

# The persistence of corruption

(A cross-country study of corruption's persistence and the role of social capital)

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In this study, we interrogate the persistence of corruption in a sample of 144 countries from 1984 to 2014. The analysis highlights the role of social capital among other country level characteristics in the persistence of corruption. Our findings are consistent with the corruption-institutions thesis that countries with weak formal institutions have persistently high corruption rates. We also found that social capital reinforces persistence in countries. However, this finding is only confirmed for countries with low corruption rates, termed as “good persistence of corruption”. Therefore, strong formal institutions, although necessary, may not be a sufficient condition to achieve “good persistence of corruption” in a country. A “dual (formal-informal) institutions strengthening approach” should be part of anti-corruption policy prescriptions especially in countries experiencing regimes of “bad persistence of corruption”.

*Keywords: Corruption, persistence, social capital, formal institutions, System GMM*

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## Introduction

While the micro foundations of corruption has been widely studied in both economics and political science disciplines (Banerjee, 1997; Rose-Ackerman, 1999; Seung-Hyun Lee, 2010; Shah, 2006; Shleifer & Vishny, 1993; Svensson, 2005), corruption literature has mostly taken for granted that if corruption is pervasive, then it must be persistent. This is evidenced in most empirical studies which focus on pervasive corruption but generalize their findings to persistent corruption. However, there have been a number of studies that have provided theoretical insights into the persistence of corruption (Mauro, 2004; Mishra, 2006; Tirole, 1996). Recently some empirical works on the persistence of corruption is also emerging (Bissessar, 2009; Herzfeld & Weiss, 2007)

Corruption, from a principal agency modelling perspective, is seen as both a sign and a consequence of weak institutions. Therefore, the strengthening of formal institutions, tend to be the key anti-corruption policy recommendation that runs through most pervasive corruption research conclusions (Ades & Di Tella, 1999; Fisman & Gatti, 2002; Jain, 2001; Rose-Ackerman, 1999, 2007; Treisman, 2000, 2007). However, in understanding how peculiar persistence of corruption is from pervasive corruption, studies taking a game theoretic approach have acknowledged particularly the role of social capital or informal institutions in the persistence of corruption (Damania, Fredriksson, & Mani, 2004; Mauro, 2004; Mishra, 2006; Tirole, 1996).<sup>1</sup> Theoretically, reputation building and contagion have been found to contribute to the persistence of corruption resulting from the interaction of different individuals, groups or societies as well as previous levels of corruption. These studies therefore allude to the fact that social interactions may be key determinants in any empirical studies on the persistence of corruption. Unfortunately, there is yet to be any empirical examination of how such social interactions influence the persistence of corruption and what this implies for the role of formal institutions.

Building on available literature, this paper aims to assess first of all, whether persistence of corruption is a true phenomenon or a spurious one (An explanation on the difference between true and spurious persistence of corruption is given later on in the study). We also analyse whether persistence of corruption is found in countries with low levels of corruption and also for countries with high levels of corruption. In other words, we also answer the question; is there empirical evidence of good and bad persistence of corruption? Thirdly, we interrogate the role of social capital in either reinforcing or reducing persistence of corruption. Finally, we test the supremacy of formal institutions thesis to find out whether social capital matters as much as formal institutions in the persistence of corruption and whether these two types of institutions are complements or substitutes.

Most studies on the causes of corruption have focused on the determinants of pervasive corruption (Mauro, 1995; Treisman, 2000). Swaleheen (2012), however draws our attention to the fact that, to effectively witness the effects of low corruption levels on economic growth, there should

<sup>1</sup> In this study, social capital, informal institutions and social institutions are used interchangeably to refer to the informal rules that exist which shapes the levels of trust in a society and therefore influence social relations thus human behaviour in such societies

not be a trend of high corruption rates. In other words, countries should not find themselves in a persistently high corruption regime otherwise, effects of corruption reduction on economic growth so far as countries remain in this regime, are at best minimal and at worst, negligible. From this assertion, focusing on the persistence of corruption and how it influences corruption levels may be more crucial than we have previously assumed. Persistence of corruption is defined in this study as the effect of past corruption on current corruption levels. It is defined as a path-dependent process whereby countries experience persistent corruption regimes (good or bad) as a result of their historical, politico-economic, and social contexts. <sup>2</sup>

With the increasing availability of corruption data, certain researchers have attempted to understand whether corruption could be seen as persistent. These studies found that, certain countries (predominantly less developed) have a similar trend of high corruption across time (Bissessar, 2009; Cieslik & Goczek, 2015). However, these studies use Markov transition probabilities and kernel density estimates which, although provide prima facie empirical evidence of likely persistence of corruption, are not able to present evidence of true persistence as against spurious persistence. <sup>3</sup>

Beyond these studies, Mauro (2004) using strategic complementarities and multiple equilibria concepts, found that some countries may find themselves in a “good” equilibrium of low corruption while some countries might continuously find themselves in a “bad” equilibrium of high corruption. This is also supported by other scholars taking a similar game theoretic approach (Blackburn, Bose, & Emranul Haque, 2006; Blackburn, Bose, & Haque, 2010; Damania et al., 2004; Mishra, 2006; Tirole, 1996). We refer to the good and bad equilibria respectively in this paper as “good corruption persistence” (persistently low corruption levels) and “bad corruption persistence” (persistently high corruption levels). These binary categories imply that 1) it is no longer sufficient to study corruption and its persistence as a cross-sectional phenomenon and 2) it will not be sufficient to lump corruption’s persistent nature together into one phenomenon of general persistence.

Social capital, as a concept, has been applied widely to capture the benefits of different social interactions. Social norms, levels of social trust and social networks are the differing ways through which social capital can be operationalised. At the macro level, social trust is widely used to operationalise social capital. Studies that have used this in understanding how social interactions affect corruption have found that, higher levels of trust are likely to lead to lower levels of corruption (Acemoglu, 1995; Bjørnskov, 2003; Rothstein & Uslaner, 2005; Sah, 2007; Svendsen, 2003). We are yet to understand however, whether social trust influences the persistence of corruption. Corruption, by its very nature, has the tendency to graft onto and rework

<sup>2</sup> Later sections of the paper will provide an in-depth discussion on the definition of the persistence of corruption

<sup>3</sup> Studies that have analysed the concept of persistence mostly in applied econometrics, econometric theory and economic growth literature have found that “true” persistence can only be determined after the initial conditions problem has been adequately taken into consideration. See Ahn and Schmidt (1995); Arellano and Bond (1991); Arellano and Bover (1995); Blundell and Bond (1998); Hahn (1999) for a comprehensive overview of the initial conditions problem in dynamic panel regression analysis and the alternative solutions for achieving consistency in estimations.

existing social processes of trust over time. We therefore focus on the role of social trust (as a form of social capital) in understanding its role in the persistence of corruption.

The study uses panel data pooled from six different sources to understand the time varying nature of corruption in a cross country study, and which factors account for the persistence of corruption. We use the corruption variable in the ICRG dataset as the main dependent variable for 144 countries from 1984 to 2014. In explaining the persistence of corruption, the study focuses on the role of institutions in general but highlighting that of social capital or informal institutions. The World Values Survey and the CANA dataset provides data on the social capital variable and thus serves as the main datasets employed in this regard.

Results show that indeed corruption has a truly persistent nature, therefore past corruption has a large influence on current and future corruption levels. Countries that have high corruption levels today are likely to have high corruption levels in the future and countries with low corruption levels are also likely to maintain such low corruption levels in future. We also find that when countries are divided into highly corrupt and lowly corrupt countries, true persistence is still observed in both regimes. We find social capital to be a strong reinforcing factor of persistent corruption. This result is however only confirmed in countries with persistently low corruption levels. On the other hand, we find weak formal institutions to be a strong reinforcing factor of bad persistence of corruption, that is for countries with persistently high corruption levels. Therefore, social capital and formal institutions are seen as necessary complements for sustaining persistently low levels of corruption.

The rest of the paper is structured as follows; a brief literature review of corruption and its persistence is laid out in section 2, as well as the gaps identified and hypotheses of the study. In section 3, we present the methodology with a description of the data used in the analysis as well as the empirical model. In section 4, we present and discuss the results from the analysis and finally conclude in section 5.

### Brief Review

Corruption is widely defined as the misuse of public power for private gain ([Rose-Ackerman, 2007](#)). This definition elicits a relativistic view whereby what is meant by corruption differs from one society to the other as “misuse” implies different things for different societies. Also, implicit in this definition is the key role of formal institutions as it is the abuse of such “public power” which is highlighted. This study adopts a universal definition of corruption as proposed by [Rothstein \(2014, p.738\)](#) as “exhibiting partiality in the exercise of public power”. This definition of corruption is however modified to include the role of the citizen in this study. As a result, corruption is defined in this study as *exhibiting partiality in the exercise of public power and/or benefitting from the exhibition of such partiality*. Implicit in this definition is the assumption that corruption is engaged in by the citizen only if it is beneficial in some way to him or her. This definition therefore imprints the role of both social interactions and formal institutions into the existence of corruption and also in its persistence. By using this definition

therefore, we do not only emphasise the role of formal institutions as in “the exercise of public power” by taking into account institutional variables (such as democratic accountability and bureaucratic quality). The study also sheds light on informal rules of the game which are dictated by the levels of trust in a country that spell out costs and benefits of social interactions from which corruption may or may not evolve.

