Grand Corruption and Its Impact on Economic Growth

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Regional Economies and Policies (*REP*)

2017(*1*)*: 1 – 17.*

Keywords grand corruption, bribery affordability, economic growth

Abstract

This study examines the idea that certain kinds of corruption might have more significance for economic growth than the overall level of corruption. It was assumed a certain type of corruption, which has been called "grand corruption," to be strongly linked with growth. Particularly, it is considered and analyzed one of the causes of the grand corruption which have been named "bribery affordability." The paper sheds some light on the validity of this cause. Existing investigations provide mixed evidence on corruption raising or lowering growth. This study considers that "bribery affordability" tends to lower economic growth. To prove the research hypothesis time-series and cross-sectional regression analyses were conducted.

JEL Classification: E02, D73, O17, O43

Contents

1. INTRODUCTION

Corruption, generally defined as "the abuse of entrusted power for private gain," is an insidious plague that has a wide range of corrosive effects on societies. It is quite common that corruption undermines democracy and the rule of law, leads to violations of human rights, distorts markets, erodes the quality of life and allows organized crime, terrorism and other threats to human security to flourish. Common wisdom views corruption as an impediment to development and growth, therefore focusing on corruption is a key determinant of economic performance.

Various studies in the literature researched the link between corruption and economic growth. At present, there are two opposite opinions on the impact of corruption on growth. One is stipulating that there is a positive relationship between corruption and growth (Leff, 1964; Huntington, 1968), while the second one is assuming that there is a negative relationship between those two (Mauro, 1995; Tanzi, 1998; Gupta, 2000; Gyimah-Brempong, 2001). This study supports the second point of view considering that corruption tends to lower economic growth.

Most empirical studies on the relationship between corruption and growth investigate the impact of some aggregate measure of corruption on the level and growth rate of output, without distinguishing between different categories of corruption, using a general overall definition of corruption or different transmission mechanisms. Given the a priori ambiguity of this effect, it is not surprising that the findings of available studies widely differ. In this sense, Wedeman (1997) argues that comparative studies of the economic consequences of corruption ought to stop trying to create catch-all, universalistic definitions of corruption and its consequences and focus instead on identifying different structures of corruption and explaining the impact of particular forms of corruption. This paper sustains the scholar's point of view that certain kinds of corruption might have more significance for growth rates than the overall level of corruption.

There are various dimensions by which corruption can be categorized facilitate the understanding of how corruption affects growth. Because there is no universally accepted definition of corruption, there is no universally valid typology of corruption. Researchers have elaborated multiple classifications. For example, corruption may be either centralized or decentralized; sporadic (occasional) or systemic; organized or chaotic; clientelist or patrimonial; political or administrative; "petty" (small in extent or scale) or "grand" (large in extent or scale), and so on.

The one strongly linked with growth, as a type of corruption, may be considered to be the "grand" corruption. Firstly, for the reason that it is characterized by a large value of the transaction concerned. Secondly, because it consists of an abuse of high-level power that benefits the few at the expense of the population. Thirdly, it requires the significant subversion of the political, legal, and economic systems.

There is no unanimous and rigorous definition of what grand corruption means. The working definition of "grand corruption" adopted in this study is the one provided by Transparency International, which defines it as an "abuse of high-level power that benefits the

few at the expense of the many, and causes serious and widespread harm to individuals and society" (Transparency International, 2016).

Toward understanding the impact of grand corruption on growth, it is necessary to know what the causes of this specific type of corruption are. This study considers that one of the causes of grand corruption can be assumed to be "bribery affordability." This paper sheds some light on the validity of this cause; however, it does not settle that this determinant is the only one which causes and fully describes grand corruption nor provides an estimate of its relative importance. Particularly, it explores the relationship between growth and "bribery affordability" as one of the causes of grand corruption.

Accordingly, the objectives of this study are to: 1) present "bribery affordability" as one of the causes of grand corruption; 2) analyze the relationship between bribery affordability and growth; and 3) test and prove the research hypothesis.

Existing investigations provide mixed evidence on corruption raising or lowering growth. This study considers that corruption tends to lower economic growth. More specifically, this paper will try to prove the hypothesis that "the more there is 'bribery affordability,' the less likely economic growth is to occur." Regression analyses were conducted, using data from 84 countries for five years (2010-2014) to test and demonstrate the validity of the research hypothesis empirically.

Therefore, the purpose of this study is to thoroughly analyze one of the causes of grand corruption by showing the negative impact of grand corruption on economic growth. This paper is organized by five parts. The first part introduces the research background, purpose and objectives of the study. The second part reviews literature in the field. To support the research hypothesis, the third part refers to the theoretical and empirical models. The fourth part indicates the results of analysis. The fifth part suggests conclusion of the study.

2. LITERATURE REVIEW

At present, there is no universally accepted definition of grand corruption. In the literature, sometimes, distinctions between the petty, medium, and grand corruption are mentioned. These are characterized by three features: 1) the value of the transaction concerned; 2) high position of the people involved in the transaction; and 3) frequency of transactions. These characteristics can be found in the definitions given by various scholars. For example, Lambsdorff (2007: 20) defines grand-corruption as "one-shot payments to higher ranks." For Rose-Ackerman (1996: 9), grand corruption "involves large sums of money with multinational corporations frequently making payoffs" and politicians using their power to shape policies in ways that benefit bribers (Jain, 2001; Bussell, 2012). For Jain (2001: 73), grand corruption is "an act of the political elite, where they exploit their powers to make public and economic policies in the name of the people that actually serve their own interests at some cost to others"; according to Bussell, grand or high-level corruption "involves the paying of bribes for influence over the design of policies and is relevant in behind-the-scenes negotiations over the content of legislation" (2013: 11). Masaya (2006: 16) defined grand corruption as "structural bribery that involves an individual official exceeding his/her mandate." According to Hellman et al. (2000: 20), grand corruption is defined as "private payments to public officials to influence the content of the basic rules of the game (e.g., legislation, rules, laws or decrees)."

