

CORRUPTION AND ECONOMIC GROWTH
IN TRANSITION ECONOMIES

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Academic Abstract

The general understanding of corruption is that the corruption harms economic growth because it increases transaction costs and information uncertainty (Rose-Ackerman, 1997). However, there are studies showing that corruption promotes economic growth as well (Leff, 1964; Lui, 1999). In this paper, I use pool regression model analyzing the impact of corruption on the real economic growth by examining how institutional quality moderates the impact of corruption on economic growth and how an external shock like a financial crisis changes the impact of corruption on economic growth. I argue that corruption does not affect GDP growth. Instead, institutions have direct impacts on GDP growth. Higher degree of economic freedom promotes more real GDP growth. Furthermore, to obtain higher growth, a government can be more centralized in order to keep being efficient.

Introduction

Corruption as a subject has been studied by numerous scholars. The study of corruption is important because the corruption affects economic performance, universal values regarding equality, and further, our daily life.

A general understanding of corruption is that corruption harms economic growth (Rose-Ackerman, 1997; Mauro, 1995). However, there are studies showing that corruption promotes economic growth as well. When bureaucrats are indifferent to business and/or have other priorities, corruption may work like piece-rate pay for bureaucrats, which induces a more efficient provision of government services, and it provides a leeway for entrepreneurs to bypass inefficient regulations (Leff, 1964; Lui, 1999; Huntington, 1968).

In this paper, I will analyze impacts of corruption on real economic growth by examining how institutional quality moderates impacts of corruption on economic growth and how an external shock like a financial crisis changes impacts of corruption on economic growth. I argue that corruption does not affect GDP growth. Instead, institutions have direct impacts on GDP growth. I use pool regression model, and I will analyze two datasets, the first dataset pertaining to the period before the 2008 financial crisis, and the second dataset to the period after the financial crisis. Thus the impact of the crisis on moderating the relationship between institutions, corruption and economic growth can be detected. In the first section I will analyze determinants of corruption in transition economies, including the impact of democratic institutions. In the second section I will consider positive and negative impacts of corruption on economic growth in

transition economies. The next section states hypothesis and the estimation strategy. The last section provides results and analysis.

Literature review

Abundant literature gave various perspectives of relationships between corruption and economic growth. First, many scholars argue that corruption will have a negative effect on economic growth. Shleifer and Vishny (1993) argue that when it is necessary to get permission from many individuals for a project, and each has veto power over approval, the cost of corruption will rise and slow economic growth. Myrdal (1974) argues that corrupt officials may use their arbitrary power to create delays and barriers that would not otherwise exist in order to collect more bribes. Rose-Ackerman (1997) points out that the corruption introduces uncertainties into the economic environment that can effect on private firms.

However, there are also reasons to believe corruption could be good for economic growth. Lui(1999) argues that corruption can shorten the amount of time waiting in queues. Leff (1964) believes that corruption is able to enhance growth by allowing individuals to pay bribes in order to circumvent inefficient rules and bureaucratic delays. Huntington (1968) points out that if corruption is reduced without corresponding changes to eliminate inefficient rules, business activity and economic growth may slow down.

Empirical studies have shown both positive and negative impacts of corruption on economic growth. Mauro conducted the seminal study on investigating corruption's impact on growth for a wide cross-section of countries. He found that higher levels of corruption significantly decrease both investment and economic growth (Mauro, 1995).

But the effect of corruption becomes insignificant after human capital¹ is controlled (Mo, 2001). However, Svensson pointed out in his survey article that the negative effect of corruption on growth was not significant. He concluded that “to the extent we can measure corruption in a cross-country setting, it does not affect growth.”² (Svensson, 2005).

Méon and Sekkat (2005) compared the “grease the wheels” which argues the corruption promotes the economic growth; and the “sand the wheels” hypothesis which indicates the corruption harms the growth. By considering an interactive effect of corruption and investment, the result rejected the “grease the wheels” hypothesis in favor of the “sand the wheel” one.

Drury, Kriekhaus and Lusztig (2006) analyzed the impact of corruption in democracies and non-democracies by testing time-series data from more than one hundred countries between 1982 and 1997. The authors drew a conclusion that corruption retards growth in authoritarian regimes, whereas democracy mitigates the negative effects of corruption due to its nature that democracy allows for the eviction of bad leaders.

Abed and Davoodi pointed out the importance of the structure reform regarding the relationship between corruption and growth in transition economies. They argue that “once structural reforms are taken into account, the corruption variables to lose their explanatory power in the analysis of macroeconomic performance.”³

There are several new features in this paper comparing to the existing ones. First, I will analyze unique features of corruption in transition economies. Second, one reason that

¹ Average schooling years in the total population over age 25 in 1970, 1985.

² Svensson, “Eight Questions about Corruption”, *Journal of Economic Perspectives*, Volume 19, Number 3, Summer 2005, pp.39

³ Abed and Davoodi. 2000. “Corruption, Structural Reforms, and Economic Performance in the Transition Economies”. *International Monetary Fund*, pp 4

earlier studies drew very different conclusions is that impacts of corruption vary across countries due to qualities of institutions. Therefore, it makes less sense if the study did not consider institutions. Abundant studies have taken institutions into account. However, the variables do not fully represent the quality of institutions, such as by using the dichotomy of “democracy” and “non-democracy”. After the third wave, the scope of democracy contains more variations. Both Norway and Russia fall into the democracy category, the qualities of institutions in the two countries, however, are very different. Other often used proxies of institutions are political instability (Mo, 2001), Freedom House (Vitas; Drury, Kriekhaus and Lusztig), Polity IV (Drury, Kriekhaus and Lusztig), Structural Index (George and Davoodi). However, in my opinion institution should be inspected with more details. Based on existing studies most institution variables can be divided into two categories. First category is something to do with the constraints on political leaders, in other words is the election competitive? Does the institution allow citizens to evict unqualified leaders? Polity IV, ACLP, and Freedom House are this kind of proxy. The second category is something to do with the market and fiscal constraints- freedom of commodity exchange, privatization, property right protection and fiscal freedom. Government spending, taxation rate, structural index and economic freedom fall into this category. Some countries might perform well on the political constraints but not well in the second category. Bulgaria, for instance, has a decent electoral system whereas its fiscal system is tightly controlled by the government. China, on another hand, has a very undemocratic political system, its market, however, is much freer than its political system. Most existing papers only use one category. Drury, Kriekhaus and Lusztig, for instance, use polityIV, freedomhouse and ACLP to divide democracy and non-democracy

which in my opinion all indices fall into "political freedom" category, whereas some other authors only use economic indices to present the quality of institutions (Choi and Zhou; Heckelman and Powell; Ade and Davoodi).

In this paper, I will focus on transition economies due to the institutional similarities among these countries. Furthermore, I will inspect two types of institution—political freedom and economic freedom, and I will analyze their single effects and their interactive effects with corruption. Before starting the discussion, it is necessary to explain what is corruption.

What is corruption?

Corruption is a term that is difficult to define. Phip (2009) uses a model which includes public official A, public official B, and a third party C to conceptualize political corruption. Whereas Nye (1967) exemplified corruption as:

“Corruption is behavior which deviates from the formal duties of a public role because of private regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private regarding influence. This includes such behavior as bribery...; nepotism...; and misappropriation.”⁴

I will use principal-agent concept and Ostrom’s benefit-cost of the internal world as the framework to explain the determinants of corrupt activities. Gambetta (2004) explains corruption via a model contains three parties, he defines three parties are: the truster (T), the fiduciary (F) and the corrupter (C)⁵. “T may be an individual, or collective body; who relies on the expectation that people in certain positions are bound to follow given rules

⁴ Cited in Heidenheimer, Johnson, and LeVine, 1989 *Political Corruption: A Handbook.*, pp 966

⁵ Gambetta, D. 2004. “Corruption: An Analytical Map.” In S. Kotkin & A. Sajó (Eds), *Political Corruption in Transition*, New York: Central European University Press, pp6.

representing their behalf. F may be anyone who agrees to act on behalf of T, can be a single person, or an entire government department. C can be anyone whose interests are affected by F's actions" (Gambetta, 2004). In this paper C may be an agent who wants resources that F is not supposed to offer, given the conditions of his relation to T. To gain benefits if fiduciaries violate their rules, offering a bribe to F is one way to achieve that⁶.

