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Cracking the Corruption Code: The Case of Afghanistan

Qaiss Khan Alokozai Mr.
Southern Illinois University Carbondale, qaiss.alokozai@siu.edu

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Qaiss Khan ALOKOZAI

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A Research paper

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This paper is about a very complicated and multifaceted issue of corruption. The main purpose of this paper is to find the impact of development indicators which are political stability and violence, government effectiveness, regulatory quality, rule of law, voice and accountability on the control of corruption in Afghanistan. Furthermore we are interested to know the direction of causality among these variables. The data is analyzed through ordinary least square regression method. Johansen test is applied for cointegration and to find the causality we have applied the Granger causality test. Political Stability and violence, government effectiveness and voice and accountability have shown very strong results and can have higher impact. Policy recommendations are made at the end of the paper.

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CHAPTER 1

Introduction

In Afghanistan people use different terms to camouflage the practice of corruption. Some of the customary terms used are Shirini (sweets), Rishwat (Bribe), Tea Money, Bakhsish and Fruits for your children. Afghanistan is one of the poorest countries in south Asia; indeed Afghanistan is a rich country in terms of its natural resources, agriculture and tourism but there are many problems and opposing forces to the development of Afghanistan. Corruption is one of those divergent forces that are becoming a hurdle in front of the international community efforts to bring development in the country. The country has been through long term turmoil and internal political disturbances from the last 30 years. As a result Afghanistan is becoming a country which is called a failed state.

Corruption is prevalent in many countries but the ratio is significantly higher in under developed countries. Afghanistan is one such case. The type of governance acts as a catalyst in a country's progress. The world governance indicators as described by World Bank are voice and accountability, political stability and absence of violence, government effectiveness, and regulatory quality, rule of law and control of corruption. Afghanistan has the lowest rank and estimated points in all these indicators as per the survey. According to the humanitarian assistance organization the total pledge to the government of Afghanistan from 2002 to 2009 was a total of 62 billion US dollar. A total of 26.7 billion US dollars have already being disbursed through different projects in Afghanistan. These projects comprise projects in various sectors like education, agriculture, governance, anti-corruption, rural development, anti-narcotics and many other economical sectors. But still the government of Afghanistan has failed to provide

people with basic needs. A survey conducted by United Nations Office on Drugs and Crime reveals that “bribery had a major impact on Afghanistan’s economy amounting to a total of 3.9 billion dollars” (p. 05). The corrupt system inside the government ministries is becoming a vital force in reducing the pace of development. The international community has done ample efforts to provide assistance both technical and capital to enable government of Afghanistan with required tools that will enable them to reduce corruption. But the performance of the government of Afghanistan has very lower result in this case.

The topic became of significant importance to me when I observed the problem while working in close coordination with the public sector in Afghanistan. The ministries as well as the top government officials are all infected by this virus. The recent news reports show a highly corrupt system in the parliament as well as among ministers. In order to get a passport, attesting or receiving your educational degrees, paying your bills, admitting your kids to school, the person has to pay bribe in order to go through the system. Adam J. Center (2008) states that “imagine being a teacher and having to pay a bribe for your paycheck, imagine being a parent and having to pay a bribe for your child to received a passing grade, imagine being an employer and being unable to decipher between authentic diplomas and the counterfeit replicas” (p. 848).

In the higher level government positions such as the parliament or ministers this is a more a severe problem. For a contractor to apply for bid participation he has to pay bribe to higher officials in order to be part of an open announced bidding for a project. The result became that these contractors then after paying bribe implement the projects with lower quality products and there is no guarantee of the sustainability of the project. Kinzer (1999) as

cited by Svanson (1999) state that the consequence of the earthquake of 2004 in Turkey would be much lower if contractors have not paid bribes and as result using lower standard materials (p. 20). The projects which are implemented due to corruption the reliability of these projects are to the lowest degree.

Still with this high level of corruption, from education sector to health, from transport to aviation, agriculture to commerce people do manage to be part of the system. Leff (1964) believes that “corruption is another less radical way of adjusting to the same pressures and goals” (p. 100). The public sector is designed and encoded in a way that; in order to function well, the citizens are indirectly forced to obey the coding rules (corruption favored). The general people are ruled by some bureaucrats and they are not free in their course of actions. Rajeev K. Goel & Michael A. Nelson in their paper “economic freedom versus political freedom” argues that lower government intervention and more economically free countries are more developed and citizens of that country enjoy democracy (p. 122). There is neither political nor economic freedom in Afghanistan.

Afghanistan is a strongly segregated country in terms of ethnic groups. Paulo Mauro (1995) in his paper titled “corruption and growth” has used empirical approach of ethno linguistic fractionalization. His findings show that members of the same ethno linguistic group will always favor their own group member (p. 693). Mauro has presented a very accurate picture of Afghanistan in his findings. In Afghanistan Pashtuns, Tajiks, Hazars, Uzbeks are some of the major ethnic groups. A strong tribal connection in different sectors of the governments, always favor their own tribal members. Beside this Jeanet Sinding Bentzen (2012) as well as

Rose-Ackerman (1999), states that corruption is ubiquitous in cultures with a strong social group philosophy which results in group favored decisions (p. 168).

