

ISSN(E):2522-2260  
ISSN(P):2522-2252

### Indexing/Abstracting



### Published by

Department of Quantitative Methods



University of Management and  
Technology, Lahore, Pakistan

This manuscript has been published under the terms of Creative Commons Attribution-ShareAlike 4.0 International License (CC-BY SA). JQM under this license lets others distribute, remix, tweak, and build upon the work it publishes, even commercially, as long as the authors of the original work are credited for the original creation and the contributions are distributed under the same license as original.



# JQM Journal of Quantitative Methods

## Corruption, Political Instability and Sustainable Development: The Interlinkages

### Author(s)

Rana Ejaz Ali Khan<sup>1</sup>  
Sarwat Farooq<sup>2</sup>

### Affiliations

<sup>1&2</sup>Department of Economics, The Islamia University of Bahawalpur, Pakistan.

### Manuscript Information

**Submission Date:** December 18, 2017

**Acceptance Date:** February 27, 2019

### Citation in APA Style

Khan, R. E. A. & Farooq, S. (2019). Corruption, political instability and sustainable development: The interlinkages, *Journal of Quantitative Methods*, 3(1), 56-83.

This manuscript contains references to 69 other manuscripts.

The online version of this manuscript can be found at  
<https://journals.umat.edu.pk/sbe/jqm/volume3issue1.aspx#>

**DOI:** <https://doi.org/10.29145/2019/jqm/030104>



### Additional Information

Subscriptions and email alerts: [editorasst.jqm@umat.edu.pk](mailto:editorasst.jqm@umat.edu.pk)

For further information, please visit  
<http://journals.umat.edu.pk/sbe/jqm/Home.aspx>

## Corruption, Political Instability and Sustainable Development: The Interlinkages

Rana Ejaz Ali Khan<sup>1</sup>

Sarwat Farooq<sup>2</sup>

<https://doi.org/10.29145/2019/jqm/030104>

### Abstract

*The study empirically probed the interdependence among corruption, political instability and sustainable development for a panel of 28 developing economies and disaggregated sample of lower-middle and upper-middle income economies for the time period 2000-2014. The three stage least square (3SLS) estimation revealed that corruption negatively affects sustainable development and political instability. The political instability impedes sustainable development and corruption. The sustainable development reduces political instability and corruption. It explains that corruption enhances political stability and political stability increases corruption. The disaggregated estimates of developing economies are almost same as aggregate estimates of developing economies, however political instability has statistically insignificant effect on sustainable development in upper-middle-income economies. To go forward for sustainable development, the elimination of corruption is imperative.*

**Keywords:** corruption, political instability, sustainable development, income inequality, resource curse, sand the wheels

**JEL Classifications:** D72, O11, O15, Q01

### 1. Introduction

Corruption has perilous implications for the economies but in developing economies it particularly has detrimental impacts on socioeconomic indicators. In various forms it retards economic growth (Tanzi & Daveoodi, 1998; Mo, 2001; Meon & Sekkat, 2005; Venard, 2013), destabilize governments (Mbaku & Paul, 1989; Abu, Karim & Aziz, 2015), harms foreign direct investment (Habib & Zurawicki, 2002),

---

<sup>1</sup>Department of Economics, The Islamia University of Bahawalpur, Pakistan.  
Email: ranaejazalikhan@yahoo.com;

<sup>2</sup>Department of Economics, The Islamia University of Bahawalpur, Pakistan.

**Author's Acknowledgment:** I (Sarwat Farooq) hereby declare that the given paper is extracted from my MPhil thesis.

decreases public and private sector investment (Alesina & Perotti, 1996; Meon & Sekkat, 2005; Mo, 2001), reduces human capital (Mo, 2001), increases poverty (Gupta, Davoodi & Alonso-Terme, 2002) and adversely affects sustainable development (Dietz, Neumayer & De Soysa, 2007; Aidt, 2010; Venard, 2013). However, the corruption may promote economic growth, the idea stems from Leff (1964) and Huntington (1968). Burdhan (1997) empirically supported it for Europe. Beck and Maher (1986) and Lien (1986) illustrated that corruption may raise the economic efficiency and ultimately the economic growth. Meon and Weill (2010) supported the phenomenon of negative effect of corruption on economic growth for the countries having inefficient political institutions. The corruption increases economic growth is also empirically proved by Piplica and Covo (2011) for Croatia (see also Huang, 2016 for South Korea).

Corruption existed in different political, administrative, judicial and legislative institutions even in army declines the magnitude and quality of social, human and physical capital formation, which increases poverty, social and economic disparity, and environmental degradation and ultimately declines sustainable development. It also leads to social displeasure, protests, strikes, political violence and consequently political instability in the country (Gupta, Davoodi & Alonso-Terme, 2002). Political instability creates political and bureaucratic corruption. Politically weak governments bribe their rivals and bureaucrats to sustain their governments which penetrate to the gross root level (Abu, Karim & Aziz, 2015). The magnitude of political instability directly and proportionally affects the degree of corruption in the economies (Park, 2003).

The politically unstable environment may affect sustainable development through irrational political and economic decision making which reduces private investment, public sector programs, pattern of public spending and economic growth (Alesina & Perotti, 1996; Jong-A-Pin, 2009). It adversely affects the taxation, debt and inflation (Aisen & Veiga, 2013). Political instability devastates environment for the economies to have sustainable development by a variety of channels like restricting capital formation - both physical and human- capital flight, brain drain, devastating institutions, glass curtain on media freedom and

restricting the mass information and awareness for the people (Alesina, Ozler, Robini & Swagel, 1996)<sup>3</sup>.

Sustainable development has economic, social and environmental dimensions and discourages corruption and political instability. It increases public welfare and discourages rent-seeking behavior of the people. Sustainable development also contributes to political stability through lowering the opportunity of unconstitutional government change, frequent switching of political parties by the parliamentarians and social unrest. Most of all, one of the Sustainable Development Goals, the 6<sup>th</sup> goal focusses to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. One of the key targets of this goal is to substantially reduce corruption and bribery in all its forms.

A plethora of the studies has focused on corruption and economic growth (Tanzi & Davoodi, 1998; Mo, 2001; Meon & Sekkat, 2005; Peplica & Covo, 2011), political instability and corruption (Serra, 2006; Compante, Chor & Do, 2009) as well as political instability and economic growth (Jong-A-Pin, 2009; Abu, Karim & Aziz, 2015). The need is to focus on sustainable development rather than economic development as the sustainable development is the prime objective of the nations to secure good living conditions for their future generations and current environment for life, economy and culture that guarantees long run sustainability. Additionally, the corruption, political instability and sustainable development are interlinked. None of these studies have focused on simultaneous analysis of corruption, political instability and sustainable development for developing economies. However, Abu, Karim and Aziz (2015) analyzed corruption, political instability and economic development simultaneously for West Africa. The sustainable development is a wider and multidimensional concept than economic growth. It incorporates the needs of the current generation and the future generations economically, socially and ecologically. Sustainable development captures not only the economic dimension but social and environmental dimension as well. This is the gap being filled by the current study through empirically investigating the interlinkage among

---

<sup>3</sup>However, Campos and Nugent (2002) have shown no significant effect of political instability on economic growth.

corruption, political instability and sustainable development rather than economic growth for a sample of developing economies.

