

**Gordon Institute  
of Business Science**  
University of Pretoria

**An assessment of the effect of institutional quality on stock exchange  
performance**

**A research project submitted to the Gordon Institute of Business  
Science, University of Pretoria, in partial fulfilment of the requirements  
for the degree of Master of Business Administration.**

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## **Abstract**

Institutions as key drivers of economic prosperity have become a widely researched area. This research sought to assess the impact of institutional quality on stock exchange performance in the developing and developed contexts using South Africa and the USA as respective case studies.

The research indicates that not all institutional quality variables are key drivers to stock exchange performance. The institutional quality variables which significantly affect stock exchange performance differs across contexts. The relationship is, however, not straightforward with results indicating that stock exchanges still grow in environments of poorly performing areas of institutional quality.

Developing countries have an increased number of interrelated institutional quality variables implying less independence of institutions. In this developing context, factors such as political stability, regulatory quality and rule of law affect stock exchange performance. Additionally, businesses can thrive in environments of decreased regulatory quality and rule of law in developing countries and in environments of decreased control of corruption in developed countries. Stock exchange performance is enhanced by political stability in developing contexts and rule of law in developed contexts.

The study demonstrates that context is an important factor when analysing the effect of institutional quality variables on stock exchange performance. Businesses need to therefore adopt multi-pronged approaches, involving institutional strategies as a key area, when operating in different environments.

## **Keywords**

Institutions, institutional quality, Worldwide Governance Indicators, stock exchange performance, developing countries, emerging markets

## Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements of the degree of Master of Business Administration at the Gordon Institute of Business science, University of Pretoria. It has not been submitted before for any degree or examination at any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

  
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Yusavia Moodley

7 November 2018

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## Glossary

ALSI	-	All Share Index
CC	-	Worldwide Governance Dimension: Control of Corruption
CI	-	Composite Index
GCI	-	Global Competitive Index
GE	-	Worldwide Governance Dimension: Government Effectiveness
JSE	-	Johannesburg Stock Exchange
NYSE	-	New York Stock Exchange
PS	-	Worldwide Governance Dimension: Political stability
RL	-	Worldwide Governance Dimension: Rule of law
RQ	-	Worldwide Governance Dimension: Regulatory Quality
TFP	-	Total Factor Productivity
USA	-	United States of America
VA	-	Worldwide Governance Dimension: Voice and Accountability
VIF	-	Variance Inflation Factor
WEF	-	World Economic Forum
WGI	-	Worldwide Governance Indicators
ZAF	-	South Africa

## **Chapter 1: Introduction to the research problem**

### **1.1. Research title**

An assessment of the effect of institutional quality indices on stock exchange performance.

### **1.2. Introduction**

Considerable philosophical, scientific and economic thought has been dedicated to understanding the drivers of economic prosperity. Economist and institutional theory pioneer, Adam Smith (1776), introduced the concept of institutions as the primary driver of an economy. This concept was woven into prominent schools of economic thought such as Marxism where institutions were seen as the superstructure. Later, the concept was included into economic theory developed by Schumpeter (Lee & Lloyd, 2016). The principle of institutional economics is therefore longstanding and has been a consistent aspect into economic theory since its formal inception by Adam Smith in the 18<sup>th</sup> century.

Short-term economic theory, which gained popularity in the late 20<sup>th</sup> century, focused on quick progress through microeconomic principles thereby overlooking the role of institutions (Lee & Lloyd, 2016), the effects of which take more time to be realised (Hartwell, 2017). The dawn of the 2000's has seen a renewed focus into the influence of institutions as a driver of economic growth giving rise to the field called new institutional economics. This is concurrent to the rise of the independence of institutions across the globe as a constraining or governance measure (Cukierman, 2008). A growing school of thought within the field of new institutional economics is the institutional quality theory which proposes that institutions are the principal determinant of economic development as they shape all socio-economic actors in an environment (Acemoglu, Johnson & Robinson, 2005; Lee & Lloyd, 2016; Peng, Sun, Pinkham & Chen, 2009; Rodrik, Subramanian & Trebbi, 2004).

Concurrent to the rise of new institutional economics, various global indices have become increasingly widespread in prominence such as the Global Competitive Index (GCI) (Schwab, 2017) and the Worldwide Governance Indicators (WGI) (Kaufmann, Kraay & Mastruzzi, 2010). The indices measure aspects such as political risk, economic risk, and national competitiveness through varying methodologies largely based on surveys and/or expert opinion. It is an important area due to the widespread reach of its

results igniting public discourse, influencing of policy making, assisting the allocation of foreign aid worth hundreds of millions of dollars in countries such as the USA and Netherlands as well as being used by ratings agencies (Ko & Park, 2012; Thomas, 2010).

However, questions as to the validity of various measured indices persist with several authors cautioning against blind acceptance of the measures. The authors voice concern over the limitations of the indices. The major shortcomings include the inherent error of the measures, particularly bias through the surveys and opinion utilised in the composite scores (Kaufmann, Kraay & Mastruzzi, 2008; Krugman, 1998; Thomas, 2010).

An aspect of many prominent and widely used indices comprise institutions as a direct or indirect input into its measure. This is aligned with the fundamental principle of institutional quality theory as the theory purports that institutions are at the forefront of aspects that drive a nation's economic therefore financial performance (Acemoglu et al., 2005; Lee & Lloyd, 2016; Peng et al., 2009; Rodrik, Subramanian & Trebbi, 2004).

### **1.3. Research motivation and problem**

The relationship between institutional quality and macroeconomic aspects such as GDP have been widely investigated and are extensively debated (Acemoglu et al., 2005; Chong & Calderon, 2000; Rodrik et al., 2004) however the direct effect that changes in institutions have on financial sector variables such as stock exchange performance has not been well researched. As observed by Hartwell (2017), the relationship with institutional changes and stock exchange development presents a noteworthy gap in research.

The stock exchange as a stand-alone aspect of financial performance of a country is particularly pertinent as it is used as a catalyst for economic growth through capital raising and the resultant development of business (Thanh, Hoai & van Bon, 2016). Areas to be researched include aspects such as the effect of changing quality of institutions on stock exchange performance as well as if any effects vary across economy types as the WEF claims (Schwab, 2017). The claim is made on the theory that economies at different stages of development are each driven by unique factors (Schwab, 2017; Vitola & Senfelde, 2013). There are several proponents of treating economies at varying stages differently when measuring indices and in overall policy making (Aidt, Dutta & Sena, 2008; Ang, 2016; Bowden & Moesen, 1991; Hartwell, 2017; Yartey & Adjasi, 2007).

On a firm level, Marquis and Raynard (2015) note that a growing challenge for the increasing number of multi-national organizations is navigating institutionally diverse environments. Organisations have had to develop unique strategies in line with this (Hoskisson, Eden, Lau & Wright, 2000). For example, the choice to enter or exit a market is strategic in nature and can have costly implications for a company, particularly when the exit decision is long and drawn out.

A practical example is the case of Aspen Holdings' exit from Venezuela in 2016 which negatively affected the company's performance (Aspen Holdings, 2017; Hodgson & Hoque, 2017). A further example is that of MTN operating in Nigeria where the company has been fined arguably exorbitant amounts for allegations of non-compliance (Sutherland, 2018). In cases such as these, knowledge or accurate forecasts of the impact that institutional environment variations have on the company performance and any impact on the share prices may have been helpful to navigate the companies environments riddled with increasing institutional voids. It is therefore useful for companies to understand if indices available on the institutional environment can inform strategic decisions. A pertinent question is therefore the applicability and relevance of institutional quality to strategic business decisions in an increasingly global business environment.

Furthermore, pension and provident funds are tied to the performance of many stock exchange listed companies therefore understanding the time that changing quality of institutions has on company performance will assist in minimizing the risk of such crucial investment.

As the indices are being used for policy making and the allocation of developmental funds (Thomas, 2010) a further area of interest is whether companies and policy makers should take such the increasingly popular global indices that measure various key performance indicators of countries/regions into account. It is important to establish their accuracy and ability to explain performance in a country across a wide set of variables in order to apply them usefully and responsibly.

#### **1.4. The relevance of this research in a South African context**

In line with institutional quality theory, South Africa's arguably deteriorating institutions has given rise to fears of economic meltdown. A recent report by the Mittner (2018) highlights this with an in-depth account of poor performance of the Johannesburg Stock

Exchange (JSE) relative to the New York Stock Exchange (NYSE) citing poor governance in the environment of the former as the main reason. This article is among a plethora of others in recent years amid a fear of a socio-economic meltdown as a result of weakening public institutions, poor governance and corruption.

Emerging economies are the area of future economic growth and opportunity globally (Marquis & Raynard, 2015). As an emerging economy with a sophisticated financial industry and an advantage in most areas of competitiveness relative to the Sub-Saharan region (Schwab, 2017), South Africa is poised to take advantage of this trend. An understanding of the key drivers and enablers of business, such as the stock exchange, can assist to sustain and create increased competitive advantage for the country. This is because stock exchanges provide the capital to develop businesses as well as enhance business confidence for operating in the country through the application of corporate governance.

There are cases of countries with weak institutions which have grown economically, some of which have become global economic powerhouses. For example, authors Glaeser, Porta, Lopez-de-Silanes and Shleifer (2004) and Ang (2016) argue that developing countries are required to grow economically first then strengthen institutions, both of whom cite China as a noteworthy example. This school of thought is in stark contrast with other researchers such as Acemoglu et al. (2005) who argue that institutional quality is a prerequisite for economic growth. However, Ang (2016) provides an account of China becoming economically successful prior to improving institutions. The improved institutions are still not as strong relative to those of developed countries.

Such insight into the progression of economic development can assist in the South African context as it can be used to inform policy making on a national basis. This is through understanding if and how the environment is unique therefore allowing measured or selective benchmarking and standardization with other countries' policies. Aidt et al. (2008) demonstrate that corruption has either a considerable negative effect or no effect at all on economic growth depending on whether the country has strong or weak institutions respectively. This leads to questions as to what policy makers should take into account as important in developing versus developed countries. It stresses the importance of investigating context specific solutions to problems as opposed to single approaches globally. Investigations into the applicability of developed world policies and

solutions in the developing world must be interrogated as growth may be caused and influenced by varying factors that differ from that of developed countries.

Along this line, the question arises as to the role that institutions play in spurring economic growth in developing countries. With South Africa's arguably deteriorating institutional environment, it is useful for businesses to understand the effects of the changing environment on the sustainability of their operations or ability to raise capital on the stock exchange. Stock exchanges are an important business lubricant in a country as the mechanism in which to raise capital and develop business. Countries with well-established institutions tend to have more liquid stock exchanges (Hartwell, 2017).

In addition, South Africa has several multinational businesses that operate in other countries with institutional voids. Examples include Aspen Holdings which entered the Venezuelan market resulting in significant financial losses (Aspen Holdings, 2017; Hodgson & Hoque, 2017) and MTN which operates in Nigeria which faced significant fines which has been largely labelled extortion thinly veiled as fines for non-compliance (Sutherland, 2018). The research can therefore be of use to understand how South African businesses can operate successfully in contexts outside the country where institutional variables are different to the local environment.

### **1.5. Research purpose**

Stock exchanges provide a key channel to mobilization of capital and therefore growth of business and overall GDP of a country. Additionally, it affords investors the opportunity to trade with decreased or known levels of risk (Ho & Lyke, 2017; Thanh et al., 2016). The key aspects which drive stock exchange development are still largely debated with various financial and economic factors being analysed to determine their relevance to the performance of the stock exchange. While several variables have been analysed to determine their relationship to stock exchange development or performance, institutional quality has been investigated less so (Thanh et al., 2016; Hartwell, 2017) although recent research has brought this question to the fore (Yartey & Adjasi, 2007). It is important to understand these drivers for the health of the stock exchange, economic growth in general, policy making and resource allocation.

Additionally, there has been an increased focus in recent years of finding context specific problems in South Africa with a focus on decolonised thinking in developing sustainable solutions for growth and prosperity. Along this line, this investigation seeks to examine if



the developing and developed contexts react in the same way to institutional quality which will inform the differences required in government policy making as well as business strategy. This is a pertinent question with many economists in disagreement about how to apply policy in different countries. For example, Ang (2016) argues that many economists such as Rodrik et al. (2004) ignore the crucial aspect of different contexts between the developing versus developed countries' needs.

The purpose of this research is therefore multi-pronged and can be summarized as follows:

- i. Allow responsible use of institutional quality measures for national policy making
- ii. Allow policy makers to understand if international benchmarking is of use given varying contexts
- iii. Enable business to ascertain the effect of institutional quality on stock exchange performance thereby allowing for strategic business decisions to be made
- iv. Inform potential risk levels of certain markets

#### **1.6. Research objectives**

The objectives of this research are designed to fulfil the research purpose. The study is focused on understanding which institutional quality variables, if any, have an impact on the performance of stock exchanges. In addition, the objective is to ascertain potential differences of this effect between developing and developed countries. In light of this, the objectives of the research are to determine if:

- i. There is there a significant relationship between institutional quality variables and the stock exchange in developing and developed contexts.
- ii. The applicability of institutional quality variables assist to explain the performance of stock exchanges in developing and developed contexts.
- iii. There are any differences in the relationship of institutional quality and stock exchange performance between developing and developed contexts.

These objectives will allow for the understanding the relevance of institutional quality to stock exchange performance which in turn can be used to inform strategic decision making on a firm and governmental policy making level.

### **1.7. Scope of the research**

This study focuses on the differing economy types classified as developing and developed in order to address the research questions. The countries chosen for study are South Africa and the United States of America (USA) representing developing and developed contexts respectively.

The research scope is confined to the institutional indices as opposed to evaluating more holistic indices such as the GCI and others which measure more broad areas of national competitiveness and performance. This is because the research study aims to investigate the relevance of institutional quality theory only to different economy types. Furthermore, the focus of the study is on stock exchange performance as opposed to other social, financial or economic aspects that may be affected by institutional quality.

The key drivers of stock exchange performance may be broadly divided into three categories namely the intrinsic attributes of stock markets such as systemic risk and size, domestic and international macroeconomic factors and the behaviour of other stock exchanges (Hartwell, 2017). This study focuses only on the role of institutions on stock exchange development. Other factors such as macroeconomic variables are important to stock exchange performance but are not within the scope of this research. As such, GDP growth has been used only as a control variable to minimise omitted variable bias and to increase accuracy of the results.

### **1.8. Overview of this report**

This report presents an overview of all relevant literature to the topic in Chapter 2. This literature review provides an overview into the research undertaken in the area of this study to date. Additionally, it provides the basis upon which the results will be discussed in Chapter 6 as the study strives to build on existing theory in the area of institutional economics.

Chapter 3 outlines the research hypotheses that this study has employed to answer the research questions and ultimately fulfil the research purpose. The methodology used to interrogate these hypotheses is outlined in detail in Chapter 4.

Chapter 5 provides the results of all data validations and hypotheses testing undertaken while Chapter 6 discusses these results in light of the relevant theory and previous work undertaken in the field.

Chapter 7 provides a proposed model to explain the findings of the study as well as concluding remarks which summarize the key or principal findings. The concluding chapter proceeds to detail the limitations of the study, suggestions for future research and the implications that this study has to business.

## **Chapter 2: Literature review**

The literature review for this study provides an overview of institutional economic theory and background into institutional and similar indices to date. It is against the backdrop provided in this chapter that all further work in this study is based, particularly the discussion in Chapter 6.

The literature review begins with a detailed description and timeline of institutional theory up to the current prevalent schools of thought. A timeline of institutional theory and other theories employed to explain economic growth and prosperity is discussed. The review proceeds to explain the way in which institutional indices are applied to economic and financial variables. Finally, it concludes with descriptions of various measures of institutions, being the independent and variable of this study.

### **2.1. Institutions defined**

A widely accepted definition of institutions has been offered by Nobel Prize winner, Douglass North (Acemoglu et al., 2005; Alesina & Giuliano, 2015; Berggren, Bergh & Bjornskov, 2012; Kingston & Caballero, 2008). North (1991) defines institutions as the structures and systems which constrain political, economic and social interaction both formally and informally. This all-encompassing definition suggests that institutions are the most pertinent of all economic drivers of growth and prosperity, a view that is echoed by several researchers of economic theory (Acemoglu et al., 2005; Acemoglu, Gallego & Robinson, 2014; Chong & Calderon, 2000; Peng et al., 2009; Rodrik et al., 2004).

Acemoglu et al. (2005) defend the idea of the primacy of institutional quality in economic growth by noting that institutions structure the incentives for investments in physical capital, human capital and technology. In turn, these factors drive long-run economic growth (Solow, 1956). In addition Acemoglu et al. (2005) assert that institutions allocate resources, profits, revenue and determine rights of control of companies and entities operating within a country.

Berggren et al. (2012) define institutional quality as the level to which institutions incentivize productive and innovative behaviour for economic decision makers. According to researchers in the field of new institutional economics (Acemoglu et al., 2005; Berggren et al., 2012; Hartwell, 2017) favourable institutions are those which:

- i. provide secure property rights for society at large which in turn incentivizes investment, innovations, economic participation and a means of collateral for lending;
- ii. include checks on political power and power holders/democratic accountability;
- iii. have limited rent seeking from political power holders;
- iv. exhibit equality of opportunity and in the legal system
- v. Transparency in public decision making
- vi. Implementation and enforcement of institutional decisions

On the other hand, weak institutions are kept in place by an elite minority with majority of the political power. These groups are unchecked and develop or cling onto institutions that protect their own interest at the expense of society at large (Acemoglu et al., 2005). According to Meyer, Estrin, Bhaumik and Peng (2008), and Rottig (2016), weak institutions are characterised by:

- i. failing to ensure effective markets or undermine markets through corruption
- ii. institutional voids
- iii. insufficient quality and quantity of information for business activity
- iv. erroneous regulations by government which benefits a political agenda over market efficiency
- v. weak enforcement of contracts and inefficient judicial systems
- vi. absence of intermediary institutions as regulators

## **2.2. Historic overview of economic growth drivers**

### **2.2.1. Old institutional economics**

Adam Smith is often considered the pioneer of institutional economics. His famous work was published in 1776 and has been an influence for several other economic and political thought leaders including John Stuart Mill, Karl Marx and Schumpeter (Acemoglu et al., 2005; Lee & Lloyd, 2016). A key area of Adam Smith's (1776) work was focused on the role of institutions on socio-economic development. Smith (1776) was the first proponent of institutional quality as a fundamental precursor of the prosperity of nations. He cited entrepreneurship and savings as the catalysts or mechanisms which are enabled by increased institutional quality which in turn improves overall prosperity. This has laid the foundation for institutional economic theory.

This early era of research and schools of thought regarding institutional economics has been dubbed old institutional economics (Lee & Lloyd, 2016). The school of thought that advocates institutions as the primary driver of stability and prosperity is now known as the institutional quality hypothesis and is part of the school of thought dubbed new institutional economics with the principle having been largely revived in the early 21<sup>st</sup> century (Lee & Lloyd, 2016; Osman, Alexiou & Tsaliki, 2012).

### **2.2.2. An era of alternate hypotheses from institutional quality**

The mid-20<sup>th</sup> century saw a decline in the prominence of institutions as the foremost driver of economic prosperity among economic thought leaders. Instead long-run growth theories such as the Solow-Swan model or Neoclassical Growth Theory (Solow, 1956) became commonplace in explaining varying economic development and growth rates of nations. Economic development in this theory was measured in the form of overall national output. The key driving factors of output proposed by Solow (1956) are capital, investment and labour.

The theory catalysed large amounts of research into expansions or variations of the model as well as similar long-run growth theories (Elbers, Adema & Stabler, 2015). Later expansions in long run growth theories include the addition of factors such as total factor productivity (TFP) to account for residual economic growth that is unaccounted for by the Solow-Swan model and similar long-run growth models. TFP comprises aspects such as technology and innovation (Raa & Shestalova, 2011). The Solow-Swan model and various other versions thereof are still widely accepted and used as models to explain economic growth (Elbers et al., 2015; Grinshpan, 2017; Raa & Shestalova, 2011).