There is copious literature on the pervasiveness of corruption. Different studies have analysed the causes and effects of widespread corruption ([Ali & Isse, 2003](#); [Bardhan, 1997](#); [Rose-Ackerman, 2007](#); [Sarlo, 2014](#); [Shah, 2006](#); [Treisman, 2000](#)). However, very few have gone beyond this to understand whether corruption is indeed persistent and why. Two measures of persistence are mostly used in persistence studies. First, persistence is defined and measured as lagged corruption. Therefore, corruption is said to be persistent when the lagged value of corruption is significant and its co-efficient is less than 1 in our estimations. Secondly, corruption is said to be persistent when a country remains in one steady state of corruption over the entire period of time being analysed. For this second definition, corruption is said to be persistent of the textitfirst markov order if there is no difference between the corruption state between two consectuive time periods, ie. at time  $t$  and  $t - 1$ . These two measures of persistence follow from the broad literature of persistence where persistence is measured either as a non-transition between different states or the significance of the lagged value of the variable of interest (see [Cieslik & Goczek, 2015](#); [Herzfeld & Weiss, 2007](#); [Seldadyo & De Haan, 2011](#); [Wladimir, Mohnen, Franz, & van der Loeff, 2010](#)).

We employ the first definition of persistent corruption in this study, that is, the significance of past corruption in explaining current corruption levels after unobserved heterogeneity and initial conditions are taken into account. We place particular emphasis on taking initial conditions and unobserved heterogeneity into account since this determines whether the observed persistence of corruption is true or spurious persistence. Ideally, we would like to find that past corruption levels have an effect on current corruption levels. There is however a possibility that the “persistent” corruption is not caused by past corruption but by some unobserved heterogeneities including initial conditions prior to the start date of our data. This is termed as spurious persistence ([Heckman, 1981](#)). Therefore, after taking care of such unobserved heterogeneities, we will test for evidence of true persistence of corruption.

Persistence of corruption, as result of a lack of quantitative data in years past, could only be discussed using theoretical models from which some insights could be drawn (e.g [Mauro, 2004](#)). Inferences on the causes of persistent corruption were made based on what was observed in pervasive corruption. The question, however remains, is corruption really persistent? With the emergence of corruption data over a lengthy period of time, researchers are beginning to get some, albeit conflictual, answers to the question of whether corruption is persistent or not. [Seldadyo and De Haan \(2011\)](#) analyzed the persistence of corruption for 101 countries from 1984-2008, and found that corruption does not persist at all. Even though countries do not get to a period of zero corruption levels, they find that some countries moved from high corruption levels to low corruption levels and others from low to relatively high corruption

levels. On the other hand, [Herzfeld and Weiss \(2007\)](#) found evidence of corruption's persistence in some countries. [Bissessar \(2009\)](#) also focused on African countries and found corruption to be highly persistent in Africa particularly Sub-Saharan Africa. This finding is also supported by [Cieslik and Goczek \(2015\)](#) who focused on Post-Communist countries. All these findings however focus on general persistence across countries with differing corruption levels. However, in understanding the persistence of corruption, persistently low levels of corruption may be preferred over persistently high levels of corruption. This distinction in the forms of persistence and their implications are however not given much attention in the literature.

Three major arguments have been put forth by scholars in the quest to explain the likely reasons for corruption's persistence. From these arguments, the hypotheses in this study are formulated.

The first argument advanced is about true persistence of corruption. These researchers argue that current and future corruption levels are past dependent. This denotes that corruption in a current period is dependent on the history of corruption of a society ([Acemoglu, 1995](#); [Aidt, 2003](#); [Andvig & Moene, 1990](#); [Mauro, 2004](#); [Mishra, 2006](#); [Tirole, 1996](#)). The main mechanism identified here is that of observed rewards to rent seeking in the past. This implies that, when corruption is rewarded in the first period, it becomes difficult to curb corruption in subsequent periods as it becomes self-reinforcing and hence difficult to control. Also, people who are corrupt in one period need to maintain their reputation of being able to enforce a corrupt transaction to increase rent rewards in future. Finally, in a society where corruption is pervasive, it becomes rationally optimal to also engage in corrupt transactions thus creating a vicious cycle of persistent corruption. The question however still remains; do countries exhibit true past dependence and hence persistence in corruption? There is yet to be an empirical analysis of whether there is true persistence of corruption for countries or not.

The second argument follows from the first by going deeper into the correlation between past and future corruption levels. Researchers undertaking this kind of studies argue that social effects play a major role in determining the extent to which past levels of corruption can affect current and future corruption levels. Elements of reciprocity and conformity within societies and organisations tend to affect an individual's perception and hence behavior towards corruption. [Dong, Dulleck, and Torgler \(2012\)](#) sum this up nicely in their article, *Conditional Corruption*. Conditional corruption refers to the situation where corruption today depends on 1) past levels of corruption and 2) how others around also behave towards corruption. In this instance, contagion effects arising from social interactions become predominant in explaining persistent corruption. Some empirical studies have examined contagion effects ([Fischbacher, Gaechter, & Fehr, 2001](#); [Henrich et al., 2004](#)). These studies however do not focus on corruption and its persistence. The role of social capital in the persistence of corruption therefore remains a subject of current empirical enquiries in the corruption literature.

The third and final argument arises from the culture and corruption thesis. This thesis posits that a culture of corruption is likely to persist in individuals who have been exposed to some corrupt norms in the past ([Harrison & Huntington, 2000](#)). Here, implicit in their argument is the fact that current social interactions may not matter as much as an intergenerational

persistence of a corruption norm which is more likely to affect current and future corruption levels and cause corrupt behaviours to be persistent. The first to make such an empirical inquiry was [Fisman and Miguel \(2007\)](#). However, there has been mixed results subsequently as other researchers such as [Barr and Serra \(2010\)](#) and [Alatas, Cameron, Chaudhuri, Erkal, and Gangadharan \(2009\)](#), have not found any evidence of this intergenerational norm of corruption.

From the three arguments put forth by corruption scholars, we formulate our hypotheses:

1. *Past corruption levels significantly affect current corruption levels positively.*

This is from the first argument that highlights the past dependence of corruption.

2. *High levels of social trust (as a form of informal institution which results from social interactions) lead to lower influence of past high corruption on future corruption levels.*

In other words, social trust is a significant negative moderating factor between past and current corruption levels. This is from the second argument of conditional corruption and path dependence of corruption. This hypothesis is also used to counter the third argument of inter-generational norm of corruption which nullifies the role of social interactions and hence evolving informal institutions.

3. *High levels of social trust positively affects the move of a country from a high corruption state to a low corruption state*

We hypothesise that an increase in the level of social trust will cause countries to move from a high corruption state to a low corruption state.

4. *Social trust will have no effect on the persistence of corruption*

We hypothesise that an increase in the level of social trust will reduce the bad persistence of corruption and increase the good persistence of corruption. However, depending on the proportion of good versus bad persistence countries within our sample, the re-inforcing effect of social capital within the good persistence countries will be neutralised by the switching effect of social capital for bad persistence countries. Finally, we borrow from the pervasive corruption literature using the neoclassical-institutionalist perspective to test our last hypothesis:

5. *Strong formal institutions serve as negative moderating factors between past and future corruption levels.*

Particularly from the principal agency modelling approach, we test whether the pathway of formal institutions remains even after controlling for the effect of social capital



## Methodology

### Data Description

The dependent variable in the study is *Corruption*. We use the Political Risk measure of corruption from the International Country Risk Guide (ICRG). This dataset, compared to others such as the World Governance Indicators and Transparency International's Corruption Perceptions Index, has comparable macro-data for the longest time period (1984 to 2014) and for most countries (144 countries). The data is based on the perceptions of experts and it is expressed as an index which ranges from 0 to 6 with 6 being the least corrupt. The corruption variable is a continuous dependent variable with a bounded range.

We use generalised trust from the World Values Survey and the CANA dataset as our measure of social capital or informal institutions. The trust variable is the percentage of people in each country who answer "*most people can be trusted*" to the question, "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*". A score of 1 is the highest level of social trust. We take this social capital variable from the CANA dataset which is a new panel dataset compiled by the Norwegian Institute of International affairs using multiple imputation methods to make up for the missing data (see [Castellacci and Natera \(2011\)](#) for a full description of the dataset and methods used). The CANA dataset however has data for social trust up to 2008. We therefore append data from the World Values Survey from 2008 to 2014. As the World Values Survey is conducted in waves (every four to five years) and not annually, we employ a nearest neighbour linear interpolation method on year of the country percentages to reduce the count of missing values in the estimation.

Existing corruption literature has identified certain factors as relevant in explaining corruption levels. Among these factors is economic growth, which is seen as one of the primary causes of corruption ([Brunetti & Weder, 2003](#); [Treisman, 2000](#)). Countries with high levels of GDP are most often less corrupt. The direction of causation in this relationship is however not very clear in literature as corruption also influences the levels of economic growth. In the same vein, Inequality ([Gupta, Davoodi, & Alonso-Terme, 2002](#)), formal institutions ([Dreher, Kotsogiannis, & McCorrison, 2009](#); [Rose-Ackerman, 2007](#)), education levels ([Ades & Di Tella, 1999](#); [Serra, 2006](#)), level of openness of an economy ([Sachs & Warner, 1995](#)), government expenditure ([Sachs & Warner, 1995](#)) and size of population ([Serra, 2006](#)) have all been identified as factors likely to cause corruption. Again, the direction of most of these factors, with the exception of population, is not very well established in the literature. Aside social capital therefore, other variables were used as controls based on existing corruption literature namely, economic growth using GDP per capita from the World Development Indicators, inequality from the World Inequality Index Database, type of institutions from the Polity IV score and the ICRG, level of human capital from the Penn World Tables, level of openness measured as total exports and imports as a share of GDP also from the WDI, size of government measured as the government expenditures or consumption as a share of GDP also from the WDI, and the size of the population. A detailed



explanation of each variable is given in the appendix. We also present correlation coefficients of all variables used in the appendix.

The pooled dataset is therefore an unbalanced panel dataset from the period 1984 to 2014 for 224 states.<sup>4</sup> We present the summary statistics in Appendix 4.