Measuring corruption, political instability and sustainable development is a puzzle for the researchers due to multi-dimensionality of these concepts. A variety of proxies, indicators and indices have been used for their measurement in the literature. For instance, corruption is measured by Graft Index and corruption perception index<sup>4</sup> (Serra, 2006), control of corruption (Venard, 2013) and corruption perception index (Gyimah-Brempong & De Camacho, 1998; Farooq, Shahbaz, Arouri & Teulon, 2013; Abu, Karim & Aziz, 2015).

Similarly political instability is measured by an index<sup>5</sup> (Alesina & Perotti, 1996; Abu, Karim & Aziz, 2015), number of violent political events like strikes, riots, assassination or coups (Clemens & Siermann, 1998), number of government changes (Bienen & Van de Walle, 1991) and probability of government change estimated by bogit model (Alesina, Ozler, Robini & Swagel, 1996). In addition, four dimensions of political instability, i.e. politically motivated violence, mass political violence, instability within the political regime and instability of the political regime (Jong-A-Pin, 2009), number of assassinations and the number of revolutions (Mo, 2001), two dimensions of political instability, i.e. regime instability and government instability (Aisen & Veiga, 2013) and three proxy variables of rule of law, political stability index and durable index (Radu, 2015) have been used for political instability.

Sustainable development is the most debatable concept with respect to its operationalization. It is captured by genuine saving rate (Auty, 2004; Dietz et al., 2007), sustainable society index (Kerk & Manuel, 2008), two dimensions of human development index and

---

<sup>4</sup>Basically both measures are computed from surveys of business people, local citizens and experts' opinions. The difference between these indices is rooted in aggregation methodology. The former is constructed through unbiased component model which presents the corruption values coming from each source as a linear function while latter is a simple mean of values coming from each source. It captures the individual sources proportionately and equal weighted.

<sup>5</sup>The index was comprised of number of politically motivated assassinations, number of people killed in conjunction with phenomena of domestic mass violence, number of successful coups, number of attempted but unsuccessful coups and a dummy variable of government structure.

ecological footprint<sup>6</sup> (Moran, Wackernagel, Kitzes, Goldfinger & Boutaud, 2008), genuine wealth per capita (Aidt, 2010; Venard, 2013) and three-dimensional concept of sustainable development, i.e. economic, environmental and social (Kondyli, 2010; Abou-Ali & Abdelfattah, 2013). Radu (2015) measured sustainable development through a number of proxy indicators<sup>7</sup>. Nourry (2008) used eight measures of sustainable development to see the status of sustainable development in France. They are green national net product, genuine saving, ecological foot print, indicators of sustainable economic welfare, genuine progress indicators, pollution-sensitive human development indicators, sustainable human development indicators and French dashboard on sustainable development<sup>8</sup>. The current study attempts to measure the sustainable development and political instability through indices that is another contribution of the study.

## 2. Literature Review

In the existing literature, the studies focused on individual and groups of economies, using various types of operational definitions, so they revealed the varying results. Mo (2001) explained that corruption negatively impacts economic growth via human capital and political instability. Political instability was measured for 54 countries by the number of assassinations and revolutions during 1960 to 1985 with five years interval. However, the political instability may exist in the form of regime change and cabinet changes as polarization in the economies. It means the study has used a weak measurement of political instability.

Meon and Sekkat (2005) tested grease the wheels hypothesis for a sample of 63 to 71 countries for the time period of 1970 to 1998. They proved that investment and economic growth are adversely influenced by corruption measured by two indicators, i.e. CPI index by Transparency International and World Bank corruption index. The

---

<sup>6</sup>Human development index was a combination of four sub-indicators of life expectancy at birth, adult literacy rate, gross school enrolment ratio and GDP per capita. Ecological footprint measures the magnitude of the recovering capacity of the biosphere.

<sup>7</sup>The indicators were GDP per capita, government consumption, household consumption, capital investment, savings, foreign direct investment, exports of goods and services, and imports of goods and services.

<sup>8</sup>Nourry (2008) highlighted that all the measures of sustainable development prevalent in literature have their own advantages and drawbacks.

study has also included the interaction term of corruption with rule of law and government effectiveness. It was found that weak rule of law and low government effectiveness make the corruption more detrimental to growth. Serra (2006) measured the corruption through Graft index by Kaufmann, Kraay and Mastruzzi (2010) and corruption perception index by Transparency International. The study concluded that political stability and democracy negatively influence corruption.

The association between corruption, resource abundance and genuine saving has been estimated by Dietz, Neumayer and De Soysa (2007)<sup>9</sup>. The resource rich countries are found to have a negative effect on genuine saving. The resource abundant countries had poor performance in genuine saving in contrast with resource poor countries because these countries insufficiently invest the resources on human capital and technology. In the three indicators of institutional quality, i.e. corruption, bureaucratic quality and rule of law, the corruption has shown a negative impact on genuine saving in interaction with resource abundance.

Jong-A-Pin (2009) examined the multidimensionality of political instability in the perspective of implications for economic growth for 90 economies using unbalanced data-set with five years interval. For the purpose, 25 political instability indicators were categorized into four dimensions, i.e. politically motivated violence, mass civil protests, instability within the political regime, and instability of political regime through explanatory factor analysis. These dimensions had shown different effect on economic growth. The instability of political regime has a robust and significant negative effect on economic growth. It explained that this dimension measures de facto uncertainty. The study further evidenced that more instability within the political regime supports economic growth.

Campante, Chor and Do (2009) evidenced that corruption and political instability are bonded in a U-shaped pattern. The intensive and bigger magnitude of corruption has been found in the nations possessing the severe political instability as well as in the nations having mild level of political instability. However, the corruption remained low in the nations living in between two extremes of political

---

<sup>9</sup>Genuine saving is a measure of sustainable development (Auty, 2004; Dietz, Neumayer & De Soysa, 2007).

instability. The results were obtained by using two different measures of political instability, i.e. average tenure of a country's chief executive and average tenure of the party in power. They were further supported by a more direct measure of stability, i.e. governing coalition's share of seats in the legislative.

Aidt (2010) examining the implications of corruption on sustainable development explained that for sustainable development, corruption measured by any of the criteria, is the most unfavorable and detrimental factor. The sustainable development was measured by genuine wealth per capita that captures only one aspect of sustainable development. The sustainable development measured by an index covering the aspects of nation's economic, social and environmental development may enhance the contribution of the study. Piplica and Covo (2011) have also analyzed the influence of corruption on economic growth in Croatia along with ten transition European Union economies. They evidenced higher level of corruption in Croatia than ten transition countries and a positive impact of corruption on economic growth. However, in ten transition EU member countries corruption decreases the economic growth.