Elbers et al. (2015) tested the traditional Solow model proposed in 1956 and concluded that the model produced measurable inaccuracies. Using a later variation, the augmented Solow model, Elbers et al. (2015) obtained results that were more promising and reflective of reality demonstrating that long run growth theories are still valid although certain inaccuracies exist. The authors note that there are differences between African and European countries with the effect of certain variables such as population growth being stronger in African countries than European countries.

In the 1970's, international trade theory became one of the prevailing explanations for national competitive advantage (Olczyk, 2016). This theory purports that countries which

focus on the production of what it can produce more efficiently than others gain an overall competitive advantage. However, increasing two-way trade deemed this theory largely redundant (Smit, 2010).

Other theories proposed to explain differences in economic performance include geographic location (Gallup & Sachs, 1998) and culture of countries (Alesina & Giuliano, 2015). Gallup and Sachs (1998) emphasize the importance of geography in growth by noting that it determines factors such as transport costs, disease burdens and agricultural production, all of which affect income levels and financial aspects of a country. The authors note that geography results in the way that policy and institutions are set up and controlled.

Alesina and Giuliano (2015) stress that culture plays a central role in determining the way in which institutions are set up and perform. However, the authors also note that institutions and culture co-evolve and the relationship is therefore not unidirectional. Instead, it is multidirectional with each affecting the other as time progresses. This theory is supported by Glaeser et al. (2004) who state that institutional opportunities are a result of human and social capital of a population suggesting an interplay between human/cultural aspects and institutional development. The theories of geography and culture that are strongly refuted by Acemoglu et al. (2005) as discussed in the following section, Chapter 2.2.3.

### **2.2.3. New institutional economics**

In the last two decades, the mandate of formal institutions has transformed given the expansion of their oversight and increasing independence as a governance measure. With its increasing prominence, there has been an increased research focus in this area, particularly regarding the effect of institutions on a variety of parameters related to macroeconomic variables such as GDP (Cukierman, 2008). The revival prompted a new area of research within the field of economics dubbed new institutional economics which builds on the theories of institutions as a primary driver of growth and prosperity of a country (Lee & Lloyd, 2016).

Within new institutional economics, is the institutional quality theory which asserts that institutional quality is the central factor which determines socio-economic performance and therefore overall prosperity of a nation (Acemoglu et al., 2005; Peng et al., 2009; Rodrik et al., 2004).

Positive economic growth trajectories are largely influenced by institutions that are focused on investment and productivity growth of a country (Akpalu, Agenyo, Letete & Sarr, 2017) through incentives and reduced transaction costs (Kingston & Caballero, 2009). The importance of institutions is further evidenced by resource rich countries that still lag economically despite natural endowments due to the resource curse, a phenomenon largely dependent on the quality of institutions of a country (Moshiri & Hayati, 2017). This is counter to Gallup and Sachs (1998) who assert that geography is a key driver of economic prosperity. An overwhelming amount of empirical evidence and practical case studies have brought the institutional quality hypothesis to the fore of prevalent schools of thought into economic growth drivers once again (Lee & Lloyd, 2016).

In defence of the institutional quality hypothesis, several researchers assert that economic performance can only be partially explained by growth models and its associated inputs necessitating the need for residual inputs such as TFP (Elbers et al., 2015; Raa & Shestalova, 2011). Indeed, in the study conducted by Elbers et al. (2015) inaccuracies and shortcomings of such long-run growth models were highlighted. Furthermore, factors such as geography and culture are discounted from having any causal relationship to economic performance (Acemoglu et al., 2005; Acemoglu et al., 2014; Acemoglu & Robinson, 2012; Rodrik, et al. 2004), the rationale of which is explained in the following paragraphs.

By using previous European colonies as practical examples, Acemoglu et al. (2005) control for geography and culture showing that following colonization, radical changes in economic prosperity ensued due to a sudden change in institutions and resulting policies despite geography and culture remaining uniform.

A second example demonstrating the paramount role of institutions in economic growth over other factors provided by Acemoglu et al. (2005) is that of North versus South Korea. The authors recounts that these countries were split into separate nations in 1945. At the time of the split, the countries were largely homogenous in terms of geography, climate, language and culture. However, the political and economic systems that each country adopted were vastly different with North Korea opting for an authoritarian communist system while South Korea transitioned into a democracy with a free market economy. Since the time of the split, the countries have diverged drastically in terms of economic growth and prosperity. The authors therefore discount geography and culture



as factors altogether and demonstrate the importance of institutional quality in economic performance.

This view is supported by further case studies of countries that are similar in geography and culture but have vastly different economic performance such as Mauritius and Fiji. Fiji outperformed Mauritius economically in the 1980's but was destabilised by de facto political groups gaining power through a military coup. Mauritius now exhibits far increased economic growth than Fiji due to the stability of political and economic systems (Prasad, 2013).

The view that institutions matter and are central to economic growth is the principle of a framework developed by Acemoglu et al. (2005). The framework asserts that groups with majority of political power (whether de jure or de facto) determine the way in which economic and political institutions operate. This influences economic development and the way in which resources are allocated. The authors therefore assert that institutions that drive economic performance are interrelated and broad ranging from formal as well informal political and economic institutions (Figure 1).

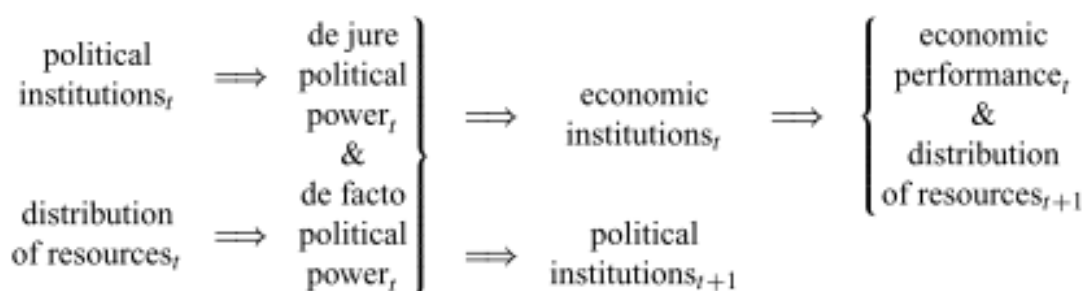


Figure 1: Acemoglu, Johnson and Robinson's (2005) institutional quality framework

Lehne, Mo and Plekhanov (2014) take a broader view on the drivers of economic prosperity and growth by asserting that institutions matter but they are shaped by aspects such as geography, political system, natural resource endowment and ethnic fractionalisation. This all-encompassing view weaves in aspects of most theories proposing the key variables that drive financial development and overall economic prosperity in a country.

### 2.3. Institutions and economic growth

Per Berggren et al. (2012) a growing number of studies into the effects of policy instability on macroeconomic variation have largely produced negative relationships resulting a

growing body of research that highlights the counterintuitive growth effects of instability (political and economic). The findings of the study conducted by Berggren et al. (2012) highlight that the effect of institutions in transition is based on the stage of the economy (i.e. developing versus developed) and the institution type. This is in line with Marquis and Raynard (2015) who highlight the unique conditions of emerging or developing economies regarding institutional characteristics including weak capital markets, weak regulatory environments and unpredictable change.

Berggren et al. (2012) note that improving institutional quality entails a period of instability and transaction costs which may hinder growth in the short-term. The author differentiates between two types of instability, namely positively and negatively trended, depending on whether institutional quality is improving or deteriorating. Positively trended growth may spur confidence in an economy as the institutions, albeit unstable, are improving. Several mechanisms have been observed which result in institutional instability positively affecting growth rates, a theory described by Berggren et al. (2012) as plausible as such cases result in the changing of the balance of power thereby preventing Olsonian institutional sclerosis which refers to institutions that do not adapt and change at a sufficient pace.

Collier (2007) asserts that institutions in the poorest countries of the world are on average in fact of better quality than is perceived by international investors, particularly those on a positively trended growth trajectory. According to Sobel (2017) little is known about the nature of institutional reform with sparse work being conducted on transitions of political and economic systems.

On the other hand, Brunetti & Weder (1998) have found that certain measures of uncertainty have a negative impact on investment. Aspects such as government stability, frequent changes in government, changing incentives, social unrest, corruption and uncertainty regarding property rights have all been shown to have negative effects on investment. This is echoed by Lehne et al. (2014) who state that countries with effective rule of law and secure property rights are in a better position to attract investment resulting in better growth performance over the long term.

Authors such as Acemoglu et al. (2005) and Rodrik et al. (2004) assert that institutions are the first requirement for economic prosperity to ensue in a nation. However, there is a dichotomy in economic schools of thought with a growing number of researchers

proposing that growth is required first then institutions will strengthen (Ang, 2016; Berggren et al., 2012). This poses a chicken and egg problem that has policy implications for many developing countries.

Ang (2016) considers conventional theory regarding what constitutes strong institutions as a developed world view which does not fit the extraordinary growth story of China where conventional definitions of strong institutions did not exist, particularly under the leadership of previous Prime Minister, Mao. Ang (2016) goes onto argue that only once industries began to develop, the state intervened through regulation and the encouragement of complimentary industries. Therefore, financial sector development occurred first and this spurred strengthening of key economic institutions of the country.

The idea that financial and economic growth spurs improvements in institutional quality was introduced by Lipset (1959). The author argues that certain conditions, largely involving the economic systems, key values and literacy levels of a nation result in democracy as a consequence which then results in additional consequences as depicted in Figure 2.

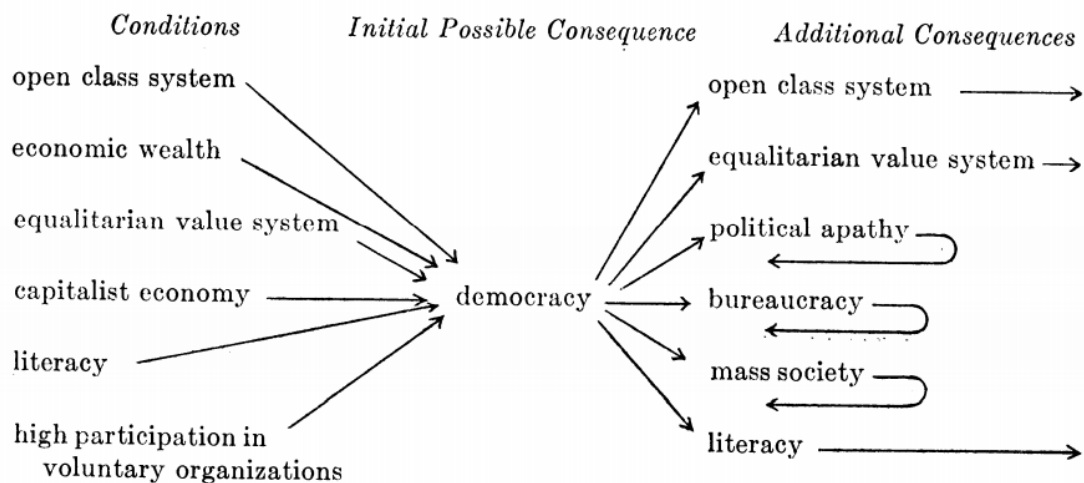


Figure 2: Model of economic growth translating into institutional improvements per Lipset (1959)

This theory has since been supported and developed by researchers such as Barro (1999) and Glaeser et al. (2004). Similarly, Aidt et al. (2008) found that the effect of corruption on growth is dependent on the quality of institutions in the country and is

therefore in alignment with theory that purports that development of economic and financial sectors are dependent on the economy type and stage of development.

#### **2.4. How institutions are measured**

Lehne et al. (2014) note that there are several determinants of institutional quality. These are used in varying combinations for institutional and national competitiveness indices. There are several measures or indices used to measure the independence, volatility and/or quality of institutions. Davis, Kingsbury and Merry (2015) define these indices as indicators that rely on statistical data to draw evidence based conclusions on governance, policy formation and political decision making. The authors assert that indicators are a source of information and a technology for governance which are produced in a method that simplifies data about complex socio-economic phenomena. There are several indices which measure the same components however the methodologies vary therefore the resultant scores vary. This highlights the nature of subjectivity of institutional and other governance indices as supported by Davis et al. (2015) who note that the motives of indicator producers affect the results.

Certain indices measure institutions solely while several others include institutions as a component of a larger composite index for national competitiveness or risk. However, based on the institutional quality theory, majority, if not all, aspects that make up the composite index are based on institutional quality due to the fact that institutions are the main driver of all other aspects in an economy (Acemoglu et al. 2005). Indices have become increasingly popular in national economic policies and strategies as nations continue to compete for foreign direct investment in an environment of ever decreasing trade barriers (Olczyk, 2016) as well as much needed aid with countries such as the USA and Netherlands using the WGI to allocate and lastly for policy making (Thomas, 2010).

The second common measure of institutional volatility is in the form of various indices which each have its own methodology in determining a score or ranking for a country/region. These have been summarised in Table 1. These are used in hundreds of studies measuring the impact of institutional quality and volatility on economic and less frequently, financial variables (Lee & Lloyd, 2016; Hartwell, 2017).

Voigt (2013) stresses the importance of accurately measuring institutional quality to give credence to the widely held, and still growing, view that institutions matter. He offers the following requisites for a measure to be robust:

- i. The institution must be perceptible or recognizable
- ii. Both de jure and de facto institutions must be included in the measure
- iii. Factual enforcement of institutions' rules (as opposed to mere existence and weakly or erratically applied enforcement)
- iv. Identification and inclusion of all potentially relevant institutions however caution should be applied in creating a bulk composite measure. Each institution should be measured separately.

As noted, policy uncertainty is often used as a proxy for institutional quality or volatility. Studies employ various methods are used to measure this parameter, most commonly through assessing newspaper articles with key words signalling volatility. A host of methods have been used in this regard including case studies, natural experiments, and institutional analysis and cross country regressions (Voigt, 2013).

## **2.5. The Worldwide Governance Indicators (WGI)**

The World Bank, a development financial institution, was founded in 1944 with the aim of addressing poverty and sustainably supporting collective prosperity (The World Bank, 2013). The World Bank produces a vast array of datasets and reports covering socio-economic aspects of countries in the world including the Worldwide Governance Indicators. According to the producers of the indicator, Kaufmann et al. (2010), governance is defined as rules, enforcement mechanisms and organizations encompassing a wide array of sectors/areas. This is in line with North's (1991) definition of institutions acting as constraints.

The WGI have been measured to assess the perceptions of governance by country institutions of 215 countries and territories from 1996 till 2016. Initially, the WGI was measured every two years until 2002 when it was conducted annually to date (The World Bank, 2018). The WGI has been used in several socio-economic studies to explain macroeconomic and institutional performance and quality (Lehne et al., 2014; Thanh et al., 2016). Thomas (2010) describes the WGI as an attractive index for researchers due to its global coverage however the World Bank itself does not rely on the measure for its operational matters.

There are several determinants of institutional quality (Lehne et al., 2014; Thomas, 2010). As outlined by Kaufmann et al. (2010), the WGI comprise six broad dimensions which are based on several hundred variables from 31 data sources encompassing

perceptions of governmental and business organisations. The data sources include other scores of national and institutional quality such as the World Economic Forum's Global Competitiveness Report and other such global indices. Views of economists and analysts at development agencies such as the European Bank for Reconstruction and Development, the African Development Bank, the Asian Development Bank, and the World Bank are also taken into account. Nongovernmental organizations are surveyed including Reporters Without Borders and Freedom House among others. Lastly, commercial business analysts are used as well. The data sources are therefore widespread with variables being composited into indices which are then inputs into the final estimated governance indicator as depicted in Figure 3 (Thomas, 2010).

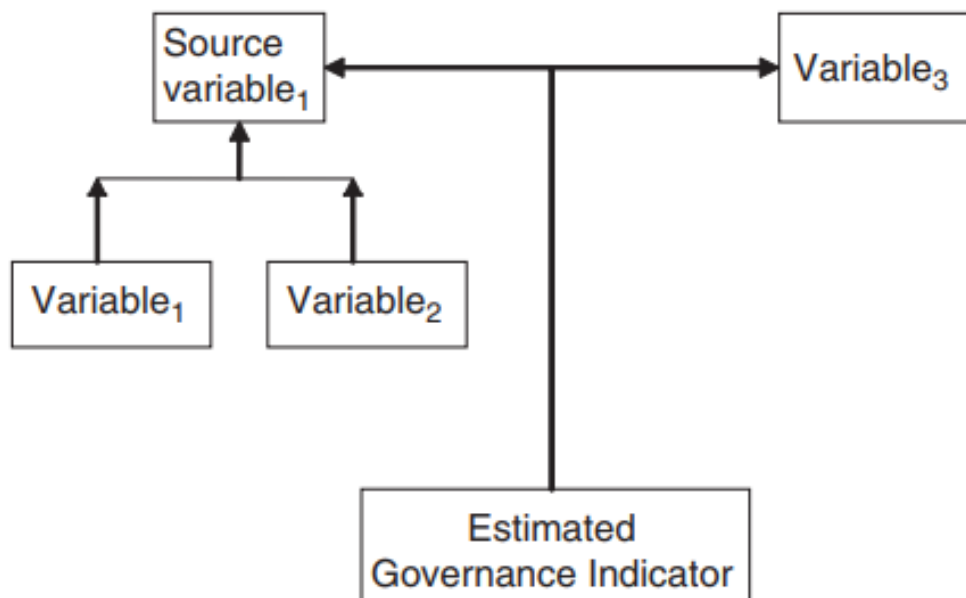


Figure 3: Model of governance indicator score composite from various variables (source variable) and sub-variables (variable<sub>1</sub> – variable<sub>3</sub>) (Thomas, 2010)

Brief descriptions of each dimension measured is provided as (Kaufmann et al., 2010):

- i. Voice and accountability (VA) – The extent of democracy, free speech and a free media.
- ii. Political stability (PS) – The likelihood of destabilizing or overthrowing government by unconstitutional means such as violence and/or terrorism.
- iii. Government effectiveness (GE) – The quality of public and civil services, policy formulation and implementation; the independence to carry out services away from political pressures; government adherence to policies.

- iv. Regulatory quality (RQ) – The government’s capability to develop and implement policies/regulations that enable development of business.
- v. Rule of law (RL) – The confidence and compliance to societal rules; the quality of enforcing contracts, property rights, the police, the judiciary; the crime and violence rate.
- vi. Control of corruption (CC) – The extent to which private gain is achieved through public power in the form of minor and grand corruption; state capture by a minority.

While the producers of the indices cite inherent error of the scores and account for it through the provision of error margins, Thomas (2010) notes that these caveats have been largely ignored by users. Thomas (2010) cautions against the use of the index describing reliance on the measure as premature citing issues with the data sources, namely survey and opinion bias as the scores are based on perception. As Collier (2007) points out, the perception of poorer countries by international investors tends to be more negative than in reality. In line with this, Thomas (2010) notes that measuring how something is perceived versus measuring the actual construct are different. The author further questions the overall validity of how each of the six dimensions are constructed describing the WGI dimensions as abstract. In line with this, Glaeser et al. (2004) note that there are conceptual problems when measuring institutions.

In addition to the WGI, there are several measures or indices used to measure the independence or quality of institutions throughout the world (Table 1). According to Voigt (2013) a host of methods have been used in this regard including case studies, natural experiments, institutional analysis and cross country regressions.