## Empirical Strategy

We apply a dynamic panel regression model to test the first hypothesis of true persistence (Wooldridge, 2002, 2005). The reduced form of the model is;

$$y_{it} = \gamma y_{it-1} + \beta x_{it} + \epsilon_{it} \quad (1)$$

$$\epsilon_{it} = \eta_i + v_{it}$$

where  $t = 2, \dots, T$ , and  $i = 1, \dots, N$ .  $y_{it}$  is the perceived corruption index of a country  $i$  in time period  $t$ . The corruption index in period  $t$  is assumed to depend on  $y_{it-1}$ , which is the corruption index of the previous year.  $y_{it-1}$  is therefore the persistence variable.  $x_{it}$  is a set of explanatory variables. The error term  $\epsilon_{it}$  is assumed to follow an error components structure in which,

$$E(\eta) = 0, \quad E(v_{it}) = 0, \quad E(v_{it}\eta_i) = 0 \quad \text{for } i = 1, \dots, N \quad \text{and } t = 2, \dots, T \quad (2)$$

$$E(v_{it}v_{is}) = 0 \quad \text{for } i = 1, \dots, N \quad \text{and } \forall t \neq s$$

$\gamma$  is expected to be positive and significant and  $\gamma < 1$  for our hypothesis of true persistence to be valid.

To capture the role of social capital and other factors in corruption's persistence, we extend the model to include interaction effects between social capital and our lagged corruption variable. We therefore specify an equation of this nature:

$$y_{it} = \gamma y_{it-1} + \beta_0 x_{it} + \beta_1 y_{it-1} \times \text{soctrust}_{it} + \epsilon_{it} \quad (3)$$

We sequentially apply equation (5) to other politico-economic factors namely democratic accountability and real GDP per capita thereby substituting  $\text{soctrust}_{it}$  with these variables for each model.

## Estimation Technique for analysing true persistence

Empirically, one of the crucial issues arising from the estimation of persistent data is the initial conditions problem. This initial condition problem mostly arises when the beginning of the

<sup>4</sup> Not only countries are included in the sample but also islands and other autonomous jurisdictions

observation period does not coincide with the start of the stochastic process which generates the corruption levels of countries. For example, we have corruption data beginning from 1984. However, almost all countries in our sample had some levels of corruption before 1984. Therefore, observed corruption levels for countries in 1984 may either be due to earlier history of corruption (true state dependence) or because of some spurious correlated characteristics (observed or unobserved) affecting corruption. This needs to be disentangled. To address some of the issues that arise with this initial conditions problem, we use the system GMM estimator technique proposed by (Blundell, Bond, & Windmeijer, 2000). This technique is chosen over the differenced GMM as this estimates two sets of equations, first in levels and secondly in orthogonal deviations. We choose to estimate the second part in orthogonal deviations and not in differences to take care of the unbalanced nature of our panel data so as to not lose more observations. Estimating using the system GMM allows us to solve three major issues associated with persistence data with small time observations and large country observations. Firstly, it allows us to solve the initial conditions problem. Secondly, it also allows us to handle endogeneity issues in our model using instruments from the first and second equations. Thirdly, it allows us to gain more instruments thus increasing the consistency of our estimators. In our estimation of the system GMM, we report one- step estimations with robust standard errors in testing hypotheses in general. Also, the Sargan and Hansen tests of over-identifying restrictions is used to test whether the model is properly identified. Finally, an autocorrelation test of the third order is used to test for the absence of any autocorrelation in the error term to ensure consistency of our estimates. The autocorrelation test is implemented in the third order as all our internal instruments are four lags and longer.

One major problem with the use of the system GMM is the possibility of using too many instruments as instruments are produced internally from both the equations in levels and orthogonal deviations (Roodman, 2009). To mitigate any effect this might have on our estimations, we report both Hansen and Sargan tests of overidentification. We also make sure that the number of instruments are not more than the number of observations we have in our sample by setting lag limits in our models as this is known to lead to overidentification issues.

## Empirical Results and Discussion

We employ the System Generalised Method of Moments (system GMM) estimation technique as the main model of estimation. However, we also run panel regressions with random effects (RE) as comparisons to our main model and also as a form of robustness check.<sup>5</sup> We report for all system GMM models, the autocorrelation tests of order 3 as order 1 is mostly expected to be autocorrelated and in our sample, order 2 as well. We therefore choose lags from order 4 to prevent any serial correlations which might then defeat the purpose of testing for true rather

<sup>5</sup> As a form of robustness check, we run pooled OLS estimates which are qualitatively very consistent with results found in the System GMM and RE models. We also run estimations for OECD versus non-OECD sub samples and high versus low and middle income sub samples. Here we find OECD and high income countries to have consistent results with our good persistence sub sample. Results of these robustness checks can be presented upon request

than spurious persistence. We report one step estimations with robust standard errors for all our models as these are known to be as robust as the two step estimator with Windmeijer's corrected standard errors. We also report both Sargan and Hansen test statistics as the GMM is highly dependent on internal instruments. Finally, year dummies are also included in all GMM models to make the assumption of no correlation across individuals in the idiosyncratic disturbances more likely to hold.

The estimation results of the test for true persistence of corruption are displayed in Table 1. There are two panels, the first is our main estimation in System GMM and the second panel displays results from our RE models. Each panel presents three models. The first is the basic model which tests only the effect of lagged corruption on current corruption levels. The second and third models include controls to ascertain the results of the persistence test from the basic model.

The result from our first analysis is presented in Table 1. For the RE models, corruption is highly persistent in our sample. This is because, as per our previous definition of persistence, the coefficient of lagged corruption in models 1 to 6 are all positive, less than 1 and highly significant. The system GMM, enabling us to control for all possible endogeneity and accounting for serial correlation, still gives us the same result. This implies that our findings on true persistence of corruption is very robust. This supports the first argument advanced that corruption in a current period is dependent on the history of corruption in previous periods (Tirole, 1996). The argument here is that in environments of pervasive corruption, observed rewards to rent seeking are likely to play a major role in creating a vicious cycle of persistent corruption (see Acemoglu, 1995; Andvig & Moene, 1990).

We also find that even after controlling for a host of factors including economic factors, institutional variables, both formal and informal, explain significantly current corruption levels.<sup>6</sup> Focusing specifically on our proxy for informal or social institutions, an increase in the level of social trust in a given country is likely to lead to an overall reduction in corruption. This finding is consistent with most of the literature on social effects which is the second argument for the pathways of persistence corruption. The identified channel through which social trust is likely to reduce corruption is through contagion (Dong et al., 2012). When there are previous high levels of trust in a society, it creates a certain expectation of trust in the subsequent periods which then reduces pervasive corruption. Other variables found to be significant are bureaucratic quality and ethnic tensions. These two are consistent with literature on corruption determinants where good formal institutions and ethnic fragmentation negatively affect current corruption levels (Dreher et al., 2009; Rose-Ackerman, 2007).

After establishing the existence of the persistence of corruption in our sample, we analyse the differing pathways through which past corruption impacts on current corruption levels. Particularly, we are interested in finding out the role of social capital or informal institutions

<sup>6</sup> Since corruption is ordered from highest to lowest with 1 being highly corrupt and 6 being lowly corrupt, the results are interpreted as such. Therefore, a positive coefficient represents a negative overall effect of social trust on corruption and vice versa

Table 1  
*Test of the persistence of corruption*

	System GMM			RE		
	(1)	(2)	(3)	(1a)	(2a)	(3a)
L.Corr	0.944*** (0.013)	0.864*** (0.027)	0.909*** (0.028)	0.961*** (0.004)	0.911*** (0.011)	0.870*** (0.020)
soctrust		0.527*** (0.193)	0.287* (0.151)		0.276*** (0.063)	0.395*** (0.129)
DemoAcc_n		0.005 (0.021)	0.028 (0.022)		0.020* (0.012)	0.048** (0.019)
Trade		0.000 (0.000)	-0.000 (0.000)		-0.000 (0.000)	0.000 (0.000)
hc		0.010 (0.055)	-0.049 (0.044)		-0.030 (0.021)	-0.060 (0.040)
govconsump		0.004 (0.006)	0.004 (0.004)		-0.002 (0.002)	0.003 (0.003)
BurQual_n		0.043 (0.030)	0.047* (0.028)		0.043*** (0.012)	0.065*** (0.023)
EthTens_n		0.022* (0.013)	0.000 (0.017)		0.003 (0.008)	-0.000 (0.016)
lnpop		-0.023 (0.020)	0.010 (0.015)		-0.022*** (0.006)	-0.006 (0.014)
lnrgdpc			-0.013 (0.032)			0.026 (0.030)
SFInd			-0.002 (0.007)			0.004 (0.006)
Gini			0.002 (0.002)			0.003** (0.001)
Wald Chi squared (pvalue)	0.000	0.000	0.000			
R squared				0.937	0.940	0.931
Sargan statistic (pvalue)	0.000	0.000	0.000			
Hansen statistic (pvalue)	0.281	1.000	1.000			
AR Test of order 3 (pvalue)	0.700	0.878	0.372			
Year dummies	Yes	Yes	Yes	No	No	No
No. of Countries	144	71	67	144	71	67
N	3917	1688	759	3917	1688	759

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

in corruption's persistence. Aside social capital, we also test the role of economic growth and formal institutions as these are the currently dominant factors associated with corruption in literature (Rose-Ackerman, 2007). We test these pathways by interacting lagged corruption with the determinants postulated by theory to influence corruption, namely institutions (formal and informal) and economic growth (Jain, 2001; Mishra, 2006; Treisman, 2007).