The public sector is highly corrupt and bureaucratic in Afghanistan. Government positions from top to lower are bought through bribes and connections. The ministries in the country are functioning based on the old system. The international community has provided all kinds of modern technology but the civil service employees usually all employees of government cannot work on computers and prefer to work on the same old system. The public sector has a huge hierarchical structure, where you an employee should show and do what his higher authorities are ordering him. Bentzen (2012), Hofsted (2001), has termed such action as "power distances" (p. 168). According to their findings such societies with a greater power distance are more corrupt and less developed (p. 168). As a result of power distances in Afghanistan there is substantial difference in income inequality throughout the country. The citizens who can are in better position in terms of their contacts and networks are better off in comparison to the poor citizens of the society. Gupta, Davoodi & Terme (2011) states that as a result of prevalence of higher differences in income and poverty will result in more corruption…one point increment in standard deviation of corruption will bring changes of increment of 11 points in gini coefficient and poor people income will grow by 5 percentage point (p. 23).

Gupta, Davoodi and Terre (2001) have mentioned good point about poor targeting of social programs where social programs are implemented in a wrong target place; instead they are more favored to already well connect people (p.25).

The civil service employees claim in Afghanistan that due to lower wages of the civil sector they can only compensate that through bribes. Wie (1997) argues that lower wages by the government can be a reason of corruption……he has given example of Singapore's Prime Minister's action in terms of paying higher wages to civil service employees as competitive as the private sector (p. 19). This can be true in many hierarchical levels where they are paid less but it is prevalent on the ministerial as well as parliamentary level in Afghanistan. There are many support staff working with the ministry by funding provided by international donors and are paid a competitive salary but they are paving a way for corruption by issuing contracts through illegal ways. Rauch and Evans (1997) have also rejected this hypothesis about the role of competitive salary to reduce corruption (p. 19).

Research Question

1. Which of the World Bank development indicators have higher impact on the control of corruption in Afghanistan? 1) voice and accountability 2)political stability 3)government effectiveness 4)regulatory quality 5)rule of law and 6)control of corruption.
2. What is the direction of the causality between the variables?

Definitions

Scholars have given various definitions of corruption. Some of them are giving below. Aidt, (2003) state that corruption means where the government officials are using their official position to benefit themselves (p. 01).

The World Bank & Charron. N (2010) in his paper "Exploring the impact of foreign aid on corruption" has defined corruption as "the abuse of public office for the private gain" (p. 68).

Wei (1999) defines corruption as “government officials abusing their power to extract/accept bribes from the private sector for personal benefits” (p. 04).

CHAPTER 2

Literature Review

Corruption is a multidimensional issue with a stronger negative impact on economic and social aspects of a country. In Afghanistan corruption has strong roots in the government sector. There can be various factors that are causing these roots to be stronger. These factors can be cultural, war and internal turmoil, lack of education, lower wages in public sector, political instability, poverty, lack of accountability, weak judicial system to name a few. In this section we will review scholarly articles on the topic of corruption.

Corruption leads a country to a path of economic insecurity and long term negative consequences on economic development. There are so many seminal research been done to show the negative impact of corruption on economic prosperity. Paolo Mauro (1995) in his paper "corruption and growth" has shown that corruption can result in lowering the investment in the country and as a result has an overall impact on economic growth (p. 681). Mauro has made a good point related to the link between corruption and investment. In Afghanistan investors are not willing to invest and one of the main reasons behind that is; lack of security, no rule of law, corruption and bureaucracy in government sector. Investment is very low in the country. Shang-Jin Wei (1999) in his paper titled "corruption in economic development, beneficial grease minor annoyance or major obstacle" presents corruption in this way. He states that corruption is a crucial problem for a country where it results in lowering domestic investment, foreign direct investment, and inflation of government spending which results in shifting it away from spending the capital on education, health and infrastructure (p. 02). Investors are investing in neighboring countries like India and Tajikistan and in Middle East as in

Dubai. Mauro (1995) has given an example of an action if taken by Bangladesh increase the investment in Bangladesh would raise by almost 5 percentage point and its GDP by half percentage point (p. 683). The results from Mauro's (1995) work also found that a percentage increase in the corruption index will result in an increase of 2.9 percent of investment rate. Furthermore Mauro (1996) showed that a percentage improvement in bureaucratic efficiency index will result in 4.75 percent of GDP.

Ata and Arvas in their paper "determinants of economics corruption: a cross country data analysis" have focused on the distribution of income and how does it impact growth. They found out that "economic development, inflation, economic freedom and income distribution are statistically significant determinants of corruption" (p. 161). Ata & Arvas have presented a perfect description of the determinants of corruption in Afghanistan however inflation does not seem to be a determinant of corruption in Afghanistan. The lower economic development and a high difference in income distribution in Afghanistan are causing a significant increase in corruption in the country. Jeanet Sinding Bentzen in his paper titled "how bad is corruption? Cross country evidence of the impact of corruption on economic prosperity" has mentioned a strong negative consequence of corruption on a country's productivity level (p. 167). Aidt (1999) results also provide significant evidence that corruption can hinder economic growth (p. 288). Wright & Craigwell (2001) have found that the hypothesis that corruption can have impact on economic growth depends on the statistical methods that they have used…they have found strong causal relationship from corruption to economic growth but a weaker link from economic growth to corruption (p. 38). Svensson (2005) supports the notion arguing that "corruption is closely related to GDP per capita and to human capital" (p. 29). I strongly agree

with Svensson on the point of human capital. Afghanistan has the lowest human capital. There is no investment in this case.