Table 1: Various indices that measure institutions directly or indirectly (UNDP, 2018)

Source	Index	Focus Area	Institutions Measured	Methodology	Countries Surveyed	Date Range	Access
Freedom House	Freedom in the World	Political Rights and Civil Liberties	Political	Expert Opinion	209	1973 - 2018	Free
The Heritage Foundation	Index of Economic Freedom	Economic Freedom; Macroeconomic Indicators	Political, Economic, Financial	Aggregate	186	1995 – 2018	Free
The PRS Group	International Country Risk Guide (ICRG)	National Risk	Political, Economic and Financial	Expert Opinion	140	1984 - 2018	Paid
Business Environment Risk Intelligence	BERI	National Risk	Political, Operations, Remittance and Repatriation	Expert Opinion	50	1966 - 2018	Paid
Transparency International	Corruption Perceptions Index	Corruption	Political, Economic	Aggregate	180	1995 - 2018	Free
World Economic Forum	Global Competitive Index	National Risk and Competitiveness	Institutions, Infrastructure, Economic, Political, Govt Services	Business Survey	137	1979 - 2018	Free
World Bank	World Governance Indicators	Voice and Accountability; Political Stability; Government Effectiveness; Corruption; Rule of Law	Political; Economic; Government Services; Judicial	Survey (Firms; government, household, NGO, multilateral organisations, public sector bodies)	214	1996 - 2016	Free
Economic Policy Uncertainty	Economic Policy Uncertainty Index	Economic Policy	Economic	Aggregate (newspaper coverage, no. of near future federal tax code expirations, expert opinion disagreements)	23	1998 – 2018	Free
IMD World Competitiveness Center	World Competitiveness Ranking	Economic, Government, Business and Infrastructure	Economic and Political	Business Survey	63	1989 – 2017	Free



## **2.6. Indices application to microeconomic and financial variables**

Emerging economies are described by Hoskisson et al. (2000) as low income, growth countries which utilise economic liberalisation as the engine for growth. Companies that operate in emerging economies are often faced with uncertain and unpredictable business environments due to weak institutions exhibiting voids. These companies are required to navigate the environment for survival or alternatively, exit the country (Marquis & Raynard, 2015). According to Rottig (2016) emerging markets are unique relative to developed markets and are characterized by institutional idiosyncrasies such as voids, increased importance of informal institutions, pressures by local governments and transitions, features which developed economies generally lack. Furthermore, governments in emerging economies tend to enforce greater control on companies than in developed economies. Therefore the way that countries at varying levels of development are influenced by institutions is likely to differ with emerging economies being more sensitive (Ang, 2016; Boubaker & Nguyen, 2014; Hartwell, 2017).

There is a large body of literature on the effect of institutions on macroeconomic parameters such as GDP (Abid, Bahloul & Mroua, 2016; Berggren et al., 2012; Brunetti & Weder, 1998; Yang, 2011). Per Berggren et al. (2012) institutional quality is expected to enhance economic growth through productivity enhancing incentives and reduced uncertainty of economic transactions. However, there is no consensus as to what economic variables drive stock exchange performance with studies using a wide and varying array of factors. Macroeconomic factors include GDP, GDP per capita, real income level, saving rate, private capital flows, inflation, and corporate governance. Institutional factors are less common in research and therefore the literature but include legal protection, corporate governance, financial market liberalisation and trade openness when present (Ho & Lyke, 2017). An overwhelming number of studies and consensus exists that economic growth is and stock market development are positively correlated (Ho & Lyke, 2017; Pan & Mishra, 2018; Yartey & Adjasi, 2007).

Krugman (1998) and Kohler (2006) argue that countries, unlike firms, do not compete with each other because national trade is a positive sum game making global competitive indices a misunderstood concept. Instead, national competitive indices are more applicable at a microeconomic level as companies compete for resources and market share as opposed to national economies. Despite this, Hartwell (2017) notes that the effects of institutional volatility on financial markets poses a marked gap in literature. In addition, little empirical testing of institutional change on financial markets has been undertaken. This is because institutional

change is slow-paced and difficult to measure therefore policy uncertainty is largely used as a proxy for institutional quality when studying its impact on financial sector outcomes.

Hartwell (2017) notes that on a more micro-economic level, institutional volatility results in financial sector volatility due to the fact that financial markets are nimble and sensitive to everyday events than macroeconomic measures such as GDP. This therefore makes financial markets a better indication of institutional volatility than macroeconomic factors which are more slowly affected by institutional conditions, making it longer-term in nature. Using the Central and Eastern Europe and former Soviet Union as case studies due to their changing institutional landscapes, Hartwell (2017) shows that advanced institutions are good for financial markets as institutional instability affects financial sector stability. In particular, democratic volatility has a negative effect.

Furthermore, the relationship between institutions and microeconomic performance may not always be straightforward as there are several cases of companies surviving and even thriving in environments with extensive institutional voids such as the Tata Group in India, Grupo Bimbo in Mexico and Koc Holding in Turkey. Gao, Zuzul, Jones and Khanna (2017) argue that the performance of companies operating in emerging markets depends largely on the institutional strategies employed. According to Marquis and Raynard (2015), the way in which companies plan, leverage and shape institutions to retain or gain competitive advantage is termed institutional strategies and is fundamental to how the company operates in different environments. This is echoed by Meyer and Peng (2016) who stress the importance of institutional strategies particularly in emerging economies.

A study undertaken by Thanh et al. (2016) analysed the WGI variables as causal factors for stock exchange performance in Vietnam. The researchers found that institutional quality factors such as political stability, government effectiveness, rule of law and control of corruption affect stock exchange performance concluding that well-established institutions are a crucial factor for stock exchange development in Vietnam.

## **Chapter 3: Research hypotheses**

This research study aimed to determine if institutional quality and stock exchange performance have a relationship in each economy type, namely developing and developed. South Africa (ZAF) and the United States of America were chosen for each economy type respectively. The rationale behind sample (country) selection is discussed in Chapter 4.2 (Population and sampling).

The WGI dataset comprises six institutional dimensions, each of which were assessed individually to determine if there is a significant relationship, in the form of a correlation, with stock exchange performance per country. This was undertaken to determine which variables, if any, can be used in a multivariate regression model to further explain the performance of stock exchanges in addition to the control variable, GDP growth rate. These research questions were broken down into Hypothesis 1.1 and Hypothesis 2.1 which statistically test each institutional dimension individually against stock exchange performance for South Africa and the USA respectively. As noted, the dimensions are voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL) and control of corruption (CC).

Hypothesis 1.2. and Hypothesis 2.2. tested if the addition of the institutional dimensions assist in explaining stock exchange performance for South African and USA respectively. This was assessed by the comparison of the correlation coefficients of the regression models using the control variable only (i.e. GDP growth rate) and the addition of institutional dimensions that were found to be statistically significant variables in explaining stock exchange performance.

Hypothesis 3 investigated if there is a difference in the way that stock exchange performance reacts to institutional quality changes between the different economy types (i.e. developing and developed).

### **3.1. Hypothesis 1**

Hypothesis 1 was focused on South Africa with tests of each institutional dimension tested individually in Hypothesis 1.1. In addition, Hypothesis 1.2. tested if there is an improvement in explanatory value in a regression model by including statistically significant institutional dimensions.

### 3.1.1. Hypothesis 1.1.

Hypothesis 1.1 has tested whether there is a relationship between the dimensions of institutional quality and stock exchange performance in South Africa. Each institutional dimension was tested individually per Hypothesis 1.1.a to Hypothesis 1.1.f.

#### 3.1.1.1. Hypothesis 1.1.a

The null hypothesis: There is a significant relationship between voice and accountability and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between voice and accountability and stock exchange performance in South Africa.

$$H1.1a_0: p_{ZAF\_VA} \leq 0.05$$

$$H1.1a_a: p_{ZAF\_VA} > 0.05$$

#### 3.1.1.2. Hypothesis 1.1.b

The null hypothesis: There is a significant relationship between political stability and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between political stability and stock exchange performance in South Africa.

$$H1.1b_0: p_{ZAF\_PS} \leq 0.05$$

$$H1.1b_a: p_{ZAF\_PS} > 0.05$$

#### 3.1.1.3. Hypothesis 1.1c

The null hypothesis: There is a significant relationship between government effectiveness and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between government effectiveness and stock exchange performance in South Africa.

$$H1.1c_0: p_{ZAF\_GE} \leq 0.05$$

$$H1.1c_a: p_{ZAF\_GE} > 0.05$$

#### **3.1.1.4. Hypothesis 1.1d**

The null hypothesis: There is a significant relationship between regulatory quality and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between regulatory quality and stock exchange performance in South Africa.

$$H1.1d_0: p_{ZAF\_RQ} < 0.05$$

$$H1.1d_a: p_{ZAF\_RQ} > 0.05$$

#### **3.1.1.5. Hypothesis 1.1e**

The null hypothesis: There is a significant relationship between rule of law and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between rule of law and stock exchange performance in South Africa.

$$H1.1e_0: p_{ZAF\_RL} < 0.05$$

$$H1.1e_a: p_{ZAF\_RL} > 0.05$$

#### **3.1.1.6. Hypothesis 1.1f**

The null hypothesis: There is a significant relationship between control of corruption and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between control of corruption and stock exchange performance in South Africa.

$$H1.1f_0: p_{ZAF\_CC} < 0.05$$

$$H1.1f_a: p_{ZAF\_CC} > 0.05$$

#### **3.1.2. Hypothesis 1.2.**

The null hypothesis: There is no difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in South Africa.

The alternate hypothesis: There is a difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in South Africa.

$$H1.2f_0: R_{ZAF\_Mod1} = R_{ZAF\_Mod2}$$

$$H1.2f_a: R_{ZAF\_Mod1} \neq R_{ZAF\_Mod2}$$

### **3.2. Hypothesis 2**

Hypothesis 2 was focused on the USA with tests of each institutional dimension tested individually in Hypothesis 2.1. In addition, Hypothesis 1.2. tested if there is an improvement in explanatory value in a regression model by including statistically significant institutional dimensions.

#### **3.2.1. Hypothesis 2.1**

Hypothesis 2.1 has tested whether there is a relationship between the dimensions of institutional quality and stock exchange performance in the USA. Each institutional dimension was tested individually per Hypothesis 2.1a to Hypothesis 2.1f.

##### **3.2.1.1. Hypothesis 2.1a**

The null hypothesis: There is a significant relationship between voice and accountability and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between voice and accountability and stock exchange performance in the USA.

$$H1a_0: p_{USA\_VA} < 0.05$$

$$H1a_a: p_{USA\_VA} > 0.05$$

##### **3.2.1.2. Hypothesis 2.1b**

The null hypothesis: There is a significant relationship between political stability and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between political stability and stock exchange performance in the USA.

$$H1b_0: p_{USA\_PS} < 0.05$$

$$H1b_a: p_{USA\_PS} > 0.05$$

### **3.2.1.3. Hypothesis 2.1c**

The null hypothesis: There is a significant relationship between government effectiveness and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between government effectiveness and stock exchange performance in the USA.

$$H1c_0: p_{USA_{GE}} < 0.05$$

$$H1c_a: p_{USA_{GE}} > 0.05$$

### **3.2.1.4. Hypothesis 2.1d**

The null hypothesis: There is a significant relationship between regulatory quality and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between regulatory quality and stock exchange performance in the USA.

$$H1d_0: p_{USA_{RQ}} < 0.05$$

$$H1d_a: p_{USA_{RQ}} > 0.05$$

### **3.2.1.5. Hypothesis 2.1e**

The null hypothesis: There is a significant relationship between rule of law and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between rule of law and stock exchange performance in the USA.

$$H1e_0: p_{USA_{RL}} < 0.05$$

$$H1e_a: p_{USA_{RL}} > 0.05$$

### 3.2.1.6. Hypothesis 2.1f

The null hypothesis: There is a significant relationship between control of corruption and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between control of corruption and stock exchange performance in the USA.

$$H1f_0: p_{USA\_CC} < 0.05$$

$$H1f_a: p_{USA\_CC} > 0.05$$

### 3.2.2. Hypothesis 2.2.

The null hypothesis: There is no difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in the USA.

The alternate hypothesis: There is a difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in the USA.

$$H1.2f_0: R_{USA\_Mod1} \leq R_{USA\_Mod2}$$

$$H1.2f_a: R_{USA\_Mod1} > R_{USA\_Mod2}$$

### 3.3. Hypothesis 3

Hypothesis 3 aimed to address the research question as to whether there are significant differences in the relationship between institutional quality and stock exchange performance between different economy types namely developing (South Africa) and developed (USA).

The null hypothesis: There is no difference in the change of the correlation coefficient between South Africa and the USA when institutional indices are applied in the regression model between institutional quality and stock exchange performance.

The alternate hypothesis: There is a difference in the change of the correlation coefficient between South Africa and the USA when institutional indices are applied in the regression model between institutional quality and stock exchange performance.

$$H3f_0: \Delta R^2_{ModZAF} = \Delta R^2_{ModUSA}$$

$$H3f_a: \Delta R^2_{ModZAF} \neq \Delta R^2_{ModUSA}$$



## Chapter 4: Research methodology

Chapter 4 outlines the research methodology employed to conduct this study, an overview of which is depicted in Figure 4.

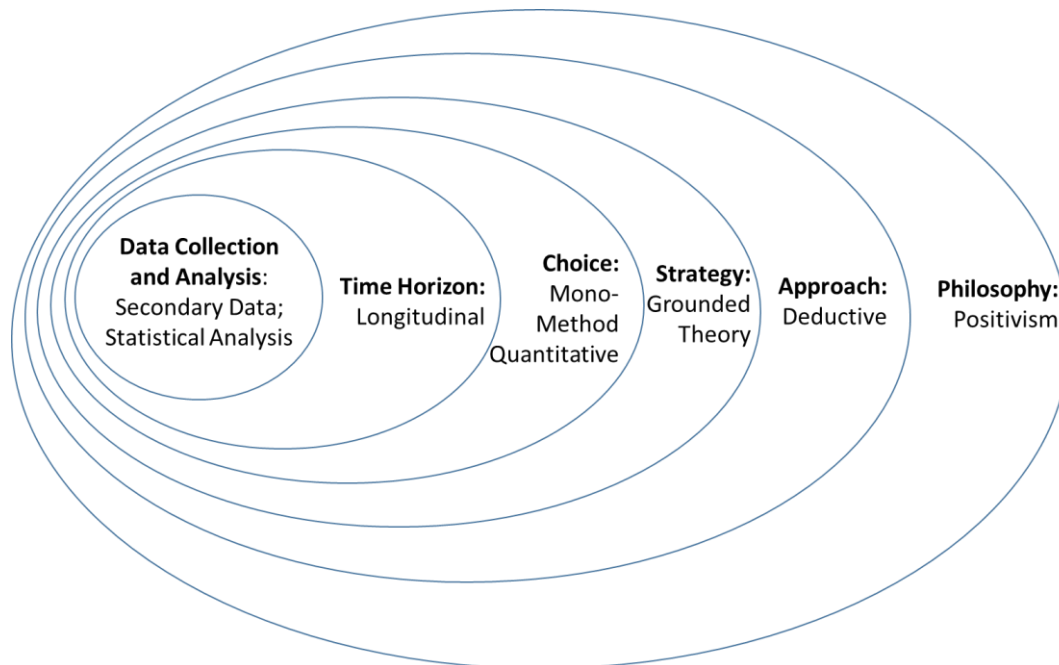


Figure 4: Research onion overview diagram after Saunders, Lewis and Thornhill (2009)

### 4.1. Philosophy and strategy

In the attempt to address the hypotheses of this research study, relationships between observed variables were evaluated using statistical data analysis. The research was undertaken using a positivist philosophy as quantifiable observations and interpretation of data was carried out to develop law-like generalisations (Saunders, Lewis & Thornhill, 2009). The research strategy was based on grounded theory. Grounded theory is used to predict and explain behaviour with an emphasis on developing and building theory (Saunders et al., 2009). The methodological choice was a mono-method quantitative based on statistical analysis of variables from secondary time series data (Saunders et al., 2009).

The study was longitudinal in nature as the variables (institutional quality and stock exchange performance) were measured sequentially over time. The data available for institutional quality indices, the independent variable, spanned from 1996 – 2016 at the time of this research. The research questions required longitudinal study as cross-sectional study does not provide

insight into the effects of variations of institutional quality to the dependent variable, stock exchange performance.

Saunders et al. (2009) distinguish between three study types – exploratory, descriptive and explanatory. Exploratory research aims to seek new insights and obtain a new understanding that was not explored in detail previously. A descriptive study seeks to identify and describe situations and events. Explanatory research is the next step from descriptive research as it seeks to explain why a situation or relationship exists.

This study aimed to identify if a relationship exists between two variables and explored possible reasons for any significant relationships. Furthermore, it built on existing institutional theory, particularly the institutional quality theory. The research design therefore had elements of a descriptive and explanatory design.

Quantitative data consists of numbers and figures. It can either be categorical or numerical (Saunders et al., 2009). This study rested on a quantitative research method which is defined by Antwi and Hamza (2015) as a method which follows a confirmatory scientific method with the aim to test hypotheses and/or theory.

Secondary data is defined as data that has been collected for another purpose outside of the study where the data is reanalysed. Secondary data provides a rich source of information that is often untapped (Saunders et al., 2009). The research design of this study included a quantitative analysis of secondary data gathered from rankings of the quality of institutions and stock exchange performance in the form of the performance of a key index of the largest stock exchange of each country being analysed, namely the JSE All Share Index (ALSI) of South Africa and the NSYE Composite Index (CI) of the USA.

The independent variable of the study was institutional quality. This study employed the WGI dataset of institutional quality measured in six dimensions (Chapter 2.4). The dependent variable was stock exchange performance which was measured through stock exchange indices for each country analysed. These were the JSE and the NYSE where the Johannesburg ALSI and CI were used respectively.

## **4.2. Population and sampling**

The population of the study was all sovereign states represented by a government as these have formal political and economic institutions as well as operating businesses. According to the United Nations, there are 195 countries in the world (UN, 2018). This represents the population of the research study.

Non-probability sampling was used as a result of purposive and convenience sampling being used for practical purposes. Purposive/judgemental sampling is where the researcher's judgement is used to select the sample based on a range of possible reasons and premises while convenience sampling is used to select cases for which data is easiest to obtain for the study (Saunders et al., 2009).

The selected sample was a subset of two countries, one of which is an emerging or developing economy (South Africa) whereas the other was a well-developed economy (USA). A country per economy type has been chosen to test Hypothesis 3 (Chapter 3.3) which seeks to determine if there are differences in the relationship between institutional quality and stock exchange performance across economy types.

To limit bias in the country selection per economy type, the country with the largest stock exchange in terms of market capitalization (Bloomberg, 2018) was chosen for the developed country. This was the USA with the largest stock exchange being the NYSE. South Africa has been chosen for relevance to the local business context for which this research study is undertaken. The largest stock exchange in South Africa is the JSE which has been used for this country.

Both the JSE and NYSE are liquid stock exchanges where investors are able to move money thereby making these examples applicable to test if changes in institutional quality have an effect on stock exchange performance using stock exchange performance as a proxy. Furthermore, each of these stock exchanges report the required data such that the research question could be investigated.

## **4.3. Unit of analysis**

The independent variables of this study were stock exchange performance in the form of the Johannesburg ALSI and the New York CI representing South Africa and USA respectively. These are composite indices measured in points. The dependent variable, institutional quality,

is measured by the WGI as a measure/score from -2.5 to 2.5. with a higher score indicating increased quality (Kaufmann et al., 2008; Kaufmann et al., 2010). The index has been used in similar studies to assess institutional quality determinants (Lehne et al., 2014) and the effects of institutional quality on stock exchanges (Thanh et al., 2016). All the independent and dependent variables were differenced and indexed such that statistical analysis could detect variances in the data as the original format resulted in large differences between the variables being analysed (i.e. decimals to tens of thousands). The rationale and methodology of this is further detailed in Chapter 4.6.

#### **4.4. Data collection process**

The study was a quantitative study which used secondary data. The measurement instruments and data gathering processes were interlinked and have therefore been discussed in a single section below.

##### **i. Quality of Institutions**

There are several measures or indices used to measure the independence or quality of institutions throughout the world (Table 1). According to Voigt (2013) a host of methods have been used in this regard including case studies, natural experiments, institutional analysis and cross country regressions. As noted, the index that has been used for this study is the WGI score compiled by the World Bank. This was chosen as the data and methodology is freely available (The World Bank, 2018) and well documented (Kaufmann et al., 2010). Furthermore, the scores are available for a time period close to current thereby making the scores and findings relevant.

##### **ii. Stock Exchange Performance**

Stock exchange data was retrieved from the CapitalIQ database. Daily close values per stock exchange index was extracted in Microsoft Excel format. The data is an index, the methodology of which is described in Chapter 2.5.

##### **iii. Inflation Data**

Quarterly inflation data, in the form of the consumer price index (CPI), was retrieved from StatsSA (StatsSA, 2018) and the Federal Reserve Bank USA (Federal Reserve Economic Data, 2018) for South Africa and USA respectively where the information is publicly available.