Aisen and Veiga (2013) using cabinet changes as proxy variable for political instability and employing system-GMM on a sample of 165 countries covering five year interval period from 1960 to 2004 showed that political instability decreases economic growth due to its depressing impact on maintaining or increasing total factor productivity and restricting the development of human and physical capital. The study has focused on change in cabinet as political instability. The change of the political regime, polarization and the political violence along with civil conflicts may be the critical factors for economic growth as Jong-A-Pin (2009) has included 25 political instability indicators.

Venard (2013) measured the economic development by genuine wealth growth per capita and analyzed the link between corruption, institutional quality and economic development. It was evidenced that good quality of institutional framework decreases corruption which enhances the economic growth. It supports the sand the wheel theory that is corruption retards the process of economic development (Farooq et. al., 2013). Abu, Karim and Aziz (2015) evidenced that mass corruption and underdevelopment of the nations is attributed to political instability in ECOWAS countries. The dynamic

interaction among corruption, political instability and economic development confirmed that corruption, political instability and economic development are endogenous. Political instability is the most important variable accounting for shocks in corruption, while corruption is the most important variable accounting for shocks in political instability and economic growth. d'Agostino, Dunne and Pieroni (2016) have analyzed the effect of corruption interacting with government expenditures on economic growth for a panel of 106 countries. The corruption was captured by the control of corruption index by World Bank. They concluded that interaction between corruption and investment, and corruption and military spending have a strong negative effect on economic growth. Combating the corruption not only have direct positive impact on economic growth but it has also positive indirect effect on economic growth through reducing the size of negative impact of military burden.

The literature has shown varying results possibly due to different socioeconomic structures of the economies, economic levels of the countries or use of different measures of political instability and sustainable development. To make the results robust, it is attempted to estimate the interlinkages among corruption, political instability and sustainable development for developing economies as well as disaggregated economies by income group<sup>10</sup> through a comprehensive measure of political instability and sustainable development in the form of indices.

### **3. Methodology**

To have empirical evidence of interlinkages among corruption, political instability and sustainable development a system of equations has been designed. This framework is applied for developing economies and disaggregated data into lower-middle income and upper-middle income economies.

#### **3.1. Simultaneous Equations Model**

The SEM uses two types of variables in the models, i.e. the exogenous variables and the endogenous variables. Endogenous variables are variables determined within the system of equations representing the

---

<sup>10</sup>The disaggregation of data into lower-middle income countries and upper-middle income countries makes to check the heterogeneity by level of income of the countries and to make the results robust.

real world (Wooldridge, 1996; Pindyck, Rubinfeld, Hall, & Schmukler, 1997; Wooldridge, 2009), and are functions of other variables present in the system. The exogenous variables are variables determined outside the system. As a general rule, when a variable is endogenous, it will be related to the perturbation term. It generates endogenous variables, violates the assumptions of Gauss Markov (GM) and distorts the OLS estimates (Wooldridge, 2009). This fact can be seen in equations (1) and (2), in which  $Y$  and  $X_1$  are both endogenous.

$$Y_{it} = \alpha_1 + \beta_{11}X_{1,it} + \beta_{12}X_{2,it} + \beta_{13}X_{3,it} + \epsilon_{it} \quad (1)$$

$$X_{it} = \alpha_2 + \beta_{21}Y_{1,it} + \beta_{22}Z_{1,it} + \beta_{23}Z_{2,it} + \epsilon_{it} \quad (2)$$

### 3.2. Two-Stage Least Squares

Two-stage least squares (2SLS) regression analysis (Wooldridge, 1996; Pindyck et al., 1997; Wooldridge, 2009) is a statistical technique that is used in the analysis of structural equations. It is an extension of the OLS method and is used when the error terms of the dependent variable are related to independent variables (Pindyck et al., 1997; Wooldridge, 2009). This technique is useful when there are feedback cycles in the model and the method is called "two stages" because it performs the two-step estimation,

Step 1: Regress  $Y_{-i}$  on  $X$  and obtain the predicted values of  $\hat{Y}_{-i}$ .

Step 2: Estimate  $\alpha_i, \beta_i$  by the ordinary least square regression of  $y_i$  and  $\hat{Y}_{-i}$  and  $X_i$ .

### 3.3. Three-Stage Least Square

The three-stage least squares method combines the two-stage least squares (2SLS) with seemingly unrelated regressions (SUR) (Wooldridge, 1996; Pindyck et al., 1997). SUR is a generalization of a linear regression model consisting of several regression equations. Each equation has its own dependent variable and potentially different sets of exogenous explanatory variables. Each equation is a linear regression valid in itself and can be evaluated separately. The model can be the equation of the estimated equation using ordinary standard least squares (OLS). These estimates are consistent, although in general they are not as efficient as the SUR method, with generalized least-squares feasible with a specific form of variance-covariance matrix. Two important cases when SUR is in effect equivalent to OLS are: when the error terms are not correlated between equations (so they are not really

related), or when each equation contains exactly the same set of regressors on the right side of the hand (Pindyck et al., 1997).

New econometrics techniques and data mining techniques are available for analysis, for instance, Taylan, Weber and Ozkurt (2010) explained the multivariate adaptive regression splines (MARS) that is important for classification and regression. Ozmen and Weber (2012) discussed Generalized Partial Linear Models (GPLMs) and Ozmen, Batmaz and Weber (2014) Generalized Partial Linear Models (GPLMs) that is used for forecasting and uncertainty of models. Ozmen, Weber, Batmaz and Kropat (2011) examined the CMARS method which is useful to handle the heterogeneous and complex data. They suggested that if the data is uncertain which may lead to uncertain results so to overcome this CMARS algorithm is proposed to cope with data uncertainty.

Hence the above-mentioned techniques are non-parametric techniques. These methods give productive results in case of nonlinear equations, time series analysis and especially in the heterogeneous and complex data i.e. big data analysis. We discussed the objective of this research that is to estimate the simultaneous relationship between corruption, political instability and sustainable development. To the best of our knowledge simultaneous equation model is much appropriate. The three stage least square gives efficient results according to our objective because there occurred endogeneity in the model and three stage least square efficiently overcame this endogeneity problem and gave efficient results.

