ABBREVIATIONS LIST

ADB	Asian Development Bank
AFDB	African Development
CCI	Corruption Control Index
CONN	Connectivity
CORR	Corruption
CORRTI	Corruption Transparency International
CORRCCI	CORR Corruption Control Index
CPI	Corruption Perception Index
DEM	Democracy
FE	Fixed Effects
GDP	Gross Domestic Product
GDPPC	GDP per Capita
HC	Human Capital
HDI	Human Development Index
IMF	International Monetary Fund
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PF	Press Freedom
PLS	Panel Least Squares

RE	Random Effects
SADC	Southern African Development Community
SD	Social Development
STD	Standard Deviation
TI	Transparency International
TRAD	Trade
UNESCO	United Nations Educational Scientific and Cultural Organization
VAR	Vector Auto regression
WB	World Bank
WDI	World Bank Indicators

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CHAPTER I

INTRODUCTION

1.1 Background to the Study

This research project's personal motivation is to pursue an undertaking which found its common grounds at a confluent of the writer's own intellectual infatuation, professional interest as a United Nations civil servant, an audit practitioner in both areas of human development economics and its associated social demands of ethics and integrity.

Such curiosity was among other motives prompted by the huge variety of patterns of growth and their differing levels of social inclusion and accountability systems across Sub Saharan Africa, notably in SADC countries – some of which account for the most unequal of societies worldwide. Growth and equity outcomes in most SADC countries appear patently asymmetrical for similar levels of resources endowments while national integrity systems remain largely uneven. The SADC Protocol against Corruption signed in 2001 has seen neither its committee established nor any of its provisions implemented. (Peters, 2011: 157). He further notes that "the picture concerning corruption in the SADC region is on the whole negative". (2011: 158).

1.2 Aims of the study

Closer to our shores in the SADC region, studies, many descriptive, few empirical have highlighted issues around corruption, income inequality (Naidu and Roberts, 2004; Kalaba, *et al.,* 2006; Peters, 2011; Jauch, *et al.,* 2011; Van Vuuren, 2014) and human capital (Strydom and Fongwa, 2012; Bittencourt, 2013), however most of them offer a one way- approach to corruption unidimensionally linked to either growth, inequality or human capital. Instead, the approach pursued in this study will provide a multi-pronged perspective untangling the interplay between human capital and corruption along its joint - and possibly opposing effects (Blackburn, *et al.,* 2006) - not just on absolute growth but on growth relative to its social outcomes.

More explicitly this study will deliver an assessment of the conditional effect of the human capital and social development and their combined impact on a corruption model in the SADC

countries. Then it will attempt to identify other key determinants and covariates - and their functional dependence to hypothesised nexus of the triad human capital / social development / corruption - that may explain the diversity of corruption level outcomes among SADC countries.

In exploring those intricacies of corruption, human capital and social development this research will offer a milestone towards a complete framework for understanding both the causal relationships between the three conceptual strands (corruption, human capital and social development) as well as the embedded mechanisms by which their relationships operate.

The study hopes to expand the knowledge base pertaining to the influence of human capital and corruption on development economics and find a unifying explanation for these crucial links. More tangibly, this work seeks to inspire policy solutions for public officials to act on addressing the inextricable question of how human capital and more broadly social development and corruption can affect the crucial national agenda of fighting and curbing inequality (Atkinson and Bourguignon, 2000; Bourguignon, 2004) and in the end, contribute to the framing of more effective anti- corruption strategies around SADC countries and beyond.

1.3 Definition of key concepts

Human Capital. This study will mainly consider human capital from an economic perspective and therefore it will be defined in macroeconomic terms as factor of production equivalent to the sum of skills, knowledge, and capabilities of the population of a country (Blair, 2011).

Social Development. Just what is social development also termed by many as inclusive growth remains still a matter of debate which leaves it to be defined as a multidimensional concept far from a convergent path (Ranieri and Ramos, 2013). The United Nations has provided an authoritative definition of social development (Human Development Report, 1996, UNDP) which emphasized “human development” measured by all aspect of well- being including life expectancy, health, access to education to people’s economic and political freedom; and concluded that “human development is the end and economic growth a means” (1996: 1). Hence, social development demands that countries meet human needs both by increasing productive capacities and by ensuring equitable opportunities and assistance for all (Brundtland United Nations report 1987).

Increasingly the literature of development economics – in the footsteps of Sen capability theory recognizing that incremental GDP is not an end by itself but a proxy for improvements in human condition - has stressed and widely agreed on the need to broadening the measurement of society's well-being and reducing inequality as an enabling condition for economic advancement notably in the developing world (United Nations, Inclusive Wealth Report, 2012). The broadening of the contemporary notion of economic growth beyond its neo-classical meanings led to closer scrutiny of other non-income based growth factors which brought to revelation new and wider in scope-concepts largely inspired by the ground-breaking development theory of capability approach by Amartya Sen (1985). Earlier Simon Kuznets (1955) first among development economists studied the links - through its inverted U shape model - between growth, income, structural change and inequality. Later a more holistic accounting of countries wealth subsequently initiated by economists in multilateral institutions (UNDP Human Development Report 1990, World Bank Report Equity and Development 2006) then set out more evaluative inquiries to determine in what forms human capital and other institutional determinants relate to economic progress.

The idea of economic growth based solely on output/ income measures has been critically discussed. Economic growth alone was largely deemed not enough particularly in the circumstances of developing countries in Sub Saharan Africa. From the ground breaking propositions of the Brundtland United Nations report (1987) to founding writings (Perkins, *et al.,* 2006), a growing body of literature has built a delineation and debated the difference between "economic growth" (seen as rate of outputs growth in goods and services for a given country) and the wider concept of "development" – which claim to encompass beyond economic growth changes in human development variables.

Corruption**.** This study views corruption as "bureaucratic" corruption by government that is public corruption also defined by Transparency International (TI) as "the abuse of entrusted power for private gain" and considered by the World Bank "… as one of the single largest obstacles to economic and social development." (World Bank, 2012: 2).

The practice may take various forms for example it may be due to diversion of public resources by public officials (Mauro, 2002) or to bribery, kickbacks, embezzlement, tax evasion and similar activities as explained by Blackburn, Bose, and Haque (2006).

1.4 Rationale

Beyond the above personal significance, with the increasing recognition across the globe of the damaging effects of corruption on economic growth and social stability in Sub Saharan Africa, the policy debate on corruption and inequality in Africa seems inescapable. The Global Financial Integrity's (2013) report found that illicit financial outflows depleted 5.7 percent of GDP from Sub-Saharan Africa over the last decade (2002 – 2011), more than any other region in the developing world. This only epitomizes the inclusive growth challenges of African countries "not harnessing the human development opportunities from economic growth due to rising inequality in income as well as in access to education and health" (African Economic Outlook 2013: 86).

The United Nations and African Union report noted not long ago that "Africa's growth can be described as largely non-inclusive because of its limited contribution to job creation and overall improvement to people's living standards" (UNECA 2011). Also central to the debate is the countervailing evidence mainly from South East Asia with countries which posted in the last decades impressive results in wealth creation and poverty reduction most of which driven not by strong governance but by financial and human capital accumulation (Glaeser, *et al.*, 2004).

Human capital in the form of "diffusion of knowledge and investment in training and skills" is acknowledged as one of the main forces "pushing towards convergence that is towards reduction and compression of inequalities" (Piketty 2014). From the above, Sub Saharan Africa then appears as an ideal place for greater scrutiny as it displayed "ample evidence that poor health, knowledge and skills is a brake on the structural transformation that Africa needs despite rapid economic growth (Gauci and Temah, 2011). Indeed, the increasing evidence across the world and notably in Africa of the detrimental effects of corruption on sustainable economic growth and the social demand for strategies to curtail corruption has increased substantially. As noted by Glynn, *et al.,* (1997) the problem is not restricted to any particular continent or country as no region, and hardly any country, has been immune. However, developing countries notably resource rich African countries are confronting these challenges more acutely than ever as weaker human and institutional capacities have created fertile ground for corruption. As for SADC, it remains a region in "deep crisis [where] neither agricultural economies nor resource-rich countries have been able to significantly reduce wealth gaps and the rates of poverty and unemployment" (Frye, I.S. and Farred, G. 2011: 1).

Although seemingly pervasive corruption in Africa remains to some extent an unknown quantity to academics as Chahal and Daloz (1999) ominously noted: "corruption in Africa is one of the most familiar and the least understood of issues…It is familiar because, however it is defined, it is clearly endemic and ... poorly understood because we lack the investigative tools to make sense of its rationality." (1999: 102). When under theoretical consideration corruption is seen as a causal factor rather than a consequence as in Rogers (2008) proposition and may inflict adverse effects on human capital and growth. Similar views have also framed corruption as a determinant of human capital (Mauro, 1997; Tanzi and Davoodi, 2001; Delavallade, 2006); or as a negative factor of growth and development (Barro, 1991; Gupta, 1998; Blackburn, *et al.*, 2006; Gymiah - Brempong and De Camacho, 2006; Okori 2010); or as a source of income inequality (Perotti, 1996; Easterly, 2007; Papagapitos and Riley, 2009).

In rare instances the role of corruption is recognized in a model linking human capital to growth (Haque, E.; Hussain, B. 2011) though not to social development. In the end little has been studied on the impact of human capital on national transparency control levels and transitively on social development.

1.5 Conceptual Framework

The need to avoid duplication of existing research requires some knowledge of the already existing academic work on one's subject matter. A limited review of the literature and key definitional aspects is offered in this section in order to provide for the theoretical foundation of this study.

Human capital was acknowledged as one the critical determinants of source of economic growth over time and has become a central conceptual device to labour economics, growth economics and development economics (Collier, 2007). Human capital is a multidimensional concept. It" identifies human characteristics which can be acquired and which increase income. It is commonly taken to include peoples' knowledge and skills, acquired partly through education, but can also include their strength and vitality, which are dependent on their health and nutrition" (Appleton and Teal, 1998: 9).

From an economic perspective the expression of human capital is evocative of the idea that workers' skills and capabilities are important factors of production and that other resources spent on education, training, etc. may be comparable to investments in physical capital (Blair, 2011**).** In recent decades, countless studies of the sources of economic growth (Schultz, 1961;

Becker, 1993; Barro & Lee, 1993) – departing from the neo classical Solow growth model of physical and financial capital accumulation – have since demonstrated that human capital accumulation factors are among the main drivers of economic development. Human capital, economic growth are closely interrelated as it is seen as an input which impacts significantly on the productive capacity and growth output of an economy.

Historical evidence owing to the notable achievements of South East Asian economies has often been cited as glaring examples of the importance of human capital to economic growth (Clarke, 2011*)***.** Indeed, despite their generally low endowment of natural resources, these countries have managed to post remarkable economic performances largely attributed to the quality of their human capital formation (Becker, 1992). Researchers such as Schultz (1961), Bryant (1990), Barro (1991) Lucas, (1988) have applied the concept of human capital since, in a variety of ways but they all provided pertinent analysis of a positive link between human capital and economic progress mainly in the form of growth rate of per capita Gross Domestic Product (GDP).

Numerous studies, for example Miyamoto (2008), Anyanwu (2011), have particularly highlighted the role of human capital in attracting foreign direct investment (FDI) inflows. More broadly a long and old stream of researchers have shifted attention away from the neo-classical focus on physical accumulation and have established – both theoretically and empirically - the linkage between human capital formation and economic fluctuations through direct or indirect returns. An increase in human capital accumulation will lead to an increase in the return to schooling (Mincer, 1996). Then an increase in human capital intensifies the growth rate of technology and innovation (Lucas, 1988). Finally, an increase in human capital will positively impact the level of output growth (Barro, 1991).

Closer to the African shores the seminal work by the OECD on the central role of human capital in economic advancement (*The Knowledge -Based Economy* 1996) and the World Bank (Knowledge *for Development* 1998) have attracted the interest of the developing world including in Sub Saharan Africa a region increasingly aware that natural resources alone may not bring economic success (Maddison, 2000).

The theoretical and applied literature on growth and development in Sub Saharan Africa has provided added rationale by claiming that human capital is a key contributor to growth and social development. In South Africa researchers including Fedderke (2006) have also stressed

the importance of human capital on productivity growth. Although widely recognized as a key contributing element in economic growth, human capital formation has been viewed mainly through economists' eyes as a by-product of policy supply or a function of the labour market disjointed from its social surroundings. The possibility that human capital and its knowledge effect may be critical factors in enhancing sustainable growth and social cohesion in developing countries – particularly in Sub Saharan Africa is largely ignored and has revealed an essential but relatively unexplored link with social development. The African Economic Outlook 2013 report concludes crucially that "African countries are not harnessing the human development opportunities from economic growth due to rising inequality in income as well as in access to education and health" (2013: 86).

Economic growth alone is largely deemed not enough particularly in the circumstances of developing countries in Sub Saharan Africa. The idea of economic growth based solely on output/ income measures has been critically discussed. From the ground breaking propositions of the Brundtland United Nations report (1987) to founding writings (Perkins *et al.*, 2006) a growing body of literature has built a delineation and debated the difference between "economic growth" (seen as rate of outputs growth in goods and services for a given country) and the wider concept of "development" – which claim to encompass beyond economic growth changes in human development variables. This paradigm shift in is plainly described in the first Human Development Report (1990) and has had far reaching theoretical implications in development economics.

The question on how economic growth dividends transform - or fail to convert - into human development became central to the policy making debate. The quality of growth is viewed as critical as its quantity reiterating that the goals of social well-being are not just monetary but amount more fundamentally to people's choice and freedoms. As the report puts it "income is not the sum total of human life." (1990: 2).

The renewed approach of the concept of development (Haq, 1999) deemed more comprehensive, has stressed as one of its key finding the deterministic role of "intangible" wealth factors identified by the World Bank (2011) as human and institutional capital and critically important when applied to the context of economic progress in developing countries.

In the well renowned publication *Economics of Development*, Perkins *et al.*, (2006) clearly delineates the difference between "economic growth" - as rate of output growth for goods and

services - and the wider concept of "development" which involve more human variables such as education, health, life expectancy. In the developing world the notion of human development was quickly complemented by the idea that development effectiveness is to include equitable access by individuals and communities to opportunities as precondition to improving people's living standard.

The World Bank (2011: 1) defines inclusive growth - a concept often assimilated to social development - as "growth that allows people to contribute to and benefit from economic growth." The AfDB argues more specifically that inclusive growth is "economic growth that results in a wider access to sustainable socio-economic opportunities for a broader number of people, regions or countries, while protecting the vulnerable, all being done in an environment of fairness, equal justice, and political plurality" (2012: 2). Hence social development demands that developing countries meet human needs both by increasing productive capacities and by ensuring equitable opportunities and assistance for all. (UN, 1987).

Increasingly the literature of development economics – in the footsteps of Sen capability theory recognizing that incremental GDP is not an end by itself but a proxy for improvements in human condition - has stressed and has since widely agreed on the need to broadening the measurement of society's well-being and reducing social disparities as an enabling condition for economic advancement notably in the developing world. (UN, 2012). Nonetheless, most the debate about growth and social development has remained largely conceptual with arguments that revolved around the question of whether market-led growth is sufficient to eliminate poverty and reduce inequality largely ignoring the crucial policy considerations of public intervention and crucially the need for governments to account for the corruption factor and design effective anticorruption strategies.

International organizations and global watchdogs have in recent years recognized the relevance and urgency of the problem of corruption for international development. Although it is present in almost all countries, corruption is most pervasive throughout the developing world and particularly in resources- rich of Sub Saharan Africa. It is referred to by Nye (1967: 417) as "endemic in all governments" and" no region, and hardly any country, has been immune." (Glynn, *et al.*, 1997: 7). Corruption is commonly defined as abuse of public power for private benefit. Transparency International (TI) defines the concept as "the abuse of entrusted power for private gain"

In examining the significance and human capital and social development as determinants of corruption we shall consider corruption less from an ethical perspective as "an immoral and unethical phenomenon that contains a set of moral aberrations from moral standards of society" (Gould, 1991: 468) but rather it will be viewed in its socio economic context as public phenomenon. Therefore, this study will posit corruption as "bureaucratic" corruption by government in the context of this thesis. The practice may take various forms for example it may be due to diversion of public resources by public officials (Mauro, 2002) or to bribery, kickbacks, embezzlement, tax evasion (Blackburn, *et al.*, 2006). According to Transparency International (2010: 1) "nearly three quarters of the 178 countries in the Corruption Perceptions Index score below five, on a scale from 10 (highly clean) to 0 (highly corrupt), suggesting a perception of widespread corruption among public officials**".**

Corrupt practices have various determinants and particular repercussions in developing countries notably in Africa where often public funds that are needed for delivery of basic human needs are diverted at the personal benefit of the few. The World Bank considers "… corruption as one of the single largest obstacles to economic and social development." (World Bank, 2012: 2).

Often driven by discretionary authority, economic rents, and weak institutions (Jain, 2001) corruption affects access to basic services, undermines fair market competition and particularly affects the poor. As underlined by the United Nations Development Programme (UNDP), corruption "siphons off scarce resources and diminishes a country's prospects for development. In a country where corruption is endemic, the consequences are disproportionately borne by the poor who have no resources to compete with those able and willing to pay bribes. In the end, corruption tightens the shackles of poverty on countries that can least afford it, on societies that need every dollar to pay for important social and economic programs" (2004: 3).

From a sustainability perspective the nefarious effects of corruption on development have long been a concern for researchers through an established body of literature. Shleifer and Vishny (1993) conclude that corruption is a factor of disruption in the development process. Jain (2001) inconclusively found, that the causes and consequences of corruption are often entangled. Earlier Mauro (1997) found the directional causation of corruption and development remains unresolved while Treisman (2000) asserts that developed countries were less prone to corruption.

Numerous studies (TI, 2012; Buehn and Schneider, 2012) have established a causal link between increased corruption and investments in high profile "white elephant" projects at the expense of useful infrastructure projects in education or health of crucial importance. As a key determinant of socio – economic growth corruption is found to increase inequality (Dreher, *et al.*, 2007) through unequal redistribution of income and wealth and to disfavour social programs intended for the poor (Ackerman, 2008). Human capital formation through education also may be affected by corruption. Mauro (1997) concludes that education spending is negatively correlated with corruption. This will result according to Dreher, *et al.*, (2007) in low levels of school enrolment causing higher corruption, while Buehn and Schneider (2012) could not arrive at similar correlation.

From a governance perspective political and institutional factors have relevant impact on the level of corruption according to Dreher, *et al.*, (2007) who argue that deficit in democratic controls are likely to increase corruption and conversely stronger transparency and accountability systems are likely to deter corruption. Buehn and Schneider (2012) found similar evidence while Tanzi (1998) seems to emphasize particularly the effect of bureaucratic inefficiency - through convoluted regulations- as a major conduit for corruption. Corruption appears indeed as a multifaceted proposition driven here by socio- economic determinants which will be examined as to their functional dependence to human capital and social development. In his seminal paper Treisman (2000) uses quantitative analysis to find the causes of corruption. He considers 14 research hypotheses on the causes of corruption from political science, economics to sociology, and runs regression models across a multi – country setting (64 countries) with a vast set of independent variables on the Corruption Perception Index (TI 1996, 1997, 1998). He arrived at mixed conclusions finding no effect of democratization on corruption levels while on the contrary economic development appeared to have curbing effects (2000: 46) on corruption.

From a human development perspective Sen's theory (1977, 1985, 1988, 1990, 1993, 1997, 2005) as an expansion of capabilities can be applied as a potent analysis of the intricacies between corruption, human capital and social development. Sen (1985) describes the building blocks of the Capability Approach, with the concept of "functionings" and "capabilities". A "functioning" is an achievement of a person, what a person manages to do or be (Sen, 1985: 10); a "capability" reflects a person's potential to achieve a particular functioning (Sen, 1985: 10). Corruption may be seen as a limitation capability for individuals to achieve given

functionings including being educated or fulfilling their basic needs of well - being. Human capital is indeed a foundational element of the capability framework as, "…being better educated can help in the conversion of incomes and resources into various functionings and ways of living". (Sen, 1990: 55).

Corruption becomes ultimately a capability problem in that its nefarious effect on social development is to curtail human capital formation and deprive people of the opportunities for the "enhancement of those freedoms and capabilities that matter most in the lives that we can lead" (Sen, 1990:55). This approach provides the conceptual foundations for broadening the problematic of corruption beyond standard economic and utility frameworks for a richer conception grounded into a more "foundational understanding of the process of development…" (1997: 1960).

The acknowledgment of the human capability redirects the focus on corruption not just as a deprivation of economic prospects for the vulnerable but more fundamentally as a denial of opportunities "on the expansion of human freedom to live the kind of lives that people have reason to value" (1997: 1960).

From the above arguments I derive the below problem statement and subsequent research questions

1.6 Problem Statement

The role of human capital in economic growth has been a recurring and abundant study theme in the economic literature for both development theorists and practitioners. A large body of analyses by economists has made attempts to examine human capital through labour markets efficiencies with concerns to its quantity and quality as they are deemed suitable and adapting to market needs. Effects of human capital related to growth, economic development or FDI have been recurring subject matters for macro-economic researchers and development practitioners.

While political scientists and economists have examined overwhelmingly corruption primarily in relation to economic performance and GDP growth rather than in relation to social development. Corruption has mainly been attributed to economic factors such as rent seeking (Jain, 2001) and non-economic determinants linked to governance deficit and failure of institutions (Brunetti and Weder, 2003) and (Serra, 2006). Moreover, much of the interest in

corruption and its socio-economic ills have been expressed generally in "normative" terms (Gould (1991: 468) largely advocated on ethical or human right grounds if not on political claims.

When corruption is linked to inequality or poverty the analysis is generally framed in qualitative if not ideological terms whether political, ethical or both. Most studies for Southern Africa offer narratives framed in descriptive terms (Naidu and Roberts, 2004; Kalaba, *et al.*, 2006; Peters, 2011; Jauch, *et al.*, 2011) which for some amount to political scientists 'diatribes mainly arguing that corruption is caused by the failure of the institutions or by rent seeking, if not by state capture leading to harmful effects on economic performance (Acemoglu, Johnson, *et al.*, 2005; Ugur and Dasgupta 2011).

Despite abundant literature on corruption and economic growth the link to human capital (Rogers 2008) is seldom considered. The analysis remains confined to the human capital-growth equation (Romer, 1990; Benhabib and Spiegel, 1994; Barro, 1999; Atardi and Sala-i-Martin, 2003; Pritchett, 2006; Cohen, *et al.*, 2007; Fukase, 2010; Kwabena, *et al.*, 2010; Schundeln, *et al.*, 2014) or corruption – growth relationships (Tanzi, *et al.*, 1997; Mauro, 1995; Nye, 1967; Rose-Ackerman, 1997; Kaufmann, 2003) and stop short of examining the relationship with poverty reduction aspect and social development. Indeed, some of the missing and little-documented elements of this equation are the social advancement factor and the possible compounding effect of human capital on corruption under the development conditions of Sub Saharan African countries. Hence there is still a long way towards understanding the fundamental processes at work in order to develop effective anti – corruption strategies and provide for integrity systems fit for socio – economic progress.

Furthermore, the consequences of the combined effects of human capital levels and social development variables more broadly as root causes of corruption have been so far studied by very few contemporaneous empirical studies notably in African studies and for the SADC region in particular. Therefore, failing to recognize with Szeftel (1998) that indeed corruption levels are to be construed as outcomes of political and socioeconomic undercurrents.

In light of the theoretical ambiguities this study puts forward a contention that even fewer have contemplated that is the crucial question of why for similar resource endowments and comparable economic outlooks, a number of SADC countries display striking heterogeneities in corruption levels linked to similarly discrepant levels of social development? Does human

capital stock and its uneven dispersion have a pivotal role to play in unravelling the links between corruption and social development?

In the literature on human capital, social development and determinants of corruption, it is noted a relative scarcity of test for the functional relationships of such variables notably for African countries. To the best of this researcher's knowledge little to none grand theoretical explanation of this phenomenon has been argued, the present endeavour offers one of the first systematic cross-country quantitative studies focusing on the causal and directional effects and predictive powers of human capital and social development on corruption outcome levels in Southern Africa

1.7 Research Objectives

The objective of this study is to undertake an assessment of the relationship between human capital, social development and corruption. Precisely, this study seeks to provide a theoretical framework on the impact of human capital and social development in explaining the incidence of corruption outcomes in developing countries and particularly in the SADC region.

It deals with such undertaking at it attempts to identify (1) the effects of human capital on corruption, (2) assess the impact of social development on corruption; and (3) and analyse the combined effect of these main variables on corruption

1.8 Research Questions

1. What is the effect of human capital formation on corruption? How does the causal direction of their relationship operate?

2. What is the effect of social development on corruption? How does the causal direction of their relationship operate?

3. What is the simultaneous effect of human capital and social development on corruption?

1.9 Research Hypotheses

Intuitively, it makes sense to expect that high levels of education will result in people being aware of the devastating effects of corruption on the economy. Therefore, it is not unreasonable to expect that high human capital is likely to result in lower levels of corruption. Similarly, it may be reasonably assumed that high levels of human capital accumulation have the "potential

for ensuring a more equitable distribution of income among individuals by equipping them with the needed tools to pull themselves out of poverty (De Mello and Dutz, 2012).

Therefore, this study hypothesises that:

Hypothesis 1**:** There is a negative relationship between human capital and corruption

In line with Podobnik, Shao, Njaviro, Ivanov and Stanley (2008) this study sets forth that:

Hypothesis 2: There is negative relationship between corruption and social development

Contrary to Haque, *et al.,* (2010) who conclude to little effect of education on growth when corruption is prevalent the following hypothesis is put forward:

Hypothesis 3: Human capital has a higher predictive power on corruption than other social development indicators as suggested by Barro (1991) Lucas, (1988).

1.10 Data, Models and Methodologies

This study will be mainly concerned with identifying the nature and causal direction of the relationships between human capital and corruption; between corruption and social development; and to explain how human capital and social development interrelate to explain corruption in the SADC region. The study will use Ordinary Least-Squares (OLS) to estimate the growth equation specified above using the E-Views statistical package. The study will also use a pooled fixed-effects specification which allows to control for unobserved country heterogeneity and associated omitted variable bias (Startz, 2013). Before running the Ordinary Least Square to approximate the coefficients of the regression equation, the study will test for the stationarity of the variables. The stationarity of the time series will be tested using the Augmented Dickey Fuller (ADF) test. The Granger Causality test will be used to determine the nature and direction of causality among the variables in equations.

1.10.1 Data Description and Population

The main component of this empirical analysis consists of annual time- series panel data sourced from world class international databases available from the UNDP, UNESCO, the World Bank, IMF the AFDB, SADC countries, United Nations

Statistics, Freedom House database. The regression model tested in the study will include the interaction of human capital, corruption and inclusive growth.

The fifteen SADC countries to be considered (Angola, Botswana, D.R Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe). The sampling of SADC countries for this review is largely dictated by the objectives. The majority of the countries has reached a middle to higher MIC economic status in terms of per capita income and / or enjoy significant levels of human or natural resource endowments. However, high level of revenues and abundance of resources have often cultivated corruption and undermined social progress in the process of building their market economies. The target countries while faced with serious inequality and integrity - related challenges, also present striking disparities in terms of poverty rates, institutional capacity and social development all of which will be key factors of consideration in this study. When investigating patterns of corruption, it is suitable to consider countries where the level of corruption is significantly and durably high.

This informs the choice of the SADC region countries for this study, where the corruption perception indexes from TI and WB showed stable patterns of high levels of corruption "The perceived level of corruption in the SADC member states in 2010 was higher than in 2000" (Peters, 2011). Indeed, abundance of natural resources can benefit developing countries or be a curse (Collier and Hoeffler, 2009). This particularly applies to most of the selected countries where huge natural resource endowments present opportunities for rent-seeking behaviour among bureaucrats and politicians tempted to drain resources away from more socially advantageous projects to the detriment of the disaffected (Ploeg, V. 2006)

Therefore, the above features made them attractive for the purpose of this research. Due to data limitation data will be collected for the period 2005- 2013 across the fifteen SADC countries as this time span seems to be less prone to gaps in data availability. The data will have fifteen panels and nine periods which will amount to 135 observations.

1.10.2 Data Sources

The analysis for this study will require compilation of relevant data on human capital stocks, corruption indexes and economic growth. In addition to the relevant human development indicators and income distribution estimates (GDP, GINI, HDI) across host SADC countries and across time (2005 - 2013).

For cross-country time series data the following sources will be consulted for the purpose of this examination: Country tables in the World Bank annual publications of key economic indicators, Statistical Appendices to the World Bank's annual World Development Reports, Statistical Appendices to the UNDP's annual Human Development Reports, Statistical tables from UNESCO Institute of Statistics, World Bank's World Development Indicators (WDI) database, Freedom House Data

1.10.3 Variables and Unit of analysis

The unit of analysis used will be the sampled member-state. Analysis of such data may be arduous due to the data could vary greatly across time and space. The analysis therefore will attempt to use a variety of techniques to control for the special statistical hurdles inherent to such statistical methodology. The level of corruption through the human capital and social development effects is the ultimate phenomenon we are attempting to explain. For all hypotheses to be considered the level of corruption will be the dependent variable all other variables (human capital, social development and other control variables) are assumed as independent explanatory variables.

As a measure of a country's social development (SD) this study will use the HDI index as a proxy. The HDI is considered the most comprehensive measure of a country's economic progress besides GDP. It provides information on the human development aspect of economic growth. It is constructed around three indicators: longevity measured by life expectancy at birth; educational attainment measured by a combination of adult literacy rate and the combined school levels enrolment ratios; and standard of living measured by GDP per capita. Due to its availability for a large set of countries and for a long time span we use the HDI and its education and health sub categories to measure inclusive growth. As a measure of human capital (HC) this study will use the average years of secondary education in the population aged 25 and over

as a proxy. Commonly human capital has been viewed as a function of education and experience including both training and learning by doing (Becker, 1964; Barro, 1991).

By analogy to investment in physical capital we will consider expenditures on education as investments and therefore use education budget costs data - combined with literacy and schooling levels data disaggregated by school levels - as a proxy for human capital. As a measure of corruption this study will use corruption perception indexes (CPI) developed by the World Bank Institute.

Control Variables. A number of socio- economic, political variables and institutional measures identified as significant by previous studies are selected eight independent variables. Social Development, Human Capital Trade openness, GDP per capita, GDP growth, Democracy, Press Freedom, Social Connectivity (Telephone line per 100 people) will be included in the model based on availability of data se

1.10.4 Model Specifications

With the aim to ascertain a number of variables assumptions, the base model specifications derived from our research questions are as follows:

1. What is the effect of human capital formation on corruption? How does the causal direction of their relationship operate?

$$CPI_{it} = a_0 + a_1 * HC_{it} + u_i + u_t + u_{it} \quad (1)$$

2. What is the effect of social development on corruption? How does the causal direction of their relationship operate?

$$CPI_{it} = b_0 + b_1 * SD_{it} + v_i + v_t + v_{it} \quad (2)$$

3. What is the simultaneous effect of human capital and social development on corruption?

$$CPI_{it} = c_0 + c_1 * HC_{it} + c_2 * SD_{it}\, w_i + w_t + w_{it} \quad (3)$$

Where *i* indexes countries and *t* the time period. The error term in all three equations is made up of three components: u_i, v_i and w_i stand for country-

specific component; u_t, v_t and w_t stand for time-specific component; and u_{it}, v_{it} and w_{it} stand for random error term of a panel data model.

1.10.5 Econometric Methodology

The statistical analysis will test the relationships hypothesized between the levels of human capital, and social development functions and their resulting effect on corruption outcomes.

This study will be mainly concerned with identifying the nature and causal direction of the relationships between human capital and corruption; between corruption and social development; and to explain how human capital and social development interrelate to explain corruption in the SADC region. The study will use Ordinary Least-Squares (OLS) to estimate the growth equation specified above using the E-Views statistical package. The study will also use a pooled fixed-effects (FE) specification which allows to control for unobserved country heterogeneity and associated omitted variable bias (Startz, 2013).

Before running the Ordinary Least Square to approximate the coefficients of the regression equation, the study will test for the stationarity of the variables. The stationarity of the time series will be tested using the Augmented Dickey Fuller (ADF) test. The Granger Causality test will be used to determine the nature and direction of causality among the variables in equations. Using panel data model is advantageous because it allows for the capability "to capture not only the variation of what emerges through time or space, but the variation of these two dimensions simultaneously" (Podesta, 2000 : 9). It is also the most common estimation method in the literature which allows for comparison with other studies. And it best fit the data to generate better estimations (e.g. higher T statistics, adjusted R- square, F- statistics).

1.11 Significance of the Study

This research offers an empirically grounded contribution and adds to the mostly normative and descriptive studies about public corruption. Using panel data analytical framework, the study examines the implication/causation forms as they affect human capital, social development and corruption in order to elicit the patterns of relationships underlying the three theoretical strands. The methodology moves from a deontological approach mostly focused

on the narrative of policy and rights imperatives to a positivist perspective for the empirical analysis of the conditions of human capital and social development with their respective formation mechanisms that affect corruption levels across SADC countries

1.12 Assumptions

Assumptions are described as concepts not tested but accepted without being necessarily proven (Creswell, 2009: 49). In academic inquiry they are defined as "postulates, premises, and propositions that are accepted as operational for purposes of the research" (Lunenburg and Irby, 2008: 135). One commonly recognized flaw of quantitative researchers is to "often neglect philosophical assumptions in favor of the methods…Too much emphasis is given to the technical procedures necessary to implement a study, while the principles grounding these procedures are often neglected or not sufficiently considered" (Gioacchino, 2012: 111). Such lack of critical awareness fails to recognize that "science is itself a (meta) theoretical human construction which heavily depends on the worldviews of those who have constructed it" (Gioacchino, 2012: 112). In light of these observations this study is premised on several assumptions both theoretical and practical which provide for its basic philosophical foundations. This section is meant to plainly articulate the beliefs underlying this empirical analysis with particular reference to the philosophical - ontological and epistemological - paradigms – that sustain such views. (Slife and Williams, 1995).

First, corruption is a topic abundantly researched and defined in countless ways and meanings. Corruption is assumed here as a determined outcome in the public domain, hence its private manifestations and psychological undertones are beyond the scope of this review. Second, the philosophical corollary of such reality of corruption - transcendent of the outside observer - is embedded in the positivist view that indeed it has its own rationalities objectively knowable through "scientific" inquiry (Cohen, *et al.*, 2007: 7) and susceptible of causal understanding. Third, from this ontological premise it is derived epistemologically a frame of knowledge which allows for a deductive approach in order to produce valid causal inferences about corruption and its correlates. It is posited that the data of interest on corruption and its covariates may be reliably measured and analysed by means of statistical analysis.

The goal here is to test our research hypotheses on corruption derived from this positivist theory which strives "for objectivity, replicability and control with the aim of causal explanation and generalization" (Gioacchino, 2012: 113). However, the proposed knowledge framework does not imply, that this empirical research - which is not grounded on a reductionist empiricism –

"does not carry any trace" (Högskola, 2012: 32) of the researcher. In the footsteps of Bachelard (1938) this epistemological stance is premised on "the importance of the subject in science, but without making of science something subjective "(Högskola, 2012: 33).

On human capital there have been other dimensions identified by researchers that account for human capital from health to migration, but this study has retained education as a prime focus for the empirical analysis.

And one last assumption worthy of note. There have been countless attempts to describe social development linked either to categories of social capital, or sustainable growth, or seen as an inclusive process of removing inequalities. This study opted for the human development approach of social development measured by the HDI and focusing the development thinking more towards the enhancement of people's freedoms and capabilities (Sen, 1989; UNDP, 1990)

1.13 Delimitations

The main goal of this quantitative approach was to investigate corruption and its underlying causes, thus harvesting more knowledge on how best to curb the phenomenon at policy level. However, prudence is advised before making generalizations from the results which do claim universality status as delimitations apply. This section explains the boundaries and scope of the review. Unlike limitations which relate to elements that may affect the study but are beyond the researcher's own resolve, delimitations are factors that may affect the analysis but are determined by the researcher; they are "self-imposed boundaries set by the researcher on the purpose and scope of the study" (Lunenburg and Irby, 2008: 134).

This study is geographically focused on the SADC countries. The target region was not randomly selected but instead such decision was largely dictated by the particulars of the region as they relate to the objectives this review. This may indeed limit the generalizability of the results therefore caution must be observed as they may not be necessarily applicable to other sub Saharan African regional groupings. Regarding the data source, the fact of utilizing pre-existing databases in the form of secondary data has also restricted the research in terms of the conceptualization of variables and the scope of research.

Because a quantitative methodology was decided in relation to the research questions it was not possible to fully to explore and account for hard - to measure variables linked to socio - cultural norms including for instance the notion of power distance that would have been of interest in accounting for more societal factors of corruption.

