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FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC GROWTH IN SOUTH AFRICA: ROLE OF THE BANKING SECTOR

By

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A research (ECON7052A) report submitted towards the fulfilment of the requirement for a Master of Commerce degree by coursework in the field of Applied Development Economics (CCA01), at the University of the Witwatersrand.

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Declaration

Student number: **2068689**

I, the undersigned, **K Precious Monareng**, hereby declare that this dissertation is my own original work and that it has not been submitted at any other University for a similar or any other degree award, and that all the sources that have been cited and acknowledged by means of complete references.

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K Precious Monareng Date

Acknowledgements

I would like to thank God who has made this study a success. I am indebted to my supervisor Dr Ismail Fasanya for his immense support, patience, and valuable comments.

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It gives me great pleasure to thank Nelis Bezuidenhout, from Sanlam Investments, without whom I may never have had the opportunity to enrol for this master's degree.

Dedication

Completing this dissertation has been one of the most significant academic challenges I have ever faced. This dissertation is dedicated to me.

Abstract

This study examines effects of the efficiency of the financial sector on economic growth in South Africa through an augmented Solow-Swan growth model using annual data from 1975 to 2020. The financial sector development is characterised by the role of the banking sector in enhancing growth through the productive use of a country's stock of financial capital. In this study, autoregressive distributed lag (ARDL) and instrumental variable (IV) models are used to estimate the derived augmented financial sector induced growth regressions. The ARDL method observes a positive but insignificant effect of financial sector development on economic growth. However, using internal instruments, instrumental variable regression provides joint endogeneity between regressors. The IV estimation results show that financial sector development has a significant positive effect on economic growth, hence, increased efficiency in the banking sector can lead to enhanced growth. In addition, the results observe that the quality of institutions are crucial to the relationship between financial sector and economic growth. To this end, policymakers should continue to improve financial inclusion and the quality of institutions, which could potentially spur economic growth in South Africa.

Keywords: South Africa, financial sector development, economic growth, institutions, ARDL and IV regressions.

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1. INTRODUCTION

1.1. Background and Motivation

A plethora of existing academic research has focused on the association between economic growth and the financial sector (Beck, 2003; Allen & Gale, 2000; Ujunwa, Arestis, Luintel, & Luintel, 2005; Salami, Nwakoby, & Umar, 2012; Levine, 2002; Demirgüc-Kunt and Levine, 1996). Insights, on the other hand, have been mixed and conclusions based on findings vary extensively. These studies were performed with the presumption that an economy's stabilisation as well as growth are heavily dependent on an efficient and sound financial sector. Consequently, the financial system is of critical importance in furthering economic growth.

From a broader perspective, financial system that is adequately functioning is regarded as among the most critical foundations for long-term economic growth (Demirgüc-Kunt, 2006). That being said, there really is no agreement on how the financial sector development and fiscal expansion are strongly linked. The nexus of financial growth is a primary focus in financial economics literature, and often highly debated.

The various school of thought have been developed. As per viewpoints by proponents from the first school of thought (Schumpeter, 1934; Levine, 1997; Goldsmith, 1969; McKinnon, 1973), financial development, is considered necessary for economic growth. Finance, in fact, has an impact on growth by being able to influence investment, saving as well as technological advancements (Demirgüc-Kunt, 2006). Nevertheless, Neoclassical theorists, who advocated for the second train of thought, contended that finance is not the single most important economic development source (Lucas, 1988).

Lucas (1988) emphasises that prior studies have generally and greatly overstated the extent of correlation between financial sector development and economic growth "(Christopoulos & Tsionas, 2004). Correspondingly, Andersen and Tarp (2003), Ductor and Grechyna (2015)," Ayadi, Arbak, Naceur, and De Groen (2015), as well as Singh (1997) presented robust evidence and arguments substantiating an inverse relationship respectively between economic growth and financial sector development. Nonetheless, a number of recent studies concluded that financial sector development affects economic growth both significantly and positively (King & Levine,1993; Beck, Levine, & Loayza, 2000; Muhammad, Islam, & Marashdeh, 2016; Zhang, Wang, & Wang, 2012; Levine, Loayza, & Beck, 2000; Samargandi, Fidrmuc, & Ghosh, 2014; Pradhan, Arvin, Hall, & Nair, 2016; Uddin, Sjö, & Shahbaz, 2013; Jedidia, Boujelbène, & Helali, 2014; Durusu-Ciftci, Ispir, "& Yetkiner, 2017; Herwartz & Walle, 2014;" Christopoulos & Tsionas, 2004).