There are also definitions given by international organizations. The Organisation for Economic Cooperation and Development (OECD) considers that in the case of grand corruption "typically, the larger the value of the corrupt transaction, the higher the position in the public hierarchy of the public official involved" (OECD, 2013: 7). In the United Nations Manual on Anti-Corruption Policy grand corruption is classified as "the use of public office for a private benefit which involves the compromise of government procedures or the capture of a government institution's rulings" (UN ODCCP, 2001: 7). Later in the UN Handbook on Practical-Anticorruption Measures for Prosecutors and Investigators grand corruption was defined as "corruption that pervades the highest levels of government, engendering major abuses of power. A broad erosion of the rule of law, economic stability and confidence in good governance quickly follow. Sometimes it is referred to as 'state capture,' which is where

external interests illegally distort the highest level of a political system to private ends" (2004: 23).

In conclusion, the working definition of "grand corruption" adopted in this paper implies that by definition grand corruption involves "abuse of high-level power that benefits the few at the expense of the many, and causes serious and widespread harm to individuals and society" (Transparency International, 2016).

In the literature, interest toward grand corruption was expressed by Hellman J. et al. (2000) who pay special attention to certain forms of grand corruption, notably state capture by parts of the corporate sector – through the "purchase" of decrees and legislation – and by graft in procurement. Mashali (2012) analyzed through a case study of Iran the relationship between perceived grand corruption and petty corruption in developing countries. Poeschl and Ribeiro (2012) evaluated everyday opinions on grand and petty corruption through a Portuguese study. Rose-Ackerman (1996) wrote about democracy and "grand" corruption making an accent on the impact of corruption, the incidence of bribery and the inefficiency of corruption, country-specific rents, the disposition of bribes, democracy and the control of corruption, and systemic reform, stability and independent checks. Rose-Ackerman (1999) also researched grand corruption and the ethics of global business with respect to why the avoidance of corruption is an ethical issue for business.

Because grand corruption consists of acts committed at the high level of government, it can distort the whole decision-making process or the central functioning of the state, creating many channels through which economic growth can be reduced. Consequently, grand corruption is carrying higher risks being negatively correlated with economic growth.

In the literature two competing hypotheses can be found regarding the economic impacts of corruption. The positive impact of corruption or the "greasing the wheels" hypothesis suggests that corruption does better than evil in society. It argues that corruption is beneficial for growth and development because it allows circumventing of administrative impediments. The negative impact of corruption or the "sand in the wheels" hypothesis postulates that corruption impedes growth and development because it entails resource misallocation, raises transaction costs, among others.

The first hypothesis was popular regarding the take-off period in low-income countries in the second half of the 20th century. Specifically, Leff (1964) and Huntington (1968) suggested that corruption might raise economic growth through two types of mechanisms. First, corrupt practices such as "speed money" would enable individuals to avoid bureaucratic delay. Second, government employees who are allowed to levy bribes would work harder, especially in the case where bribes act as a piece rate. While the first mechanism would increase the likelihood that corruption can be beneficial to growth only in countries where bureaucratic regulations are cumbersome, the second one would operate regardless of the level of red tape.

The supporters of the "sand in the wheels" hypothesis, on the other hand, argue that corruption would tend to lower economic growth. To sustain this position economists have identified channels through which corruption may negatively affect economic growth (Mauro, 1995; Tanzi, 1998; Gupta, 2000; Gyimah-Brempong, 2001). The research made by Rothstein and Holmberg (2011) indicated that corruption is consistently correlated with lower growth rates, GDP per capita, economic equality, as well as lower levels of human development. Similarly, a 2011 systematic review of available evidence of the effect of corruption on economic growth confirms that corruption has a direct and negative effect on growth in low income countries (Ugur and Dasgupta, 2011). Leite and Weidemann (1999: 25) conducted regression analyses in their investigations report that showed long-term growth is negatively affected by the level of corruption. Based on an analysis of 53 developing countries, Poirson (1998: 16) suggested that economic growth is affected by corruption in the long run. Mo (2001) found a significant adverse impact of corruption on growth between 1970 and 1985 for a cross-section of 45 countries. Using decomposition method, he finds that a 1% increase in the corruption level reduces the growth rate by about 0.72% or, expressed differently, a one-unit increase in the corruption index reduces the growth rate by 0.545% points. For Mo (2001), the most important channel through which corruption affects economic growth is political instability, which accounts for about 53% of the overall effect. The other channels include the

level of human capital and the share of private investment. In a similar spirit, Pellegrini and Gerlagh (2004) suggested that the negative effect of corruption on the economic growth is mainly transmitted by its impact on human capital and political instability. Méon and Sekkat (2005), equally detect an adverse impact of corruption on growth. The scholars assess the relationship between the impact of corruption on growth and investment and the quality of governance in a sample of 63 to 71 countries between 1970 and 1998. They find a negative effect of corruption on both growth and investment, as well that corruption has a negative impact on growth independently from its impact on investment.

However, a major puzzle in the discussion of the corruption and its relation with growth is the combination of rapid growth and high levels of perceived corruption in many Asian economies. There seems to be a negative relationship between output growth and the corruption indicator. This is a result indicative of what has been labeled as "the Asian Paradox," which means that several Asian economies which have very high levels of corruption as estimated by the conventional perception indices also record some of the highest GDP growth rates. While a number of plausible arguments have been advanced to elucidate the causes underlying the Asian Paradox, a comprehensive and robust explanation lending itself to firm policy conclusions has so far not been found (OECD, 2013).

