecting the impact of corruption to the GDP per capita. Another empirical study, Paldam (2002), concludes that the correlation between corruption and per capita GDP is almost linear with positive slope. Husted (1999) also shows highly correlation (1 percent significance level) between corruption and per capita GDP.

There is a study determining the impact of corruption on capital productivity written by Lambsdorff (1999). The measurement of productivity is represented by the ratio of GDP to capital stock. The capital stock is determined as accumulated and depreciated investments. A significant negative impact of corruption on this ratio is found in a cross-section of 69 countries, while controlling for the total capital stock and testing for various other variables. It is concluded that a 6-point improvement in integrity on the TI index - for example an increase in Colombia's level of integrity to that of the United Kingdom - would increase Colombia's GDP by 20 percent.

Chapter 3
Analysis Method

3.1. The Model

In order to knowing that there is an impact of corruption on development, I make a simple specification that is modified from Ehrlich and Lui model (1999). Their specification is a model for regress a panel data set. There is a little bit modification from their model by changing the right hand side variables in determining income per capita in the left hand side. In the Ehrlich and Lui model, GDP per capita is a function of corruption, red tape, and initial level of government size. The basic model in this paper is:

$$(1)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \varepsilon_{it}$$

From that model, in order to give treatment for problem of omitted variables bias, I modify with some additional variables in the right hand side variables. The model is that income per capita is a function of corruption, physical capital, and human capital.

$$(2)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 logPhysical_{it} + \beta_3 Human_{it} + \varepsilon_{it}$$

Where $Corruption_i$ is a country index of corruption, $Physical_i$ is physical capital or gross capital formation of i country, and $Human_i$ is a country index of human development of i country.

3.2. Empirical Specification

From that modification above, I use log and some dummy variables for getting information of the pattern of the impact of corruption on income per capita across different groups of countries.

3.2.1. OLS Specification

The first estimation used in this paper is OLS. The empirical specifications for this estimation are:

$$(3)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \varepsilon_{it}$$

$$(4)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 logPhysical_{it} + \beta_3 Human_{it} + \varepsilon_{it}$$

$$(5)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 Corruption_{it} * D_{developing} + \beta_3 logPhysic_{it} + \beta_4\ log\ Physic_{it} * D_{developing} + \beta_5 Human_{it} + \beta_5 Human_{it} * D_{developing} + \varepsilon_{it}$$

$$(6)\ LogY_{it} = \alpha + \beta_1\ Corruption_{it} + \beta_2 Corruption_{it} * D_{Asia} + \beta_3\ Corruption_{it} * D_{Africa} + \beta_4\ Corruption_{it} * D_{SouthAmerica} + \beta_5\ Corruption_{it} * D_{EasternEurope\&ExSoviet} + \beta_6\ log\ Physic_{it} + \beta_7 logPhysic_{it} * D_{Asia} + \beta_8 logPhysic_{it} * D_{Africa} + \beta_9 logPhysic_{it} * D_{SouthAmerica} + \beta_{10} logPhysic_{it} * D_{EasternEurope\&ExSoviet} + \beta_{11} Human_{it} + \beta_{12} Human_{it} * D_{Asia} + \beta_{13}\ Human_{it} * D_{Africa} + \beta_{14} Human_{it} * D_{SouthAmerica} + \beta_{15} Human_{it} * D_{EasternEurope\&ExSoviet} + \varepsilon_{it}$$

Where Y is per capita GDP, ε is an error term, i is a country, and t is time. Dummy Developed Countries is as a base in the equation (5). Dummy Western and developed countries is as a base or an excluded region in equation (6).

OLS is used on pooled model with the condition that specification provides consistent estimators for all of the coefficients of independent variables if the zero conditional mean assumption that error does not correlate with independent variables is satisfied. If not, it causes the estimators to be biased and inconsistent (de Klauw, 2005). In order to deal with those conditions, I also use IV method.

3.2.2. Fixed Effect Specification

Fixed effect controls for omitted country characteristics for time-invariant variables (Stock and Watson, 2003). The specifications are almost the same as OLS

specification, but there is an additional variable of a country specific effect (η_i). The complete specifications are:

$$(7)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 logPhysical_{it} + \beta_3 Human_{it} + \eta_i + \varepsilon_{it}$$

$$(8)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 Corruption_{it}*D_{developing} + \beta_3 logPhysic_{it} + \beta_4 logPhysic_{it}*D_{developing} + \beta_5 Human_{it} + \beta_5 Human_{it}*D_{developing} + \eta_i + \varepsilon_{it}$$

$$(9)\ LogY_{it} = \alpha + \beta_1 Corruption_{it} + \beta_2 Corruption_{it}*D_{Asia} + \beta_3 Corruption_{it}*D_{Africa} + \beta_4 Corruption_{it}*D_{SouthAmerica} + \beta_5 Corruption_{it}*D_{EasternEurope\&ExSoviet} + \beta_6 logPhysic_{it} + \beta_7 logPhysic_{it}*D_{Asia} + \beta_8 logPhysic_{it}*D_{Africa} + \beta_9 logPhysic_{it}*D_{SouthAmerica} + \beta_{10} logPhysic_{it}*D_{EasternEurope\&ExSoviet} + \beta_{11} Human_{it} + \beta_{12} Human_{it}*D_{Asia} + \beta_{13} Human_{it}*D_{Africa} + \beta_{14} Human_{it}*D_{SouthAmerica} + \beta_{15} Human_{it}*D_{EasternEurope\&ExSoviet} ++ \eta_i + \varepsilon_{it}$$

3.2.3. Instrumental Variables (IV)

IV regression is general method to get a consistent estimator when the regressor is correlated with error term (Stock and Watson, 2003). Using instrument is to deal with the problem of endogeneity. In the model, corruption is presumed not strictly exogenous because corruption has correlation with error terms. There are several determinants affecting per capita GDP such as government expenditure, trade, and foreign investment and corruption has causality with those determinants. Because of this correlation, it is needed an instrument to make distinction the impact of corruption on per capita GDP.