1.14 Structure of the thesis

The thesis will be organised as follows:

CHAPTER I: INTRODUCTION
CHAPTER II: Literature Survey. Political Economy of Corruption
CHAPTER III: Literature Survey. Economics of Human Capital
CHAPTER IV: Conceptual Framework
CHAPTER V: Methodology
CHAPTER VI: Empirical Findings
CHAPTER VII: Discussions and Conclusion

1.15 Conclusion

This Chapter lays the foundation for this thesis by first discussing the motivation, the rationale for pursuing the study and the purpose of the thesis. This is followed by the definition of the key concepts of this work – corruption, human capital and social development. This chapter introduced the research problem and the research questions. The overall aim of the study which is to provide a theoretical framework on the impact of human capital and social development in explaining the incidence of corruption in developing countries and particularly in the SADC region was justified. The proposed method to achieve this aim was presented. The philosophical, ontological, axiological and causality assumptions were presented and the structure of the thesis was outlined. On these foundations, the thesis proceeds with a critical evaluation of the political economy theory in explaining corruption, human capital and social development.

CHAPTER II

POLITICAL ECONOMY OF CORRUPTION

2.1 Introduction

Corruption has been widely and negatively associated with economic and development outcomes. The World Bank (2011) estimated the amount of bribes paid across the developed and the developing world for the years 2001/2002 at 1 trillion USD that is approximately 3% of the world GDP. The African Union (2002) estimates that corruption costs African economies more than $148 billion a year. These figures only point to financial transfers between corruptors and corruptees but do not indicate the true negative impact of the phenomenon as corrupt practices remain hidden and difficult to estimate. Such harmful effects are substantial enough and worthy of worldwide concern for the World Bank (1997) to name corruption as "…among the greatest obstacle to economic and social development."

The interest in recent years of the research and political economy literature about public corruption has had some resurgence owing to the renewed debate after the 2008 financial crisis about the re-affirmation of the role of the state as an indispensable actor for economic development and social welfare in a triumphant all - market driven world economy. Corruption and good governance have been among the most deliberated concepts informing the development economics debate and the two notions have been the subject of examination and decision by researchers and policy makers for some time.

Our approach is to capture the definitional variances of corruption which we posit as a multidimensional "umbrella concept" (Varraich, 2014) impacted by multiple economic, institutional, social or cultural dynamics, in order to set the conditions for a critical analysis of the macro- level theories dealing with the structural causes and effects of the corruption phenomenon which define its political economy.

2.2 Corruption: Short Genesis of a Long History

Corruption has affected nations throughout history and is known as an old age practice with a universal footprint throughout the centuries and around the globe. The phenomenon was already a worry in the early days of documented human evolution "In the history of the ancient Egyptians, Babylonians, Hebrews, Indians, Chinese, Greeks, and Romans corruption often

surfaced as a problem…" (Alatas, 1990: 13). The author further refers to the excerpts of the Old Testament Book of Exodus (earlier than 1200 BC) which expressly condemned the bribery and other injustices. "Beware of accepting bribery: they blind even the prudent and disturb the judgment even of just men" (Alatas, 1990: 13). Writers of Ancient Greece such as Aristotle expressed concern about the "organized bribing of judges". (Aristotle cited by Alatas, 1990: 15). Such concern was equally present in the Roman Empire where "the intensity and variety of corruption … was probably greater" (Alatas, 1990: 16). Documented history in Asia and China in particular shows equal concern for corruption and the "Chinese sages warned against it in no uncertain terms" (Alatas, 1990: 40). The concern remained undying throughout the literature." In ancient times corruption ultimately prevailed over Greece and Rome as their rulers abused power for private leading to the downfall of the great empires (MacMullen, 1988).

In the late Middle Ages "Dante placed bribers in the deepest part of Hell reflecting the medieval distaste for corrupt behaviour. Shakespeare gave corruption a prominent role in his plays" (Alatas, 1990). Later another Italian Machiavelli in his most renowned work (The Prince, 1513) will cynically note that the best people may be subject to corruption owing to greed and ambition. In contemporary times the interest has continued to gain momentum and the amount of interest paid to corruption in recent years by researchers and policy makers at both national and international levels is unparalleled for the developing world (Tanzi, 2001) and particularly for Sub- Saharan Africa. Earlier the World Bank (1997) had recognized such intensified scrutiny and published one of its first pivotal study noting that "there is increasing evidence that corruption undermines development" (1997: 1). The interest and concern about the incidence of corruption have since been unrelenting and continues unabated across academia and government circles.

2.3 African Origins of Corruption

Origins of corruption in Africa have been linked to both internal and external factors. Most of the literature has traced not the incidence – which is evidently ubiquitous and inherent to human failings - but the prevalence of public corruption back to its colonial roots. Indeed, the beginnings and spread of corruption may be linked to others socio- historical dimensions but its primary causes are "rooted in Africa's colonial past and its associated legacy" (Mulinge and Lesetedi, 2002: 53). Albeit the authors argue for a more exhaustive chronology from the "pre-colonial sociocultural practices of gift giving, through the practices of colonial

administrators…" (Mulinge and Lesetedi, 2002: 53). Of those practices the "technique of divide and rule" among indigenous communities provided the fertile ground for "corrupt practices such as tribalism and nepotism which have become deeply entrenched in most African countries" (Mulinge and Lesetedi, 2002:56). Colonial practices institutionalized nepotism and autocratic rule, ultimately schooling African leaders in the methods of patrimonialism, monopolistic power and self- enrichment. Sadly, the African nascent bourgeoisie "unlike those of Europe did not promote essential values for development" (Mulinge and Lesetedi, 2002: 55). Instead such practices will survive durably the colonial times into modern days and become deeply entrenched into African bureaucracies. As noted by Szeftel "the roots of African clienteles were bequeathed by the nature of colonial development and the post-colonial settlement which succeeded it" (2000: 430).

The post-colonial period and early days of independence and one party- rule saw most African countries drifting into patrimonial practices if not outright tribalism leading to civil conflicts and political unrest. Indeed, the newly formed countries were not only bureaucratic but also monopolistic both politically and economically under the one party system with little concern for accountability rules (Dia, 1996) which allowed corruption to fester and economies to be looted across the newly independent African states (Ayittey, 1992). This led to the nefarious forms of patrimonialism and clienteles which are characterized by the loyalty of officials to the strong man rather than to the state institutions (Dia, 1996).

If colonialism appears to be at the initiation of the corruption phenomenon in Africa, the process of globalization can be regarded as its catalyst in the modern era through the actions of multinational firms and international organizations and foreign governments. "Corruption in sub-Saharan Africa is not a problem that is caused and sustained by internal factors alone. Rather, it is also a consequence of external factors manifested through the activities of foreign governments, aid organizations and private companies seeking to further their own (economic) interests through actions and practices that condone corrupt practices or that are corrupt in themselves" (Mulinge and Lesetedi, 2002: 62).

In our time whether systemic or sporadic corruption has become highly prevalent across Sub Saharan Africa and "…has led to a cooperative and institutionalized abuse of public office for personal" (Hope, 2000: 18). Sadly, the trend seems unrelenting and "for more than four decades, corruption has spread like a hurricane throughout post-independence Africa. No

country or region of the continent has remained untainted, to a greater or lesser degree, by the corruption pestilence" (Uneke, 2010: 112). And SADC conspicuously has been no exception.

2.3.1 SADC and Corruption

Similarly, to other parts of the world, the SADC organization conforming to growing international interest in corruption matters in recent times adopted a SADC Protocol against Corruption in 2001 which went into force in 2005. This provided the framework for assessing corruption both in theory and in practice across SADC countries. The SADC Protocol Against Corruption in its Article 1 offers a comprehensive definition of corruption and reads: "corruption means any act referred to … and includes bribery or any other behaviour in relation to persons entrusted with responsibilities in the public and private sectors which violates their duties as public officials, private employees, independent agents or other relationships of that kind and aimed at obtaining undue advantage of any kind for themselves or others." (2005: 1). If the SADC definition falls within the generally accepted conceptual standards and seems theoretically sound - inspired like many others by the "Weberian" principal-agent model - its practical corollary however remains elusive. The oversight committee to monitor implementation has yet to be put in place and all deadlines have been ignored by SADC member states (Peters, 2010) and there are no regionally accepted standards for assessing and monitoring the incidence of corruption.

Meanwhile corruption in SADC countries has been recognized as a concerning problem and is seen by the UN (2002) as a "serious developmental issue". This is confirmed less euphemistically by Peters (2011) who notes that "on the whole the majority of SADC countries can be perceived as corrupt" (2011: 158).

On records the data on the incidence of corrupt practices and its perception levels is limited and generally stems from various sources and methodologies which make it difficult to use for comparative analysis. The perceived corruption of public officials remains high. From the latest Afro barometer release (2013) which surveyed 34 African countries -including twelve SADC countries - more than half of respondents believe that corruption among public officials was high (56%). The growing concern of perceived corruption is confirmed by the corruption perception index (CPI) published by Transparency International (TI) in the last 4years (2012 -2015) which features 10 out of

15 SADC countries at the bottom of the index with less than 50 of the maximum of 100 points. Indeed the sustained gaps persist between policy and implementation and similarly to other parts of Africa, corruption in SADC countries remains generally and sadly a challenge which undercuts the moral compass of public officials and undermines the regional capacity to provide for growth, reduce poverty and curb inequality.

2.4 Definitional Issues

Despite some scepticism in the anthropologist camp the concept and reality of corruption have been overwhelmingly acknowledged by the mainstream literature and largely researched by academics in recent years fuelled by accrued interest around good governance issues in developing countries. The categorization of the various types of corruption models found in the literature can be distributed in three major strands with the first normative and "ethical", the second rational and "Weberian" and the third utilitarian and "market efficient".

2.4.1 Corruption: An ethical Lapse

This perspective focuses on individuals rather than systems or institutions. Corruption is seen as a moral deviance which Klittgaard regards as "an impairment of virtue, integrity or moral principle" (Klitgaard, 1988: 190). Corruption is seen as a deviation from established norms and binding public duties. In that regard Nye (1967) sees it as a "behaviour which deviates from a normal duty of a public duty because of private pecuniary or status gains." (1967: 469). A corrupt act appears as a transgression of public office duties and can be construed as "the abuse of trust in the interest of private gains" (Alatas, 1990). Thus it amounts to a failure of ethical leadership "an act undertaken with the deliberate intent of deriving or extracting private and or personal rewards against the interest of the state" (Hope, 1997). Such attitude may be triggered by the failing conscience. Douglas (1977) indicates that individuals losing their puritanical faith and religious beliefs are more prone to corrupt acts. More cynically Rose Ackermann (1978) finds that corruption is at the confluence of individual choices and circumstantial opportunities which conspire to create a corrupt conduct.

But corruption can be defined not just as a moral category, a deviant personal behaviour as its dynamics apply not only to individuals but to systems and situational conditions whether in corporate settings, state structures or in society at large. It is at the confluence of private and public circumstances.

2.4.2 The Weberian Rationale

Widespread corruption is not just a consequence of ethical failings of imperfect human beings it is also a symptom of the degeneration of the state. It is therefore a failure of the bureaucratic order mostly seen by the mainstream literature as a departure from Weberian norms of legal-rational administration. Such rationale following the principal - agent model is grounded on the distinction between public and private spheres as the foundation of non-corrupt politics and administration (Médard, 1991). Corruption then becomes an exception from the Weberian legal-rational model bureaucratic rules, a deviation from the tenets of public duty. Indeed, this rational-legal paradigm appears critical for the understanding of corruption as the non-respect of the distinction between public and private. Its causes may pertain to an incomplete process of modernisation, remnant of "traditionalism" of modernising countries (Myrdal, 1968). Consequently, corruption is destined to dwindling proportion with the consolidation of the state and the growing separation of the public and private spheres.

However, such approach continues to consider corruption as an exception to the bureaucratic rules within a principal- agent framework. Instead Charap and Harm (2002) argue that corruption should not be regarded as exogenous practice and "viewed as a decentralized and coincidental phenomenon…it should be considered as systemic and deliberate: it is the natural result of efficient predatory behaviour in a lawless world" (2002: 137). Corruption manifests itself as endogenous "a systemic device for the ruler to extract rents…" (2002: 137). This argument only highlights the multi-dimension and multi - layered complexity of the theory and practice of corruption. In short its relativity.

2.4.3. Corruption: A Relative Concept

Corruption is generally framed as a failure of virtuous leadership and of institutional order and most commonly defined as "the abuse of a public office for private benefits and gains" (World Bank, 1997: 8).

This definition presumes the existence of a public domain that is clearly separated from the private sphere. The question is how this definition, which is informed by the Weber's rational-legal paradigm, applies to non-Western contexts. (Andvig, *et al.*, 2001). In fact, corruption "corruption is also complicated by the conflict of values and norms as they differ from culture to culture" (Bauer, 2000: 219). But just what is private

or public? Aren't these categories dependent on the various contexts which give them social meanings?

Social anthropologists have generally argued that the conventional definition of corruption was too reductionist and tended to ignore what in fact pertains to matters of social experience. Andvig, *et al.*, (2001) note that peoples own assessments of courses of action do not arise from a set of culturally universal, invariable norms that help to decide if certain actions are to be classified as "corrupt" or not. Rather, what is seen as corruption varies from one region to another. Given such variations, explorations of how the actors themselves evaluate social practices are required." (2001: 46). Wood (1994) argues that "it does not proceed from an a priori assumption that such [Weberian] rationality is or can be the norm in society" (1994: 520). As Torsello puts it "this definition is problematic in its very essence for anthropology: the dichotomy private-public, informed by the Weberian rationality of the western bureaucratic machinery is context-specific." (2011: 3). Indeed the dichotomist views provide little understanding of corrupt practices that are often deep seated in well-established forms of social interaction that allow space for their flourishing and where corruption becomes " the space in which the state dissolves at local level and is replaced by a plethora of socio-cultural practices and relations (2011: 8).

Furthermore, the very notion that corruption should be deemed immoral may be open for debate as it derives from a normative approach to corruption. Sardan (1999) is at odds with such a "weberian" view and finds a new rationality within African indigenous practices described as "moral economy" under which under "a number of culturally constructed practices (gift giving, brokerage, solidarity networks, predatory authority and redistributive accumulation) corruption becomes banalised, as commonly accepted and esteemed practice" (Torsello, 2011: 12). In fact, such "western-centric" view is not only narrow but also too worried with the legalities of "corrupt" practices. This legalistic approach is founded on the premise that legal frameworks are neutral and universally applicable. However corrupt activity is not an objective form of practice, it may be construed as a social act and its meaning must be understood within social and historical contexts. (Williams, 1999). Such view is also supported by Scott (1969) who distinguishes between social and legal norms which translate into "parochial corruption" and "market corruption": the former amounts to patrimonialism where ties of family and affiliation provide access to favours while the latter implies an arm's

length, more business –like process in which favour is extended against payment. Blundo and Olivier de Sardan (2000) contend that corruption is largely an ambivalent practice with normative connotations to be recognized. Hence with such ambivalence, what is corruption and what is not can only be agreed within wider social and cultural circumstances as "types of human conduct that are frowned upon in one culture and attract the label of corruption may be common practice and accepted (or tolerated) as such in other cultures" (Carr, 2009: 156). This anthropological approach however intends not to legitimize corrupt practices through some cultural relativism but to demonstrate that the meaning for corrupt behaviour is not universal. While there is no universal acceptable understanding of corruption there isn't total convergence either on the effects of corruption viewed by some as harmful and to the contrary beneficial by others - subscribing to a functionalist view- as a means for curtailing bureaucratic apathy and circumventing government red tape.

2.4.4. Corruption: A market Equilibrium by-product

The idea that corruption impairs economic efficiency and has only negative effects on growth has largely been challenged by other scholars. Some have argued that truly corruption ought to be taken as a trade-off for economic progress a "welcome lubricant easing the path to modernisation" (Huntington, 1979: 69) which may present opportunities for positive outcomes and can be seen as a market equilibrium business practice. First corruption can improve bureaucratic efficiency. Leff (1964) and Huntington, (1968) argue that corruption can remove government rigidities and bottlenecks that obstruct investment and allow entrepreneurs to circumvent bureaucratic obstruction and excessive red tape. Hence corruption appears as a functional tool, beneficial to grease a rigid bureaucracy and contribute to a nimbler system by reducing or avoiding the financial costs of pervasive regulation through the means of bribery. Huntington says "in terms of economic growth, the only thing worse than a society with a rigid, over-centralized dishonest bureaucracy, is one with a rigid, over-centralized, honest bureaucracy." (1968: 386). Osterfeld (1992) has comparable views and sees corruption as a way to increase output and efficiency through more free market. Cuervo-Cazurro (2008) finds that some corruption can grease bureaucratic rigidities and facilitate economic transactions.

Corruption can also allow a better allocation of time and increase economic efficiency. Lui (1985) suggests comparing corruption with a queuing model that offers a more

efficient allocation of time by allowing those most productive and time- conscious the opportunity to move to the front of the line. Shleifer and Vishny (1991) contend that practices in corrupt societies will favour the ablest in rent-seeking activities and suggest that corruption may contribute to awarding deals to most efficient companies and most able entrepreneurs willing to pay for the opportunity cost of doing business, and in turn will make the most out of the paid bribes. Dreher and Gassebner (2007) also state that corruption can help entrepreneurial dynamism in highly controlled economies while Bardhan (1997) relates corruption to free market and free thinking entrepreneurs. In the same vein, DiRienzo and Redington (2014) through a cross- country study conclude that some "minimal" level of corruption can 'grease the wheels' enhance productivity and add economic efficiencies.

However, while preoccupied by the efficiency implications of corruption some empirical literature may have been fixated on the margins of the phenomenon and disregarded most of the negative consequences of corruption and its dysfunctional effects on economies, institutions and societies at large. Put shortly what are the harms of corruption? But first what causes corruption?

2.5 Determinants of corruption

The mainstream literature has broadly classified the causes of corruption into three main categories which relate to their economic, institutional and cultural connotations.

2.5.1 Economic Triggers

One of the major contributing factors has been linked to distortions at the public policy level including the dominant role attributed to the state in Africa. As noted by Hope (2000). "Along with the emergence of the patrimonial state came the expanded role of state activity. Economic decision making became centralized and public enterprises proliferated. This resulted in an expanding bureaucracy with an increasing discretionary power which was put to use as conduit for graft. Public enterprises then became a playground for corruption" (2000: 20). Corruption is directly associated with the state involvement and crucially with its dominance and authoritarian power (Abed and Gupta, 2002), and this ascendancy of the state control as a main variable of public corruption is also noted by Hope (2000) who argue: "this exercise of state power has led to the supremacy of state over civil society and in turn to the ascendancy of the patrimonial

state with its characteristic stranglehold on the economic and political levers of power through which corruption thrives for it is through this stranglehold that all decision making occurs and patronage is dispensed" (2000: 19).

The other significant factor is related to the scarcity of resource exacerbated by a competition for survival and fuelled by a greed mentality in the developing world (Hope, 2000). But Huntington (1979) contends that the march out of poverty through modernization with its accompanying value changes may also be viewed as a source of corruption. The situation may be exacerbated by the abundance of resources and its exploitation seen as a high rent- seeking commerce which cultivates rent-seeking conduct amongst insatiable state officials (Leite, *et al.*, 1999). The economic survival of public bureaucrats and civil servants then becomes source of corruption.

The relationship between wage level and corruption index has been tested empirically by Van Rijckeghem and Weder (1997) and found to be significant and negatively correlated. Higher wages in public sector may be efficient in deterring perpetrators by increasing the potential loss in case of detection.

Market conditions framed through competition or lack thereof may also be a structural factor to induce or reduce corruption. Leite and Weidmann (1999) provided empirical evidence that trade openness negatively impacts on the level of corruption. But in Africa corruption thrives owing not just to economic circumstances and market conditions but crucially to the flaws of government, weak institutional capacity and lax implementation of state regulations.

2.5.2 Governance Drivers

Crucial to sound functioning of the public sphere is the rule of law. In many countries the lack of transparency in rules and laws provides a conducive ground for corruption (Hope and Chikulo, 2000). Disrespect for judicial processes allows then the ruling elite to interfere with the functions of the state for their private and selfish end. This is also typically a symptom of a faltering leadership which is another critical ingredient to institutional quality. Where leadership is in deficit "personal and private gains take precedence over national interests. The state is an artificial entity. Public officials have no fear for being held accountable for their actions" (Abed and Gupta, 2002: 34).

Accountability will not be enforced owing to lack of oversight and credible penalty system. Indeed "the penalty imposed plays an important role in determining the probability that criminal or illegal acts would take place" (Abed and Gupta, 2002: 35). And for the oversight to be exercised against corruption, institutional controls are required as they are "the first line of defence. Honest and effective supervisors, good auditing offices, clear rules on ethical behaviour should be able to discourage or discover corrupt activities" (Abed and Gupta, 2002: 35).

In effect most of the academic analysis has adopted an economistic if not materialistic approach and has commonly presented the phenomenon of corruption through its underlying tangible causes - whether institutional or economic - without truly focusing on the various cultural forms and the social circumstances in which corrupt practices flourish.

2.5.3 Indigenous Variables

While the geography and prevalence of corruption may be driven by factors such as institutions or resources of a country other characteristics and circumstances such as cultural and social customs are just as significant. Indeed, it is manifest that public corruption cannot be fully explained by individual moral factors or economic motives alone. Societies and their collective inclinations can also be an enabler to provide for the social norms and legitimized ground in which corrupt practices flourish.

The influence of family links and loyalties has been often seen as a source of corruption in Africa (Hope and Chikulo, 2000). Associations between customs, kinships and power have been fertile ground for either tolerating or condoning corruption (Alatas, 1990). This provided the foundation for a very tenuous distinction between public and private interests characteristic of clientelism and nepotism to be constituted (Medard, 1998). Earlier in a pivotal study Ekeh (1975) noted that public officials in Africa, obedient to clientelistic rather than bureaucratic rules tend to direct their primary loyalty to kinships and entourage before public interest. Hence bribery and favouritism become embedded in a web of every day practices, customs, personal allegiances which Sardan (1999) describes as "corruption complex" governed by "logics of corruption" where networks of patronage are fostered by common social values and practices.

Husted (1999) after Hofstede (1991) identify another pertinent cultural attitude termed "power distance" which is "the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally" (Husted, 1999: 343). Where societies display a "high distance power" as in most African (and Asian) traditions there is a belief "that power and authority are facts of life. Both consciously and unconsciously, these cultures teach their members that people are not equal in this world and that everybody has a rightful place, which is clearly marked by countless vertical arrangements. Social hierarchy is prevalent and institutionalises inequality". (Samovar, *et.al*., 1998: 71). Such societal attitude driven by a high acceptance of authority and low accessibility to people in command will in turn provide room for corrupt behaviour from the rent- seeking elite and powerful. But while corruption may be driven by soft causes its consequences are indeed tangibly genuine and its effects have a hard-hitting reality particularly for the most vulnerable and deprived of society.

2.6 Costs of Corruption

The effect of corruption on the major economic variables has been widely researched. While some studies have recognized some marginal economic benefits to be derived from corruption by helping to ease bureaucratic inertia, the overwhelming majority of findings of the empirical literature has concluded on the cost burden and the harmful effects of corruption, namely by reducing the pace to growth, hindering productive public expenditure, limiting foreign investment and obstructing the efficiency of service delivery. Transparency International (TI) considers corruption as one the greatest cost burden for developing economies "which undermines good government, fundamentally distorts public policy, leads to misallocation of resources, harms the private sector and private sector development and particularly hurts the poor" (TI, 1997: 7). Abed and Gupta (2002) summarize through the empirical literature both the qualitative and quantitative damages caused to the economy by corruption in its various facets:

- Corruption distorts markets and the allocation of resources
- It reduces the ability of governments to impose necessary controls and inspections to correct markets failures
- Corruption is likely to increase poverty because it reduces the income earning potential of the poor

- It reduces investment and as a result it reduces the rate of growth.
- It decreases expenditure on health and education which does not lend itself to corrupt practices.
- It lessens the productivity of public investment and of a country's infrastructure.
- And limits foreign direct investment because corruption operates as a tax.

2.6.1 Corruption and Growth

In its ground- breaking findings Mauro (1995, 1997) observes significant negative association between corruption and investment or the rate of growth. The same linkage has been also recognized among many others by Hope (1997) and Van Rijckghem and Weder (1997). However quantitative evidence on the direct impact of corruption on growth remains open to debate. Lambsdorff (1999) argue that if there is robust parallel between a country's GDP size and ranking on corruption indexes however no true causality from corruption to growth can be drawn. The OECD (2014) suggests a more nuanced approach with a relationship through institutions channels. "In the regime with high quality political institutions, corruption has a significant negative effect on growth; while in the regime with low quality institutions, the estimated corruption coefficient is not statistically significant intuitive explanation for this result is that the better the quality of public sector governance, the more its subversion by corruption will hurt economically.

In the other extreme, bypassing a completely dysfunctional governance regime via corruption will not hurt economic performance, and may even improve it" (OECD, 2014: 28). In the absence of robust evidence on the impact of corruption on growth it is also hypothesized that corruption may affect the accumulation of capital but does not necessarily impact its productivity (Abed and Gupta, 2002). The authors (2002: 206) also suggest that "corruption and investment assume a positive relationship between investment and growth" (2002: 206). Therefore, if corruption affects investment it must also affect growth.

2.6.2 Corruption and Investment

If the link between corruption and growth remains an open question the effect of corruption on investment has been one the most scrutinized in the literature with a larger research consensus. Most scholars and much of the economic theory (Mauro, 1995, 1997) Murphy, Shleifer and Vishny (1993) Dreher and Herzfeld (2005) investment conclude through empirical work that corruption has a significant negative impact on the

ratio of investment to GDP. Campos, Lien and Pradhan (1999) in a cross-section of 59 countries, Dreher and Herzfeld (2005) and others find a statistically significant negative effect of corruption on investment. Not only corruption affects total investment level but in particular it puts severe constraints on foreign direct investment (FDI). Corruption may weaken a country's ability to attract foreign capital inflows (Brunetti and Weder 1998) due rent- seeking costs which reduce profitability (Javorcik and Wei, 2009), and increase unpredictability (Boycko, Shleifer and Vishny, 1995).

However, it has also been noted that the directional causality may be reversed as FDI may be a major source of corruption particularly in developing and resource- rich countries as international investors contend for access to markets at times through bribes (Pinto and Zhu, 2013). Nevertheless, can one argue that an important channel through which corruption affects capital productivity is by impacting both the quality and the composition of public expenditures? The question has been largely and more consensually examined in the literature.

2.6.3 Corruption and Public Spending

Indeed, the majority of scholars have focused on the quality-effect of corruption on government expenditure. In Africa as noted by Okori (2010: 112) "…bribery, inflation of contracts, and brazen mismanagement, corruption account for the channelling of scarce public funds to uneconomic and highly-capital intensive projects, such as pipelines and refineries, dams, and power plants, at the expense of more necessary infrastructure projects, such as water and electricity supply, hospitals, schools, and roads". Earlier Shleifer and Vishny (1993) equally found that government officials tend to favour capital intensive projects in lieu of more social human –capital oriented programmes which often leads to inefficient allocation of capital and uneconomic projects (Frisch 1995). In the same vein Mauro (1997) confirms that public investments may be redirected to low if not unproductive sectors more prone to misappropriation of funds and finds evidence that corruption lowers expenditures on education. Tanzi and Davoodi (1997), analysing cross-country data also conclude that corruption significantly augments public investment while sinking its productivity due to added rent –seeking charges. Such capital misallocation accounts for the "cemetery of white elephants" or "cathedrals in the desert - abandoned super highways, uneconomic dams, industrial plants - that litter the African landscape" (Okori 2010: 119).

The evidence overwhelmingly seems to point to a negative impact of corruption on the allocation and use of public resources which provide for the enabling environment of private sector development. Therefore, corruption must also affect private firms and the corporate environment.

2.6.4 Enterprise and Corruption

While the negative effect of corruption on the performance and profitability of private firms is widely acknowledged by the literature, (Alam, 1995 and Di Tella, 1999) it however may have varying impact owing to the size of the enterprises involved. It is suggested that large corporations may benefit from corrupt practices by securing monopolistic markets and little competition whereas for "SMEs it is of cost increasing kind because they have to make payments which do not contribute to the productivity or profitability of the firm" (Alatas and Hants, 1990: 203). Such cost inflation is also noted in the African context as bribes and kickbacks only contribute to escalate projects final expenditures (Hope, 2000). Not only that corruption has a damaging effect on the firms' profits and productivity but it also leads to decreasing private investment as uncertainty and unpredictability arise (OECD, 2014). Such decline in investment may affect transfer of technology and cause delay of technological advancement (Mahagaonkar, 2008) as private financial inflows are seen as major channel for innovation.

Clearly most of the literature has stressed the harmful effects of corruption and its overall detriments to the growth of the private sector leading to misallocation and wasteful use of resources.

2.6.5 Resource Endowment and Corruption

In contrast to the mixed evidence on the correlation between corporate turnover and corruption, the link between endowment of natural resources and corruption has been found as generally strong in low income countries notably in Africa where "one of the main sources of misappropriation of public resources is generated by the lack of accountability of funds generated from natural resources" (Vazquez, *et al.*, 2007: 47).

Earlier Sachs and Warner (1995), from a cross- section study of 70 countries, report a negative relationship between the ratio of natural resources exports and the growth rate, and when the economic growth is hampered then the problem may crucially arise from

the revenues accrued out of mineral exports as they prompt the prevalence of rent - seeking behaviour from officials (Khan, 1994). The phenomenon would not only affect the country's macro- economic variables but also its institutions as the high incidence of bribery threatens "the quality of legal and political institutions, and the level of political instability (Ayitteh, 2000: 181). Indeed, for many countries in Sub Saharan Africa, abundance of nature has not brought windfall gains and prosperity to the people but rather created opportunities for graft and self- enrichment for politicians and bureaucrats all conspiring to weaken the state and compromise political stability (Coolidge and Ackerman, 2000).

The more vital effects will translate into threats to already dire economic conditions for many and increased vulnerability to the livelihoods of the poor, all of which may compromise human development.

2.6.6 Corruption and Social Development

Corruption affects not only major economic variables such as growth and investment but it also has direct impact on other development variables including the welfare outcomes of growth across society. Hence the corruption social inequality nexus has been of particular concern to researchers in developing countries and particularly in Sub Saharan Africa. Generally, corruption is found to exacerbate inequality and poverty in numerous ways. First at the policy level, Gupta, *et al.*, (2002) note that "government officials may use their authority for private gain when designing and implementing public policies, intentionally distorting public policy decisions in an attempt to create opportunities for bribery and" (2002: 458) giving preference to investment in capital intensive projects (Rose Ackermann, 1999) instead of socially-oriented programs (Gupta, *et al.*, 1998). Such choice will harm the poor's wellbeing as Mauro, (1998) found corruption to be associated with lower spending on education and health.

The impact of corruption on poverty is also function of the government officials' involvement in implementation. Large portions of public funds are embezzled or misallocate to benefit the powerful (Tanzi, 1995 and Gupta, *et al.*, 2002). Such practice will concur to produce unequal distributional consequences (Ward, 1989) and preserve status quo and inequality (Johnston, 1989). In a cross - section study of 37 countries

Gupta *et al.* (1998) empirically conclude to a significant positive correlation of corruption with inequality measured by the Gini coefficient. Apart from extending income inequality by favouring the well-offs corruption indeed tends to harm developmental outcomes by directing lesser public funding towards social programs. Dreher and Herzfeld (2005) argue that corruption is correlated with lower life expectancy and school enrolment. Such findings of damaging effects on human capital were earlier reported by Gupta, *et al.*,1998.

Ultimately corruption is seen as having multiple regressive effects on many socio-economic fronts and pre-empting the state ability to transform the economy and change society as reported by the OECD (2014: 2): "the true social cost of corruption cannot be measured by the amount of bribes paid or even the amount of state property stolen. Rather, it is the loss of output due to the misallocation of resources, distortions of incentives and other inefficiencies caused by corruption that represent its real cost to society. In addition to these output losses, corruption can inflict additional welfare costs in terms of adverse effects on the distribution of income and disregard for environmental protection" (2014: 2). The same perspective is confirmed by Aidt's empirical work (2009) which demonstrates a significant relationship and a negative impact of corruption on wealth formation (which adjusts fixed investment for depletion of resource and human capital). Afrobarometer in its latest survey (2013) suggests that the poor are more exposed to corruption than others notably in countries with high incidence of such phenomenon namely African countries.

But most importantly, corruption undermines public trust in the government, thereby diminishing its ability to fulfil its core task of providing adequate public services, eventually distorting the "allocation of economic benefits, favouring the haves over the have-nots and leading to a less equitable distribution of income" (Ackerman R, 2006: 33).

In extreme cases, it may entail the delegitimization of the state, leading to severe political and economic instability. The resulting general uncertainty is detrimental to the concerned countries' ability to manage public resources effectively and to commit to a long-term development strategy, the lack of which make equitable and sustainable development elusive.

2.7 Conclusion

Indeed, whether in the public or private domain corruption is seen as a diversion of collective resources towards selfish ends that crucially affect an economy and more broadly a society through multiplier effects which all make up the political economy of the phenomenon that we reviewed in this section.

Although there seems to be some mixed evidence - markedly with regards to growth- it is generally widely accepted that corruption is one of the most damaging variables for development with negative implications for economic progress and social welfare.

The varied empirical results of various studies however points to the facts that although we may have learnt a lot about the causes and effects of corruption we still have to learn much more about the root causes of the phenomenon and its diffusion channels. This may also lead to recognize the greater complexity of corruption as a ubiquitous practice with dimensions that might have unique and non-generalizable origins and effects. African countries - including SADC - should be well aware of such idiosyncrasies as they have not only analytical but practical implications for the success of good governance public policy- initiatives and the implementation effectiveness of anti- corruption strategies.

CHAPTER III

ECONOMICS OF HUMAN CAPITAL

3.1 The concept of human capital

3.1.1 Definitional Aspects

The notion of human capital widely referenced in development economics is seen as one the key factor of production in economic output and one of the most critical input for economic growth in modern economies. The concept generally refers to the "to the skills knowledge and capabilities of a workforce of a firm or of the population of the country as well as the organizational arrangements and networks of relationships those people have formed that enable them to be more innovative and productive" (Blair, 2011:50). In the economic literature the suggestion that the human factor is essential to production goes back to Adam Smith (1776) who pointed that investment to equip workers with special skills and capabilities are key to improving productivity. This provided the theoretical foundation for expenditures on human capital to be categorized as investment instead of consumption good. Later, Mincer (1958) Schultz (1961) Becker (1964) successively recognized the importance of human capital as capabilities and skills gained through investment in education which allow for higher private returns and differences in workers' earnings. Coff (2002) designates human capital as the set of knowledge, skills and abilities which can be categorized as tacit or explicit and which refers to the extent of transferability of such knowhow (Crook, *et al.* 2011)

At a macroeconomic level the term was later coined by Becker (1993: 16) who put forward that the growth not explained by physical capital or quantity of labor is to be linked to residual factors of "labor quality" he later called – reluctantly – human capital. More recently and comprehensively the OECD (2001: 18) proposed a more extensive scope of individual attributes and has defined human capital "as the knowledge, skills, competencies and attributes embodied in individuals that facilitates the creation of personal social and economic wellbeing". This definition represents a widening of the scope of human capital to not only traits but also to contextual and social elements. It also points to the multi – dimensions of human capital which can be "framed as

heterogeneous and its value contingent on the context of its application – and these contexts vary widely from the national and firm level to the individual level" (2011: 187).

3.1.2 Categories of Human capital

Indeed, human capital is not a unidimensional construct. If it is the sum of knowledge and training skills embodied in an individual, it is for businesses the addition of capabilities which form a workforce while it represents for policy the capacity of the educated in a country. This translates into distinct intellectual capitals that have been categorized in human, relational and organizational types (Stewart, 1997). As Blair puts it human capital can be "framed as heterogeneous and its value contingent on the context of its application – and these contexts vary widely from the national and firm level to the individual" (2011: 187).

As an individual asset human capital is viewed as the antipode of physical capital. One important difference is that human capital is not alienable "its services can be rented but the capital itself remains the property of the original owner" (2011: 153). It refers here to knowledge embodied in individuals and acquired through formal education, learning and workplace training. But if human capital is viewed as a function of individual traits, its value in practice is predicated by the social environment which is the contextual element (Burt, 2005) to explain its different manifestations within the educated populace. Such link has been notably proposed by Coleman (1988) emphasizing the importance of the family environment in education outcomes. Blair (2011) later suggested that "social capital provide both the theory and evidence to illuminate the ways in which connections and relationships shape the development and realization of human potential" (2011: 79).