From a more specific context, the South African financial system is remarkably comprehensive. The sector is composed of a sophisticated banking industry, capital markets that are sufficiently established, and a cluster of non-banking institutions, along with insurance companies, a variety of pension funds and a grouping of investment schemes or mutual funds. Capital markets are fairly developed, with important factors associated with activities inside the securitisation, hedge fund and derivatives markets (Mandiefe, 2015).

In line with this background, due to their close interconnections to offshore markets, South Africa's markets are vulnerable to contagion risks and uncertainties. Comprising the largest section of the financial sector are commercial banks, accounting for approximately 20 % or more of the of Gross Domestic Product (GDP) (IMF, 2008). Nonetheless, banks encounter an excessive credit risk, particularly in household lending portfolios. This is the result of recent spikes in domestic indebtedness, and also the financial strain of increasing debt services. Research has shown that, in terms of household credit derived from the financial sector among several emerging markets,

especially in the developing world, South Africa exhibits the highest average household credit, at 144.06 % of the total GDP (Tsaurai, 2017, p. 160). South Africa's financial sector has become increasingly sophisticated but also developed.

South Africa is ranked third from out of a list of 148 countries in relation to financial market development, as per the Global Competitiveness Report for 2013/14 (WEF, 2013). According to Odhiambo (2010), South Africa had 36 banking institutions in 1990, with 9 of them being foreign-controlled. Odhiambo (2010) went on to say that in 2010, South Africa had 47 banking institutions, 15 of which have been foreign bank divisions. In the fourth quarter of 2014, about 73 banks as well as bank representatives have been certified throughout South Africa, representing a 55% increase from the previous four years and just a 102% rise over the previous 24 years' period as noted by the (SARB, 2015).

South Africa's financial development attributes began to rise in the 1980s and early 1990s. Interestingly, they began to grow at a rapid rate beginning in the 1990s. Consequently, due to the international monetary crisis, a gradual decrease was seen from 2007 to 2009. Nonetheless, the attributes have continued to show substantial growth since then. For this context, South Africa is host to the Johannesburg Stock Exchange (JSE), founded in 1887, and considered to be one of the major global securities markets in relation to capitalisation in the markers (Odhiambo, 2009). Both the South African Futures Exchange (SAFEX) and also the South African Bond Exchange (BESA) were founded in 1996. SAFEX had risen first from 22nd towards the 18th biggest futures exchange globally by 1999. It occurred that in the year of its registration; BESA traded upwards and over 430 000 bonds, amounting to $704 billion in value (Odhiambo, 2010). Moreover, the JSE acquired the SAFEX and BESA throughout 2001 and 2009, combined, allowing the JSE to can provide five distinct markets, notably derivatives, interest rate derivatives, financial, bonds and commodities, as well as equities.

In relation to market capitalisation, the JSE has thus far been ranked as the 16th biggest stock exchange globally. The World Economic Forum (2013) states that it is also the world leader in terms of regulation as well as auditing. Additionally, South Africa's strong and very well advanced stock market provides substantial evidence that the country has exceedingly advanced financial development levels.

The rise in the number of registered South African banking institutions, combined with the country's financial development index expansion, and the establishment of its own stock exchange, indicate that the country has experienced significant financial broadening, particularly since after the 1980s.

South Africa's yearly GDP growth rate in absolute terms has been 4.0% between 1969 and 1975, and 2.4% between 1975 and 1984, with 1980 measuring the fastest growth which stood at 9.2 percentage points. The duration of 1985–1989 saw a massive decrease in growth to that of an overall mean of 1.4%, with the primary reason being another form of international sanctions but also political unrest that occurred during that time (Levy, 1999). Following that, South Africa has encountered a negative growth annually at about 1.6% from 1990 to 1992. Also in 1993 another factor was the downtrend overturned, and South Africa was perfectly able to witness growth annually with an average 3.0% rate from 1993 until 1996.