People make decisions based on the calculation of expected benefits and expected costs (Ostrom, 1990). In the case of corruption, expected benefits for F are bribes offered by C. The expected cost would be the punishment if F were to get caught.

Table1. Costs and benefits of agents engaging in corruption

Costs	Benefits
Searching costs	Bribe
Negotiating costs	
Covering-up costs	
Penalty*probability of getting caught	
Moral costs	

Source: Groenendijk, 1997

Table2. Costs and benefits of trusters in corruption context

Costs	Benefits
Inspection costs	None
Prevention costs	
Failure costs	

Source: Groenendijk, 1997

The utility of F is $U_f = Pr * B - Pr * C$, Pr=probability, B=benefits, C=costs. F is more likely to engage in corruption if the benefits are bigger than the costs; if the benefits are less than the costs, in turn, F is less likely to engage in corruption. However, in this case, T is the victim if corruption occurs no matter if F or C gets punishment or not. If they decide

⁶ Same idea also can be found in Gambetta, 2004. "An Analytical Map"

to exchange resources, F and C jointly cheat on T. F is bribed by C to violate the rules in C's favor.

According to the principal-agent theory, T has a legitimate claim to regulate the allocation of the resource. If T has any question both F and C should be excluded. In other word, if the coveted resources belonged to F, F should be the owner who is free to sell it, and the C would be a buyer instead of being a corrupter. Based on the example illustrated above, the core of defining corruption is the fact that if the exchange between C and F sacrifices T's interests. If the harm occurs, no matter what the benefits called-gift or social convention-it is corruption.

What do we know about corruption in Transition Economies?

Transition economies have been associated with a reduction in the size of the public sector and, with a shift in the role of market from central planning state owning or controlling most productive resources to one that more market based (Edgar, 1994), furthermore, the creation of fundamentally different governmental institutions.

Transition economies mostly are authoritarian regimes and new democracies. Compared to established democracies, corruption in transition economies has unique features and determinates.

Lack of recognition

Culture explanation recognizes that corruption has different meanings in different societies. One person's bribe is another person's gift. A political figure or public official who aids friends, and family members might be seen as praiseworthy in some societies

and corrupt in others (Kibwana, Wanjala, and Okech-Owiti, 1996; Rose-Ackerman, 1999). Most transition economies do not have cognizance of civil society since most of them had or are having history of being authoritarian regimes. They lack sense of principal-agent concept that government officials are agents who serve citizens. Instead, the sense of relationship between bureaucrats and citizens is more like relationship between leaders and followers. Thus people in transition economies are more tolerant to corrupt behaviors. The Bribe Payers Report from the Transparency International measures the perceived likelihood of companies from 28 countries to pay bribes abroad; it to some extent reflects the tolerance and cognizance of different countries regarding corrupt behaviors (See Table 3). Obviously transition economies have lower scores which means companies from these countries are more willing to pay bribes when they do business abroad.

Table.3 The Bribe Payers Report, 2011

Rank	Country	Score	Number of Observations	Standard Deviation	90% CI (Low)	90% CI (High)
1	Netherlands	8.8	273	2.0	8.6	9.0
1	Switzerland	8.8	244	2.2	8.5	9.0
3	Belgium	8.7	221	2.0	8.5	9.0
4	Germany	8.6	576	2.2	8.5	8.8
4	Japan	8.6	319	2.4	8.4	8.9
6	Australia	8.5	168	2.2	8.2	8.8
6	Canada	8.5	209	2.3	8.2	8.8
8	Singapore	8.3	256	2.3	8.1	8.6
8	United Kingdom	8.3	414	2.5	8.1	8.5
10	United States	8.1	651	2.7	7.9	8.3
11	France	8.0	435	2.6	7.8	8.2
11	Spain	8.0	326	2.6	7.7	8.2
13	South Korea	7.9	152	2.8	7.5	8.2
14	Brazil	7.7	163	3.0	7.3	8.1
15	Hong Kong	7.6	208	2.9	7.3	7.9
15	Italy	7.6	397	2.8	7.4	7.8
15	Malaysia	7.6	148	2.9	7.2	8.0
15	South Africa	7.6	191	2.8	7.2	7.9
19	Taiwan	7.5	193	3.0	7.2	7.9
19	India	7.5	168	3.0	7.1	7.9
19	Turkey	7.5	139	2.7	7.2	7.9
22	Saudi Arabia	7.4	138	3.0	7.0	7.8
23	Argentina	7.3	115	3.0	6.8	7.7
23	United Arab Emirates	7.3	156	2.9	6.9	7.7
25	Indonesia	7.1	153	3.4	6.6	7.5
26	Mexico	7.0	121	3.2	6.6	7.5
27	China	6.5	608	3.5	6.3	6.7
28	Russia	6.1	172	3.6	5.7	6.6

Source: Transparency International

Weak political competition

Well-organized competitive elections allow the public to elect more responsible officials. Transition economies have weak political competition, hence corruption will

flourish if voters have limited alternative preferences for leaderships. Politicians will not be limited by outside pressure from the public.

Voters and official holders do not agree on all policies (Manin, Przeworski, and Stokes, 1999). Politicians may want something whose pursuit is injurious to citizens, this “something” is called “rents” (Manin, Przeworski, and Stokes, 1999). In well-competitive democracies, politicians have to set up a trade-off between extracting rents and losing office or not extracting rents and staying in office, this would induce them to keep rents low. In transition economies, however, citizens do not have effective way to hold politicians accountable due to lacks of political competition. Hence politicians are careless of keeping uncorrupted. The table 4 shows the competitiveness of participation in transition economies and of OECD countries. Competitiveness of participation refers to the extent to which alternative preferences for leadership can be pursued in the political arena. Scores of transition economies are obviously lower than OECD countries.

Table.4 The Competitiveness of Participation from Polity IV

Transition economies	The Competitiveness of Participation	OECDs	The Competitiveness of Participation
Albania	4	Australia	5
Armenia	3	Austria	5
Azerbaijan	2	Belgium	5
Belarus	2	Canada	5
Bulgaria	4	Denmark	5
Cambodia	2.8	Finland	5
Croatia	4	France	5
Czech Republic	3	Germany	5
Estonia	3.7	Israel	5
Georgia	4	Japan	5
Hungary	5	Netherlands	5
Latvia	4	New Zealand	5
Lithuania	5	Norway	5
Kazakhstan	2	Sweden	5
Kyrgyz Republic	3	Switzerland	5
Lao PDR	1	United Kingdom	5
Macedonia	4	United States	5
Moldova	3		
Poland	5		
Romania	4		
Russia	4		
Slovak Republic	5		

Source: Polity IV

Authority decentralization and weak regulation

Authority decentralization means policymaking authorities were delegated to regions (provinces, states and cities) from central government (Choi and Zhou, 2001). Such as local governments gained rights to sell free lands or work with foreign institutes without requesting permissions from upper levels of the government. Before the decentralization all policies were made by central government. Now central government has decentralized certain authorizes to regional governments in order to make the governmental

performance more effectively responses to market changes. In a case study of China's market Hao and Johnston pointed out that the goal of decentralization was to promote transaction from central planning to free market, to make local government with certain rights and duties (Hao and Johnston, 2009). The implementation, however, is a process without appropriate regulations. The central government decentralized policymaking authorities such as issuing budget, privatizing enterprises, however the government did not release sufficient regulations which balance authorities.