Table 2  
*Pathways of persistence of corruption*

	System GMM				RE			
	(1)	(2)	(3)	(4)	(1a)	(2a)	(3a)	(4a)
L.Corr	0.919*** (0.020)	0.814*** (0.035)	0.499*** (0.106)	0.591*** (0.139)	0.919*** (0.012)	0.832*** (0.019)	0.769*** (0.036)	0.563*** (0.103)
soctrust	0.009 (0.146)	0.077 (0.268)		0.079 (0.115)	0.013 (0.102)	-0.062 (0.145)		0.192 (0.120)
soctrust * L.Corr	0.113** (0.047)	0.091* (0.055)			0.082*** (0.027)	0.120*** (0.032)		
lnrgdpc		-0.077 (0.064)	-0.072** (0.029)	-0.084* (0.044)		0.025 (0.020)	-0.034*** (0.012)	-0.065** (0.030)
lnrgdpc * L.Corr			0.046*** (0.011)	0.036** (0.015)			0.019*** (0.004)	0.033*** (0.011)
Trade		0.001* (0.000)		-0.000 (0.000)		0.000 (0.000)		-0.000 (0.000)
govconsump		0.011* (0.006)		-0.000 (0.003)		-0.001 (0.003)		-0.001 (0.003)
hc		-0.005 (0.089)		-0.054** (0.027)		-0.066** (0.029)		-0.064** (0.028)
BurQual_n		0.159*** (0.046)		0.032 (0.022)		0.055*** (0.020)		0.048** (0.020)
EthTens_n		0.012 (0.017)		0.001 (0.010)		0.004 (0.011)		0.009 (0.011)
DemoAcc_n		0.034 (0.025)		-0.006 (0.013)		0.028** (0.013)		0.029** (0.013)
lnpop		-0.001 (0.027)		0.005 (0.011)		-0.009 (0.011)		-0.010 (0.011)
SFInd		0.000 (0.011)		-0.007 (0.007)		-0.005 (0.005)		-0.005 (0.005)
Wald Chi squared (pvalue)	0.000	0.000	0.000	0.000				
R squared					0.940	0.925	0.935	0.925
Sargan statistic (pvalue)	0.003	0.003	0.000	0.000				
Hansen statistic (pvalue)	1.000	1.000	0.987	1.000				
AR Test of order 3 (pvalue)	0.982	0.307	0.824	0.334				
Year dummies	Yes	Yes	Yes	Yes	No	No	No	No
No. of Countries	77	70	127	70	77	70	127	70
N	2120	1112	3187	1112	2120	1112	3187	1112

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 3  
*Pathways of persistence of corruption II*

	System GMM						RE					
	(5)	(6)	(7)	(8)	(9)	(10)	(5a)	(6a)	(7a)	(8a)	(9a)	(10a)
L.Corr	0.771*** (0.057)	0.858*** (0.043)	0.818*** (0.071)	0.889*** (0.030)	0.867*** (0.030)	0.883*** (0.077)	0.911*** (0.013)	0.808*** (0.037)	0.830*** (0.055)	0.892*** (0.011)	0.789*** (0.028)	0.750*** (0.042)
DemoAcc_n	-0.077*** (0.026)	-0.035* (0.020)	0.045 (0.057)		0.004 (0.011)	0.015 (0.028)	0.001 (0.007)	-0.013 (0.019)	0.012 (0.027)		0.029*** (0.009)	0.031** (0.013)
DemoAcc_n * L.Corr	0.038*** (0.011)	0.017** (0.008)	-0.001 (0.018)				0.008*** (0.002)	0.018** (0.007)	0.008 (0.010)			
BurQual_n		0.022 (0.017)	0.080 (0.055)	0.003 (0.030)	-0.045 (0.033)	0.107 (0.083)		0.034** (0.016)	0.057*** (0.019)	0.000 (0.011)	-0.070** (0.027)	-0.057 (0.038)
BurQual_n * L.Corr				0.017* (0.010)	0.025*** (0.010)	-0.013 (0.025)				0.016*** (0.003)	0.037*** (0.008)	0.040*** (0.013)
EthTens_n		-0.026** (0.012)	0.042* (0.024)		-0.026** (0.012)	0.040 (0.025)		0.004 (0.009)	0.006 (0.012)		0.003 (0.009)	0.008 (0.011)
lnrgdpc		0.027 (0.017)	0.075 (0.077)		0.025 (0.017)	0.101 (0.068)		0.030** (0.012)	0.027 (0.020)		0.026** (0.013)	0.026 (0.021)
Trade		0.000 (0.000)	0.000 (0.001)		0.000 (0.000)	-0.001 (0.001)		0.000 (0.000)	0.000 (0.000)		0.000 (0.000)	-0.000 (0.000)
govconsump		-0.000 (0.003)	0.010 (0.007)		0.000 (0.003)	0.009 (0.006)		-0.003 (0.002)	-0.001 (0.003)		-0.003* (0.002)	-0.002 (0.003)
hc		-0.074*** (0.025)	-0.065 (0.072)		-0.071*** (0.024)	0.044 (0.078)		-0.036* (0.021)	-0.062** (0.031)		-0.044** (0.022)	-0.082*** (0.030)
lnpop		0.005 (0.007)	-0.016 (0.031)		0.005 (0.007)	-0.038 (0.029)		-0.005 (0.007)	-0.012 (0.011)		-0.005 (0.007)	-0.009 (0.011)
SFIInd		-0.006	0.010		-0.007	0.024*		-0.000	-0.002		-0.003	-0.006

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	System GMM						RE					
	(5)	(6)	(7)	(8)	(9)	(10)	(5a)	(6a)	(7a)	(8a)	(9a)	(10a)
		(0.005)	(0.015)		(0.004)	(0.013)		(0.004)	(0.005)		(0.003)	(0.005)
soctrust			0.858*** (0.327)			0.599** (0.299)			0.280** (0.127)			0.163 (0.122)
Wald Chi squared	0.000	0.000	0.000	0.000	0.000	0.000						
R squared							0.938	0.920	0.924	0.939	0.921	0.925
Sargan statistic	0.000	0.000	0.000	0.000	0.000	0.060						
Hansen statistic	0.942	1.000	1.000	0.846	1.000	1.000						
AR Test of order 3	0.798	0.610	0.346	0.685	0.616	0.395						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
No. of Countries	142	105	70	142	105	70	142	105	70	142	105	70
<i>N</i>	3862	1677	1112	3862	1677	1112	3862	1677	1112	3862	1677	1112

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



Tables 2 and 3 present the findings of testing four different pathways of how past corruption impacts on future corruption levels. [Tirole \(1996\)](#) theorises that past corruption affects future corruption as a result of the build up of a history of corruption which is already confirmed by the evidence of persistent corruption in Table 1. We however also test other pathways, particularly the role of institutions and economic growth in the persistence of corruption. This is because, aside the literature that focuses on informal or social institutions as being crucial factors in determining how past corruption impacts on future corruption levels ([Dong et al., 2012](#)), institutional economics and principal agent models of corruption all point to economic growth and formal institutions as being the most important factors that affect pervasive bureaucratic corruption ([Rose-Ackerman, 2007](#)). We borrow from the pervasive corruption literature to test these pathways and most importantly to also test whether informal institutions matter more as a pathway for persistent corruption than formal institutions.

From Table 2, we find that social trust is a strong determinant of current corruption levels. However, when social trust is interacted with past corruption levels, it loses its effect on current corruption levels but the pathway of social trust influencing current corruption levels through past corruption become significant. This result is robust across all specifications. This supports the conditional corruption thesis advanced by [Dong et al. \(2012\)](#). High past corruption levels are likely to impact negatively on future corruption levels when levels of social trust are also low. From a macro perspective, when there is a lack of trust generally among a given population, people are likely to be corrupt in the future when there is an already established trend of corruption from the past which further reduces the social trust. This leads to a vicious cycle of low trust- low corruption through established trends of past corruption.

We again find from Table 2 that, past corruption impacts future corruption levels through economic growth. That is, the higher the real GDP of a country, the lower the effect of past corruption levels on future corruption levels. This finding is robust to possible endogeneity issues between economic growth and corruption as the system GMM is also employed in the estimation using the Random effects model as the base with both models arriving at similar results. The results hold even when the base model is extended to include more covariates. However, although the interaction term enters the equation as significant and with the right sign, real GDP does not. This gives us the finding that, when there is a high level of past corruption in a given society, high levels of real GDP is still likely to result in high levels of corruption in the future. This finding seems counter-intuitive as economic growth is perceived to lead to lower levels of corruption. However, as [Swaleheen \(2012\)](#) points out in his study, unless there is a decline in the persistent trend of corruption in a given society, the relationship between economic growth and corruption is likely to remain inconsistent at best and ineffective at worst.

From Table 3, we find that formal institutions indeed also matter in explaining how past corruption affects future corruption. Looking at democratic accountability and bureaucratic quality as proxies of formal institutions, models 5, 6, 8 and 9 reveal that, past corruption is likely to affect future corruption levels through formal institutions. In other words, when there are strong

formal institutions such as high levels of democratic accountability and bureaucratic quality in a country, the effect of past corruption levels or trends on corruption reduces but a propelling effect is experienced in countries with weak formal institutions. This confirms the supremacy of formal institutions as postulated by principal agent models where mechanisms such as strong democratic accountability to check the amoral behaviours of agents, are more likely to reduce corruption levels (Rose-Ackerman, 2007).

Since we find that social institutions also matter in determining the effect of past corruption on future corruption, in models 7 and 10 (and their corresponding RE models 7a and 10a), we control for social trust in our models to see whether the pathway of formal institutions still matters as much when informal institutions are included in the model.<sup>7</sup> What we find is that, not only do our formal institutions variables lose their significance, but in the system GMM models, their sign even changes.<sup>8</sup> This implies that though formal institutions matter for both pervasive and persistence corruption, once social institutions are introduced, the pathway of formal institutions for past corruptions effects vanishes. This provides prima facie evidence that social institutions may matter more than formal institutions in reducing past corruption's impacts on future corruption.