#### **4.5. Analysis approach**

This study used a deductive reasoning approach which emphasizes scientific principles, explanation of causal relationships between variables and a highly structured approach (Saunders et al., 2009). Deductive reasoning is also used when attempting to forecast events after testing hypotheses (Antwi & Hamza, 2015) which was in line with the aim of this study as it tested if stock exchange performance can be explained by variations in institutional quality.

#### **4.6. Data preparation**

Data used in this study include the stock exchange indices and institutional scores per dimension or aspect assessed in the WGI dataset. The steps undertaken to prepare the data for regression modelling is outlined in 4.6.1 and 4.6.2 as well as depicted in Figure 5.

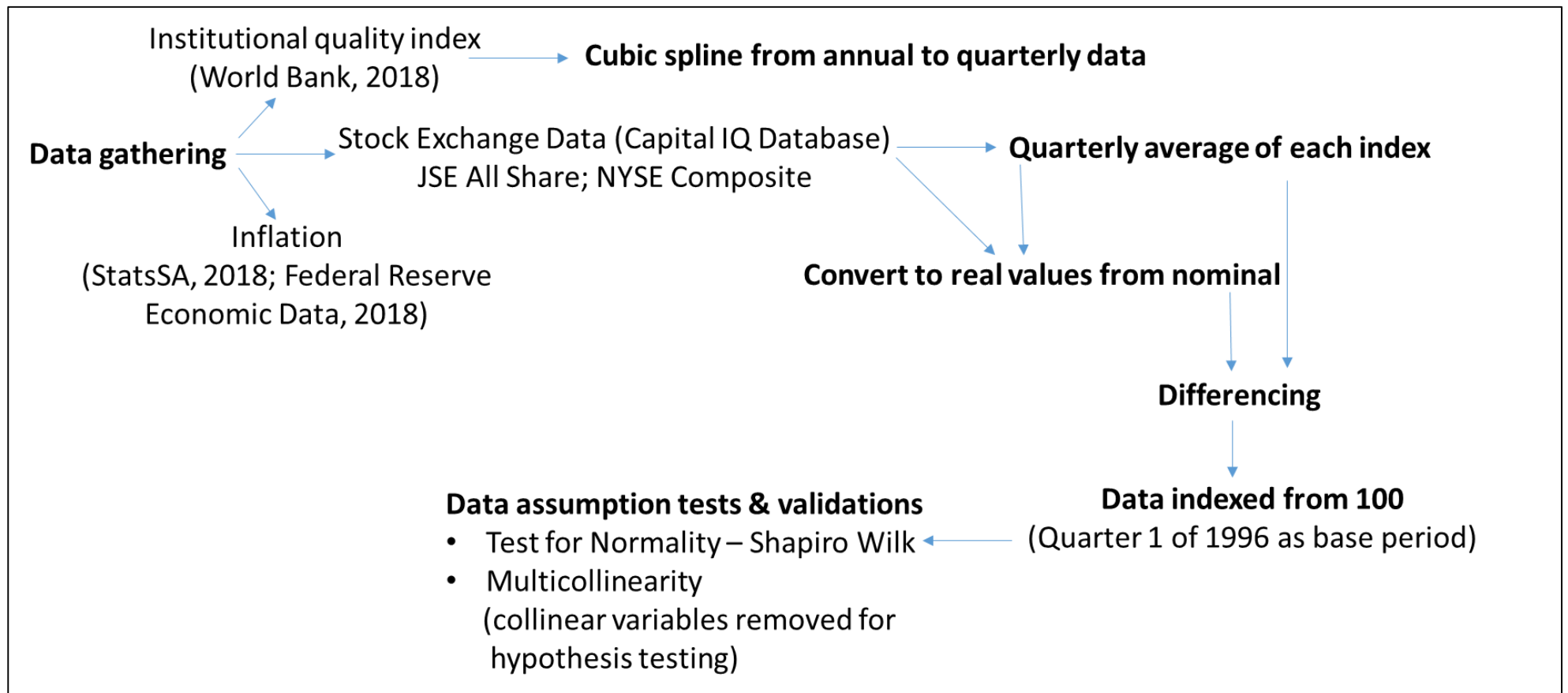


Figure 5. Data preparation methodology for the assessment of the effect of institutional quality on stock exchange performance

#### 4.6.1. Stock exchange indices

This study was conducted on a quarterly time period therefore each index was averaged from daily close values to four quarterly values representing the time periods of January to March, April to June, July to September and October to December termed quarter one to four respectively.

Using the CPI values, the quarterly stock exchange data was then converted from nominal values to real values to remove the effect of inflation over the twenty one year time period of the study. This is required to understand the true variation in the variables being analysed for study. The real values reflect the actual growth or decline of the stock exchange without the influence of confounding inflation rates (Wegner, 2012).

The calculation was undertaken using Equation 1 where  $i$  is the CPI value indexed to 100 using the first quarter of 1996 (the start of this study) as a base period; the observation at time  $t$  is the corresponding CPI observed for the period and the observation at  $t - 1$  is the preceding period value namely the CPI observed for the previous quarter. The real value is then calculated by (Wegner, 2012)

Equation 2 where the nominal value is the stock exchange daily close value. This is a common technique applied in econometrics to assess and compare currency data over periods of time (Wegner, 2012).

Each real stock exchange value was then differenced to observe the quarter on quarter change in value. This technique assists to remove common issues associated with time series data such as seasonality and trends thereby making the dataset more stable (Hyndman & Athanasopoulos, 2013).

The resulting value from Equation 3 is the quarter on quarter difference in real stock exchange values. Using Equation 1, each of these values has been indexed using a consistent base period of the first quarter in 1996.

Equation 1: Percentage difference between time periods

$$i = \frac{Observation(t) - Observation(t - 1)}{Observation(t - 1)} \times 100\%$$

(Wegner, 2012)

Equation 2: Real value calculation by nominal value multiplied by indexed CPI

$$Real\ value = Nominal\ value \times i_{CPI}$$

(Wegner, 2012)

Equation 3: Absolute difference between time periods

$$Difference(t) = Observation(t) - Observation(t - 1)$$

(Hyndman & Athanasopoulos, 2013)

#### **4.6.2. World Governance Indicator dataset**

##### **4.6.2.1. Cubic spline**

At the time of this research, the WGI datasets covered a timespan of 20 years with the first estimate measured in 1996 and the most recent in 2016. However till 2002, estimates were taken every two years. From 2002 onwards, estimates were taken annually. This has resulted in an inconsistent availability of data over the period with 18 data observations per dimension over a period of 21 years. Similarly, the International Country Risk Guide data is measured and reported on an annual basis and cited as a limitation by researchers such as Berggren et al. (2012) as too infrequent. In order to minimise this limitation, the inconsistency of data calls for interpolation in order to provide data points consistently such that an analysis can be undertaken on a regular frequency.

In order to smooth the data and obtain increased observations in line with the stock exchange indices data (dependent variable) for this study, cubic spline interpolation was applied as undertaken by previous researchers (Abid et al., 2016; Boateng, Hua, Nisar & Wu, 2015; Laurini & Moura, 2010). Cubic splines connect data points through a third order polynomial with conditions such that smooth transitions are created as depicted in Figure 6 (Klasson, 2008; Stoer & Bulirsch, 1993).



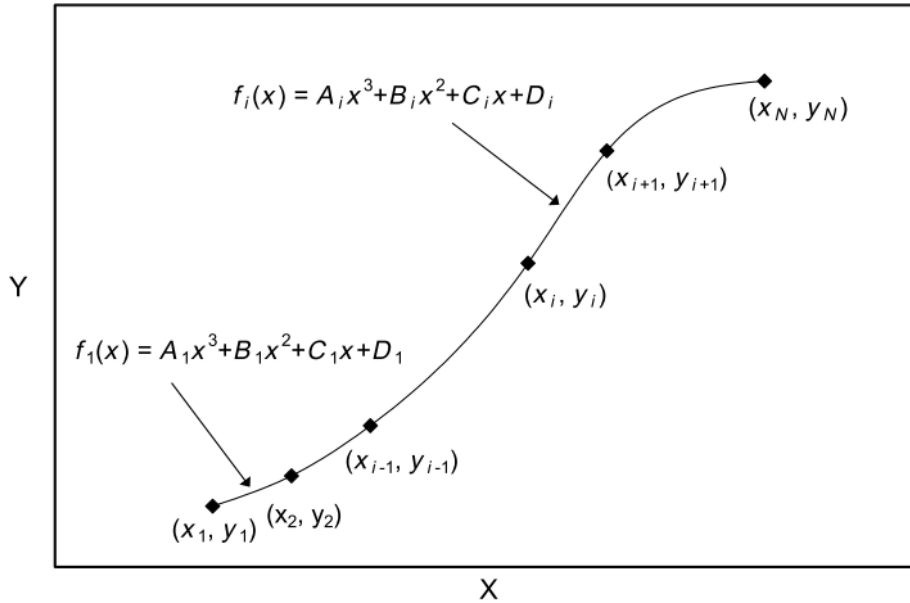


Figure 6: Cubic spline construction (Klasson, 2008)

Following the interpolation of data values from annual to quarterly, the institutional scores per dimension were differenced per the methodology employed in treating the stock exchange data per *Equation 3* (Hyndman & Athanasopoulos, 2018) and indexed using the first quarter of the study period (Quarter One of 1996) as the base value of 100. Cumulative quarter on quarter variability was computed per *Equation 4* where the cumulative change is the change from the initial period being in the study,  $t_0$  for the cumulative change at observation  $t$ .

Equation 4: Cumulative percentage change over time period

$$\text{Cumulative Change} = \frac{\text{Observation}(t) \times 100\%}{\text{Observation}(t_0)}$$

#### 4.6.3. Regression data validation

The assumptions of normality and multicollinearity were tested per 4.6.3.1 and 4.6.3.2. as linear regressions require that these are understood to determine validity and shortcomings of the model (Andrews, Dean, Swain & Cole, 2013; Hair, Black, Babin & Anderson, 2010; Hyndman & Athanasopoulos, 2013; Wegner, 2012).

##### 4.6.3.1. Normality

Parametric tests such as regressions and time series analysis assume normally distributed dependent variables. However, per Yanagihara (2015) regression analyses tend to be more

robust when data are non-normal. The Shapiro-Wilk test (Shapiro & Wilk, 1965) has been undertaken to assess the normality of each of the three dependent variables in this study.

#### **4.6.3.2. Multicollinearity**

Multicollinearity is the occurrence of significant correlation between independent variables in a regression model. The consequences of multicollinearity include distortion and reducing the validity of statistics such that significant relationships are suppressed (Hair et al., 2010).

As noted by Kaufmann et al. (2010), the dimensions that comprise the WGI, which are the independent variables of this study, are not independent of each other due to some of the variables naturally having an effect on others such as a better regulatory environment which is likely to result in reduced corruption. This emphasizes the need to test for multicollinearity of the variables to ensure that the regression model is not marred by variables which are accounted for more than once.

The variance inflation factor (VIF) statistic (*Equation 5*) is used to ascertain if variables are collinear. Collinear variables are identified when the VIF is greater than 10. Collinear variables have been excluded from the hypothesis testing as they do not add value to the models (Andrews et al., 2013) as done in the study of investment and institutional uncertainty undertaken by Brunetti and Weder (1998).

Equation 5: Variance inflation factor

$$VIF = \frac{1}{1 - R^2}$$

(Andrews et al., 2013; Hair et al., 2010)

#### **4.6.3.3. Testing the control variable – GDP growth rate**

There is no consensus as to which variable are stock exchange determinants with a wide variety of variables tested. However there is general consensus that GDP growth has a positive effect on stock exchange performance and development (Ho & Lyke, 2017; Pan & Mishra, 2018; Thanh et al., 2016; Yartey & Adjasi, 2007). GDP growth has therefore been used as a control variable in this study to ensure that the statistical error of omitted variable bias does not occur. GDP growth rate has been tested against each stock exchange tested

(the JSE and NYSE) to ensure that a significantly statistically strong relationship exists to use the variable as a control.

#### **4.6.4. Hypothesis testing methodology**

##### **4.6.4.1. Hypothesis 1.1 and Hypothesis 2.1**

Regression modelling is a statistical technique that quantifies the relationship between response and predictor variables for forecasting or prediction purposes (Wegner, 2012). Hypothesis 1 was tested using simple linear regressions of each independent variable (institutional quality score) against the dependent variable (stock exchange index) repeated per stock exchange being analysed (i.e. JSE ALSI and NYSE CI). The correlation coefficient,  $r^2$ , was determined which described the strength of the relationship between the variables. The significance, denoted by the  $p$  value, described the statistical significance of the relationship and if there is cause to include this variable in a regression model (Andrews et al., 2013; Wegner, 2012).

Following the determination of statistically significant independent variables per dependent variable, a multiple linear regression model was produced which allows for accounting of more than one variable in a model.

A control variable is one which has an already proven established relationship with the dependent variable. Accounting for the control variable allows for a more accurate analysis of the independent and dependent variables being analysed (Wegner, 2012). According to Berggren et al. (2012) there is no consensus regarding the variables that are to be used as controls in growth regressions presenting an area for future research (Chapter 7.5). However, GDP growth rate has been proven to be a control variable for stock exchange performance per several studies (Berggren et al., 2012). As such, GDP growth rate will be used as a control variable in this study with an initial test undertaken to determine the strength of the relationship between GDP growth rate and stock exchange performance.

##### **4.6.4.2. Hypothesis 1.2 and Hypothesis 2.2**

Hypothesis 1.2 and 2.2 aimed to test if there are improvements to the explanatory value of the model when institutional factors are included. This will be undertaken using a comparison of the correlation coefficient of Model 1 and Model 2 which include and exclude institutional quality variables respectively.

#### **4.6.4.3. Hypothesis 3**

Hypothesis 3 aimed to determine if institutional quality factors affect the stock exchanges of developing and developed countries differently. Therefore the correlation coefficient change when adding institutional variables of South Africa and USA will be compared to determine which economy type is most affected by these variables, if at all.

## Chapter 5: Results

### 5.1. Stock exchange indices data preparation

Data preparation of stock exchange indices included averaging daily close values to quarterly values as well as converting from nominal to real to reduce the effects of inflation as depicted per stock exchange index in Figure 7 and Figure 8. The data was then indexed per 4.6.1.

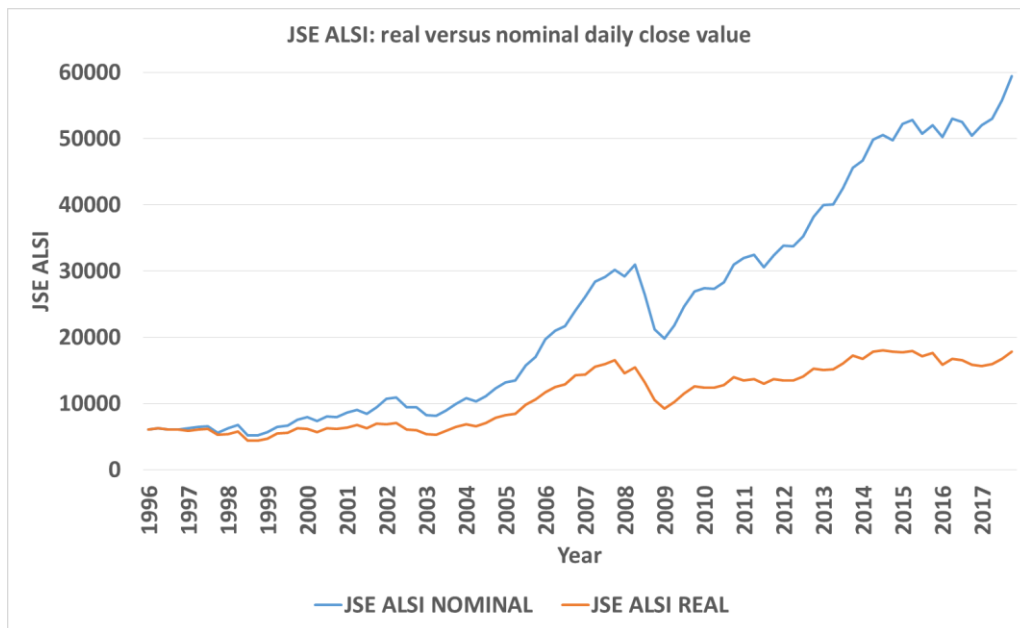


Figure 7: JSE ALSI nominal versus real values

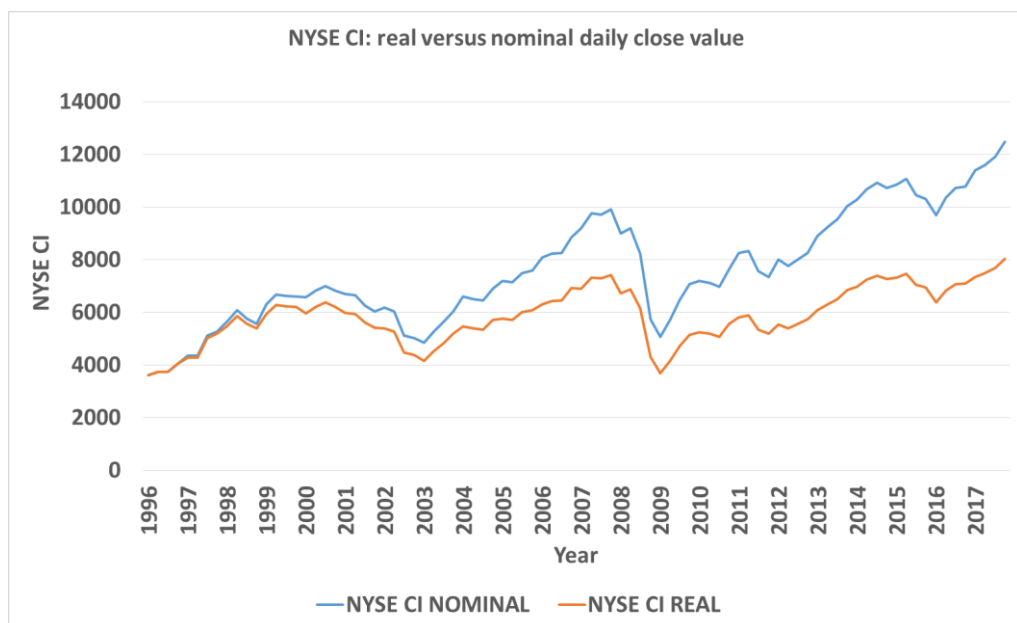


Figure 8: NYSE CI nominal versus real values

## 5.2. Cubic spline of World Governance Indicator dataset

Data points were added from an annually measured score per dimension to quarterly data points as described in 4.6.2.1. The resulting data is depicted in Appendix 9.3. This dataset, converted from annual to quarterly, has been used as the independent variables of the study.

## 5.3. Regression data validation results

### 5.3.1. Normality results

The dependent variables (i.e. the various stock exchange indices) were tested for normality using the Shapiro-Wilk test. The results are summarised in Table 2. The results indicate that the dependent variables are non-normal as the p values (Sig.) less than 0.05. This is a common occurrence with economic data as real-life observations are often not normally distributed.

Table 2: Shapiro-Wilk normality test results for each dependent variable

Variable	Statistic	df	Sig.	Conclusion
JSE ALSI	0.882	89	0.00	Non-normal
NYSE CI	0.928	89	0.00	Non-normal

### 5.3.2. Multicollinearity results

Multicollinearity tests were undertaken per country to determine which variables are correlated which has the potential to introduce inaccuracy. The results of the multicollinearity tests are summarised per stock exchange index in Table 3 and Table 4. Each table depicts the collinearity statistic VIF prior to the removal of variables where an assessment was done between each of the WGI dimensions and the control variable, GDP growth rate to determine any overlap of these variables against each other. The second column, VIF (post removal of variables) shows the outcome of the VIF statistic after removing variables that are found to be collinear with other variables as identified where the  $VIF > 10$ . Where the growth rate  $VIF > 10$ , this is ignored and not removed as it is the control variable which is shown to have a relationship with stock exchange performance (Chapter 2.6). The remaining variables that are not removed post the multicollinearity VIF test have been used in the regression model. Collinear variables do not add value to a regression model and distort the effects of other variables that affect the dependent variable.