Since local governments make most policies within local market, the distance between policy makers and entrepreneurs has been shorten than in any other era before. Thus authority decentralization without regulation has given more room to power-money exchange. Furthermore due to lacks of regulation local bureaucrats like to actively obstacle business to gain benefits from entrepreneurs. Thus entrepreneurs have to engage in "informal institutions", namely, entrepreneurs would maintain good personal relationship with local bureaucrats by offering money, club membership, or travel packages, etc., to "get things done". Collusion of bureaucrats and entrepreneurs became very common on the local level, the resource allocation thus is more likely to be on a range of non-market considerations instead of based on market needs.

Fixed public supplies

The public service system can be seen as a supply-demand framework that governments provide services and taxpayers enjoy services (Shleifer and Vishny, 1993; Weingast, 1995). One opinion from this supply-demand perspective claims that when several agencies provide exactly the same service, and citizens can freely choose where

to purchase it, competition among agencies will reduce corruption (Shleifer and Vishny, 1993; Weignast, 1995). If the supply-demand is based on market needs then there would be limited room for rent-seeking activities. In transition economies, however, most public services, such as electricity, mobile communication, water supply, natural gas, etc., are either controlled by governments, or by crony companies. They enjoy monopolies that supply can be easily fixed. This monopoly power strongly affects supply-demand relationship. Bureaucrats would delicately raise the threshold of entering the market in order to obtain bribes or any other kind of rent-seeking payoff. Entrepreneurs have to bid for bureaucratic favors to obtain their right to start business. This “bid” can be bribes (Leff, 1964).

Enterprise survey released by the World Bank and International Finance Corporation indicates high percentage of enterprise in transition economies pay bribes to get fixed supplies.

Table.5 Enterprise Survey effect of corruption on economic development

country	Percent of firms expected to give gifts to public officials "to get things done"	Percent of firms expected to give gifts in meetings with tax officials	Percent of firms expected to give gifts to secure government contract	Percent of firms expected to give gifts to get an operating license	Percent of firms expected to give gifts to get an electrical connection	Percent of firms expected to give gifts to get a construction permit	Percent of firms expected to give gifts to get a water connection
Albania	57.7	22.4	30.5	10.9	25.4	29.2	27.2
Armenia	16	13.3	0.6	11.3	0	21.7	0
Azerbaijan	52.2	43.2	14.2	34.6	54.3	71.4	40.6
Belarus	26.1	6.3	7.1	11.7	5.4	19.2	3.3
Bulgaria	22.4	6.6	2.6	16.8	3.7	26.9	10.1
Cambodia	2.8	1.5	32.8	n.a.	58	91.6	33.3
Croatia	14.5	6	4.3	2.1	1	1.3	0.6
Czech Republic	12.8	0.2	19.2	0.2	3.4	18	0.8
Estonia	3.7	0	0	0	3.4	12.7	2.6
Georgia	14.7	8.4	0	3.5	0.3	3.9	9.2
Hungary	5.4	0.7	0	2.6	0	0	0
Latvia	13.4	4.4	45.5	0	4.4	13.2	4.2
Lithuania	10.7	3.4	12.2	5.4	3.8	32.4	0
Kazakhstan	34	25.1	44.9	30	25.1	36.7	21.5
Kyrgyz Republic	47.8	39	53	25.7	37.3	56.3	33.9
Lao PDR	39.8	26.2	n.a.	18.5	25	42.3	24.2
Macedonia	16.9	8.1	0.2	2.9	19.9	17.3	15.1
Moldova	33.5	15.5	18.1	7.4	5.6	29.3	7.2
Poland	14.7	4.8	9.8	1.4	3.8	8.3	15.6
Romania	22.2	12.1	12.8	25.8	6.6	27.8	2.6
Russia	39.6	17.4	39	12.6	25.8	26.8	12.7
Slovak Republic	15.7	3.1	40.8	0	5.2	9.7	2
Slovenia	5.8	0	0	0	0	3.6	0
Tajikistan	44.6	33	26.6	38.5	32.8	42.3	13.5
Ukraine	31.8	28.3	38.5	37.3	27	59.1	19.4
Uzbekistan	59.5	52.4	48.9	58.9	6.4	53.3	11
Vietnam	52.5	33.7	43.7	15.2	18.8	47.9	3.7

Source: International Finance Corporation & World Bank

Dualism

Dualism means coexistence of state-owned business and private business. Transition economies are at an early stage of free market. Their economy system is a kind of dichotomy between a modern sector which means the business is owned by private parties (Putterman, 1992), and a traditional sector which means the business is owned by governments.

Dualism is due to industrial histories in transition economies. Most transition economies had followed the Soviet model regarding industrial structure and economic development. Soviet model refers to that first all enterprises are owned by government, second government determines products quota and prices, further economic growth is driven by heavy manufacturing. From the positive prospect, state-owned enterprises were also responsible for their employees' subsidies, insurance, retirement, and education. Such a system supported a basic living standard, promoted the process of urbanization (Putterman, 1992). The negative side, however, is quite obvious as well. The system manifested inefficiencies. Furthermore, interest groups who dominate certain products have appeared along the development.

The crash of the Soviet Union showed the falsehood of the Soviet model. Transition economies have started embracing private business. However, due to the history of Soviet model, nowadays dualism is still a common phenomenon in these countries. State-owned enterprises have a long-term tight relationship with the government and enjoy privileges such as easier to obtain public provisions and loans that most private enterprises have more difficulties to access.

Table 6 shows the domestic credit to private sector issued by the World Bank refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. It reflects private enterprises have been treated unfairly under dualism: the portion of domestic credit earned by private sectors in transition economies mostly are below 50%.

Table 6. domestic credit to private sector

country	Domestic credit to private sector (% of GDP)	country	Domestic credit to private sector (% of GDP)
Albania	39.252	Kazakhstan	35.999
Armenia	35.003	Macedonia	46.305
Azerbaijan	17.976	Moldova	33.633
Belarus	41.999	Poland	54.942
Bulgaria	72.092	Romania	45.197
Cambodia	28.253	Russia	46.834
Croatia	73.791	Slovenia	91.358
Czech Republic	55.374	Lithuania	53.686
Estonia	84.719	Hungary	65.023
Georgia	32.836	Latvia	82.684

Source: The World Bank, 2012

Although private enterprises enjoy very little equal opportunity, during the transition private enterprises have increasingly contributed GDP growth. Since private enterprise contributes most of the trade in services in these countries, the trade in services of private sectors issued by The World Bank is a good reflection of showing the gravity of private enterprise in transition economies. It is the sum of service exports and imports divided by the value of GDP.

Table 7. Trade in services

country	Trade in services (% of GDP)	country	Trade in services (% of GDP)
Albania	36.157	Kazakhstan	8.205
Armenia	19.184	Macedonia	20.730
Azerbaijan	13.344	Moldova	25.221
Belarus	15.315	Poland	13.500
Bulgaria	21.912	Romania	10.973
Cambodia	27.561	Russia	7.751
Croatia	25.933	Slovenia	23.144
Czech Republic	19.537	Lithuania	20.849
Estonia	41.216	Hungary	27.785
Georgia	22.525	Latvia	25.008

Source: The World Bank

Due to the nature of the dualism, private enterprises suffer from inequalities. Therefore private entrepreneurs have to choose offering bribes to compensate the weaknesses of their nature, otherwise they have to take much higher risk of dying out in the market.