Bentzen (2012) has further questioned the badness of corruption for a country. He believes that in order to understand and analyze the severity of this problem we have to figure out which weaker aspect of the governments to fix first (p. 167). The author has asked and assessed the issue through a very logical question. In Afghanistan the corruption is becoming a cancerous cell. But in order to fight it afghan people as well as anti corruption organization would need to know which kind of cancer it is and in which part of the society. Almost all the public sector is severely infected but the impact is on general people of the country and they are not taking any kind of action against it. Bentzen agrees with (Licht er al. 2007) that societies with collective and group nature, the decisions made are ceterus paribus. In this way an easy deal is made without the fear of questioning from the same group member (p. 174). Wright & Craigwell in their paper have cited Reinikka and Svensson (2004, 2005) and agrees that corruption can have a significant impact on human capital accumulation. Furthermore Amaro-Reynes (1983), Mauro (1995, 1997), United Nations (2001) and Tanzi and Davoodi (1997) all have found out that corruption is seem to cause wrong implementation of projects to areas where it is easy to get bribes, and the projects are of low productivity rather than investment enhancing projects (p. 23).

The poor citizens of Afghanistan are highly affected by corruption. They have limited resources in order to process and be part of the system. They are deprived of their most basic rights. IWA Corruption survey of 2010 mentions about their finding related to impact of corruption of poor as “households in villages close to cities are more likely to pay briber then

those in remote villages or in cities. Single breadwinner households with an income of less thatn 3000 Afs (60 US) are the most exposed to bribery….poor farmers are more likely to pay bribe than those in urban areas.

Aidt (2009) states that, “corruption is one of the causes of low income and is believed to play a critical role in generating poverty traps (p. 271). Gupta, Davoodi and Terme (2001) states that corruption not only affects the major and most influential macroeconomic variables of the country but also affects the income distribution…it increases the level of poverty and investment is more capital based rather than labor based (p. 23). In Afghanistan the increasing corruption is becoming a true obstacle for the poor citizens of the country who are affected by it. Wei (1999) agrees with Rose-Ackerman (1997) that corruption can have severe effects on poor people, they receive lower social services; poor areas will be biased in terms of infrastructure project, high taxes, less competent in selling their agricultural products (p. 13). According to World Bank “corruption is the greatest obstacle to reducing poverty. Wei (1999) and Ackeman (1997) have made a very important point about the impact of corruption on poor citizens of a country. But the case is different in Afghanistan. Where there are projects implemented in poor areas and the people who are in real hands but usually the culture of corruption which has became a norm is causing a serious problem of transferring the exact money to these projects. The government officials have a high share through bribes and even then the project is implemented with no further assurance of how long it will last. Paulo Mauro (1996) found out that “poor countries tend to be politically unstable, bureaucratic and corrupt” (p. 706).

The lower literacy rate in Afghanistan is one of the major concerns. The country is facing a lower rate of literacy. Adam J, Centre of the Case Western Reserve Journal of Law in his paper titled "implementing anti corruption standards to improve Afghanistan's education system" stresses on the point that "Afghanistan is at a pivotal moment, decades of instability, warfare, and the future of this war torn country relies on today's policies and initiatives…education may be the most vital of these policies and initiatives" (p. 847-848). Gupta, Dvoodi and Terme (2001) states that, corruption will have an impact on the quality of education, which will ultimately have negative effect on the government efforts to attain the required level of education (p.26). Gupta has presented a very logical point here. In Afghanistan you have to pay the bribe in order to process any educational documents through the relevant office in education sector. Private universities are forced to pay huge amount of money in order to retain their operation licenses. This in turn has crucial effect on the quality of education in these institutes. Cartner (2008) states that if the authorities in Afghanistan don't control corruption its education goals will never be met and the country has to pay a huge opportunity cost in terms of education children which are the future of this country (p. 848).

Political corruption is the worst form of corruption which gives birth to other sorts of corruption. The politicians in Afghanistan are highly corrupt. There are some media reports published on huge scandals like the Kabul Bank and many minister involved in stealing millions of dollars.

Some authors and economist do believe that corruption can grease the wheel of development. The seminal work was presented by Nathaniel H. Leff (1964) in his paper titled "economic development through bureaucratic corruption" states that countries can boost

economic development as a result of bureaucratic system of the government….and corruption reduces the uncertainty involved in bad policies and reduces the higher effects of bad policy…. Corruption provides the insurance that if the government decides to steam in full speed in the wrong direction all will not be lost (p. 10-11).

A strong rule of law plays a very vital role in a country. Afghanistan is facing severe problems in this part. The prevalent corruption also seems to be somehow related to the weak judicial system. North (1990) as cited by Paolo Mauro (1995) states that corruption can be hindered by "an efficient judicial system to enforce contracts as a crucial determinant of economic performance" (p. 681). Wei (1999) states that "the ability of a country to detect acts of corruption and to prosecute those guilty…is essential to deter corruption (p.22). Honkong and Singapur are some of the asian countries where through a mix of strategies and program have controlled corruption in an excellent way. Svensson (2005) has given example of Hong Kong and Singapore as the most cited countries in terms of lowest corruption level….this happened as result of setting independent commission against corruption which states that "guilty until proven innocent". Afghanistan has also set up anti corruption agency. But till date it has not worked. The higher corruption in top government officials and bribes at lower level is hiddenj ust because of the networks between officials. But how does it worked in Singapore? Svanson (2005) states that in Singapore this program was implemented in combination of several other reforms in the country like higher payment to civil service employees, transfer of employees from one office to another, in this way it forces and acts as an opposing force to corrupt officials to get bribes..and political leaders are the top are committed to fight corruption (p. 35). Unfortunately most of the government officials as the reports and projects

have show are highly committed to reducing corruption. Many of the top level officials were publicly blamed in the media to be corrupt but no one took action. This all leads us to point at a weak judicial system of the country.