Table 3: South Africa multicollinearity test results with VIF per variable (prior to removal of variable and post removal of variable)

Variable	VIF (prior to removal of variables)	VIF (post removal of variables)
ZAF_GDP	32.031	4.253
VA	13.794	Removed
PS	6.355	2.761
GE	16.081	Removed
RQ	2.645	1.863
RL	2.077	1.661
CC	10.375	Removed

Table 4: USA multicollinearity test results with VIF per variable (prior to removal of variable and post removal of variable)

Variable	VIF (prior to removal of variables)	VIF (post removal of variables)
USA_GDP	11.741	6.668
VA	15.012	Removed
PS	2.908	2.876
GE	5.546	5.263
RQ	4.908	4.618
RL	3.982	3.973
CC	7.665	4.229

#### 5.4. GDP growth rate vs stock exchange performance – control variable results

Statistical testing of the control variable, GDP growth rate, was undertaken to ensure that its use is valid. The results are provided in Table 5.

Table 5: Control variable correlations: GDP growth rate versus stock exchange performance

Country	R	Sig.
ZAF	0.944	0.00
USA	0.607	0.00

## 5.5. Hypothesis 1 results

### 5.5.1. Hypothesis 1.1 results

As outline in Chapter 4.6.3.2, non-collinear variables will be used to test the hypotheses as these meet data validation conditions. For South Africa, the non-collinear variables were found to be PS, RQ and RL (Table 6).

Table 6: South Africa JSE ALSI correlation coefficient and significance per non-collinear independent variable (institutional dimension)

Variable	Correlation Coefficient	Sig.	Hypothesis Test Outcome
PS	0.65	0.00	Accept
RQ	-0.54	0.00	Accept
RL	-0.56	0.00	Accept

In line with the results above, the tested hypotheses results are as follows:

#### 5.5.1.1. Hypothesis 1.1.b results

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between political stability and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between political stability and stock exchange performance in South Africa.

$$H1.1b_0: p_{ZAF\_PS} \leq 0.05$$

$$H1.1b_a: p_{ZAF\_PS} > 0.05$$

The study accepts the null hypothesis that there is a significant relationship between PS and stock exchange performance in South Africa as  $p_{ZAF\_PS} \leq 0.05$ .

#### 5.5.1.2. Hypothesis 1.1.d results

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between regulatory quality and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between regulatory quality and stock exchange performance in South Africa.



$$H1.1d_0: p_{ZAF\_RQ} < 0.05$$

$$H1.1d_a: p_{ZAF\_RQ} > 0.05$$

The study accepts the null hypothesis that there is a significant relationship between RQ and stock exchange performance in South Africa as  $p_{ZAF\_RQ} \leq 0.05$ .

### **5.5.1.3. Hypothesis 1.1.e results**

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between rule of law and stock exchange performance in South Africa.

The alternate hypothesis: There is no significant relationship between rule of law and stock exchange performance in South Africa.

$$H1.1e_0: p_{ZAF\_RL} < 0.05$$

$$H1.1e_a: p_{ZAF\_RL} > 0.05$$

The study accepts the null hypothesis that there is a significant relationship between RL and stock exchange performance in South Africa as  $p_{ZAF\_RL} \leq 0.05$ .

### **5.5.2. Normal P-P plots per tested variable in South Africa**

The normal P-P plot per variable that was tested in the hypothesis testing is provided as a further data validation check. Per Wilk and Gnanadesikan (1968), when the data plots closely along a perfect linear line, there is minimal

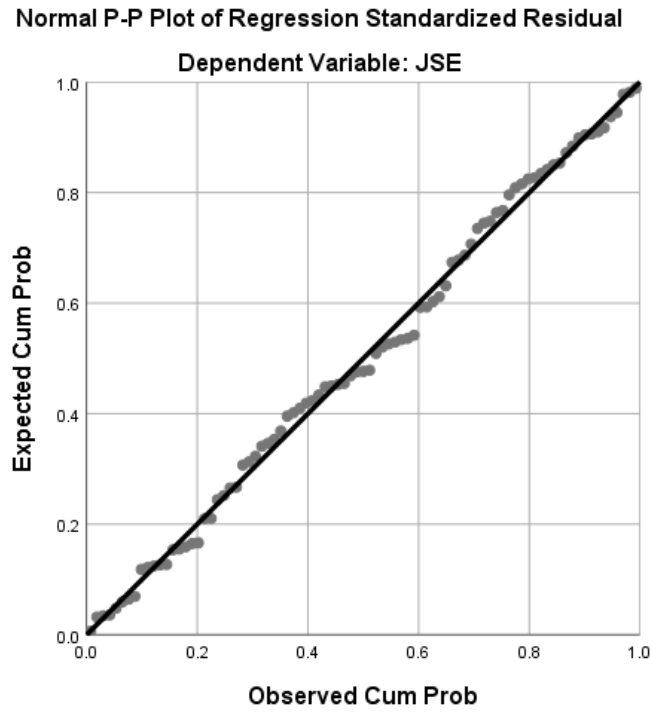


Figure 9: Normal P-P plot of regression standardized residuals (PS vs JSE ALSI)

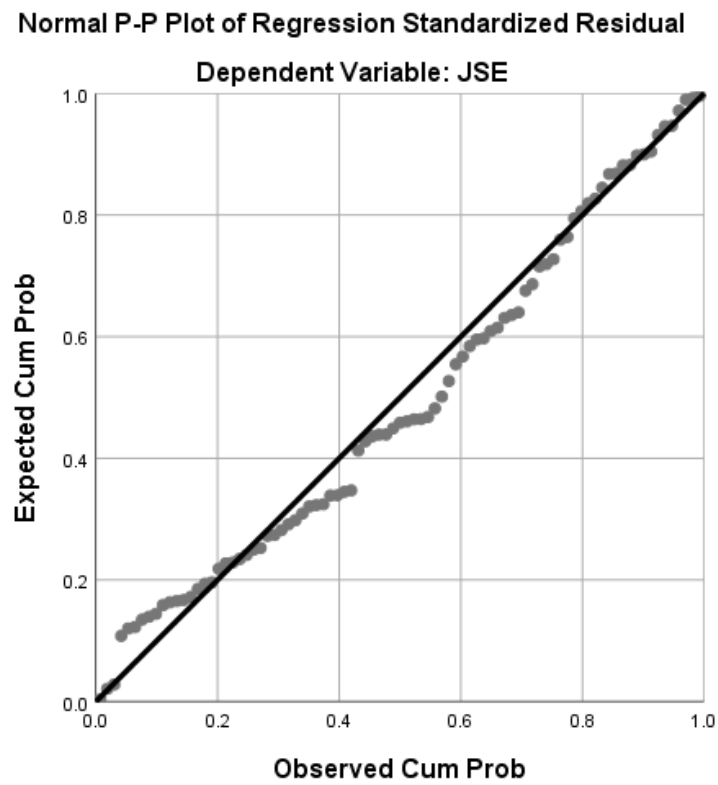


Figure 10: Normal P-P plot of regression standardized residuals (RQ vs JSE ALSI)

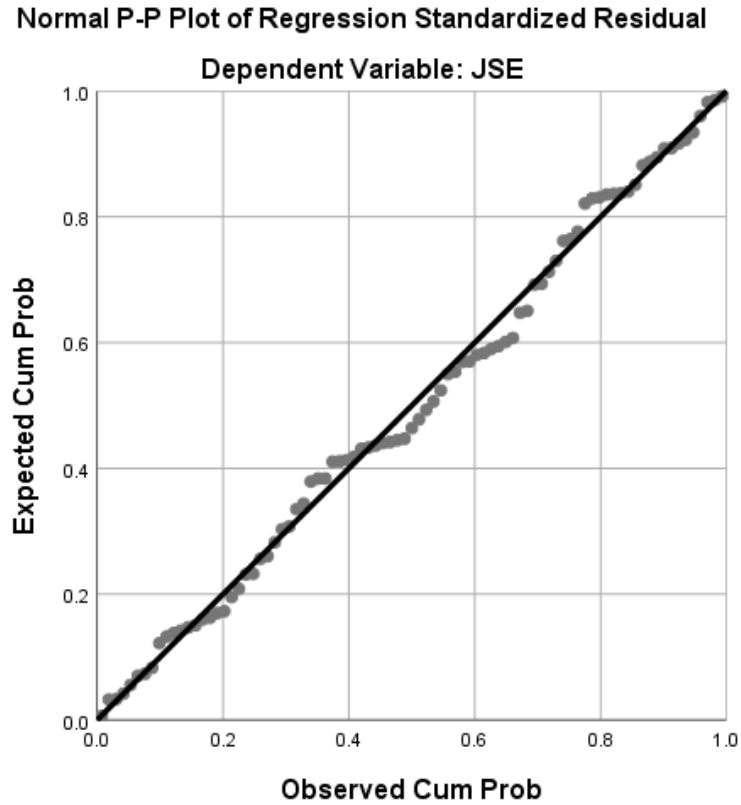


Figure 11: Normal P-P plot of regression standardized residuals (RL vs JSE ALSI)

### 5.5.3. Hypothesis 1.2 results

Hypothesis 1.2 tested if there is an improvement in the model when the addition of valid statistically significant institutional quality variables are included in South Africa.

Table 7: South Africa Model 1 (control variable GDP growth only) and Model 2 (non-collinear institutional variables included) statistical test results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change
1	0.94	0.89	0.89	25.01	0.89
2	0.96	0.91	0.91	22.77	0.02

Table 8: South Africa Model 1 (control variable GDP growth only) and Model 2 (institutional variables included) coefficient details for regression modelling

Model	Unstandardized Coefficients			Standardized Coefficients	Sig.	Correlations		VIF
	Variable	B	Std. Error	Beta		Partial	Part	
1	ZAF_GDP	0.90	0.03	0.94	0.00	0.94	0.94	1.00
2	ZAF_GDP	0.73	0.06	0.77	0.00	0.78	0.37	4.25
	ZAF_PS	0.21	0.09	0.13	0.02	0.26	0.08	2.76
	ZAF_RQ	-0.46	0.10	-0.20	0.00	-0.44	-0.15	1.84
	ZAF_RL	0.01	0.04	0.01	0.85	0.02	0.01	1.66

The hypothesis tested was the following:

The null hypothesis: There is no difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in South Africa.

The alternate hypothesis: There is a difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in South Africa.

$$H1.2f_0: R_{ZAF\_Mod1} = R_{ZAF\_Mod2}$$

$$H1.2f_a: R_{ZAF\_Mod1} \neq R_{ZAF\_Mod2}$$

The study rejects the null hypothesis that there is no difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in South Africa in favour of the alternate hypothesis stating that there is a difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in South Africa.

## 5.6. Hypothesis 2 results

### 5.6.1. Hypothesis 2.1. results

As outline in Chapter 4.6.3.2, non-collinear variables will be used to test the hypotheses as these meet data validation conditions. For the USA, the non-collinear variables were found to be PS, GE, RQ, RL and CC (Table 9).

Table 9: USA NYSE CI correlation coefficient and significance per independent variable (institutional dimension)

Variable	Correlation Coefficient	Sig.	Hypothesis Test Outcome
PS	-0.03	0.76	Reject
GE	-0.23	0.31	Reject
RQ	-0.09	0.39	Reject
RL	0.49	0.00	Accept
CC	-0.36	0.00	Accept

In line with the results above, the tested hypotheses results are as follows:

#### 5.6.1.1. Hypothesis 2.1b results

The study rejects the null hypothesis that there is a significant relationship between PS and stock exchange performance in the USA in favour of the alternate hypothesis that there is no significant relationship between PS and stock exchange performance in the USA as  $p_{USA\_PS} > 0.05$ .

#### 5.6.1.2. Hypothesis 2.1c results

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between political stability and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between political stability and stock exchange performance in the USA.

$$H1b_0: p_{USA\_PS} < 0.05$$

$$H1b_a: p_{USA\_PS} > 0.05$$

The study rejects the null hypothesis that there is a significant relationship between GE and stock exchange performance in the USA in favour of the alternate hypothesis that there is no significant relationship between GE and stock exchange performance in the USA as  $p_{USA\_GE} > 0.05$ .

### 5.6.1.3. Hypothesis 2.1d results

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between regulatory quality and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between regulatory quality and stock exchange performance in the USA.

$$H1d_0: p_{USA,RQ} < 0.05$$

$$H1d_a: p_{USA,RQ} > 0.05$$

The study rejects the null hypothesis that there is a significant relationship between RQ and stock exchange performance in the USA in favour of the alternate hypothesis that there is no significant relationship between RQ and stock exchange performance in the USA as  $p_{USA,RQ} > 0.05$ .

### 5.6.1.4. Hypothesis 2.1e results

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between rule of law and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between rule of law and stock exchange performance in the USA.

$$H1e_0: p_{USA,RL} < 0.05$$

$$H1e_a: p_{USA,RL} > 0.05$$

The study accepts the null hypothesis that there is a significant relationship between RL and stock exchange performance in the USA as  $p_{USA,RL} \leq 0.05$ .

### 5.6.1.5. Hypothesis 2.1f results

The following hypothesis was tested:

The null hypothesis: There is a significant relationship between control of corruption and stock exchange performance in the USA.

The alternate hypothesis: There is no significant relationship between control of corruption and stock exchange performance in the USA.

$$H1f_0: p_{USA\_CC} < 0.05$$

$$H1f_a: p_{USA\_CC} > 0.05$$

The study accepts the null hypothesis that there is a significant relationship between CC and stock exchange performance in the USA as  $p_{USA\_CC} \leq 0.05$ .

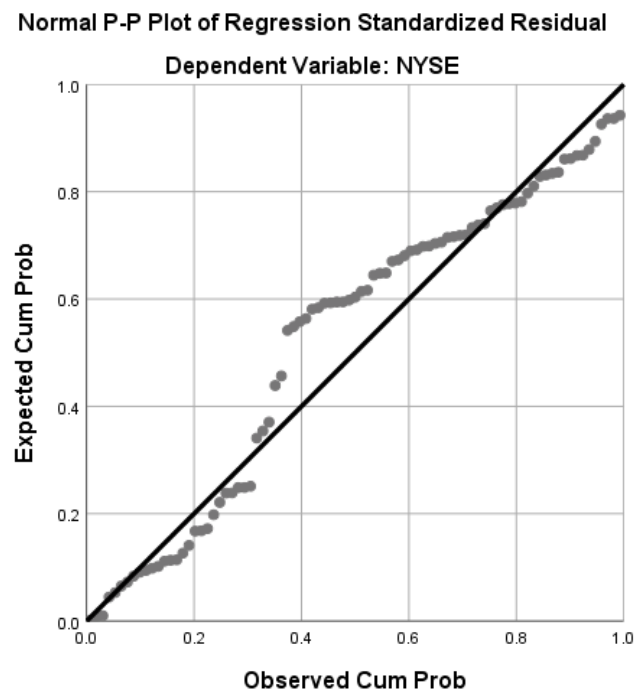


Figure 12: Normal P-P plot of regression standardized residuals (PS vs NYSE CI)

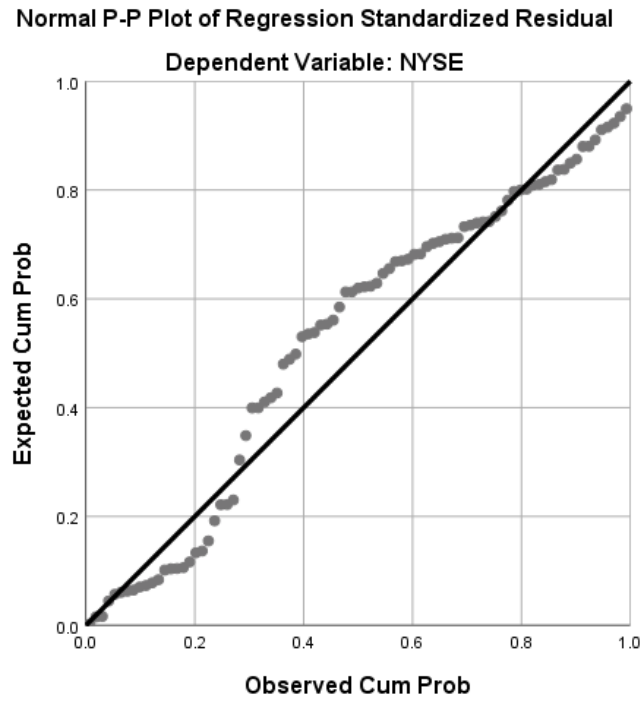


Figure 13: Normal P-P plot of regression standardized residuals (GE vs NYSE CI)

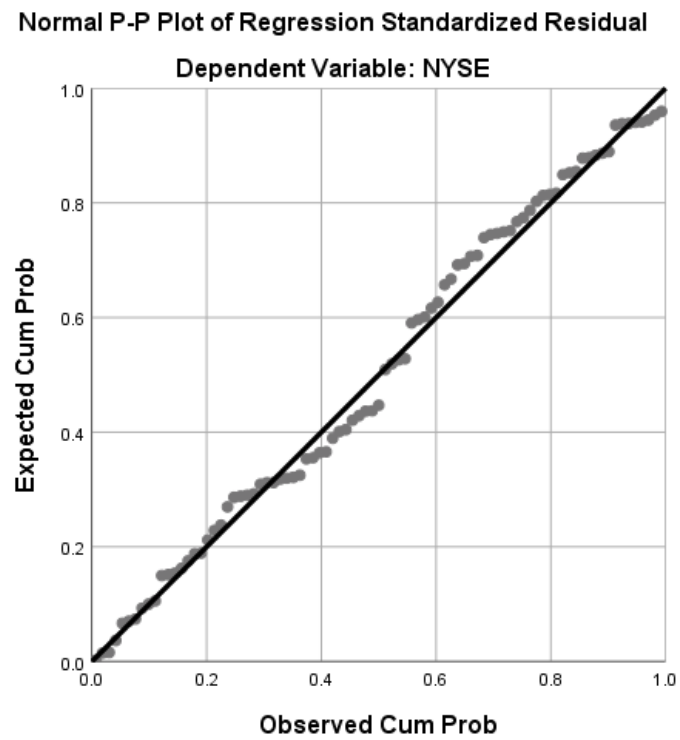


Figure 14: Normal P-P plot of regression standardized residuals (RQ vs NYSE CI)



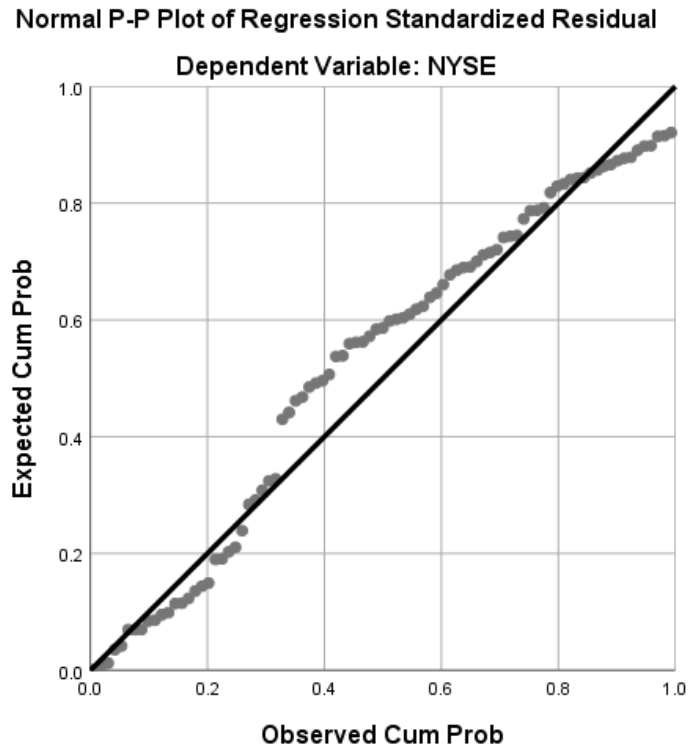


Figure 15: Normal P-P plot of regression standardized residuals (RL vs NYSE CI)

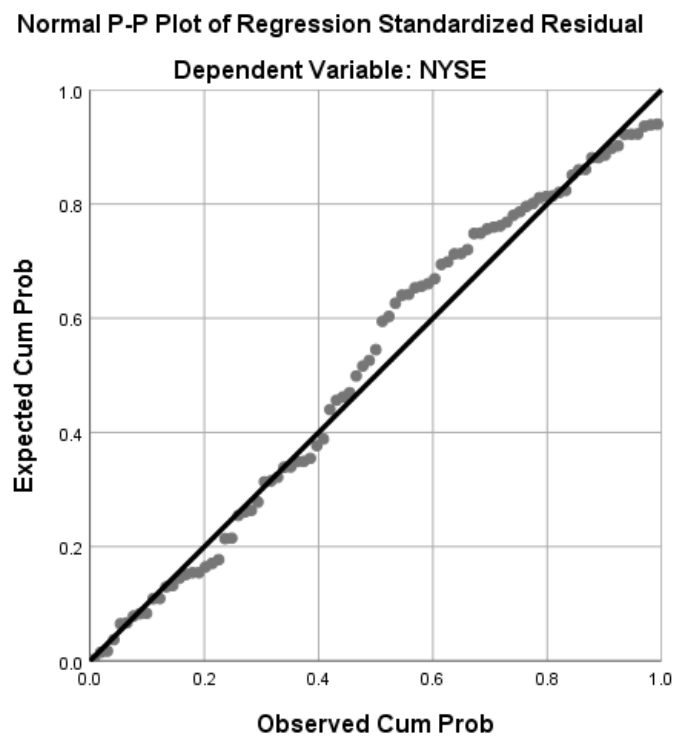


Figure 16: Normal P-P plot of regression standardized residuals (CC vs NYSE CI)

### 5.6.2. Hypothesis 2.2 results

Hypothesis 2.2 tested if there is an improvement in the model when the addition of valid statistically significant institutional quality variables are included in the USA.