In sum, earlier investigations provide mixed evidence on the relationship between corruption and economic growth. Despite various researches on the connection between corruption, as a broad concept, and economic growth, there are a limited number of studies focused on the impact of grand corruption, as a type of corruption, on growth. For example, Tanzi and Davoodi (1997) analyzed grand corruption, as an activity which distorts the entire decision-making process connected with public investment projects, and argue on five channels through which grand corruption lowers growth. Kenny (2006) examined the extent and impact of both petty and grand corruption in infrastructure in developing countries. Rose-Ackerman (1996) showed that grand-corruption, in a broader perspective, substitutes for tax revenues and over time can discourage investments that further economic growth.

Theoretically, the literature reaches no agreement about the effect of corruption on economic growth. Overall, the evidence on the link between corruption and growth has its empirical and theoretical weaknesses. Hypothetically, the link between grand corruption and economic growth is even trickier.

3. MODELS

3.1. Theoretical Model

Given the growing interest in corruption, attempts to quantify its extent have become fundamental. Although inflation and unemployment have been measured with relatively standardized "rates," corruption has not been. It is intrinsically secretive, illegal, or highly variable across different economic activities, which makes it impossible to obtain precise information on its extent within a country. Statistics on the criminal prosecution of corruption activities are, more or less, indicators of the legal tolerance of corrupt practices, than of their prevalence in a given jurisdiction. For this reason, available corruption measures rely on the "perceptions" of economic agents dealing routinely with government officials and not on concrete measures of payoffs. Currently, there are several survey-based measures of "corruption perceptions" that are available and which have been widely used in empirical researches.

Despite advances in the measure of corruption there were no changes in conceptualization; scientists are still using the same general broad definition of corruption. Consequently, by using a general definition of corruption each scholar carries out investigations by measuring corruption in their selected manner, being difficult to compare the findings between analyses. To minimize this conceptual gap a number of analysts tried to establish typologies of corruption. The most common distinction, emphasized by Rose-Ackerman (1999), differentiates between petty and grand corruption.

From previously showed definitions resulted that grand corruption is a continuous variable which can be characterized by various aspects. This paper tries to identify a new aspect which can allow delivering more accurately the interconnection with economic growth.

One of the distinguishing features of grand corruption is the scale of wealth acquired by corrupt means. One difficulty is that there is obviously no reliable publicly available information as to the sums involved (SALS, 2000). Nevertheless, it is assumed that the wealth is obtained by a transaction. A corruption transaction usually involves two sides: the bribe-taker (demand side) and the bribe-giver (supply side). It seems that when referring to grand corruption both sides can afford to take and give bribes.

Regarding the bribe-taker, the direct beneficiaries of corrupt transactions are people with high positions in the hierarchy of the public or private sector. For Bussell (2013), these are legislators at national and state levels, particularly members of the cabinet or committees tasked with policy development, as well as bureaucrats who provide inputs into the policy development process. As elected officials, politicians are supposed to make resource allocation decisions based solely upon the interest of the people. They have to balance the interest of various segments of society as well as their desire to remain in power. Model of such behavior is showed by Rose-Ackerman (1999: Ch. 8) who based her analysis on the realistic view of politicians as maximizing agents who pursue their selfish interests rather than as benevolent agents seeking to maximize aggregate welfare. According to Jain (2001), a corrupt political elite can change either the national policies or the implementation of national policies to serve its own interest at some cost to the populace. "Public spending is ... diverted to those sectors where gains from corruption are greatest.... little attention is paid to whether the needs of the collectivity are served by those works or services" (della Porta and Vannucci, 1997: 519).

Concerning bribe-taker, there is a view that higher salaries tend to discourage corruption. This supposition is based on the idea that if the societies at large, as well as the administrators themselves, believe that they are being paid fair wages for their work, there will be little sympathy for an administrator or a policy-maker who tries to supplement his or her income with bribes. However, Van Rijckeghem and Weder (1997) tended to reject the hypothesis that higher salaries lead to reduced corruption in the short run. The scholars examined whether the concept of "fair wages" affects the behavior of the civil servants as well as that of the public at large. Based on analysis, the authors are not able to differentiate empirically between an efficiency or a fair wage hypothesis (that higher wages will reduce corruption by tilting the balance in favor of the costs of penalties when corrupt officials weigh the extra income from corruption against the cost of penalties) and a shirking model (in which income from bribery is so high that wages have no influence on the level of corruption). Consequently, a high salary is not a panacea for curbing corruption.

Therefore, there have been some speculations in the theoretical economic literature that high wages may reduce the number of corrupt acts, while they may lead to demands for higher bribes on the part of those who continue to be corrupt. The reason is that high wages raise the opportunity cost of losing one's job while they do not eliminate the greed on the part of some officials. In such conditions, it is less likely to occur in one year 100 cases involving each a bribe for $1,000, however there is a high chance to occur 10 cases involving each a bribe of $100,000. Thus, the number of corrupt acts is reduced; the total amount of corruption money paid may not necessarily fail. Accordingly, the cause for the occurrence of grand corruption in high-income countries is related to the fact that, because of good economic conditions a person will not risk his job, position or status for a medium bribe or a few advantages. The better the economic conditions of the country, the higher will be the demanded bribe price.

On the other side, there is the part that offers bribes (the supply side). The most likely bribe payers are representatives of large companies or organizations with an economic stake in the outcome of significant legislation. Regulatory policies, in particular, may be of primary interest to private companies, who are looking to maximize market share and revenues (Bussell, 2013). Hence, grand corruption involves heads of states, ministers, or other senior government officials that serves the interests of a narrow group of business people and politicians as criminal elements.