So far, persistence of corruption has been bundled together to encompass both persistently low levels of corruption and persistently high levels of corruption. However, though the optimum desire for every country is zero levels of corruption, most often we have to settle for a second best solution of low corruption levels as there is yet to be empirical evidence of zero levels of corruption in any given society. We therefore move beyond generalising persistence of corruption to find evidence of what we term in the study as good persistence and bad persistence of corruption and to also find pathways which may matter in these two situations focusing solely on the role of institutions, both formal and informal.

Here, we categorise countries into high and low corruption categories. Countries ever recording a corruption level of 3 and below are grouped into the low corruption category while countries ever recording a corruption value of above three are grouped into a high corruption category. This implies that some countries are likely to find themselves in both high and low corruption categories. It is therefore of particular interest to find out whether countries can find themselves in a persistently low corruption category. Persistence of corruption observed in the low corruption category is termed "good persistence" and persistence observed in the high corruption category is termed "bad persistence".

Once we have established evidence of good and bad persistence in our sample, we go further to test pathways of these different types of persistence. Here we focus again on formal and informal institutions to see what pathway matters more in reducing the effect of past corruption levels on future ones. This is because, most countries in the bad persistence regime especially cannot

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<sup>7</sup> In models 4 and 4a of table 4, formal institutions are included in the model, however, the pathway of social institutions still remain significant

<sup>8</sup> This finding is however only robust for democratic accountability and not for bureaucratic quality as the RE models do not present similar results

do anything about their past, that is, they cannot change the fact that they have persistently had high corruption levels in the past. However, if the pathways through which this bad persistence occurs are known, then there could be hope for a reversal of corruption trends in these countries. We also test the pathways for countries that experience good persistence separately as there might be different factors that affect these two sets of countries. For example, we hypothesise that social trust may matter more for countries in the bad persistence regime than for those in the good persistence regime. This is because countries in the bad persistence regime are also mostly characterised by weak formal institutions which then increases the role of informal institutions in such societies. This hypothesis is supported by some studies that have considered the role of social norms in shaping anti-corruption behaviours and have found that informal institutions sometimes work better than formal rules (Dixit, 2009; Hira, 2016; Jancsics, 2014). In fact, social norms may neutralise and overpower any effect formal laws or institutions may have depending on the context but particularly in countries with weak formal institutions (Chang, Lai, & Yang, 2000; Fadahunsi & Rosa, 2002; Pottenger, 2014a, 2014b). However, none of these studies focus particularly on the informal institution of trust. There is therefore not enough empirical evidence to support this hypothesis or its alternative. Hence, this presents one of the first empirical evidence on what type of institution may matter for countries in good or bad persistence regimes of corruption.

Table 4  
*Pathways of Good and bad persistence of corruptions's impact*

	Countries with Good Persistence						Countries with Bad Persistence					
	System GMM				RE		System GMM				RE	
	(1) Trust	(2) Trust	(3) DemoAcc_n	(4) DemoAcc_n	(2a) Trust	(4a) DemoAcc_n	(5) Trust	(6) Trust	(7) DemoAcc_n	(8) DemoAcc_n	(6a) Trust	(8a) DemoAcc_n
L.Corr	0.831*** (0.050)	0.979*** (0.035)	1.043*** (0.041)	1.077*** (0.142)	0.671*** (0.042)	0.151 (0.269)	0.685*** (0.073)	0.831*** (0.055)	0.733*** (0.078)	0.779*** (0.100)	0.688*** (0.050)	0.877*** (0.091)
soctrust	0.945** (0.419)	0.630*** (0.231)		0.791*** (0.250)	-0.102 (0.242)	0.428** (0.209)	-0.166 (0.428)	0.300 (0.425)		0.059 (0.167)	-0.142 (0.384)	-0.264 (0.211)
soctrust_1	0.000 (0.085)	-0.088* (0.053)			0.160*** (0.052)		-0.112 (0.142)	-0.046 (0.153)			0.020 (0.128)	
DemoAcc_n		-0.002 (0.034)	-0.002 (0.026)	0.100 (0.114)	0.010 (0.028)	-0.268 (0.171)		0.020 (0.018)	-0.068 (0.044)	-0.076 (0.046)	0.021 (0.020)	0.196*** (0.050)
lnrgdpc		0.035 (0.042)		0.087 (0.061)	0.003 (0.028)	0.024 (0.042)		0.015 (0.033)		0.005 (0.017)	0.080** (0.032)	0.045 (0.035)
Trade		0.000 (0.000)		-0.000 (0.001)	-0.001* (0.001)	0.000 (0.001)		-0.001 (0.001)		0.000 (0.000)	-0.001 (0.001)	-0.000 (0.001)
lnpop		-0.010 (0.021)		0.008 (0.029)	-0.043*** (0.014)	-0.008 (0.026)		-0.009 (0.017)		0.008 (0.008)	-0.039*** (0.014)	0.004 (0.019)
EthTens_n		0.023 (0.025)		0.036 (0.029)	0.012 (0.017)	0.020 (0.036)				0.008 (0.010)		0.024 (0.018)
DemoAcc_1			-0.002 (0.008)	-0.026 (0.027)		0.088* (0.046)			0.040** (0.020)	0.040** (0.020)		-0.076*** (0.022)
govconsump				-0.005 (0.008)		0.002 (0.007)		-0.003 (0.005)		-0.002 (0.003)	-0.004 (0.004)	0.005 (0.004)
hc				-0.229***		-0.010		-0.107**		-0.056	-0.133**	-0.090

continued ...

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	Countries with Good Persistence						Countries with Bad Persistence					
	System GMM				RE		System GMM				RE	
	(1)	(2)	(3)	(4)	(2a)	(4a)	(5)	(6)	(7)	(8)	(6a)	(8a)
	Trust	Trust	DemoAcc_n	DemoAcc_n	Trust	DemoAcc_n	Trust	Trust	DemoAcc_n	DemoAcc_n	Trust	DemoAcc_n
				(0.086)		(0.081)		(0.051)		(0.035)	(0.056)	(0.066)
SFInd				0.002		0.008				-0.004		-0.012
				(0.016)		(0.010)				(0.006)		(0.007)
BurQual_n								0.042**			0.016	
								(0.019)			(0.030)	
Wald Chi squared	0.000	0.000	0.000	0.000			0.000	0.000	0.000	0.000		
R squared					0.857	0.812					0.747	0.727
Sargan statistic	0.001	0.000	0.070	0.003			0.066	0.000	0.000	0.000		
Hansen statistic	0.999	1.000	1.000	1.000			0.977	1.000	0.254	1.000		
AR Test of order 3	0.697	0.573	0.545	0.201			0.650	0.912	0.710	0.367		
Year dummies	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
No. of Countries	58	55	98	49	55	49	61	55	122	55	55	55
N	884	774	1273	425	774	425	1236	919	2589	687	919	687

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 4 presents the results of our estimation for our two sub samples; countries experiencing “good persistence” and countries experiencing “bad persistence”. We again present results for both RE and System GMM estimations. For our RE models, we only present findings from our extended models, that is models with covariates included.

Looking first at the results for countries with good persistence of corruption, we find that, democratic accountability and its pathway for past corruption are not significant. In fact, we do not even find evidence of persistent corruption when we focus on the democratic accountability pathway at all values of democratic accountability in this sub sample as confirmed in table 10. We only find evidence of true persistence at very high levels of democratic accountability and only for the extended model (model 4). We also find social trust to be highly significant in explaining current corruption levels. However, we only find a slight significance (at 10%) for the pathway of social trust only in the extended model. The significance of the social trust pathway is also confirmed in the RE model (2a).

This finding, though contrary to our initial hypothesis, is not very surprising. This is because most of the countries in this sub-sample are already established democracies with strong formal institutions. Since we know that formal institutions tend to be sticky over time, any change of their formal institutions from good to better is not likely to influence how past corruption levels affect current and future corruption levels. Therefore, the only way past corruption levels can still influence current corruption levels is how the society still perceives corruption, which then reflects in the trust levels in these countries. Therefore, regardless of the levels of past corruption, once there is a high level of social trust within the society, current corruption levels are likely going to reduce keeping these countries in persistently good levels of corruption. Also, once there are persistently low levels of corruption, this is likely to create a virtuous cycle of high social trust levels leading to persistently low levels of corruption.

The result is opposite in the case of countries with bad persistence of corruption. First, we find all countries in this sub-sample to experience bad persistence of corruption at all values of social trust and democratic accountability except at very high levels of democratic accountability - there is no evidence of persistence corruption when there is high democratic accountability. Also, we find that social trust and its pathway are insignificant across all specifications. We however find strong evidence of democratic accountability and its pathway influencing current corruption in our RE model and corresponding evidence albeit weaker in our system GMM model.

Again, this finding goes contrary to our hypothesis that social institutions may matter more for countries with bad persistence of corruption. Indeed, we find that high levels of past corruption influence current and future levels of corruption through democratic accountability, thus through formal institutions. This implies that, with the weak formal institutions in most of the countries in this sub sample, past high corruption levels are likely to persist leading to high corruption levels in the future if there are no improvements in existing formal institutions.

For countries with bad persistence of corruption, this finding gives a bleak future in their efforts

at reducing corruption levels. The vicious cycle of weak formal institutions and associated high corruption levels in these countries breeds the persistence of corruption. However, the bright side of this argument is found in the results for countries with good persistence of corruption. Combining the results from both good and bad persistence of corruption, we find that, formal institutions are important, to move countries from a bad to a good persistence of corruption to a good persistence of corruption. However, to prevent them from moving back into a regime of bad persistence of corruption, social institutions become more important.