Low level of information transparency

Transparency means the release of information that is relevant for evaluating those institutions (Lindstendt and Naurin, 2010). The information transparency reduces corruption because it makes it more complicated to engage in corrupt behavior (Lindstendt and Naurin, 2010). In the principal-agent context, in order to hold bureaucrats accountable, voters need to know bureaucrats' activities in order to monitor them. However, due to the information asymmetry between voters and bureaucrats, voters can never perfectly observe the actions of the bureaucrats. But the more

information asymmetries are reduced the less room there will be for shirking and the more efficient will be the delegation (Holmström, 1979; Miller 2005). Thus information transparency is crucial for controlling bureaucrats for corruption. Sunshine laws and requirements to provide details on budget and spending imply that an agent who seeks to engage in corrupt activities has to put more effort on concealing those activities.

The press in transition economies, however, is mostly controlled by the government. The government tactically and strategically maneuvers the process of disclosing information. First, there will be disclosure of relevant information, such as blocking information which is supposed to be delivered to public. Second, government would apply intentional information overload (Greiling and Spraul, 2005). For example, government might provide too much information including irrelevant information that public could not handle. Both ways could disturb the pathway of information delivery to make voters have more difficulties to monitor government officials hence give room to government officials to engage in corrupt activities.

Impacts of the corruption on economic growth

The stereotype of the impact corruption on economic growth is corruption harms growth. Corruption in transition economies, however, has both positive and negative impact due to insufficiency and ineffectiveness of institutions in these countries.

Positive impact-When Government is indifferent to business and/or has other priorities

Bureaucracies in transition economies may be indifferent to the desires of entrepreneurs wanting to carry on economic activities (Leff, 1964). Such a situation is quite likely in the absence of effective popular pressure for economic development, or in absence of effective participation of business interests in the policymaking process. More generally, when the government does not focus on economic pursuits or innovation, it may be reluctant to move actively in the support of economic activity (Leff, 1964). Bureaucracies in transition economies are oriented primarily to maintaining the political legitimacy. All economic activities are served for this purpose. The bureaucracy plays an extensive interventionist role in the economy, and its consent or support is a sine qua non for the conduct of most economic enterprise.

When bureaucrats are indifferent to business and/or have other priorities, corruption works like piece-rate pay for bureaucrats, which induces a more efficient provision of government services, and it provides a leeway for entrepreneurs to bypass inefficient regulations (Bardhan, 1997). Corruption also maintains efficiency by offering contacts to the lowest-cost firm, hence promotes economic growth (Bardhan, 1997). Since licenses and favors are in limited supply, they are allocated by competitive bidding among entrepreneurs. Because payment of the highest bribes is one of the major criteria for allocation, the ability to collect revenue is prior. Corruption can be seen as part of a Coasean bargaining process on which a bureaucrat and the private agent may negotiate to an efficient outcome. The corrupt official awards the contract to the highest bidder in bribes, and then allocation efficiency is maintained, because only the lowest-cost firm can afford the largest bribe (Bardhan, 1997). The situation would be more complex when incomplete information exists, in other words, the briber does not have full information

about the costs and the bribing capacity of competitors. However, the situation can be considered as an n-person symmetric game with incomplete information (Beck and Maher, 1986; Lien, 1986). Assuming suppliers know the bureaucrats' policy of awarding the contract to the firm offering the largest bribe and suppliers are also assumed to know their own costs, but have incomplete information about competitors (Beck and Maher, 1986). The lowest-cost firm is always the winner of the contract, and thus bribery regenerates the efficiency consequences of competitive bidding procedures under imperfect information (Leff, 1964).

Negative impact--Uncertainty

Corruption introduces uncertainties into the economic environment that can have additional effects on the way private firms do business (Rose-Ackerman, 1997). It may give the firm a short run orientation. First, the briber may fear that those in power are vulnerable to overthrow because of their corruption. Second, competitors will be permitted to enter the market or the briber's contract will be voided due to politics or greed. Third, having a record of paying a bribe in the past, the firm is always vulnerable to demands by those who can document the illegal payments (Rose-Ackerman, 1997).

Negative impact--High transaction cost

North (1990) emphasizes the cost of transaction, since resources are required not only to measure the features of a good or service in economic exchange but also to define and measure the rights that are transferred and to protect these rights by policies and enforcing agreements (Aron, 2000). Transition economies, as I mentioned above, have

low levels of information transparency. Further, the property right is weakly defined and protected in transition economies. Therefore the exchange is complex hence the transaction cost is high. Such an environment gives room to bureaucrats may use their arbitrary power to create delays and barriers in granting license and permits in order to collect more bribes (Rose-Ackerman, 1997).

When is corruption harmful?

Since corruption has both positive and negative impacts on economic growth, when does corruption harm economic growth? To answer the question institutional environment and external environment should be taken into consideration.

Regarding impacts of corruption on growth, there are two main understandings. Scholars who hold the viewpoint that corruption “greases the wheels” argue corruption can shorten the amount of time waiting in queues, hence increases growth. Scholars who hold the opinion that corruption is “the sand of the wheel” point out that the ability of civil servants to speed up the process can be very limited when the administration is made of decision centers. To decode the puzzle of the impact of the corruption on economic growth we must put the institutions into the framework.

North defines institutions as “a set of rules, compliance procedures, and moral and ethical behavioral norms designed to constrain the behavior of individuals in the interests of maximizing the wealth or utility of principals.”⁷(North, 1981). In other words, institution determines the environment in which the relations between individuals and the state takes place. There are two types of institution will be considered in this paper, one is

⁷ Douglass North. 1981. Structural and Change in Economic History. Chapter 15, pp.201

political freedom, another one is economic freedom. Political freedom refers to constraints on political executives, more specifically, refers to the extent of institutionalized constraints on the political decision-making powers of chief executives, whether individuals or collectives (North, 1991). Institutions like competitive electoral system, accountability mechanism, checks and balance mechanism guarantee citizens are able to express effective preference about alternative policies and leaders.

Political freedom mediate incentives of politicians to be honest or to seek rents. We assume that bureaucrats care about re-election and their reputation (Manin, Przeworski, and Stokes, 1999). Thus when other factors are given, high level of political freedom should make bureaucrats focus on voters' needs, including to promote economic growth. In transition economies, on another hand, weak political competition, and weak regulation are reflections of poor political freedom. When the level of political freedom is low, it fails to create incentives for bureaucrats to care about citizens' needs. Corruption hence to some extent plays a role of agreement between accounter and accountee that holds bureaucrats to focus on promoting economic growth (Hutchcroft, 1996).

Economic freedom has something to do with property rights and freedom of commodity exchange. "The highest form of economic freedom provides an absolute right of property ownership, fully realized freedoms of movement for labor, capital, and goods, and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself⁸" (The Heritage Foundation and The Wall Street Journal). In a society has high level of economic freedom, property right should be well defined and protected. It means the freedom to enter into voluntary exchanges without government interference (Swaleheen and Stansel, 2007). The failure

⁸ See "Economic Freedom Index" issued by *The Heritage Foundation* and *The Wall Street Journal*

of the property rights protection undermines the free market, reduces incentives of businesses to participate in productive activities and increases transaction costs (Acemoglu and Verier, 1998), leading to inefficiencies of economic growth.

The factor of external shock such as financial crisis has not been explicitly addressed in explaining the relationship between corruption and economic growth. It is possible that corrupt bureaucrats periodically change the economic rules of the market after crisis which changes the dynamics between corruption and economic growth. It is also possible that due to weak institution the market requires more informal stimulations to promote economic growth after a hit of a financial crisis. Friedman (1977) points out that especially developing countries experience higher volatility in growth and he states that the periods of expansionary monetary and fiscal policies followed by the periods of economic stabilization.