Human capital becomes defined as a relational resource, breaking away from "the reductionist neo –classical model of human capital in which individuals are presumed to invest on the basis of instrumental, self - maximizing motives" (2011: 78). The economistic view which implies human capital is invested in return for economic value is challenged in favour of an understanding of its wider social context (Schuller, *et al.*, 2004; Erault and Hirsh, 2007). The shift towards a more social view of human capital also caused the OECD to provide a new and wider definition of human capital now seen as "the knowledge, competencies, skills, attributes embodied in in individuals that facilitate the creation of personal social and economic wellbeing" (OECD, 2001: 18).

If in an organizational context, human capital remains within the paradigm in which knowledge and skills are its main attributes embodied in an individual, for policy makers, human capital amounts to the capabilities of a country's population and comprising a health factor which has come "to be seen as a fundamental component of human capital" (Blair, 2011: 79). Here the importance of human capital is derived from its collective significance as a key variable for the purpose of national planning and managing economic output. It evolves from an individual to a more social stance over time retaining its distinctive character from physical capital. The fundamental difference is "that human capital is not alienable. Human capital ownership cannot be alienated from its original owner. Its services can be rented but the capital itself remains the property of the original owner (Blair, 2011: 153) as it stands, unlike other forms of capital as an inalienable asset tied to the individual. Meanwhile this review of the multiple forms of human capital is also pertinent to the issue of categorizing and measuring human capital.

3.2 Metrics of Human capital

A host of proxies have been suggested in the labor economics literature to account for human capital. Attempts to provide for some estimate human capital were suggested on the onset in the early definitions (Schultz, 1961; Becker, 1965) which posited the sum of knowledge and skills of the population as a form capital instrumental to the supremacy of developed countries. Human capital is then measured through the education level of the population to which estimates are assigned such as literacy rate (Romer, 1990) or enrolment rates (Barro, 1991; Mankiw, *et al.*, 1992) or average years of schooling (Barro and Sala-i-Martin, 1995; Benhabib and Spiegel, 1994).

Another thread of research has highlighted the occupational element as a measure of human capital that is the type of work performed instead of intellectual knowhow (Florida, *et al.*, 2008).

3.2.1 Human capital: A Cost Center

These views are linked to the neoclassical approach which provided the basis for labor economists and policy planners to use as a measure of human capital, the inputs needed for its acquisition such as years of education, years of training. The neoclassical approach is further elaborated by Mankiv, Romer and Weil (1992) who suggest a "Cobb – Douglass production function with human capital as an H factor of the workforce." (Blair, 2011:57). It follows that measuring human capital amounts more to measuring

not its value but its cost through estimates of direct costs of education and training seen as investments and used by labor analysts to "… measure the economic effects of such investments in terms of wages salaries and other forms of compensation for workers" (Blair, 2011: 56).

At an organizational level, human capital is defined by the American Accounting Association (1973) as the "process of identifying and measuring data about human resources…" The focus is initially more towards quantifying human resources on the balance sheet treated as "expenses" and not "assets" (Brummett, *et al.*, 1968).

Then new frameworks provided wider scopes to account for human capital (Boedker, 2007) not just in terms of outlays but relied on other human and performance dimensions (Kaplan, *et al.*, 1992). Such approach included "…accounting for knowledge information, culture, values, skills, links to the community, practices to improve the environment, and customer service" (2011: 383). The emphasis is no longer on the financial accounting but rather on the wider delineation of human capital which accounts for more strategic elements such as "competitive advantage of human capital and organizational effectiveness (Blair, 2011: 384) not to mention its monetary value.

3.2.2 Human Capital: A Revenue Stream

A well - established strand of research has long provided evidence of economic returns at the individual level. From the pioneers (Schultz, 1961) who first described spending on education as an investment instead of consumption meant to develop workers 'skills and improve their earnings potential, to Becker (1964) who also found knowledge to accumulate towards increased future income, all recognized the key role of education and improved skills to improved marginal productivity and improved workers' earnings. Later Mincer (1974) determined the rate of earning for an additional one year in school to be 11.5%. Investments in education are seen as means to accrue monetary benefits and educational choices become "rational choices of optimizing agents, who compare the present value of earnings to be expected from education and its related costs, over a life-cycle period" (Blair, 2011: 76).

In more recent empirical studies, the higher productivity yield of human capital is also confirmed. Psacharopoulos and Patrinos (2002) conclude that in developing countries the average return to education is superior than that to financial capital. The OECD

reports (2012) have shown across countries a strong positive association between private earnings and years of schooling.

If the accrual of human capital through education and training seems to be recognized throughout the literature as the main driver behind private returns it also has more encompassing effects at the macroeconomic level. Human capital affects not only individuals but also national growth.

3.3 Impact of Human Capital

The effect of human capital accumulation to explain the divergent economic fortunes among countries has long been established in development economics. Early on Adam Smith in *The Wealth of Nations* (1776) suggest the important role of human capital as a factor of higher productivity. The research has since overwhelmingly found strong associations between levels of human capital and economic prosperity.

3.3.1 Human Capital and Economic Growth

A long stream of economic and social research has recognized the critical contribution of human capital in explaining the divergent paths to growth among nations.

Pioneers in human capital theory such as Becker (1964), Schultz (1972) first recast the human element as a capital which accumulation is a key contributor to both individuals' productivity and nations' growth. Later Lucas (1988) found a strong association between gains in productivity and levels of school attainment notably in secondary and tertiary education. Across economies the human factor is linked more explicitly to economic output after Becker (1993: 16) identifies that "human capital was the key to unlocking the mystery of the growth not linked to known factors of production and inputs such as physical capital, equipment, or technology". Investigating growth in the US economy. Denison (1985) finds significant correlation between workers' education and per capita income for the period 1929 to 1982. Other studies brought renewed concurrence to the discussion with the prominent writings of Lucas (1988) and Romer (1992) reasserting education as a long term factor to explain differences in GDP evolutions among countries. Mankiv, *et al.*, (1992) using the Solow model pointed to the key role of human capital to account for variations in growth rates between countries. Barro (1991) while

analyzing data across 98 nations for the period 1960 -1985 found a strong association between human capital and the growth rate of per capita GDP.

Indeed, investment in human capital is critical to a country's economic development as it is also recognized to drive other investments and notably for direct investment (FDI). Markusen (2001) found human capital and knowledge to be key determinants for foreign investment inflows. While Nonnemberg and Cardoso de Mendonça (2004), conclude that FDI is strongly correlated to education attainment among other factors in a panel data analysis across 38 developing countries for the period 1975 to 2000. Similarly, Reiter, *et al.,* (2010) confirm a positive relationship between human development and foreign investment particularly in countries with lower corruption levels.

However, some economists albeit in the minority have questioned such positive association between human capital and economic growth. Caselli, *et al.,* (1996) find no positive relationship between the two variables which was later concurred by Pritchett (2001). Instead these authors highlighted factors of quality and not quantity in education as diminishing returns may affect yields in human capital investment. It is not just the returns on the quantity of education to be considered but the quality which provides for learning abilities and faster knowledge acquisition. Some studies (Barro and Lee 1993, 1996; Hanushek and Woessmann, 2008) using test scores clearly established the importance of quality education in relation to income distribution and national growth levels.

How to account for human capital in the incidence of growth and incorporate knowledge in the growth models has been a continuing interest for the contemporary economic literature. The various economic models can be grouped into exogenous or endogenous categories according to their approach in linking human capital and economic growth.

3.3.2 The Exogenous Economic Model

Human capital as an exogenous output to economic growth has been best framed after the Solow model (1957) and looked at knowledge as a given factor outside the economic growth model.

Mankiw, Romer and Weil (1992: 432) in their ground breaking paper reframe the production model by adding human capital as a new input factor. Human capital

similarly to physical capital is taken as an input factor in the production function, "It is accumulated by investing a fraction of income in its production, depreciates at the same rate as physical capital, and is produced with the same technology as both physical capital and consumption" (Schutt, 2003: 9). Such approach externalizes the human capital factor and like physical capital is subject to diminishing returns "it can depreciate over time if worker become ill, weaker of less physically or mentally able as they age. It can also depreciate if certain skills become obsolete" (Blair, 2011: 52).

However, under the neo – classical model factors determining the long - run growth such as savings rate or rate of technical progress are exogenous to growth variations and remain unexplained. The endogenous growth model is an attempt to unlock such unknown.

3.3.3 The Endogenous Growth Model

Distinct from the previous approach which hold the long - run growth model outside the model the second approach "emphasizes the role of the human capital stock in the process of innovation and adoption of new technologies" (Schutt, 2003: 9). Romer (1986) and Lucas (1988) are first to theorize the endogenous framework for human capital and suggest a new growth theory which accounts for human capital from within the model. Technological progress becomes a catalyst of the growth engine rather than an external factor. The long- run growth is no longer a mystery as it "becomes self-sustained and…driven by the accumulation of human capital" (Schutt, 2003: 10). Both human capital and technical knowledge are seen with increasing returns which drive the economic growth. This model underlines the importance of investment in human capital formation as it becomes another internal source of growth. Knowledge is no longer subject to diminishing returns and "because there are no diminishing returns to the acquisition of skills, human capital can grow without bound, thereby generating endogenous growth" (Schutt, 2003: 10)

Others will follow suit with new variants of the basic endogenous growth model. Barro (2001) uses an endogenous growth model and also concluded to the positive relationship between education and growth in his sample of 100 countries for the period 1960 to 1995.

Using another approach of endogenous growth theory Benhabib and Spiegel (1994) propose to model total factor productivity (TFP) growth as a function of human capital

formation. Human capital is no longer a detached production factor generating growth but as an added source of growth produces spillover effects into the economy. Similar approach is taken by Altinok (2006) using the endogenous model who finds a positive relationship of human capital indicators with growth across 105 countries for the period 1960 to 2000. More recently the function of human capital in the form of knowledge in spreading social progress was recognized more explicitly by Piketty (2014) as he put it: **"**Knowledge and skill diffusion is the key of the overall productivity growth as well as the reduction of inequality both within and between countries" (2014: 21). Arguably human capital is revived as a critical resource at the macro – level for growth but it also appears as a key determinant at the micro – enterprise level.

3.3.4 Human Capital and Corporate Performance

The idea of human capital has become a dominant concept not only in development macroeconomics but also in the theory of the firm and human resource management within the context of assessing enterprise performance and corporate governance. Human capital defined as the sum of knowledge skills and experience of workers is viewed as a critical resource in organizational environments, "a value generating potential of employee knowledge skills and abilities" (Kang, *et al*., 2007: 333). Benefits to be accrued from investing in human capital include higher productivity through enhancing worker's ability to manage information about input costs (Welch, 1970), higher potential for innovation through learning and learning by doing. Professionals with high human capital are likely to induce lesser staff costs due to a lower turnover rate (Chang and Wang, 1996) and greater capability to deliver consistently high level of quality services (Pennings, *et al.*, 1998).

Increased productivity is also likely to be derived from the spillover effect induced by multinational firms through the spread of technology and knowledge from the global to local markets. Porter (1990) suggests that international firms have a key role in the trickledown effect of human capital as they use foreign direct investment (FDI) to maximize profits by leveraging cutting edge technology and highly trained workers. Human capital is described as a critical resource for firms to sustain their competitive advantage. Patibandla and Petersen (2002) confirm that multinationals are more willing and able to invest in skills development which in turn will benefit the local market through staff movement.

Despite being a high productivity generating potential for firms, human capital unlike other factors of production cannot be alienated from its owner, bought or sold. It is not owned by the employer but only rented through the labor market. This entails that human capital may only be available to firms through contractual workplace relationships as in the form of principals and agents (Williamson, 1985). In an agency framework agent - employees while acting in their self-interest are committed to discharge their tasks and willing to also act in the interest of the principal - employer (Crawford 2009). Then such relationships construed as human resources will need to be managed strategically across contracts within firm structures with the aim for companies to maximize employees' potential and build the competitive edge for a lasting survival

3.3.5 Human Capital and Governance

But the effects of human capital go beyond improved economic returns in the form of individual earnings or national growth. Indeed, human capital is "an intensely political process constantly being negotiated between state market and labor" (Blair, 2011: 602) which provides for the various political forms of human capital formation regimes. Liberal regimes as market – oriented structures are generally characterized by weaker public spending on education (Pontusson, 2005). The burden of education spending is borne significantly by the middle class notably for the higher education. On the contrary social democratic regimes with a more egalitarian approach to social stratification are regarded as systems with higher public spending in all levels of education in which policies are geared towards strong support to human capital promotion. (Pontusson, 2005).

These various political formations and institutional arrangements will in turn produce not only economic but also non-economic returns for human capital particularly with regards to improved public governance and enhanced social convergence. As Piketty (2014) argues "the main forces for convergence are the diffusion of knowledge and investments in training and skills" which are even more powerful than the economic "law of supply and demand" (Piketty, 2014: 21)

3.3.6 Human Capital and Corruption

The literature has predominantly focused on the incidence of corruption on growth, investment or foreign aid. Meanwhile the research on the impact of corruption on human

capital has been scarce and has generally paid one directional attention to its effects. Seldom is a theoretical or empirical scrutiny offered on the impact of human capital on corruption.

One pioneer study by Ehrlich and Lui (1999) suggest that corruption is likely to impede human capital formation as talented individuals spend more time in rent - seeking activities and have less incentives for seeking education opportunities. The same concern for the sub optimal use of human resources is also identified by Tanzi and Davoodi (2001) who find that countries with high corruption tend to have more humanities than technical skills in higher education, which points to possible unproductive allocation of resources. Through its seminal review Rogers (2008) confirms empirically using corruption index cross country data the low impact of human capital on growth in highly corrupt countries.

Corruption not only has direct harmful effects in many respects but it also engenders indirect consequences on the human capital stock. Renown empirical studies (Li, *et al.*, 2000, Tebaldi and Mohan, 2010) have established the negative impact of corruption on social programs mostly due to diversion of funds resulting in increased inequality and reduced access to education programs. (Gupta, *et al.*, 2002; Gymiah-Brempong, 2002). Dridi (2014) using empirical analysis not only found that corruption affect human capital accumulation by squeezing the share of funding for education but emphasizes the magnitude of the effect. "A one-point increase in the corruption index is associated with a decrease in the secondary school enrollment rates of about 10 percentage points" (2014: 489) while Mo (2001) finds earlier "that a one-unit increase in the corruption index is associated with a decrease in average schooling years by 0.25 years" (2001: 66). Mauro reports a similar result which concludes "that a one standard-deviation improvement in the corruption index leads education expenditure to increase by over six percentage points of total government consumption expenditure" (1998: 276).

If it is generally found in the literature that countries with high levels of corruption allocate less for education, Pellegrini (2011: 53) takes exception and underlines that corruption has no significant effect on average years of schooling. This is however not in line with the most overwhelming argument which is that corruption is acutely detrimental to the setting of an economic and institutional space that promotes enlargement of education and quality human capital accumulation. It still remains that

in view of the aforementioned, in rare instances the role of corruption is recognized in a model linking human capital to its causation, which is the concern of this study.

3.4 Human Capital in Developing countries

The history of economic development across nations worldwide suggests that mass education has been the precursor of giant leaps in economic growth first in the 19th century in the West and more recently in the last quarter of the 20th century in Asia. Indeed, in the last few decades, human capital appears at the center of localized growth across developing continents in a much globalized economy.

3.4.1 The Case of Asia

Numerous studies on the source of large scale economic growth in Asia have established a strong link to human capital. Becker (1992) suggests that countries like Taiwan, Singapore, South Korea, and Hong Kong have transformed their economies and standards of living by relying first on mass education and skills development in the absence of natural resources. Through massive investment in human resources to produce highly skilled workers these countries have achieved unprecedented and sustained rates of growth (World Bank, 2002). This is also confirmed by Olaniyan & Okemakinde (2008: 157) who found that quantity and quality education were a strong predictor of high growth in East Asian economies. Such spectacular economic and social advances included "productivity growth in agriculture, rapid growth in manufacturing exports, declines in human fertility, increases in labor productivity and high rates of domestic savings" (Blair: 627).

The formula for economic success has relied heavily on large public investments to allow access to the education system, while creating the conditions of a sustained and fast growth derived from "from high rates of capital accumulation, technological change, and the influx of young educated workers" (Yusuf, 2003: 27). The infusion of education for the enhancement of human capital formation not only has assisted in promoting economic growth but it has also proved an effective means of raising human development standards "reducing income inequalities, promoting health and enhancing social development" (Yusuf, 2003: 27).

The next model of growth for these Asian countries is to move "from a supply- driven economy of simple mass- produced products, to an innovative, customer - driven knowledge economy" (Yusuf, 2003: 27) where human capital is leveraged into high added – value manufacturing and advanced technology goods.

3.4.2 Human Capital in Africa and SADC

Africa's human capital and skills development levels remain a challenge to its economic development and that of its private sector. The African Development Bank (2011) identified that "Africa suffers from crippling shortages of human capital and skills. Only 1 % of African adults had completed tertiary education by 2010, compared to a global average of 3.9 %. (2011: 102). This translates into a low human capital development base, weak levels of adult literacy and inadequate support mechanisms for education. The potential returns for human capital along with the challenges are enormous with a population of approximately 1 billion projected at 2.3 billion in 2050.

The AfDB (2011) further notes that "after Asia Africa is the world's largest and most populous continent and accounts for about 15% of the world's population… it is also the youngest region in the world... By 2040, Africa will have the largest workforce in the world" (2011: 5). With these demographic features the continent stands to reap the benefits of high accumulation both in quality and quantity of human capital or to face the dire economic and social consequences of uneducated and unemployed citizens particularly the youth. Currently most African countries still rely on their natural endowments under commodity – based models which do not require high skill – labor and continue to reproduce low quality of human capital.

In order to reverse the economic fortunes of a continent with such important labor resources African countries need according to the World bank "to invest heavily in physical infrastructure and productive capacity…However, maximizing productivity and achieving competitiveness will depend upon success in augmenting human capital and raising its quality" (2009: 9). Indeed, it is the human capital that will provide the conditions for skills - based development, knowledge – intensive growth and a sustainable path to economic resilience. But the advent of such outcome as warned by the AfDB will require "continued, high impact, investments in human development – in

education, nutrition and health, science and technology..." (2011: 4) in the absence of which African economies will remain uncompetitive

The SADC region with a population of approximately 300 million that is almost one third of the continent's population is also confronted with the same human capital challenges. Naidu and Roberts (2004: 37) already noted that the region was challenged by a host of education and health issues. Khembo (2013: 151) confirms in his study that the educational variable was significant when accounting for economic growth in the region. The SADC organization in its SADC Industrialization Strategy and Roadmap 2015-2063 identifies that "all the countries have serious skills deficits" (2014: 9) and recognizes the need for "education systems …to be restructured and re-purposed with focus on technical and vocational skills of all kinds, especially those appropriate for a modern, knowledge economy" (2014: 13).

Put simply, the requisite transformation across the region will require a more and better educated workforce in order to move SADC economies up the value chain with the view of improving workers' employability, maximizing production and achieving competiveness. In fact, the path to economic prosperity in the 21st century lies in how countries can harness available knowledge and cutting edge technologies to sustain productive capacities and build comparative advantages.

3.5 The Knowledge Economy Growth Model

Most of the economic literature when examining the human capital theory has notably focused on developed countries (Malik, 2006) and has often considered physical and natural resources as the major sources of economic growth (Lucas, 1988). But economic growth models in the last decades have seen a paradigm shift towards knowledge - based economies. A long stream of research which begun with the framing of the "information society" (Mattelart, 2003: 113) then deepened into the theorization and adoption of the concept of knowledge economy across the developed and then the developing world. The new growth theory fueled by the endogenous approach emphasized the increasing returns of intangible assets (ideas, skills) instead of accumulation of physical capital as the path to growth (Easterly, 2001; Evans, 2007). A knowledge economy relies for its performance primarily on the application of technologies and know how rather than crude exploitation of raw materials.

The World Bank (1998) identifies the importance of knowledge and information in spurring economic development in their leading "Knowledge for Development" report (1998) and then emphasizes that "…knowledge, and its application, are now widely acknowledged to be one of the key engines of economic growth" (World Bank, 2004: 1). Such recognition of the knowledge factor in the resurgence of economies was made earlier by the OECD (2005) in its renown report, "The Knowledge- Based Economy" (1996) which further elaborated on the concept outlining the knowledge economy around four pillars: human capital, innovation, new technologies and enterprise dynamics. (2005: 19). The value of knowledge and technology as determinant of economic success and firms' viability has been almost universally acknowledged. Both developed and developing countries have placed high reliance on the skills and competencies which can drive research and development, innovation and high value added manufacturing. Brinkley (2006) identifies that "advanced industrial economies around the globe are steadily moving to the unprecedented position where knowledge based industries and knowledge based organizations will within the foreseeable future generate more than half of total GDP and total employment (2006: 6).

Asian countries including Korea, Malaysia, Singapore, Taiwan, India, China moving away from an export – driven model of basic mass – products have also committed to programs emphasizing high returns to human capital as the key to economic growth by means of large investments in education and training. The Asian Development Bank (2007) suggests that "knowledge can eventually become a means of mass production – similar to manual labor in the industrial economy – once web – based information and communication technologies have reached worldwide penetration levels" (2007: 1). Faced with competition from the West and Asia, a more knowledge intensive route to economic development could provide Africa an avenue for raising its productive value added and building a more resilient competitive edge.

3.5.1 Africa and the Knowledge Economy

A chance is presented to the African continent to leap through periods of economic development from mostly commodity – based productions to knowledge – intensive growth models.

The World Economic Forum (2015) notes: this incentive to "bypass manufacturing and shift into high-productivity services" (2015: 7) is even greater as the commodity crisis looms larger amidst a slowing global demand with nefarious consequences on growth

rates across African countries. As argued by Anyanwu (2011: 2) the global knowledge economy has created for African countries "new challenges as well as new windows of opportunity".

And the key to unlocking economic success lies in how Africa will adapt knowledge into its growth models with the aim to increase allocative efficiencies, boost productive capacities and sustain competitive pressures in a globalized world. Such move remains critical for any prospect of long term development as "a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy would be unable to develop anything else." (Harbison 1973: 18)

In theory, many academic views on African economies have placed human capital at the center of productivity growth. Fedderke (2006) includes variables such as human capital, research and development (R&D) in a Schumpeterian growth model to estimate output growth in South Africa. Babatunde and Adefabi (2005) estimate association between education and growth between 1970 and 2003 in Nigeria and found a strong correlation in the long run.

In reality there is urgency for Sub Saharan Africa to carve its ways to skills – based development, and devise the requisite accompanying policies so as "to diversify into higher value, knowledge – intensive business sectors less exposed to competitive pressures. For now, as ominously noted by Anyanwu (2011) "from the available indicators, knowledge in Africa today appears to be on the retreat. Africa's overall score in the knowledge index fell between 2000 and 2009…" (2011: 14).

In all the three pillars of the knowledge index - which are education, innovation and information technology - Africa's comparators are lagging behind the rest of the world. Productivity growth has been a challenge with a vast scope for technology catch up (Ndulu *et al.*, 2007) which still remains a potential as the fundamentals have barely moved.

Bloom, Canning, and Chan (2006) in a World Bank review identified that Sub-Saharan Africa's output is 23 percent below its production capacity due to gaps in human capital

The World Economic Forum in its 2015 Africa Competiveness Report suggests little improvement and identifies "the majority of African countries as being among the least

competitive in the world and indicates that, despite 15 years of strong growth, Africa's overall competitiveness has remained stagnant" (2015: 14). This unfortunate performance has been attributed not just to an education deficit but also to a lacking innovation system, an inadequate information infrastructure and a weak economic and institutional regime.

Closing the knowledge gap in order to leapfrog to a knowledge–driven economy will indeed necessitate large investments in physical and human capital along with a sustained policy direction over extended periods.

But optimistically Anyanwu contends that "a major part of what is required is not money but the political commitment… and accountability … to formulate the requisite strategies… as well as the institutional changes" (2011: 36). Meanwhile such dire situation seems to be compounded as Africa's already low level stock of human capital continues to be depleted by the flight of its ablest and talented brains.

3.5.2 Africa and the Human Capital Flight

Labor economists following the neoclassical model have generally considered movements of international migration as an outcome of markets largely driven by the ebbs and flows of supply and demand of labor in the origin and destination countries.

According to the United Nations Global Migration Database in 2015, the number of international migrants worldwide reached 244 million, an increase of 71 million, or 41per cent, compared to 2000. Within the broader context of international migration, the more conspicuous brain drain phenomenon takes place, mostly borne out of the asymmetries of international development. It refers to "the international transfer of human capital resources and it applies mainly to the migration of highly educated individuals from developing to developed countries" (Docquier, 2014: 2). International migrants according to the United Nations statistics (2015) represented 10% and 15% of the population in Europe and North America against 3% for the rest of the World.

In Africa the expatriation of skilled professionals towards richer countries in the West has left many countries acutely short of the human capital resources needed for their advancement in the drive to a knowledge-based economy (Imran, *et al.*, 2011). The main reasons for such depletion are mainly socio – economic and marginally political.

Researchers (Olumide and Isioma, 2012; Dzvimbo, 2003) have framed these reasons around push and pull factors. The push factors refer to the adverse conditions from origin countries which cause people to emigrate. They include unemployment, low wages and poor education systems. The pull factors relate to the attractive conditions prevailing in the destination countries. They consist among others of better salary packages, more professional opportunities and higher living standards. (Imran, *et al*., 2011)

If talent migration is indeed a contributing factor to the skills shortage in Africa, the findings of the literature remains inconclusive as to the overall effects of the brain drain on human capital accumulation and economic growth. The phenomenon is generally found to have an ambivalent effect (Beine, *et al.*, 2001), on the educational and occupational structure of the workforce.

A number of studies on one hand, has argued that the effect on the source countries economic progress may be on the whole harmful (Mckenzie and Rapoport, 2010) with due regard to the social returns lost to the origin countries which are greater than the private returns for the departing individuals. The arguments include the increasing educational technological gap between the sending and receiving countries, the fiscal losses due to unpaid taxes, and occupational distortions with shortages in specialized skills. (Imran, *et al*., 2011).

On the other hand, a brain drain was also found by others (Kamoche, 2011; Batista, *et al.*, 2011) to be advantageous to source countries. The benefits include the income generation from the remittances flows, the participation of highly skilled migrants in business and technology transfers are among the many "diaspora externalities" (Docquier, 2014: 5) to be provided by the talent migration. Beine, *et al.*, (2001) suggest that the opportunity for migration and earning higher wages abroad may create incentives for investment in education and produce overall human capital accumulation. This is confirmed by Easterly and Nyarko (2008) who found that "the opportunity for brain gain does stimulate skill accumulation and that this effect seems to offset the direct loss of skills from brain drain" (2008: 4).

In the end the effects of the human capital flight whether positive or negative on the whole remain an open debate. In reality, as Sub Saharan Africa redoubles its efforts at mitigating the effects of the talent outflow, the remedy is surely not to erect walls around

source countries as "talent will flee from where it finds no gainful use" (Ndulu, 2007: 158) but to set the appropriate policies for talent retention and return namely around education policy, quality of institutions, and wages (Ndulu, 2007; Docquier, 2014).

3.6 Social Development and Human Capital

Modern economic growth theory has long recognized the importance of human capital formation as a key contributor to economic output. Furthermore, the literature has also identified educational attainment as a key ingredient towards ensuring social development and a more inclusive growth. Ali and Son (2007) suggest that reinforcing capabilities in the form of human capital is a significant factor for social development and shared growth. Such link is mediated at the country level by policy initiatives geared towards priority investments in health and education.

The World Economic Forum report (2015) recognizes that "economic policies to promote structural transformation and create productive employment for poor people will need to be complemented by investments in human capital and other programmes to support social inclusion…" (2015: 2). Social development is hence framed as a broad based - growth (World Bank, 2013) that involved a sectors of sectors across a country's economy including critically human capital drivers such as education and health. Balakrishnan, *et al.*, (2013) found that larger spending on health, education and social safety nets have contributed to higher standards of social development and a more inclusive economy. Ali and Zhuang (2007) earlier suggest that social development requires policy interventions in key domains which include education, health, and other social services.

Investment in education and human capital is viewed as essential for the advent of social development. Skills acquisition through education allows labor market access to the disadvantaged and marginalized which in turn help curtail poverty rates and enhance social cohesion (Duflo, 2011; CAFOD, 2014).

Empirically there is also large evidence which indicates strong association between investment in human capital and better social development outcomes with social sector fiscal spending robustly linked to decline in poverty rate and inequality (UNESCO, 2007; Anand, *et al.*, 2014). Conversely social protection programmes will enhance human capacities such as health and education while ensuring longer term social development outcomes (Browne 2015).

From a human development perspective, it becomes critical to consider the role of human capital not as a catalyst to the rate of economic growth but also relative its impact on social cohesion and equity. Indeed, education and skills training not only are recognized as growth element but also help reduce poverty and inequality through better employability of job seekers enabling more economic inclusion and superior social cohesion (AfDB 2011, 2014).

But the extent to which human capital expands advancements in economic opportunities and improves living standards, is prejudiced more exhaustively by a mix of structural and institutional elements of political economy, some of which this chapter has attempted to ascertain.

3.7 Conclusion

It is widely admitted nowadays that modern economic growth has become increasingly reliant on skill – intensive production models, technical competencies and high levels of education (Cohen and Soto, 2007). As knowledge and qualified human resources carry an ever a growing bearing on development outcomes in a globalized world, it becomes crucial for Sub Saharan Africa to recognize the skills requirements of a knowledge – intensive development which calls for a reappraisal of its economic fundamentals.

For too long the continent has relied for its economic revival on a commodity - based growth model fueled by the higher prices of energy and raw materials (Ndulu, 2007) taking no notice according to the IMF (2015) that "enhanced education outcomes will be particularly important to improve the employability and increase the productivity" (2015: 35) of a new economy. Its repositioning towards building a more resilient economy involves a paradigm shift in recognizing the pivotal role of human capital.

Such orientation will include reprioritizing of investment towards education, stronger institutional support towards innovation which is "not so much a matter of pushing back the frontier of global knowledge, but more the challenge of facilitating the first use of new technology in the domestic context (Dahlman, 2006: 31).

Crucially it will not just require knowledge it will also entail an enabling environment of institutions, networks and focused policy support without which the human capital accumulation cannot be effective. Only then the incidence levels of corruption may be affected, which is the main focus of this study. That is the political economy of corruption through the human capital formation.

CHAPTER IV

CONCEPTUAL FRAMEWORK

4.1 Introduction

The purpose of this chapter is to provide a theoretical approach to understanding the relationship between human capital, corruption and social development. In examining the significance of corruption and human capital as determinants of social development, this work considers corruption less from an ethical perspective as "an immoral and unethical phenomenon that contains a set of moral aberrations from moral standards of society" (Gould, 1991: 468) but rather viewed in its socio economic context as a public phenomenon. Corruption is viewed as "bureaucratic" corruption by public officials. The practice may take various forms, for example it may be due to diversion of public resources by public officials (Mauro, 2002) or to bribery, kickbacks, embezzlement, or tax evasion. Corruption commonly defined as abuse of public power for private benefit is referred to by Nye (1967: 417) as "*endemic in all governments"* and no country has been immune to its spread. The scourge remains ubiquitous and ever present around the globe.

According to Transparency International "nearly three quarters of the 178 countries in the Corruption Perceptions Index score below five, on a scale from 10 (highly clean) to 0 (highly corrupt), suggesting a perception of widespread corruption among public officials". International organizations and global watchdogs have in recent years recognized the relevance and urgency of the problem of corruption for international development. Although it is present in almost all countries, corruption is most pervasive throughout the developing world and particularly in resource-rich Sub Saharan Africa.

While economists and social scientists have abundantly examined the idiosyncrasies of corruption across countries and continents, cross - country empirical studies about corruption, causes and their uneven levels remain much more infrequent notably for African regions. Most of the debate about growth and social development has remained largely conceptual with arguments that revolve around the question of whether market-led growth is sufficient to eliminate poverty and reduce inequality largely ignoring the crucial policy considerations of public intervention and notably the need for governments to tackle the scourge of corruption and design effective anticorruption strategies. However, such policy attention requires first an

analytical focus geared towards an understanding of the layers of political economy which provide the possibility conditions of corruption. Following the blueprint of the renewed approach of economic development by Haq (1999) and later Perkins *et al.* (2006), which posited a wider concept of development involving more human variables such as education, health; this study sets out to investigate the deterministic role of "intangible" (World Bank, 2011) factors identified as human and social development, when applied to corruption occurrences across SADC countries.

4.2 Corruption and Human Dimensions

Human capital was acknowledged as one the critical determinants of source of economic growth over time and has become a central conceptual device to labour economics, growth economics and development economics (Collier, 2007). Human capital is a multidimensional concept that identifies human characteristics which can be acquired and which increase income. It is commonly taken to include peoples' knowledge and skills, acquired partly through education, but can also include their strength and vitality, which are dependent on their health and nutrition (Appleton and Teal, 1998: 9). From an economic perspective the expression of human capital is evocative of the idea that workers' skills and capabilities are important factors of production and that other resources spent for example on education, training may be comparable to investments in physical capital (Blair, 2011).

In recent decades, countless studies of the sources of economic growth (Schultz, 1961; Becker, 1993; Barro and Lee, 1993) – departing from the neo classical Solow growth model of physical and financial capital accumulation – have since demonstrated that human capital accumulation factors are among the main drivers of economic development. Human capital and economic growth are closely interrelated as the former is seen as an input which impacts significantly on the productive capacity and growth output of an economy. Historical evidence owing to the notable achievements of South East Asian economies has often been cited as glaring examples of the importance of human capital to economic growth (Clarke, 2011).

Indeed, despite their generally low endowment of natural resources, these countries have managed to post remarkable economic performances largely attributed to the quality of their human capital formation (Becker, 1992).

Researchers such as Schultz (1961), Bryant (1990), Barro (1991) Lucas, (1988) have applied the concept of human capital since, in a variety of ways but they all provided pertinent analysis

of a positive link between human capital and economic progress mainly in the form of growth rate of per capita Gross Domestic Product (GDP).

Numerous studies, for example Miyamoto (2008), Anyanwu (2011), have particularly highlighted the role of human capital in attracting foreign direct investment (FDI) inflows. More broadly, a long and old stream of researchers have shifted attention away from the neo-classical focus on physical accumulation and have established – both theoretically and empirically - the linkage between human capital formation and economic fluctuations through direct or indirect returns.

An increase in human capital accumulation will lead to an increase in the return to schooling (Mincer, 1996). Then an increase in human capital intensifies the growth rate of technology and innovation (Lucas, 1988). Finally, an increase in human capital will positively impact the level of output growth (Barro, 1991).

Human capital formation through education also may be affected by corruption. Mauro (1997) concludes that education spending is negatively correlated with corruption. This will result according to Dreher, *et al.*, (2007) in low levels of school enrolment causing higher corruption, while Buehn and Schneider (2012) could not arrive at similar correlation. The influential work by the OECD on the central role of human capital in economic advancement (The Knowledge-Based Economy 1996) and the World Bank (Knowledge for Development 1998) have attracted the interest of the developing world including, Sub Saharan Africa, a region increasingly aware that natural resources alone may not bring economic success (Maddison, 2000). The theoretical and applied literature on growth and development in Sub Saharan Africa has provided added rationale by claiming that human capital is a key contributor to growth and inclusive development.

In South Africa for instance researchers including Fedderke (2006) have also stressed the importance of human capital on productivity growth. Although widely recognized as a key contributing element in economic growth, human capital formation has been viewed mainly through economists' eyes as a by-product of policy supply or a function of the labour market disjointed from its social surroundings. The possibility that human capital and its knowledge effect may be critical factors in curbing corruption in developing countries – particularly in Sub Saharan Africa is largely under-studied and has revealed an essential but relatively unexplored link with anti – corruption strategies. The African Economic Outlook 2013 concludes remarkably that "African countries are not harnessing the human development

opportunities from economic growth due to rising inequality in income as well as in access to education and health" (2013: 86). But according to the Oxfam Research Report (2011) if economic growth remains highly indispensable and critical as a precondition to poverty reduction "it is the distribution of that growth that matters for poverty reduction, rather than the pursuit of growth for its own sake*"* (2011: 3)

4.3 Corruption and economics

Among the multitude of causes which can be inventoried in the literature, economic development as a key function of perceived level of corruption remain the most constant fin**d**ing **(**Gupta, *et al.*, 1998**;** Ades and Di Tella, 1999; Treisman, 2000; OECD, 2014; Aidt, 2009).

If there is large consensus in the research as to the robust association of corruption with economic growth, just what it means and how do they relate to each other remains an open debate. Does economic growth lessen corruption or conversely does corruption hinder the path to development? Are they affected by more fundamental determinants?

Corrupt practices have various determinants and particular repercussions in developing countries notably in Africa where often public funds that are needed for delivery of basic human needs are diverted at the personal benefit of the few.