In this case, 2SLS in the general IV model is a method with 2 stages of regression that there is a single endogenous regressor that is corruption. 2SLS does regression of corruption and some additional included exogenous variables. In the first stage, the regression is between corruption and instrument and included exogenous variables, and it will get the predicted values from the first stage. In the second stage, the regression only replaces corruption variable with predicted values from the first stage

In order to obtain a consistent estimator for variable of corruption in case corruption is endogenously determined, I include an instrument variable (IV) that is based on Mauro (1995) paper by using ethno linguistic fractionalization (ELF).

2SLS specifications are below:

First stage:

(10) $Corruption_{it} = \alpha + \beta_1 Elf_i + \beta_{1....n}\, Exogenous\ Variables(1...n) + \varepsilon_{it}$

Second stage:

(11) $LogY_{it} = \alpha + \beta_1 \hat{Corruption}_{it} + \varepsilon_{it}$

(12) $LogY_{it} = \alpha + \beta_1 \hat{Corruption}_{it} + \beta_2 logPhysical_{it} + \beta_3 Human + \varepsilon_{it}$

(13) $LogY_{it} = \alpha + \beta_1 \hat{Corruption}_{it} + \beta_2 \hat{Corruption}_{it} * D_{developing} + \beta_3 logPhysic_{it} + \beta_4 logPhysic_{it} * D_{developing} + \beta_5 Human_{it} + \beta_5 Human_{it} * Dummy_{developing} + \varepsilon_{it}$

(14) $LogY_{it} = \alpha + \beta_1 \hat{Corruption}_{it} + \beta_2 \hat{Corruption}_{it} * D_{Asia} + \beta_3 \hat{Corruption}_{it} * D_{Africa} + \beta_4 \hat{Corruption}_{it} * D_{SouthAmerica} + \beta_5 \hat{Corruption}_{it} * D_{EasternEurope\&ExSoviet} + \beta_6 logPhysic_{it} + \beta_7 logPhysic_{it} * D_{Asia} + \beta_8 logPhysic_{it} * D_{Africa} + \beta_9 logPhysic_{it} * D_{SouthAmerica} + \beta_{10} logPhysic_{it} * D_{EasternEurope\&ExSoviet} + \beta_{11} Human_{it} + \beta_{12} Human_{it} * D_{Asia} + \beta_{13} Human_{it} * D_{Africa} + \beta_{14} Human_{it} * D_{SouthAmerica} + \beta_{15} Human_{it} * D_{EasternEurope\&ExSoviet} + \varepsilon_{it}$

Chapter 4
Description of the Data

The data involve 105 countries and 6 years data from 1998 – 2003.

4.1. Corruption

Corruption variable in this paper is an index of corruption. The data is Corruption Perception Index (CPI) which is compiled and developed by Transparency International (TI) and Gottingen University (www.transparency.org). TI is one of a few of the transnational non government organization which has a mission to fight against corruption around the world. TI has a widely network around the world and has more than 90 branch independent office in different countries.

TI publishes CPI annually with the main objective is to provide data on extensive perceptions of corruption within countries. CPI can be used to understand the level of corruption among countries and its fluctuation. The annual TI Corruption Perceptions Index (CPI), first released in 1995, gives grade by indexing more than 150 countries in terms of perceived levels of corruption, as determined by expert assessments and opinion surveys.

CPI includes data from some resources. Each of the sources elaborates the definition of corruption (which is the misuse of public power for private benefit) to assess the measurement of corruption. Here below are the sources and the main questions raised by the sources:

- The State Capacity Survey by the Center for International Earth Science Information Network (CIESIN) at Columbia University has a panel of experts asked the severity of overall corruption with scale: Low/Modest; Modest; Modest/Severe; Severe.
- The Economist Intelligence Unit (EIU), has some experts to assess the incidence of corruption with integers between 0 (very low incidence of corruption) and 4 (very high).