These findings provide insights into the role of social trust in keeping countries at the second best option of good persistence of corruption. They also accentuate the importance of building strong formal institutions hand-in-hand with good informal institutions. This is because, as strong formal institutions lead countries from a position of bad corruption persistence to good persistence, the sustainability of persistently low levels of corruption are highly dependent on the latter, thus on social institutions.

Therefore in economically stable (rich) countries with low levels of corruption, social trust which stems from what [Knack and Keefer \(1997\)](#) refer to as civic cooperation may matter more as a result of a shift in focus from daily subsistence to social cohesion. Although formal institutions affect level of corruption in societies, informal institution of trust, which governs the interactions of people within the society, may be the driving factor of their level of corruption. The opposite, however, holds for low income countries with high corruption levels. This implies that formal institutions such as democratic accountability are necessary conditions for countries that find themselves in a bad persistence of corruption regime. However, focusing solely on strengthening formal institutions at the neglect of informal institutions may not be a sufficient condition to emancipate countries experiencing regimes of bad persistence of corruption.

## Conclusion

The role of institutions in reducing corruption has been widely researched in corruption literature and there is a lot of evidence pointing to the fact that strong formal institutions play a huge role in reducing pervasive bureaucratic corruption levels. However, not much attention has been paid to the persistence of corruption and how different types of institutions may matter or not in reducing the effects of persistent corruption on current and future corruption levels. The aim of this paper was to shed broader light on the persistence of corruption and especially establish the pathways through which past corruption is likely to influence current and future corruption levels.

Using a system GMM model applied on a pooled panel dataset for 144 countries spanning 27 years, we were able to establish the presence of true persistence of corruption in our sample taking into account the initial conditions problem. Our findings after unbundling what is termed generally as persistence of corruption, revealed a distinction between “good” and “bad” persistence of corruption after dis-aggregating our sample into countries with corruption levels of 3 and below and above 3. Focusing on differing pathways through which past corruption was



likely to influence future corruption levels, we found three very important pathways, through economic growth, formal institutions and informal or social institutions.

Economic growth has a strong positive effect on how past corruption levels affect current corruption. This implies that, once corruption is highly persistent in an economy, increasing economic growth is likely not going to lead to a reduction in future corruption levels. Past corruption is seen to influence future corruption levels through formal institutions but only when social institutions are not accounted for. Once social institutions are accounted for, the formal institutions pathway loses its significance. However, social institutions, even after controlling for formal institutions still remains a very significant pathway through which past corruption influences future corruption; the higher the levels of trust in a society, past corruption only influences future corruption positively. Focusing on formal versus informal institutions and how they matter in reducing corruption (good and bad persistence of corruption regimes), we find that whereas informal institutions matter in keeping countries in a good persistence regime, formal institutions matter in moving countries from a bad persistence regime to a good persistence regime. This reveals both necessary and sufficient conditions for maintaining a good persistence of corruption.

These findings have significant implications for anti-corruption policy formulation. From the findings of this study, a prudent anti-corruption policy will have to focus on strengthening both formal and informal institutional mechanisms to sustainably move countries from a bad corruption persistence regime to a good persistence regime. Given the vicious cycle within which most countries in the bad persistence regime find themselves, neglecting one type of institutional approach in favour of the other will not suffice since the very nature of this vicious cycle makes it difficult to improve overall corruption without focusing on these dual institutional arrangements.

## References

- Acemoglu, D. (1995, January). Reward structures and the allocation of talent. *European Economic Review*, 39(1), 17–33. Retrieved from <http://www.sciencedirect.com/science/article/pii/001429219400014Q><http://www.sciencedirect.com/science/article/pii/001429219400014Q/pdf?md5=cb25d9d89f6254050d6c724199df2955&pid=1-s2.0-001429219400014Q-main.pdf> doi: 10.1016/0014-2921(94)00014-Q
- Ades, A., & Di Tella, R. (1999, September). Rents, Competition, and Corruption. *The American Economic Review*, 89(4), 982–993. Retrieved from <http://www.jstor.org/stable/pdf/117169.pdf>
- Ahn, S. C., & Schmidt, P. (1995, July). Efficient estimation of models for dynamic panel data. *Journal of Econometrics*, 68(1), 5-27. Retrieved from <https://ideas.repec.org/a/eee/econom/v68y1995i1p5-27.html>
- Aidt, T. (2003). Economic analysis of corruption: a survey. *Economic Journal*, 113(491), F632-F652. Retrieved from <http://EconPapers.repec.org/RePEc:ecj:econjl:v:113:y:2003:i:491:p:f632-f652>
- Alatas, V., Cameron, L., Chaudhuri, A., Erkal, N., & Gangadharan, L. (2009). Gender and corruption: insights from an experimental analysis. *Southern Economic Journal*, 75(3), 663–680. Retrieved from <http://www.economics.unimelb.edu.au/SITE/research/workingpapers/wp06/974.pdf>
- Ali, A. M., & Isse, H. S. (2003). Determinants of economic corruption: A cross-country comparison. *Cato Journal*, 22(3), 449-466. Retrieved from <http://EconPapers.repec.org/RePEc:cto:journl:v:22:y:2003:i:3:p:449-466>
- Andvig, J. C., & Moene, K. O. (1990). How corruption may corrupt. *Journal of Economic Behavior & Organization*, 13(1), 63 - 76. Retrieved from <http://www.sciencedirect.com/science/article/pii/016726819090053G> doi: [http://dx.doi.org/10.1016/0167-2681\(90\)90053-G](http://dx.doi.org/10.1016/0167-2681(90)90053-G)
- Arellano, M., & Bond, S. (1991, April). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58(2), 277-97. Retrieved from <https://ideas.repec.org/a/bla/restud/v58y1991i2p277-97.html>
- Arellano, M., & Bover, O. (1995, July). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. Retrieved from <https://ideas.repec.org/a/eee/econom/v68y1995i1p29-51.html>
- Banerjee, A. V. (1997, November). A Theory of Misgovernance. *The Quarterly Journal of Economics*, 112(4), 1289–1332. Retrieved from <http://www.jstor.org/stable/2951272><http://www.jstor.org/stable/pdfplus/10.2307/2951272.pdf?acceptTC=true>
- Bardhan, P. (1997). Corruption and Development: A Review of Issues. *Journal of Economic Literature*, 35(3), 1320–1346. Retrieved from <http://www.scopus.com/record/display.url?eid=2-s2.0-1542424092&origin=inward&txGid=B63F24B394B48071B67F11FB3F9BDFAC.fM4vPBipdL1BpirDq5Cw%3a1>
- Barr, A., & Serra, D. (2010, December). Corruption and culture: An experimental

- analysis. *Journal of Public Economics*, 94(11?Å\$12), 862–869. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0047272710000927http://www.sciencedirect.com/science/article/pii/S0047272710000927/pdf?md5=61675bb88f491f62f59cab4f9ed29b64&pid=1-s2.0-S0047272710000927-main.pdf> doi: 10.1016/j.jpubeco.2010.07.006
- Bissessar, N. (2009). Does corruption persist in sub-saharan africa? *International Advances in Economic Research*, 15(3), 336-350. Retrieved from <http://EconPapers.repec.org/RePEc:kap:iaecre:v:15:y:2009:i:3:p:336-350>
- Bjørnskov, C. (2003). *Corruption and Social Capital* (Tech. Rep.). University of Aarhus, Aarhus School of Business, Department of Economics. Retrieved from [https://ideas.repec.org/p/hhs/aareco/2003\\_013.htmlhttp://www.hha.dk/nat/wper/03-13\\_chbj.pdf](https://ideas.repec.org/p/hhs/aareco/2003_013.htmlhttp://www.hha.dk/nat/wper/03-13_chbj.pdf)
- Blackburn, K., Bose, N., & Emranul Haque, M. (2006, December). The incidence and persistence of corruption in economic development. *Journal of Economic Dynamics and Control*, 30(12), 2447–2467. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0165188905001727http://www.sciencedirect.com/science/article/pii/S0165188905001727/pdf?md5=fb55b3b1add679cb69241a9e46ead4be&pid=1-s2.0-S0165188905001727-main.pdf> doi: 10.1016/j.jedc.2005.07.007
- Blackburn, K., Bose, N., & Haque, M. E. (2010). Endogenous corruption in economic development. *Journal of Economic Studies*, 37(1), 4-25. Retrieved from <http://dx.doi.org/10.1108/01443581011012234> doi: 10.1108/01443581011012234
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143. Retrieved from <http://EconPapers.repec.org/RePEc:eee:econom:v:87:y:1998:i:1:p:115-143>
- Blundell, R., Bond, S., & Windmeijer, F. (2000). *Estimation in dynamic panel data models: improving on the performance of the standard gmm estimator* (IFS Working Papers No. W00/12). Institute for Fiscal Studies. Retrieved from <http://EconPapers.repec.org/RePEc:ifs:ifsewp:00/12>
- Brunetti, A., & Weder, B. (2003). A free press is bad news for corruption. *Journal of Public Economics*, 87(7-8), 1801-1824. Retrieved from <http://EconPapers.repec.org/RePEc:eee:pubeco:v:87:y:2003:i:7-8:p:1801-1824>
- Castellacci, F., & Natera, J. M. (2011). A new panel dataset for cross-country analyses of national systems, growth and development (cana). *Innovation and Development*, 1(2), 205-226. Retrieved from <http://dx.doi.org/10.1080/2157930X.2011.605871> doi: 10.1080/2157930X.2011.605871
- Chang, J. J., Lai, C. C., & Yang, C. C. (2000, March). Casual police corruption and the economics of crime: Further results. *International Review of Law and Economics*, 20(1), 35–51. doi: 10.1016/S0144-8188(00)00020-X
- Cieslik, A., & Goczek, L. (2015). *On the Evolution of Corruption Patterns in the Post-Communist Countries* (Tech. Rep.). Institute of Economic Research. Retrieved from [https://ideas.repec.org/p/pes/wpaper/2015no7.htmlhttp://www.badania-gospodarcze.pl/images/Working\\_Papers/2015\\_No\\_7.pdf](https://ideas.repec.org/p/pes/wpaper/2015no7.htmlhttp://www.badania-gospodarcze.pl/images/Working_Papers/2015_No_7.pdf)
- Damania, R., Fredriksson, P. G., & Mani, M. (2004, October). The persistence of corruption and