Table 10: USA Model 1 (control variable GDP growth only) and Model 2 (institutional variables included) statistical test results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change
1	0.61	0.37	0.36	22.86	0.37
2	0.69	0.48	0.46	21.00	0.11

Table 11: USA Model 1 (control variable GDP growth only) and Model 2 (institutional variables included) coefficient details for regression modelling

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.	Correlations		VIF
		B	Std. Error	Beta		Partial	Part	
1	USA_GDP	0.16	0.02	0.61	0.00	0.61	0.61	1.00
2	USA_GDP	0.19	0.03	0.70	0.00	0.55	0.48	2.13
	USA_RL	3.20	0.81	0.42	0.00	0.40	0.31	1.83
	USA_CC	0.95	0.29	0.43	0.00	0.33	0.26	2.83

The hypothesis tested was the following:

The null hypothesis: There is no difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in the USA.

The alternate hypothesis: There is a difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in the USA.

$$H1.2f_0: R_{USA\_Mod1} \leq R_{USA\_Mod2}$$

$$H1.2f_a: R_{USA\_Mod1} > R_{USA\_Mod2}$$

The study rejects the null hypothesis that there is no difference between the correlation coefficient of Model 1 (no institutional dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in the USA in favour of the alternate hypothesis stating that there is a difference between the correlation coefficient of Model 1 (no institutional

dimension variables) and Model 2 (inclusion of non-collinear statistically significant variables) in the USA.

### 5.7. Hypothesis 3 results

Hypothesis 3 aimed to address the research question as to whether there are significant differences in the relationship between institutional quality and stock exchange performance between different economy types namely developing (South Africa) and developed (USA), the results of which are provided in Table 12.

Table 12: Model 2 multiple regression variables and change in correlation coefficient per country

Country	Variables	Change in R
ZAF	ZAF_RQ	0.022
	ZAF_RL	
	ZAF_PS	
USA	USA_RL	0.111
	USA_CC	

$$\begin{aligned}
 \Delta R^2_{ModZAF} - \Delta R^2_{ModUSA} \\
 &= 0.022 - 0.111 \\
 &= -0.089
 \end{aligned}$$

The following hypothesis was tested:

The null hypothesis: There is no difference in the change of the correlation coefficient between South Africa and the USA when institutional indices are applied in the regression model between institutional quality and stock exchange performance.

The alternate hypothesis: There is a difference in the change of the correlation coefficient between South Africa and the USA when institutional indices are applied in the regression model between institutional quality and stock exchange performance.

$$H3f_0: \Delta R^2_{ModZAF} = \Delta R^2_{ModUSA}$$

$$H3f_a: \Delta R^2_{ModZAF} \neq \Delta R^2_{ModUSA}$$

Based on the difference of -0.089, the study rejects the null hypothesis that there is no difference in the change of the correlation coefficient between South Africa and the USA when institutional indices are applied in the regression model between institutional quality and stock

exchange performance in favour of the alternate hypothesis that there is a difference in the change of the correlation coefficient between South Africa and the USA when institutional indices are applied in the regression model between institutional quality and stock exchange performance.

## **Chapter 6: Discussion**

This chapter discusses the results outlined in Chapter 5 by making use of pertinent literature and existing theory as described in the literature review. The discussion seeks to gain an understanding and insight into the results by assessing it against the research questions.

### **6.1. Normality tests**

The dependent variables were found to be non-normal according to the Shapiro-Wilk normality test. Due to the fact that the dependent variable has already been transformed by indexing, no further transformations have been undertaken to preserve the integrity of the data and to limit accumulated error.

As noted by Bland (1996) confidence intervals for transformed data are difficult to interpret. This is echoed by Osborne (2002) who notes that data transformations alter the fundamental nature of the data complicating interpretation. Furthermore, per Yanagihara (2015) linear regression analyses tend to be more robust than other parametric tests when the data is non-normal.

In addition, P-P plots produced for each variable against the respective stock exchange (i.e. JSE ALSI or NYSE CI) have produced results which indicate that the data can be analysed using regression as that data points align in a linear fashion (Figure 9 to Figure 16). This indicates that there are minimal discrepancies in the middle of the data which allows for parametric statistical testing (Wilk & Gnanadesikan, 1968).

### **6.2. WGI institutional variables**

#### **6.2.1. WGI methodology**

The WGI dataset comprises six dimensions, each of which reflect a sphere of governance and/or institutional quality. Several questions or limitations can be drawn from the methodology used to determine the WGI scores as outlined in Chapter 2.5. The scores are a composite from several sources including perception surveys, other indices and views of country analysts. A wide range of data sources can counter biases however each of the data sources may pose its own limitations regarding biases or inaccuracy. However per Kaufmann et al. (2010) imprecision in such ratings are unavoidable.

### 6.2.2. Multicollinearity of institutional variables

Kaufmann et al. (2010) note that the dimensions are not necessarily independent of each other due to the fact that many of these areas are naturally interrelated with each other. It is therefore unsurprising to note that variables have been found to be collinear with VIF values greater than 10 produced in the multicollinearity results obtained. The collinear variables are listed in Table 13.

Table 13: Collinear/related WGI dimensions per country

Country	Variable
	VA
ZAF	GE
	CC
USA	VA

This results in a potential question regarding the validity of the composite score produced by the WGI. The composite score would be distorted by accounting for the dimensions represented by the collinear variables more than once. This study has therefore studied each variable separately and removed collinear variables to eliminate this statistical error.

There are more collinear variables in South Africa than in the USA indicating that spheres or dimensions of governance and institutions are more interrelated in South Africa. According to Hoskisson et al. (2010) government and societal influences are more pronounced in emerging markets as opposed to developed economies suggesting that more areas are likely to be inter-related and influenced by institutions. Furthermore, governments in emerging economies tend to enforce greater control than in developed economies. Therefore it is unsurprising that more spheres of governance are more interrelated in the developing country or emerging market context (Ang, 2016; Boubaker & Nguyen, 2014; Hartwell, 2017). This finding represents an area for future research (Chapter 7.5). Furthermore, this provides evidence that the position of several authors (Aidt et al., 2008; Ang, 2016; Marquis & Raynard, 2015) who assert that developing and developed countries differ in terms of institutional environments and the resulting strategies to be undertaken by businesses in these distinctive environments.

In addition, South Africa is a unique developing environment where social redress of previous human rights violations are being addressed by the government therefore it is unsurprising that institutional quality variables are increasingly interrelated as the government is more involved and active in various areas or spheres within the socio-political context in order to

implement reforms. Examples include the redistribution of land and economic empowerment legislation in the form of employment equity among others.

The finding that more areas of institutional quality are interrelated in a developing economy leads to the assumption that institutional theory is more pertinent as an influencing factor in emerging economies whereas the resource based view of the firm is more pertinent in developed economies, a view supported by Peng et al. (2009). In line with this, Marquis and Raynard (2015) propose three mechanisms based on institutional strategy that organisations can use to navigate the emerging economy environment namely relational, infrastructure-building and socio-cultural bridging. The authors note that these strategies are useful when entering a new market, particularly an emerging market environment.

### **6.3. GDP growth rate control variable**

GDP growth rate is a commonly used control variable for stock market development, it has been used and proven to have a robust enough statistically significant relationship with stock market development (Abid et al., 2016; Berggren et al., 2012; Brunetti & Weder, 1998; Thanh et al., 2016; Yang, 2011) and has therefore been used as a control variable for both South Africa and the USA. As such, it has been retained in the multivariate regression model for both South Africa and USA when analysing the institutional quality dimension independent variables although having a VIF > 10 in the multicollinearity test undertaken implying that it is a collinear variable (Andrews et al., 2013). However, the VIF post removal of collinear variables indicate that GDP VIF < 10 meaning that the interrelated variables were removed and GDP is a valid variable upon removing other collinear variables per Table 13.

There is no consensus as to the determinants of the stock market performance (Ho & lyke, 2017). A host of additional variables have been tested in varying combinations as stock market determinants in a variety of economies. These variables include GDP, GDP per capita, real income level, saving rate, private capital flows, inflation and corporate governance among others (Ho & lyke, 2017; Thanh et al., 2016). While GDP growth and stock market development have been shown to be positively correlated in prior studies (Thanh et al., 2016) as well as this one, a shortcoming exists in the fact that significant correlation does not imply causality (Wegner, 2012). As GDP growth has been used interchangeably as a causal factor (Thanh et al., 2016) or resulting factor (Abid et al., 2016) of stock market development in various countries or regions being analysed, it is likely that it has a complex multi-directional relationship with stock market development. Therefore, studies to hone down which variables

result in stock market development, and to what extent, are required in the South African context to ensure that control variables are all accounted for and accurate (Chapter 7.5).

#### **6.4. Hypothesis 1.1**

Hypothesis 1.1 focused on emerging economies using South Africa as a case study. Each institutional variable (the independent variable) that was found to be non-collinear, therefore valid for the model, were analysed against stock exchange performance (the dependent variable) to determine which have significant relationships to be included in a model to explain the effects of institutional quality on stock exchange performance. The remaining non-collinear variables were PS, RQ and RL, all of which were found to have statistically significant relationships with the South African JSE ALSI.

PS was found to have a statistically positive relationship with the JSE ALSI meaning that with increased political stability, there is improved performance of the stock exchange. This is an expected outcome as business prefers stable environments without interruption to conduct business activity. This is in line with the findings of the study conducted by Thanh et al. (2016) in Vietnam.

On the other hand, both RQ and RL were found to have statistically significant inverse relationships with the JSE ALSI implying that the stock exchange performs better when these factors are in fact deteriorating. These parameters both reflect the legal framework and enforcement of rules and laws in the country respectively (Chapter 2.5). This finding indicates that businesses on the stock exchange thrive in environments of weak or deteriorating regulation and law enforcement. This signals that businesses may also leverage of weak law enforcement and decreased regulation. These conditions may offer increased freedom for business decisions, innovation without hindering legislation and the possibility that non-compliance to law is not addressed.

However, Thanh et al. (2016) found that in Vietnam the factors RQ and RL are positively correlated with stock exchange performance. In addition, CC was also found to have a statistically significant relationship with stock exchange performance whereas this was not found in this study using South Africa as an example. This indicates that not all emerging or developing countries react to institutional quality variables in the same manner. There may be other contextual factors that determine the way in which a country's stock exchange reacts to institutional variables as opposed to whether it is in a developing or developed nation.



## 6.5. Hypothesis 1.2

Hypothesis 1.2 focused on emerging economies, using South Africa as a case study, by comparing if the regression model using GDP growth rate as a control factor against stock exchange performance is enhanced by adding institutional quality variables. As noted, the variables included in the test were those found to be non-collinear namely PS, RQ and RL.

Indeed, the addition of the independent institutional quality variables enhanced the models applicability in accounting for or explaining the performance of the stock exchange. This is evident as the correlation metrics, R and R<sup>2</sup>, were both improved, albeit marginally, from 0.94 to 0.96 and 0.89 and 0.91 respectively (Table 7).

The results prove that institutional variables, PS, RQ and RL are statistically significant factors that affect stock exchange performance in developing countries such as South Africa. However, the variables do not affect the stock exchange in the same way with PS having a positive relationship while RQ and RL have inverse relationships. This is supportive of Ang (2016), Glaeser et al. (2004), who stresses that financial market development is a precursor to strengthen institutions as was the case in China which has performed remarkably financially and less so regarding institutional development.

Berggren et al. (2012) differentiates between positively and negatively trended instability, the former of which can spur confidence in an economy. The results of this study are aligned to this theory due to the fact that increasing exposure of corruption in recent years in the country has both created an unstable institutional environment as well as improved transparency. Therefore while RL in South Africa has been decreasing, the increasing transparency may spur confidence and therefore stock exchange development. As noted by Berggren et al. (2012), improvements in institutional quality requires changes which entail instability. Hartwell (2017) also notes that institutional volatility is related to financial volatility which is more pronounced in a transition context implying that the relationship of institutional variables on financial performance is not straightforward. There are several proponents of financial and economic development as a precursor to institutional strengthening (Barro, 1999; Glaeser et al., 2004; Lipset, 1959). However, this is a preliminary finding which requires further research as outlined in Chapter 7.5.

It is also in contrast of institutions as a primary driver of economic growth as proposed by several authors (Acemoglu et al., 2005; Acemoglu et al., 2014; Chong & Calderon, 2000; Peng et al., 2009; Rodrik et al., 2004). This is because a lack of RL and RQ imply weak institutions

(Meyer et al., 2008; Rottig, 2016) with voids however the stock exchange performance is still positive despite these conditions. This is in agreement with both Ang (2016) and Lehne et al. (2014) who propose that financial sectors require development to spur institutional improvements. Therefore, other growth models such as Neoclassical Growth Theory (Solow, 1956) may be pertinent in explaining economic growth as such models take several factors into account (Grinshpan, 2017; Raa & Shestalova, 2011; Solow, 1956).

In addition, further contextual theories regarding economic growth may be valid or be contributing factors such as theories those based on varying geography (Gallup & Sachs, 1998), culture (Alesina & Giuliano, 2015) and political systems (Lehne et al., 2015), all of which differ within the categories of developing and developed countries. The contrast of the findings of this study and the effect of institutional quality parameters undertaken by Thanh et al. (2016) in Vietnam point to contextual factors as well due to the fact that both countries are developing however the effect of institutional quality parameters differ between the countries.

#### **6.6. Hypothesis 2.1**

Hypothesis 2.1 focused on developed countries, using the USA as a case study, to determine which institutional quality variables (the independent variable) that were found to be non-collinear have a statistically significant relationship with stock exchange performance (the NYSE CI). All non-collinear were variables tested namely PS, GE, RQ, RL and CC. PS, GE and RQ were found to not be statistically significant to the performance of the stock exchange while RL and CC were found to be statistically significant. This indicates that the stock exchange performance is dependent on RL which deals with the enforcement of laws and not on the RQ being the formation and implementation of policies and regulations. This may be due to the fact that in developed countries, parameters such as PS, GE and RQ are all anchors of the economy and regarded as inherent. These therefore do little in causing variation of the stock exchange or business performance. On the other hand, variables such as RL and CC are issues even in developed countries with their variations being correlated with the stock exchange performance.

RL was found to have a positive statistically significant relationship with stock exchange performance indicating that increased enforcement of law is aligned to increased stock exchange performance. CC, on the other hand, was found to have a statistically significant inverse relationship with stock exchange performance indicating that decreased control of corruption results in increased stock exchange performance. This may be due to businesses leveraging of corruption to gain advantage.

### **6.7. Hypothesis 2.2**

Hypothesis 2.2 focused on developed economies, using the USA as a case study, by comparing if the regression model using GDP growth rate as a control factor against stock exchange performance is enhanced by adding institutional quality variables. As noted, the variables included in the test were those found to be non-collinear namely RL and CC.

The addition of the institutional quality variables, RL and CC, which were found to be non-collinear and therefore valid for the model, enhanced the model's explanation of stock exchange performance. Correlation metrics, R and  $R^2$ , increased from 0.61 to 0.69 and 0.37 to 0.48 respectively (Table 10). The results prove that institutional variables, RL and CC, are statistically significant factors that affect stock exchange performance in developed countries such as the USA. However, increased research must be undertaken to verify the results including rigorous analysis to determine control factors for stock exchange performance in the USA and other developed countries.

### **6.8. Hypothesis 3**

Hypothesis 3 tested whether institutional quality variables affect one economy type (i.e. developing versus developed) more than the other. The addition of the institutional quality variables in each country's regression model of GDP growth rate (control factor), institutional quality variables (independent variables) against stock exchange performance (dependent variable) indicate that institutional quality variables are more pertinent in developed countries like the USA than developing countries like South Africa. This is seen as the addition of the institutional quality variables in the USA model creates a larger change in correlation than in the South Africa model indicating that the effect in the USA model is greater.

This finding is counter to the position of Marquis and Raynard (2015) who propose that institutions are more pertinent in a developing or emerging country context as businesses navigate environments with institutional voids and instability. However, given the limitations of testing one example per economy type as well as the requirement to fully investigate control variables into stock exchange performance per country or economy type (Chapter 7.5), it would be premature to claim that institutions are more influential in the developed country context.

Furthermore, the institutional quality input variables per country tested (South Africa and USA) differ due to the validation of multicollinearity. This is in line with several authors who assert

that the developing versus developed environments are different to each other and are influenced by factors at varying degrees. Factors that are statistically significant in a developing nation context may not be so in a developed nation context. Hence the analysis of variables for South Africa produced more that was statistically significant to that of the USA. In particular, PS and RQ were factors that influence stock exchange performance that are unique to South Africa when compared to the USA whereas CC is a unique factor to the USA.

A common parameter between both countries and economy types is RL which was found to be a statistically significant influencing factor on stock exchange performance in both cases. However, in the South African case, RL and stock exchange performance have an inverse relationship whereas in the USA, RL and stock exchange performance have a positive relationship. This is a pertinent difference as it indicates that businesses in South Africa perform better in an environment of deteriorating rule of law whereas in the USA businesses perform in alignment with the rule of law. This finding requires verification upon a more rigorous check of control variables (Chapter 7.5).

The difference in input parameters as well as the nature of the statistical relationships reveal that developing and developed countries are indeed unique in terms of influencing factors and reactions thereof. This is an important point regarding policy making and economic interventions as a blanket approach globally does not apply as emphasized by Ang (2016).

## **6.9. Summary**

This study indicates that the institutional quality factors do indeed affect stock exchange performance in both developed and developing countries. However, the exact variables and the extent to which institutional quality factors affect stock exchange performance across countries differ. The results of this study align with the findings of Berggren et al. (2012) who note that institutional quality and growth are positively associated. However, context is a factor as the influence that institutional instability has also depend the economy type and type of institutions in question. In addition to economic development, other contextual factors play a role in explaining stock exchange performance in various countries. This poses an area of future research.

In addition, per Berggren et al. (2012), the study of the influence of institutional quality may produce complex results due to the following factors:

- i. Multidimensionality of institutional quality. This is reflected in the diverse inputs into the WGI scores as well as the multicollinearity data validation undertaken to ensure minimal overlap in variables.
- ii. The effects of institutional quality or instability will vary depending on the trend in institutional quality
- iii. Effects will vary between rich and poor countries

There is therefore no blanket approach as suggested by Acemoglu et al. (2014) regarding the trajectory of prosperity and growth of a nation. Rather, in line with authors such as Ang (2016), growth may require development of financial markets as a precursor to strengthened institutions and there may be a complex multi-directional cause and effect relationship between these two variables.