- Freedom House nations in Transit (FH), has experts to assess the implementation of anticorruption initiatives from the following criteria: (a) the government's freedom from excessive bureaucratic regulations and other controls that increase opportunities for corruption; (b) public perceptions of corruption; (c) the business interest of top policy makers; (d) laws on financial disclosure and conflict of interest; (e) laws on financial disclosure and conflict of interest; (f) audit and investigative rules for executive and legislative bodies; (g) protections for whistleblowers, anticorruption activists, and others who report corruption; and (h) the media's coverage of corruption.
- Information International (II) surveys to the stakeholders of business by asking: How common are payment like bribes, illegitimate or additional personal payment in doing business in come countries.
- The International Institute for Management Development (IIMD) surveys alite businesspeople and asks them to assess whether "bribing and corruption prevail or do not prevail in the economy"
- Grey Area Dynamics Ratings by the Merchant International Group (MIG) asks its panel of correspondents assess levels of corruption.
- The Political and Economic Risk Consultancy (PERC) asks expatriate businesspeople to rate on scale zero to 10 how bad they considered the problem of corruption in the country, which they are working.
- United Nations Economic Commission for Africa (UNECA) determines the control of corruption as determined by its local expert panel.
- The World Economic Forum (WEF) asks "In your industry, how commonly would you estimate that firms make undocumented extra payments or bribes connected with?" on case exports and imports, public utilities, annual tax payments, public contracts, influencing laws and policies, regulations, and judicial decisions.
- The World Markets Research Centre (WMRC) provides an assessment of the likelihood of encountering corrupt officials.

TI and Gottingen University compile and develop those sources and they make an index between 0 for the highest of corruption and 10 for the lowest of corruption.

4.2. Income Per capita, Physical Capital, and Human Capital

Data of income per capita and physical capital are from World Bank Database and World Development Indicators (http://econ.devdata.worlbank.org). The data of income per capita is Gross Domestic Product (GDP) per capita real and the data of physical capital is Gross Capital Formation real.

The data of human capital use an index from Human Development Index provided by United Nation Development Program (UNDP)(http://www.undp.org). HDI consists of 3 indexes which are life expectancy index, education index, and GDP per capita PPP index. In this paper, I only use two of them and leave GDP per capita index because I already put GDP per capita on the left hand side of the specification. The index is between 0 and 1, where if the value close to1 meaning the higher index.

4.3. Ethno Linguistic Fractionalization

The index of ethno linguistic fractionalization (ELF) is first constructed in 960 and come from the Atlas Narodov Mira (Department of Geodesy and Cartography of the State Geological Committee of the USSR 1964). The data for 1961 and 1985 calculate the ELF in three different ways. Each index uses the Taylor and Hudson formula, but the three indices differ from one another in what they consider an ethnic group. In this paper, I use the 1985 data (http://weber.ucsd.edu/~proeder/elf.htm).

An ELF Index using none of the groupings reports in the sources when data on sub-groups are available (for example, it treats separate Native American groups as separate ethnic groups rather than combining these in a catch-all "Indigenous Peoples"). Similarly, it treats Hutus and Tutsis as separate ethnic groups rather than grouping these as Banyarwanda in Rwanda or Barundi in Burundi). In addition, in settler societies of the Western Hemisphere, this index treats racial distinctions within ethno linguistic groups (Afro-Americans versus White Americans or Afro-Colombians versus Euro-Colombians) as separate ethnic groups.

The distinguishing groups are by relating some ethnic characteristics such as historical linguistic origin, and no economic or political variables were considered during the project. It is defined as:

$$ELF = 1 - \sum_{i=1}^{I} \left(\frac{n_i}{N} \right)^2 , i = 1, \ldots, I$$

where n_i is the number of people in the i-th group, N is total population, and I is the number of ethno linguistic groups in the country. ELF is a measurement of the probability of two randomly persons from a given country will not belong to the same ethno linguistic group. The higher the ELF index, the more fragmented the country.

4.4. Grouping of the Data

I have specifications needing to make several groups from the data set. The first grouping is that the data are divided in to two groups, developed and developing countries. In this term, I use definition provided by World Bank that bases on the income per capita. Developed countries are those categorized as high income countries with income per capita higher than US$ 10,500. For those countries that have income per capita less than US$ 10,500 are categorized as developing countries or low and middle income countries. I make a base of grouping from the data of GDP per capita in 2003.

The second grouping is that the data are divided into 5 groups of geographical areas. These clusters are modification from Paldam (2002) that uses cultural patterns approach in his specification. I omit residual countries and include them to the closest of geographical areas. The groups are:

- Developed Countries: Western Europe, North America, Australia, Japan, Singapore, South Korea, and Hong Kong
- Developing countries in Asia
- Developing countries in Africa
- Developing countries in South America and Caribbean
- Developing countries in Eastern Europe and Ex Soviet Union.

The complete lists of grouping are in Appendix 1.

Chapter 5
Results and Discussion

5.1. Econometrics Results

5.1.1. Basic and General Models

Table 5.1 presents the summaries of regression analysis in basic and general specification models. Column (1), (2), and (3) are results of regressions of basic model, and column (4), (5), and (6) are those of general model.

In column (1), by using OLS estimation, the coefficient of corruption is 0.24 and it is highly significant. The t statistics is 21.13 which is based on robust standard error for clustering at the country level. It means that corruption has negative impact to the level of per capita GDP (there is adverse sign from corruption index, the higher the index of corruption, the cleaner the country). By increasing 1 unit point of the index of corruption (the country is cleaner from corruption), the level of per capita GDP will raise 24 percent. In column (2) shows that by using 2SLS regression with instrument variable ELF, the estimation is quite consistent where the different of coefficient of corruption is not large. It means that the OLS result is not severely suffering from endogeneity bias.