Fijnaut & Hubert in their paper titled “corruption, integrity and rule of law enforcement” have argued the role of law enforcement organizations and the problem of corruption within these orgnziations (p. 03).

Aidt (2009) takes a critical view of the two hypotheses that whether corruption greases the wheel of development or sands the wheel of development and found out that the hypothesis greasing the when does not seem to be correlated with increase in GDP (p. 271). He has focused also on the part of public integrity which he defines as the behavior from public officials in a way that will benefit him (p. 03).

The author has further distinguished some public integrity misconducts. Fijanut & Hubert states that “corruption including bribery, nepotism, cronyism, patronage, fraud nd theft; conflict of interest through assets, jobs, gifts, manipulation of information; discrimination and sexual harassment improper method for noble causes (using immoral means to achieve moral ends); the waste and abuse of resources; and private time misconduct” (p. 04).

Heather Marquette (2001) in her paper “donors, state building and corruption: lessons from Afghanistan and the implication from aid in policy” have analyzed the situation of state building in Afghanistan from governance, aid and anti corruption perspective (p. 1871).

Svenson (2005) in his paper “eight questions about corruption” has asked a question about the common characteristics of corruption. He found out that all these countries have some common characteristics like they are developing or transition countries, socialist

government or ruled by a socialist regime and low income levels and they are closed economies (p.24).

The media in Afghanistan is not free and independent. This hinders to report any kind of corrupt activities. According to Svensson (2005), “corrupt countries are less open and regulate both entry to the market and the press more” (p. 28). According to Svensson public procurement is highly infected by the viral disease of corruption. Svensson and Reinikke in 2004 assessed education program in Uganda that provided education support grant to each student..they compared the flow of these funds from central government to the school and the findings show that the school received only 13 percent of the total amount of money. Olken (2003-04) as cited by Svensson has assessed the same situation in Indonesia where only 29 percent of the funds allocated for road building projects and 18 percent of anti poverty program were stolen (p. 31). Hsieh and Moretti (2005) as cited by Svensson argues that through the United Nations Oil for Food Program, Iraqi regime obtained a sum of 1 to 4 billion dollars from 1997 to 2001 (p. 31).

Svensson (2001) has questioned another aspect of corruption reduction technique of paying higher wages to bureaucrats. He has cited Becker and Stigler (1974) where they argue that higher wages will ultimately result in lower corruption and will ensure honest behavior from officials (p. 32). Rauch and Evans (2000) and Treisman (2000) as cited by Svensson (2005) have not found any evidence that support the hypothesis of higher wages (p. 32). Reinikka and Svensson (2005) found out that corruption is a leading factor in knowing the result of many projects in under developed countries and its failure (p. 38).

Caiden (2001) as cited by Graff (2005) states that “in common corruption can be attributed to almost anything…but while the opportunity exist everywhere, public agencies, administrative cultures, and geographic regions” (p. 42).

The United Nations Office on Drugs & Crime survey in 2012 on corruption in Afghanistan has the following main findings.

1. Corruption is the most important concern of adults in Afghanistan.
2. 44.6 percentages of the household members who secured a job was through connections or paying bribe.
3. The prevalence of the bribery in Afghanistan was out to be 50.1 percent. And a total of 5.6 bribes were paid by adults to public service.
4. Males haves faced 53.7 percent bribe prevalence than female which is 45.1 percent.
5. More than 50 % of the bribes have been paid to province, district or municipal offices in comparison to bribes paid to police offices of more than 50 percent.

CHAPTER 3

Data & Methodology

The data used in this paper is the world development indicators index from World Bank. The data is based on six broad dimensions of government throughout the world. Following are the indicators.

1. Voice and Accountability (va) (-2.5 to +2.5)
2. Political Stability and Absence of Violence (pos) (-2.5 to +2.5)
3. Government Effectiveness (ge) (-2.5 to +2.5)
4. Regulatory Quality (req) (-2.5 to +2.5)
5. Rule of Law (rol) (-2.5 to +2.5)
6. Control of Corruption (coc) (-2.5 to +2.5)

There are 30 underlying data sources utilized for the calculation of these indicators alongside the surveys and expert assessment around the world (Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi (2010). The ranking of the data is done in the manner that -2.5 represents the weak and +2.5 represents the stronger position based on these indicators. For example for control of corruption -2.5 represents the most corrupt and +2.5 represents the least corrupt. Beside this we also have use panel data for comparative analysis. We have used a panel data of 8 countries namely Afghanistan, Pakistan, India, China, Singapore, Brazil, Chad and Nigeria. These countries are selected based on their corruption level which is almost similar except Singapore which is selected because of its improvement in the control of corruption.

We have used ordinary least square regression method. Researchers have used the same technique in many of the published papers. The main problem with the questions and

researches related to corruption is that we can not quantify this very well. Following models are proposed.