People are entering into corrupt transactions consciously. Profit and opportunity are weighed against the risks of being detected and the likelihood and extent of any punishment. At the level of grand corruption, Hobbes (2005) interviewed a small number of bidders on World Bank financed projects and suggested that "all experienced bidders know that they must offer bribes in order not just to win the contract, but also successfully implement it." He suggests that bribes are usually between 10-15% of the contract value, often recovered in the mark-up the bidder places on the unit prices of the procurement items. The one that pays the highest price is winning. By a 2006 survey on international business attitudes to corruption, overall, 43% of respondents believe that they failed to win new business in the last five years because a competitor had paid a bribe, and one-third had lost business to bribery in the last year. Hong Kong was by far the worst affected with 76% of companies believing that they had lost business in the last five years. Even in the UK, a quarter of UK-based international companies say that they have lost business to corrupt competitors in the last five years (Control Risks and Simmons & Simmons, 2006). In 2014, Eurobarometer (survey conducted in EU countries) revealed that 81% of Europeans agree that too-close links between business and politics in their country lead to corruption. The findings of the 2013 Global Corruption Barometer survey is that around the world, on average, those that could afford to pay bribes are more likely to pay them. For people whose income is above the average in their country, 31% report having paid a bribe against 26% of those respondents with below average income. A survey in Mexico finds that the cost of bribery has a regressive effect on Mexican households hurting the poor the most, with average-income households spending 14% of that income on bribes and those with the lowest incomes spending 33% (Transparencia Mexicana, 2010). In Greece, the total costs households incurred due to corruption were estimated to amount to €420 million in 2012 (Transparency International Greece, 2012).

In high-income countries, preconditions for occurrence of grand corruption can easily be created because, despite a demand for a high bribe, the supply side can afford to pay it. Therefore, the parts involved in transactions are feeling very comfortable on committing corruption actions. In short, one of the causes of grand corruption can be named "bribery affordability."

If referring to economics, the "bribery affordability" can be expressed as the "practical realizability of WTP (willingness to pay) or WTA (willingness to accept)." Accordingly, the research hypothesis can be rewritten in economics terms as "the more there is a practical realizability of WTP (willingness to pay) or WTA (willingness to accept), the less likely economic growth is to occur." Affordability here means the higher realizability of the willingness to pay (WTP) for doing corruptive behaviors without incurring financial difficulties or risks. In economics, willingness to accept (WTA) is the minimum amount of money that a person is willing to accept to abandon a good. It is equivalent to the minimum monetary amount required for the sale of a good or acquisition of something undesirable to be accepted by an individual. Summarily, WTA is the other name of "supply price." Conversely, willingness to pay (WTP) is the maximum amount an individual is willing to sacrifice to procure a good. More simply, WTP is defined as the "demand price." In short, WTP is the demand price (by consumers) while WTA is the supply price (e.g., by producers or suppliers, for a detailed graphical illustration, see Figure 1).

Is WTP likely to be matched with WTA? Since the monetary value of bribes cannot be directly estimated, the next best way for appraising bribes is to indirectly measure affordability as the higher realizability of WTP. The more realizable WTP is the higher affordability will be. In this regard, the "practical realizability of WTP" can be approached in the market of bribes as the most distinguished aspect of affordability of bribe prices. Any direct measure of this aspect of the practical realizability of WTP is, as for now, limited. Instead, the present study utilizes a proxy variable for this measure. The "prevalence of practical occurrence of paying bribes at certain prices" as a proxy variable of the "practical realizability of WTP" is indicative of the demand price of bribes in the market of bribes. That is, such prevalence implies the greater supplied quantity of bribes, which is proportional to an increase in the supply price or WTA (to "paying bribes").

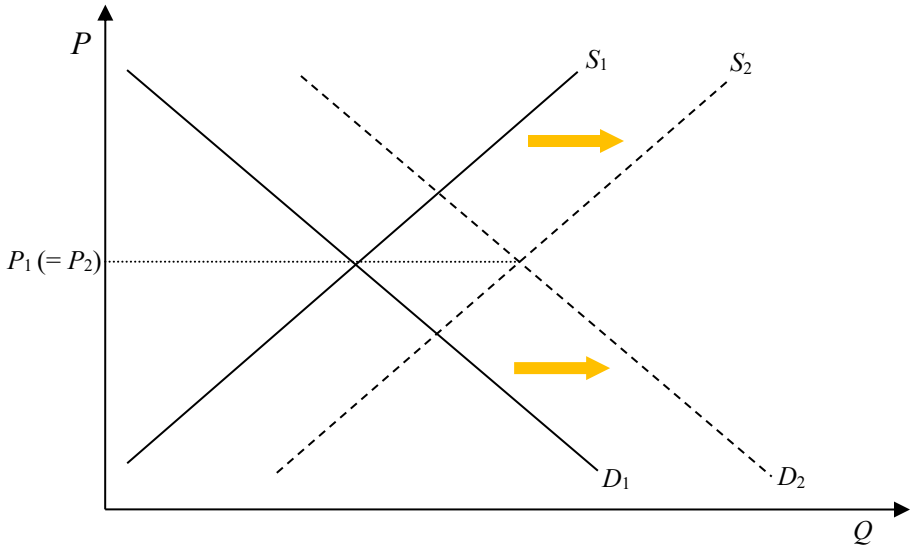

Figure I. A Model of the Bribery Market

Note: *P* is (bribe) price, *Q* is (bribe) quantity, *S* is (bribe) supply, and *D* is (bribe) demand. The two blank arrows express the shift (i.e., expansion) of supply and demand. In this case, some economists say, "supply (or demand) shifts out." Many other economists will be able to say, "supply (or demand) shifts to the right." The expansion (i.e., "shift") of supply or demand differs to an "increase" in the quantity supplied or demanded. The latter means the movement "along" the supply curve whose form is determined by the (functional) relationship between P and Q. The former means the movement of this relationship. The above (economic) P-Q relationship is directly applicable to the "bribery market." Suppliers: providers (of favorable position or power upon bribes). Demanders: recipients (of favorable position or power upon bribes). If a supplier sets a higher (bribe) price, demanders become less willing to pay bribes. This makes the *P-Q* graph as above, "with 'bribe' explicitly added." This willingness to pay (WTP) is the demand price. The willingness to accept (WTA) (paying a price by bribes) is the supply price. The WTA is almost compatible with 'reserve price' or 'reservation price' in actions.