### 3.4. Theoretical Model and Construction of Variables

Based on the objectives of the study the theoretical models have been designed as:

$$\text{SUSTAIN} = f(\text{CORRP}, \text{INSTAB}, \text{INF}, \text{TOPEN}, \text{RESOUR}) \quad (3)$$

$$\text{CORRP} = f(\text{INSTAB}, \text{SUSTAIN}, \text{GINI}, \text{UNEMP}) \quad (4)$$

$$\text{INSTAB} = f(\text{SUSTAIN}, \text{CORRP}, \text{GINI}, \text{MEDIA}) \quad (5)$$

where SUSTAIN = Sustainable development (Sustainable development index), CORRP = Corruption (Control of corruption

index)<sup>11</sup>, INSTAB = Political instability (Political instability index), INF = Inflation (Consumer price index), TOPEN = Trade openness (Exports + imports as % of GDP), RESOUR = Resource intensity (Resource intensity index), GINI = GINI index, UNEMP = Unemployment (Unemployment rate) , MEDIA = Media reach (Media reach index)

**Table 1: Dimensions and Indicators of Sustainable Development Index**

Dimension and sub-Dimensions		Indicators	Direction
<b>Economic Dimension</b>		Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population).	-
		Poverty gap at \$1.90 a day (2011 PPP) (%).	-
<b>Social Dimension</b>	Human capital accumulation	Total net enrolment in primary education	+
		Gross enrollment ratio, primary, both sexes (%)	+
		Gross enrollment ratio, secondary, both sexes (%)	+
		Gross enrollment ratio, tertiary, both sexes (%)	+
	Health status	Fertility rate, total (births per woman)	-
		Prevalence of HIV, total (% of population ages 15-49)	-
		Tuberculosis death rate per year per 100000 people	-
Government effort to enhance education	Government expenditure on education, total (% of GDP)	+	
<b>Environment Dimension</b>		CO <sub>2</sub> emissions (metric tons per capita)	-
		Energy use (kg of oil equivalent) per \$1,000 GDP (constant 2011 PPP)	-

<sup>11</sup>Serra (2006) has shown that corruption index and Graft index are highly correlated which signifies the consistency in the evaluation. We have used the control of corruption index by World Bank (d'Agostino, Dunne & Pieroni, 2016). Meon and Sekkat (2005) have explained that corruption perception index and World Bank corruption index stand as complements to each other for analysis. Although the control of corruption index is criticized (Donchev & Ujhelyi 2014) but it provides a comparatively larger number of observations than any alternative measure.

Sustainable development index is constructed by three-dimensional approach, i.e. economic, environmental and social through principle component analysis. Political instability index is based on three-dimensions following Jong-A-Pin (2009) and is constructed by principle component analysis.

**Table 2: Dimensions and Indicators of Political Instability Index**

<b>Dimensions</b>	<b>Indicators</b>	<b>Direction</b>
<b>Politically Motivated Violence</b>	Political stability and absence of violence (government stability, ethnic tension, internal conflicts, external conflicts)	-
	Civil war	+
	Assassination of executive	+
	Minor civil conflicts	+
	Polarization	+
<b>Instability within Political Regime</b>	Fractionalization	+
	Regime changes	+
<b>Instability of the Political Regime</b>	Coups d'état (successful coups, attempted coups)	+

The resource intensity index is also constructed by principal component analysis. It is proxy for natural resource abundance and comprised of two variables.

**Table 3: Indicators of Resource Intensity Index**

	<b>Indicators</b>	<b>Desired Value</b>
<b>Resource Intensity</b>	Ore and metal exports (Ores and metals exports as percentage of merchandise exports)	+
	Fuel exports (Fuel exports as percentage of merchandise exports)	+

### 3.5. Econometric Estimation

The simultaneous equations model was used purposely for explaining the potential endogeneity of numerous explanatory variables. The existence of endogeneity in the independent variables creates a serious econometric problem. Since OLS does not differentiate between endogenous and exogenous explanatory variables in the equation so endogeneity may leads to the inconsistency and bias OLS estimations. The problem becomes severe when least squares are applied directly to

estimate the equation using explanatory endogenous variables  $Y_h$  which are correlated with the disturbance terms  $\varepsilon_h$ , even in probability limit. The issue may be solved and the estimator may be formed consistent with the disturbance terms by replacing these variables with appropriate instruments, in the probability limit. To search the instruments is generally problematic but two-stage least squares (2SLS) method has the capability to replace explanatory endogenous variables with their estimated values. The use of 2SLS in cross-section regression makes the estimated parameters consistent, but not efficient. To improve the results of 2SLS some improvement is needed. For the purpose the three stage least squares (3SLS) technique is framed. It is asymptotically more efficient than 2SLS as it uses information on the correlation of the disturbance terms of the structural equations and improves asymptotic efficiency.

First of all to check the endogeneity in the model, the Durbin-Wu-Hausman test has been applied. It is needed to justify the necessity to use the instrumental variables. The estimated prob value is determined as 0.0000, that is less than 5 percent so the null hypothesis is rejected and endogeneity is found in the model and instrument variables are need to remove the endogeneity. The mathematical forms of the models for the current analysis are given as:

$$\text{SUSTAIN}_{it} = \beta_0 + \beta_1 \text{CORRP}_{it} + \beta_2 \text{INSTAB}_{it} + \beta_3 \text{INF}_{it} + \beta_4 \text{TOPEN}_{it} + \beta_5 \text{RESOUR}_{it} + \varepsilon_{eit} \quad (6)$$

$$\text{CORRP}_{it} = \gamma_0 + \gamma_1 \text{INSTAB}_{it} + \gamma_2 \text{SUSTAIN}_{it} + \gamma_3 \text{GINI}_{it} + \gamma_4 \text{UNEMP}_{it} + \varepsilon_{eit} \quad (7)$$

$$\text{INSTAB}_{it} = \delta_0 + \delta_1 \text{SUSTAIN}_{it} + \delta_2 \text{CORRP}_{it} + \delta_3 \text{GINI}_{it} + \delta_4 \text{MEDIA}_{it} + \varepsilon_{eit} \quad (8)$$

In above equations SUSTAIN, CORRP and INSTAB are endogenous variables and INF, TOPEN, RESOURCE, GINI, UNEMP and MEDIA are instrumental variables.

### 3.3. Data Source

Annual panel data of 28 developing countries for the year 2000-2014 has been taken from the World Development Indicator (World Bank, 2016b), Political Risk Services (International Country Risk Guide, 2014), INSCR Data Page (INSCR 2016), The Database of Political Institutions 2015 (DPI2015) (Cruz, Keefer & Scartascini, 2015), Armed Conflict database (International Institute for Strategic Studies 2014),

Millennium Development Goals (World Bank, 2016a) and World Governance Indicators (Kaufmann, Kraay & Mastruzzi, 2010)<sup>12</sup>.

#### 4. Results and Discussion

The summary statistics expressed in table 4 shows that corruption is prevalent in developing economies as the mean of corruption (CORRP) is -0.54 while maximum value is 0.76. The lower value represents the lower control of corruption or high existence of corruption (the reverse of World Bank index). The political instability and sustainable development are at middle level in the sample of the economies.