The World Bank considers corruption as one of the single largest obstacles to economic and social development (World Bank Live Q&A: Anti-Corruption, 2012). Often driven by discretionary authority, economic rents, and weak institutions (Jain, 2001) corruption affects access to basic services, undermines fair market competition and particularly affects the poor.

As underlined by the United Nations Development Programme (UNDP), corruption *"*siphons off scarce resources and diminishes a country's prospects for development (UNDP, 1997). In the UNDP report (UNDP, 1997) it is further argued that in countries where corruption is widespread, the consequences are disproportionately borne by the poor such that poverty is entrenched in communities that can least afford it. In the case of Sub Saharan Africa there is overwhelming evidence that corruption impairs economic and social development (Osoba, 1996; Hope, *et al.,* 2000; Okori 2010).

From a sustainability perspective the effects and negative impact of corruption on development have long been a concern for researchers. Shleifer and Vishny (1993) conclude that corruption

is a factor of disruption in the development process. Jain (2001) inconclusively found, that the causes and consequences of corruption are often entangled. Earlier Mauro (1997) concluded that the directional causation of corruption and development remains unresolved while Treisman (2000) asserts that developed countries were less prone to corruption.

Numerous studies (TI, 2012a, para. 4; Buehn and Schneider, 2012) have established a causal link between increased corruption and investments in high profile "white elephant" projects at the expense of useful infrastructure projects in education or health of crucial importance. As a key determinant of inclusive growth corruption is found to increase inequality (Dreher, *et al.*, 2007) through unequal redistribution of income and wealth and to disfavour social programs intended for the poor (Ackerman, 2008).

Meanwhile on the economic front Ades and Di Tella (1999) finds that growing economies create more opportunities for rent seeking and hence for corruption. On the contrary corruption is due to decline as trade openness deepens market competition to the detriment of monopolistic firms curtailing profits available for corruption.

4.4 Corruption and governance

As to the dual relationship between corruption and institutions, Ahrend (2002), Brunetti and Weder (2003) and Chowdhury (2004) agree that higher levels of corruption are consistently correlated with low levels of press freedom.

From a governance vantage point political and institutional factors have relevant impact on the level of corruption according to Dreher, *et al.,* (2007) who argue that deficit in democratic controls are likely to increase corruption and conversely stronger transparency and accountability systems are likely to deter corruption. Buehn and Schneider (2012) found similar evidence while Tanzi (1998) seems to identify more precisely the effect of bureaucratic inefficiency – through convoluted regulations- as a major conduit for corruption.

Glaeser, *et al.,* (2003) after Mauro (1998) argue that education and human capital formation are crucial to economic and institutional progress. Rodrik, *et al.,* (2004) believe sound institutions are key to economic advancement while Triesman (2000) emphasizes a nonlinear relationship which means that effects of good governance only yield economic returns in the long run.

4.5 Conclusion

Most analyses have used a one pronged approach which connects broadly along three dominant links: corruption to either human capital/ education (Mauro, 1997; Tanzi and Davoodi, 2001; Delavallade, 2006; Ndikumana and Baliamoune, 2007; De la Croix and Delavallade, 2009) or corruption to growth / income inequality (Barro, 1991; Gupta, 1998; Gymiah-Brempong and De Camacho, 2006; Ullah and Ahmad 2007; Tebaldi and Mohan 2010), or human capital to growth (Schutt, 2003; Miller, 2006; Hanushek and Woessmann, 2007; Haque and Babar, 2011) and income inequality (Perotti, 1996; Easterly, 2007; Papagapitos and Riley, 2009).

In his seminal paper Treisman (2000) provides a wide – ranging analysis of corruption causes using quantitative methods. He considers 14 research hypotheses on the causes of corruption from political science, economics to sociology, and runs regression models across a multi – country setting (64 countries) with a vast set of independent variables on the Corruption Perception Index (TI, 1996, 1997, 1998). He arrives at mixed conclusions as to possible associations and could only acknowledge the challenge of finding directions of causality among variables. As he puts it "To establish a direction of causation, one needs good instruments, which are unfortunately in short supply … problems of endogeneity are severe …some plausible determinants are highly correlated among themselves, rendering it difficult to disentangle their separate effects" (2006: 14 -17).

Such large scope may still be partial as indeed Caiden remarks "the complexity of the phenomenon makes it impossible to provide a comprehensive account of the causes of political corruption." (Caiden, 2001: 21- 26).

In the end corruption appears as a multifaceted proposition driven here by socio-economic determinants which are examined as to their functional dependence to human capital within the framework of social development.

From the above arguments and their corollary theoretical ambiguities, I derive the below research hypotheses.

CHAPTER V

METHODOLOGY

5.1 Introduction

This chapter presents the research design, data collection, data analysis methods that were deemed most suitable to address the research questions. But first the rationale of the selected methodology is ascertained along with its theoretical underpinnings. Then the general method and procedures of investigation used to assess the associations between human capital, corruption and social development is described. This is followed by a description of the data collected and a discussion of the selected variables along with their operationalization and measurement in the statistical analysis.

The research questions already formulated in Chapter are restated here.

1. What is the effect of human capital formation on corruption? How does the causal direction of their relationship operate?
2. What is the effect of social development on corruption? How does the causal direction of their relationship operate?
3. What is the simultaneous effect of human capital and social development on corruption?

5.2 Philosophical underpinnings

Our heuristic aim in this study is practical if not ideological; it is to design a research that will generate valid inferences about corruption and provide reliable policy prescriptions in the real world. (Ashby, 1964). Research design is defined by Polit and Hungler (1999: 155) as a structured process which provides for the plan to generate answers to the research questions.

To that effect the quantitative approach – which is not just a mechanical process of data analysis – first needs to outline the theoretical prerequisites that inform the relevance of its questions and the internal validity of its conclusions. Hence there is a necessity to ascertain the ontological, epistemological and methodological assumptions that predicate this quantitative review. Indeed, any serious empirical inquiry claiming the mantle of academia must not leave its philosophical premises implicit and needs to outline "the theoretical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria." (Crotty, 2003: 7). In the case at hand the design and methodology offered here were

fundamentally affected by the explanatory – rather than descriptive – nature of the hypothesized research questions leading to causal and correlation- type explanations more amenable to quantitative inquiry. Quantitative research is described by Burns and Grove (1993: 777) as an objective orderly process meant to test associations and examine cause and effect relationships among variables.

To be clear this empirical analysis is epistemologically grounded on a positivist stance using a deductive approach in order to produce valid causal inferences about corruption and its correlates. Its ontological corollary is that the reality of corruption – albeit social – exists beyond what it is perceived to be, it has its own and independent rationalities knowable through "scientific" inquiry (Cohen, *et al.*, 2007: 7; Pring, 2000: 59) and susceptible of both descriptive and causal understanding. Put differently the reality of corruption has an existence transcendent of this author's own perceptions.

In fact, corrupt practices although an outcome of social interactions – and as such cannot be detached from societal ideologies – are not just a construct out of the researcher's representations but an objective reality that may be responsive to quantitative "scientific" scrutiny. (Gallagher, 2008). Because the researcher and the researched object in this present undertaking are seen as separate independent entities this analysis seeks to contribute to value – free knowledge about a corrupt object deemed knowable outside the conscience of the researcher. (Crotty, 1998: 8). This is indeed a departure from a relativist world view which posits that the world and its meanings do not exist independently of our knowledge of it (Grix, 2004: 83).

However, the proposed objectivity does not imply, that this empirical research – which is not grounded on a reductionist empiricism – does not carry any trace of the researcher. It informs both on his theoretical and real - world leanings. In the footsteps of Bachelard (1938) this epistemological stance emphasises "the importance of the subject in science, but without making of science something subjective "(Högskola, 2012: 33).

In fact, what "objectivity requires is the disappearance of subjectivity" not of the researcher (Högskola, 2012: 33) which indeed acknowledges that the empirical results in this study are produced not only through a logical frame but also a perceptual frame. (Högskola, 2012: 33). In fact it is a " phenomenological " school of thought - to speak with Bachelard (1938) and later Canguilhem (1967) - which stands at equidistance between a dogmatic positivism

claiming science would be wholly independent from the scientist and a subjectivist relativism relying disproportionately on subjective experience, to account for an empirical truth, that despite its quantitative and universal claim, remains in the end a mediated rationality, a construct humanly and historically determined, bound in space and time.

From this ontological perspective which provides the true reality of corruption sought after in this undertaking, an epistemology is derived to account for the nature of empirical knowledge warranted for the purpose of addressing the research questions. This analysis used a quantitative statistical design to identify, describe and analyse explanatory factors, trends and patterns contributing to the occurrence of corruption. This approach attempts to articulate the ways in which the findings are processed and the logic by which conclusions were arrived at and uses defined and codified procedures to analyse data and derive factual conclusions whose reliability and validity can be publicly and contradictorily assessed.

On the contrary the "the sociological analysis of qualitative data often resides in a private world of penetrating but unfathomable insights and ineffable understandings…[however,] science . . . is public, not private." (Merton, 1968: 71-72). This indeed makes it difficult for other researchers to learn from or replicate their results (Scotland, 2012: 8) and for policy makers to rely on non-generalizable and highly contextualized findings. Conclusions reached through qualitative, interpretive approach as they differ from one individual to the next often appear unworkably equivocal and fail to produce the universal threshold of facts that can be consensually relied upon (Angen, 2000: 384).

As a result, the knowledge produced has limited validity dispersed across various individual perspectives with little unified substance. In this case conclusions around corruption would be burdened by value – judgements and suffer from extreme subjective relativity and limited transferability.

The above epistemological stance leads to this study's empirical methodology geared at explaining associations and possible causal relationships. It attempts to identify causal links which influence corruption outcomes (Creswell, 2009: 7). A deductive approach is undertaken which is meant to uncover rules and patterns to allow for prediction and generalization; statistical testing methods are out to seek verifiable evidence about corruption. Meanwhile some theoretical precaution may be called for before we further delve into our quantitative analysis so as to contextualize the theory of this research. The literature abounds more with

studies that enunciate propositions on the possible causes of corruption rather than those that arrive at a strong causal chain that relates to corruption. As argued by Theobald (1999: 473): "There is a danger that we are simply describing symptoms rather than identifying underlying causes".

In fact, in the realm of quantitative research statistical significance may be often mistaken for causality as perhaps true causality may be beyond reach. In the epistemological convention it is predicated – for causality to ring true – that the "cause" always coincide with the "consequence" (Hume, 1990) which grounds the "necessity criterion" (De Graag, 2007) for causation to be found. For the purpose of this study our causation model does not seek to emulate this theoretical threshold. That is the causes to be identified may not be wholly necessary and sufficient and may not always lead to corruption in a deterministic sense. A Granger test causality is used to approximate such type of causal relationship as it implies causality in a realist sense of predicting the outcome rather than in a positivist experimental sense.

In summary, analytical approach relies on deductive method using statistical and verifiable inferences instead of subjective interpretations of social meanings (Crotty, 1998: 42), all of which are grounded on the ontological premise of a social reality deemed objectively knowable. Nevertheless, this analysis would be liable of culpable naivety or worse, of arrogant scientific presumption if it were to claim absolute certainty as to the observations and findings it has reached.

Indeed, the subject matter of this study that is corruption deals with humans and not objects and therefore its quantitative approach does not amount to a narrow deterministic view of what is after all a social phenomenon whose human, historical dimensions and cultural traits do not allow for a mechanistic blueprint. This theoretical approach to the social world is rather "dialectical" (Marx, 1845) than idealistic, hence it argues that corruption is to be viewed as an outcome of interconnected processes affected by underlying deep ideological and socio - economic structural determinants.

Therefore, this quantitative approach using causal thinking is epistemologically more probabilistic than deterministic (Suppes, 1970). Because the corruption occurrence isn't uniformly determined it cannot be reduced to simple deterministic inferences which may trivialize the complexities of social interactions and cultural contexts of the phenomenon.

Mindful of the possible pitfalls of making invalid inferences the empirical results can only claim a probabilistic status, not be mistaken with absolute certainty, as they remain constrained by "observables" (Cook and Campbell, 1979: 10) or possibly blind sighted by unknown variables. As summed up by Keohane and King "… uncertainty is a central aspect of all research and all knowledge about the world. Without a reasonable estimate of uncertainty, a description of the real world or an inference about a causal effect in the real world is uninterpretable" (1996: 9). Indeed, while reckoning with the assumptions of partial and imperfect knowability" (1996: 9), this analysis provides however a genuine attempt to improve the internal validity and reliability of its discoveries by strictly abiding by the rules and rigor of quantitative inference.

The proposed framework is aimed much less at forming a dogmatic "episteme" or paradigm (Foucault, 1980) but instead at formulating a disciplined approach which provide verifiable accounts of reliability and validity that credibly justify the methods used and the results reached (Cohen, *et al.*, 2007: 133-149). But more importantly the theoretical assumptions that underpin this study are meant – beyond the philosophical nuances and the subtleties of dogmatic paradigms – not just to produce dependable accounts of corruption for analytical sake – but to add to reliable findings responsive to action – oriented public policy pronouncements. After all, when all things are considered 'the differences between the quantitative and qualitative traditions are only stylistic and are methodologically and substantively unimportant" (Keohane and King, 1996: 4). They are both deserving of academic status provided that their approach is orderly, conducted systematically and follows formal rules.

The ultimate theoretical stance of this review, which is also political – is to stop "interpreting" the world of corruption in countless prescriptive deliberations and speculative diatribes and to begin "changing" it (Marx, 1845).

5.3 Study Approach

One of the challenges involved in inserting soft variables in an economic analysis is how to measure certain types of constructs or concepts. While some categories are discrete and measurable others are latent and intangible and therefore harder to quantify. In the areas of political and economic sciences space and time have been often combined in comparative research with the aim to investigate relationship between institutional, social practices and economic variables by comparing observations across space or observations over time.

For the purpose of this study bivariate and multivariate regression analyses will be the techniques to be applied on the pooled cross-national time series data. Using this method allows to identify whether levels of human capital stocks and social development corruption control may determine the patterns of corruption across selected SADC countries.

The time and space components of this quantitative method will allow to investigate how changes in the levels of human capital and social advancement of a particular country affect that country's corruption outcome levels. Hence the time-series cross-sectional structure of the data is fit for a rigorous test to our theoretical arguments and can provide a refined analysis to our research questions. In case of missing data fixed effects will be considered as indeed "the fixed-effects framework … represents a common, unbiased method of controlling for omitted variables in a panel data set". (Yermack, 1996: 185).

5.4 Data Description and Population

The main component of this empirical analysis consists of annual time- series panel data sourced from world class international databases available from the UNDP, UNESCO, the World Bank, IMF the AFDB, SADC countries, United Nations Statistics, Freedom House database. The regression models tested in the study include the interaction of human capital, corruption and inclusive growth.

The fifteen SADC countries were considered as population (Angola, Botswana, D.R Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe). Population is defined as the whole of units that conform to a set of specifications and to which the research results can be generalised (Polit and Hungler, 1999: 43).

The choice of SADC countries for this review is largely dictated by the objectives. The majority of the countries has reached a middle to higher MIC economic status in terms of per capita income and / or enjoy significant levels of human or natural resource endowments. However high level of revenues and abundance of resources have often cultivated corruption and undermined social progress in the process of building their market economies. The target countries while faced with serious inequality and integrity – related challenges, also present striking disparities in terms of poverty rates, institutional capacity and social development all of which will be key factors of consideration in this study.

When investigating patterns corruption, it is suitable to consider countries where the level of corruption is significantly and durably high. This informs the choice of the SADC region countries for this study, where the corruption perception indexes from TI and WB showed stable patterns of high levels of corruption "The perceived level of corruption in the SADC member states in 2010 was higher than in 2000" (Christian Peters, 2011).

Indeed, abundance of natural resources can benefit developing countries or be a curse (Collier & Hoeffler, 2009). This particularly applies to most of the selected countries where huge natural resource endowments present opportunities for rent-seeking behaviour among bureaucrats and politicians tempted to drain resources away from more socially advantageous projects to the detriment of the disaffected (Ploeg, 2006).

Therefore, the above features made them attractive for the purpose of this research. Due to data limitation data will be collected for the period 2005- 2013 across the fifteen SADC countries as this time span seems to be less prone to gaps in data availability.

The data has fifteen panels and nine periods which amount to 135 observations.

5.5 Data Source

The analysis for this study required compilation of relevant data on human capital stocks, corruption indexes and economic growth. In addition to the relevant human development indicators and income distribution estimates (GDP, GINI, HDI) across host SADC countries and across time (2005 – 2013).

For cross-country time series data, the following sources were consulted for the purpose of this examination:

- Country tables in the World Bank annual publications of key economic indicators
- Statistical Appendices to the World Bank's annual World Development Reports
- Statistical Appendices to the UNDP's annual Human Development Reports
- Statistical tables. UNESCO Institute of Statistics
- World Bank's World Development Indicators (WDI) database

  Freedom House Data

5.6 Variables and Operationalization

Variables. The analysis considered two major independent variables included in the base model: Social Development with associated measures of Human Development Index (HDI), Human Capital/ Education with associated measures of Adult literacy. Corruption is the dependent variable with associated measures of Word Bank and Transparency International corruption control indexes (CCI and CPI).

As a measure of a country's social development (SD) this study used the HDI index as a proxy owing to its availability for a large set of countries and for a long time span. The HDI is considered the most comprehensive measure of a country's economic progress besides GDP. It provides information on the human development aspect of economic growth. It is constructed around three indicators: longevity measured by life expectancy at birth; educational attainment measured by a combination of adult literacy rate and the combined school levels enrolment ratios; and standard of living measured by GDP per capita.

As a measure of human capital (HC) this study considered the average years of secondary education in the population aged 25 and over as a proxy. Commonly human capital has been viewed as a function of education and experience including both training and learning.

Six other control variables were also selected based on availability of data set: Trade openness, GDP per capita, GDP growth, Democracy, Press Freedom, Social Connectivity (Telephone line per 100 people), which are included in the model.

The statistical analysis tested the relationships hypothesized between levels of human capital, and social development functions and their resulting effect on corruption outcomes. Ordinary Least Squares (OLS) regression analysis was conducted on a panel data series. Using this model was advantageous because it allowed for the capability "to capture not only the variation of what emerges through time or space, but the variation of these two dimensions simultaneously" (Podesta, 2000: 9). It is also best fitted to generate better estimations (e.g. higher T statistics, adjusted R- square, F- statistics) and as one the most common estimation method in the literature, which it also allowed for comparison with other studies.

The unit of analysis used is the member-state for the population of SADC countries. Analysis of such data was indeed arduous due to the data could vary greatly across time and space. The analysis therefore attempted to use a variety of techniques to control for the special statistical hurdles inherent to such statistical methodology. The level of corruption through the human

capital and social development effects was the ultimate phenomenon we tried to explain. Additional control variables were included in the estimation to account for various socio-economic and institutional impact levels. For all hypotheses considered the level of corruption was the dependent variable all other variables were assumed as independent explanatory variables.

As a measure of corruption this study used two corruption perception indexes. The two indexes of perceived corruption are the most commonly used in empirical work. The Corruption Perceptions Index (CPI) constructed by Transparency International (TI) and an index of controls of corruption (CCI) from the World Bank. Both indexes aggregate information from a variety of sources that include surveys of international or local businesses polls of country populations, and country risk ratings from specialised agencies

5.7 Model Specification

With the aim to ascertain a number of variables assumptions, the base model specifications derived from our research questions were as follows:

1. What is the effect of human capital formation on corruption? How does the causal direction of their relationship operate?

   $$CPI_{it} = a_0 + a_1 * HC_{it} + u_i + u_t + u_{it} \quad (1)$$

2. What is the effect of social development on corruption? How does the causal direction of their relationship operate?

   $$CPI_{it} = b_0 + b_1 * SD_{it} + v_i + v_t + v_{it} \quad (2)$$

3. What is the simultaneous effect of human capital and social development on corruption?

   $$CPI_{it} = c_0 + c_1 * HC_{it} + c_2 * SD_{it}\, w_i + w_t + w_{it} \quad (3)$$

   Where *i* indexes countries and *t* the time period. The error term in all three equations is made up of three components: u_i, v_i and w_i stand for country-specific component; u_t, v_t and w_t stand for time-specific component; and u_{it}, v_{it} and w_{it} stand for random error term of a panel data model.

5.8 Conclusion

This study was mainly concerned with identifying the nature and causal direction of the relationships between human capital and corruption; between corruption and social development; and to explain how human capital and social development interrelate to explain corruption in the SADC region.

Ordinary Least-Squares (OLS) were selected to estimate the corruption equation specified above using the E-Views statistical package. The analysis used a pooled fixed-effects (FE) specification which allows to control for unobserved country heterogeneity and associated omitted variable bias (Startz, 2013). The random effects (RE) were also included for the purpose of the generalizability of the results. Before running the Ordinary Least Square to approximate the coefficients of the regression equation, the study tested for the stationarity of the variables. The stationarity of the time series was tested using the Augmented Dickey Fuller (ADF) test. The Granger Causality test was used to determine the nature and direction of causality among the variables in equations. Lastly the validity of our models and their robustness were validated through sensitivity analysis by using alternative proxy measures for corruption in the regressions.

CHAPTER VI

EMPIRICAL FINDINGS

6.1 Introduction

This section presents the methodology used in this empirical investigation. We first present panel data estimation its advantages and limitations. Then we describe the econometric models used to analyse the causes of corruption incorporating both economic and institutional as controls. OLS regressions, fixed effects (FE) and random effects (RE) considered. We ascertain the causal relationships and its directions through Granger causality of the main variables which are corruption (CORR) human capital (HC) and social development (SD); we then perform a sensitivity analysis through the transmission channels of the effects of social development and human capital on corruption.

Lastly we test the validity of our models and their robustness through replacement analysis by using alternative proxy measures for corruption in the regressions.

6.2 Background

Studies on corruption have flourished since the late 1990s. Political scandals in countries across SADC over many years have discredited governments and public officials and caused increasing interest of the international community into matters of public corruption over the last two decades.

Corruption is largely to be one the main obstacle to social development and economic advancement (Mauro, 1995; World Bank, 1997) yet reasons of high variance and high levels of heterogeneity for levels of corruption across countries and namely developing countries remain largely undetermined despite mounting policy and academic attention towards developing countries and Africa in particular.

While many studies predominantly descriptive or using a normative script have analysed the details of the phenomenon mostly theorizing on the idiosyncrasies of corruption in certain regions or countries, cross- country quantitative research is a more exceptional undertaking. Through the anthropological filters of Africanist researchers (Ekeh, 1975; Chabal and Daloz, 1999; Blundo and Olivier de Sardan, 2006) to more generic politico- scientist studies (Hofstede, 1997; Aidt, 2011) corruption despite its risk severity in Sub – Saharan – and

admittedly- widespread prevalence, remains by and large an elusive object of empirical study. In fact, by its very nature as hidden phenomenon – hard to observe and measure – and due to lack of good and accurate metrics (Treisman, 2000) corruption is as much of a nefarious practice for African development as it remains a reticent object of knowledge.

Meanwhile when providing an empirical focus on corruption the research has had two main strands. One that accounts for the majority of the studies focused at unpicking the consequences – many seen as harmful – of corruption hence taken as an explanatory variable. (Mauro, 1995; Tanzi and Davoodi, 1997; Gupta, *et al.*, 1998; Dreher and Herzfeld, 2005). The other which is less prolific seeks to expose the determinants of corruption treated here as a dependent variable. (Treisman, 2000; Caiden, 2001; Huberts, 1998).

In a most notable attempt to unravel the complexity of the phenomenon Treisman (2000) in its seminal study considers no less than14 determinants across 64 countries regressed against Transparency International CPI Index (1996, 1997, 1998). Such large scope may still be partial as indeed Caiden remarks "the complexity of the phenomenon makes it impossible to provide a comprehensive account of the causes of political corruption." (Caiden, 2001: 21- 26).

Some theoretical precaution may be called for before we further delve into our quantitative analysis so as to contextualize the empirics of this research. The literature abounds more with studies that enunciate propositions on the possible causes of corruption rather than those that arrive at a strong causal chain that relates to corruption. As argued by Theobald (1999: 473): "There is a danger that we are simply describing symptoms rather than identifying underlying causes". In fact, in the realm of quantitative research statistical significance may be often mistaken for causality as perhaps true causality may be beyond reach. In the epistemological convention it is predicated – for causality to ring true – that the "cause" always coincide with the "consequence" (Hume, 1990) which grounds the "necessity criterion" (De Graag, 2007) for causation to be found. For the purpose of this study our causation model does not emulate this theoretical threshold. That is the causes to be identified may not be wholly necessary and sufficient and may not always lead to corruption in the philosophical sense.

A Granger test causality is used to approximate such type of causal relationship as it implies causality in a realist sense of predicting the outcome rather than in a positivist experimental sense (Hume, 1777) of the same event invariably related to the same outcome that is A causes B; if A, then B.

6.3 Data, Models and Methodologies

6.3.1 Data Description

This study is based on cross – country data collected for fifteen SADC countries for the period of 2005 -2013. The data for each country over the period is defined as time series data; and data for all countries for a given year is categorized as cross-sectional data. The review period was determined with the view to allow for optimal data availability in order to secure complete and balanced panel data. The data has been compiled mainly from the World Development Indicators (WDI) and other sources as per Table 1.1. Table 1 below gives the list of selected countries

Table 1. List of Countries.

1	Angola	9	Namibia
2	Botswana	10	Seychelles
3	Congo Dem. Rep	11	South Africa
4	Lesotho	12	Swaziland
5	Madagascar	13	Tanzania
6	Malawi	14	Zambia
7	Mauritius	15	Zimbabwe
8	Mozambique		

6.3.2 Descriptive Statistics

Before we begin to make inferences we examine descriptively the data to observe patterns, find possible violations of statistical norms and generate assumptions among variables.

6.3.2.1 Variables

Eight independent variables such as Human Capital, Social Development, Trade openness, GDP growth, GDP per capita, Connectivity, Democracy, and Press Freedom

were included in the model based on secondary data availability. This analysis considers eight independent variables. Social Development, Human Capital Trade openness, GDP per capita, GDP growth, Democracy, Press Freedom, Social Connectivity (Telephone line per 100 people), which are included in the model based on availability of data set.

Table 2. Variables

Variables	Definition	Data Source
CORR	Corruption as per Corruption Perception Index	WGI / World Bank CPI/ Transparency International. Accessed in 2014
SD	Social Development. Proxied by the Human Development Index	UNDP database accessed in 2014
HC	Human Capital. Mean Years of Adult Schooling	UNESCO database accessed in 2014
TRAD	Trade openness (Export + import / GDP)	World Bank database. WDI accessed in 2014
GDP	Gross Domestic product growth (annual %)	World Bank database. WDI accessed in 2014
GDPC	Gross Domestic product per capita	World Bank database. WDI accessed in 2014
DEM	Democracy. Proxied by Political Freedom as per Freedom House Index. Ratings from 1 to 10 ranging from “Free” to “Not Free”	Freedom House Database accessed in 2014
PF	Press Freedom proxied as per Freedom of the Press index.	Freedom House Database accessed in 2014

	Ratings from 0 to 100 ranging from "Free" to "Not Free"	
CONN	Connectivity. Social network connectivity. Proxied by mobile cellular subscription per 100 people	World Bank database. WDI accessed in 2014

- Human Capital: A number of empirical and theoretical studies have determined that corruption is likely to hinder the provision of education and to affect the quality of a country's human capital stock. By lowering incentives to invest in education (Mauro, 1998; Gupta, Davoodi, & Alonso-Terme, 1998) or by increasing poverty and income inequalities, corruption could affect education which is a key determinant of a country's human profile (Tebaldi and Mohan, 2010; Tanzi and Davoodi, 2001; Gymiah-Brempong and de Camacho, 2006).

- Social Development: Less corrupt countries tend to have a higher level of human development than more corrupt countries. Corruption is generally related to diminishing levels of social spending (Mauro,1998; Gupta, Davoodi, & Alonso-Terme, 1998) and has long been categorized as a strong deterrent to socio – economic development (Rose-Ackerman, 1998; Ali and Isse, 2003).

- Trade Openness: Less corruption is expected where there are fewer trade restrictions. Trade openness has been linked in the literature to reduced corruption as increased competitiveness lessens rents seeking and opportunities for corruption. (Krueger, 1974; Ades and Di Tella, 1999; Tanzi, 1998; Chang, 2009; Majeed, 2014).

- Gross Domestic Product: The link between corruption and economic growth is well established across the economic literature (Mauro, 1995, 1997; Hope, 1997; Van Rijckghem and Weder, 1997) throughout many studies with mainly two major competing perspectives (Svensson, 2005). The "greasing the wheels" view which contends that corruption is beneficial to growth (Leff, 1964, Huntington, 1968; Osterfeld, 1992) as it evades bureaucratic red tape, and on the other hand the "sand in the wheels" opinion which argues that corruption is an obstacle to development and

leads to resource misallocation and higher transaction costs (Krueger, 1974; Shleifer and Vishny, 1993; Tanzi and Davoodi, 1997; Mauro, 1995; Leite, *et al.*, 1999).

- Gross Domestic Product Per Capita: The hypothesis of negative correlation between corruption and income is largely documented by studies such as Kunicova and Rose-Ackerman (2005), Brown, *et al.*, (2005), Lederman, *et al.*, (2005). Abed and Davoodi (2000) also conclude to a negative association between real per capita GDP growth and corruption. While at the opposite end other studies find a positive relation between these variables including Frechette (2001) and Braun and Di Tella (2004).

- Democracy: The majority of studies (Hope and Chikulo, 2000; Abed and Gupta, 2002) acknowledge that more democracy generally leads to less corruption. According to such views in democracy freedom of expression, freedom of association, free elections and vibrant civil society are effective means for more scrutiny on the powers of government and therefore ways to lessen public corruption. Although other countries have seen less corruption while under authoritarian rule notably in Asia.

- Press Freedom: A general consensus through several studies (Brunetti and Weder, 2003; Chowdhury, 2004) has been established around the preponderance of a free press in fighting corruption as more demand for transparency and accountability leads to less corruption.

- Connectivity: Researchers have long argued that social networks' structures offer opportunities for individuals to be more integrated in community links, associational life and in political processes (Putnam, 1993; Jottier and Heyndels, 2011). A dense network of communication creates a more open society and augments the likelihood of detecting illicit rent extractions and therefore preventing corruption (Shleifer and Vishny, 1993).

From the analysis of the existing literature the above independent variables are expected to have the following relationships with corruption

Table 3. Expected signs of variables

No	Independent Variables	Abbreviations	Expected signs	Notes
1	Social Development	SD	Negative	Higher standards of living are less conducive to corruption
2	Human Capital	HC	Negative	Highly corrupt countries have lower levels of human capital stock.
3	Trade Openness	TRA	Negative	Less corruption is expected where there are fewer trade restrictions
4	Gross Domestic product / Growth %	GDP	Positive	High rates of economic growth mean higher rents and may create more opportunities for corruption
5	Gross Domestic product per capita	GDPPC	Negative	Higher personal income may be less vulnerable to corruption
6	Democracy	DEM	Negative	Democratic countries have more check and balances to fight corruption. More transparency and plurality help reduce corruption
7	Press Freedom	PF	Negative	More demand for accountability and more press scrutiny lead to less corruption

8	Connectivity	CON	Negative	More social network communication may lead to more open society and less corruption

Table 4. Summary Statistics

Variables	Mean	Median	Max	Min	Std.Dev.
CORR	-0.294577	-0.329177	1.141267	-1.484902	0.680155
HC	6.181481	6.100000	9.900000	2.900000	2.044694
SD	0.524533	0.498000	0.832000	0.185000	0.183853
DEM	3.762963	3.000000	7.000000	1.000000	1.853627
PF	53.68148	52.00000	90.00000	26.00000	17.75230
GDP	5.210708	5.382346	22.59305	-17.66895	4.509609
TRA	79.39383	72.97729	164.5975	29.33353	32.55491
GDPPC	3221.416	1437.884	16185.90	213.1567	3450.910
CONN	53.87245	43.41215	160.6411	2.789820	39.74328

The above table (4) describes all the main variables that were reported in the study. Corruption has a maximum of 1.1 and a minimum. Of -1.1 respectively which shows overall – despite some outliers – little differences for the levels of corruption across SADC Social development with maximum and minimum of .83 and .18 and a man of .52 shows rather uneven levels of human development across SADC. The same applies to Human Capital with maximum and minimum of 9.9 and 2.9 respectively showing notable disparities of education profiles and skill levels across SADC countries. Trade openness and connectivity with a maximum of 164 and 160 and minimum of 79 and 53 seems to have a larger spread across countries. GDP growth with a mean value of 5.2 displays a relatively steady pace of economic growth for the period under consideration (2008 – 2013) although with large disparities across countries with a maximum and minimum of 22 and -17 respectively. GDPPC with a maximum of 16185 and a minimum of 213 points to large income disparities across SADC countries between the richest and poorest nations.

6.3.2.2 Correlation Matrix between Variables

Table 5. Correlation Matrix

	CORR	HC	SD	GDP	GDPPC	TRA	DEM	PF	CONN
CORRTI	1.000000	-0.686674	-0.720853	0.139703	-0.270193	-0.277765	0.746540	0.739048	-0.170627
HC	-0.686674	1.000000	0.846651	-0.211118	-0.000914	0.289069	-0.376260	-0.321221	0.208421
SD	-0.720853	0.846651	1.000000	-0.048857	0.201771	0.416123	-0.442227	-0.497659	0.219100
GDP	0.139703	-0.211118	-0.048857	1.000000	0.018777	-0.069192	-0.030180	-0.042110	0.027050
GDPPC	-0.270193	-0.000914	0.201771	0.018777	1.000000	-0.039869	-0.254308	-0.425086	0.311655
TRA	-0.277765	0.289069	0.416123	-0.069192	-0.039869	1.000000	-0.054386	-0.001005	0.332363
DEM	0.746540	-0.376260	-0.442227	-0.030180	-0.254308	-0.054386	1.000000	0.897807	0.138882
PF	0.739048	-0.321221	-0.497659	-0.042110	-0.425086	-0.001005	0.897807	1.000000	0.129656
CONN	-0.170627	0.208421	0.219100	0.027050	0.311655	0.332363	0.138882	0.129656	1.000000

The above results (table 5) show a strong and positive correlation between social development and human capital which is expected. Whereas gross domestic product growth (GDP) seems to move in opposite direction with social development and human capital which is undesirable. Democracy has a positive and high correlation with press freedom which is expected. Meanwhile GDP is weakly correlated with both democracy and press freedom which may imply little impact of the institutional environment on economic growth. Connectivity appears to have a rather modest relationship with the other variables. GDPPC is negatively correlated with corruption which is expected while it is negatively associated with both democracy and press freedom which is unexpected and confirms the ambiguous impact of income level on institutions. Corruption seems to display a strong negative correlation with both human and social development which is anticipated while it appears to be weakly associated with GDP growth. However, these partial correlations remain only indicative of association of variables, predictive powers and causal relationships of the variables will be further tested through the regression analysis.

Although there are many measures of association, correlation is the most commonly used approach. Table 3 is intended to give an indication of the strength (high or low) and direction (positive, negative or none) of the linear relationship between the independent variables

6.3.3 Model specifications

This study sets out to investigate the determinants of corruption in SADC countries by using panel data estimation. A panel analysis using country and time observations will provide the basis for estimating the relationship between corruption, human capital and social development along with other selected determinants.

Advantages of panel method. Panel data includes multidimensional observations with space as well as time dimensions for the same entities which are countries in this review (Greene, 2003). Our panel is balanced that is each country (i) is observed in all time periods (t). According to Schmidheiny (2015) "Panel data are most useful when we suspect that the outcome variable depends on explanatory variables which are not observable but correlated with the observed explanatory variables. If such omitted variables are constant over time, panel data estimators allow to consistently estimate the effect of the observed explanatory variables".

Multiple observations on each country can also provide superior estimates as opposed to cross-sectional models of association (Gujarati and Porter, 2009) while also allowing possible control for individual heterogeneity (Baltagi, 2008). In the case of SADC countries unobservable factors more intangible and more "constant" in nature such as values, culture may be correlated with the selected variables for which panel data can provide a better estimation while accounting for a corruption which tends to vary and display more heterogeneity across countries than within. 'Panel data give more informative data, more variability, less collinearity among the variables, more degree of freedom and more efficiency.'' It is also a better estimation method to study the duration of economic states and the ''dynamics of change'' over time (Baltagi, 2001)

Our base model is constructed by incorporating alongside the dependent variable which is corruption (measured as in most known empirical studies by the corruption perception indexes from TI and the World Bank) other socio- economic factors (as grounded in

previous studies and based on data availability) as right-hand side variables. These are social development (proxied by HDI index) to focus on social standards of living, human capital to account for effect of literacy.