The complexity of the results of the institutional quality variables (collinear nature, contrasts between economies) should be received as preliminary due to the fact that limitations exist per Chapter 7.4. Exercising caution is recommended in blindly accepting the WGI as absolutely accurate due to the fact that bias exists from surveys and opinion which inform the score (Krugman, 2008; Thomas, 2010). There are large standard errors that are provided by the producers of the index to account for this (Kaufmann et al., 2010; Thomas, 2010). However, Thomas (2010) also questions the constructs of each WGI dimension noting that they are abstract concepts based on an unsupported hypothesis. Furthermore, the WGI measures perceptions and not the variable itself which can differ (Thomas, 2010). Collier (2007) suggests that institutions in the poorest countries of the world are better in quality than they are perceived. This highlights the danger in placing complete confidence in a perceptions based measure.

## **Chapter 7: Conclusion**

The purpose of this research was to determine if institutional quality variables affect stock exchange performance. In addition, differences between how these factors affect economy types was also investigated to understand key drivers unique to context in terms of developing or developed economies. This is a critical area of research as firms operate in a global arena and are required to understand context specific risks and opportunities in order to be successful.

### **7.1. Principal findings**

Institutional quality variables are a broad, and arguably abstract, concept encompassing many areas as echoed by Kauffman et al. (2010) and Glaeser et al. (2004). The WGI scores therefore use a plethora of data sources to capture the institutional quality scores under six broad dimensions. This study has found that these variables interact with each other in varying levels of interrelation across countries with developing countries such as South Africa displaying increased interrelatedness of the dimensions when compared to developed countries such as the USA.

The research indicates that not all institutional quality variables are key drivers to stock exchange performance in all contexts. Furthermore, developing countries behave differently to each other therefore there are other contextual factors that affect stock exchanges in addition to GDP (the control factor) and institutional quality variables.

In certain contexts, some variables have no statistically significant relationship while in others, the same variables are significant and drivers of stock exchange performance. Where variables are significant, they do indeed affect the performance of stock exchanges in both the developed and developing contexts. The relationship is, however, not simplistic and straightforward with results indicating that in certain instances, the stock exchange still grows in environments of poorly performing institutions. This points to the conclusion that there are other factors that contribute to the stock exchange performance.

In developing countries, such as South Africa, the institutional variables that are key drivers to stock exchange performance are PS, RL and RQ. Increased PS results in better performance of the stock exchange whereas decreased RL and RQ result in better performance of the stock exchange.

In developed countries, such as the USA, RL and CC are key drivers to the stock exchange with increased RL resulting in increased performance of the stock exchange whereas decreased CC results in better performance of the stock exchange.

The results confirm that institutional quality variables effect on the stock exchange are variable and not simplistic. In addition, a preliminary finding which should be ratified using further research (Chapter 7.5) indicates that businesses can thrive in environments of decreased RQ, RL and CC. Businesses may leverage such an environment to become more nimble and perhaps take opportunities that will not be available in more rigid environments.

## 7.2. A proposed model

The following model can be used to explain the findings of this study with unique institutional quality variables affecting stock exchange performance in developing versus developed countries per the examples used in this study (i.e. South Africa and the USA). The common variable which has a significant relationship to stock exchange performance in both economies is RL however, the effect that this factor has differs. Whereas increased RL has a positive effect on stock exchange performance in developed countries, it has a negative or inverse relationship in developing countries meaning that the stock exchange continues to grow in an environment of deteriorating RL. The relationships are reflected in graph depictions in the model. Developed countries are displayed in green, developing countries are displayed in orange and the shared variable is displayed in black (Figure 17).

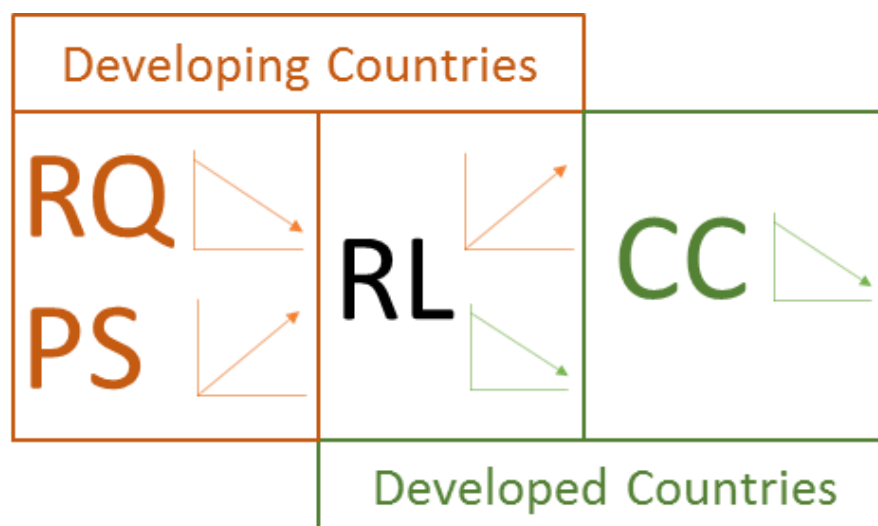


Figure 17: Model proposed to explain study result findings: factors affecting each economy type and corresponding relationship (positive versus inverse)

### **7.3. Implications for business**

Despite the complexities of navigating challenging contexts, many multi-national businesses still choose to operate in environments with institutional voids experiencing varying levels of success or failure. Per Marquis and Raynard (2015), this is an area of growing research as it poses a greater challenge as global trade continues to increase.

The importance of institutional strategies for firms to undertake as they seek to understand and successfully operate across a multitude of contexts. This research shows that the strategies employed cannot be a straightforward approach as there are also differences within developing economies such as South Africa and Vietnam as evidenced by this study and the study undertaken by Thanh et al. (2016). Therefore, other contextual and firm specific circumstances must be taken into account highlighting the relevance of both institutional and firm-based strategy. Strategy which deals with various business environments is therefore required to be multi-pronged and to take a variety of factors into account. The key drivers differ and this poses an area for future research.

Institutional strategy informs both entry and exit decisions of a country as well as how to successfully operate within a country. South African companies such as MTN and Aspen have had challenges operating in countries with pronounced institutional voids namely Nigeria and Venezuela respectively (Hodgon & Hoque, 2017; Sutherland, 2018). Each company reported significant losses due to contextual issues affecting the operation of the business highlighting the importance of understanding the challenges and the way in which a country operates prior to entry. This must be evaluated against the risk appetite of the business.

It is critical that business understand and appreciate the available information such as the WGI scores which as evidenced by this study are valid for certain variables. Such information can give a business an advantage by the firm leveraging of positively trended institutional instability. For example, many businesses may be risk averse and unwilling to operate in an environment that is unstable however improving institutional environments are also characterised by instability (Berggren et al., 2012). A company may therefore gain an early entry advantage into a country that is improving institutionally prior to competitors understanding that the environment is conducive for business. As noted by Collier (2008) the risk of operating in developing countries is sometimes misunderstood by international investors with developing countries characterised in the same manner regardless of other context specific differentiating factors.



#### **7.4. Research limitations**

- i. As noted by Saunders et al. (2009), a disadvantage of using secondary data is that there is no control over data quality therefore care must be taken when choosing and analysing data sources. A limitation of the study is that subjectivity is applied in the measurement of institutions with indices such as the WGI using opinions and survey to inform the scores (Kaufmann et al., 2010) introducing biases from those surveyed. This creates the potential of errors in the results and differing results that could be observed if other measurement instruments are used for institutional quality are used in a similar study such as those listed in Table 1. Kaufmann et al. (2008) note that there is unavoidable margins of error in the assessment of governance measures across countries. The attempt to counter this is to add a rich diverse set of data sources. However, this, along with the fact that the WGI dataset is based on perceptions creates the possibility of subjectivity and biases in the data.
- ii. There are many variables or factors that many may affect stock exchange performance in a country (Ho & lyke, 2017; Thanh et al., 2016). A complete study of the variables that affect stock exchange and to what extent is required per economy or region in order to determine the control factors and to limit omitted variable bias. This will enhance the accuracy of any future study of variables that affect stock exchange performance.
- iii. Similar to the study conducted by Berggren et al. (2012), there is a lack of annual and quarterly data for institutional quality. This study used the WGI governance indicators which were generated every two years initially then annually. Quarterly data was obtained through the cubic spline method. As noted by Berggren et al. (2012) such results should be considered tentative due to the fact that there is a lack of actual data.
- iv. Statistically significant relationships were found between certain institutional quality variable and stock exchange performance. However, while the study may be able to determine a relationship, it does not determine causality. This is assumed from prior literature as outlined in the literature review of this study.

#### **7.5. Areas for future research**

- i. The multicollinearity data validation undertaken per Chapter 4.6.3.2 reveal that certain institutional quality variables are interrelated in both developing and developing countries. These are VA, GE and CC in developing countries and VA

- in developed countries. The reason for this collinearity or interrelatedness as well as the contrast between economy types presents an area for future research.
- ii. GDP growth was used as a control variable for this study and was found to have a strong correlation with stock exchange performance in both developing and developed countries. However, a plethora of other variables have been tested for relevance to stock exchange performance. It is expected that the factors will differ contextually (Berggren et al., 2012). These require further study to hone down what variables affect the stock exchange and to what extent to understand the control variables to be used in studies such as this which looks at additional factors to explain performance of stock exchanges.
  - iii. This study found that PS positively affects stock exchange performance while RQ and RL have inverse relationships with the stock exchange in developing countries using South Africa as a case study. However, this is in contrast to the study undertaken by Thanh et al. (2016) who found that improvements in all of these factors result in stock exchange development in Vietnam. It is therefore likely that there are other contextual factors such as culture and geography that drive stock exchange performance. These factors should also be explored as well as what differentiating factors exist within economy types such as developing and developed as opposed to comparing these two types against each other only.
  - iv. Several other indices that measure institutional quality and other variables such as competitiveness exist (Table 1). These may be tested in the same way that the WGI scores were tested in this study to determine which other variables can be used to explain stock exchange performance. In addition, where there are other institutional quality scores, there may be more accurate than the WGI. This poses as an area for future research as indices become more widespread in popularity and use.

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## 9. Appendices

### 9.1. Inflation data

Table 14: South Africa and USA Inflation

Year	ZAF_CPI	USA_CPI
1996	9.31	3.32
1997	6.17	1.70
1998	8.95	1.62
1999	2.24	2.68
2000	6.99	3.39
2001	4.59	1.55
2002	13.51	2.38
2003	5.80	1.88
2004	2.20	3.26
2005	2.02	3.42
2006	4.82	2.54
2007	7.57	4.08
2008	9.35	0.09
2009	6.04	2.72
2010	3.37	0.09
2011	6.41	2.96
2012	5.71	1.74
2013	5.30	1.50
2014	5.32	0.76
2015	5.18	0.73
2016	7.07	2.07
2017	4.50	2.11

### 9.2. WGI data: South Africa and the USA

Table 15: WGI scores for South Africa and the USA

Year	ZAF_GE	USA_GE	ZAF_RQ	USA_RQ	ZAF_RL	USA_RL	ZAF_CC	USA_CC
1996	1.02	1.52	0.52	1.59	0.09	1.50	0.73	1.57
1998	0.66	1.76	0.33	1.67	0.27	1.61	0.67	1.60
2000	0.73	1.80	0.44	1.76	0.20	1.59	0.63	1.66
2002	0.67	1.68	0.66	1.60	0.13	1.55	0.35	1.92
2003	0.69	1.60	0.80	1.60	0.12	1.59	0.35	1.76
2004	0.64	1.76	0.66	1.57	0.11	1.44	0.46	1.83
2005	0.64	1.54	0.70	1.61	0.11	1.54	0.57	1.55
2006	0.44	1.59	0.68	1.64	0.26	1.61	0.45	1.35
2007	0.47	1.65	0.49	1.49	0.09	1.63	0.25	1.39

2008	0.51	1.61	0.50	1.53	0.07	1.64	0.21	1.45
2009	0.48	1.51	0.41	1.40	0.12	1.60	0.18	1.29
2010	0.39	1.56	0.36	1.45	0.14	1.64	0.13	1.27
2011	0.41	1.52	0.41	1.46	0.15	1.60	0.06	1.27
2012	0.35	1.53	0.38	1.30	0.11	1.63	-0.12	1.41
2013	0.44	1.52	0.42	1.27	0.16	1.56	-0.07	1.31
2014	0.34	1.47	0.29	1.28	0.18	1.61	-0.06	1.38
2015	0.26	1.46	0.28	1.26	0.09	1.60	0.03	1.40
2016	0.27	1.48	0.21	1.50	0.07	1.67	0.05	1.33

### 9.3. Cubic spline graphs: interpolated WGI scores

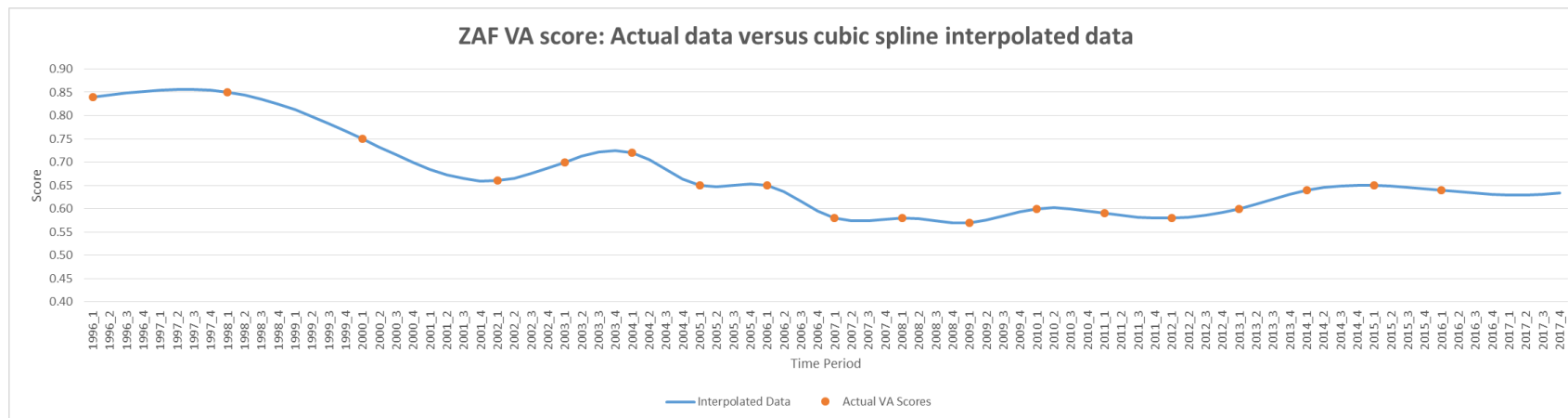


Figure 18: Actual versus interpolated data of South Africa’s voice and accountability (VA) scores from first quarter in 1996 to fourth quarter in 2017

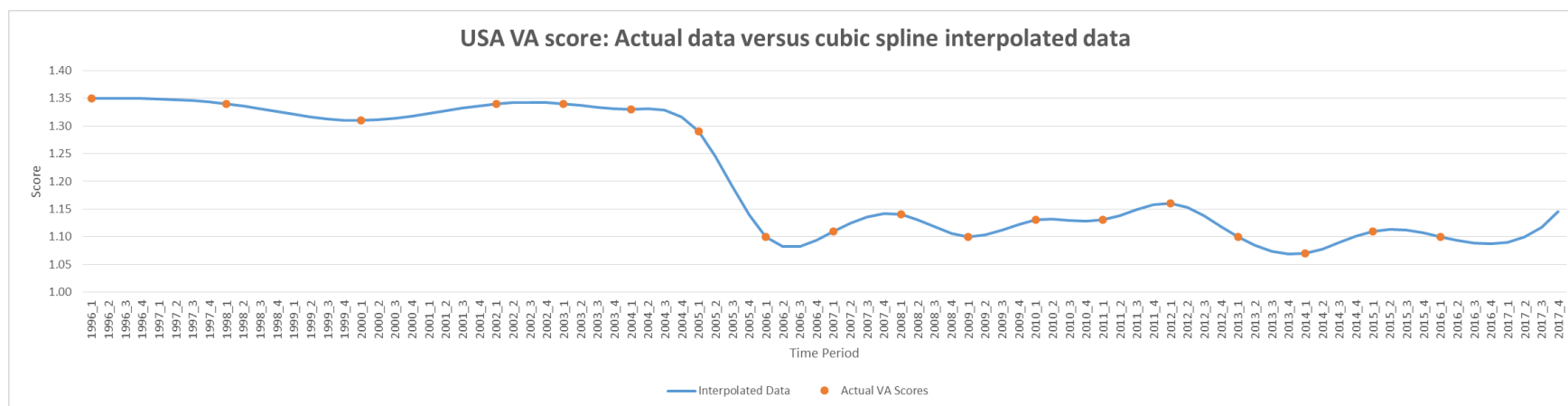


Figure 19: Actual versus interpolated data of USA’s voice and accountability (VA) scores from first quarter in 1996 to fourth quarter in 2017

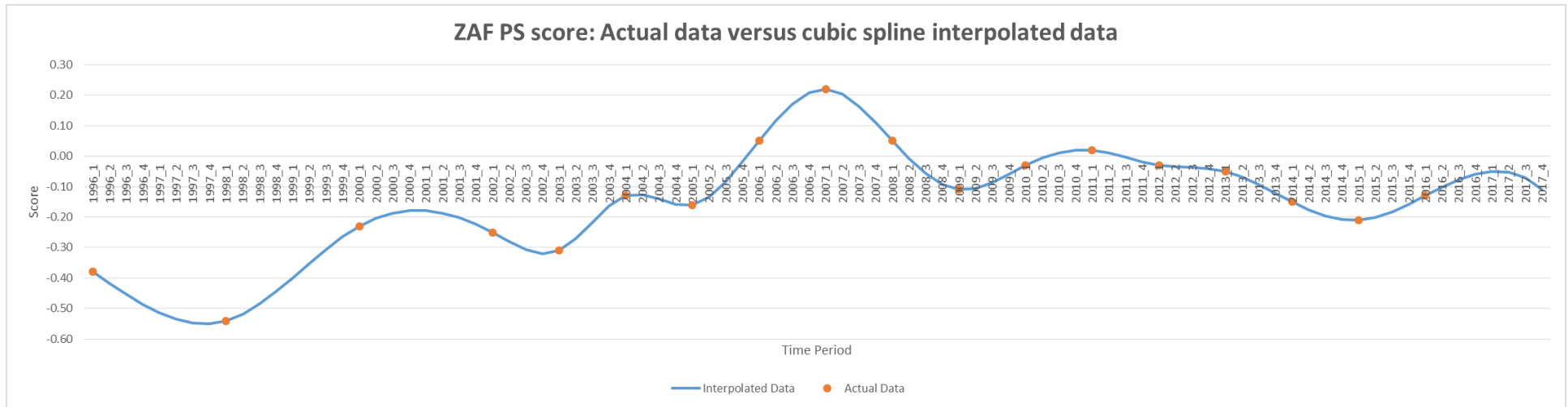


Figure 20: Actual versus interpolated data of South Africa's political stability (PS) scores from first quarter in 1996 to fourth quarter in 2017