- regulatory compliance failures: Theory and evidence. *Public Choice*, 121(3-4), 363–390. doi: 10.1007/s11127-004-1684-0
- Dixit, A. (2009, March). Governance Institutions and Economic Activity. *American Economic Review*, 99(1), 5–24. doi: 10.1257/aer.99.1.5
- Dong, B., Dulleck, U., & Torgler, B. (2012). Conditional corruption. *Journal of Economic Psychology*, 33(3), 609–627. Retrieved from <http://dx.doi.org/10.1016/j.joep.2011.12.001> doi: 10.1016/j.joep.2011.12.001
- Dreher, A., Kotsogiannis, C., & McCorriston, S. (2009). How do institutions affect corruption and the shadow economy? *International Tax and Public Finance*, 16(6), 773–796. Retrieved from <http://EconPapers.repec.org/RePEc:kap:itaxpf:v:16:y:2009:i:6:p:773-796>
- Fadahunsi, A., & Rosa, P. (2002, September). Entrepreneurship and illegality: Insights from the Nigerian cross-border Trade. *Journal of Business Venturing*, 17(5), 397–429. doi: 10.1016/S0883-9026(01)00073-8
- Fischbacher, U., Gächter, S., & Fehr, E. (2001). *Are People Conditionally Cooperative? Evidence from a Public Goods Experiment* (Tech. Rep.). Institute for Empirical Research in Economics - University of Zurich. Retrieved from <https://ideas.repec.org/p/zur/iewwpx/016.html><http://www.iew.uzh.ch/wp/iewwpx016.pdf>
- Fisman, R., & Gatti, R. (2002). Decentralization and corruption: evidence across countries. *Journal of Public Economics*, 83(3), 325–345. Retrieved from <http://EconPapers.repec.org/RePEc:eee:pubeco:v:83:y:2002:i:3:p:325-345>
- Fisman, R., & Miguel, E. (2007). Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets. *Journal of Political Economy*, 115(6), 1020–1048. Retrieved from <https://ideas.repec.org/a/ucp/jpolec/v115y2007i6p1020-1048.html>
- Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? *Economics of Governance*, 3(1), 23–45. Retrieved from <http://EconPapers.repec.org/RePEc:spr:ecogov:v:3:y:2002:i:1:p:23-45>
- Hahn, J. (1999, December). How informative is the initial condition in the dynamic panel model with fixed effects? *Journal of Econometrics*, 93(2), 309–326. Retrieved from <https://ideas.repec.org/a/eee/econom/v93y1999i2p309-326.html>
- Harrison, L. E., & Huntington, S. P. (2000). *Culture matters: How values shape human progress*. Basic books.
- Heckman, J. J. (1981). *The incidental parameters problem and the problem of initial conditions in estimating a discrete time-discrete data stochastic process* (Vol. The structural analysis of discrete data; C. Manski & D. McFadden, Eds.). MIT Press.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., & Gintis, H. (2004). *Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies* (Tech. Rep.). Oxford University Press. Retrieved from <http://econpapers.repec.org/bookchap/oxpobooks/9780199262052.htm>
- Herzfeld, T., & Weiss, C. (2007, July). Corruption clubs: empirical evidence from kernel density estimates. *Applied Economics*, 39(12), 1565–1572. Retrieved from <http://dx.doi.org/10.1080/00036840500461980><http://www.tandfonline.com/doi/>

- abs/10.1080/00036840500461980#.VTKdtvmUcnEhttp://www.tandfonline.com/doi/pdf/10.1080/00036840500461980 doi: 10.1080/00036840500461980
- Hira, A. (2016, March). Broken Windows: Why Culture Matters in Corruption Reform. *Journal of Developing Societies*, 32(1), 1–16. doi: 10.1177/0169796X15609710
- Jain, A. K. (2001, February). Corruption: A Review. *Journal of Economic Surveys*, 15(1), 71–121. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/1467-6419.00133/abstract><http://onlinelibrary.wiley.com/store/10.1111/1467-6419.00133/asset/1467-6419.00133.pdf?v=1&t=i8k7uq13&s=d6b71b0de40dde5fc05521b44fe00e25e6e8b33f> doi: 10.1111/1467-6419.00133
- Jancsics, D. (2014). Interdisciplinary perspectives on corruption. *Sociology Compass*, 8(4), 358–372.
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly journal of economics*, 1251–1288. Retrieved from <http://www.jstor.org/stable/2951271><http://www.jstor.org.ezproxy.unimaas.nl/stable/pdf/2951271.pdf?acceptTC=true>
- Mauro, P. (1995). Corruption and Growth. *The Quarterly Journal of Economics*, 110(3), 681–712. Retrieved from <https://ideas.repec.org/a/tpr/qjecon/v110y1995i3p681-712.html>
- Mauro, P. (2004). *The persistence of corruption and slow economic growth? ŽŽ*, *IMF Staff Papers* 51 (1): 1?Š18 (Tech. Rep.). Academic Press. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/summary;jsessionid=531D193C396A41CB6CC3F7EEDAD360E6?doi=10.1.1.545.3931>
- Mishra, A. (2006). Persistence of corruption: Some theoretical perspectives. *World Development*, 34(2), 349–358. doi: 10.1016/j.worlddev.2005.03.010
- Pottenger, M. (2014a, December). Incentives and Norms in Anticorruption Reform. *Australian Journal of Public Administration*, 73(4), 482–490. doi: 10.1111/1467-8500.12111
- Pottenger, M. (2014b, April). Moving beyond the rational choice debate via social capital: The study of illegal private protection. *Australian Journal of Political Science*, 49(2), 267–281. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/10361146.2014.898242> doi: 10.1080/10361146.2014.898242
- Roodman, D. (2009, March). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, 9(1), 86–136. Retrieved from <https://ideas.repec.org/a/tsj/stataj/v9y2009i1p86-136.html>
- Rose-Ackerman, S. (1999). *Corruption and government: Causes, consequences, and reform*. Cambridge University Press. Retrieved from <https://books.google.nl/books?id=XBA1cZlB5AoC>
- Rose-Ackerman, S. (2007). *International Handbook on the Economics of Corruption* (S. Rose-Ackerman, Ed.). Edward Elgar Publishing. Retrieved from <https://books.google.nl/books?id=P60nmWlJWEoC>
- Rothstein, B. (2014). What is the opposite of corruption? *Third World Quarterly*, 35(5), 737–752.
- Rothstein, B., & Uslaner, E. (2005, October). All for All: Equality, Corruption and Social

- Trust. *World Politics*, 58(1), 41–72. Retrieved from <http://www.jstor.org/stable/pdf/40060124.pdf>
- Sachs, J. D., & Warner, A. M. (1995, December). *Natural Resource Abundance and Economic Growth* (NBER Working Papers No. 5398). National Bureau of Economic Research, Inc. Retrieved from <https://ideas.repec.org/p/nbr/nberwo/5398.html>
- Sah, R. (2007, August). Corruption across countries and regions: Some consequences of local osmosis. *Journal of Economic Dynamics and Control*, 31(8), 2573–2598. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0165188906001667> doi: 10.1016/j.jedc.2006.09.002
- Sarlo, P. (2014). The Global Financial Crisis and the Transnational Anti-Corruption Regime: A call for regulation of the World Bank’s lending practices. *Georgetown Journal of International Law*, 45, 1294–1321.
- Seldadyo, H., & De Haan, J. (2011). Is corruption really persistent? *Pacific Economic Review*, 16(2), 192–206. doi: 10.1111/j.1468-0106.2011.00542.x
- Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1), 225–256. Retrieved from <http://EconPapers.repec.org/RePEc:kap:pubcho:v:126:y:2006:i:1:p:225-256>
- Seung-Hyun Lee, K. O. (2010). Why Do Firms Bribe? Insights from Residual Control Theory into Firms’ Exposure and Vulnerability to Corruption. *MIR: Management International Review*, 50(6), 775–796. Retrieved from [http://www.researchgate.net/publication/261973471\\_Why\\_Do\\_Firms\\_Bribe\\_Insights\\_from\\_Residual\\_Control\\_Theory\\_into\\_Firms%27\\_Exposure\\_and\\_Vulnerability\\_to\\_Corruption](http://www.researchgate.net/publication/261973471_Why_Do_Firms_Bribe_Insights_from_Residual_Control_Theory_into_Firms%27_Exposure_and_Vulnerability_to_Corruption) doi: 10.2307/41426823
- Shah, A. (2006, March). Corruption and Decentralized Public Governance. In *Handbook of Fiscal Federalism* (chap. 19). Edward Elgar. Retrieved from [http://ideas.repec.org/h/elg/eechap/3584\\_19.html](http://ideas.repec.org/h/elg/eechap/3584_19.html)
- Shleifer, A., & Vishny, R. W. (1993, August). Corruption. *The Quarterly Journal of Economics*, 108(3), 599–617. Retrieved from <http://qje.oxfordjournals.org/content/108/3/599><http://qje.oxfordjournals.org/content/108/3/599.abstract> doi: 10.2307/2118402
- Svendsen, G. T. (2003). *Social Capital, Corruption and Economic Growth: Eastern and Western Europe* (Tech. Rep.). University of Aarhus, Aarhus School of Business, Department of Economics. Retrieved from [https://ideas.repec.org/p/hhs/aareco/2003\\_021.html](https://ideas.repec.org/p/hhs/aareco/2003_021.html)
- Svensson, J. (2005, September). Eight Questions about Corruption. *The Journal of Economic Perspectives*, 19(3), 19–42. Retrieved from <http://www.ingentaconnect.com/search/download?pub=infobike://aea/jep/2005/00000019/00000003/art00002&mimetype=application/pdf> doi: 10.1257/089533005774357860
- Swaleheen, M. (2012). Curbing corruption for higher growth: The importance of persistence. *Economics Letters*, 116(2), 255–257. Retrieved from <http://dx.doi.org/10.1016/j.econlet.2012.03.011> doi: 10.1016/j.econlet.2012.03.011
- Tirole, J. (1996, January). A Theory of Collective Reputations (with applications to the persistence of corruption and to firm quality). *The Review of Economic Studies*, 63(1),