Dependent variable

Real GDP growth

I will use real GDP growth as the dependent variable. The real GDP growth is the value of GDP growth adjusted for inflation. It is calculated by the formula as:

$$\text{Real GDP growth} = (1 + \text{nominal GDP growth}) / (1 + \text{inflation}) - 1$$

Independent Variables

Corruption

A big problem in the empirical analysis of corruption is the fact that there is no direct indicator, and the activity *per se* is difficult to observe. Any study of the subject

inevitably relies on some sort of survey. Different indicators represent different concerns. Despite the weakness, however, the results from indicators with very different methodologies are highly correlated (Treisman, 2000). Table 8 shows the analysis by Lederman, Loayza, and Reis Soares who compared the correlations among some main corruption indices from 1998.

These indices can be briefly described as follows: the International Risk Guide (ICRG) measures corruption in the political system as a threat to foreign investment. It is a widely used indicator of corruption; however, foreign investment is not the focus of this paper. The World Development Report (WDR) measures corruption as an obstacle to business. It measures the extent to which public power is exercised for private gain. The index is coded from -2.5 to 2.5 with higher values corresponding with better governance outcomes. The GALLUP measures the frequency of cases of corruption among public officials. Its methodology, however, counts the cases of corruption that were criminal charged. It highly depends upon the quality of the law in the given country which might bring a spurious effect. The Global Competitiveness Survey (GCS) indices measure the frequency of irregular payments connected with imports, exports, business licenses, police protection, and loan application. Its focus is on the macroeconomics environment and the quality of the government executives which are not focuses of this paper. The Country Risk Review (CRR-DIR) measures corruption among public officials and effectiveness of anticorruption initiatives. This index explains the effectiveness of anticorruption instead of level of corruption which is not the topic of this paper. The Corruption Perception Index (CPI) measures corruption in the public sector, or corruption which involves public officials, civil servants or politicians.

Table8. Correlation among different corruption indices

	ICRG	WDR	GALLUP	GCS	CPI	CRR-DIR
ICRG	1					
WDR	0.58*	1				
GALLUP	0.71*	0.72	1			
GCS	0.64*	0.78*	0.78*	1		
CPI	0.64*	0.75*	0.83*	0.90*	1	
CRR-DIR	0.63*	0.75*	0.7*	0.81*	0.79*	1

*Notes: *- significant at 1% number of observation below the correlation. Indices refer to 1998;*

Source: Lederman, Loayza, and Reis Soares, 2001

In this paper, I will use CPI as the independent variable. CPI is one of the most widely used corruption indicators (Lederman, Loayza, and Soares, 2001; Chang, 2010; Tavits, 2007; Lambsdorff, 2002; Rose-Ackerman, 1999). It is a combination of polls, drawing on corruption-related data collected by a variety of reputable institutions, and it ranks countries according to their perceived levels of public-sector corruption. It reflects the views of observers from around the world, including experts living and working in the countries/territories evaluated. The data sources used to compile the index include questions relating to the abuse of public power and focus on: bribery of public officials, kickbacks in public procurement, embezzlement of public funds, and on questions that probe the strength and effectiveness of anti-corruption efforts in the public sector. The CPI uses a 10-point scales, where 10 means the least corrupt and 1 means the most corrupt.

Political freedom

Indices presenting political freedom can be briefly describes as follows: Freedom House democracy index, which measures civil liberties and political rights. Freedom House index is trichotomy--“free”, “not-free”, and “partial-free”. Since most transition

economies are either “partial-free” or “not-free”; this trichotomy is too broad to analyze countries in this paper. Another index is the voice and accountability index issued by Kaufman *et al.* This index attempts to measure the degree to which citizens participate in the selection of their government and have the ability to hold government officials responsible for policy outcomes.

In this paper I will use Polity IV as the index presenting political freedom. Polity IV offers a great measurement of political freedom. It divides institution into DEMOC and AUTOC. DEMOC stands for institutionalized democracy. The measurement reflects “the three essential, interdependent elements”⁹. These include “the presence of institutions and procedures through which citizens can express effective preference about alternative policies and leaders, the existence of institutional constraints of the exercise of power by the executive, and the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation.”¹⁰ AUTOC stands for institutionalized autocracy. The common properties are a lack of regularized political competition and concern for political freedoms. In mature form, autocracies sharply restrict or suppress competitive political participation. Their chief executives are chosen in a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints.

The first step of making the index is to obtain DEMOC and AUTOC scores. Each country has both scores. The democracy indicator scores from 1 to 10. Weights the score uses are shown in the following table:

⁹ Dataset Users’ Manual, Polity IV, pp14

¹⁰ Dataset Users’ Manual, Polity IV, pp15

Table9. Weights of the democracy score

<i>Competitiveness of Executive Recruitment</i>	
Election	+2
Transitional	+1
<i>Openness of Executive Recruitment</i>	
Dual/election	+1
Election	+1
<i>Constraint on Chief Executive</i>	
Executive parity or subordination	+4
Intermediate category	+3
Substantial limitations	+2
Intermediate category	+1
<i>Competitiveness of Political Participation</i>	
Competitive	+3
Transitional	+2
Factional	+1

Its operational indicator of autocracy is derived from codings of the competitiveness of political participation, the regulation of participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive. Weights the score uses are shown in the following table:

Table10. Weights of the autocracy score

<i>Competitiveness of Executive Recruitment</i>	
Selection	+2
<i>Openness of Executive Recruitment</i>	
Closed	+1
Dual/designation	+1
<i>Constraints on Chief Executive</i>	
Unlimited authority	+3
Intermediate category	+2
Slight to moderate limitations	+1
<i>Regulation of participation</i>	
Restricted	+2
Sectarian	+1
<i>Competitiveness of Participation</i>	
Repressed	+2
Suppressed	+1

Competitiveness of Executive Recruitment refers to the extent that prevailing modes of advancement give subordinates equal opportunities to become superordinates. Openness of Executive Recruitment means recruitment of the chief executive is "open" to the extent that all the politically active population has an opportunity, in principle, to attain the position through a regularized process. The measurement of Constraints on Chief Executive is based on Eckstein and Gurr, with decision rules defined in the following manner: "superordinate structures in action make decisions concerning the direction of social units. Making such decisions requires that supers and subs be able to recognize when decision-processes have been concluded, especially 'properly' concluded. An indispensable ingredient of the processes, therefore, is the existence of Decision Rules that provide basic criteria under which decisions are considered to have been taken."¹¹ The competitiveness of participation refers to the extent to which alternative preferences

¹¹ See Eckstein, Jagers and Gurr. *Polity IV code book*, pp20.

for policy and leadership can be pursued in the political arena. Regulation of Participation is regulated to the extent that there are binding rules on when, whether, and how political preferences are expressed.

The final score of each country is obtained by subtracting the AUTO score from the DEMOC score. Scores are from -10 to 10, ranging from pure autocracy to consolidated democracy.

Economic freedom

The measurement of economic freedom comes from Economic Freedom index of The Heritage Foundation. It is a series of 10 economic measurements created by The Heritage Foundation and *The Wall Street Journal* since 1995. It covers 183 nations all over the world. The index matches the concept of economic freedom this paper focuses on. The definition of economic freedom according to the index is "the highest form of economic freedom provides an absolute right of property ownership, fully realized freedoms of movement for labor, capital, and goods, and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself."¹² (The Heritage Foundation and The Wall Street Journal). The index scores nations on 10 broad factors of economic freedom which are business freedom; trade freedom; monetary freedom; government size/spending; fiscal freedom; property rights; investment freedom; financial freedom; freedom from corruption; labor freedom. The 10 factors are averaged equally into a total score. Each one of the 10 freedoms is graded using a scale from 0 to 100, where 100 represents the maximum freedom. A score of 100

¹² See "Economic Freedom Index" issued by *The Heritage Foundation* and *The Wall Street Journal*

signifies an economic environment or set of policies that is most conducive to economic freedom.