In column (3), using fixed effect regression, the results show that corruption is not significant to affect per capita GDP. It means that country specific effect has dominant effect on per capita GDP. The coefficient for corruption becomes zero in the fixed effects regression probably because of either the short panel or measurement error. In order to control for measurement error, in column (4), I use another corruption index as instrument (Corrupt2) and still, however, find no impact of corruption.[3]

[3] The corruption index is one of governance indicators developed by World Bank. See http://www.worldbank.org.

Table 5.1 Basic and General Specification

Dependent variable: Log GDP	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation	OLS	2SLS	Fixed Effects	FE with IV Corrupt2	OLS	2SLS	Fixed Effect	FE with IV Corrupt2
Corrupt	0.24**	0.41**	0.01	-0.02	0.16**	0.05	0.02	-0.01
			(0.004)	(0.01)			(0.003)	(0.01)
	[0.01]	[0.06]			[0.01]	[0.05]		
LogPhysic					0.09**	0.15**	0.28**	0.30**
							(0.01)	(0.02)
					[0.03]	[0.04]		
Human					1.68**	2.73**	0.32**	0.33**
							(0.06)	(0.08)
					[0.20]	[0.28]		
Constant	2.36**	1.58**	3.44**	3.53**	0.51**	-0.37	0.39**	0.19
			(0.02)	(0.06)			(0.15)	(0.20)
	[0.07]	[0.27]			[0.33]	[0.44]		
R^2	0.73	0.72	0.73	0.72	0.88	0.69	0.48	0.48
Number of observations	689	682	689	498	583	577	583	392

Note: *) significant at 5%, **) significant at 1%. In the [ ] is a clustered (robust) standard error

This basic model is very straightforward, but the model with single regressor is very sensitive to omitted variable bias. Omitted variable biases make the estimation not consistent. In this model, the condition happens because the determinant of per capita GDP is not only corruption but also other variables not including in this model.

In order to get better analysis, I add 2 variables as treatment of omitted variable bias, so the specification contains 3 dependent variables. In column (5), by using OLS, all of three independent variables have significant impact on per capita GDP, but 2SLS method (column (6)) with instrument ELF fail to explain the variation of corruption in determining per capita GDP. However, even though the coefficients of physical and human capital in 2SLS are significant, the regression is not really 2SLS method, it only uses ELF as a single instrument without including exogenous variables as instruments. This is because by including exogenous variables as instrument the estimation does not give plausible result, but more plausible by excluding them. In OLS method, the results show that the coefficient of corruption is 0.16; it means that by increasing the index of corruption by 1 point (cleaner), it leads the increase of the level of per capita GDP by 16 percent. R^2 is 0.88, and it is higher than R^2 in basic

model (only 0.73); it illustrates that independent variables explain the variation of per capita GDP until 88 percent.

Other variables, physical and human capital have coefficients 0.09 and 1.68 respectively. Adding more 1 percent of physical capital will increase per capita GDP by 0.9 percent. Human capital has much more positive effect to per capita GDP, by increasing 1 point more of index will lead 437 percent[4] per capita GDP (the index is between 0 and 1, so the improvement is from the lowest to the highest index of human capital). It indicates that human capital still have important role in development. This results support Barro (1989) that increasing in human capital help the country with lower per capita GDP to grow faster. Another important message from the results is controlling corruption is beneficial for country to move forward its per capita GDP.

Those results of OLS regressions do not reject the hypothesis H1 and confirm the prior study by Ehrlich and Lui (1999) that corruption exerts significant adverse effect (the signs are positive) on the level of per capita GDP. It is also in line with other studies determining the impact of corruption on development such as investment (Mauro, 1995; and Lui, 1997), growth (Mauro, 1995; Del Monte and Papagni, 2001), infrastructure devoting to physical capital (Tanzi and Davoodi, 1997), and capital productivity (Lambsdorff, 1999).

But if including initial endowment of the countries, in column (7) fixed effect regression display that corruption is not a main determinant in affecting per capita GDP, and because of fixed effects, there is measurement error in the corruption index leads to a large bias towards zero. The measurement error might possible because corruption index is a subjective measurement, and the panel is very short. Controlling the initial endowments of the countries show that per capita GDP depends on physical and human capital. Looking for the coefficients, corruption has 0.02, physical capital has 0.32 and human capital has 0.39. That implies that controlling corruption can influence per capita GDP with other factors because the coefficient is very small and insignificant. On the other hand, physical capital and human capital encourage per capita GDP directly. In column (8), I use instrument variable Corrupt2 to control for

[4] The calculation is: (exp 1.68)-1 = 4.37

measurement error in the corruption index, but it still give an insignificant coefficient for the corruption variable.

5.1.2. Specification with Dummies Developed and Developing Countries

I extent the specification by imposing dummy variables developed and developing countries. In this specification developed countries as a base or equal zero, and developing countries equal 1. From 105 samples, there are 28 developed countries and 77 developing countries. I use OLS, 2SLS and fixed effect regression, and the results are presented in Table 5.2. Column (1) shows that the corruption and dummy have significant effect on per capita GDP. For developed countries the impact is 0.06 meaning that every increase the level of index of corruption generates per capita GDP 6 percents, and for developing countries 15 percents. In developing countries, corruption has much more impact than in developed countries. These results do not reject the hypotheses that developing countries have the worse impact of corruption on their per capita GDP than developed countries. The large differences of the coefficients are also evidence for human capital, but adverse impact. Human capital has much higher impact in developed countries than in developing countries. In developed countries the coefficient is 2.68 and in developing countries is only 1.54. A small different is illustrated in the coefficient of physical capital whereas developed and developing countries have 0.05 and 0.07 correspondingly.