- 1-22. Retrieved from <http://restud.oxfordjournals.org/content/63/1/1><http://restud.oxfordjournals.org/content/63/1/1.abstract> doi: 10.2307/2298112
- Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of Public Economics*, 76(3), 399-457. Retrieved from <http://EconPapers.repec.org/RePEc:eee:pubeco:v:76:y:2000:i:3:p:399-457>
- Treisman, D. (2007, June). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annual Review of Political Science*, 10, 211-244. doi: DOI:10.1146/annurev.polisci.10.081205.095418
- Wladimir, R., Mohnen, P., Franz, P., & van der Loeff, S. S. (2010, August). Persistence of innovation in dutch manufacturing: Is it spurious? *Review of Economics and Statistics*, 92(3), 495-504. doi: 10.1162/REST\_a\_00004
- Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data* (Vol. 58) (No. 2). MIT Press. doi: 10.1515/humr.2003.021
- Wooldridge, J. M. (2005). Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity. *Journal of Applied Econometrics*, 20(1), 39-54. Retrieved from <https://ideas.repec.org/a/jae/japmet/v20y2005i1p39-54.html>



## Appendix One: Variable Definitions

**Corruption:** A measure of corruption within the political system that is a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process. It is more concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, "favour-for-favours", secret party funding, and suspiciously close ties between politics and business.

**Bureaucratic Quality:** Measures the institutional strength and quality of the bureaucracy of a country. It is meant as a shock absorber that tends to minimize revisions of policy when governments change. In low-risk countries, the bureaucracy is somewhat autonomous from political pressure.

**Democratic Accountability:** A measure of, not just whether there are free and fair elections, but how responsive government is to its people. The less responsive it is, the more likely it will fall. Even democratically elected governments can delude themselves into thinking they know what is best for the people, regardless of clear indications to the contrary from the people.

**Ethnic Tensions:** A measure of the degree of tension attributable to racial, national, or language divisions. Lower ratings (higher risk) are given to countries where tensions are high because opposing groups are intolerant and unwilling to compromise.

**Real Gross Domestic Product per capita:** GDP per capita is gross domestic product divided by midyear population. GDP is 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 products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars. We transform the data into logarithmic form for the estimations.

**Population (in millions):** Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. Data is transformed into the logarithm of population.

**Government Consumption:** General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. It is measured as a percentage of GDP.

**Trade:** Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product

**GINI Inequality Index:** The Gini index is defined to be the area between the 45 degree line

and the Lorenz curve. The greater the Gini index, the more unequally income is distributed. It takes values between 0 (perfectly equal distribution) and 100 (perfectly unequal distribution with all income going to the highest income household).

**State Fragility Index:** The State Fragility Index combines scores on eight indicators and ranges from 0 “no fragility” to 25 “extreme fragility.” A country’s fragility is closely associated with its state capacity to manage conflict; make and implement public policy; and deliver essential services and its systemic resilience in maintaining system coherence, cohesion, and quality of life; responding effectively to challenges and crises, and sustaining progressive development.

**Polity Score:** The POLITY scale ranges from -10, fully institutionalized autocracy, to +10, fully institutionalized democracy.

**Social Trust:** Social Trust is the percentage of people in each country who “agree” with this statement: “Most people can be trusted”.

**Human capital:** The human capital index is based on the average years of schooling from Barro and Lee (2013) and on data by Cohen and Leker (2014).

Appendix Two: Correlation Coefficient of variables

Table 5

*Pearson's Correlation Coefficients*

Variable	Corr	SocT	Gini	GDP	SFI	Pol	Hc	GovC	Trade	BurQ	DemAc	EthT	Pop
Corr	1												
SocT	0.553*	1											
Gini	-0.327*	-0.439*	1										
GDP	0.501*	0.491*	-0.363*	1									
SFI	-0.579*	-0.432*	0.403*	-0.826*	1								
Pol	0.378*	0.187*	-0.104*	0.380*	-0.499*	1							
Hc	0.469*	0.458*	-0.422*	0.751*	-0.809*	0.584*	1						
GovC	0.305*	0.395*	-0.328*	0.311*	-0.297*	-0.000	0.247*	1					
Trade	0.088*	0.037	-0.015	0.247*	-0.233*	-0.011	0.216*	0.145*	1				
BurQ	0.680*	0.543*	-0.351*	0.701*	-0.745*	0.456*	0.647*	0.308*	0.197*	1			
DemAc	0.524*	0.345*	-0.310*	0.429*	-0.582*	0.772*	0.575*	0.144*	0.076*	0.617*	1		
EthT	0.342*	0.257*	-0.064*	0.437*	-0.504*	0.211*	0.388*	0.119*	0.140*	0.343*	0.257*	1	
Pop	-0.120*	0.007	-0.017	-0.132*	0.127*	0.099*	-0.037*	-0.250*	-0.483*	-0.061*	-0.002	-0.179*	1

\*Significant at 5%

## Appendix Three

Table 6  
*Descriptive Statistics of Data*

Sample Categories	Variable	Mean	S.D Overall	S.D Within	S.D Between	Observations	No. of Countries
	<i>Main Variables</i>						
	Corruption	2.970	1.345	.742	1.127	3917	144
	Social Trust	.280	.137	.028	.131	2128	83
	<i>Control Variables</i>						
Full	Gini	38.101	10.132	5.538	8.853	1539	130
	State Fragility Index	8.74	6.686	1.366	6.531	2416	133
	Polity	3.322	6.900	3.212	6.176	3570	136
	Bureaucratic Quality	2.162	1.181	.492	1.067	3862	142
	Democratic Accountability	3.775	1.681	.877	1.432	3862	142
	Ethnic Tensions	3.976	1.418	.747	1.205	3862	142
	Employment <sup>9</sup>	20.178	74.085	8.749	71.385	3187	127
	Real GDP per capita <sup>10</sup>	13252.77	15056.03	3681.029	14445.77	3187	127
	Govt. consumption	16.219	6.241	3.302	5.526891	3253	126
	Trade	78.542	49.628	19.187	45.421	3323	127
	Human capital	2.332	.696	.188	.683	3483	125
	Population (millions) <sup>11</sup>	46.165	147.884	15.977	142.749	3187	127
	<i>Main Variables</i>						
OECD	Corruption	4.425	1.210	.666	1.058	859	31
Non-OECD	Corruption	2.552	.941	.760	.574	1261	46
OECD	Social Trust	.360	.144	.031	.141	859	31
Non-OECD	Social Trust	.227	.102	.026	.097	1261	46
	<i>Control Variables</i>						
OECD	Gini	33.338	8.488	6.126	6.238	613	31
Non-OECD	Gini	41.200	9.373	5.237	7.606	527	44
OECD	State Fragility Index	1.199	2.172	.740	2.038	547	30
Non-OECD	State Fragility Index	10.195	5.333	1.602	5.157	821	46
OECD	Polity	9.310	2.301	1.899	1.286	828	30
Non-OECD	Polity	2.390	6.380	3.451	5.481	1245	46
OECD	Bureaucratic Quality	3.494	.680	.292	.635	859	31
Non-OECD	Bureaucratic Quality	1.803	.919	.539	.758	1226	45
OECD	Democratic Accountability	5.529	.783	.595	.508	859	31
Non-OECD	Democratic Accountability	3.514	1.359	.918	1.042	1226	45
OECD	Ethnic Tensions	4.682	1.127	.643	.974	859	31
Non-OECD	Ethnic Tensions	3.928	1.344	.817	1.075	1226	45
OECD	Employment	16.112	25.845	2.507	25.818	774	31
Non-OECD	Employment	43.011	121.585	14.798	117.058	1084	44
OECD	Real GDP per capita	25113	10505.36	4267.499	9702.855	774	31
Non-OECD	Real GDP per capita	6307.015	6869.899	2106.408	6464.22	1084	44
OECD	Govt. consumption	18.723	4.081	1.469	3.711	848	31
Non-OECD	Govt. consumption	13.821	5.318	2.431	4.981	1098	43
OECD	Trade	72.340	35.047	14.507	33.562	848	31

continued ...

<sup>9</sup> Logarithmic transformations are used in estimations

<sup>10</sup> Logarithmic transformations are used in estimations

<sup>11</sup> Logarithmic transformations are used in estimations

... continued

Sample	Variable	Mean	S.D	S.D	S.D	Observations	No. of
Categories			Overall	Within	Between		Countries
Non-OECD	Trade	72.202	57.200	16.824	53.941	1123	43
OECD	Human capital	3.043	.431	.149	.408	859	31
Non-OECD	Human capital	2.134	.574	.212	.572	1211	44
OECD	Population (millions)	36.332	54.594	4.810	54.619	774	31
Non-OECD	Population (millions)	96.619	240.472	26.913	232.057	1084	44