Table11. Economic measures from the empirical growth literature

Institutional measure	Source	Period, country	Components of index
BERI disaggregated business risk indicators: subjective (ranked by a “permanent” panel of experts)	Knack & Keefer (1995), private firm for potential foreign investors	Annual from 1972; about 47 countries	Security of contract and property rights; bureaucratic delay; nationalization potential; contract enforceability; infrastructure quality
ICRG disaggregated business risk indicators: subjective (ranked by staff of political risk services)	Knack& Keefer (1995), data from international country risk guide: private firm for potential foreign investors	Annual from 1982; 135 countries	Security of contract and property rights; rule of law; corruption in government; quality of the bureaucracy; repudiation of contracts by government; expropriation risk of private investment
Heritage Foundation index of economic freedom: partly subjective (not from risk-rating agencies)	Heritage Foundation	Annual, from 1995; 183 countries	Dimensions of market efficiency; trade policy; taxation; government intervention; monetary policy; capital flows and foreign investment regulations; banking regulations; wage or price controls; protection of property rights; efficiency of regulation; extent of parallel market
Gastil-Wright economic freedom ratings: subjective	Wright (1982)	One year; 165 countries	Economic freedom; freedom of property; freedom of association; freedom of movement; freedom of information
Banks’ government purges and peaceful demonstrations: objective	Banks (1975 onward)	1970 onward; currently more than 190 countries	Social capital measures; purges: any systematic elimination by jailing or execution of political opposition; antigovernment demonstrations: any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly antiforeign

Source: Janine Aron, 2000

There are differences between political freedom and economic freedom. Political freedom focuses on constraints on executives, regulations of political competitiveness

whereas economic freedom refers to the degree of property rights protection, freedom of trade, etc. Correlation between the two variables shown below indicates that the two variables have a correlation of about 0.4, showing they are not related.

Table12. Correlation of political freedom and economic freedom

	Political freedom	Economic freedom
Political freedom	1	
Economic freedom	0.4164	1

Obs=116

Other factors

Human Development Index

I will use HDI as the indicator of social capital. Social capital plays an important role in economic growth. It is a way of measuring development by combining indicators of life expectancy, educational attainment and income. The breakthrough for the HDI was the creation of a single statistic which was to serve as a frame of reference for both social and economic development. The education component of the HDI is measured by mean of years of schooling for adults aged 25 years and older, and expected years of schooling for children of school entering age. The life expectancy at birth component of the HDI has a minimum value of 20 years and maximum value of 83.57 years. For the wealth component, the minimum income is \$100 (PPP) and the maximum is \$87,478 (PPP), estimated for Qatar in 2012.

Financial crisis

Impacts of 2008 financial crisis are different across transition economies depend upon levels of globalization of that country. The empirical analysis in Coricelli et al. (2008), using industry-level data for EU and transition countries, revealed that it indeed

significantly contributed to growth and catching-up in transition economies. As documented by Lane and Milesi-Ferretti (2007), transition countries differed sharply from other emerging countries. Transition economies are undergoing transition from central planning to free market; therefore a hit of financial crisis should yield different outcomes of economic growth due to different degrees of capital inflows, levels of international economic integration such as trade openness. Therefore I should take the possible impact of financial crisis into account.

I will use two datasets to control the impact of the financial crisis. The first dataset pertains to the period before the 2008 financial crisis, and the second dataset pertains to the period after the financial crisis. Thus the impact of the crisis can be detected.

Endogeneity

In general, we expect a country's institutional structure to remain the same over time, in which case institutional variables might be considered exogenous to growth. In many developing countries, however, institutional quality periodically can deteriorate sharply as a result of political instability, terms of trade, policy reversals. In this case, institutions may deteriorate in periods of low growth.

Ideally, to reduce endogeneity problems, institutional quality should be measured at the beginning of the period on which the research is concentrating. For example, if growth is averaged over 10 years, the institutional variables should be measured before, or at the beginning of, the decade.

In this paper institution qualities I choose are five years ahead of economic growth. Further, the influence of human capital is long-term; its dominant character appears

slower than other variables, thus the HDI I use is 12 years ahead of the dependent variable.

I collect four-years' data from each country. The total sample size is 116 from 29 countries.

Table13. Data Summery

Variable	years	Sam ple size	Mean	Min	Max	Std Dev	years	Mean	Min	Max	Std Dev
Economic growth	2003-2006	116	-0.669	-45.091	20.846	7.535	2008-2011	-4.170	-33.510	34.689	8.050
Corruption	1998-2001	116	3.134	1.5	6	1.153	2003-2006	3.217	1.8	6.7	1.186
Political freedom	1998-2001	116	2.474	-9	10	6.859	2003-2006	3.138	-9	10	7.1904
Economic freedom	1998-2001	116	52.655	31.5	76.1	9.965	2003-2006	57.188	38.3	77.7	8.539
HDI	1991-1994	116	0.331	0.178	0.897	0.166	1996-1999	0.536	0.279	0.887	0.120

Models and hypotheses

In 2000, the IMF listed the following countries with transition economies: Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Cambodia, China, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Kazakhstan, Kyrgyz Republic, Laos, Macedonia, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam. The data description of these countries is shown in appendix. The study is conducted by pool regression model. The research question of this paper is in transition economies, what is the impact of corruption on real economic growth when qualities of institutions and financial crisis are taken into consideration. My research question can be quantified as:

$$Growth = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \mu$$

Where x_1 is corruption; x_2 is political freedom; x_3 is economic freedom; x_4 =HDI;

μ =error

Hypothesis 1: Corruption promotes growth in a country with low quality of political freedom.

The hypothesis can be quantified as:

$$Growth = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_{1*2} x_{1*2} + \mu$$

Where $x_{1*2} = x_1 * x_2$

$$\beta_{1*2} x_{1*2} > 0 \text{ or } \beta_{1*2} x_{1*2} < 0$$

Hypothesis 2: Corruption promotes growth in a country with low quality of economic freedom.

The hypothesis can be quantified as:

$$Growth = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_{1*3} x_{1*3} + \mu$$

Where $x_{1*3} = x_1 * x_3$

$$\beta_{1*3} x_{1*3} > 0$$

Results and Analysis

The results are shown in the table below

Table14. Result: Time period 2003-2006

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Corruption	0.607 (0.736)	0.599 (0.909)	0.552 (0.915)	0.364 (0.915)	2.396 (3.249)	2.168 (3.291)	3.327 (3.451)
Political Freedom	0.056 (0.125)	-0.073 (0.331)	-0.081 (0.333)	-0.083 (0.330)			-0.256* (0.127)
Economic freedom	0.090* (0.053)			0.088* (0.053)	0.485*** (0.196)	0.478*** (0.196)	0.635*** (0.204)
HDI	-0.255 (0.252)		-0.146 (0.246)	-0.253 (0.253)		-0.235 (0.249)	-0.184 (0.252)
Political Inst*Corr		0.066 (0.107)	0.067 (0.107)	0.048 (0.107)			
Economic free*Corr					-0.049 (0.056)	-0.045 (0.057)	-0.061 (0.059)
Constant	-7.324	-3.165	-3.034	-6.668	-25.436	-24.817	-33.496
R ²	0.077	0.053	0.056	0.079	0.167	0.187	0.203
Adjusted R ²	0.044	0.028	0.022	0.037	0.144	0.156	0.165