The most important here is that both demand and supply prices will increase if the bribe market is (Pareto) "efficient" or optimal. Given this bribe market "efficiency," it is possible to utilize the "prevalence of practical occurrence of paying bribes at certain prices" as a proxy variable of the "practical realizability of WTP or WTA", although the mismatch between WTP and WTA is, for the moment, hard to be directly estimated according to the standard of monetary values. This proxy variable is measurable through "field surveys" across countries and, among some representative measurement of it; World Economic Forum (WEF) Executive Opinion Survey enables researchers to reflect the "practical realizability of WTP or WTA" in their studies.

Since 1979 and its first report on the competitiveness of European industry, the WEF's annual survey has been a key ingredient of its research and benchmarking activities. The Executive Opinion Survey is the longest-running and most extensive survey of its kind. The survey captures the opinions of business leaders around the world on a broad range of topics for which data sources are scarce or, frequently, nonexistent on a global scale. It helps to capture aspects of a particular domain – such as the extent of the skills gap, the level of corruption, or the intensity of market competition – that are more qualitative than hard data can provide (WEF The Global Competitiveness Report, 2016). In analyzing the relationship between bribery affordability and economic growth this study is interested especially in the answers of two questions of WEF Executive Opinion Survey.

3.2. Empirical Model

The research hypothesis, which this study tries to prove, is that "the more there is 'bribery affordability,' the less likely economic growth is to occur." Regression analyses were conducted to test and demonstrate the validity of this hypothesis empirically. To do this it was needed to find an appropriate index of bribery affordability.

As previously indicated, existing corruption indices are based on personal judgments, perceptions and opinions of a number of observers, and not on statistical "hard data." Therefore, the appropriate index of bribery affordability will rely on a survey-based measure of "corruption perceptions" as well. The international measure of "bribery affordability" is currently not available. Nevertheless, this study considers that the best available index related to "bribery affordability" can be calculated based on two questions of the WEF Executive Opinion Survey whose index is a direct composite of aggregated Likert scales. The two questions which compose the "bribery affordability" index are: "In your country, how common is diversion of public funds to companies, individuals or groups due to corruption?" and "In your country, how common is it for firms to make undocumented extra payments or bribes connected with the following: a) Imports and Exports; b) Public Utilities; c) Annual Tax Payments; d) Awarding of Public Contracts and Licensing; and e) Obtaining Favorable Judicial Decisions"? Responses are scaled from 1 (worst) to 7 (best). Hence, "bribery affordability" index is composed of two proxy variables, whose code names are "*bribeafford1*" and "*bribeafford2*."

Economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period to another. It can be measured in nominal or real terms, the latter of which is adjusted for inflation. Traditionally, aggregate economic growth is measured either by gross national product (GNP) or gross domestic product (GDP), although alternative metrics are sometimes used (Investopedia, 2016). In this study, economic growth is explained, measured and best indicated by gross domestic product (GDP) defined as "the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the product" (World Bank, 2016). In the regression analyses, economic growth is represented by four variables: GDP per capita and GDP at market prices as dependent variables; and gross capital formation (K) and total labor force (L) as independent variables (control variables). Data are in constant 2005 US $. Data provider is the World Bank.

To test the impact of independent variables on the dependent one, in the analysis other nine control variables was included, besides K and L, which partially represent only some aspects of grand corruption and its level. The code names, the general explanation of the meaning and data provider of the control variables are showed in Table I.

Table I. Definitions and Sources of the Independent Variables

Variable	*Description*	*Data Source*
gcapathy	*Income-Based Grand Corruption Apathy*	*Bertelsmann Foundation Sustainable Governance Indicators, Bertelsmann Stiftung's Transformation Index*
bribeafford1	*Bribery Affordability in Public Funds*	
bribeafford2	*Bribery Affordability in Firms*	*WEF Global Competitiveness Survey*
gcsq104	*Public Trust in the Ethical Standards of Politicians*	
gwp	*Widespread Corruption in the Government*	*Gallup World Poll*
eiu	*Corruption in the Government Offices*	*Economist Intelligence Unit*
gcb	*Frequency of Corruption in Political Parties*	*TI Global Corruption Barometer*
m	*Frequency of Corruption in the Parliament*	*TI Global Corruption Barometer*

prs	*Financial Corruption in Politics and Business*	*Political Risk Services*
ipd1	*Level of Large-Scale Corruption between Administrations and Local Businesses*	*French Ministry of the Economy, Industry and Employment and the Agence Française de Developpement*
ipd2	*Level of Large-Scale Corruption between Administrations and Foreign Firms*	*French Ministry of the Economy, Industry and Employment and the Agence Française de Developpement*
K	*Gross Capital Formation*	*World Bank*
L	*Total Labor Force*	*World Bank*

Data on the mean and standard deviation of the variables are indicated in Table II.