Model 1:

$$Dcoc_t = \beta_0 + \beta_1 Dpos_t + \beta_2 Drol_t + \beta_3 DDge_t + \beta_4 DDreq_t + \beta_4 DDDva_t + \varepsilon \quad (1)$$

Model 2:

$$coc_t = \alpha_0 + \alpha_1 req_t + \epsilon \quad (2)$$

$$coc_t = \alpha + \bar{\alpha}_1 va_t + \epsilon \quad (3)$$

Model 3:

$$coc_t = \bar{\beta}_0 + \bar{\beta}_1 psav + \bar{\beta}_2 req + \bar{\varepsilon} \quad (4)$$

$$coc_t = \gamma_0 + \gamma_1 req_t + \gamma_2 rol_t + \theta \quad (5)$$

$$coc_t = \tilde{\gamma}_0 + \tilde{\gamma}_1 va_t + \tilde{\gamma}_2 rol_t + \tilde{\theta} \quad (6)$$

$$coc_t = \delta_0 + \delta_1 rol_t + \delta_2 ge_t + \bar{\theta} \quad (7)$$

Model 4:

$$coc_t = \bar{\vartheta}_0 + \bar{\vartheta}_1 psav_t + \bar{\vartheta}_2 req_t + \bar{\vartheta}_2 rol_t + \sigma \quad (8)$$

$$coc_t = \vartheta_0 + \vartheta_1 rol_t + \vartheta_2 ge_t + \vartheta_2 req_t + \acute{\sigma} \quad (9)$$

$$coc_t = \bar{\beta}_0 + \bar{\beta}_1 req_t + \bar{\beta}_2 ge_t + \bar{\beta}_2 va_t + \tilde{\sigma} \quad (10)$$

We also thought to use panel data regression. Gujarati (2011) has cited Baltagi (1995) related to the benefits of the panel data which are, "no bound to be heterogeneity in these units, which may be unobservable……the panel data is more informative, more variability, less co linearity among variables, more degrees of freedom and more efficiency" (p. 279-280). We have run both fixed effect and random effect model and found out that the random effect model is better.

Model 5 (Fixed Effect)

$$coc_{it} = \beta_{1i} + \beta_2 pos_{it} + \beta_2 req_{it} + \beta_2 rol_{it} + \beta_2 ge_{it} + \beta_2 va_{it} + u_{it} \quad (11)$$

I=1,2,3,……,128; t=1,2……,8

Model 6 (Random Effect)

$$coc_{it} = \beta_1 + \beta_2 pos_{it} + \beta_2 req_{it} + \beta_2 rol_{it} + \beta_2 ge_{it} + \beta_2 va_{it} + \varphi_{it} \quad (12)$$

I=1,2,3,……,128; t=1,2……,8

Due to the less availability of data we had no other way other than coming up with multiple regression equations. Based on the cointegration assumption we have run all the regressions and results have been analyzed. Please see Appendix for the results and further details.

Empirical Estimates

Unit Root Test (Augmented Dickey-Fuller Test)

Based on the time series data we had to check for stationarity of the variables in order to avoid the problem of spurious or nonsense regression as explained by Damodar Gujarati (2001). We have used the augmented dickey fuller test to check for the unit root. We cannot reject the null hypothesis for all the variables and conclude that all the variables are non stationary.

The time series data should be stationary which means that its means and variances should be constant over time (Green, 2001). In order to solve the problem of non stationary we took the first difference in order to see if we can come up with reliable results. But the

regression results were not significant. The problem with difference was that we could not take reliability because our data is for a limited period of time.

Cointegration Test:

After further analysis we thought that these variables must be cointegrated. The correlation was checked through Johansen test of cointegration. We found no cointegration among these variables all together. After further analysis we came up with the following idea to check for cointegration and the results were significant. The Granger Causality test is run for all the variables to see the causality between the variables.

Granger Causality Test:

The Granger Causality test is being used to see the direction of causality between all these variables. The granger causality test was applied through the following equation for all of the indicators as already mentioned. The null and alternate hypothesis is shown in the results.

$$coc_t = \sum_{i=1}^{p} a\, coc_{t-1} + \sum_{i=1}^{q} \delta\, WDI_{t-1} + \vartheta_{1t}$$

$$WDI_t = \sum_{i=1}^{r} a\, WDI_{t-1} + \sum_{i=1}^{s} \pi\, coc_{t-1} + \vartheta_{2t}$$

Hausman Test:

Hausman test is used for the comparison of fixed effect and random effect model. The null hypothesis of Hausman test is that fixed and random effect model does not differ to a large extent (Guarati, 2011).

CHAPTER 4

Results

Johansen Cointegration test is run for all of the above mentioned variables. A strong contergation relationship is found between control of corruption and regulatory quality at 10%, control of corruption and voice and accountability at 10%, coc, psav and req have atleast one cointegration equation at 5% and two equations at 10%, coc psav and rol have atleast one cointeggration equation at 5%, coc, psav and ge atlest one equation at 5%, coc, req and va have two cointegrated equations at 10%, coc, req and rol have two equatons at 10%, coc, req and ge have one at 5%, coc va and rol have one at 5% and coc rol and ge have two at 5%. All of them have shown strong significance based on Eigenvalues and trace test results. Please see the appendix for the related results.