The implication of the results challenges the Mauro's finding. Suppose it follows Mauro, if Philippines could improve its bureaucracy and reduce corruption to Singapore level (the level of index increases from 3.0 to 9.2), Philippines would have increased its per capita GDP 45 percent (exp (6.2 * 0.06)-1). Because there is different impact between developed and developing countries, per capita GDP of Philippines would have increased 153 percent (exp (6.2 * 0.15)-1), and it is much higher comparing with the previous one.

Based on the theory of Shleifer and Vishny (1993), the worse impact of corruption on developing countries can be explained that because first, there is monopoly corruption scheme. In some African countries and a number of developing countries, there are strong dictators that try to keep loyalty and patronage of bureaucrats by letting them to

be corrupt. Second, other developing countries that start to establish decentralization make political leader, legislators, local government, and government officials or bureaucrats can take action independently to sell government goods, and every agents does corrupt. Third, it is also because the transition from strong dictatorship to weak dictatorship in some ex communist and Soviet Union countries make all agents can be as rest-secking of corruption (Charap and Harm, 1999).

Developed countries have lower impact of corruption, even if they have the same level of corruption index with developing countries, rent-seeking patterns of corruption in benevolent monarchy and functioning democracy (mostly political regimes in developed countries) are still less inconducive for development. Mostly developed countries are also decentralized their power and not being in transition. The corruption patterns in those countries are less risky as well as political regimes in developing countries.

Other reason why there is different impact across countries is parameter productivity of government expenditure and risk aversion. Base on Del Monte and Papagni (2003) model, it might possible that parameter productivity of government expenditure is higher in developing countries, and corruption makes less productive, so the impact is harmful. Another parameter is risk aversion. Developing countries are more risk aversion, and there is no monitoring on corruption, so it makes the negative impact higher because corruption without monitoring is more harmful than that with monitoring.

On the other hand, in column (3), if regarding country specific effect, Corruption and dummy corruption are not significant affecting per capita GDP, but Physic and Human capital are significant affecting per capita GDP because of fixed effects the measurement error in the corruption index leads to a bias towards zero. It means that per capita GDP is only determined by physical and human capital. This result is consistent with general specification that by including country specific effect, corruption is not significant determining per capita GDP. In column (4), I try to solve the measurement error by using instrument variable Corupt2, but this instrument still can not explain the variation of the effect of corruption on per capita GDP.

Table 5.2. Specification with Dummy Developed and Developing Countries

Dependent variable: Log GDP	(1)	(2)	(3)	(4)
Estimation	OLS	2SLS	Fixed Effects	Fixed Effects with IV Corrupt2
Corrupt	0.06**	-0.08	-0.01	-0.01
	(0.01)	(0.07)	(0.01)	(0.04)
Corrupt*$D_{Developing}$	0.09**	0.24**	0.01	0.01
	(0.02)	(0.08)	(0.01)	(0.04)
LogPhysic	0.05**	-0.04	0.14**	0.20**
	(0.02)	(0.05)	(0.03)	(0.06)
LogPhysic*$D_{Developing}$	0.02	0.12*	0.16**	0.11*
	(0.02)	(0.06)	(0.04)	(0.06)
Human	2.68**	5.09**	1.29**	1.30**
	(0.32)	(1.29)	(0.19)	(0.37)
Human*$D_{Developing}$	-1.14**	-3.55**	-1.05**	-1.07**
	(0.32)	(1.29)	(0.20)	(0.38)
Constant	0.80**	0.75**	0.52**	0.24
	(0.10)	(0.11)	(0.16)	(0.24)
R^2	0.89	0.86	0.51	0.52
F-test on Corrupt* $D_{Developing}$	35.23**	9.25**	1.40	0.06
F-test on LogPhysic* $D_{Developing}$	0.61	4.36**	14.65**	3.25**
F-test on Human*$D_{Developing}$	12.47**	7.59**	25.80**	7.89**
Number of Observations	583	577	583	392

Note: *) significant at 5%, **) significant at 1%.

5.1.3. Specification with Dummies Geographical Areas

Another specification is by replacing dummy developed and developed countries with dummy cultural areas. The results are showed in Table 5.3. In column (1) By using OLS, almost all of the coefficients of corruption and dummy corruption are significant, except Dummy South America. Joint F-test of all dummies is also significant. Dummy Western and developed countries as a base has coefficient corruption 0.06, dummy Asia 0.19, dummy Africa 0.14, dummy South America 0.05 and dummy Eastern Europe and Ex Soviet Union 0.22. The highest impact of corruption is in Asia and Eastern Europe and Ex Soviet Union, and then Africa, Western and the lowest is in South America.

In variable of physical capital, the coefficients have little differences. Developed countries as a base has coefficient 0.05, Africa is 0.05, Asia is 0.08, South America is 0.8, and Eastern Europe and Ex Soviet Union is surprisingly 0.19.

In variable of human capital, dummy Western is the highest with the coefficient 2.67. Then South America is 1.98, Africa is 1.87, Asia is 0.90, and Eastern Europe and Ex Soviet Union is -0.19.