With the aim to ascertain a number of variables assumptions, the base model specifications derived from our research questions are as follows:

1. What is the effect of human capital formation on corruption? How does the causal direction of their relationship operate?

$$CPI_{it} = a_0 + a_1 * HC_{it} + u_i + u_t + u_{it} \quad (1)$$

2. What is the effect of social development on corruption? How does the causal direction of their relationship operate?

$$CPI_{it} = b_0 + b_1 * SD_{it} + v_i + v_t + v_{it} \quad (2)$$

3. What is the simultaneous effect of human capital and social development on corruption?

$$CPI_{it} = c_0 + c_1 * HC_{it} + c_2 * SD_{it}\, w_i + w_t + w_{it} \quad (3)$$

Where *i* indexes countries and *t* the time period. The error term in all three equations is made up of three components: u_i, v_i and w_i stand for country-specific component; u_t, v_t and w_t stand for time-specific component; and u_{it}, v_{it} and w_{it} stand for random error term of a panel data model.

6.3.4 Econometric Methodology

In order to estimate the above hypotheses, the panel data estimates are based on equations (1) to (3).

To construct an empirical model on corruption, panel data is used and OLS regression is performed. The base model using specifically Ordinary Least Squares (OLS) regression is constructed on the footsteps of previous econometric work on the subject matter (Treisman, 2000; La Porta, *et al.*, 1998; Ades and Di Tella, 1997). A multiple OLS regression analysis will be performed by using the statistical package Eviews. With a multiple OLS regression, the relationship between several independent variables and an

outcome/dependent variable can be explained (Cameron and Trivedi, 2005), that is the behaviour in the dependent variable can be predicted by the independent variables.

The study starts by using OLS to investigate the effect of human capital and social development on corruption. One limitation with this model is that it does not discriminate between the various countries nor does it tell us whether the response of corruption to the explanatory variables over time is the same for each country.

In other words, by grouping the countries together at different times the model does not recognize the heterogeneity that may exist among countries with the possibility that the error term may be correlated with the explanatory variables in the model. If so, the estimated coefficients may be biased.

Moreover, in the time series several variables are likely to be correlated, and causal relationships to possibly run in more than one direction. Since many of the explanatory factors are likely to be correlated, there is high risk of omitted variable bias to test hypotheses individually without also controlling for their correlated factors. A fixed effects model takes such characteristics into account to address possible endogeneity bias.

6.3.4.1 Fixed effects model

The variables included in the Ordinary Least Square (OLS) estimation may be subject to potential bias due to several reasons. One likely bias is omitted variables bias as it is probable that some important factors omitted as explanatory variables may affect corruption, human capital and social development simultaneously. Fixed effect model can adjust for unobserved effects that are correlated with covariates. It is also possible to use a fixed effects model to account for time-invariant unobserved factors that might be correlated with the variables that are included in the regression equation.

The fixed effects explore the relationship between corruption and the selected variables within each country (Baltagi, 2001).

A critical assumption of the fixed effects which suits the corruption model estimate is that time-invariant characteristics (such as values, culture, religion) are unique to individual entities / countries and should not be correlated with other individual characteristics. Each country's corruption in this case has its own features which make

its level and magnitude unique. Therefore, it's assumed that the selected country error term and the constant should not be correlated with others. Hence the results are adjusted for effects that are country specific and that may have biased the OLS estimates

The following (FE) model is estimated:

- Additional economic variables (FE)

$$CP_{i,t} = \beta_0 + \beta_1(SD)_{i,t} + \beta_5(GDP)_{i,t} + \beta_6(GDPPC)_{i,t} + \beta_6(TRA) + \gamma i + \delta t + \varepsilon_{i,t} \quad (4)$$

$$CP_{i,t} = \beta_0 + \beta_2(HC)_{i,t} + \beta_5(GDP)_{i,t} + \beta_6(GDPPC)_{i,t} + \beta_6(TRA) + \gamma i + \delta t + \varepsilon_{i,t} \quad (5)$$

$$CP_{i,t} = \beta_0 + \beta_1(SD)_{i,t} + \beta_2(HC)_{I,t} + \beta_5(GDP)_{i,t} + \beta_6(GDPPC)_{i,t} + \beta_6(TRA) + \gamma i + \delta t + \varepsilon_{i,t} \quad (6)$$

- Institutional Variables (FE)

$$CP_{i,t} = \beta_0 + \beta_1(SD)_{I,t} + \beta_2(HC)\ \beta_3(DEM)_{i,t} + \beta_4(PF)_{i,t} + \beta_7(CON)_{i,t} + \gamma i + \delta t + \varepsilon_{i,t} \quad (7)$$

$$CP_{i,t} = \beta_0 + \beta_1(SD)_{I,t} + \beta_2(\ \beta_3(DEM)_{i,t} + \beta_4(PF)_{i,t} + \beta_7(CON)_{i,t} + \gamma i + \delta t + \varepsilon_{i,t} \quad (8)$$

$$CP_{i,t} = \beta_0 + \beta_1(SD)_{I,t} + \beta_2(HC)_{I,t} + \beta_3(DEM)_{i,t} + \beta_4(PF)_{i,t} + \beta_7(CON)_{i,t} + \gamma i + \delta t + \varepsilon_{i,t} \quad (9)$$

Where:

- $CP_{i,t}$ is an observation on the dependent variable (Corruption perception index).
- β is coefficient for independent variables (SD, HC, DEM, PF, GDP, TRA, CON)
- $\varepsilon_{i,t}$ depicts the error term across countries and time
- γi, : stands for specific country characteristics constant over time
- δt, : depicts is a time-specific effect
- i = countries
- t = time

The fixed-effect method helps ascertain if the correlates of corruption hold when controlling for country and year fixed effects, or if they are mainly due to omitted variables. Country-fixed effects allow comparisons not to be made across countries, but only using within-country variation. This helps control for differences across countries that are not easily observed and measured. And provide a consistent estimate of the corruption parameter under the assumption that all unobserved variables that influence the corruption outcome are time invariant, since these unobservables are removed by a within or first difference transformation (Wooldridge, 2002).

In order to confirm the appropriate use of the fixed effects method a Hausman test is performed which is the generally accepted mode of selecting between fixed and random effect models. The Hausman test poses as null hypothesis that there is no material difference in the coefficients of fixed effect and random effect models. If the null hypothesis (Ho) is rejected the fixed effect model will be found as appropriate method, alternatively the random effect should be used. However, our Haussmann test estimation ($p > 5\%$) provides no evidence against the null hypothesis (Ho) which suggests that random effects should also be considered to ascertain the issue of corruption as per our equations.

6.3.4.2 Random effects

Moreover, as this study is also interested in making sample inferences beyond the SADC dataset, using fixed effects model would only allow conclusions on the "fixed" number of SADC countries. Hence the random effects (RE) is also considered which allows estimates on the broader underlying population of African countries thereby benefiting from the generalisability offered by such statistical approach. However, the random effects model (RE) assumes no correlation between the explanatory variables and the individual country – specific effects, implying that, in the presence of endogeneity random effects (RE) will produce biased estimates. Using the fixed effects (FE) model which can adjust for unobserved effects that are correlated with the covariate through the inclusion of a country-fixed-effect term eliminates this source of endogeneity bias.

But before estimating the equations, an examination of the properties of the underlying data was effected. Testing for stationarity of the data series was done using panel unit root method to ensure that the variables used in the regressions were not subject to spurious correlation. As per below results it appears all main variables considered, corruption (CORR), human capital (HC) and social development (SD) are stationary at level and need not to be differenced.

Also in order to subsequently test for Granger-causality between corruption (CORR) and human capital (HC) or social development (SD), it is necessary that the time series are stationary. The stationary properties of the time series are tested using panel unit root method.

We further proceed with the VAR lag order selection criteria to choose the best lag length for the VAR time series model to examine the Granger causality and we perform the pair wise Granger Causality test for all the series. As the Granger causality tests require the data to be stationary pre- testing for stationary property of the data is in effect necessary as most economic and financial time series exhibit trending behaviour in their means when plotted against time (Zivot and Wang, 2006; Razzak, 2007). Hence the data would be transformed to stationary if necessary before analysis. In this case, the null hypothesis of presence of unit root is tested.

6.3.4.3 Panel Unit Root Testing Stationary data

Test summary1. Panel unit root test results

Panel unit root test: Summary
Series: CORRTI
Date: 12/19/15 Time: 19:24
Sample: 2005 2013
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-10.3759	0.0000	15	114
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.70952	0.0034	15	114
ADF - Fisher Chi-square	61.5508	0.0006	15	114
PP - Fisher Chi-square	60.2536	0.0009	15	120

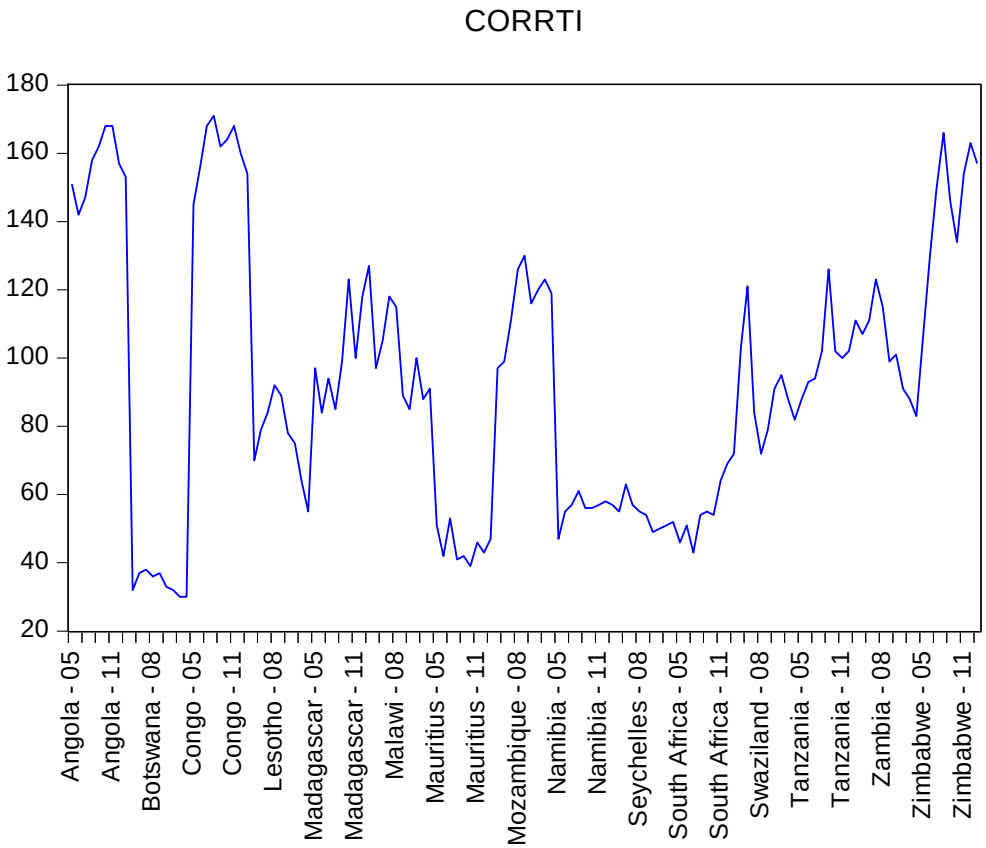
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ho = CORR has unit root

H_A= CORR does not have unit

If P value (0%) is less than 5% Ho is rejected; that is corruption (CORR) does not have unit the data is stationary

Figure1. Graphical output (CORRTI)



Test summary2. Panel unit root test results

Panel unit root test: Summary
Series: HC
Date: 12/19/15 Time: 19:35
Sample: 2005 2013
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.58559	0.0000	13	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.60493	0.2726	13	102
ADF - Fisher Chi-square	29.5442	0.2869	13	102
PP - Fisher Chi-square	45.9151	0.0093	13	104

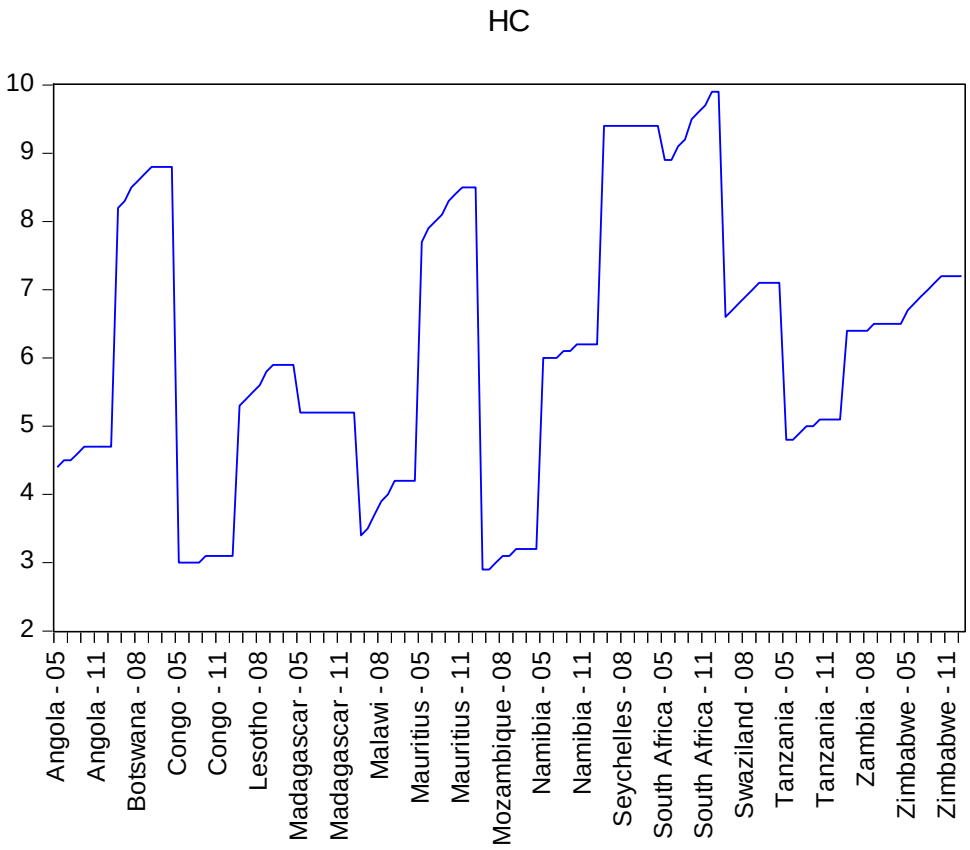
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ho = HC has unit root

H_A = HC does not have unit root

If P value (0%) is less than 5% Ho is rejected; that is human capital (HC) does not have unit the data is stationary

Figure 2. Graphical output (HC)



Test summary3. Panel unit root test results

Panel unit root test: Summary
Series: SD
Date: 12/19/15 Time: 19:38
Sample: 2005 2013
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.16149	0.0153	15	118
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.11864	0.8684	15	118
ADF - Fisher Chi-square	24.3689	0.7551	15	118
PP - Fisher Chi-square	38.4225	0.1392	15	120

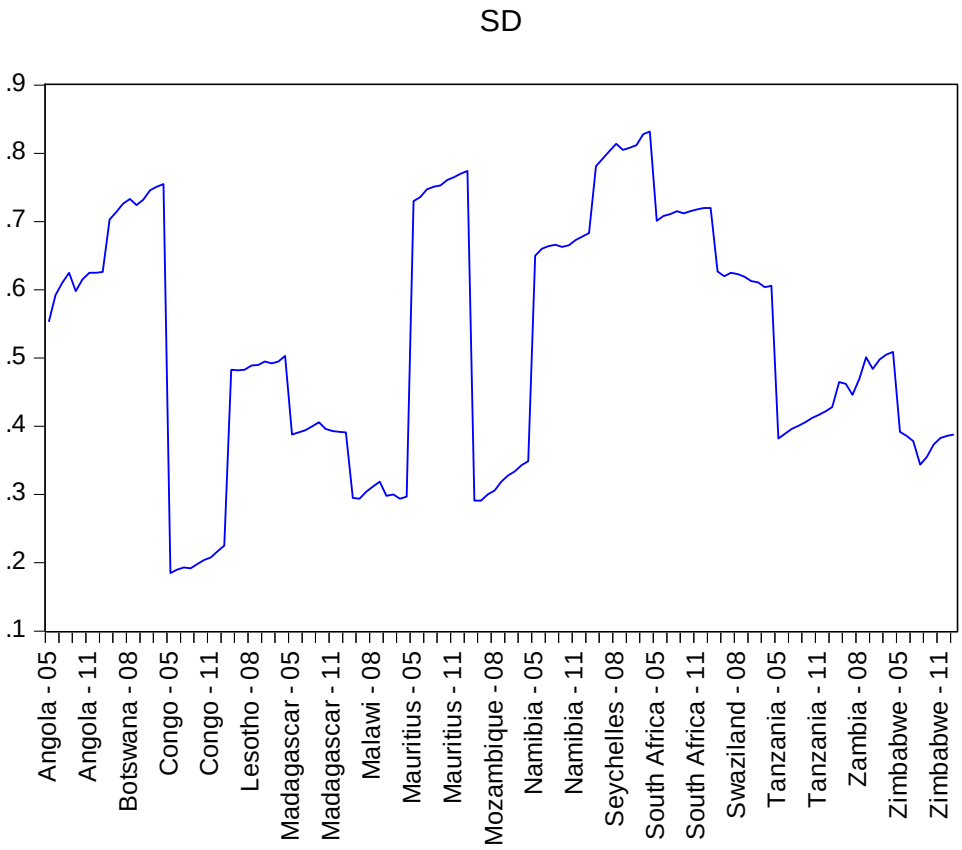
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ho = SD has unit root

H_A = SD does not have unit

If P value (0%) is less than 5% Ho is rejected that is social development (SD) does not have unit the data is stationary

Figure 3. Graphical output (HC)



From the above statistical evidence – both from the test results and the graph pattern – we conclude the data is free from unit root therefore it is stationary and doesn't need to be differenced.

6.3.4.4 Hausman test results

We run the Hausman test to choose the appropriate estimation method. The generally accepted way of choosing between a fixed and a random effect model is running a Hausman test. The Hausman test tests the null hypothesis to determine if the coefficients of the random effects model are the same as the ones of fixed effects model. If they are and therefore have an insignificant p-value, then it is safe to use random-effect models

Test summary4. Hausman test results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.169996	2	0.0754

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
HC	7.448756	0.614005	13.544501	0.0633
SD	-70.845269	-130.687282	3100.109569	0.2825

Cross-section random effects test equation:
Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 19:45
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	84.16080	39.77937	2.115690	0.0365
HC	7.448756	5.593899	1.331586	0.1856
SD	-70.84527	74.37370	-0.952558	0.3428

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.933183	Mean dependent var	93.04444
Adjusted R-squared	0.924123	S.D. dependent var	40.23306
S.E. of regression	11.08254	Akaike info criterion	7.765880
Sum squared resid	14493.08	Schwarz criterion	8.131730
Log likelihood	-507.1969	Hannan-Quinn criter.	7.914551
F-statistic	103.0004	Durbin-Watson stat	0.965504
Prob(F-statistic)	0.000000		

The Hausman test conducted for the model in this section however shows insignificant p- value (> 5%) as per above results and therefore suggests the use of random effect. Thus in this context to estimate the coefficients, a panel data analysis with random effect models is also conducted.

Therefore, this study will include three panel data regression models:

1. Panel least Squares (cross section),
2. Fixed Effects, and
3. Random Effects

6.4 Panel Estimation Results

6.4.1 OLS Regressions Results

Table 4 below reports the results of the Panel Least Square (PLS).

Column (1) shows the results of the first research question i.e. how does human capital affect corruption?

Column (2) reports the on the results of the second research question i.e. what is the impact of social development on corruption?

Colum (3) reports on the results of the third question i.e. how the combined effects of human capital and social development simultaneously affect corruption?

Column (4) reports the estimation results which capture the socio – economic factors (GDP, GDPPC, TRA) along with human capital to measure their combined impact on corruption level.

Column (5) reports the estimation results which capture the institutional factors (DEM, PF, CON) along with human capital to measure their combined impact on corruption level

Column (6) reports the estimation results which capture the socio – economic factors (GDP, GDPPC, TRA) along with social development to measure their combined impact on corruption level

Column (7) reports the estimation results which capture the institutional factors (DEM, PF, CON) along with social development to measure their combined impact on corruption level

Column (8) reports the results which include all variables to ascertain their overall impact on corruption level

Table 6. OLS estimates for explanatory variables and corruption (TI) relationships

Dependent Variable: Corruption Perception Index (CPI from TI)

Hypotheses	1	2	3	4	5	6	7	8
	HC/CORR	SD/CORR	SD,HC/CORR	HC+ GDP, GDPPC, TRA/CORR	HC+ DEM, PF, CONN/CORR	SD+ GDP, GDPPC, TRA/CORR	SD+ DEM, PF, CONN/CORR	HC+SD, GDP, GDPPC,TRA, DEM, PF, CONN/CORR
Variables	PLS (1)	PLS (2)	PLS (3)	PLS (4)	PLS (5)	PLS (6)	PLS (7)	PLS(8)
HC	-13.511***		-5.306***	-12.961***	-8.450***			-7.167***
	(1.204)		(2.182)	(1.229)	(0.859)			(1.821)
SD		-157.746***	-107.785***			152.009***	-89.855***	-4.383
		(13.151)	(24.269)			(14.628)	(11.179)	(22.461)
GDP				-0.009		0.974*		0.755**
				(0.534)		(0.527)		(0.368)
GDPPC				-0.003***		-0.001***		0.000

	(0.000)		(0.000)	(0.000)
TRA	-0.121		0.016*	-0.113*
	(0.075)		(0.081)	(0.059)
DEM		5.489***	9.911***	5.194***
		(1.966)	(2.064)	(2.178)
PF		0.896***	0.223	0.974***
		(0.199)	(1.477)	(0.259)
CONN		-0.169***	-0.165	-0.159***
		(0.413)	(0.045)	(0.048)

R- squared: 0.819

Adj. R- squared: 0.808

Legend: HC is human capital, SD is social development, GDP is gross domestic product, GDPPC is GDP per capita, TRA is trade openness, DEM is democracy, PF is press freedom, CONN is social connectivity.

Coefficients and standard errors (in parenthesis) are reported

****, **, * indicate significance level at 1 percent, 5 percent and 10 percent respectively*

Column (1) shows the result of hypothesis (1) i.e. does human capital affect corruption? The coefficient of HC has the expected negative sign and is quite significant at 1% level which suggests that higher human capital stock has a limiting effect on corruption level. It also indicates that that a one standard deviation increase in the human capital level decreases the CPI score by 27.61 points on a scale of 100. This also confirms Rogers (2008) findings which establishes the impact of human capital among low corrupt developing countries.

(NB: A one STD increase in the human capital level is calculated by multiplying the coefficient of HC (-13.511) and the STD of HC (2.044) which gives -27.616)

Column (2) reports the estimation results of hypothesis (2) i.e. how does social development link to public corruption level? The coefficient has the expected sign with high significance at 1% level tends to confirm the generally accepted view that higher social prosperity has a serious dampening effect on corruption. It also indicates that a one standard deviation increase in the social development variable level decreases the CPI score by 28.866 points on a scale of 100.

(NB: A one STD increase in the social development variable is calculated by multiplying the coefficient of SD (-157.74) and the STD of SD (0.183) which gives -28.866)

Column (3) reports the estimation results of hypothesis (3) that is how the combined effect of both human capital and social development interact with levels of corruption? Both signs point to the expected negative direction with the SD (social development) variable showing a significant coefficient at 1% level confirming its strong correlation with levels of corruption.

Column (4) displays the regression results which include other socio- economic factors (GDP, GDPPC, and TRA) along with HC (human capital) to measure their simultaneous impact on corruption. Interestingly GDPPC (GDP per capita) is singularly significant (at 1% level) among other variables such as GDP and trade which are insignificant (over 10% level) while the HC (human capital) variable retains its negative sign and significance at 1% level. A one standard deviation increase in the per capita income variable level decreases the CPI score by 10.352 points. This suggests that income level and distribution may indeed have a critical role in curbing corruption levels as increasing prosperity reduces the need for rent seeking.

(*NB: A one STD increase in the per capita income variable is calculated by multiplying the coefficient of GDPPC (0.003) and the STD of GDPPC (3450.91) which gives -10.352)*

Column (5) captures the estimation results which incorporate institutional determinants (DEM, PF, CONN) along with HC (human capital) to ascertain the role of these factors in determining the corruption level. With the inclusion of governance factors human capital (HC) retains its expected negative sign. It's worthwhile noting that the other variables do not display the expected negative sign. This tends to suggest institutional factors do not necessarily have a linear relationship with corruption levels. This result would reinforce the conclusions of Ades and Di Tella (1999) suggesting that political conditions have no major significant effect on countries' corruption levels.

Column (6) shows the results which include economic indicators (GDP, GDPPC, TRA) along with social development (SD) to measure the incidence of these variables on corruption. The inclusion of economic variables confirms the strong correlation of social development with corruption as illustrated by a high significance (at 1% level) and the large magnitude of the coefficient with the unexpected positive sign. Similarly, GDP growth appears not to have a diminishing effect on corruption with a positive sign which is not in line with Mauro's (1995), Blackburn, *et al.*, (2002) findings that establishes a negative correlation between growth, rate of investment and corruption. Although the result which shows a negative direction for GDPPC (GDP /capita) at a significant 1% level confirms for the income variable Mauro's conclusion which suggests that corruption and bureaucratic efficiency are negatively and significantly associated with the average GDP/capita.

Column (7) displays the regression results which comprise the institutional variables (DEM, PF, CONN) along with social development (SD) to measure the impact of these determinants on corruption. The inclusion of governance variables continues to reaffirm the strong and negative sign of social development (SD) as determinant significant a 1% level and with a large magnitude coefficient. Meanwhile the other institutional variables (DEM, PF) do not display the expected negative signs except for the social connectivity (CONN) variable which shows the expected negative direction at a significant level of 1%. This would suggest that social connectivity as an enabling link for social communication does contribute to increased transparency and decreased corruption level. The mixed results would indicate that governance factors do not have necessarily a linear relationship with corruption.

Column (8) shows the estimation results for all considered variables. With this all-inclusive equation both human capital (HC) and social development (SD) retain their expected negative sign although the social development (SD) variable appears insignificant. Other independent variables both economic and institutional persist with their unexpected positive signs except trade for openness (TRA) and social connectivity (CONN). The latter confirms its negative sign and high significance at 1% level reinforcing its relevance as a determining factor for corruption level. Unlike Press freedom (PF) which displays high magnitude coefficient but not the expected negative direction. This is not consistent with the major findings of Brunetti and Weder (2003) and Chowdhury (2004) which conclude that low levels of press freedom are associated with greater corruption. The high R square and Adjusted R^2 at respectively 0.82 and 0.81 ??? suggest the high fit of the regression and the strength of the relationship between our selected regression model and the response variable along with the relevance of the selected variables to explain corruption.

Table 7. Fixed Effects (FE) estimates for explanatory variables and corruption (TI) relationships

Dependent Variable: Corruption Perception Index (CPI from TI)

Hypotheses	1	2	3	4	5	6	7	8
	HC/CORR	SD/CORR	SD, HC/CORR	HC+ GDP, GDPPC, TRA/CORR	HC+ DEM, PF, CONN/CORR	SD+ GDP, GDPPC, TRA/CORR	SD+ DEM, PF, CONN/CORR	HC+SD, GDP, GDPPC, TRA, DEM, PF, CONN/CORR
Variables	FE (1)	FE (2)	FE (3)	FE (4)	FE (5)	FE (6)	FE (7)	FE (8)
HC	-3.719		-7.256	-2.952	-2.320			-6.491
	(8.531)		(8.568)	(9.032)	(8.705)			(9.454)

SD		-176.059**	-191.110**			-174.121*	-174.365*	-191.169
						(90.664)	(89.418)	(93.869)
		(88.826)	(90.697)					
GDP				-0.254		-0.241		-0.100
				(0.272)		(0.266)		(0.291)
GDPPC				-0.000		0.000		0.000
				(0.001)		(0.001)		(0.001)
TRA				-0.031		-0.018		-0.0302
				(0.101)		(0.099)		(0.102)
DEM					3.365		3.580	3.177
					(2.597)		(2.486)	(2.165)
PF					0.249		0.211	0.238
					(0.417)		(0.402)	(0.437)
CONN					-0.016		0.093	0.022
					(0.093)		(0.144)	(0.099)
R2	0.937	0.939	0.939	0.940	0.942	0.939	0.942	0.942

Legend: HC is human capital, SD is social development, GDP is gross domestic product, GDPPC is GDP per capita, TRA is trade openness, DEM is democracy, PF is press freedom, CONN is social connectivity.

Coefficients and standard errors (in parenthesis) are reported

****, **, * indicate significance level at 1 percent, 5 percent and 10 percent respectively*

Table 7 reports the regression results for the cross - section fixed effects with very strong R squared for all columns of over 0.90 which would suggest a better model fit. But remarkably most

coefficient for most variables are of small magnitude and insignificant except for social development (SD) which shows a significant coefficient at 5% level and the expected negative sign along with human capital (HC).

Table 8. Random Effects (RE) estimates for explanatory variables and corruption (TI) relationships

Dependent Variable: Corruption Perception Index (CPI from TI)

Hypotheses	1	2	3	4	5	6	7	8
	HC/CORR	SD/CORR	SD, HC/CORR	HC+ GDP, GDPPC, TRA/CORR	HC+ DEM, PF, CONN/CORR	SD+ GDP, GDPPC, TRA/CORR	SD+ DEM, PF, CONN/CORR	HC+SD, GDP, GDPPC, TRA, DEM, PF, CONN/CORR
Variables	RE (1)	RE (2)	RE (3)	RE (4)	RE (5)	RE (6)	RE (7)	RE (8)
HC	-7.137***		0.614	-7.595***	-7.595***			-5.380*
	(2.984)		(5.212)		(3.141)			(3.059)
SD		-126.262***	-130.687***			-174.121**	-115.867***	-56.175
		(33.792)	(49.308)			(90.664)	(26.307)	(37.166)
GDP					0.258	-0.241		0.018
					(0.250)	(0.266)		(0.254)

GDPPC	0.000	0.000		-9.760
	(0.000)	(0.001)		(0.000)
TRA	-0.250	-0.018		-0.048
	(0.893)	(0.099)		(0.079)
DEM			4.165*	3.685
			(2.296)	(2.324)
PF			0.490	0.688
			(0.302)	(0.307) **
CONN			0.044	0.041
			(0.396)	(0.045)

Legend: HC is human capital, SD is social development, GDP is gross domestic product, GDPPC is GDP per capita, TRA is trade openness, DEM is democracy, PF is press freedom, and CONN is social connectivity.

Coefficients and standard errors (in parenthesis) are reported

****, **, * indicate significance level at 1 percent, 5 percent and 10 percent respectively*

Table 6 reports the results of the cross – section random effects which are to some large extent similar with the Ordinary Least Square (OLS) results namely for the variables of human capital (HC) and social development (SD) which confirm their negative sign and highly significant coefficient at 1% level. This tends to reiterate that higher literacy rate and higher standards of living have a curtailing effect on corruption also shown under the previous models (OLS and FE). However, the other variables generally display coefficients of small magnitude and significance.

Overall the results presented under Tables 4, 5, 6 show that there is a strong and negative relationship between corruption and both human capital and social development with evidence of an even stronger correlation for the latter which remains robust and significant under various

specifications. From these results human capital (HC), social development (SD) were found to be strong predictors of corruption control even after controlling for both economic and institutional variables, but the results provide evidence against the simple linear relationship between corruption and socio economic variables as correlations remain inconsistent or weak and coefficient insignificant at many times. This should cause caution against the idea (Kaufmann, *et al.*, 2009) that countries with better governance practices or higher literacy rates (Gupta, *et al.*, 2001; Mo, 2001) are necessarily less corrupt. All of which confirms that corruption remains indeed an intricate area of study, due to its secret nature and the many probable elements that may affect its incidence

6.4.1.1 Granger Test Causality

The Panel Least Squares (PLS) or other models (FE, RE) results considered so far do not convey much about the causation of the variables. They do not tell us if a higher corruption is causing human capital or vice versa and similarly for social development. To ascertain this issue of reverse causality running in both directions a Granger causality test is applied to the relationships firstly between corruption and human capital; secondly and between corruption and social development. Indeed, neither the panel least square (PLS) the fixed effects (FE) model do not explain the relationship between the dependent and the independent variable in both directions, therefore not accounting for the endogeneity effect which may cause the dependent variable to affect as well as being affected by other independent variables, (Arellano and Bover, 1995; Blundell and Bond, 1998). In this case corruption may be caused by human capital and social development as much as they might be affected by corruption. As corruption is likely to impact adversely human capital and social development (Gupta, 2002) Ordinary Least Square (OLS) may overestimate the coefficient for CPI values. Any possibility to infer a causal relationship from a cross-sectional parameter is restricted by the potential of endogeneity bias (Hausman, 1978; Finkel, 1995) and unobserved variable bias (Duncan, 1972; Holland, 1986).

To address causality between corruption and human capital, and between corruption and social development the study applies Engle-Granger causality test of panel (Wald test). Engle and Granger (1969) which posed causality between variables as: “a given variable Granger causes another variable if better predictions of the latter variable are obtained using lagged and current information on the former variable”.

In other words, Granger causality is verified when the coefficients of the lagged variable are statistically significant when a variable is regressed both against its own lagged value and the past value of variable. Precisely in this case if corruption can be better explained on the basis of past corruption and human capital (or social development) than on the basis of past corruption alone, then a causal relationship exists from human capital (or social development) to corruption. That is corruption is said to Granger-cause *human capital* if *human capital* (or social development) can be better predicted using the histories of both *corruption* and *human capital* (or social development) than it can by using the history of *human capital* (or social development) alone.

Wald tests on lags of corruption in below equations (1 and 2) and on lags of human capital and social development in equation (3 and 4) are used to infer whether corruption causes human capital or human capital causes corruption, and similar determination is made for social development. The possible Granger causal relations between Corruption (CORR) and Human Capital (HC) can be expressed using the parameters of equations (1) and (2) which form a vector autoregressive system. We can test for the absence of Granger causality by estimating the following VAR model:

$$CORR_t = a_0 + a_1 CORR_{t-1} + ... + a_p CORR_{t-p} + b_1 HC_{t-1} + ... + b_p HC_{t-p} + u_t \quad (1)$$

$$HC_t = c_0 + c_1 HC_{t-1} + ... + c_p HC_{t-p} + d_1 CORR_{t-1} + ... + d_p CORR_{t-p} + v_t \quad (2)$$

Where t = time (t= 2, 3, …T)

p = no of lags included (p = 1, 2 ….n)

There is Granger causality from corruption to human capital if:

$b_1 \neq 0$ and $b_2 = 0$

Equally there is causality from human capital to corruption if:

$b_1 = 0$ and $b_2 \neq 0$

The causality is seen as reciprocal if:

$b_1 \neq 0$ and $b_2 \neq 0$

There is no relation between corruption and human capital (Null hypothesis H_0 rejected) if:

$b_1 = 0$ and $b_2 = 0$

SC = Human Capital

CORR = corruption

Testing null hypothesis H_0: $b_1 = b_2 \ ... = b_p = 0$, against H_A: Not H_0 is that *corruption (CORR) does not* Granger-cause *human capital (HC).*

Similarly, testing H_0: $d_1 = d_2 \ ... = d_p = 0$, against H_A: Not H_0, is that human capital (*HC) does not* Granger-cause corruption (*CORR).* In each case, a *rejection* of the null implies there is Granger causality

Similar approach is applied to assess Granger causality for social development with the following specification:

$$CORR_t = a_0 + a_1 CORR_{t-1} + ... + a_p CORR_{t-p} + b_1 SD_{t-1} + ... + b_p SD_{t-p} + u_t \quad (3)$$

$$SD_t = c_0 + c_1 SD_{t-1} + ... + c_p SD_{t-p} + d_1 CORR_{t-1} + ... + d_p CORR_{t-p} + v_t \quad (4)$$

Where

SD = Social development

CORR = corruption

6.3.2.9 Granger results estimation

Wald test on lags of corruption, human capital and social development are used in below equations (5,6,7,8,9,10) to infer (with a 5% probability benchmark) whether corruption causes human capital or social development and vice versa.

NB: We assign p the value of 0.05 (R.A. Fisher, 1925) as a benchmark measure of evidence against null effect.

Test summary 5. Wald test results

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	0.602775	2	0.7398

Null Hypothesis: C(3)=C(4)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	11.80900	15.21705
C(4)	-11.86692	15.29383

Restrictions are linear in coefficients.

Ho (Null hypothesis) = HC lag1 and HC lag2 cannot cause CORR that is C (3) +C (4) = 0

p value is more than 5% (73.9%) that is we accept null hypothesis (Ho) meaning that HC (-1) and HC (-2) jointly cannot cause CORR. We cannot reject Ho meaning that human capital (HC) cannot granger cause corruption (CORR)

Test summary 6. Wald test results

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	1.884055	2	0.3898

Null Hypothesis: C(5) =C(6)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(5)	90.34497	109.3003
C(6)	-103.8928	111.1992

Restrictions are linear in coefficients.