Table 1: Hausman Cointegration test

	Independent Variables					**Test**
Control of Corruption (coc), ns=non stationary	**Political Stability & Absence of Violence (pos)**	**Regulatory Quality (req)**	**Voice & Accountability (vs)**	**Rule of Law (rol)**	**Government Effectiveness (ge)**	**Cointegration**
ns/coc	ns/pos					N
ns/coc		ns/req				Y
ns/coc			ns/va			Y
ns/coc				ns/rol		N

ns/coc					ns/ge	N
ns/coc	ns/pos	ns/req				Y
ns/coc	ns/pos		ns/va			N
ns/coc	ns/pos			ns/rol		N
ns/coc	ns/pos				ns/ge	N
ns/coc		ns/req	ns/va			Y
ns/coc		ns/req		ns/rol		Y
ns/coc		ns/req			ns/ge	N
ns/coc			ns/va	ns/rol		Y
ns/coc			ns/va		ns/ge	Y
ns/coc				ns/rol	ns/ge	Y

Table 2:Regression

Non stationary, coc=dep.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
pos				0.364 2.73				0.445 2.78		
rol					0.175 0.56	0.232 0.79	-0.069 -0.29	-0.285 -0.285	-0.407 -1.34	
ge							0.312 6.18		0.644 3.19	0.437 2.24
req		0.486 4.89	0.16 0.69	0.396 4.62	0.509 4.62			0.337 3.09	-0.611 -1.69	-0.319 -1.08
va			0.29 1.53			0.442 5.19				0.088 0.46
Stationary Variables										
Dpos	0.666 t=2									
DDge	0.326 1.99									
DDreq	-0.530 -1.4									
DDDva	-0.385 -1.66									
Drol	-0.091 -0.17									

No Obs.	16	16	16	16	16	16	16	16	16	16
F Test	1.32	23.95	14.3	21.15	11.54	14.53	20.42	14.25	16.51	14.15
R-Squared	0.48	0.63	0.68	0.76	0.63	0.69	0.75	0.78	0.8	0.77

The results from Model 1 show very insignificant results even they are stationary variables. Political stability and violence and government effectiveness are significant at 10% significance. The t-statistics is significant for political stability in comparison to 1.99 to government effectiveness. The value of R-squared shows that the model is 48% percent reliable, The F-statistics value is very low. This shows that globally that model is not significant at all.

Based on the cointegrated nature of control of corruption and regulatory quality we run the OLS regression and the results are highly significant at 95% confidence interval. The trace test shows the reliability of the coefficient which is significantly higher. The F test is 23.95 which show that the model is over all fit. R-squared explains the model 63%. we expected a positive sign of the coefficient of regulatory quality. We found out 0.48, which means that a one point increase in regulatory quality of the government will have an impact of 1 point increment in control of corruption.

We also observed a strong cointegration (check appendix for Johansen Cointegration test) between control of corruption and voice and accountability. The coefficients are significant with 95% confidence interval. Trace test shows a value of 5.41 for the coefficient of voice and accountability which is significant. The value of R-squared shows 68% accuracy of the model which is quite good. We expected a positive sign of coefficient of voice and accountability and the results also shows positive sign. A one point increase in voice and

accountability will have an impact on corruption of one plus point which means strong hold on the control of corruption.

A strong cointegration was found between control of corruption, political stability and violence and regulatory quality. This means that in the long run these variables behave in the same pattern. The results from the regression show highly significant values for the coefficient of both the independent variables. They are significant at 95% confidence interval. The trace test show shat the coefficients are significant. The F statistics has a value of 21.15 which is highly significant. The value of R-squared is 0.76 which shows the reliability of the model. A one point increment in both political stability and regulatory quality will have an impact of 0.36 and 0.39 on the control of corruption.

We also found at least one cointegration equation between control of corruption, regulatory quality and rule of law. But the results from regression show only one significant coefficient for regulatory quality. The global F statistics shows a value of 11.54 which states that the model is explained in the best possible way by these variables. Rule of law is not significant in this case.

Results from this equation show only significance in voice and accountability. Controls of corruption, rule of law and government effectiveness are also conitegrated but the results from regressions shows only one significant coefficient with a strong trace test results.

In model 04 which is a combination of multiple equations. We found a strong relationship between 1) control o corruption, political stability and violence, regulatory quality and rule of law 2) control of corruption, rule of law and government effectiveness and regulatory quality 3) control of corruption, regulatory quality, government effectiveness and

voice and accountability. The results show that political stability and violence and regulatory quality are highly significant at 95% confidence interval. The trace test result for both regulatory quality and political stability and violence is 3.09 and 2.78 which is significant as well. A one point increase in pos will have an impact of 0.44 point and a one point increase in regulatory quality will have an impact of 0.33 points on the control of corruption. The coefficient of rule of law is not significant. The results from control of corruption, rule of law, government effectiveness and regulatory quality shows only significance for government effectiveness at 95% confidence interval. The results from last model 10 show significance for government effectiveness at 95% confidence interval.

Table 3: Pairwise Granger Causality Tests

Sample: 1996 2011

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
GE does not Granger Cause COC	14	0.04614	0.9551	no
COC does not Granger Cause GE		3.90627	0.0601	yes
PSAV does not Granger Cause COC	14	0.00224	0.9978	no
COC does not Granger Cause PSAV		4.65602	0.0409	yes
REQ does not Granger Cause COC	14	0.42972	0.6634	no
COC does not Granger Cause REQ		4.08469	0.0547	yes
ROL does not Granger Cause COC	14	0.46156	0.6444	no
COC does not Granger Cause ROL		3.21452	0.0884	yes
VA does not Granger Cause COC	14	0.34428	0.7177	no
COC does not Granger Cause VA		9.83540	0.0054	yes
PSAV does not Granger Cause GE	14	0.08207	0.9219	no
GE does not Granger Cause PSAV		0.20149	0.8211	no
REQ does not Granger Cause GE	14	1.42012	0.2911	no
GE does not Granger Cause REQ		0.28263	0.7602	no