**Table 4: Summary Statics of the Variables (Developing Economies)**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
SUSTAIN	<b>74.0977</b>	<b>8.1157</b>	<b>46.6400</b>	<b>95.0100</b>
CORRP	<b>-0.5461</b>	0.4014	-1.4444	0.7612
INSTAB	<b>6.0133</b>	1.9269	1.7400	12.2400
INF	<b>9.3912</b>	12.8947	-1.4200	168.6200
TOPEN	<b>77.5192</b>	34.4534	21.8500	163.3400
RESOUR	<b>13.9940</b>	13.1200	0.2300	47.2700
GINI	<b>42.6022</b>	10.2196	16.2300	63.0000
UNEMP	<b>8.0578</b>	4.7160	0.5000	35.9000
MEDIA	<b>62.2522</b>	43.9419	0.3800	172.7300

##### 4.1. Estimates for Sustainable Development

The 3SLS estimates of sustainable development for developing economies, lower-middle-income economies and upper-middle income economies are shown in table 5. Wald test is applied to see the significance of variables. *P* value of Wald test is less than 5 percent so the null hypothesis is rejected and hypothesis, i.e. corruption (CORRP) and political instability (INSTAB) had significant effect on sustainable development is accepted<sup>13</sup>. The results reveal that corruption has negative

<sup>12</sup>The selection of the countries is based on availability of data. The countries included in the analysis are: Armenia, Bolivia, El Salvador, Honduras, Indonesia, Moldova, Mongolia, Pakistan and Ukraine (lower-middle income economies) and Argentina, Azerbaijan, Belarus, Brazil, Bulgaria, Colombia, Costa Rica, Dominican Rep., Ecuador, Kazakhstan, Mexico, Panama, Paraguay, Peru, Romania, Russian Fed., Thailand, Turkey and Venezuela (upper-middle income economies). The ranks of these economies in corruption range from 39 of Costa Rica to 166 of Venezuela.

<sup>13</sup>However, the  $R^2$  is negative. According to Hill, Griffiths and Lim (2008: example 312) when using generalized least squares, instrumental variables or two-stage least squares, for any estimator but least squares, the identity  $SST = SSR + SSE$  does not

impact on sustainable development in developing economies, lower-middle income economies and upper-middle income economies. The effect is comparatively lesser in upper-middle income economies. Basically it supports the theory of sand in wheels which explains that corruption negatively affects the economic growth due to inefficient allocation of resources and bad decision making (Svensson, 2005). Tanzi and Davoodi, (1998) showed that higher levels of corruption exist in the bigger public investments in less productive areas. Mo (2001) evidenced that human capital is adversely affected by corruption. It also negatively affects foreign direct investment (Wei, 2000) which consequent on an unfavorable effect on socioeconomic development. The political instability has also shown negative effect on sustainable development for developing economies and lower-middle income economies. For higher-middle income economies the result is insignificant.

Political instability destroys physical capital and displaces human capital. The political disorder, civil war, ethnic conflicts and mass violence reduce production activity and investment that influences economic performance and hurdles the sustainable development. Political instability in the form of polarization, regime change and coup d'état disrupts the long term economic and environmental policies favorable for sustainable development. It affects sustainable development through lower physical and human capital accumulation. The literature on political instability and economic development has empirically proved the devastating effect of political instability on development of the economies (Jong-A-Pin 2009; Aisen & Veiga 2013; Radu 2015). It partially supports the adverse impact of political instability on sustainable development.

The inflation has been found to negatively influence the sustainable development in developing economies and upper-middle income economies. It may be explained through the costs of inflation, given by Fischer and Modigliani (1978), as taxation on capital that implies an inverse effect of inflation on economic growth. Similarly, the high inflation rate reflects high uncertainty or risk and consequently low investment that squeeze domestic market and decreases foreign direct investment as well as accelerate capital flight that results into decreased economic growth and development (Fischer, 1993).

---

hold, so the usual  $R^2 = 1 - SSE/SST$  can produce negative number. This just shows that the goodness of fit is not appropriate in this context, and should be ignored.

**Table 5: Results of 3SLS for Sustainable Development**  
 Dependent variable = SUSTAIN (Sustainable development)

Variables	Developing Economies		Lower-middle Income Economies		Upper-middle Income Economies	
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value
C	76.0459***	0.000	83.9620***	0.000	73.0098***	0.000
CORRP (Corruption)	-19.0015***	0.000	-19.1061***	0.005	-12.1421***	0.000
INSTAB (Political instability)	-2.1788***	0.000	-2.7738***	0.000	-1.1191	0.178
INF (Inflation)	-0.1150***	0.001	-0.0555	0.548	-0.08444***	0.004
TOPEN (Trade openness)	0.0397**	0.022	0.0066	0.773	0.02690*	0.109
RESOUR (Resource intensity)	-0.0677*	0.067	-0.1373***	0.002	-0.0839**	0.058
				$R^2 = -0.2037$		$R^2 = -0.6046$
Wald test						
CORRP (p value)		0.0000		0.0050		0.0000
INSTAB (p value)		0.0005		0.0000		0.1776
No. of observations		420		135		285

Note: \*, \*\* and \*\*\* indicate significance level of 10, 5 and 1 percent.

The trade openness positively impacts the sustainable development in all the three categories of the economies. Trade openness raises standards of living, ensures full employment, enhances the local and international demand, expands production and adaptation of technology, and increases the bulk and quality of commodity and services traded which results into optimal utilization of resources globally. These are the basic pillars to sustainable development. The trade openness seeks to protect the resources, nature and environment, improves the techniques for preserving resources for future generations, and enhances the economic and social mobility among the nations.

The sustainable development is inversely influenced by the resource intensity. It creates the replica of resource curse hypothesis applicable for sustainable development<sup>14</sup>. Sachs and Warner (2001) identified a puzzle, but more pointedly a paradox, about the association between natural resource abundance and economic growth. The resource-abundance countries should have higher levels of investments and thereby growth rates but the resource-poor economies like Korea, Taiwan and Thailand are excelling in economic growth and ranking as world's star performers. These economies are also doing well in education and health. This paradox is explained through four major economic phenomena, i.e. lower prices of natural resource are offered to resource-rich countries in global markets, the demand of natural resources is decreasing globally due to innovation particularly in developed economies, the fluctuations are happening in exchange rate which remains unfavorable to exporters of resource-rich countries (Auty & Mikesell, 1998), and finally the sophisticated progress in capital and technology like digital innovations in export sector of resource-poor countries give them advantage in local production and international trade. The economists and environmentalists advocate that wise use of resources by the resource-rich economies for physical and human capital may enhance sustainable development in these countries.

#### **4.2. Estimates for Corruption**

The results of 3SLS estimates for corruption are shown in table 6. This study hypothesized that political instability enhances corruption but the

---

<sup>14</sup>The resource curse is supported by a number of studies (Sachs & Warner, 2001; Auty, 2001; Atkinson & Hamilton, 2003; Gylfason & Zoega, 2006).

current analysis has shown that political instability decreases corruption in developing economies, lower-middle income economies and upper-middle income economies. The results are partially supported by Compante, Chor and Do (2009) who found that very stable economies and very unstable economies suffer the higher levels of corruption as compared to the economies at intermediate range of stability. They have given the examples of Mexico during the more than seventy years long regime of Institutional Revolutionary Party, the economy of Kenya during the rule of five times elected Daniel Arap Moi and military based long period Suharto government in Indonesia where political stability and corruption existed side by side<sup>15</sup>.