Developing countries in South America has the lowest impact of corruption on per capita GDP, it is only 5 percent every change of level of corruption index by 1 percent. It is lower than dummy western as dummy developed countries in the previous specification. Typically, South and Central American, and Caribbean countries are functioning democracy and not being in transition either from strong dictator to weak dictator or centralized to decentralized or conversely. According to Charap and Harm (1999), this regime is not really risky to the corruption behavior because the rent seeking agents do corrupt not systematically and the system still can eliminate of corruption and not all agents have corruption opportunity. So the patterns of rent-seeking of corruption in this regime do not have much more harmful impact on per capita GDP.

Developed countries will have a change on per capita GDP by 6 percent if there is a change in the level of corruption index by 1 point. As well as countries in South America, western countries typically have benevolent monarchy and functioning democracy regimes and also not being in transition.

Developing countries in Africa have impact of corruption by 14 percent every change the level of corruption index by 1 point. The regimes of most African countries are strong dictator, so the corruption is monopoly scheme (Shleifer and Vishny, 1993).

Table 5.3. Specification with Dummy Cultural Areas

Dependent variable: Log GDP	(1)	(2)	(3)	(4)
Estimation	OLS	2SLS	Fixed Effect	FE with IV Corrupt2
Corrupt	0.06**	0.01	-0.01	0.01
	(0.01)	(0.06)	(0.01)	(0.04)
Corrupt*D_{Asia}	0.13**	0.19**	-0.00	0.02
	(0.03)	(0.07)	(0.01)	(0.04)
Corrupt*D_{Africa}	0.08**	0.13*	0.01	0.00
	(0.02)	(0.06)	(0.01)	(0.04)
Corrupt*$D_{SouthAmerica}$	-0.01	0.05	-0.00	-0.02
	(0.02)	(0.06)	(0.01)	(0.04)
Corrupt*$D_{EasternEurope\&ExSoviet}$	0.16**	0.21**	0.00	-0.02
	(0.02)	(0.06)	(0.01)	(0.04)
LogPhysic	0.05**	0.02	0.14**	0.21**
	(0.02)	(0.04)	(0.04)	(0.06)
LogPhysic*D_{Asia}	0.03	0.07	0.29**	0.26**
	(0.03)	(0.05)	(0.08)	(0.12)
LogPhysic*D_{Africa}	0.00	0.04	0.11*	0.05
	(0.02)	(0.04)	(0.05)	(0.07)
LogPhysic*$D_{SouthAmerica}$	0.03	0.07	0.01	-0.06
	(0.03)	(0.05)	(0.05)	(0.07)
LogPhysic*$D_{EasternEurope\&ExSoviet}$	0.14**	0.17**	0.22**	0.18**
	(0.03)	(0.05)	(0.04)	(0.06)
Human	2.67**	3.57**	1.29**	1.17
	(0.29)	(0.98)	(0.19)	(0.35)
Human*D_{Asia}	-1.77**	-2.66**	-0.93*	-0.89
	(0.38)	(1.00)	(0.31)	(0.50)
Human*D_{Africa}	-0.80**	-1.67*	-1.18**	-1.12
	(0.30)	(0.97)	(0.20)	(0.36)
Human*$D_{SouthAmerica}$	-0.69*	-1.57	-1.34**	-1.33
	(0.36)	(0.99)	(0.22)	(0.40)
Human*$D_{EasternEurope\&ExSoviet}$	-2.86**	-3.72**	-0.56	-0.30
	(0.39)	(0.99)	(0.25)	(0.42)
Constant	0.80**	0.76**	0.58	0.24
	(0.12)	(0.12)	(0.16)	(0.24)
Joint F-test Corrupt*dummy	24.46**	16.21**	1.10	3.68
Joint F-test LogPhysic *dummy	9.42**	9.22**	17.12**	26.68**
Joint F-test Human*dummy	19.51**	15.16**	16.27**	21.74**
R^2	0.92	0.91	0.58	0.58
Number of Observations	583	577	583	392

Note: *) significant at at 5%, **) significant at 1%.

Developing countries in Asia and Eastern Europe and Ex Soviet Union have the highest consequences of corruption. The coefficient is 0.19 and 0.21 respectively meaning that every change the level of corruption index by 1 percent will make a change in per capita GDP by 19 and 22 percent. The reason that can explain this situation is because of the transitions of mostly of those countries. The transitions can be from strong dictator to democracy or weak dictator, and centralization to decentralization. Kuncoro and Henderson (2004) argue that transition in decentralized

country in Indonesia make the worse impact of corruption on development, even in the same level of corruption. It also might possible that these countries have higher productivity of government expenditure more risk aversion (Del Monte and Papagni, 2001).

In column (3), by using fixed effect regression, the results show a consistent outcome with three previous specifications that corruption and dummies are insignificant affecting per capita GDP because of fixed effects the measurement error in the corruption index leads to a bias towards zero. Joint F-test of all dummies also has insignificant results. On the other hand, almost all physic and human capital variables show significant results. It means that per capita GDP is only determined by physical and human capital. This result is consistent with general specification that by including country specific effect, corruption is not significant determining per capita GDP. In column (4), I use instrument variable Corupt2, but this instrument still can not explain the variation of the effect of corruption on per capita GDP.