ROL does not Granger Cause GE	14	0.37153	0.6998	no
GE does not Granger Cause ROL		24.3158	0.0002	yes
VA does not Granger Cause GE	14	1.15582	0.3575	no
GE does not Granger Cause VA		0.13699	0.8738	no
REQ does not Granger Cause PSAV	14	0.00328	0.9967	no
PSAV does not Granger Cause REQ		0.99260	0.4078	no
ROL does not Granger Cause PSAV	14	1.28149	0.3238	no
PSAV does not Granger Cause ROL		0.65496	0.5426	no
VA does not Granger Cause PSAV	14	0.11102	0.8961	no
PSAV does not Granger Cause VA		0.44592	0.6536	no
ROL does not Granger Cause REQ	14	0.52165	0.6104	no
REQ does not Granger Cause ROL		5.73748	0.0248	yes
VA does not Granger Cause REQ	14	0.58848	0.5752	no
REQ does not Granger Cause VA		0.08991	0.9148	no
VA does not Granger Cause ROL	14	2.59630	0.1288	no
ROL does not Granger Cause VA		0.36362	0.7049	no

The null hypothesis is mentioned in the table 3 above. The granger causality test shows that control of corruption granger causes government effectiveness, political stability and violence, regulatory quality and rule of law. These are all significant at 5% and some of the variables below 10%. Government effectiveness and regulatory quality are found to granger cause rule of law at below 10%.

Table 04: Fixed Effect Model
Dependent Variable: COC

Method: Panel Least Squares

Sample: 1996 2011

Periods included: 16

Cross-sections included: 8

Total panel (unbalanced) observations: 127

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.101494	0.052441	1.935382	0.0554
Pos	0.072569	0.029932	2.424428	0.0169
Rol	0.422489	0.066629	6.340913	0.0000
Req	0.161067	0.056656	2.842874	0.0053
Ge	0.066267	0.045609	1.452938	0.1490
Va	0.212213	0.043930	4.830657	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.993948	Mean dependent var	-0.413386
Adjusted R-squared	0.993311	S.D. dependent var	1.127242
S.E. of regression	0.092191	Akaike info criterion	-1.833177
Sum squared resid	0.968902	Schwarz criterion	-1.542040
Log likelihood	129.4068	Hannan-Quinn criter.	-1.714892
F-statistic	1560.316	Durbin-Watson stat	1.210122
Prob(F-statistic)	0.000000		

Table 05: Random Effect Model Dependent Variable: COC				
Method: Panel EGLS (Cross-section random effects)				
Sample: 1996 2011				
Periods included: 16				
Cross-sections included: 8				
Total panel (unbalanced) observations: 127				
Swamy and Arora estimator of component variances				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.132099	0.122557	1.077860	0.2832
cos	0.076653	0.029663	2.584096	0.0110
rol	0.463019	0.061129	7.574450	0.0000
req	0.205785	0.053596	3.839532	0.0002
ge	0.072966	0.045300	1.610723	0.1098
va	0.194767	0.042722	4.558890	0.0000
	Effects Specification			
			S.D.	Rho
Cross-section random			0.319798	0.9233
Idiosyncratic random			0.092191	0.0767
	Weighted Statistics			
R-squared	0.648879	Mean dependent var		-0.030035
Adjusted R-squared	0.634370	S.D. dependent var		0.154555
S.E. of regression	0.093430	Sum squared resid		1.056234
F-statistic	44.72215	Durbin-Watson stat		1.141516
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.903336	Mean dependent var		-0.413386
Sum squared resid	15.47646	Durbin-Watson stat		0.077906

Table 06: Hausman Test				
	Fixed Effect Model	**Random Effect Model**	**Difference**	**Sqrt(S.E)**
rol	0.4224894	0.4631093	-0.0406199	0.0245429
req	0.1610672	0.2059062	-0.0448389	0.0161168
ge	0.0662666	0.0729904	-0.0067238	

va	0.2122127	0.1947048	0.0175079	0.0074268
pos	0.0725687	0.0766631	-0.0040944	

Fixed Effect=consistent under null hypothesis

Fixed Effect Different=difference in coefficients not systematic

Chi2(5)=10.39

Prob>Chi2=0.0649

Table 07: Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
pos	0.072569	0.076653	0.000016	0.3076
rol	0.422489	0.463019	0.000703	0.1263
req	0.161067	0.205785	0.000337	0.0149
ge	0.066267	0.072966	0.000028	0.2059
va	0.212213	0.194767	0.000105	0.0882

We can see from the results that the fixed effect and random effect model gives us different results. The coefficient values are different with very little difference. In table 6 we can see that the difference among the variables between fixed effect and random effect is very low. In the fixed effect model all the variables are highly significant and trace test results are also highly significant for all variables. The only insignificant variable is government effectiveness both in random and fixed effect model. The rule of law and voice and accountability variables are found to be highly significant and have a higher impact on the control of corruption in out panel data. In the time series regression for Afghanistan only we found rule of law to be not significant that may be because less data in the case of Afghanistan.

CHAPTER 5

Conclusion & Recommendations

This research paper is about troubleshooting the code of corruption in Afghanistan. We wanted to know the impact of five development indicators on the control of corruption in Afghanistan. We also run a panel data regression to see the impact of these variables in a panel data of 8 countries namely Afghanistan, Pakistan, India, Singapore, China, Brazil, Chad, Nigeria. This is one of the most important issues in and has both economical and social consequences. Control of corruption, voice and accountability, regulatory quality and government effectiveness are found to be strongly cointegrated besides other variables which are significantly cointegrated but the regression results are weak. In summary a policy that will work in joint coordination on rule of law, government effectiveness and voice and accountability will have an impact on the control of corruption. Following are some of the policy recommendations.