The sustainable development negatively affects the corruption in all the three categories of economies. A society with sustainable development ensures good environmental condition, human capital accumulation through education and health, and lower level of poverty which retards incentive for corruption because people live in good living conditions. Income inequality has shown positive affect on corruption in developing economies only.

The literature has identified income inequality as a significant determinant of corruption (Zhang, Cao & Vaughn, 2009; Mehrara, Firouzjaee & Gholami, 2011; Justesen & Bjornskov, 2014). It explains that in unequal societies, political corruption rises because poor people become interested to sell their votes to receive gifts, money and other favors and rich ones become interested to buy votes of poor people to keep their political status and power to obtain more benefits. Similarly poor community becomes corrupt to meet the basic needs like food and shelter through jobs. These jobs are distributed by bureaucrats through bribes.

The unemployment is a major issue of developing economies. In our sample the average unemployment rate is estimated at 8 percent. The maximum rate remains at 35.9 percent. The unemployment is included in corruption equation to see its implications. It has shown positive effect on corruption in developing economies, lower-middle income and upper-middle income economies.

---

<sup>15</sup>However, on the other end there is example of Pakistan where political instability and higher corruption existed parallel to each other (Easterly 2001) and of Brazil for the same type of phenomenon in the last decade of previous century.

**Table 6: Results of 3SLS for Corruption**  
 Dependent variable = CORRP (Corruption)

Variables	Developing Economies		Lower-middle Income Economies		Upper-middle Income Economies	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
C	1.2320**	0.041	1.2627***	0.000	3.6229***	0.004
INSTAB (Political instability)	-0.1599***	0.000	-0.0823***	0.000	-0.2648***	0.000
SUSTAIN (Sustainable development)	-0.0156**	0.031	-0.0184***	0.000	-0.0357**	0.038
GINI (GINI index)	0.0079***	0.000	0.0012	0.671	0.0063	0.493
UNEMP (Unemployment)	0.0262***	0.000	0.0136***	0.000	0.0315***	0.0000
	R <sup>2</sup> = -0.4953		R <sup>2</sup> = -0.0168		R <sup>2</sup> = -0.8247	
<b>Wald test</b>						
INSTAB (p value)	0.0000		0.0000		0.0000	
SUSTAIN (p value)	0.0307		0.0000		0.0370	
No. of observations	420		135		285	

**Note:** \*, \*\* and \*\*\* indicate significance level of 10, 5 and 1 percent.

Azeng and Yogo (2013) also found positive effect of unemployment on corruption. Higher unemployment increases poverty and inequality which instigate the unemployed mass to involve in corruption for their livelihood. Another channel for the effect of unemployment on corruption in an economy may be through the political and bureaucratic figures. The politicians and bureaucrats become involved in rent seeking from the employment schemes and programs. The unemployed persons remain ready to give bribes for employment particularly in public sector jobs.

### **4.3. Estimates for Political Instability**

The 3SLS estimates for political instability are shown in table 6 which shows that sustainable development and corruption both negatively affect the political instability for all three categories of the economies. The results depict the negative effect of sustainable development on political instability much stronger in lower middle income economies as compared to developing economies and upper-middle income economies. The overall results explain that higher level of sustainable development reflects lower level of poverty, higher education enrolment, good health facilities and pollution free environment which satisfy the people about governmental affairs and decreases political unrest or instability. Most of the existing literature is concerned with economic growth and political instability but we are concerned with sustainable development and political instability. Our results may have the partial support from existing literature about economic growth and political instability (Alesina et al., 1996; Gyimah-Brempong & De Camacho, 1998; Miljkovic & Rimal, 2008; Aisen & Veiga, 2013; Jong-A-Pin, 2009; Radu, 2015).

It is strange to observe that corruption decreases political instability and the association between corruption and political instability is almost three times stronger in lower-middle income economies as compared to upper-middle income economies. It explains that corruption creates political stability. The political and bureaucratic corruption may smooth the political instability when the ruling class and the policy makers are involved in corruption and use the rent for prolonging their status and power. The lower class of the society suffers but it remains unable to make some efforts for regime change and political unrest (Compante, Chor & Do, 2009).

**Table 7: Results of 3SLS for Political Instability**  
 Dependent variable = INSTAB (Political instability)

Variables	Developing Economies		Lower-middle income Economies		Upper-middle income Economies	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
C	8.0699**	0.019	16.6615**	0.022	12.6349**	0.024
SUSTAIN (Sustainable development)	-0.0927**	0.023	-0.2588***	0.000	-0.1253**	0.089
CORRP (Corruption)	-5.2947***	0.000	-10.9296***	0.000	-3.5292***	0.000
GINI (GINI index)	0.0418***	0.003	0.02819	0.404	0.0040	0.829
MEDIA (Media reach)	0.0022	0.552	0.01187	0.364	0.0045	0.377
	R <sup>2</sup> = -0.10989		R <sup>2</sup> = -0.5282		R <sup>2</sup> = -0.3988	
<b>Wald test</b>						
SUSTAIN (p value)	0.0209		0.0001		0.0886	
CORRP (p value)	0.0000		0.0000		0.0000	
No. of observations	420		135		285	

Note: \*, \*\* and \*\*\* indicate significance level of 10, 5 and 1 percent.

Inequality increases political instability due to higher dissatisfaction of public about government policies regarding distribution of resources. It augments the social dissatisfaction and energizes civil unrest by increasing probability of coups, civil conflicts and mass violence.

## 5. Conclusion and Policy Recommendations

It is concluded that there is interdependence among corruption, political instability and sustainable development. Both corruption and political instability adversely affect sustainable development. Corruption impedes sustainable development because it distorts decision making process, decreases human capital and private investment, and reduces social services like healthcare and education.

Political instability and sustainable development negatively affect corruption. It means that political stability enhances corruption. In developing economies whenever the ruling class avail the opportunity of political stability it becomes involved in corruption. It also reflects the existence of mass corruption in developing economies in political and bureaucratic groups. They use the money taken through corruption to prolong the regimes and their status quo. However, the sustainable development decreases the corruption and political instability. So the economies moving towards sustainable development have the benefits of decrease in corruption, and ethnic conflicts, civil wars, mass violence and polarization.

The major focus of the study was sustainable development and the way it was linked with corruption and political instability and vice versa. The results have shown an important aspect in this troika of variables, that is corruption increases political stability, and political stability increases corruption. It gives a clue that in developing economies the politicians and bureaucrats are involved in corruption and the rulers, administration and policy makers have a strong hold on the public reactions. They earn money from corruption and use it for prolonging the rule. So the first fist to break this cycle is to eliminate corruption, then sustainable development may be attained.

## References

- Abou-Ali, H., & Abdelfattah, Y. M. (2013). Integrated paradigm for sustainable development: A panel data study. *Economic Modeling*, 30, 334-342. <https://doi.org/10.1016/j.econmod.2012.09.016>.