Table II. Mean and Standard Deviation of the Variables of the Panel Dataset

	Mean	***Std. Dev.***		***Mean***	***Std. Dev.***
gcapathy	*5.604*	*2.143*	***Prs***	*.452*	*.207*
bribeafford1	*3.449*	*1.297*	***ipd1***	*.349*	*.324*
bribeafford2	*4.075*	*1.262*	***ipd2***	*.475*	*.331*
gcsq104	*2.877*	*1.161*	***GDP per capita***	*12224.36*	*16019.650*
Gwp	*.312*	*.199*	***GDP***	*4.62E+11*	*1.6E+12*
Eiu	*.380*	*.301*	***K***	*9.93E+10*	*3.21E+11*
Gcb	*3.470*	*1.252*	***L***	*24315573*	*57283717*
M	*3.250*	*1.201*			

Note: GDP at market prices.

In conducting regression analyses data from 84 countries were used: 35 high-income countries, 20 upper-middle-income countries, 20 lower-middle-income countries, and 9 low-income countries. The classification of countries as low-income economies, lower-middle income economies, upper-middle economies and high-income economies was provided by the World Bank. Calculated using the World Bank Atlas method for the 2016 fiscal year, low-income economies are defined as those with a gross national income (GNI) per capita of $1,045 or less in 2014; middle-income economies with a GNI per capita of more than $1,045 but less than $12,736; and high-income economies with a GNI per capita of $12,736 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,125 (World Bank, 2016). The classification of countries is according to information accessed in March 2016. Data availability is from 2010 until 2014. It was difficult to gather data for a larger period due to the inexistence of collected data sources before 2010.

4. ANALYSIS

To prove the research hypothesis, multi-variate time series and cross-sectional regression analyses were conducted using Stata commands. The panel data, which allows controlling of variables which cannot be observed or measured such as bribery affordability were constructed and used. To analyze the panel data, the study focused on two techniques: fixed-effects and random-effects.

For the first two multi-variate regressions, “GDP at market prices” was used as the dependent variable and 13 independent variables (two variables of interest and 11 control variables). In both cases fixed-effects technique was performed (see Tables III and IV).

Table III. The Analysis of the Relationship between GDP at Market Prices and Bribery Affordability (Two Aspects) with Control Variables (Fixed Effects)

	Std. Coef.	Std. Err.	t	p
K*	2.180	.04219964	51.93	.000
L*	10387	721.3462	14.40	.000
gcapathy	1.20e+09	2.01e+09	.60	.551
**bribeafford1 ** **	-1.19e+10	5.25e+09	-2.26	.024
bribeafford2	7.17e+08	4.52e+09	.16	.874
gcsq104**	1.09e+10	4.22e+09	2.57	.011
gwp*	-2.91e+10	1.58e+10	-1.84	.067
eiu	1.66e+10	1.81e+10	.92	.358
gcb	-1.51e+09	6.52e+09	-.23	.817
m	6.86e+08	6.97e+09	.10	.922
prs	2.71e+10	2.34e+10	1.16	.248
ipd1	-1.44e+10	9.80e+09	-1.47	.144
ipd2	7.50e+09	7.66e+09	.98	.328
(constant)	-1.17e+10	2.79e+10	-.42	.675

Note: *$p < .1$; ** $p < .05$; ***$p < .01$; R^2 Overall = .690; $F(130,323) = 264.77$; $Corr(u_i, X_b) = .2552$; Number of Observations. = 420; Number of Groups = 84.

With a *p*-value of zero to four decimal places, the fixed-effects model regression is statistically significant. By analyzing the *p*-value, it is possible to conclude that the independent variables reliably predict the dependent variable. From the group of 13 independent variables five are statistically significant (one variable of interest and four control variables). The coefficients for each of the variables indicate the amount of change one could expect in dependent variable given a one-unit change in the value of that variable, given that all other variables in the model are held constant. In the group of five statistically significant variables, one variable of interest ("*bribeafford1"*) and one control variable ("*gwp*") are showing a negative relationship towards GDP at market prices. The other three control variables are indicating a positive relationship toward GDP at market prices. A negative coefficient suggests that for every unit increase in the "*bribeafford1*," a -1.19e+10 unit decrease in the GDP at market prices is predicted, as well, for every unit increase in "*gwp*," GDP at market prices is presumed to be -2.91e+10 units lower. A positive coefficient illustrates that for every unit increase in "*K*," "*L*" and "*gcsq104*," GDP at market prices is predicted to be 3.58, 10387.06, and respectively 1.09e+10 units higher, respectively. The overall *R*-square for this model is 0.690, which indicates that 69% of the variance of the dependent variable "GDP at market prices" can be predicted from the 13 independent variables.

The other, eight independent variables are not statistically significant, including "*bribeafford2*." Consequently, they cannot be taken into consideration as variables which have a significant influence on the dependent variable.

Based on the findings of the fixed-effects model regression, the results show that:

1. The group of all 13 independent variables can be used to reliably predict the dependent variable "GDP at market prices."

2. Only the first aspect of bribery affordability reliably predicts GDP at market prices. The regression between variables is statistically significant, with a negative coefficient and high "overall" R-square. This result leads to the assumption that, the greater the frequency in the diversion of public funds to companies is, individuals or groups due to corruption, the less likely GDP at market prices is to grow. Moreover, more than two thirds of the variance in the GDP at market prices can be predicted from the frequency in the diversion of public funds to companies, individuals or groups due to corruption.

3. As for control variables, the more there is gross capital formation (*K*), total labor force (*L*), and public trust in the ethical standards of politicians (*gcsq104*), the more likely GDP at market

prices is to grow. On the contrary, the more there is widespread corruption in the Government (*gwp*), the less likely GDP at market prices is to grow.

For the same fixed-effects model, the results are clearer when using the *xtreg* command in Stata (see Table IV).