*** Significant at 0.01 level

** Significant at 0.05 level

* Significant at 0.1 level

Table15. Result: Time period 2008-2011

	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
Corruption	0.796 (0.833)	0.971 (1.375)	0.974 (0.770)	0.926 (1.391)	1.983 (4.796)	1.660 (4.993)	2.811 (5.500)
Political freedom	-0.062 (0.154)	-0.005 (0.413)	-0.008 (0.127)	-0.017 (0.417)			-0.086 (0.170)
Economic freedom	0.052 (0.136)			0.055 (0.138)	0.083 (0.275)	0.068 (0.281)	0.165 (0.340)
HDI	-0.257 (0.496)		-0.229 (0.488)	-0.259 (0.498)		-0.233 (0.847)	-0.260 (0.851)
Political Inst*Corr		-0.007 (0.150)	-0.008 (0.150)	-0.178 (0.153)			
Economic Inst*Corr					-0.020 (0.076)	-0.015 (0.079)	-0.031 (0.086)
Constant	-9.400	-7.173	-7.061	-9.845	-11.515	-10.505	-16.249
R ²	0.019	0.016	0.017	0.019	0.016	0.018	0.020
Adjusted R ²	0.017	0.011	0.018	0.026	0.010	0.018	0.025

*** Significant at 0.01 level

** Significant at 0.05 level

* Significant at 0.1 level

From Table 14 and Table 15 we see that the interaction terms are not significant on any level. Values of both R squared and adjusted R squared are low. Based on the insignificancies, standard errors and values of R squared, we must accept the null hypothesis. In another word, I find no evidence that corruption promotes economic growth when qualities of institutions are taken into consideration, even in countries have poor qualities of political freedom and/or economic freedom.

Taking results of the interactive variable in model 7 into a microscope level, I plug corruption scores into different economic freedom level. The coefficients of corruption are shown below:

Table16. Interactive Coefficients from model 7

Corruption	Coefficient	Std. Err.
Of the economic freedom with minimum value (31.5)	1.416	1.648
Of the economic freedom with value 40	0.900	1.237
Of the economic freedom with value 50	0.293	0.850
Of the economic freedom with value 60	-0.313	0.744
Of the economic freedom with value 70	-0.920	1.011
Of the economic freedom with maximum value (76.1)	-1.290	1.274

On the lowest level of economic freedom which is 31.5, the effect of corruption on growth is 1.416. Since the higher score of corruption stands for lower level of corruption. The result indicates that when the economic freedom is fixed on the 31.5 percent, one point increase in the corruption decreases the economic growth by 1.416 percent. In countries with the highest level of economic freedom the coefficient is -1.29, it means that one point increase in the corruption promotes the economic growth by 1.29 percent when the economic freedom is fixed on the 76.1. The finding does not support the hypothesis, therefore the hypothesis should be rejected.

The single effects, however, show significant results. Model 1 shows a basic linear relationship. Economic freedom is significant on 0.1 level with coefficient of 0.09. It shows that higher economic freedom promotes more real GDP growth. After adding the interaction term of political freedom and corruption in model 4, the economic freedom is significant on 0.1 level. The value of coefficient slightly reduced from 0.09 in model 1 to 0.088 when interactive effect of political freedom and corruption is taken into consideration. The coefficient indicates that when economic freedom increases one percent, the real GDP growth increases 0.088.

Political freedom in model 7 is significant on 0.1 level. The result shows that when other factors remain constant, one degree increase in political freedom contributes 0.256 percent drop in real GDP growth. The reason for this is that as bureaucrats are organized monopolistically, the bureaucratic leadership controls the average bureaucrat's political power and there are fewer obstacles to apply policies. In this case, a rational bureaucratic leadership would not allow the reduction in growth for the purpose of increasing bureaucrats' political power. Therefore, in a centralized bureaucracy, sustained growth would be the only admissible outcome.

Standard errors of interactive terms, political freedom, and economic freedom in models of before the financial crisis are smaller than the ones in models of after the crisis. This indicates that after the financial crisis, both interactive and single impacts vary in a more among transition economies. These findings lead to the implication that insofar as these countries are standing at different levels of transition from central planning to free market, their institutions have different levels of tolerance to external turmoil. Thus after

the hit of the financial crisis, these countries appeared to have more varied impacts on growth.

In a summary, although there are continual arguments regarding the impact of corruption on economic growth-grease the wheel or sand the wheel-based on the results in this paper, in transition economies, corruption does not promote or retard real GDP growth in transition economies. Second, economic freedom plays important role in triggering real GDP growth. The results show that higher economic freedom promotes higher growth. Furthermore, to obtain higher growth, a rational government can be more centralized in order to keep being efficient.

Comparing findings of this paper and the study of Drury, Krieckhaus, and Lusztig's study, there are two new discoveries. Drury, Krieckhaus, and Lusztig point out that corruption effects economic growth, and democracy has indirect effect on economic growth by mitigating the negative effects of corruption on economic growth. My findings indicate that economic freedom has a direct effect on economic growth. Higher economic freedom promotes more growth, whereas higher degree of political institution does not promote higher economic growth. Furthermore, corruption does not mediate growth when economic freedom and political institution are taken into account.

Conclusion

Corruption usually is present in a non-transparent environment and/or those characterized by low economic and political competition (Nowak, 2000). This paper insight more pictures about the relationship among corruption, institution and economic growth in the scope of transition economies. In this paper, by using pool regression

models, I analyze determinants of corruption in transition economies, as well as roles of political freedom and economic freedom in terms of impact of corruption on growth, and impacts of corruption on economic growth by testing two sets of data.

Indeed, in transition economies both economic freedom and political freedom play important roles in terms of stimulating economic growth. However, neither economic freedom nor political freedom mediates the impact of corruption on economic growth. Both political freedom and economic freedom have single significant impacts on economic growth. Economic freedom plays an important role in triggering real GDP growth. The results show that higher economic freedom, higher growth. Furthermore, when bureaucrats are organized monopolistically, the bureaucratic leadership controls the average bureaucrat's political power, so there are fewer obstacles to apply policies. In this case, a rational bureaucratic leadership would not allow the reduction in growth for the purpose of increasing bureaucrats' political power. Therefore a centralized bureaucracy promotes more growth.

Transition economies stand at different levels of transition from central planning to free market. Their institutions have different levels of tolerance to external turmoil. Thus after the hit of a financial crisis, these countries displayed more variation of impact on growth.

Appedix

Country	GDP	Corruption	Political freedom	Economic freedom
Albania	5.7	2.3	5	53.9
	5.9	2.3	5	53.4
	5.5	2.4	5	53.6
	5	2.5	5	56.8
	7.7	2.5	7	56.8
	3.3	2.5	7	58.5
	3.5	2.4	9	57.8
	3	3.1	9	60.3
Armenia	14.04	2.5	5	49.6
	10.47	2.5	5	56.4
	13.87	2.5	5	63
	13.2	2.5	5	66.4
	6.9	3	5	67.3
	-14.15	3.1	5	70.3
	2.1	2.9	5	69.8
	4.6	2.9	5	70.6
Azerbaijan	11.2	1.7	-7	43.1
	10.2	1.5	-7	47.4
	26.4	2	-7	49.8
	34.5	2	-7	50.3
	6.9	1.8	-7	54.1
	-14.15	1.9	-7	53.4
	2.1	2.2	-7	54.4
	4.6	2.4	-7	53.2
Belarus	7.04	3.4	-7	38
	11.45	4.1	-7	35.4
	9.44	4.1	-7	41.3
	10	4.8	-7	38
	10.25	4.2	-7	39.7
	0.16	3.3	-7	43.1
	7.7	2.6	-7	46.7
	5.3	2.1	-7	47.5
Bulgaria	5.51	3.3	8	45.7
	6.75	3.5	8	46.2
	6.36	3.9	8	47.3
	6.56	4	9	51.9
	6.2	3.9	9	57
	-5.5	4.1	9	59.2
	0.4	4	9	62.3
	1.7	4	9	64.1
Cambodia	8.51	2	2	59.8
	10.34	2	2	59.9
	13.25	2.1	2	59.3
	10.77	2.3	2	59.6
	6.69	1.8	2	63.7
	0.09	2	2	61.1
	5.96	2.5	2	60
	7.07	2.1	2	56.7
China	10	3.5	-7	53.1