5.2. Discussion

In this section, I want to discuss two drawbacks of this paper and the consequences of them. The problems are that the panel data is to short and it is difficult to find valid instruments for fixed effects regression.

I start from the length of the data. I only have the data from 1996 to 2004 where the data that can be analyzed are only from 1998 to 2003, so the analyses have no more than 6 years data. It is quite short in order to determine the impact of a variable to the level of per capita GDP. If we can get much longer of data, we can explain the variation of impact more dynamically. Usually, studies determining impacts of institution capital to the level of per capita GDP involve long term data, and it can be more than 10 years.

The second weakness is that it is very difficult to find time variant valid instruments explaining the variation of the effect corruption on per capita GDP. There is a valid instrument that is ethno linguistic fractionalization (ELF) suggested by Mauro (1995),

but this variable is time invariant, it is only valid for OLS regression method, but it can not be applied in the fixed effects regression method. The valid instruments are needed for explaining the variation of impact of corruption on per capita GDP, and eliminate the endogeinity of corruption because of causality between corruption and per capita GDP.

In order to get better analysis in fixed effects regression, I try to estimate by using another corruption index as instrument variable, but it still can not reduce the bias in corruption index, so the coefficients of corruption in fixed effects regression still are not significant. It also relates to the first drawback that the panel data is too short so it still leads bias toward zero.

Chapter 6
Conclusion

The objectives of this paper are to response several questions about the impacts of corruption on per capita GDP.

Corruption is something malfeasance in using power of public to get private benefits. Corruption is generated by the opportunities rising because of lack of monitoring. The agents of corruption can be political leaders, legislators, bureaucrats, and other positions that have public power.

In this paper, by using cross-country data involving 105 countries and 6 years from 1998 to 2003, by using OLS regression, the results reject all of three hypotheses that corruption has negative impact to the level of income per capita. The results show consistently that by using OLS, corruption and dummies are significant in determining per capita GDP. On the other hand, by using fixed effect, corruption and dummies are insignificant affecting per capita GDP, because of measurement of corruption index leads to a bigger bias zero, even by including another corruption index as instrument variable.

In the second hypothesis, the results show significant differences between dummies. In the specification with dummy developed and developing countries, there are 9 percent differences of the impacts between them. It challenges the Mauro's finding that the impacts are the same.

In the third hypothesis, surprisingly, dummy developing countries in South America and Caribbean have the lowest impact of corruption, and then respectively from the lowest to the highest impact is western and developed countries, developing countries in Africa, Asia, and the last is developing countries in Eastern Europe and Ex Soviet Union.

Once again, testing one of Mauro's outcomes that there is an example that if Bangladesh could reduce its corruption to the level of that of Uruguay; its investment rate would increase by almost 5 per cent of GDP. It is based on that the impact is the same between them. In this paper, the difference of impact between developing countries in Asia and South America is 14 percent, so if Bangladesh has the same level of corruption as Uruguay (from average 1.3 to 4.9), its per capita GDP will increase up to 98.17 percent (exp (3.6*0.19)-1). Conversely, if the level of corruption in Uruguay turns down to the Bangladesh level, the impact to the Uruguay's level of GDP will only decrease 19.72 percent (exp (3.6*0.05)-1).

However, by using fixed effects regression, this paper has two shortcomings causing that there is measurement error of corruption index that leads a bigger bias toward zero. The first one is the panel data is too short which is only 6 years data from 1998 to 2003. The second one is hardly to find time variant instruments in order to get better analysis in fixed effects regression.

Refferences

Alesina A., and Weder B., 2002, ***Do Corrupt Governments Receive Less Foreign Aid?***, The American Economic Review, Vol. 92, No. 4 (Sep., 2002), 1126-1137.

Andvig, J.C., 2006, ***Corruption and Fast Change***, Journal of World Development, Vol. 34 No.2.

Bardhan P., 1997, ***Corruption and Development: A Review of Issues***, Journal of Economic Literature, Vol. 35, No. 3 (Sep., 1997), 1320-1346.

Barro, R.J., 1989, ***Economic Growth in a Cross Section Countries***, NBER Working Paper No. W3120.

Blackburn, K., Bose, N., Haque, M.E., 2002, ***Endogenous Corruption in Economic Development***, Centre for Growth and Business Cycles Research, Economic Studies, University of Manchester.

Bond, S., Hoeffler, A., Temple, J., 2001, ***GMM Estimation of Empirical Growth Models***, September 12, 2001.

Dabla-Norris E., 2000, ***A Game-Theoretic Analysis of Corruption in Bureaucracies***, IMF Working Paper WP/00/106, www.imf.org.

Damania R., Fredriksson, P.G, Mani, M., 2003, ***The Persistence of Corruption and Regulatory Compliance Failures: Theory and Evidence***, IMF Working Paper WP/03/172, www.imf.org.

Del Monte, A., Papagni, E., 2001, ***Public Expenditure, Corruption, and Economic Growth: The Case of Italy***, European Journal of Political Economy. Universita di Napoli.

Duncan, N., and Dutta I., 2006, ***Editorial of special sections: Corruption and Development***, Journal of World Development, Vol. 34 No.2.