Table IV. The Analysis of the Relationship between GDP at Market Prices and Bribery Affordability with Control Variables as New Generated Variables (Fixed Effects)

	Coef.	Std. Err.	t	p
lnK***	*.119*	*.019*	*6.04*	*.000*
lnL***	*1.165*	*.122*	*9.49*	*.000*
lngcapathy ***	*-.080*	*.030*	*-2.67*	*.008*
lnbribeafford1*	*-.086*	*.049*	*-1.75*	*.082*
lnbribeafford2	*-.003*	*.039*	*-.09*	*.930*
lngcsq104***	*.090*	*.027*	*3.24*	*.001*
lngwp	*-.009*	*.010*	*-.91*	*.366*
lneiu	*.002*	*.032*	*.07*	*.948*
lngcb*	*.222*	*.109*	*2.02*	*.045*
lnm	*-.000*	*.070*	*-.01*	*.994*
lnprs*	*.060*	*.024*	*2.47*	*.015*
lnipd1	*.019*	*.014*	*1.34*	*.182*
lnipd2	*-.001*	*.014*	*-.13*	*.900*
(constant)	*4.296*	*1.765*	*2.43*	*.016*

Note: *p < .1; ** p < .05; ***p < .01; R^2 Overall = .584; $F(13,147) = 31.39$; $Corr(u_i, X_b) = -.3815$; Number of Observations = 213; Number of Groups = 53.

For this regression, the p-value is from zero to four decimal places; thus, the model is statistically significant. The overall R-square for the fixed-effects model is 0.584 which indicates that 58% of the variance of the dependent variable (GDP at market prices) can be predicted from the 13 independent variables. From the total group of independent variables seven are statistically significant (one variable of interest and six control variables). Between these seven variables, five have positive coefficients and two have negative coefficients. Similar to the previous regression, the variable of interest ("*bribeafford1*") is statistically significant while its coefficient is negative (t = -1.75). This result is consistent to what this study tries to prove. However, the second variable of interest "*briberafford2*," despite having a negative coefficient (t = -.09) is statistically not significant and cannot be taken into consideration for this model as a variable that has a significant influence on the dependent variable.

For this regression, the *xtreg* command was applied in Stata, which means that the coefficients for each of the variables show the amount of change one could expect from a dependent variable given a one-percentage change in the value of that variable. Accordingly, for every percentage increase in "*lnK*," "*lnL*," "*lngcsq104*," "*lngcb*," and "*lnprs*," GDP at market prices is predicted to be .119 %, 1.16%, .090%, .222%, and .060% higher. Also, for every percentage increase in "*lngcapathy*" and "*lnbribeafford1*," GDP at market prices is expected to be -.080% and -.086% lower.

Referring to the other six independent variables, four of them are showing a negative relationship towards GDP at market prices, two suggest a positive relationship to the dependent variable. Nonetheless, all of them are statistically not significant and cannot be taken into consideration as variables which have a significant influence on the dependent variable.

The results of this regression are similar to previous findings. These findings imply that:

1. The group of all 13 independent variables can be used to predict the dependent variable reliably.
2. Only the first aspect of bribery affordability reliably predicts GDP at market prices. The

coefficient is statistically significant; parameter estimate is negative; "overall" R-square is high; the relationship between the first aspect of "bribery affordability" and GDP at market prices is negative, in consonance to what this study tries to prove. The result means that the greater the frequency in the diversion of public funds to companies is, individuals or groups due to corruption, the less likely GDP at market prices is to grow.

3. As for control variables, the more there is *K*, *L*, public trust in the ethical standards of politicians (*gcsq104*), frequency of corruption among political parties (*gcb*), and financial corruption between politics and business (*prs*), the more likely GDP at market prices is to grow. On the contrary, the more there is income-based grand corruption apathy, the less likely GDP at market prices is to grow.

For the last regression, the dependent variable, GDP per capita (constant 2005 US $) and 11 independent variables (two variables of interest and nine control variables) were used. Random-effects regression was performed and the results are summarized in Table V.

Table V. The Analysis of the Relationship between GDP per capita and Bribery Affordability with Control Variables (Random Effects)

	Coef.	Std. Err.	t	p
gcapathy	*-36.0986*	*59.58409*	*-.61*	*.545*
bribeafford1 ***	*-691.6539*	*155.8744*	*-4.44*	*.000*
bribeafford2	*139.3481*	*130.8726*	*1.06*	*.287*
gcsq104***	*581.7928*	*120.8014*	*4.82*	*.000*
gwp	*129.9691*	*468.1364*	*0.28*	*.781*
eiu	*644.1684*	*533.4296*	*1.21*	*.227*
gcb	*77.17905*	*192.4823*	*.40*	*.688*
m	*-66.4555*	*205.7085*	*-.32*	*.747*
prs***	*2211.276*	*690.0292*	*3.20*	*.001*
ipd1***	*940.1426*	*289.0905*	*3.25*	*.001*
ipd2*	*537.2023*	*225.6453*	*2.38*	*.017*
(constant)	*510649.6*	*. 1255.803*	*8.48*	*.000*

Note: *p < .1; ** p < .05; ***p < .01; R^2 Overall = .625; Number of Observations = 420; Number of Groups = 84; *Wald* chi^2 (1) = 79.15 (p = .000).

The random-effects model is statistically significant having a *p*-value of zero to four decimal places. The overall R-square for this multi-variate regression is .625. From the group of 11 independent variables five are statistically significant (1 variable of interest and four control variables): four variables are statistically significant at the .01 level while one variable is statistically significant at the .05 level.