Ho = CORR lag1 and CORR lag2 cannot cause that is C (5) +C (6) = 0

p value is more than 5% (38.9%) that is we accept null hypothesis (Ho) which means that SD (-1) +SD (-2) jointly cannot cause CORR. We cannot reject Ho meaning that social development (SD) cannot granger cause corruption (CORR)

Test summary7. Wald test results

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	4.404364	2	0.1106

Null Hypothesis: C(8)=C(9)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(8)	0.000792	0.000586
C(9)	-0.001108	0.000595

Restrictions are linear in coefficients.

Ho = CORR lag1 and CORR lag2 cannot cause jointly HC that is C (8) +C (9) = 0

P value is more than 5% (11, 6%) that is we accept null hypothesis (Ho) which means that CORR (-1) +CORR (-2) jointly cannot cause HC. We cannot reject Ho meaning that is corruption (CORR) cannot granger cause human capital (HC)

Test summary 8. Wald test results

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	0.922434	2	0.6305

Null Hypothesis: C(12)=C(13)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(12)	0.539239	0.647119
C(13)	-0.577880	0.658362

Restrictions are linear in coefficients.

Ho = SD lag1 and SD lag2 cannot cause jointly HC that is C (12) +C (13) = 0

P value is more than 5% (63%) that is we accept null hypothesis meaning that SD (-1) + SD (-2) jointly cannot cause HC. We cannot reject Ho which means that is social development (SD) cannot granger cause human capital (HC).

Test summary 9. Wald test results

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	0.482009	2	0.7858

Null Hypothesis: C(15)=C(16)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(15)	-5.82E-05	8.65E-05
C(16)	6.03E-05	8.77E-05

Restrictions are linear in coefficients.

Ho = CORR lag1 and CORR lag2 cannot cause jointly SD that is C (15) +C (16) = 0

P value is more than 5% (78%) that is we accept null hypothesis meaning that CORR (-1) + CORR (-2) jointly cannot cause SD. We cannot reject Ho meaning that is corruption (CORR) cannot granger cause social development (SD)

The above results are confirmed using Pairwise Granger causality tests

Test summary 10. Granger test results

Pairwise Granger Causality Tests
Date: 01/19/16 Time: 17:06
Sample: 2005 2013
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
HC does not Granger Cause CORRTI	90	1.12168	0.3451
CORRTI does not Granger Cause HC		1.04546	0.3769

Test Summary 11: Pairwise Granger Causality Tests

Date: 01/19/16 Time: 17:10

Sample: 2005 2013

Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
SD does not Granger Cause CORRTI	90	0.26552	0.8501
CORRTI does not Granger Cause SD		0.11967	0.9483

Based on the probability values reported in the above tables ($p > 5\%$) for all variables the hypothesis that human capital (HC) does not Granger cause corruption (CORR/TI) or the opposite i.e. corruption (CORR) does not cause human capital (HC) cannot be rejected therefore no causality runs from one variable to the other and vice versa. This suggests from the above statistical evidence that associations between corruption and human capital or social development while displaying various correlations types are not of (Granger) causal nature in any direction.

6.4.2 Sensitivity Analysis

It is an established practice to confirm the results robustness by undertaking sensitivity tests which include investigating the results found with alternative definitions of key variables of the regression equation (Siebert and Zubanov, 2009). In this study we document the robustness of the above findings through other sensitivity check using replacement analysis with alternative measure of corruption. To mitigate concerns of omitted variable bias the above models are extended to incorporate additional variables (such as GDP growth, GDP per capita, Trade openness, Income per Capita, Democracy, Press freedom, Social connectivity) to further test the robustness of the models (Verbeek, 2008) and find out if their inclusion affects the significance of the two main covariates (Human capital and Social Development). This sensitivity analysis approach allows for added layers of complexity with added variables that are likely to influence the outcome variable (Kennedy, 2008) which is corruption in this case. Indeed, corruption is influenced by many variables (Chowdhury,

2004; Shen and Williamson, 2005) which may create the temptation of controlling for too many factors while the data may not have enough variation to distinguish clearly between all the factors (Treisman, 2000).

6.4.3 Replacement Analysis

The next step is to test the impact of human capital and social development on corruption using World Bank corruption control index (CCI) index as an alternative measure of corruption instead of Transparency International's (TI) corruption perception index (CPI). Control of Corruption Index (CCI) is constructed by the *World Bank.* It ranges from –2.5 to 2.5, with positive scores representing low levels of corruption. Both indexes have been used widely by noteworthy empirical studies on corruption (Treismans, 2000; Gupta, *et al.*, 2002).

Table 9. OLS estimates for explanatory variables and corruption (CCI) relationships

Dependent Variable: Corruption Control Index (CCI / WB)

Variables	PLS (1)	PLS (2)	PLS (3)	PLS (4)	PLS (5)	PLS (6)	PLS (7)	PLS (8)
HC	0.209***		0.047	0.118***	0.196***			0.080**
	(0.022)		(0.038)	(0.015)	(0.022)			(0.031)
SD		2.569***	2.119***			2.433***	1.281***	0.180
		(0.230)	(0.432)			(0.256)	(0.191)	(0.387)
GDP					-0.001	-0.016*		-0.016***
					(0.009)	(0.009)		(0.006)
GDPPC					5.450***	2.770**		-1.960*
					(1.240)	(1.250)		(1.030)
TRA					0.002*	0.000		0.002**
					(0.001)	(0.001)		(0.001)

DEM	-0.061*	-0.126***	-0.046
	(0.034)	(0.035)	(0.037)
PF	-0.020***	-0.011***	-0.023***
	(0.003)	(0.003)	(0.004)
CONN	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)

Legend: HC is human capital, SD is social development, GDP is gross domestic product, GDPPC is GDP per capita, TRA is trade openness, DEM is democracy, PF is press freedom, and CONN is social connectivity.

Coefficients and standard errors (in parenthesis) are reported

****, **, * indicate significance level at 1 percent, 5 percent and 10 percent respectively*

The previous section has described the results of testing the various hypotheses and variables configuration to explain the levels of corruption (with CPI /TI as a proxy) to explain the relationships between corruption, human capital (HC) and social development (SD). In order to check the robustness of the results this section will res-estimate the basic regression for the panel analysis. An alternative measure of corruption (control of corruption index / CCI from the World Bank Group's Worldwide Governance Indicators /WGI),) is used instead of the CPI from Transparency International. The results are discussed in this subsection as per above table 7.

Columns (1) and (2) estimate the results of human capital (HC) and social development (SD). Unexpectedly the signs are positive - which is not consistent with the results for the CPI / TI corruption and seems to suggest that corruption is not negatively affected. Some variables do not confirm their signs under CCI / corruption except for certain institutional variables. Both democracy (DEM) and press freedom (PF) under columns (4, 7, and 8) display

significant coefficients which would tend to reaffirm that a widely accepted causal hypothesis that is good governance factors are strong predictors of low corruption. Economic variables (GDP, GDPPC, and TRA) do not confirm their respective signs when corruption /CCI is used instead of instead / CPI. This partial confirmation of earlier CPI corruption tests also points to the difference in their approaches and methodologies between these main aggregate measures of corruption which sometimes lead to "different data sets used in quantitative research are routinely associated with different findings, and that the relative validity of different measures of corruption and hence of the different findings is not readily apparent" (Hawken and Munck, 2009: 2).

6.5 Conclusion

This analysis has reviewed several dimensions of the relationships between human capital, social development and corruption with the aim of adding to the riches of the empirical literature. The focus has been directed towards the determinants of corruption using a number of models and methods to find out the associations between those three main variables along with a host of both socio- economic and institutional variables. The empirical evidence gathered through various regression models suggest that indeed both human capital (HC) and social development (SD) are key determinants of corruption levels in SADC countries. Both are found to be negatively correlated with corruption with high magnitude coefficients.

The test results reliably support such conclusion which appears robust under several estimation models and for various control variables. One key finding suggests that a one standard deviation increase in the human capital level dents corruption by 27.61 points while a one standard deviation increase in the social development variable level triggers a drop of corruption by 19.724 points on the CPI scale of 100.

The analysis used pointers from the existing literature on the footsteps of seminal studies (Triesman, 2000) to identify other relevant determinants to test the robustness of such relationships in relation to a range of potential factors using OLS panel data estimation methods. For instance, the results for economic control variables provide some unforeseen observations. The correlations reported between corruption and GDP and trade openness with most coefficients under various estimates displaying positive signs tend to challenge the linear relationship conventionally

expected between these variables and corruption. With the exception of GDP per capita (GDPPC) which is found to be significantly and negatively correlated with corruption, the proposed hypotheses for the other economic variables are not confirmed. Equally the institutional variables do not confirm for SADC countries the mostly recognized negative association of corruption with democracy / press freedom (Goldsmith 1999, Brunetti and Weder, 2003).

The non-linear relationship of democracy and corruption suggests that political freedom does not carry much weight on corruption for SADC countries. It also indicates that in order to fight corruption we must perhaps provide for people's education first before people's political rights. However, one variable which runs counter to the non-linear pattern is social connectivity (CONN) which shows consistently the expected negative sign. This suggests that social interaction is seen to be critically relevant to the incidence of corruption and that indeed social connectivity – proxied here by lines of communication - provides for added social network density which contributes to curbing corruption levels. The fixed effects estimates which were introduced to account for fixed - across time and time-varying characteristics of specific countries, do not generally contradict but rather confirms previous results with higher R – squared and coefficients.

The results remain consistent through sensitivity analysis under various estimation models and alternate measure of corruption. The review also presented evidence to control for endogeneity through Granger causality tests.

It appears that despite significant associations between the considered variables no conclusive argument can be made as to the directions and effects of causality between human capital, social development and corruption in anyway. As Mauro (1997) found earlier the directional causation of corruption and development remains unresolved. This reiterates the view that corruption remains a multiform phenomenon which complexity is still perplexing as ever and remains difficult to unravel.

Overall the results in totality indicate that corruption levels in concerned SADC countries are socially - triggered outcomes crucially determined by human development conditions rather than affected by anti – corruption strategies and bureaucratic enforcement schemes. Hence it is concluded that anti – corruption policies not framed within the wider ambit of progressive social

policies of human development will remain ineffective in the long run and have only marginal effect on curbing corruption.

Put simply, policies aimed at curbing corruption in Africa and SADC in particular ought not to focus so much on regulatory frameworks, but must begin first and foremost with laying the foundation for strong institutions and transformative initiatives geared at enhancing human capital formation and uplifting standards of human development.

CHAPTER VII

DISCUSSIONS AND CONCLUSION

7.1 Introduction

This last chapter provides the conclusions and recommendations of this thesis. Firstly, the main objectives of the research are restated. Secondly the major findings of are highlighted before the policy implications are discussed. And lastly in light of this present study possible avenues for future research are identified.

Corruption remains a complex and enduring socio - political practice across the world. Its detrimental externality effects on society at large and the distortive influence of rent - seeking activities on market efficiencies along with its distributional impact on poverty levels have generally and overwhelmingly been recognized. Yet despite much scrutiny both from academia and policy makers the phenomenon has proved tenacious and even possibly on the rise notably in sub Saharan Africa as most cross - country indices tend to suggest. This provides an appropriate justification for this study's focus on the region and particularly on SADC countries which have shown historically stable patterns of high levels of corruption (Peters, 2011). The scale and perpetuation of such scourge - along with both the local and international awareness on the issue - have fortified this study's interest in the assessment of the prevalence of corruption in the SADC region which remains sadly a malignant disease of contemporary African societies.

The central aim of the present study was to investigate the relationships between human capital, social development and corruption in order to arrive at possible theoretical models of associations and causal links. And more holistically to offer a theoretical framework and practical policy prescriptions on the impact of human capital and social development in explaining the incidence of corruption. Then it sought to identify other key determinants and covariates both economic and institutional, and their functional dependence to the hypothesised nexus of human capital and social development - that may explain the diversity of corruption level outcomes among SADC countries. As a result of this study new rationalities for corruption occurrences are found and new perspectives on public policy approaches are formulated

The theoretical rationale of this review stems from an extensive body of knowledge on the causes and consequences of corruption which despite its scope and intensity has remained largely inconclusive. This thesis attempted to add to such perennial quest by answering these crucial research questions:

1 What is the effect of human capital formation on corruption? How does the causal direction of their relationship operate?
2 What is the effect of social development on corruption? How does the causal direction of their relationship operate?
3 What is the simultaneous effect of human capital and social development on corruption?

In fact, the effects of corruption have largely been scrutinized by socio - economists as its pervasiveness was seen to have detrimental effects on a country's economic advancement by shackling growth, distorting market efficiencies and producing inequality through misallocated resources (Mauro, 1995; Murphy, *et al.*, 1993; Rose-Ackerman, 1997; Kaufmann, 2003). Corruption appears indeed in the literature as a multifaceted proposition driven by socio- economic determinants which are examined as to their functional dependence to human capital and social development. Shleifer and Vishny (1993) conclude that corruption is a factor of disruption in the development process. Jain (2001) inconclusively found, that the causes and consequences of corruption are often entangled. Earlier Mauro (1997) found the directional causation of corruption and development remains unresolved. As a key determinant of socio - economic growth corruption is found to increase inequality (Dreher, *et al.*, 2007) through unequal redistribution of income and wealth and to disfavour social programs intended for the poor (Ackerman, 2008).

Human capital formation through education is also affected by corruption; Mauro (1997) concludes that education spending is negatively correlated with corruption. This will generally result according to Dreher, *et al.*, (2007) in low levels of school enrolment causing higher corruption, while Buehn and Schneider (2012) could not arrive at similar correlation.

From a governance perspective political and institutional factors have relevant impact on the level of corruption according to Dreher, *et al.*, (2007) who argue that deficit in democratic controls are likely to increase corruption and conversely stronger transparency and accountability systems are likely to deter corruption. Buehn and Schneider (2012) find similar evidence while Tanzi (1998)

seems to emphasize particularly the effect of bureaucratic inefficiency - through convoluted regulations - as a major conduit for corruption. When dealing with causality aspects Treisman (2000) uses quantitative analysis to find the causes of corruption. He arrives at mixed conclusions finding no effect of the current degree of democratization on corruption levels while on the contrary economic development appeared to have curbing effects on corruption. (2000: 46). He also suggests that more advanced countries with long established institutions may have less exposure to corruption.

In fact, political scientists and economists have widely examined corruption primarily in relation to economic performance and GDP growth rather than in relation to social development. Moreover, much of the interest in corruption and its socio-economic ills have been expressed generally in "normative" terms (Gould, 1991: 468) largely advocated on ethical or human right grounds if not on political claims. When corruption is linked to inequality or poverty the analysis is generally framed in qualitative if not ideological terms whether political, ethical or both. Most studies for Southern Africa offer narratives framed in descriptive terms (Naidu and Roberts, 2004; Kalaba, *et al.,* 2006; Peters, 2011, Jauch, *et al.,* 2011) which for some amount to political scientists' diatribes mainly arguing that corruption is caused by the failure of the institutions or by rent seeking, if not by state capture leading to harmful effects on economic performance (Acemoglu, Johnson, *et al.,* 2005; Ugur and Dasgupta, 2011).

Despite abundant literature on corruption and economic growth the link to human capital (Rogers, 2008) is seldom considered. The analysis remains confined to the human capital-growth equation (Romer, 1990; Benhabib and Spiegel, 1994; Barro, 1999; Atardi and Sala-i-Martin, 2003; Pritchett, 2006; Kwabena, *et al.,* 2010; Schundeln, *et al.,* 2014) or corruption - growth relationships (Tanzi, *et al.,* 1997; Mauro, 1995; Nye, 1967; Rose-Ackerman, 1997; Kaufmann, 2003) and stop short of examining the relationship with poverty reduction aspect and social development. Therefore, failing to recognize (Szeftel, 1998) that indeed corruption levels are to be construed as outcomes of socioeconomic undercurrents. In light of the theoretical ambiguities this study put forward a contention that even fewer have contemplated that is the crucial question of why for similar resource endowments and comparable economic outlooks, a number of SADC countries display striking heterogeneities in corruption levels linked to similarly discrepant levels of human capital stock and social development? Does human capital stock and its uneven dispersion have a pivotal

role to play in unravelling the links between corruption and social development? Such conjectures then led to the major research question at the core of this review that is meant to uncover the associations and causal relationships of corruption with the human capital and social development variables.

7.2 Thesis structure.

This dissertation is structured in seven chapters. The introduction in Chapter 1 lays the foundation for this thesis by first discussing the rationale and the purpose for pursuing the study. This is followed by the formulation of the conceptual foundation of this work through the review of the existing body of knowledge which provided the framework for the research problem and the research questions, before the philosophical underpinnings and theoretical assumptions were outlined. The introduction is followed by an extensive literature review in chapters 2 and 3 where the economics of human capital and the political economy of corruption are discussed thoroughly. The outcome of literature review provides the groundwork for the theoretical framework in chapter 4 which articulates how and why the key variables namely human capital and social development affect the phenomenon of interest to this review that is corruption. The framework then gives a well - supported rationale that informs the research hypotheses and questions. To address the research questions chapter 5 provides the methodology for the empirical validation of the theoretical arguments raised earlier. The theoretical premises, the research design and the data analysis procedures in the form of quantitative methods - using various panel data regression models - that were deemed most suitable for the formulated research questions are presented. Chapter 6 addresses the results from the statistical data analysis and discusses the findings in connection with the existing body of knowledge around corruption and highlight their pertinence relative to the research questions. And finally, this Chapter 7 presents the conclusions as detailed earlier.

7.3 Summary of Findings and Contribution

This dissertation empirically investigated the relationships between corruption human capital and social development for a panel of SADC countries over the period 2005 -2013. The quantitative approach is based on a number of panel regression models with the view to find out various association types and possible correlations or causes. The hypotheses considered and tested

suggest that both human capital (HC) and social development (SD) are key determinants of corruption levels. The research reports consistently strong R squared ($R^{2)}$ and high magnitude coefficients for the two variables under various estimates which indicate that together they account for high degree of the variation in the regression estimate of corruption levels. Both OLS and FE models find consistent results in the estimations which support such conclusion which appears robust under several estimation models and for various control variables. Furthermore, corruption data from different sources (TI, WB) also corroborates the results.

Human capital is found to be negatively and significantly correlated with corruption under various estimations. This suggests that countries with higher literacy rates are likely to be less corrupt whereas low levels of education prompt low demand for transparency and accountability which breeds higher corrupt practices. This research reports that a one standard deviation increase in the human capital level decreases corruption by 27.61 points. Similarly, social development appears to run significantly in opposite direction of corruption under various estimates. This suggests that countries experience less corruption as they build higher standards of living at least in the long run. This finding is consistent with most of the empirical conclusions on the subject matter (Pellegrini and Gerlagh, 2004; Ades and Di Tella, 1999; La Porta, *et al.*, 1999; Treisman, 2000). This research reports that a one standard deviation increase in the social development variable level decreases corruption 19.724 points.

The results for economic and institutional control variables provide some intriguing and unexpected observations. The observed correlations between corruption and GDP and trade openness with most coefficients under several estimates showing weak significance and positive signs tend to challenge the expected linear relationship between these variables and corruption. Examination of the non - linear relationship between corruption and trade openness finds that trade liberalization has no particular role in decreasing opportunities for corruption while GDP growth seems to increase opportunities for rent seeking. Except for GDP per capita (GDPPC) which is found to be significantly and negatively correlated with corruption the proposed hypotheses for the other economic variables are not confirmed.

From the above findings it can be concluded that corruption levels are more responsive to human development conditions of living than to macro - economic conditions and aggregates. This association is robust under different estimation methodologies and for various control variables.

Similarly, the inclusion of the institutional variables do not confirm for SADC countries the largely found negative association of corruption with democracy / press freedom (Goldsmith, 1999; Triesman, 2000; Brunetti and Weder 2003).

Examination of the non-linear relationship of democracy and corruption suggest that political rights have no significant impact on corruption for SADC countries, which may be explained by the fact that in most countries democracy amounts at best to free and fair elections without the active and effective institutions indispensable to combat corruption. Hence young and developing democracies across SADC may not benefit from lower levels of corruption in the short run as institutional frameworks in formation remain weak to deter political corruption in particular as confirmed by previous findings in the literature (Dahl, 1971; Shleifer and Vishny, 1993). In the long run however enduring and mature democracies have achieved significant reductions in the level of corruption as seen among developed western countries.

One crucial result and noteworthy exception however is the social connectivity variable (CONN) variable which shows consistently under various estimates the expected negative sign and significance. This would suggest that social connectivity through means of communication may contribute – to a greater degree than recognized in the literature - to social network density which in turn leads to increased transparency and decreased corruption level.

Using fixed effects - to account for characteristics that are fixed across time and time-varying characteristics that are constant among SADC countries – does not lead to opposing conclusions but rather confirms previous results with higher R – squared and more significant coefficients suggesting a better model fit for the selected variables.

Clearly in this study, human capital and social development in particular were found to be good and consistent predictors of corruption control which remains robust and significant under numerous specifications. Indeed, if higher social development standards are negatively associated with corruption this finding has crucial policy implication. Policies that rest solely on an anti – corruption agencies even with vigorous prosecution – may be simply inadequate and will not have the desired results. What would be required first is a sustained socially progressive agenda towards better living conditions, only then anti- corruption strategies have a chance to be effective in curbing the scourge of public corruption.

Meanwhile this research did not allow to derive clear arguments with regards to true causality and effects' directions. At the end the results remain agnostic with regards to causation between corruption and the selected explanatory variables – albeit the analysis did exhibit significant relationships - as our conclusions remain careful not to derive active causation from simple correlation. This confirms corruption as a double - edge, endogenous phenomenon which complexity remains still hard to disentangle. In the end the results strongly support that corruption control level is indeed a socially induced outcome critically impacted by human development conditions – including levels of social engagement through social networks - rather than engineered out of anti - corruption schemes and enforcement actions which effectiveness is largely predicated on the former prerequisite.

7.4 Contribution to Knowledge

This thesis isn't over claiming to revolutionize the current debate on corruption practices but it is keen to add new perspectives to the existing body of academic research at various levels.

Topically, this researcher is not aware of a study that captures the interaction effect of human capital and social development on corruption and even less so for the SADC region. Indeed, there is a relative scarcity of tests for the functional relationships of such variables notably for African countries. To the best of this researcher's knowledge little grand theoretical explanation of this phenomenon has been argued, the present study has offered one of the first systematic cross-country analysis of such a conceptual combination.

This review offers an empirically grounded contribution and add to the mostly normative and descriptive studies about public corruption in SADC countries. The approach moves from a deontological approach mostly focused on the narrative of policy and rights imperatives to a positivist perspective for the empirical analysis - using panel data - of the formation mechanisms that affect corruption levels across SADC countries

Theoretically this study offers a political economy - based approach of corruption which breaks away from the views of corruption as a political or morally - loaded concept mostly seen as a matter of individual rent - seeking or public morality to turn the focus on the macro foundations which explain the structural socio - economic dimensions of societies that allow the preponderance of corruption. It is also a departure from the market – based views of corruption which explain

corruption through the categories of supply and demand or principal - agent. It argues a paradigm shift which provides a new scheme of intelligibility, an "episteme" of corruption - conditions of possibility for knowledge (Foucault, 1966) - which refer to the order of developmental structures underlying the production of corruption

Empirically using panel data analytical framework, the study examines the implication / causation forms as they affect human capital, social development and corruption in order to elicit the patterns of relationships underlying the three theoretical strands. The analysis put forth valuable empirical findings, which question some of the basic assumptions in the field of corruption research. The nexus corruption - human capital and - social development is examined. It is argued that both human capital (HC) and social development (SD) are consistent predictors and structural determinants of corruption levels in SADC countries under several estimation models and for various control variables. Significant non - linearities are investigated for various components of economic and institutional indicators.

Ultimately this dissertation claims to contribute to the broader understanding of the composite nature of corruption. It takes the framework of corruption one step further from an analytically if not politically - contested concept to a policy - loaded concept which emphasizes corruption as an outcome of macro – development factors rather than borne out of the failures of governance controls or limitations of the human nature. From a government perspective, it encourages the exploration of human development - based policies as effective means to dealing with the generation of corruption and battling sustainably its prevalence.

7.5 Policy implications

What can be derived from this review and done about corruption? One perennial question often debated in deliberations about policy responses and their adequateness in tackling corruption is whether to focus chiefly on the pursuit and prosecution of the crimes committed or to engage in more preventive actions designed to minimize rent- seeking opportunities and reduce incentives to engage in corrupt acts.

In light of the aforementioned findings the answer is unequivocal. Corruption is not fundamentally rooted in decadent ethics or deficient governance frameworks, with the policy implication that

bureaucratic and enforcement actions cannot be seen as panacea in anti- corruption national strategies.

Countries equipped with all the requisite institutions still experience pervasive levels of corruption. Other nations interested in combating durably corruption ought to focus more on socio- economic policies towards better education and higher living standards and less on sanctions measures and oversight agencies all of which may be in vain without the requisite enabling developmental context. And while many noteworthy anti – corruption strategies including by the World Bank (2007) acknowledge the need to consider the root causes of poor governance or lackluster economic performance, their diagnosis generally fall short of recognizing the underlying human capabilities functionality of corruption. Hence there is no real emphasis on the developmental process involved in creating more effective and sustained anti - corruption strategies.

From another evidence – based policy perspective this crucial conclusion also would compel governments, when prioritizing resources allocation to focus more on education spending than anti – corruption regulations as higher human capital productivity will in turn yield higher returns in curbing corruption in the long run than law enforcement actions or even enhanced democratic institutions.

Efforts to stamp out corruption should be designed first to eliminate or mitigate the root - conditions of its incidence. Lending to much focus on enforcement actions and regulatory frameworks would indeed prove to be a misplaced priority.

7.6 Study Limitations and Further Research

First this study was constrained by limited data availability concerning SADC affairs. The unavailability of corruption time series data from the SADC organization series data caused this research to use mostly World Bank databases and proxies for the measurement of variables which might affect the accuracy of our estimations.

Then the researcher's attempt at drawing conclusions on data relationships and making inferences on causality did not yield positive conclusions. Despite the causality tests this empirical analysis could not arrive at confident inferences on causality and effects directions between corruption and the selected variables. One reason is surely linked to the potential high endogeneity of the

variables of interest as often seen in social sciences. This should however not deter from pursuing the causality inquiry around corruption using other variables and or quantitative models as such endeavour remains critical to fighting the scourge and to priority setting in policy formulation. Also in the sensitivity analysis we did not pay further attention to possible interaction and indirect interplay among the corruption determinants.

Furthermore, there a number of new topical avenues that may be of interest on the heels of this research. By using quantitative method on the SADC countries which in many ways share both economical and institutional similarities this review has produced empirical conclusions which may benefit from the generalizability to be derived from cross- country quantitative analysis. Meanwhile such approach fails to account for countries' heterogeneities and for the intricacies of the corruption phenomenon.

A more country - specific method using possibly both quantitative and qualitative analysis should be considered to account for the complex associations between corruption and the independent variables and provide a better context – specific understanding leading to a more country – sensitive policy formulation. Such approach could include a wider range of more societal variables such as culture, social norms -including power distance - which have not been considered in this review and which may provide explanations to variables' associations that quantitative analysis alone would not deliver.

Another approach of corruption worth considering is the need to investigate the practical modalities of corruption. Such study would focus on the concrete manifestations of corruption to ascertain where, how and why such incidences, moving theoretically beyond macro data from particular concrete occurrences of corruption to generalizable theory.

Finally, as we find that human capital and social development are important in elucidating corruption, it would be worthwhile investigating factors explaining the pre-eminence of those variables.

7.7 Conclusion

Corruption remains universally tenacious to a lesser or greater degree among nations but notably in Africa with an unprecedented scope and scale (Medard, 2002). A considerable amount of

research has been directed towards the comprehension of the nefarious effects of the phenomenon. Much of this research has paid attention to the microeconomic aspects of private supply and demand or individual incentives and opportunities that may encourage or dissuade corrupt acts. Much less has applied scrutiny on the causes and possible joint determination of the scourge as tested in this study. The objective was to explore the formation conditions of corruption through its interaction with human capital and social development. The conclusions of the empirical analysis accord to some degree with existing findings while challenging or subjecting others to significant qualifications.

The direction of causality for the considered variables has remained unresolved suggesting that the mutual dependencies between human capital, social development and corruption are still to be disentangled. Meanwhile this study claims to have contributed towards unlocking one among the most baffling mystery in academic anti- corruption research. That is, why does widespread and systemic corruption continue to persist in developing countries and particularly in the selected countries despite laudable anti-corruption initiatives and brave enforcement efforts and how countries in the SADC region with similar economic profiles continue to display glaring heterogeneities for their corruption outcome levels?

This thesis which has sought to ascertain the macro conditions underlying the production of corruption, in effect provides additional evidence - which fundamentally refers to the need for the human and social order to be transformed for corruption to be curbed - that gets us hopefully closer to answering this perplexing question.

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APPENDICES

APPENDIX A

Eviews Test Results - Descriptive Statistics

Correlation Matrix

	CON01	CORR_TI	DEM	GDP	GDPPC	HC	PF	SD	TRADE
CON01	1.000000	-0.170627	0.138882	0.027050	0.311655	0.208421	0.129656	0.219100	0.332363
CORR_TI	-0.170627	1.000000	0.746540	0.139703	-0.270193	-0.686674	0.739048	-0.720853	-0.277765
DEM	0.138882	0.746540	1.000000	-0.030180	-0.254308	-0.376260	0.897807	-0.442227	-0.054386
GDP	0.027050	0.139703	-0.030180	1.000000	0.018777	-0.211118	-0.042110	-0.048857	-0.069192
GDPPC	0.311655	-0.270193	-0.254308	0.018777	1.000000	-0.000914	-0.425086	0.201771	-0.039869
HC	0.208421	-0.686674	-0.376260	-0.211118	-0.000914	1.000000	-0.321221	0.846651	0.289069
PF	0.129656	0.739048	0.897807	-0.042110	-0.425086	-0.321221	1.000000	-0.497659	-0.001005
SD	0.219100	-0.720853	-0.442227	-0.048857	0.201771	0.846651	-0.497659	1.000000	0.416123
TRADE	0.332363	-0.277765	-0.054386	-0.069192	-0.039869	0.289069	-0.001005	0.416123	1.000000

Summary Statistics

	CONN	CORRTI	DEM	GDP	GDPPC	HC	PF	RESID	SD	TRADE
Mean	53.87245	93.04444	3.762963	5.210708	3221.416	6.181481	53.68148	-1.91E-14	0.524533	79.39383
Median	43.41215	91.00000	3.000000	5.382346	1437.884	6.100000	52.00000	-1.732461	0.498000	72.97729
Maximum	160.6411	171.0000	7.000000	22.59305	16185.90	9.900000	90.00000	51.81947	0.832000	164.5975
Minimum	2.789820	30.00000	1.000000	-17.66895	213.1567	2.900000	26.00000	-46.71301	0.185000	29.33353
Std. Dev.	39.74328	40.23306	1.853627	4.509609	3450.910	2.044694	17.75230	17.77637	0.183853	32.55491
Skewness	0.816823	0.321562	0.413050	-0.465216	1.233142	0.109209	0.204947	0.360066	-0.067128	0.847717
Kurtosis	2.831695	2.036456	1.947066	9.764406	3.978817	1.965457	2.032337	3.482760	1.756004	2.997193
Jarque-Bera	15.17134	7.548894	10.07500	262.2537	39.60362	6.288671	6.212165	4.228009	8.806218	16.16908
Probability	0.000508	0.022950	0.006490	0.000000	0.000000	0.043096	0.044776	0.120753	0.012239	0.000308
Sum	7272.780	12561.00	508.0000	703.4455	434891.1	834.5000	7247.000	-2.60E-12	70.81200	10718.17
Sum Sq. Dev.	211656.8	216905.7	460.4148	2725.101	1.60E+09	560.2237	42229.30	42343.91	4.529440	142016.2
Observations	135	135	135	135	135	135	135	135	135	135

APPENDIX B

Eviews Regression Results

Panel Least Squares - Fixed Effects - Random Effects

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:11
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	176.5658	8.072790	21.87172	0.0000
HC	-13.51155	1.240346	-10.89337	0.0000

R-squared	0.471521	Mean dependent var	93.04444
Adjusted R-squared	0.467547	S.D. dependent var	40.23306
S.E. of regression	29.35782	Akaike info criterion	9.611699
Sum squared resid	114630.2	Schwarz criterion	9.654740
Log likelihood	-646.7897	Hannan-Quinn criter.	9.629189
F-statistic	118.6654	Durbin-Watson stat	0.126124
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:39
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	116.0356	52.74571	2.199906	0.0299
HC	-3.719357	8.531465	-0.435958	0.6637

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.937198	Mean dependent var	93.04444
Adjusted R-squared	0.924185	S.D. dependent var	40.23306
S.E. of regression	11.07801	Akaike info criterion	7.807613
Sum squared resid	13622.19	Schwarz criterion	8.324106
Log likelihood	-503.0139	Hannan-Quinn criter.	8.017501
F-statistic	72.01957	Durbin-Watson stat	0.979319
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:39
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	137.1656	19.90676	6.890401	0.0000
HC	-7.137631	2.984031	-2.391943	0.0182

Effects Specification	S.D.	Rho
Cross-section random	28.75546	0.8708
Idiosyncratic random	11.07823	0.1292

Weighted Statistics

R-squared	0.038980	Mean dependent var	11.85133
Adjusted R-squared	0.031754	S.D. dependent var	11.59445
S.E. of regression	11.40888	Sum squared resid	17311.61
F-statistic	5.394560	Durbin-Watson stat	0.827682
Prob(F-statistic)	0.021718		

Unweighted Statistics

R-squared	0.366590	Mean dependent var	93.04444
Sum squared resid	137390.3	Durbin-Watson stat	0.104290

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:12
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	85.61434	8.308631	10.30427	0.0000
HC	-8.450570	0.859008	-9.837591	0.0000
DEM	5.489156	1.966618	2.791165	0.0060
PF	0.896947	0.199590	4.493948	0.0000
CONN	-0.169618	0.041315	-4.105451	0.0001

R-squared	0.804782	Mean dependent var	93.04444
Adjusted R-squared	0.798775	S.D. dependent var	40.23306
S.E. of regression	18.04778	Akaike info criterion	8.660256
Sum squared resid	42343.91	Schwarz criterion	8.767859
Log likelihood	-579.5673	Hannan-Quinn criter.	8.703983
F-statistic	133.9805	Durbin-Watson stat	0.348322
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:42
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	82.23038	55.25231	1.488270	0.1396
HC	-2.320874	8.705055	-0.266612	0.7903
DEM	3.365313	2.597025	1.295834	0.1978
PF	0.249150	0.417739	0.596425	0.5521
CONN	-0.016293	0.093294	-0.174646	0.8617

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.940061	Mean dependent var	93.04444
Adjusted R-squared	0.925631	S.D. dependent var	40.23306
S.E. of regression	10.97185	Akaike info criterion	7.805400
Sum squared resid	13001.21	Schwarz criterion	8.386455
Log likelihood	-499.8645	Hannan-Quinn criter.	8.041525
F-statistic	65.14685	Durbin-Watson stat	1.006243
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:42
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	92.19549	17.17878	5.366825	0.0000
HC	-9.298162	1.948935	-4.770894	0.0000
DEM	2.941596	2.284691	1.287525	0.2002
PF	0.841936	0.277289	3.036311	0.0029
CONN	0.038236	0.039587	0.965876	0.3359

Effects Specification	S.D.	Rho
Cross-section random	14.55432	0.6375
Idiosyncratic random	10.97604	0.3625

Weighted Statistics

R-squared	0.368164	Mean dependent var	22.68387
Adjusted R-squared	0.348723	S.D. dependent var	14.12898
S.E. of regression	11.40233	Sum squared resid	16901.72
F-statistic	18.93740	Durbin-Watson stat	0.809165
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.757437	Mean dependent var	93.04444
Sum squared resid	52613.31	Durbin-Watson stat	0.259940

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:14
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	193.1799	9.766835	19.77917	0.0000
HC	-12.96112	1.229298	-10.54351	0.0000
GDP	-0.009004	0.534897	-0.016834	0.9866
GDPPC	-0.003203	0.000684	-4.683557	0.0000
TRA	-0.121580	0.075707	-1.605932	0.1107