- Abu, N., Karim, M. Z. A. & Aziz, M. I. A. (2015). Corruption, political instability and economic development in the economic community of West African states (ECOWAS): Is there a causal relationship? *Contemporary Economics*, 9(1),45-60. <http://doi.org/10.5709/ce.1897-9254.159>.
- Aidt, T. S. (2010). Corruption and sustainable development. In Rose-Ackerman, S. & Soreide, T. (Ed.) *International handbook on the economics of corruption*. (pp. 3-51). <https://doi.org/10.17863/CAM.5249>.
- Aisen, A., & Veiga, F. J. (2013). How does political instability affect economic growth?. *European Journal of Political Economy*, 29, 151-167. <https://doi.org/10.1016/j.ejpoleco.2012.11.001>.
- Alesina, A., & Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review*, 40(6),1203-1228. [https://doi.org/10.1016/0014-2921\(95\)00030-5](https://doi.org/10.1016/0014-2921(95)00030-5).
- Alesina, A., Ozler, S., Roubini, N., & Swagel, P. (1996). Political instability and economic growth. *Journal of Economic growth*, 1(2),189-211. <https://doi.org/10.1007/BF00138862>.
- Atkinson, G., & Hamilton, K. (2003). Savings, growth and the resource curse hypothesis. *World Development*, 31(11), 1793-1807. <https://doi.org/10.1016/j.worlddev.2003.05.001>.
- Auty, R. M. (2004). Natural resources, development models and sustainable development. *Journal of Environmental Economics*, 2(2), 51-74.
- Auty, R. M. (Ed.). (2001). *Resource abundance and economic development*. New York, UK: Oxford University Press.
- Auty, R. M., & Mikesell, R. F. (1998). *Sustainable development in mineral economies*. New York, UK: Oxford University Press.
- Azeng, T. F., & Yogo, T. U. & Urbain, T. U. (2013). *Youth unemployment and political instability in selected developing countries* (African Development Bank Group Working Paper Series, 171).
- Bardhan, P. (1997). Corruption and development: A review of issues. *Journal of Economic Literature*, 35(3), 1320-1346.

- Beck, P.J. & Maher, M.W. (1986). A comparison of bribery and bidding in thin markets. *Economics Letters*, 20(1), 1-5. [https://doi.org/10.1016/0165-1765\(86\)90068-6](https://doi.org/10.1016/0165-1765(86)90068-6).
- Bienen, H., & Van de Walle, N. (1991). *Of time and power: Leadership duration in the modern world*. California, USA: Stanford University Press.
- Campante, F. R., Chor, D., & Do, Q. A. (2009). Instability and the incentives for corruption. *Economics & Politics*, 21(1), 42-92. <https://doi.org/10.1111/j.1468-0343.2008.00335.x>.
- Campos, N. F., & Nugent, J. B. (2002). Who is afraid of political instability?. *Journal of Developing Economies*, 67(1), 157-172. [https://doi.org/10.1016/S0304-3878\(01\)00181-X](https://doi.org/10.1016/S0304-3878(01)00181-X).
- Cruz, C., Keefer, P. & Scartascini, C. (2015). *The Database of Political Institutions 2015 (DPI2015)*. Retrieved from <https://publications.iadb.org/en/publication/12390/database-political-institutions-2015-dpi2015>.
- d'Agostino, G., Dunne, J. P. & Pieroni, L. (2016). Government spending, corruption and economic growth. *World Development*, 84, 190-205. <https://doi.org/10.1016/j.worlddev.2016.03.011>.
- Dietz, S., Neumayer, E., & De Soysa, I. (2007). Corruption, the resource curse and genuine saving. *Environment and Development Economics*, 12(1), 33-53. <https://doi.org/10.1017/S1355770X06003378>.
- Donchev, D. & Ujhelyi, G. (2014). What do corruption measure?. *Economics and Politics*, 26(2), 1468-1483.
- Easterly, W. (2001). The political economy of growth without development: A case study of Pakistan. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.543.6905&rep=rep1&type=pdf>.
- Farooq, A., Shahbaz, M., Arouri, M., & Teulon, F. (2013). Does corruption impede economic growth in Pakistan?. *Economic Modeling*, 35, 622-633. <https://doi.org/10.1016/j.econmod.2013.08.019>.
- Fischer, S. (1993). The role of macroeconomic factors in growth. *Journal of Monetary Economics*, 32(3), 485-512. [https://doi.org/10.1016/0304-3932\(93\)90027-D](https://doi.org/10.1016/0304-3932(93)90027-D).
- Fischer, S., & Modigliani, F. (1978). Towards an understanding of the real effects and costs of inflation. *Review of World Economics*, 114(4), 810-833.

- Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty?. *Economics of Governance*, 3(1), 23-45. <https://doi.org/10.1007/s101010100039>.
- Gyimah-Brempong, K., & De Camacho, S. M. (1998). Political instability, human capital, and economic growth in Latin America. *The Journal of Developing Areas*, 32(4) 449-466.
- Gylfason, T., & Zoega, G. (2006). Natural resources and economic growth: The role of investment. *The World Economy*, 29(8), 1091-1115. <https://doi.org/10.1111/j.1467-9701.2006.00807.x>.
- Habib, M., & Zurawicki, L. (2002). Corruption and foreign direct investment. *Journal of International Business Studies*, 33(2),291-307. <https://doi.org/10.1057/palgrave.jibs.8491017>.
- Hill, R. C., Griffiths, W. E. & Lim, G. C. (2008). Principles of Econometrics. New York: John Willey & Sons, Inc.
- Huang, C. J. (2016). Is corruption bad for economic growth? Evidence from Asia Pacific countries. *The North-American Journal of Economics and Finance*, 35, 247-256. <https://doi.org/10.1016/j.najef.2015.10.013>.
- Huntington, S. P. (1968). Political order in changing societies. New Haven: Yale University Press.
- INSCR (2016) INSCR Data Page. Center for Systemic Peace. Retrieved from <http://www.systemicpeace.org/inscrdata.html>
- International Country Risk Guide (2014). International Country Risk Guide (ICRG) Researchers Dataset. Retrieved from <https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/21446>.
- International Institute for Strategic Studies (2014). Armed Conflict Database. Retrieved from <https://www.iiss.org/publications/armed-conflict-database>.
- Jong-A-Pin, R. (2009). On the measurement of political instability and its impact on economic growth. *European Journal of Political Economy*, 25(1), 15-29. <https://doi.org/10.1016/j.ejpoleco.2008.09.010>.
- Justesen, M. K., & Bjornskov, C. (2014). Exploiting the poor: bureaucratic corruption and poverty in Africa. *World Development*, 58, 106-115. <https://doi.org/10.1016/j.worlddev.2014.01.002>.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). *The worldwide governance indicators: A summary of methodology, data and analytical issues*