Policy Recommendations

The problem is multidimensional, especially in the context of Afghanistan. Based on our results we propose the following policy recommendations for the effective control of corruption in Afghanistan.

1. The government of Afghanistan should focus on the regulatory quality of the public sector in order to provide better services to general public.

2. The government should extend efforts to strengthen the rule of law in Afghanistan and to make public officials accountable for their actions which are against the rule of law. This rule should also apply to the judicial officials of the government of Afghanistan.

3. The citizens of Afghanistan should also play a role so that to make themselves as well as others accountable for actions related to corruption. They should also be accountable for the cases where they pay bribes to officials.

4. Afghan government should maintain political stability through a movement towards a more democratic form of the government.

5. In joint; the variables namely rule of law voice and accountability, government effectiveness and regulatory quality should be strongly improved; this will have a higher impact on the control of corruption in the country based on empirical results.

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APPENDIX

Appendix A

A) Johansen Test for Cointegration

Table 08: Johansen Cointegration Test

Included Observations: 14 after adjustment Trend Assumption: linear deterministic assumption Lags interval(in first difference): 1 to 1				
Series	coc and ge			
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob****
Non*	0.745605	21.85338	15.49471	0.0048
At most 1	0.174766	2.689233	3.841466	0.1010
Trace test indicates 1 cointegrating equation at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				
Series	coc req			
Non*	0.346610	9.138975	15.49471	0.3527
At most 1	0.203241	3.180835	3.841466	0.0745
Trace test indicates no cointegrating equation at 0.05 level				
Series	coc va			
Non*	0.548161	14.08448	15.49471	0.0806
At most 1	0.190717	2.962487	3.840466	0.0852
Trace test indicates no cointegrating equation at 0.05 level.				
Series	coc rol			
Non*	0.352066	8.197201	15.49471	0.4446
At most 1	0.140623	2.121670	3.841466	0.1452
Trace test indicates no cointegrating equation at 0.05 level				
Series	coc pos			
Non*	0.332762	8.045831	15.49471	0.4605
At most 1	0.156415	2.381320	3.841466	0.1228
Trace test indicates no cointegrating equation at 0.05 level				
Series	coc pos req			
None*	0.942314	55.18120	29.79707	0.0000
At most 1	0.578245	15.24280	15.494471	0.0545
At most 2	0.201835	3.156157	3.841466	0.0756

Trace test indicates 1 cointegrating equation at 0.05 level				
Series	coc pos va			
None*	0.815425	30.52076	29.79707	0.0412
At most 1	0.264459	6.864947	15.49471	0.5934
At most 2	0.167402	2.564869	3.841466	0.1093
Trace test indicates 1 cointegrating equation at 0.05 level				
Series	coc pos rol			
None*	0.813455	30.96194	29.79707	0.0366
At most 1	0.316070	7.454749	15.49471	0.5254
At most 2	0.141512	2.136161	3.841466	0.1439
Trace test indicates 1 cointegrating equation at 0.05 level				
Series	coc pos ge			
None*	0.965189	55.77950	29.79707	0.0000
At most 1	0.360817	8.770078	15.49471	0.3871
At most 2	0.163785	2.504176	3.841466	0.1135
Trace test indicates 1 cointegrating equation at 0.05 level				
Series	coc req va			
None*	0.723147	26.14150	29.79707	0.1245
At most 1	0.305893	8.161744	15.49471	0.4483
At most 2	0.195755	3.049927	3.841466	0.0807
Trace test indicates no cointegrating equation at 0.05 level				
Series	coc req rol			
None*	0.962101	67.04471	29.79707	0.0000
At most 1	0.757467	21.22501	15.49471	0.0061
At most 2	0.094670	1.392374	3.841466	0.2380
Trace test indicates 2 cointegrating equations at 0.05 level				
Series	coc req ge			
None*	0.916912	41.00411	29.79707	0.0017
At most 1	0.356097	6.174056	15.49471	0.6750
At most 2	0.000797	0.011158	3.841466	0.9156
Trace test indicates 1 cointegrating equations at 0.05 level				
Series	coc va rol			
None*	0.716256	31.54394	29.79707	0.0311
At most 1	0.569955	13.90837	15.49471	0.0855
At most 2	0.138940	2.094269	3.841466	0.1479

Trace test indicates 1 cointegrating equations at 0.05 level				
Series	coc va ge			
None*	0.919667	50.02847	29.79707	0.0001
At most 1	0.560926	14.72284	15.49471	0.0651
At most 2	0.204309	3.199623	3.841466	0.0737
Trace test indicates 1 cointegrating equations at 0.05 level				
Series	Coc rol ge			
None*	0.935591	64.70410	29.79707	0.0000
At most 1	0.825999	26.30897	15.49471	0.0008
At most 2	0.122361	1.827283	3.741466	0.1764
Trace test indicates 2 cointegrating equations at 0.05 level				

VITA

Graduate School

Southern Illinois University

Qaiss Khan ALOKOZAI

Qaisskhan10@hotmail.com

Kardan University, Kabul Afghanistan
Bachelors in Business Administration, 2010

Special Honors and Awards: Fulbright scholar from 2011-2013.

Research Paper Title: Cracking the code of corruption, the case of Afghanistan

Major Professor: Dr. Scott Gilbert