As for the coefficients, four control variables have positive coefficients while one variable of interest has a negative coefficient. In particular, "*bribeafford1*" is showing a negative relationship towards GDP per capita (t = -4.44). Thus, for every unit increase in "*bribeafford1*," GDP per capita is predicted to be -691.65 units lower. Other four variables are indicating a positive relationship to GDP per capita, so that for every unit increase in "*gcsq104*," "*prs*," "*ipd1*," and "*ipd2*," GDP per capita will be 581.79, 2211.27, 940.14, and 537.20 units higher, respectively.

Other six independent variables, including the second variable of interest "*briberafford2*," are not statistically significant and cannot be taken into consideration as variables which have a significant influence on the dependent variable. Based on the findings of the random-effects model, regression results show the following. First, the group of all 11 independent variables can be used to predict the dependent variable reliably. Second, only the first aspect of "bribery affordability" reliably predicts GDP per capita. The coefficient is statistically significant; parameter estimate is negative; "overall" R-square is high. This result indicates that the greater the frequency in the diversion of public funds to companies is, individuals or groups due to corruption, the less likely GDP per capita is to grow. Likewise, 62% of the

variance in the GDP per capita can be predicted from the frequency in the diversion of public funds to companies, individuals or groups due to corruption. Third, as for control variables, the more there is financial corruption between politics and business (*prs*), public trust in the ethical standards of politicians (*gcsq104*), level of "large-scale" corruption between administrations and local business (*ipd1*), and level of "large-scale" corruption between administrations and foreign firms (*ipd2*), the more likely GDP per capita is to grow.

5. CONCLUSION

Corruption is strongly correlated with growth. This study began with the idea that certain kinds of corruption might have more significance for growth than the overall level of corruption. This study assumed a certain type of corruption, which has been called "grand" corruption, to be strongly linked with growth. The working definition of "grand corruption" used in this paper is "abuse of high-level power that benefits the few at the expense of the many, and causes serious and widespread harm to individuals and society. This definition was selected for analyzing one presumed cause of grand corruption and its impact on growth so that the interconnection between grand corruption and growth can be examined more accurately.

The assumed cause of grand corruption is called "bribery affordability." This paper intended to shed some light on the literature by empirically testing the validity of the presumed cause, although, practically, other causes can also affect grand corruption directly or indirectly and any single study neither confirms that only this cause fully describes grand corruption nor provides a precise estimate of its relative importance. In this study bribe affordability is defined as "practical realizability of willingness to pay or willingness to accept."

Existing investigations provide mixed evidence on corruption raising or lowering growth. This study considered that grand corruption, particularly, bribery affordability, tends to lower growth. Hence, the research hypothesis that this study tried to prove is that "the more there is 'bribery affordability,' the less likely economic growth is to occur." To test and demonstrate empirically the validity of research hypothesis, regression analyses were conducted. To analyze panel data, fixed-effects and random-effects models were selected. In analyses, due to the insufficiency of available measure, this study adopted an appropriate proxy index representing "bribery affordability" which was composed by two separate variables of interest. For the "economic growth" were selected GDP per capita and GDP at market prices as the dependent variables. For making a panel dataset the data from 84 countries for five years (2010-2014) were used. The number of observations was 420. Larger data availability was difficult to gather due to non-accessibility or inexistence of some data sources.

As a general conclusion, the results of time-series and cross-sectional analyses partially proved the research hypothesis. Only the first aspect of bribery affordability has a presumed negative impact on economic growth. Therefore, it is possible to assume that, "the more there is 'bribery affordability,' in the form of a frequency in the diversion of public funds to companies, individuals or groups due to corruption, the less likely economic growth is to occur." The results of fixed-effects model suggested that, for every percentage increase in the first aspect of bribery affordability, GDP at market prices is expected to be -.086% lower. Likewise, for every unit increase in the first aspect of bribery affordability, a -1.19 unit decrease in the GDP at market prices was predicted. Particularly, a strong negative impact of first aspect of bribery affordability on economic growth was indicated in the case of random-effects model. For every unit change in the frequency in the diversion of public funds to companies, individuals or groups due to corruption, GDP per capita was predicted to be -691.65 units lower.

The results of the analyses showed that governments should pay close attention to the way public funds are used. The transparency of the administration of public funds can reduce the possibility of its diversion due to corruption, which subsequently can lead to economic growth. Otherwise, if the frequency in the diversion of public funds is favored and maintained by corruption in the government, less likely economic growth is to occur. The fixed-effects model regression suggested that the frequency in the diversion of public funds due to corruption

together with widespread corruption in the government (*gwp*), will have a more negative result on economic growth.

Based on the results of time-series and cross-sectional analyses, the second aspect of "bribery affordability," in the form of frequency for firms to make undocumented extra payments or bribes connected with imports and exports, public utilities, annual tax payments, awarding of public contracts and licensing, obtaining favorable judicial decisions, was statistically not significant and could not be considered as having significant influence on economic growth.

Some of the control variables indicated a positive relationship toward the dependent variable; others showed a negative relationship. This result may confirm the fact that controversy of the two competing hypotheses on corruption raising or lowering economic growth ("sand in the wheels" and "greasing the wheels") persists to this day.

Last but not least, this study has some limitations. Firstly, it analyzed just one presumed cause of grand corruption and its connection with economic growth. Hence, it cannot be interpreted that grand corruption as a whole has an impact on growth. Secondly, to prove the research hypothesis an appropriate index was proposed in the absence of available one. Thirdly, the hypothesis was tried to be proved, relying on the limited information.

Recently new cases of grand corruption and sums involved in it made newspaper headlines around the world (e.g., top FIFA officials accused of stealing millions; Petrobras corruption scandal in Brazil), which once again acknowledge that this type of corruption needs to be closely observed and studied. Finally, future investigation of the relation between other causes of grand corruption and growth is recommended.

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