- (World Bank Policy Research Working Paper No. 5430). Retrieved from <http://info.worldbank.org/governance/wgi/pdf/wgi.pdf>.
- Kerk, G. V., & Manuel, A. R. (2008). A comprehensive index for a sustainable society: The SSI—the sustainable society index. *Ecological Economics*, 66(2-3), 228-242. <https://doi.org/10.1016/j.ecolecon.2008.01.029>.
- Kondyli, J. (2010). Measurement and evaluation of sustainable development: A composite indicator for the islands of the North Aegean region, Greece. *Environmental Impact Assessment Review*, 30(6), 347-356. <https://doi.org/10.1016/j.eiar.2009.08.006>.
- Leff, N. H. (1964). Economic development through bureaucratic corruption. *American Behavioral Scientist*, 8(3), 8-14. <https://doi.org/10.1177/000276426400800303>.
- Lien, D. H. D. (1986). A note on competitive bribery games. *Economics Letters*, 22(4), 337-341. [https://doi.org/10.1016/0165-1765\(86\)90093-5](https://doi.org/10.1016/0165-1765(86)90093-5).
- Mbaku, J. M., & Paul, C. (1989). Political instability in Africa: A rent-seeking approach. *Public Choice*, 63(1), 63-72.
- Mehrara, M., Firouzjaee, B. A., & Gholami, A. (2011). The corruption and income distribution in OPEC and OECD countries: a comparative study. *International Journal of Economics and Research*, 2(6), 51-61.
- Meon, P. G & Weil, L. (2010). Is corruption an efficient grease?. *World Development*, 38(3), 244-259. <https://doi.org/10.1016/j.worlddev.2009.06.004>.
- Meon, P. G., & Sekkat, K. (2005). Does corruption grease or sand the wheels of growth?. *Public Choice*, 122(1-2), 69-97.
- Miljkovic, D., & Rimal, A. (2008). The impact of socio-economic factors on political instability: A cross-country analysis. *The Journal of Socio-Economics*, 37(6), 2454-2463. <https://doi.org/10.1016/j.socec.2008.04.007>.
- Mo, P. H. (2001). Corruption and economic growth. *Journal of Comparative Economics*, 29(1), 66-79. <https://doi.org/10.1006/jcec.2000.1703>.
- Moran, D. D., Wackernagel, M., Kitzes, J. A., Goldfinger, S. H., & Boutaud, A. (2008). Measuring sustainable development - nation by nation. *Ecological Economics*, 64(3), 470-474. <https://doi.org/10.1016/j.ecolecon.2007.08.017>.
- Nourry, M. (2008). Measuring sustainable development: Some empirical evidence for France from eight alternative

- indicators. *Ecological Economics*, 67, 441-456. <https://doi.org/10.1016/j.ecolecon.2007.12.019>.
- Ozmen, A., & Weber, G. W. (2012, November). Robust conic generalized partial linear models using RCMARS method - A robustification of CGPLM. *AIP Conference Proceedings (1499)*(1), 337-343. <https://doi.org/10.1063/1.4769011>.
- Ozmen, A., Batmaz, I., & Weber, G. W. (2014). Precipitation modeling by polyhedral RCMARS and comparison with MARS and CMARS. *Environmental Modeling & Assessment*, 19(5), 425-435. <https://doi.org/10.1007/s10666-014-9404-8>.
- Ozmen, A., Weber, G. W., Batmaz, I., & Kropat, E. (2011). RCMARS: Robustification of CMARS with different scenarios under polyhedral uncertainty set. *Communications in Nonlinear Science and Numerical Simulation*, 16(12), 4780-4787. <https://doi.org/10.1016/j.cnsns.2011.04.001>.
- Park, H. (2003). Determinants of corruption: A cross-national analysis. *Multinational Business Review*, 11(2), 29-48. <https://doi.org/10.1108/1525383X200300010>.
- Pindyck, R. S., Rubinfeld, D. L., Hall, B. H., & Schmukler, S. L. (1997). *TSP Handbook to Accompany Econometric Models and Economic Forecasts*. New York, USA: McGraw-Hill College.
- Piplica, D., & Covo, P. (2011). Corruption and economic growth in Croatia. *Oeconomica Jadertina*, 1(2), 85-99. <https://doi.org/10.15291/oec.206>.
- Radu, M. (2015). Political stability- A condition for sustainable growth in Romania?. *Procedia Economics and Finance*, 30, 751-757. [https://doi.org/10.1016/S2212-5671\(15\)01324-6](https://doi.org/10.1016/S2212-5671(15)01324-6).
- Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review*, 45(4-6), 827-838. [https://doi.org/10.1016/S0014-2921\(01\)00125-8](https://doi.org/10.1016/S0014-2921(01)00125-8).
- Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1-2), 225-256. <https://doi.org/10.1007/s11127-006-0286-4>.
- Siermann, C. L. J. (1998). *Politics, institutions and the economic performance of nations*. Cheltenham, UK: Edward Elgar Publishing.

- Svensson, J. (2005). Eight questions about corruption. *The Journal of Economic Perspectives*, 19(3), 19-42. <https://doi.org/10.1257/089533005774357860>.
- Tanzi V., Davoodi H. (1998) Corruption, Public Investment, and Growth. In Shibata H., Ichori T. (Eds.), *The Welfare State, Public Investment, and Growth* (pp. 41-60). Berlin, Germany: Springer. [https://doi.org/10.1007/978-4-431-67939-4\\_4](https://doi.org/10.1007/978-4-431-67939-4_4).
- Taylan, P., Weber, G. W., & Ozkurt, F. Y. (2010). A new approach to multivariate adaptive regression splines by using Tikhonov regularization and continuous optimization. *Top*, 18(2), 377-395. <https://doi.org/10.1007/s11750-010-0155-7>.
- Venard, B. (2013). Institutions, corruption and sustainable development. *Economics Bulletin*, 33(4), 2545-2562.
- Wei, S. (2000). How taxing is corruption on international investors?. *Review of Economics and Statistics*, 82(1), 1-11. <https://doi.org/10.1162/003465300558533>.
- Wooldridge, J. M. (1996). Estimating systems of equations with different instruments for different equations. *Journal of Econometrics*, 74(2), 387-405. [https://doi.org/10.1016/0304-4076\(95\)01762-3](https://doi.org/10.1016/0304-4076(95)01762-3).
- Wooldridge, J. M. (2009). *Introductory econometrics*. London, England: Macmillan Publishing Solutions.
- World Bank (2016a). Millennium Development Goals (MDG) monitoring. Retrieved from [https://www.unicef.org/statistics/index\\_24304.html](https://www.unicef.org/statistics/index_24304.html)
- World Bank (2016b). World development indicator database. Retrieved from <https://datacatalog.worldbank.org/dataset/world-development-indicators>
- Zhang, Y., Cao, L., & Vaughn, M. S. (2009). Social support and corruption: Structural determinants of corruption in the world. *Australian & New Zealand Journal of Criminology*, 42(2), 204-217. <https://doi.org/10.1375/acri.42.2.204>.

**Citation:** Khan, R. E. A. & Farooq, S. (2019). Corruption, political instability and sustainable development: The interlinkages, *Journal of Quantitative Methods*, 3(1), 56-83.



**Submission Date:** December 18, 2017

**Last Revised:** February 07, 2019

**Acceptance Date:** February 27, 2019