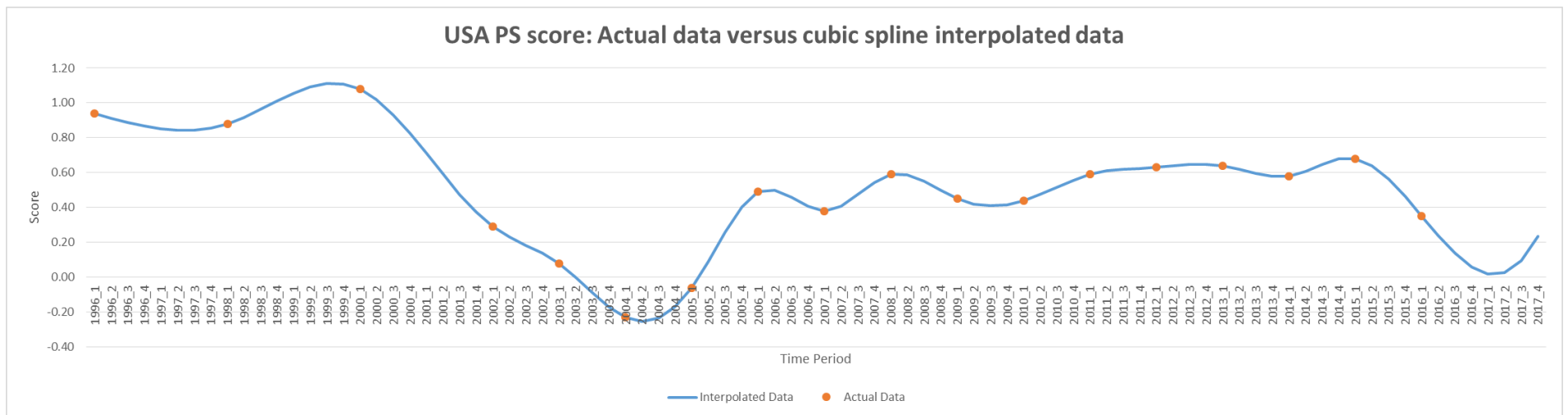


Figure 21: Actual versus interpolated data of USA's political stability (PS) scores from first quarter in 1996 to fourth quarter in 2017

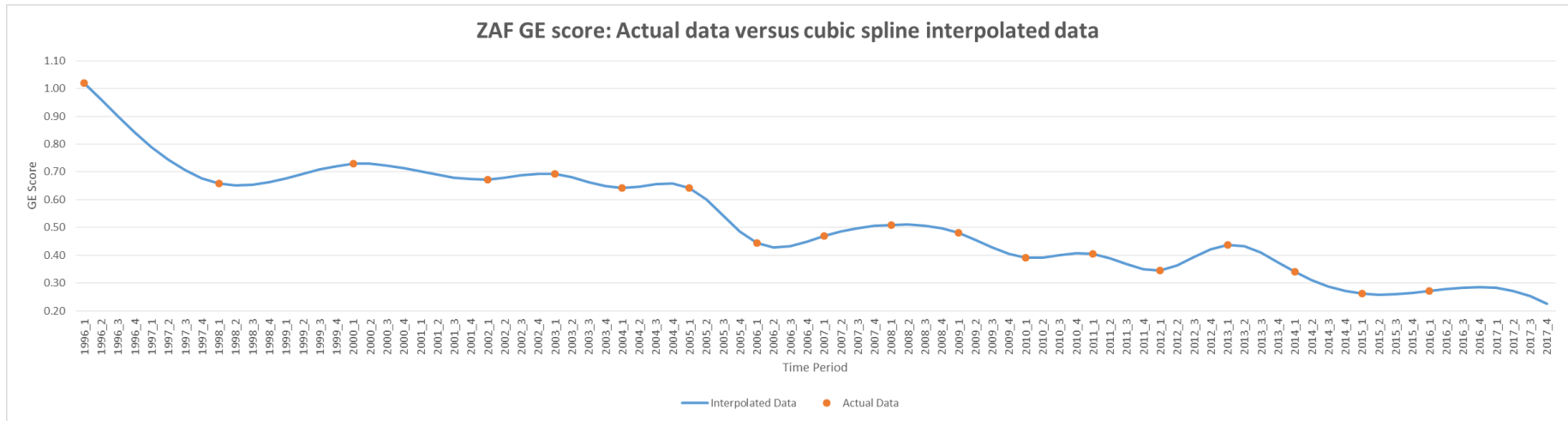


Figure 22: Actual versus interpolated data of South Africa's government effectiveness (GE) scores from first quarter in 1996 to fourth quarter in 2017

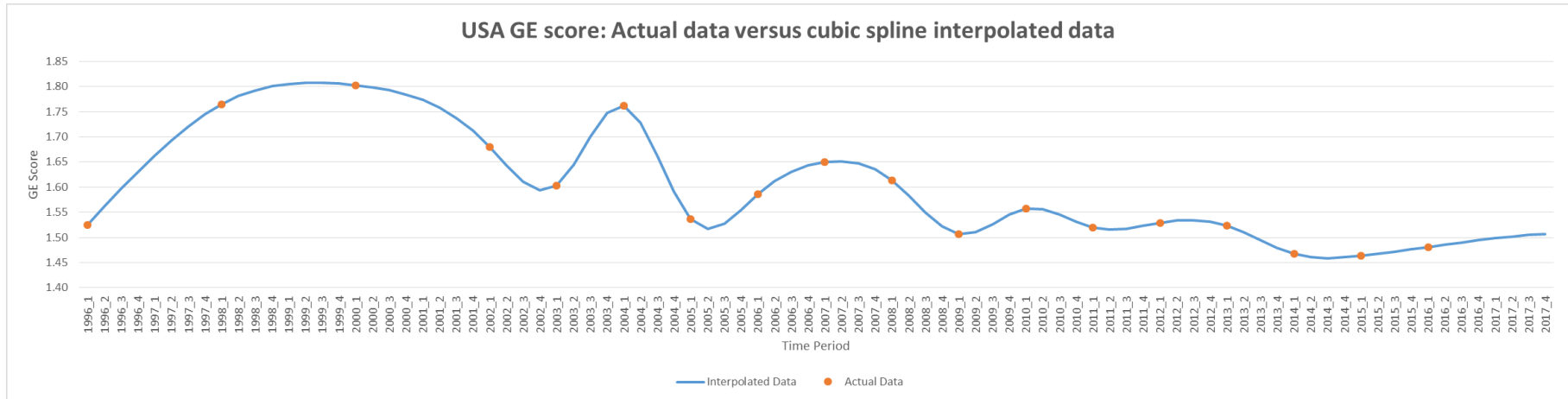


Figure 23: Actual versus interpolated data of USA's government effectiveness (GE) scores from first quarter in 1996 to fourth quarter in 2017

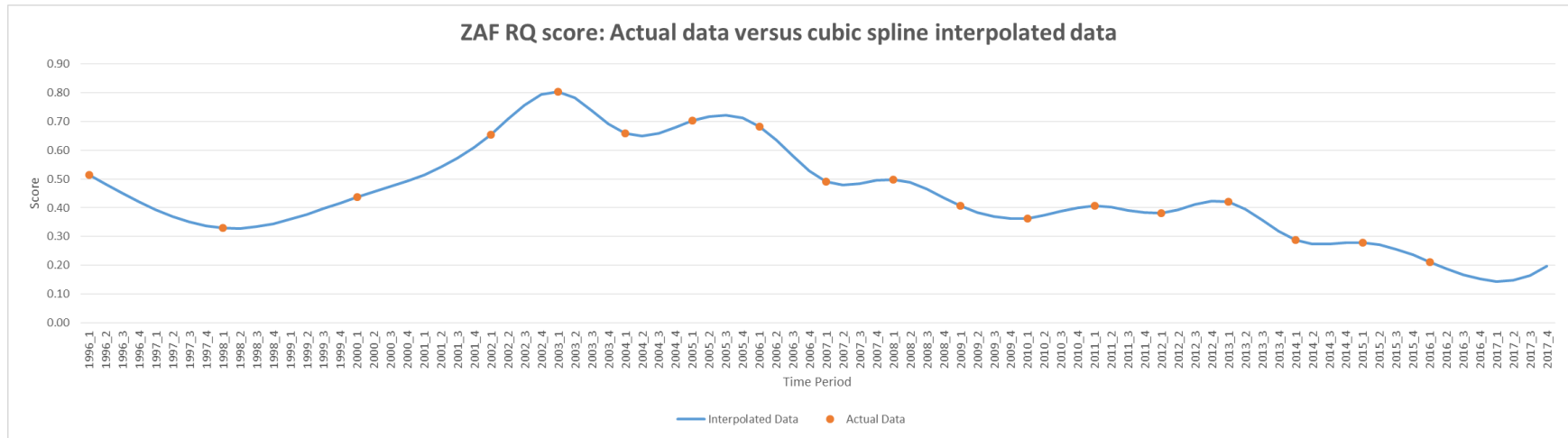


Figure 24: Actual versus interpolated data of South Africa's regulatory quality (RQ) scores from first quarter in 1996 to fourth quarter in 2017

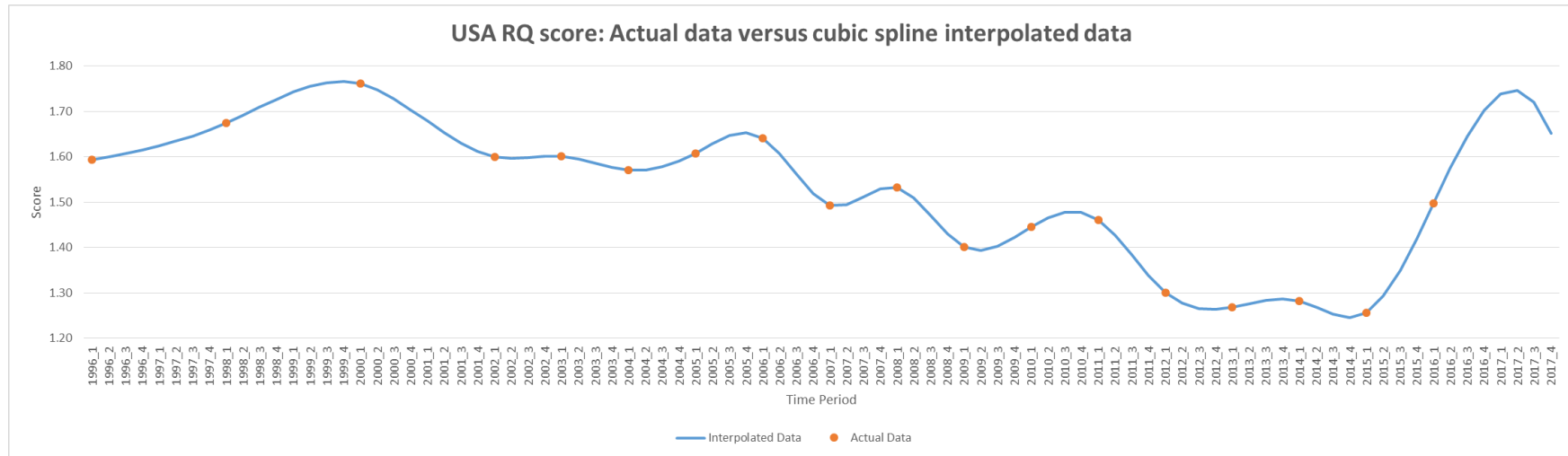


Figure 25: Actual versus interpolated data of USA's government effectiveness (GE) scores from first quarter in 1996 to fourth quarter in 2017

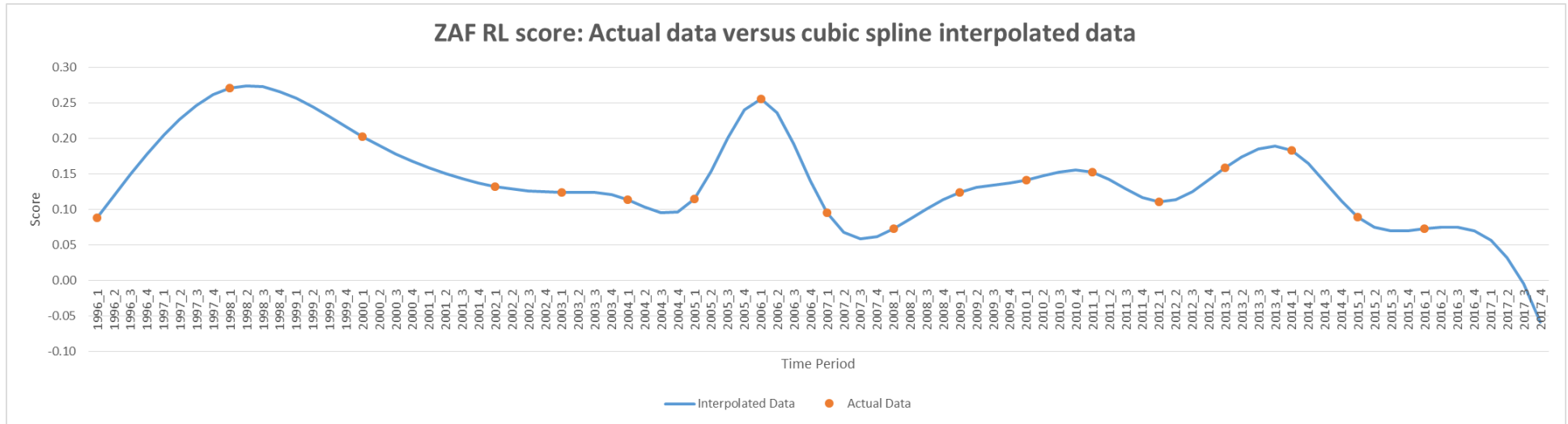


Figure 26: Actual versus interpolated data of South Africa's rule of law (RL) scores from first quarter in 1996 to fourth quarter in 2017

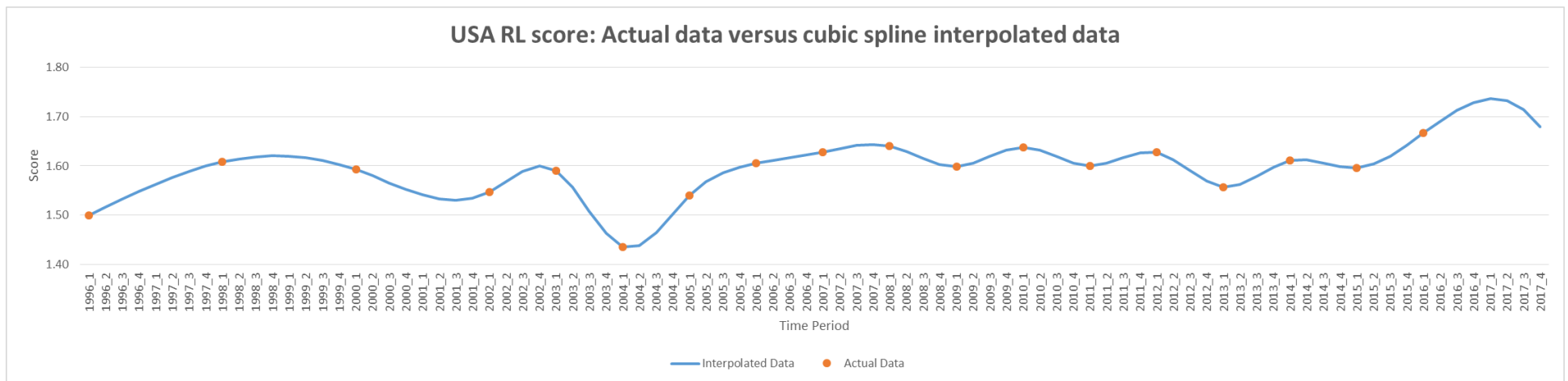


Figure 27: Actual versus interpolated data of USA's rule of law (RL) scores from first quarter in 1996 to fourth quarter in 2017

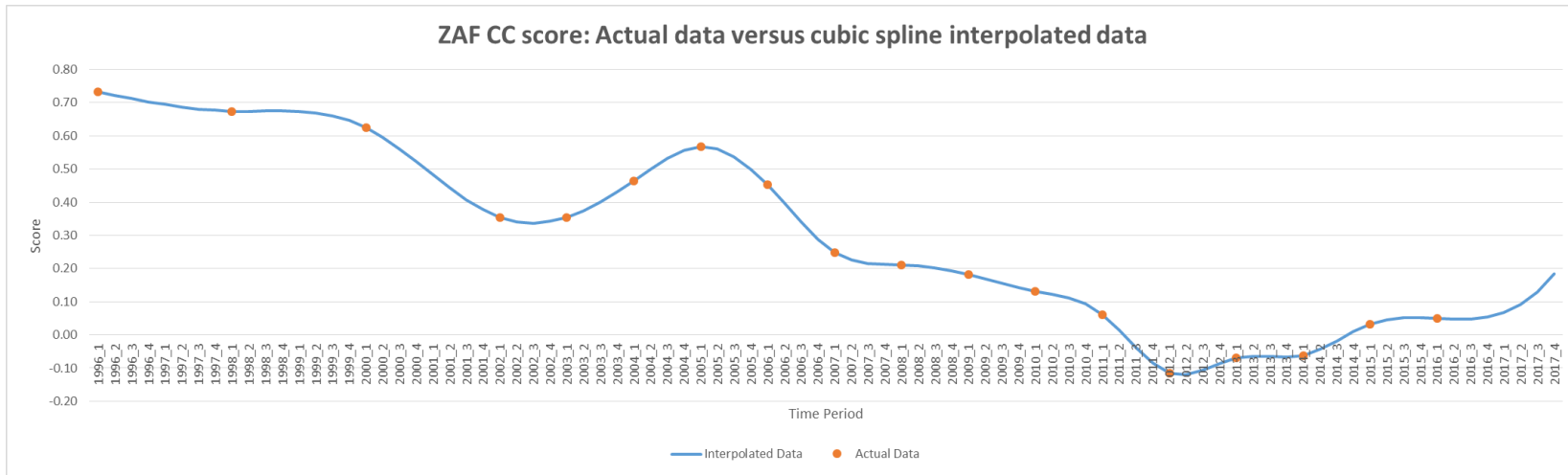


Figure 28: Actual versus interpolated data of South Africa's control of corruption (CC) scores from first quarter in 1996 to fourth quarter in 2017

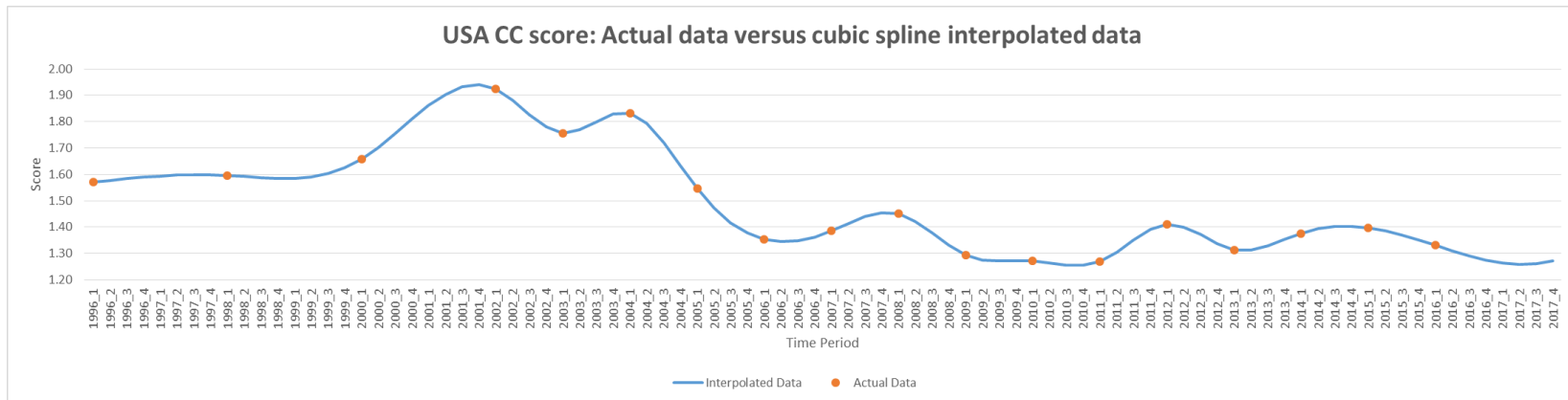


Figure 29: Actual versus interpolated data of USA's control of corruption (CC) scores from first quarter in 1996 to fourth quarter in 2017



## 9.4. Ethical Clearance Letter

**Gordon  
Institute  
of Business  
Science**  
University  
of Pretoria

27 July 2018

Moodley Yusavia

Dear Yusavia

*Please be advised that your application for Ethical Clearance has been approved.*

*You are therefore allowed to continue collecting your data.*

*Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained*

*We wish you everything of the best for the rest of the project.*

*Kind Regards*

GIBS MBA Research Ethical Clearance Committee