R-squared	0.553718	Mean dependent var	93.04444
Adjusted R-squared	0.539986	S.D. dependent var	40.23306
S.E. of regression	27.28779	Akaike info criterion	9.487090
Sum squared resid	96801.07	Schwarz criterion	9.594692
Log likelihood	-635.3786	Hannan-Quinn criter.	9.530816
F-statistic	40.32395	Durbin-Watson stat	0.165694
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:44
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	115.6184	56.21663	2.056659	0.0421
HC	-2.952510	9.032234	-0.326886	0.7444
TRA	-0.031424	0.101595	-0.309303	0.7577
GDP	-0.254479	0.272451	-0.934035	0.3524
GDPPC	-0.000156	0.001627	-0.095822	0.9238

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.937715	Mean dependent var	93.04444
Adjusted R-squared	0.922721	S.D. dependent var	40.23306
S.E. of regression	11.18447	Akaike info criterion	7.843785
Sum squared resid	13509.97	Schwarz criterion	8.424840
Log likelihood	-502.4555	Hannan-Quinn criter.	8.079910
F-statistic	62.53714	Durbin-Watson stat	0.966258
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:44
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	141.4398	21.08785	6.707172	0.0000
HC	-7.595736	3.141318	-2.418009	0.0170
GDP	-0.258603	0.250799	-1.031115	0.3044
GDPPC	0.000588	0.001119	0.525594	0.6001
TRA	-0.025066	0.089305	-0.280677	0.7794

Effects Specification	S.D.	Rho
Cross-section random	29.00156	0.8710
Idiosyncratic random	11.16091	0.1290

Weighted Statistics

R-squared	0.048345	Mean dependent var	11.83868
Adjusted R-squared	0.019063	S.D. dependent var	11.59219
S.E. of regression	11.48117	Sum squared resid	17136.24
F-statistic	1.651034	Durbin-Watson stat	0.815729
Prob(F-statistic)	0.165357		

Unweighted Statistics

R-squared	0.353452	Mean dependent var	93.04444
Sum squared resid	140240.0	Durbin-Watson stat	0.099676

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:16
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	89.09576	9.738725	9.148607	0.0000
HC	-7.515865	1.606589	-4.678149	0.0000
SD	-13.34589	19.36914	-0.689029	0.4920
DEM	5.974919	2.092916	2.854830	0.0050
PF	0.815736	0.232140	3.513980	0.0006
CONN	-0.164557	0.042046	-3.913780	0.0001

R-squared	0.805498	Mean dependent var	93.04444
Adjusted R-squared	0.797959	S.D. dependent var	40.23306
S.E. of regression	18.08435	Akaike info criterion	8.671397
Sum squared resid	42188.64	Schwarz criterion	8.800521
Log likelihood	-579.3193	Hannan-Quinn criter.	8.723870
F-statistic	106.8463	Durbin-Watson stat	0.349791
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:46
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	199.2461	79.18144	2.516323	0.0133
HC	-5.774176	8.747029	-0.660130	0.5106
SD	-186.0632	91.38785	-2.035973	0.0442
DEM	3.191422	2.561440	1.245948	0.2155
PF	0.264203	0.411852	0.641499	0.5226
CONN	0.016626	0.093375	0.178057	0.8590

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.942296	Mean dependent var	93.04444
Adjusted R-squared	0.927735	S.D. dependent var	40.23306
S.E. of regression	10.81550	Akaike info criterion	7.782206
Sum squared resid	12516.33	Schwarz criterion	8.384782
Log likelihood	-497.2989	Hannan-Quinn criter.	8.027076
F-statistic	64.71448	Durbin-Watson stat	0.966526
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:46
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	109.5818	19.84314	5.522404	0.0000
HC	-4.391453	3.262161	-1.346179	0.1806
SD	-73.57661	38.38115	-1.916999	0.0574
DEM	3.683876	2.333606	1.578620	0.1169
PF	0.611228	0.304115	2.009862	0.0465
CONN	0.046921	0.039832	1.177984	0.2410

Effects Specification

	S.D.	Rho
Cross-section random	15.38433	0.6645
Idiosyncratic random	10.93040	0.3355

Weighted Statistics

R-squared	0.363179	Mean dependent var	21.44256
Adjusted R-squared	0.338496	S.D. dependent var	13.78703
S.E. of regression	11.21340	Sum squared resid	16220.49
F-statistic	14.71373	Durbin-Watson stat	0.830069
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.749485	Mean dependent var	93.04444
Sum squared resid	54338.20	Durbin-Watson stat	0.247784

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:20
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	186.8166	9.833733	18.99752	0.0000
HC	-7.295747	2.431686	-3.000283	0.0032
SD	-77.02122	28.74485	-2.679479	0.0083
TRA	-0.035810	0.080598	-0.444301	0.6576
GDP	0.410470	0.545563	0.752379	0.4532
GDPPC	-0.002350	0.000740	-3.174871	0.0019

R-squared	0.577247	Mean dependent var	93.04444
Adjusted R-squared	0.560861	S.D. dependent var	40.23306
S.E. of regression	26.66147	Akaike info criterion	9.447742
Sum squared resid	91697.57	Schwarz criterion	9.576866
Log likelihood	-631.7226	Hannan-Quinn criter.	9.500214
F-statistic	35.22853	Durbin-Watson stat	0.173168
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:48
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	241.9929	82.71623	2.925579	0.0042
HC	-7.478531	9.167919	-0.815728	0.4165
SD	-192.4312	93.53805	-2.057250	0.0421
TRA	-0.028602	0.100117	-0.285680	0.7757
GDP	-0.212994	0.269220	-0.791151	0.4306
GDPPC	0.000496	0.001634	0.303403	0.7622

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.940085	Mean dependent var	93.04444
Adjusted R-squared	0.924966	S.D. dependent var	40.23306
S.E. of regression	11.02076	Akaike info criterion	7.819808
Sum squared resid	12995.93	Schwarz criterion	8.422384
Log likelihood	-499.8371	Hannan-Quinn criter.	8.064678
F-statistic	62.18003	Durbin-Watson stat	0.939100
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:49
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	159.6793	22.14147	7.211773	0.0000
HC	0.424506	4.346139	0.097674	0.9223
SD	-138.6185	51.92233	-2.669728	0.0086
TRA	0.019089	0.090790	0.210250	0.8338
GDP	-0.231348	0.250937	-0.921938	0.3583
GDPPC	0.000975	0.001128	0.864418	0.3890

Effects Specification

	S.D.	Rho
Cross-section random	28.96389	0.8708
Idiosyncratic random	11.15789	0.1292

Weighted Statistics

R-squared	0.097729	Mean dependent var	11.85067
Adjusted R-squared	0.062757	S.D. dependent var	11.59433
S.E. of regression	11.22462	Sum squared resid	16252.99
F-statistic	2.794499	Durbin-Watson stat	0.823719
Prob(F-statistic)	0.019756		

Unweighted Statistics

R-squared	0.466938	Mean dependent var	93.04444
Sum squared resid	115624.2	Durbin-Watson stat	0.115788

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 14:16
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	175.7877	7.306932	24.05767	0.0000
SD	-157.7465	13.15153	-11.99454	0.0000

R-squared	0.519628	Mean dependent var	93.04444
Adjusted R-squared	0.516017	S.D. dependent var	40.23306
S.E. of regression	27.98971	Akaike info criterion	9.516255
Sum squared resid	104195.4	Schwarz criterion	9.559296
Log likelihood	-640.3472	Hannan-Quinn criter.	9.533746
F-statistic	143.8690	Durbin-Watson stat	0.132144
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/22/15 Time: 18:51
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	185.3937	46.60171	3.978259	0.0001
SD	-176.0598	88.82614	-1.982072	0.0499

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.939241	Mean dependent var	93.04444
Adjusted R-squared	0.926651	S.D. dependent var	40.23306
S.E. of regression	10.89634	Akaike info criterion	7.774543
Sum squared resid	13179.07	Schwarz criterion	8.291036
Log likelihood	-500.7816	Hannan-Quinn criter.	7.984431
F-statistic	74.60336	Durbin-Watson stat	0.949894
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:52
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	159.2732	19.10261	8.337771	0.0000
SD	-126.2622	33.79203	-3.736450	0.0003

Effects Specification	S.D.	Rho
Cross-section random	27.33589	0.8580
Idiosyncratic random	11.11848	0.1420

Weighted Statistics			
R-squared	0.093885	Mean dependent var	12.50047
Adjusted R-squared	0.087072	S.D. dependent var	11.71265
S.E. of regression	11.19111	Sum squared resid	16657.06
F-statistic	13.78043	Durbin-Watson stat	0.829551
Prob(F-statistic)	0.000301		

Unweighted Statistics			
R-squared	0.498929	Mean dependent var	93.04444
Sum squared resid	108685.2	Durbin-Watson stat	0.127137

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 14:17
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	182.3806	7.670852	23.77580	0.0000
HC	-5.306067	2.182273	-2.431441	0.0164
SD	-107.7850	24.26988	-4.441102	0.0000

R-squared	0.540221	Mean dependent var	93.04444
Adjusted R-squared	0.533254	S.D. dependent var	40.23306
S.E. of regression	27.48675	Akaike info criterion	9.487256
Sum squared resid	99728.79	Schwarz criterion	9.551818
Log likelihood	-637.3898	Hannan-Quinn criter.	9.513492
F-statistic	77.54709	Durbin-Watson stat	0.139504
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 14:45
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	238.1455	77.82561	3.059989	0.0028
HC	-7.256763	8.568335	-0.846928	0.3989
SD	-191.1100	90.69738	-2.107117	0.0374

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.939634	Mean dependent var	93.04444
Adjusted R-squared	0.926463	S.D. dependent var	40.23306
S.E. of regression	10.91025	Akaike info criterion	7.782858
Sum squared resid	13093.68	Schwarz criterion	8.320872
Log likelihood	-500.3429	Hannan-Quinn criter.	8.001492
F-statistic	71.34268	Durbin-Watson stat	0.946848
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:54
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	157.7988	20.63068	7.648744	0.0000
HC	0.614005	4.212744	0.145749	0.8843
SD	-130.6873	49.30860	-2.650395	0.0090

Effects Specification

	S.D.	Rho
Cross-section random	27.68787	0.8619
Idiosyncratic random	11.08254	0.1381

Weighted Statistics

R-squared	0.091290	Mean dependent var	12.30516
Adjusted R-squared	0.077522	S.D. dependent var	11.67655
S.E. of regression	11.21482	Sum squared resid	16601.94
F-statistic	6.630463	Durbin-Watson stat	0.831592
Prob(F-statistic)	0.001803		

Unweighted Statistics

R-squared	0.492065	Mean dependent var	93.04444
Sum squared resid	110173.9	Durbin-Watson stat	0.125311

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 18:12
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	80.62517	11.64268	6.924968	0.0000
SD	-4.383837	22.46110	-0.195175	0.8456
HC	-7.167237	1.821937	-3.933856	0.0001
DEM	5.194440	2.178026	2.384929	0.0186
PF	0.974851	0.259651	3.754473	0.0003
CONN	-0.159734	0.048554	-3.289850	0.0013
GDP	0.755641	0.368634	2.049841	0.0425
GDPPC	0.000247	0.000600	0.411053	0.6817
TRA	-0.113131	0.059707	-1.894763	0.0604

R-squared	0.819581	Mean dependent var	93.04444
Adjusted R-squared	0.808126	S.D. dependent var	40.23306
S.E. of regression	17.62345	Akaike info criterion	8.640679
Sum squared resid	39133.85	Schwarz criterion	8.834364
Log likelihood	-574.2458	Hannan-Quinn criter.	8.719387
F-statistic	71.54694	Durbin-Watson stat	0.464457
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 18:27
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	208.6454	83.79362	2.489991	0.0144
HC	-6.491345	9.454308	-0.686602	0.4939
SD	-191.1697	93.86926	-2.036553	0.0442
DEM	3.177542	2.615325	1.214970	0.2271
CONN	0.022692	0.099308	0.228504	0.8197
PF	0.238203	0.437231	0.544799	0.5871
GDP	-0.100910	0.291456	-0.346227	0.7299
GDPPC	0.000547	0.001648	0.331901	0.7406
TRA	-0.030260	0.102025	-0.296595	0.7674

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.942472	Mean dependent var	93.04444
Adjusted R-squared	0.925878	S.D. dependent var	40.23306
S.E. of regression	10.95363	Akaike info criterion	7.823594
Sum squared resid	12478.12	Schwarz criterion	8.490731
Log likelihood	-497.0926	Hannan-Quinn criter.	8.094700
F-statistic	56.79399	Durbin-Watson stat	0.961998
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 18:56
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	106.7769	19.68396	5.424566	0.0000
SD	-56.17587	37.16619	-1.511478	0.1332
HC	-5.380284	3.059112	-1.758773	0.0810
DEM	3.685800	2.324491	1.585637	0.1153
PF	0.688299	0.307765	2.236443	0.0271
CONN	0.041863	0.045822	0.913592	0.3627
GDP	0.018838	0.254752	0.073948	0.9412
GDPPC	-9.76E-05	0.000954	-0.102252	0.9187
TRA	-0.048691	0.079079	-0.615721	0.5392

Effects Specification

	S.D.	Rho
Cross-section random	13.07596	0.5834
Idiosyncratic random	11.04856	0.4166

Weighted Statistics

R-squared	0.426632	Mean dependent var	25.22463
Adjusted R-squared	0.390228	S.D. dependent var	14.86074
S.E. of regression	11.60444	Sum squared resid	16967.56
F-statistic	11.71926	Durbin-Watson stat	0.809438
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.766073	Mean dependent var	93.04444
Sum squared resid	50740.10	Durbin-Watson stat	0.270677

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 14:16
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	175.7877	7.306932	24.05767	0.0000
SD	-157.7465	13.15153	-11.99454	0.0000

R-squared	0.519628	Mean dependent var	93.04444
Adjusted R-squared	0.516017	S.D. dependent var	40.23306
S.E. of regression	27.98971	Akaike info criterion	9.516255
Sum squared resid	104195.4	Schwarz criterion	9.559296
Log likelihood	-640.3472	Hannan-Quinn criter.	9.533746
F-statistic	143.8690	Durbin-Watson stat	0.132144
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:32
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	94.02329	10.43034	9.014404	0.0000
SD	-89.85564	11.17978	-8.037336	0.0000
DEM	9.911053	2.064545	4.800599	0.0000
PF	0.330608	0.223752	1.477564	0.1419
CONN	-0.165002	0.045297	-3.642641	0.0004

R-squared	0.772500	Mean dependent var	93.04444
Adjusted R-squared	0.765500	S.D. dependent var	40.23306
S.E. of regression	19.48293	Akaike info criterion	8.813289
Sum squared resid	49346.02	Schwarz criterion	8.920891
Log likelihood	-589.8970	Hannan-Quinn criter.	8.857015
F-statistic	110.3572	Durbin-Watson stat	0.317735
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:33
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	158.9631	50.32507	3.158725	0.0021
SD	-174.3650	89.41874	-1.949983	0.0538
DEM	3.580562	2.486165	1.440195	0.1527
PF	0.211309	0.402926	0.524435	0.6011
CONN	0.013453	0.093007	0.144643	0.8853

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.942061	Mean dependent var	93.04444
Adjusted R-squared	0.928113	S.D. dependent var	40.23306
S.E. of regression	10.78721	Akaike info criterion	7.771456
Sum squared resid	12567.30	Schwarz criterion	8.352511
Log likelihood	-497.5733	Hannan-Quinn criter.	8.007580
F-statistic	67.53958	Durbin-Watson stat	0.976890
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 19:04
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	109.4060	21.16552	5.169064	0.0000
SD	-115.8675	26.30758	-4.404338	0.0000
DEM	4.165186	2.296280	1.813884	0.0720
PF	0.490510	0.302569	1.621149	0.1074
CONN	0.044737	0.039676	1.127551	0.2616

Effects Specification

	S.D.	Rho
Cross-section random	17.29772	0.7162
Idiosyncratic random	10.88828	0.2838

Weighted Statistics

R-squared	0.315495	Mean dependent var	19.10664
Adjusted R-squared	0.294433	S.D. dependent var	13.17479
S.E. of regression	11.06656	Sum squared resid	15920.94
F-statistic	14.97958	Durbin-Watson stat	0.845060
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.715645	Mean dependent var	93.04444
Sum squared resid	61678.23	Durbin-Watson stat	0.218134

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:35
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	171.3092	8.619472	19.87467	0.0000
SD	-152.0094	14.62837	-10.39141	0.0000
GDP	0.974029	0.527736	1.845674	0.0672
GDPPC	-0.001534	0.000709	-2.162621	0.0324
TRA	0.016806	0.081052	0.207353	0.8361

R-squared	0.547747	Mean dependent var	93.04444
Adjusted R-squared	0.533831	S.D. dependent var	40.23306
S.E. of regression	27.46974	Akaike info criterion	9.500381
Sum squared resid	98096.28	Schwarz criterion	9.607984
Log likelihood	-636.2757	Hannan-Quinn criter.	9.544108
F-statistic	39.36243	Durbin-Watson stat	0.180956
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:36
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	186.7476	47.41628	3.938471	0.0001
SD	-174.1210	90.66411	-1.920506	0.0574
GDP	-0.241521	0.266525	-0.906184	0.3669
GDPPC	0.000104	0.001560	0.066893	0.9468
TRA	-0.018244	0.099155	-0.183999	0.8544

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.939712	Mean dependent var	93.04444
Adjusted R-squared	0.925199	S.D. dependent var	40.23306
S.E. of regression	11.00368	Akaike info criterion	7.811193
Sum squared resid	13076.75	Schwarz criterion	8.392248
Log likelihood	-500.2555	Hannan-Quinn criter.	8.047317
F-statistic	64.74656	Durbin-Watson stat	0.942595
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/15 Time: 19:02
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	161.4086	19.77374	8.162776	0.0000
SD	-136.6863	36.15050	-3.781033	0.0002
GDP	-0.229639	0.250872	-0.915367	0.3617
GDPPC	0.000936	0.001107	0.845616	0.3993
TRA	0.019066	0.089955	0.211953	0.8325

Effects Specification

	S.D.	Rho
Cross-section random	27.57192	0.8591
Idiosyncratic random	11.16464	0.1409

Weighted Statistics

R-squared	0.105175	Mean dependent var	12.44590
Adjusted R-squared	0.077642	S.D. dependent var	11.70251
S.E. of regression	11.23903	Sum squared resid	16421.06
F-statistic	3.819953	Durbin-Watson stat	0.815798
Prob(F-statistic)	0.005716		

Unweighted Statistics

R-squared	0.473824	Mean dependent var	93.04444
Sum squared resid	114130.7	Durbin-Watson stat	0.117377

APPENDIX C

Eviews Test Results - Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.169996	2	0.0754

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
HC	7.448756	0.614005	13.544501	0.0633
SD	-70.845269	-130.687282	3100.109569	0.2825

Cross-section random effects test equation:
Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 19:45
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	84.16080	39.77937	2.115690	0.0365
HC	7.448756	5.593899	1.331586	0.1856
SD	-70.84527	74.37370	-0.952558	0.3428

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.933183	Mean dependent var	93.04444
Adjusted R-squared	0.924123	S.D. dependent var	40.23306
S.E. of regression	11.08254	Akaike info criterion	7.765880
Sum squared resid	14493.08	Schwarz criterion	8.131730
Log likelihood	-507.1969	Hannan-Quinn criter.	7.914551
F-statistic	103.0004	Durbin-Watson stat	0.965504
Prob(F-statistic)	0.000000		

We run the Hausman test to choose the appropriate estimation method.

The generally accepted way of choosing between a fixed and a random effect model is running a Hausman test. The Hausman test tests the null hypothesis if the coefficients of the random effects model are the same as the ones of fixed effects model. If they are and therefore have an insignificant p-value, then it is safe to use random-effect models. The Hausman test conducted for

the model in this study however shows insignificant p- value (> 5%) and therefore suggests the use of random effect. Thus in this context to estimate the coefficients, a panel data analysis with random effect models is also conducted.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.769110	2	0.0559

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
HC	0.088280	0.010222	0.001519	0.0452
SD	-1.026937	-1.669009	0.349741	0.2776

Cross-section random effects test equation:
Dependent Variable: LNCORRTI
Method: Panel Least Squares
Date: 12/22/15 Time: 15:32
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.423484	0.425694	10.39122	0.0000
HC	0.088280	0.059862	1.474713	0.1430
SD	-1.026937	0.795901	-1.290281	0.1995

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.944003	Mean dependent var	4.430522
Adjusted R-squared	0.936410	S.D. dependent var	0.470311
S.E. of regression	0.118598	Akaike info criterion	-1.308884
Sum squared resid	1.659741	Schwarz criterion	-0.943035
Log likelihood	105.3497	Hannan-Quinn criter.	-1.160213
F-statistic	124.3285	Durbin-Watson stat	0.965581
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/18/15 Time: 21:04
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	238.1455	77.82561	3.059989	0.0028
HC	-7.256763	8.568335	-0.846928	0.3989
SD	-191.1100	90.69738	-2.107117	0.0374

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.939634	Mean dependent var	93.04444
Adjusted R-squared	0.926463	S.D. dependent var	40.23306
S.E. of regression	10.91025	Akaike info criterion	7.782858
Sum squared resid	13093.68	Schwarz criterion	8.320872
Log likelihood	-500.3429	Hannan-Quinn criter.	8.001492
F-statistic	71.34268	Durbin-Watson stat	0.946848
Prob(F-statistic)	0.000000		

Dependent Variable: CORRTI
Method: Panel EGLS (Cross-section random effects)
Date: 12/18/15 Time: 21:05
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	157.7988	20.63068	7.648744	0.0000
HC	0.614005	4.212744	0.145749	0.8843
SD	-130.6873	49.30860	-2.650395	0.0090

Effects Specification

	S.D.	Rho
Cross-section random	27.68787	0.8619
Idiosyncratic random	11.08254	0.1381

Weighted Statistics

R-squared	0.091290	Mean dependent var	12.30516
Adjusted R-squared	0.077522	S.D. dependent var	11.67655
S.E. of regression	11.21482	Sum squared resid	16601.94
F-statistic	6.630463	Durbin-Watson stat	0.831592
Prob(F-statistic)	0.001803		

Unweighted Statistics

R-squared	0.492065	Mean dependent var	93.04444
Sum squared resid	110173.9	Durbin-Watson stat	0.125311

APPENDIX D

Eviews Test Results Panel Unit Root - Stationarity

Panel unit root test: Summary
Series: CORRTI
Date: 12/19/15 Time: 19:24
Sample: 2005 2013
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

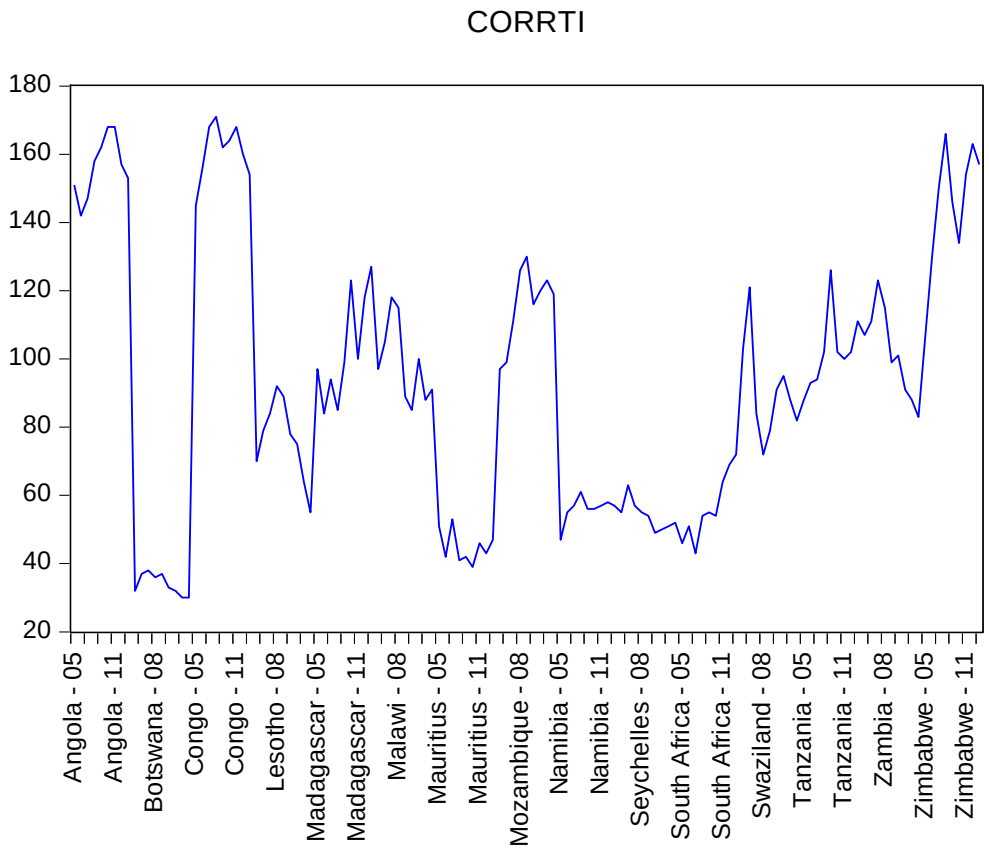
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-10.3759	0.0000	15	114
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.70952	0.0034	15	114
ADF - Fisher Chi-square	61.5508	0.0006	15	114
PP - Fisher Chi-square	60.2536	0.0009	15	120

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ho = CORR has unit root

H_1 = CORR does not have unit

If P value (0%) is less than 5% Ho is rejected that is corruption (CORR) does not have unit the data is stationary



Panel unit root test: Summary
Series: HC
Date: 12/19/15 Time: 19:35
Sample: 2005 2013
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

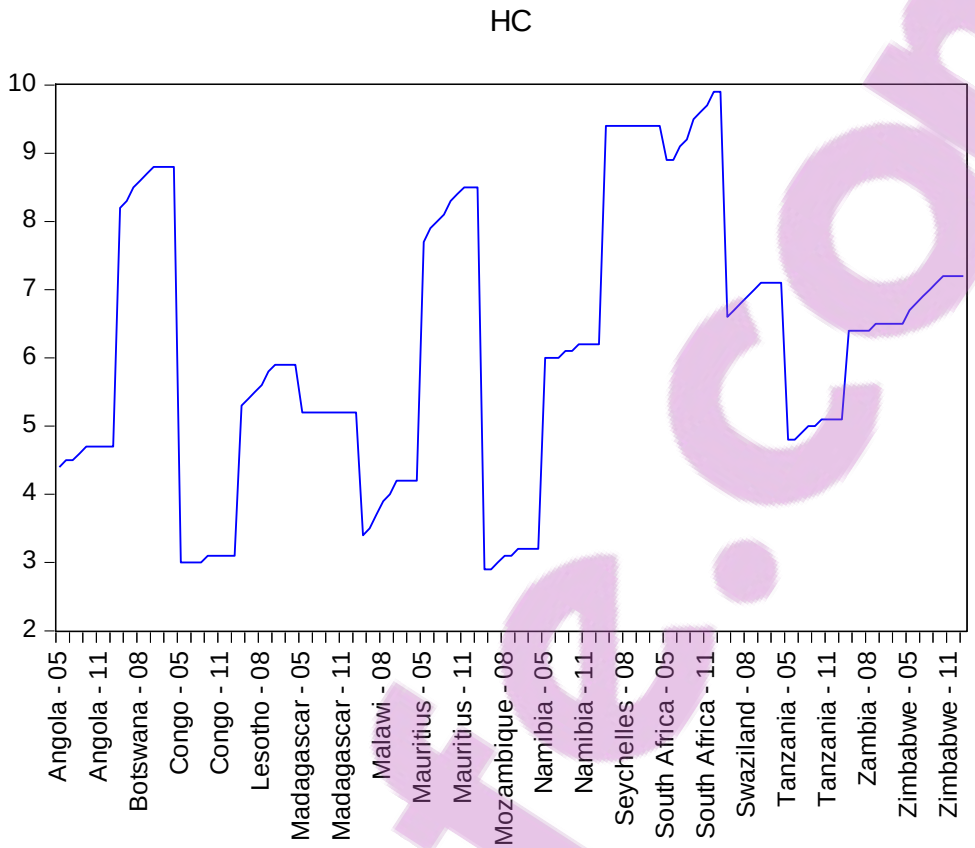
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.58559	0.0000	13	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.60493	0.2726	13	102
ADF - Fisher Chi-square	29.5442	0.2869	13	102
PP - Fisher Chi-square	45.9151	0.0093	13	104

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ho = HC has unit root

H_1 = HC does not have unit

If P value (0%) is less than 5% Ho is rejected that is human capital (HC) does not have unit the data is stationary



Panel unit root test: Summary
Series: SD
Date: 12/19/15 Time: 19:38
Sample: 2005 2013
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

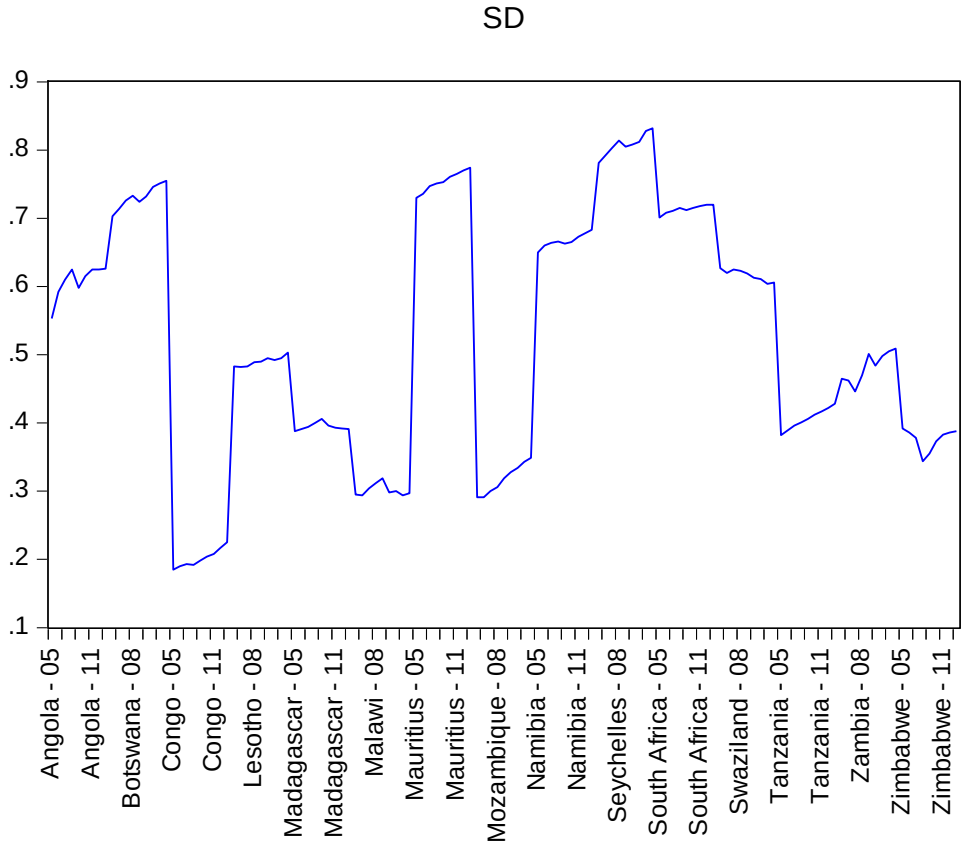
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.16149	0.0153	15	118
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.11864	0.8684	15	118
ADF - Fisher Chi-square	24.3689	0.7551	15	118
PP - Fisher Chi-square	38.4225	0.1392	15	120

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Ho = SD has unit root

H_1 = SD does not have unit

If P value (0%) is less than 5% Ho is rejected that is social development (SD) does not have unit the data is stationary



APPENDIX E

Eviews Test Results - Autocorrelation

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 02/04/16 Time: 13:55
Sample (adjusted): 2006 2013
Periods included: 8
Cross-sections included: 15
Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.29317	8.154944	2.120575	0.0362
CORRTI (-1)	0.826170	0.053788	15.35988	0.0000
SD	-6.041813	12.83878	-0.470591	0.6389
HC	-0.815660	1.121362	-0.727384	0.4685
DEM	1.187344	1.281398	0.926600	0.3562
PF	0.186473	0.160040	1.165162	0.2465
CONN	-0.077539	0.030273	-2.561352	0.0118
TRA	-0.025651	0.036048	-0.711560	0.4782
GDP	-0.200504	0.227272	-0.882219	0.3796
GDPPC	0.000306	0.000351	0.873346	0.3844

R-squared	0.945644	Mean dependent var	93.90000
Adjusted R-squared	0.941197	S.D. dependent var	40.83095
S.E. of regression	9.901253	Akaike info criterion	7.502855
Sum squared resid	10783.83	Schwarz criterion	7.735146
Log likelihood	-440.1713	Hannan-Quinn criter.	7.597189
F-statistic	212.6331	Durbin-Watson stat	2.072365
Prob(F-statistic)	0.000000		

Residual Cross-Section Dependence Test
Null hypothesis: No cross-section dependence (correlation) in residuals
Equation: Untitled
Periods included: 8
Cross-sections included: 15
Total panel observations: 120
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	124.7907	105	0.0912
Pesaran scaled LM	1.365691		0.1720
Pesaran CD	0.311271		0.7556

P greater than 5 in all 3 cases.
Meaning we cannot reject Ho
meaning model is free from
correlation

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 02/04/16 Time: 17:22
Sample (adjusted): 2006 2013
Periods included: 8
Cross-sections included: 15
Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LAG1CORRTI	0.885162	0.046755	18.93211	0.0000
SD	-0.767510	12.79242	-0.059997	0.9523
HC	-0.096019	1.085482	-0.088458	0.9297
DEM	0.330151	1.234974	0.267334	0.7897
PF	0.290676	0.154690	1.879088	0.0629
CONN	-0.086657	0.030434	-2.847381	0.0053
TRA	-0.011665	0.035994	-0.324093	0.7465
GDP	-0.141761	0.229103	-0.618762	0.5373
GDPPC	0.000632	0.000320	1.974433	0.0508

R-squared	0.943422	Mean dependent var	93.90000
Adjusted R-squared	0.939344	S.D. dependent var	40.83095
S.E. of regression	10.05600	Akaike info criterion	7.526255
Sum squared resid	11224.68	Schwarz criterion	7.735317
Log likelihood	-442.5753	Hannan-Quinn criter.	7.611156
Durbin-Watson stat	2.096345		

APPENDICE F

Eviews Test Results - Granger Causality in VAR environment

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 12/19/15 Time: 16:04
Sample: 2005 2013
Included observations: 105

Dependent variable: CORRTI

Excluded	Chi-sq	df	Prob.
HC	0.602775	2	0.7398
SD	1.884055	2	0.3898
All	3.963878	4	0.4109

Dependent variable: HC

Excluded	Chi-sq	df	Prob.
CORRTI	4.404364	2	0.1106
SD	0.922434	2	0.6305
All	4.607438	4	0.3300

Dependent variable: SD

Excluded	Chi-sq	df	Prob.
CORRTI	0.482009	2	0.7858
HC	0.573679	2	0.7506
All	1.055236	4	0.9013

Null hypothesis is: HC (lag1 & lag2) cannot cause CORR

Alternative hypothesis: HC (lag1 & lag2) can cause CORR

Dependent Variable: CORR

- P value is more than 5% (73.98%) so we cannot reject Ho that is HC cannot cause CORR
- P value is more than 5% (38.98%) so we cannot reject Ho that is SD cannot cause CORR

Dependent Variable HC

- P value is more than 5% (11%) so we cannot reject Ho that is CORR cannot cause HC
- P value is more than 5% (63%) so we cannot reject Ho that is SD cannot cause HC

Dependent Variable SD

- P value is more than 5% (78%) so we cannot reject Ho that is CORR cannot cause SD
- P value is more than 5% (75%) so we cannot reject Ho that is HC cannot cause SD

WALD TEST

Vector Autoregression Estimates
Dâte: 12/19/15 Time: 16:24
Sample (adjusted): 2007 2013
Included observations: 105 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	CORRTI	HC	SD
CORRTI(-1)	0.962487	0.000792	-5.82E-05
	(0.09906)	(0.00059)	(8.7E-05)
	[9.71651]	[1.35076]	[-0.67281]
CORRTI(-2)	-0.021345	-0.001108	6.03E-05
	(0.10044)	(0.00059)	(8.8E-05)
	[-0.21251]	[-1.86265]	[0.68713]
HC(-1)	11.80900	1.419543	-0.008067
	(15.2171)	(0.09009)	(0.01329)
	[0.77604]	[15.7563]	[-0.60683]
HC(-2)	-11.86692	-0.418912	0.007702
	(15.2938)	(0.09055)	(0.01336)
	[-0.77593]	[-4.62641]	[0.57646]
SD(-1)	90.34497	0.539239	1.036140
	(109.300)	(0.64712)	(0.09548)
	[0.82658]	[0.83329]	[10.8517]
SD(-2)	-103.8928	-0.577880	-0.032445
	(111.199)	(0.65836)	(0.09714)
	[-0.93429]	[-0.87775]	[-0.33400]
C	12.10361	0.068818	0.004123
	(7.94234)	(0.04702)	(0.00694)
	[1.52393]	[1.46350]	[0.59420]
R-squared	0.940625	0.999151	0.997711
Adj. R-squared	0.936990	0.999099	0.997571
Sum sq. resids	10638.03	0.372896	0.008118
S.E. equation	10.41880	0.061685	0.009102
F-statistic	258.7554	19228.29	7120.082
Log likelihood	-391.4456	147.1333	348.0610
Akaike AIC	7.589440	-2.669207	-6.496399
Schwarz SC	7.766371	-2.492276	-6.319469
Mean dependent	94.28571	6.246667	0.528371
S.D. dependent	41.50619	2.055390	0.184678

Determinant resid covariance (dof adj.)	3.18E-05
Determinant resid covariance	2.58E-05
Log likelihood	107.6377
Akaike information criterion	-1.650243
Schwarz criterion	-1.119451

CORRTI = C(1)*CORRTI(-1) + C(2)*CORRTI(-2) + C(3)*HC(-1) + C(4)*HC(-2) + C(5)*SD(-1) + C(6)*SD(-2) + C(7)

HC = C(8)*CORRTI(-1) + C(9)*CORRTI(-2) + C(10)*HC(-1) + C(11)*HC(-2) + C(12)*SD(-1) + C(13)*SD(-2) + C(14)

SD = C(15)*CORRTI(-1) + C(16)*CORRTI(-2) + C(17)*HC(-1) + C(18)*HC(-2) + C(19)*SD(-1) + C(20)*SD(-2) + C(21)

System: UNTITLED
Estimation Method: Least Squares
Date: 12/19/15 Time: 16:25
Sample: 2007 2013
Included observations: 105
Total system (balanced) observations 315

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.962487	0.099057	9.716508	0.0000
C(2)	-0.021345	0.100443	-0.212508	0.8319
C(3)	11.80900	15.21705	0.776037	0.4384
C(4)	-11.86692	15.29383	-0.775929	0.4384
C(5)	90.34497	109.3003	0.826576	0.4091
C(6)	-103.8928	111.1992	-0.934294	0.3509
C(7)	12.10361	7.942343	1.523935	0.1286
C(8)	0.000792	0.000586	1.350758	0.1778
C(9)	-0.001108	0.000595	-1.862652	0.0635
C(10)	1.419543	0.090094	15.75632	0.0000
C(11)	-0.418912	0.090548	-4.626406	0.0000
C(12)	0.539239	0.647119	0.833291	0.4054
C(13)	-0.577880	0.658362	-0.877755	0.3808
C(14)	0.068818	0.047023	1.463501	0.1444
C(15)	-5.82E-05	8.65E-05	-0.672810	0.5016
C(16)	6.03E-05	8.77E-05	0.687135	0.4925
C(17)	-0.008067	0.013293	-0.606829	0.5444
C(18)	0.007702	0.013360	0.576461	0.5647
C(19)	1.036140	0.095482	10.85172	0.0000
C(20)	-0.032445	0.097140	-0.334005	0.7386
C(21)	0.004123	0.006938	0.594201	0.5528

Determinant residual covariance	2.58E-05

Equation: CORRTI = C(1)*CORRTI(-1) + C(2)*CORRTI(-2) + C(3)*HC(-1) + C(4)*HC(-2) + C(5)*SD(-1) + C(6)*SD(-2) + C(7)
Observations: 105

R-squared	0.940625	Mean dependent var	94.28571
Adjusted R-squared	0.936990	S.D. dependent var	41.50619
S.E. of regression	10.41880	Sum squared resid	10638.03
Durbin-Watson stat	1.940877		

Equation: HC = C(8)*CORRTI(-1) + C(9)*CORRTI(-2) + C(10)*HC(-1) + C(11)*HC(-2) + C(12)*SD(-1) + C(13)*SD(-2) + C(14)
Observations: 105

R-squared	0.999151	Mean dependent var	6.246666
Adjusted R-squared	0.999099	S.D. dependent var	2.055390
S.E. of regression	0.061685	Sum squared resid	0.372896
Durbin-Watson stat	2.288597		

Equation: SD = C(15)*CORRTI(-1) + C(16)*CORRTI(-2) + C(17)*HC(-1) + C(18)*HC(-2) + C(19)*SD(-1) + C(20)*SD(-2) + C(21)
Observations: 105

R-squared	0.997711	Mean dependent var	0.528371
Adjusted R-squared	0.997571	S.D. dependent var	0.184678
S.E. of regression	0.009102	Sum squared resid	0.008118
Durbin-Watson stat	2.362202		

WALD TEST

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	0.602775	2	0.7398

Null Hypothesis: C(3)=C(4)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	11.80900	15.21705
C(4)	-11.86692	15.29383

Restrictions are linear in coefficients.