Ehrlich I., and Lui F.T., 1999, ***Bureaucratic Corruption and Endogenous Economic Growth***, The Journal of Political Economy, Vol. 107, No. 6, Part 2: Symposium on the Economic Analysis of Social Behavior in Honor of Gary S. Becker, (Dec., 1999), S270-S293.

Hoeffler, A., 2002, ***The Augmented Solow Model and the African Growth Debate***, Blackwell Publishers.

Jain, Arvind K., 2001, ***Corruption: A Review***, Journal of Economics Surveys, Vol. 15 No. 1.

Klaauw, B.V.D., ***Some hand outs in course Advanced Methods for Economic Research***, unpublished, 2005

Kuncoro, A., Henderson, J.V., 2004, *Corruption in Indonesia*, NBER Working Paper No. 10674.

Lambsdorf, J.G., 1999, *Corruption in Empirical Research – A Review*, Transparency International Working Paper.

Mauro P., 1995, *Corruption and Growth*, The Quarterly Journal of Economics, Vol. 110, No. 3 (Aug., 1995), 681-712.

Mishra, A., 2006, *Persistence of Corruption: Some Theoretical Perspectives*, Journal of World Development, Vol. 34 No.2.

Olken, B.A., 2005, *Corruption and The Cost of Redistribution: Micro Evidence from Indonesia*, National Bureau of Economic Research, May 2005, www.nber.org.

Paldam, M., 2002, *The Cross Country Pattern of Corruption: Economics, Culture, and the Seesaw Dynamics*, Eropean Journal of Political Economy, Vol. 18.

Shleifer A., and Vishny W., 1993, *Corruption*, The Quarterly Journal of Economics, Vol. 108, No. 3 (Aug., 1993), 599-617.

Stock, J.H, and Watson, M.W., 2003, *Introduction to Econometrics*, Addison Wesley, Pearson Education.

Tanzi, V., 1998, *Corruption Around The World*, IMF Staff Paper Vol. 45 No. 4, www.imf.org.

Tanzi, V., Davoodi, H., 1997, *Corruption, Public Investment, and Growth*, IMF Working Paper 97/139, www.imf.org.

Wei, S.J., 2000, *Bribery in the Economies: Grease or Sand?*, NBER

Wei, S.J., 1997, *How Taxing is Corruption on International Investors?*, Review of Economics and Statistics, February 2000, Vol. 82, No. 1, Pages 1-11

Van Rijckeghem C., and Weder B., 2000, *Bureaucratic Corruption and The Rate of Temptation: Do Wages in The Civil Service Affect Corruption, and by How Much?*, Journal of Development Economics, Vol. 65 (2001), 307-331.

Appendix
Grouping of Countries

1. Developing Countries

Ethiopia
Malawi
Madagascar
Mozambique
Uganda
Ghana
Tanzania
Kyrgyzstan
Zambia
Moldova
Bangladesh
Nigeria
Kenya
Haiti
Senegal
Vietnam
Zimbabwe
India
Pakistan
Côted'Ivoire
Uzbekistan
Cameroon
Angola
Nicaragua
Ukraine
Georgia
Azerbaijan
Indonesia
Armenia
Srilanka
Honduras
Bolivia
Philippines
China
Morocco
Paraguay
Ecuador
Albania
Belarus
Egypt
Kazakhstan
Guatemala
Macedonia
Bulgaria
Jordan
Namibia
Romania
Colombia
Elsalvador
Russia
Peru
Tunisia
Thailand
Dominican_Rep
Turkey
South_Africa
Jamaica
Brazil
Botswana
Venezuela
Panama
Malaysia
Latvia
Lithuania
Mauritius
Costa_Rica
Slovakia
Poland
Croatia
Estonia
Hungary
Chile
Uruguay
Mexico
Czech
Argentina
Trinidad_Tobago

2. Western and Developed Countries

Portugal
Slovenia
Greece
South_Korea
New_Zealand
Spain
Israel
Italy
Australia
Singapore
Belgium
France
Netherlands
Germany
Canada
Finland
Austria
Hongkong
UK
Ireland
Sweden
Denmark
Iceland
Switzerland
USA
Japan
Norway
Luxembourg

3. Asia

Bangladesh
China
India
Indonesia
Jordan
Malaysia
Pakistan
Philippines
Srilanka
Thailand
Vietnam

4. Africa

Angola	Mauritius	Mauritius
Botswana	Morocco	Morocco
Cameroon	Mozambique	
Egypt	Namibia	
Ethiopia	Nigeria	
Ghana	Senegal	
Ivory_Coast	South_Africa	
Kenya	Tanzania	
Madagascar	Tunisia	
Malawi	Uganda	

5. South America and Caribbean

Argentina	Haiti	Venezuela
Bolivia	Honduras	
Brazil	Jamaica	
Chile	Mexico	
Colombia	Nicaragua	
Costa_Rica	Panama	
Dominican_Rep	Paraguay	
Ecuador	Peru	
Elsalvador	Trinidad_Tobago	
Guatemala	Uruguay	

6. Eastern Europe and Ex Soviet Union

Albania	Kyrgyzstan	Uzbekistan
Armenia	Latvia	Czech
Azerbaijan	Lithuania	Slovakia
Belarus	Macedonia	
Bulgaria	Moldova	
Croatia	Poland	
Estonia	Romania	
Georgia	Russia	
Hungary	Turkey	
Kazakhstan	Ukraine	