	10.1	3.4	-7	54.8
	11.3	3.1	-7	56.4
	12.7	3.5	-7	52.6
	9.6	3.4	-7	52.6
	9.2	3.4	-7	52.5
	10.4	3.2	-7	53.7
	9.3	3.3	-7	53.6
Croatia	5.37	2.7	-5	51.7
	4.12	3.7	-5	53.1
	4.28	3.9	8	53.6
	4.94	3.8	8	50.7
	2.08	3.7	8	53.3
	-6.95	3.5	8	53.1
	-1.41	3.4	9	51.9
	-0.01	3.4	9	53.6
Czech Republic	3.77	4.8	10	68.4
	4.74	4.6	10	69.7
	6.75	4.3	10	68.6
	7.02	3.9	10	70.2
	2.08	3.9	10	67.5
	-6.95	4.2	10	67
	-1.41	4.3	10	64.6
	-0.01	4.8	8	66.4
Estonia	7.77	5.7	6	72.5
	6.34	5.7	7	73.8
	8.85	5.6	9	69.9
	10.1	5.6	9	76.1
	-3.67	5.5	9	77.7
	-14.26	6	9	77.4
	3.33	6.4	9	75.2
	8.28	6.7	9	74.9
Georgia	11.06	2.3	5	47.9
	5.86	2.3	5	52.5
	9.6	2.4	5	54.3
	9.38	2.4	5	58.3
	2.31	1.8	5	58.6
	-3.78	2	7	58.9
	6.25	2.3	7	57.1
	6.95	2.8	7	64.5
Hungary	3.85	5	10	56.9
	4.8	5.2	10	59.6
	3.96	5.2	10	64.4
	3.9	5.3	10	65.6
	0.89	4.8	10	63
	-6.8	4.8	10	62.7
	1.25	5	10	63.5
	1.69	5.2	10	65
Kazakhstan	9.3	2.3	-4	41.7
	9.6	3	-4	47.3
	9.7	2.7	-4	50.4
	10.7	2.3	-4	51.8

	3.3	2.4	-6	52.3
	1.2	2.2	-6	49.7
	7.3	2.6	-6	53.9
	7.5	2.6	-6	60.2
Kyrgyz Republic	7.03	2.2	-3	51.8
	7.03	2.2	-3	54.8
	-0.18	2.1	-3	55.7
	3.1	2.1	-3	53.7
	8.4	2.1	-3	56.8
	2.89	2.2	-3	58
	-0.47	2.3	3	56.6
	5.96	2.2	4	61
Latvia	7.2	3.4	8	63.4
	8.68	3.4	8	64.2
	10.6	3.4	8	63.4
	12.23	3.7	8	66.4
	-4.24	3.8	8	66
	-17.95	4	8	67.4
	-0.34	4.2	8	66.3
	5.47	4.7	8	66.9
Lao PDR	6.07	1.9	-7	35.2
	6.36	1.9	-7	35.2
	7.11	1.9	-7	36.8
	8.62	1.9	-7	33.5
	7.8	2	-7	41
	7.5	2	-7	42
	8.5	3.3	-7	44.4
	8.04	2.6	-7	47.5
Lithuania	10.25	3.8	10	59.4
	7.35	4.1	10	61.5
	7.8	4.8	10	61.9
	7.84	4.8	10	65.5
	2.93	4.7	10	69.7
	-14.74	4.6	10	72.4
	1.33	4.8	10	70.5
	5.87	4.8	10	71.8
Macedonia	2.82	3.3	6	56.1
	4.63	3.3	6	59.6
	4.35	3.3	6	59.4
	5.03	3.3	6	61.5
	2.93	2.3	9	65.5
	-14.74	2.7	9	69.7
	1.33	2.7	9	58.7
	5.87	2.7	9	59.6
Moldova	6.6	2.6	7	53.5
	7.41	2.6	7	56.1
	7.5	3.1	7	59.6
	4.78	2.1	8	54.9
	7.76	2.4	8	60
	-5.99	2.3	8	57.1
	7.1	2.9	8	57.4

	6.4	3.2	8	58
Poland	3.87	4.2	9	59.2
	5.34	4.1	9	59.6
	3.62	4.1	9	60
	6.23	4	9	61.8
	5.13	3.6	10	61.8
	1.63	3.5	10	58.7
	3.9	3.4	10	59.6
	4.35	3.7	10	59.3
Romania	5.2	3	8	54.4
	8.4	3.3	8	50.1
	4.17	2.9	8	52.1
	7.9	2.8	8	50
	7.93	2.8	8	50.6
	-6.58	2.9	9	50
	-1.65	3	9	52.1
	2.45	3.1	9	58.2
Russia	7.73	2.4	3	52.8
	7.17	2.4	3	54.5
	6.37	2.1	6	51.8
	8.15	2.3	6	49.8
	5.25	2.7	6	50.8
	-7.83	2.8	6	52.8
	4.3	2.4	6	51.3
	4.3	2.5	6	52.4
Slovak Republic	4.78	3.7	9	57.5
	5.06	3.5	9	54.2
	6.66	3.7	9	53.8
	8.35	3.7	9	58.5
	5.75	3.7	9	59
	-4.93	4	9	64.6
	4.18	4.3	9	66.8
	3.35	4.7	10	69.8
Slovenia	2.93	6	10	60.7
	4.4	5.5	10	61.3
	4	5.2	10	58.3
	5.84	6	10	61
	5.9	5.9	10	57.7
	6	6	10	59.2
	6.1	6.1	10	59.6
	6.4	6.4	10	61.9
Tajikistan	10	1.8	-1	35
	10.6	1.8	-1	36.1
	10.49	1.8	-1	37.6
	-15.66	1.8	-1	41.8
	21.25	1.8	-3	46.5
	3.9	2	-3	48.7
	6.5	2.1	-3	50.4
	7.4	2.2	-3	52.6
Turkmenistan	17.1	1.8	-9	35
	17.2	1.8	-9	36.1

	13	1.8	-9	37.6
	11.4	1.8	-9	41.8
	21.25	1.8	-3	51.3
	3.9	2	-3	50.7
	6.5	1.8	-3	47.6
	7.4	2.2	-3	43.8
Ukraine	9.4	2.6	7	40.4
	12.1	1.5	7	43.7
	2.7	2.1	6	47.8
	7.3	2.4	6	48.5
	2.3	2.3	6	51.1
	-14.8	2.2	6	53.7
	4.1	2.6	6	55.8
	5.2	2.8	7	54.4
Uzbekistan	4.2	1.8	-9	31.5
	7.7	2.4	-9	33.8
	7	2.7	-9	38.1
	7.3	2.9	-9	38.2
	9	2.4	-9	38.3
	8.1	2.3	-9	39.1
	8.5	2.2	-9	45.8
	8.3	2.1	-9	48.7
Vietnam	7.34	2.5	-7	40.4
	7.79	2.6	-7	42.7
	8.44	2.5	-7	43.7
	8.23	2.6	-7	44.3
	6.31	2.4	-7	46.2
	5.32	2.6	-7	46.1
	6.78	2.6	-7	46.2
	5.89	2.9	-7	45.6

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