Ho = HC lag1 and HC lag2 cannot cause CORR that is C(3) +C(4) = 0

P value is more than 5% (73.9%) that is we accept null hypothesis meaning that HC (-1) and HC (-2) jointly cannot cause CORR. We cannot reject Ho meaning that HC cannot granger cause CORR

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	1.884055	2	0.3898

Null Hypothesis: C(5) =C(6)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(5)	90.34497	109.3003
C(6)	-103.8928	111.1992

Restrictions are linear in coefficients.

Ho = CORR lag1 and CORR lag2 cannot cause that is C(5) +C(6) = 0

P value is more than 5% (38.9%) that is we accept null hypothesis meaning that SD (-1) +SD (-2) jointly cannot cause CORR. We cannot reject Ho meaning that SD cannot granger cause CORR

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	4.404364	2	0.1106

Null Hypothesis: C(8)=C(9)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(8)	0.000792	0.000586
C(9)	-0.001108	0.000595

Restrictions are linear in coefficients.

Ho = CORR lag1 and CORR lag2 cannot cause jointly HC that is C(8) +C(9) = 0

P value is more than 5% (11,6%) that is we accept null hypothesis meaning that CORR (-1) +CORR (-2) jointly cannot cause HC. We cannot reject Ho meaning that is CORR cannot granger cause HC

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	0.922434	2	0.6305

Null Hypothesis: C(12)=C(13)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(12)	0.539239	0.647119
C(13)	-0.577880	0.658362

Restrictions are linear in coefficients.

Ho = SD lag1 and SD lag2 cannot cause jointly HC that is C(12) +C(13) = 0

P value is more than 5% (63%) that is we accept null hypothesis meaning that SD (-1) + SD(-2) jointly cannot cause HC. We cannot reject Ho meaning that is SD cannot granger cause HC

Wald Test:
System: {%system}

Test Statistic	Value	df	Probability
Chi-square	0.482009	2	0.7858

Null Hypothesis: C(15)=C(16)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(15)	-5.82E-05	8.65E-05
C(16)	6.03E-05	8.77E-05

Restrictions are linear in coefficients.

Ho = CORR lag1 and CORR lag2 cannot cause jointly SD that is C(15) +C(16) = 0

P value is more than 5% (78%) that is we accept null hypothesis meaning that CORR (-1) + CORR(-2) jointly cannot cause SD. We cannot reject Ho meaning that is CORR cannot granger cause S

Pairwise Granger Causality Tests
Date: 01/19/16 Time: 17:06
Sample: 2005 2013
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
HC does not Granger Cause CORRTI	90	1.12168	0.3451
CORRTI does not Granger Cause HC		1.04546	0.3769

Pairwise Granger Causality Tests
Date: 01/19/16 Time: 17:10
Sample: 2005 2013
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
SD does not Granger Cause CORRTI	90	0.26552	0.8501
CORRTI does not Granger Cause SD		0.11967	0.9483

Based on the probability values reported in the above tables (way over 5%) the hypothesis that human capital (HC) does not Granger cause corruption (CORR/TI) or its opposite i.e. corruption (CORR/TI) does not cause human capital (HC) cannot be rejected therefore no causality runs from one variable to the other and vice versa.

APPENDICE G

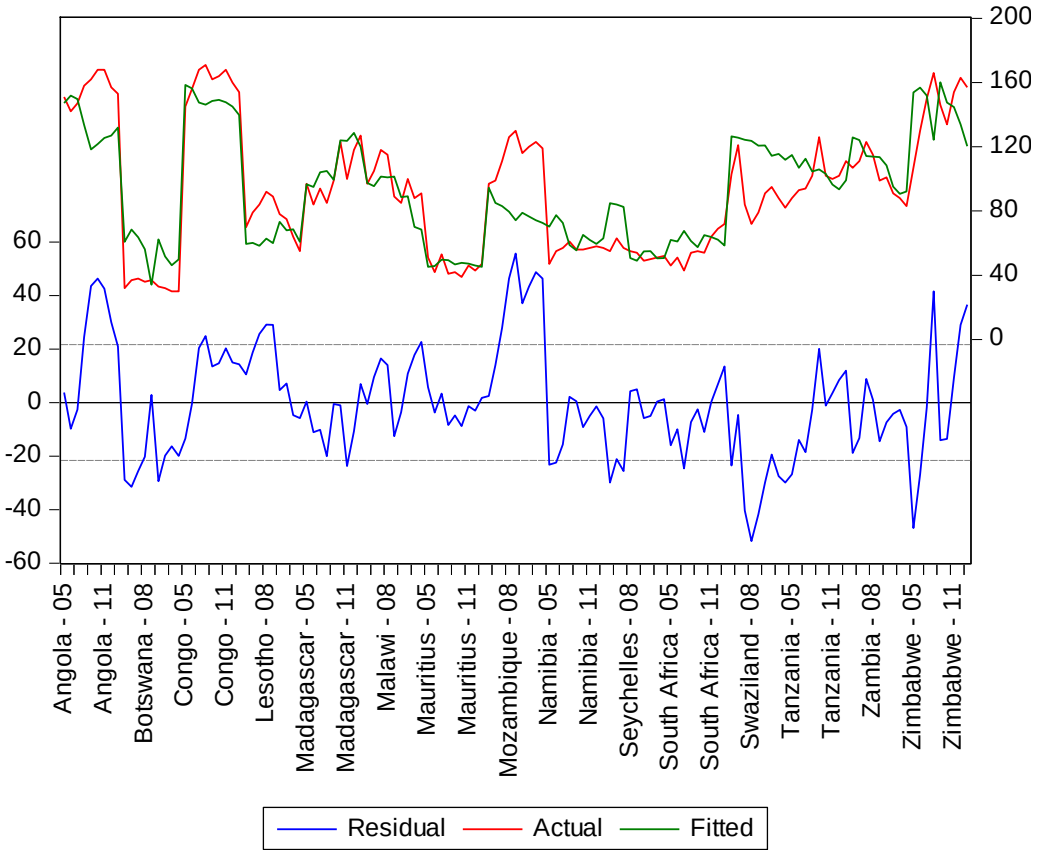
Eviews Test Results - Residuals

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/21/15 Time: 16:07
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.71042	10.48942	1.783741	0.0768
DEM	7.259284	2.437332	2.978373	0.0035
PF	1.205464	0.276545	4.359018	0.0000
CONN	-0.280788	0.056630	-4.958304	0.0000
TRA	-0.186094	0.062870	-2.959977	0.0037
GDP	1.490427	0.417165	3.572752	0.0005
GDPPC	0.001379	0.000706	1.954016	0.0529

R-squared	0.723314	Mean dependent var	93.04444
Adjusted R-squared	0.710344	S.D. dependent var	40.23306
S.E. of regression	21.65330	Akaike info criterion	9.038652
Sum squared resid	60014.78	Schwarz criterion	9.189296
Log likelihood	-603.1090	Hannan-Quinn criter.	9.099870
F-statistic	55.76971	Durbin-Watson stat	0.436212
Prob(F-statistic)	0.000000		

Residuals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80
40
0
60
40
20
0
-20
-40
-60
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Angola - 11
Botswana - 08
Congo - 05
Congo - 11
Lesotho - 08
Madagascar - 05
Madagascar - 11
Malawi - 08
Mauritius - 05
Mauritius - 11
Mozambique - 08
Namibia - 05
Namibia - 11
Seychelles - 08
South Africa - 05
South Africa - 11
Swaziland - 08
Tanzania - 05
Tanzania - 11
Zambia - 08
Zimbabwe - 05
Zimbabwe - 11
Residual
Actual
Fitted

Dependent Variable: ERRCORRTI
Method: Panel Least Squares
Date: 12/21/15 Time: 16:14
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30.80482	5.119576	6.017064	0.0000
HC	-4.983403	0.786599	-6.335380	0.0000

R-squared	0.231822	Mean dependent var	-2.59E-14
Adjusted R-squared	0.226047	S.D. dependent var	21.16297
S.E. of regression	18.61805	Akaike info criterion	8.700844
Sum squared resid	46102.01	Schwarz criterion	8.743885
Log likelihood	-585.3070	Hannan-Quinn criter.	8.718334
F-statistic	40.13704	Durbin-Watson stat	0.569806
Prob(F-statistic)	0.000000		

Low R2

Dependent Variable: ERRCORRTI
Method: Panel Least Squares
Date: 12/21/15 Time: 16:17
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.01632	5.126759	4.489449	0.0000
SD	-43.87961	9.227498	-4.755310	0.0000

R-squared	0.145315	Mean dependent var	-2.59E-14
Adjusted R-squared	0.138889	S.D. dependent var	21.16297
S.E. of regression	19.63840	Akaike info criterion	8.807555
Sum squared resid	51293.70	Schwarz criterion	8.850596
Log likelihood	-592.5100	Hannan-Quinn criter.	8.825046
F-statistic	22.61297	Durbin-Watson stat	0.503797
Prob(F-statistic)	0.000005		

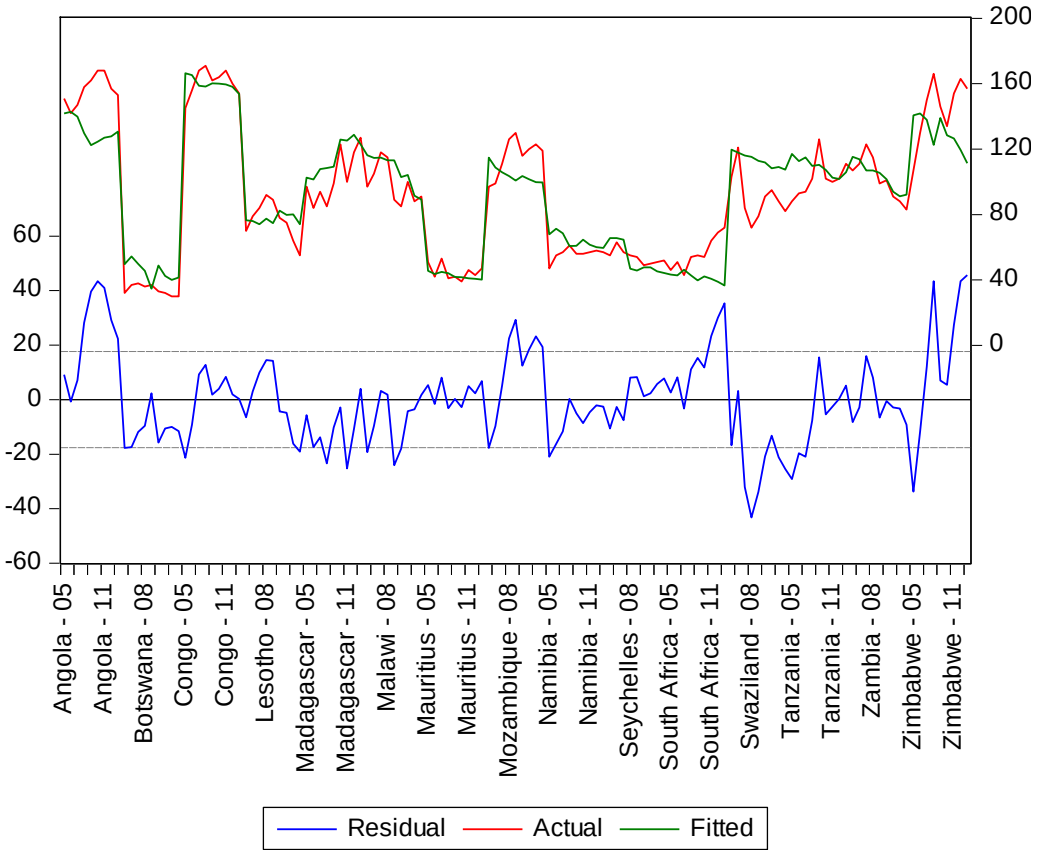
Low R2

Dependent Variable: CORRTI
Method: Panel Least Squares
Date: 12/21/15 Time: 16:24
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	80.62517	11.64268	6.924968	0.0000
SD	-4.383837	22.46110	-0.195175	0.8456
HC	-7.167237	1.821937	-3.933856	0.0001
DEM	5.194440	2.178026	2.384929	0.0186
PF	0.974851	0.259651	3.754473	0.0003
CONN	-0.159734	0.048554	-3.289850	0.0013
TRA	-0.113131	0.059707	-1.894763	0.0604
GDP	0.755641	0.368634	2.049841	0.0425
GDPPC	0.000247	0.000600	0.411053	0.6817

R-squared	0.819581	Mean dependent var	93.04444
Adjusted R-squared	0.808126	S.D. dependent var	40.23306
S.E. of regression	17.62345	Akaike info criterion	8.640679
Sum squared resid	39133.85	Schwarz criterion	8.834364
Log likelihood	-574.2458	Hannan-Quinn criter.	8.719387
F-statistic	71.54694	Durbin-Watson stat	0.464457
Prob(F-statistic)	0.000000		

RESIDUALS CORRTI (ALL)



CORRCCI

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/21/15 Time: 17:08
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.132166	0.165028	6.860469	0.0000
DEM	-0.067304	0.038346	-1.755180	0.0816
PF	-0.027443	0.004351	-6.307599	0.0000
CONN	0.005325	0.000891	5.976486	0.0000
TRA	0.003155	0.000989	3.189341	0.0018
GDP	-0.025137	0.006563	-3.830093	0.0002
GDPPC	-3.31E-05	1.11E-05	-2.981316	0.0034

R-squared	0.760367	Mean dependent var	-0.294577
Adjusted R-squared	0.749134	S.D. dependent var	0.680155
S.E. of regression	0.340666	Akaike info criterion	0.734631
Sum squared resid	14.85483	Schwarz criterion	0.885275
Log likelihood	-42.58760	Hannan-Quinn criter.	0.795849
F-statistic	67.69151	Durbin-Watson stat	0.272578
Prob(F-statistic)	0.000000		

Dependent Variable: ERRCORRCCI
Method: Panel Least Squares
Date: 12/21/15 Time: 17:11
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.382081	0.085020	-4.493989	0.0000
HC	0.061811	0.013063	4.731731	0.0000

R-squared	0.144085	Mean dependent var	1.44E-16
Adjusted R-squared	0.137650	S.D. dependent var	0.332952
S.E. of regression	0.309188	Akaike info criterion	0.504973
Sum squared resid	12.71447	Schwarz criterion	0.548014
Log likelihood	-32.08566	Hannan-Quinn criter.	0.522463
F-statistic	22.38928	Durbin-Watson stat	0.320013
Prob(F-statistic)	0.000006		

Low R2

Dependent Variable: ERRCORRCCI
Method: Panel Least Squares
Date: 12/21/15 Time: 17:13
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.294440	0.082949	-3.549661	0.0005
SD	0.561337	0.149297	3.759868	0.0003

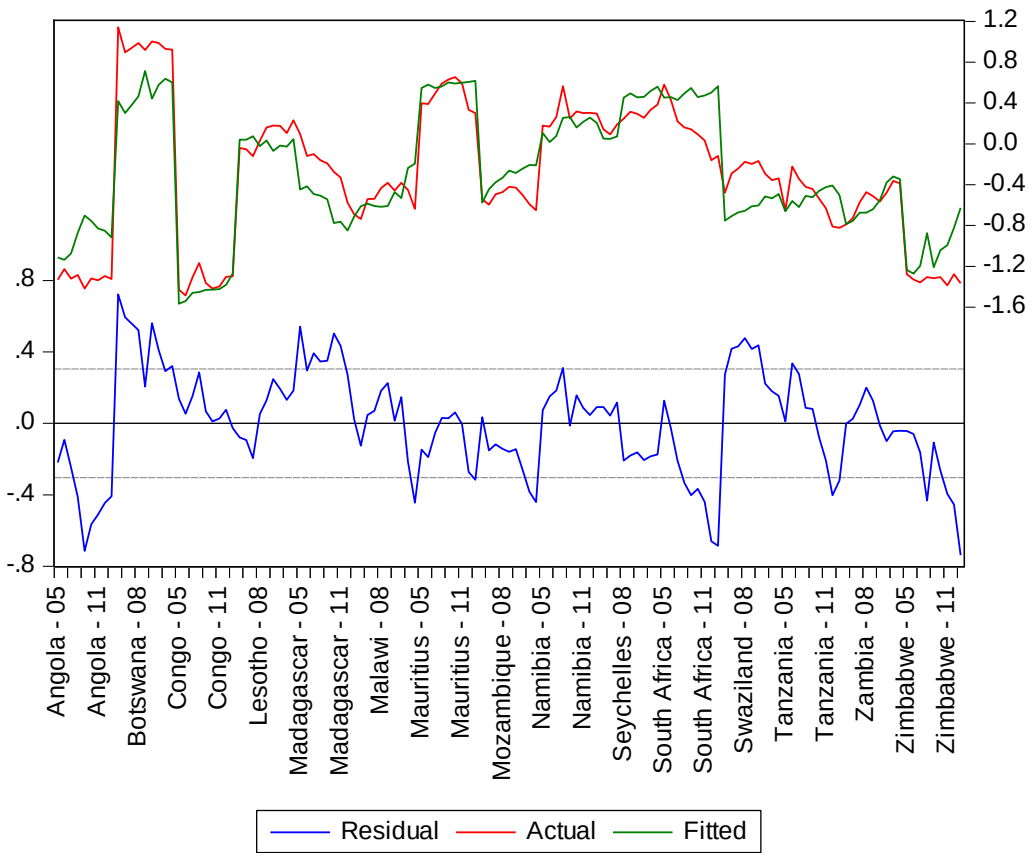
R-squared	0.096078	Mean dependent var	1.44E-16
Adjusted R-squared	0.089282	S.D. dependent var	0.332952
S.E. of regression	0.317741	Akaike info criterion	0.559545
Sum squared resid	13.42761	Schwarz criterion	0.602586
Log likelihood	-35.76926	Hannan-Quinn criter.	0.577035
F-statistic	14.13661	Durbin-Watson stat	0.298853
Prob(F-statistic)	0.000254		

Low R2

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/21/15 Time: 17:17
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.349917	0.200660	1.743831	0.0836
HC	0.080069	0.031401	2.549917	0.0120
SD	0.180083	0.387114	0.465195	0.6426
DEM	-0.046490	0.037538	-1.238471	0.2178
PF	-0.023872	0.004475	-5.334489	0.0000
CONN	0.003843	0.000837	4.592472	0.0000
TRA	0.002084	0.001029	2.024866	0.0450
GDP	-0.016639	0.006353	-2.618993	0.0099
GDPPC	-1.96E-05	1.03E-05	-1.897914	0.0600

R-squared	0.812480	Mean dependent var	-0.294577
Adjusted R-squared	0.800574	S.D. dependent var	0.680155
S.E. of regression	0.303738	Akaike info criterion	0.519036
Sum squared resid	11.62433	Schwarz criterion	0.712721
Log likelihood	-26.03495	Hannan-Quinn criter.	0.597744
F-statistic	68.24098	Durbin-Watson stat	0.231317
Prob(F-statistic)	0.000000		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.4
.0
-.4
-.8
Angola - 05
Angola - 11
Botswana - 08
Congo - 05
Congo - 11
Lesotho - 08
Madagascar - 05
Madagascar - 11
Malawi - 08
Mauritius - 05
Mauritius - 11
Mozambique - 08
Namibia - 05
Namibia - 11
Seychelles - 08
South Africa - 05
South Africa - 11
Swaziland - 08
Tanzania - 05
Tanzania - 11
Zambia - 08
Zimbabwe - 05
Zimbabwe - 11
Residual
Actual
Fitted

APPENDIX H

Eviews Test Results - Robustness Check

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:56
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.587432	0.145980	-10.87427	0.0000
HC	0.209150	0.022429	9.324871	0.0000

R-squared	0.395326	Mean dependent var	-0.294577
Adjusted R-squared	0.390780	S.D. dependent var	0.680155
S.E. of regression	0.530878	Akaike info criterion	1.586136
Sum squared resid	37.48362	Schwarz criterion	1.629177
Log likelihood	-105.0642	Hannan-Quinn criter.	1.603627
F-statistic	86.95322	Durbin-Watson stat	0.043690
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 16:57
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.581211	0.636575	0.913028	0.3632
HC	-0.141679	0.102964	-1.376007	0.1716

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.967993	Mean dependent var	-0.294577
Adjusted R-squared	0.961360	S.D. dependent var	0.680155
S.E. of regression	0.133698	Akaike info criterion	-1.026659
Sum squared resid	1.984136	Schwarz criterion	-0.510165
Log likelihood	93.29945	Hannan-Quinn criter.	-0.816770
F-statistic	145.9539	Durbin-Watson stat	0.717881
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:00
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.701776	0.136807	-12.43920	0.0000
HC	0.047794	0.038920	1.228009	0.2216
SD	2.119519	0.432846	4.896701	0.0000

R-squared	0.488280	Mean dependent var	-0.294577
Adjusted R-squared	0.480526	S.D. dependent var	0.680155
S.E. of regression	0.490218	Akaike info criterion	1.434040
Sum squared resid	31.72145	Schwarz criterion	1.498601
Log likelihood	-93.79768	Hannan-Quinn criter.	1.460276
F-statistic	62.97667	Durbin-Watson stat	0.050760
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:01
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.433339	0.949177	-0.456542	0.6489
HC	-0.112289	0.104501	-1.074522	0.2849
SD	1.587837	1.106164	1.435444	0.1540

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.968581	Mean dependent var	-0.294577
Adjusted R-squared	0.961726	S.D. dependent var	0.680155
S.E. of regression	0.133064	Akaike info criterion	-1.030402
Sum squared resid	1.947653	Schwarz criterion	-0.492388
Log likelihood	94.55215	Hannan-Quinn criter.	-0.811768
F-statistic	141.2947	Durbin-Watson stat	0.723609
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:03
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.097648	0.147277	0.663024	0.5085
HC	0.118010	0.015227	7.750232	0.0000
DEM	-0.061890	0.034860	-1.775395	0.0782
PF	-0.020052	0.003538	-5.667708	0.0000
CONN	0.003482	0.000732	4.754880	0.0000

R-squared	0.785373	Mean dependent var	-0.294577
Adjusted R-squared	0.778769	S.D. dependent var	0.680155
S.E. of regression	0.319912	Akaike info criterion	0.594791
Sum squared resid	13.30466	Schwarz criterion	0.702394
Log likelihood	-35.14838	Hannan-Quinn criter.	0.638518
F-statistic	118.9257	Durbin-Watson stat	0.140067
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:03
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.258474	0.612392	2.055012	0.0423
HC	-0.156226	0.096483	-1.619205	0.1083
DEM	-0.063261	0.028784	-2.197766	0.0301
PF	-0.008114	0.004630	-1.752504	0.0825
CONN	0.001602	0.001034	1.548942	0.1243

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.974235	Mean dependent var	-0.294577
Adjusted R-squared	0.968033	S.D. dependent var	0.680155
S.E. of regression	0.121607	Akaike info criterion	-1.199184
Sum squared resid	1.597138	Schwarz criterion	-0.618129
Log likelihood	107.9449	Hannan-Quinn criter.	-0.963060
F-statistic	157.0695	Durbin-Watson stat	0.849615
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:05
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.884543	0.177723	-10.60381	0.0000
HC	0.196878	0.022369	8.801372	0.0000
GDP	-0.001192	0.009733	-0.122499	0.9027
TRA	0.002564	0.001378	1.861148	0.0650
GDPPC	5.45E-05	1.24E-05	4.381339	0.0000

R-squared	0.482941	Mean dependent var	-0.294577
Adjusted R-squared	0.467031	S.D. dependent var	0.680155
S.E. of regression	0.496545	Akaike info criterion	1.474048
Sum squared resid	32.05238	Schwarz criterion	1.581651
Log likelihood	-94.49823	Hannan-Quinn criter.	1.517775
F-statistic	30.35549	Durbin-Watson stat	0.059299
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:06
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.906228	0.670237	1.352102	0.1792
HC	-0.195737	0.107686	-1.817669	0.0719
GDP	0.004407	0.003248	1.356754	0.1777
TRA	-0.001005	0.001211	-0.829340	0.4087
GDPPC	2.05E-05	1.94E-05	1.055122	0.2937

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.969021	Mean dependent var	-0.294577
Adjusted R-squared	0.961564	S.D. dependent var	0.680155
S.E. of regression	0.133346	Akaike info criterion	-1.014889
Sum squared resid	1.920352	Schwarz criterion	-0.433834
Log likelihood	95.50501	Hannan-Quinn criter.	-0.778765
F-statistic	129.9341	Durbin-Watson stat	0.748320
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:08
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.024502	0.172498	0.142041	0.8873
HC	0.098371	0.028457	3.456851	0.0007
SD	0.280404	0.343078	0.817319	0.4153
DEM	-0.072096	0.037071	-1.944816	0.0540
PF	-0.018345	0.004112	-4.461657	0.0000
CONN	0.003376	0.000745	4.533005	0.0000

R-squared	0.786479	Mean dependent var	-0.294577
Adjusted R-squared	0.778203	S.D. dependent var	0.680155
S.E. of regression	0.320321	Akaike info criterion	0.604441
Sum squared resid	13.23612	Schwarz criterion	0.733564
Log likelihood	-34.79974	Hannan-Quinn criter.	0.656913
F-statistic	95.03122	Durbin-Watson stat	0.138373
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:09
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.542929	0.889359	0.610473	0.5428
HC	-0.135109	0.098246	-1.375213	0.1719
SD	1.137766	1.026460	1.108437	0.2702
DEM	-0.062198	0.028770	-2.161908	0.0329
PF	-0.008206	0.004626	-1.773974	0.0789
CONN	0.001400	0.001049	1.335219	0.1846

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.974528	Mean dependent var	-0.294577
Adjusted R-squared	0.968100	S.D. dependent var	0.680155
S.E. of regression	0.121479	Akaike info criterion	-1.195787
Sum squared resid	1.579007	Schwarz criterion	-0.593211
Log likelihood	108.7156	Hannan-Quinn criter.	-0.950917
F-statistic	151.6179	Durbin-Watson stat	0.849474
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:11
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.745807	0.176758	-9.876810	0.0000
HC	0.073360	0.043709	1.678392	0.0957
SD	1.679235	0.516680	3.250051	0.0015
TRA	0.000694	0.001449	0.479005	0.6327
GDP	-0.010338	0.009806	-1.054198	0.2938
GDPPC	3.59E-05	1.33E-05	2.700180	0.0079

R-squared	0.522075	Mean dependent var	-0.294577
Adjusted R-squared	0.503550	S.D. dependent var	0.680155
S.E. of regression	0.479231	Akaike info criterion	1.410160
Sum squared resid	29.62649	Schwarz criterion	1.539283
Log likelihood	-89.18581	Hannan-Quinn criter.	1.462632
F-statistic	28.18333	Durbin-Watson stat	0.062209
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:11
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004775	0.998619	0.004782	0.9962
HC	-0.163452	0.110683	-1.476764	0.1427
SD	1.372648	1.129269	1.215519	0.2268
TRA	-0.001025	0.001209	-0.847748	0.3985
GDP	0.004111	0.003250	1.264883	0.2087
GDPPC	1.58E-05	1.97E-05	0.801761	0.4245

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.969443	Mean dependent var	-0.294577
Adjusted R-squared	0.961733	S.D. dependent var	0.680155
S.E. of regression	0.133052	Akaike info criterion	-1.013788
Sum squared resid	1.894197	Schwarz criterion	-0.411213
Log likelihood	96.43070	Hannan-Quinn criter.	-0.768918
F-statistic	125.7296	Durbin-Watson stat	0.759649
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:15
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.349917	0.200660	1.743831	0.0836
HC	0.080069	0.031401	2.549917	0.0120
SD	0.180083	0.387114	0.465195	0.6426
TRA	0.002084	0.001029	2.024866	0.0450
GDP	-0.016639	0.006353	-2.618993	0.0099
GDPPC	-1.96E-05	1.03E-05	-1.897914	0.0600
DEM	-0.046490	0.037538	-1.238471	0.2178
PF	-0.023872	0.004475	-5.334489	0.0000
CONN	0.003843	0.000837	4.592472	0.0000

R-squared	0.812480	Mean dependent var	-0.294577
Adjusted R-squared	0.800574	S.D. dependent var	0.680155
S.E. of regression	0.303738	Akaike info criterion	0.519036
Sum squared resid	11.62433	Schwarz criterion	0.712721
Log likelihood	-26.03495	Hannan-Quinn criter.	0.597744
F-statistic	68.24098	Durbin-Watson stat	0.231317
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 12/20/15 Time: 17:16
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.807404	0.935687	0.862899	0.3902
HC	-0.162561	0.105572	-1.539812	0.1266
SD	1.056889	1.048197	1.008292	0.3157
TRA	-0.001350	0.001139	-1.184529	0.2389
GDP	-0.000696	0.003255	-0.213990	0.8310
GDPPC	8.10E-06	1.84E-05	0.440239	0.6607
DEM	-0.065692	0.029204	-2.249390	0.0266
PF	-0.007571	0.004882	-1.550780	0.1240
CONN	0.001612	0.001109	1.453530	0.1491

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.974900	Mean dependent var	-0.294577
Adjusted R-squared	0.967660	S.D. dependent var	0.680155
S.E. of regression	0.122314	Akaike info criterion	-1.166069
Sum squared resid	1.555924	Schwarz criterion	-0.498932
Log likelihood	109.7096	Hannan-Quinn criter.	-0.894963
F-statistic	134.6493	Durbin-Watson stat	0.834150
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 01/18/16 Time: 15:06
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.589877	0.151421	-10.49973	0.0000
SD	2.433259	0.256981	9.468641	0.0000
GDP	-0.016005	0.009271	-1.726319	0.0867
GDPPC	2.77E-05	1.25E-05	2.224633	0.0278
TRA	0.000165	0.001424	0.115797	0.9080

R-squared	0.511638	Mean dependent var	-0.294577
Adjusted R-squared	0.496612	S.D. dependent var	0.680155
S.E. of regression	0.482569	Akaike info criterion	1.416948
Sum squared resid	30.27345	Schwarz criterion	1.524550
Log likelihood	-90.64396	Hannan-Quinn criter.	1.460674
F-statistic	34.04901	Durbin-Watson stat	0.069118
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 01/18/16 Time: 16:38
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.039992	0.178562	-0.223967	0.8231
SD	1.281800	0.191392	6.697235	0.0000
DEM	-0.123614	0.035344	-3.497458	0.0006
PF	-0.011996	0.003831	-3.131653	0.0021
CONN	0.003382	0.000775	4.360876	0.0000

R-squared	0.766700	Mean dependent var	-0.294577
Adjusted R-squared	0.759521	S.D. dependent var	0.680155
S.E. of regression	0.333539	Akaike info criterion	0.678217
Sum squared resid	14.46224	Schwarz criterion	0.785820
Log likelihood	-40.77967	Hannan-Quinn criter.	0.721944
F-statistic	106.8054	Durbin-Watson stat	0.127957
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 01/18/16 Time: 17:25
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.642391	0.128219	-12.80921	0.0000
SD	2.569547	0.230778	11.13426	0.0000

R-squared	0.482433	Mean dependent var	-0.294577
Adjusted R-squared	0.478542	S.D. dependent var	0.680155
S.E. of regression	0.491154	Akaike info criterion	1.430584
Sum squared resid	32.08384	Schwarz criterion	1.473626
Log likelihood	-94.56445	Hannan-Quinn criter.	1.448075
F-statistic	123.9718	Durbin-Watson stat	0.050511
Prob(F-statistic)	0.000000		

Dependent Variable: CORRCCI
Method: Panel Least Squares
Date: 01/18/16 Time: 17:29
Sample: 2005 2013
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.474006	0.440145	-1.076933	0.2837
SD	0.342073	0.838812	0.407806	0.6841

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.963544	Mean dependent var	-0.294577
Adjusted R-squared	0.958949	S.D. dependent var	0.680155
S.E. of regression	0.137806	Akaike info criterion	-1.015048
Sum squared resid	2.259883	Schwarz criterion	-0.670719
Log likelihood	84.51572	Hannan-Quinn criter.	-0.875122
F-statistic	209.6822	Durbin-Watson stat	0.703308
Prob(F-statistic)	0.000000		