Having followed this unprecedented growth era were two years of deteriorating growth, with rates of growth from 2.5% as well as 0.7% throughout 1997 and the year 1998, combined. In terms of economic growth, the first fifteen years from 2000 have also been extremely unstable; for instance, rate of growth throughout 2000, 2003, 2004, 2005, 2009, or even 2013 have showed variably mixed. Based on the information presented above, there appears to be a substantial variation or discrepancy among both the country's financial development and its economic growth.

Additionally, Odhiambo (2009; 2010) and Agbetsiafa (2004) are some of the only scholars who have conducted empirical research on this topic in a South African context.

Agbetsiafa (2004) found evidence of a supply-leading correlation, implying that financial development Granger intensifies and promotes economic growth. In contrast to these findings, Odhiambo (2009; 2010) successfully revealed a demand-following correlation, positing that economic growth is a primary driver behind financial development. It is therefore possible that the correlation has evolved over time. Besides this, there is a general lack of agreement pertaining this significant relation correlation. As a direct consequence, the question is whether a credible, positive association exists between the development of South Africa's financial sector and economic growth.

Considering the significance of capital markets and banks, as well as the difficulties encountered throughout both, a pertinent point of concern would be understanding which form of financial structure has the strongest influence towards South Africa’s economic growth. As this is part of the main problem identified by this study and is to be outlined extensively in the problem statement section, in this study, the key purpose is to scrutinise the effect of development of the financial sector on economic growth, with particular emphasis on the banking sector. Furthermore, the efficacy of the banking sector’s impact on economic growth is assessed.

Acemoglu, Gallego, and Robinson (2014), Guru and Yadav (2018), as well as Rodrik and Subramanian (2003) found that policy and institutional arrangements are important variables when examining the relation between growth and finance; moreover, institutions could be considered the main impetus of both economic and financial growth. Since the dominant development paradigm was unsuccessful in elucidating policy failures based on its theoretic corpus until the early 1990s, institutional issues are crucial. Exploration of this new vein of scholarship enables one to explain, almost completely, all developing nation failures. In addition,

Hervé (2021) points out that an appropriate institutional environment will foster financial development and affect growth positively. The current study contends the opposite: a weak institutional system distorts market functioning and impedes economic growth. In light of this, it follows that development of the financial sector cannot, in itself, encourage fiscal growth; institutions are crucial to the association between growth and finance.

1.2. Problem Statement

South Africa, as stated in the introduction section, has an extremely sophisticated, established, and adequately tightly controlled financial system, as illustrated by the country's consistently high standings seen in the WEF's Report for Global Competitiveness. After its addition of a financial market sophistication component towards the report in 2008, the country has maintained a position in the upper 10% of nations in respect of monetary market sophistication. Nonetheless, South Africa has, thus far, not experienced the same thresholds of improved economic growth that are sometimes associated with its own financial market sophistication growing and complexity (Calderon & Liu, 2003). As a result, a prospective discrepancy between financial sector development and fiscal growth exists. As previously stated, given the importance of capital markets and banks, as well as the difficulties encountered in both, a pertinent source of contention would be determining which category of monetary structure has the greatest influence on economic growth through South Africa's financial sector development.

Although comprehensive research regarding the impact of financial sector development on economic growth exists, little research has been conducted to establish the factors that influence the development of the financial sector. Taking this into account, this study investigated the determinants of financial sector development in South Africa. Regardless of the lack of agreement between many researchers upon an appropriate measure for documenting financial sector

development, many reputable studies have been using a single measure, which is the private sector credit to GDP.

According to Svirydzenka (2016), an only one metric would not be perfectly adequate to provide such a complete and accurate overview of the financial sector's current and evolving state. This could be attributed to the financial sector's development being vastly complex and multifaceted. King and Levine (1993), Levine and Zervos (1996), Demirgüc-Kunt and Maksimovic" (1996), and several others distinguish three characteristics regarding development of the financial sector, namely the depth and level of financial intermediaries' activities, the importance of non-bank financial intermediaries, and the financial sector's overall operational effectiveness. Owing to the fact that all these aspects may not have been indicative of the quality of the financial sector's attributes, they do portray what the body of research had already looked into.

In practical and specific terms, very few empirical studies on Sub-Saharan Africa, and especially on South Africa, have explored multiple measures, including scholars such as David, Mlachila, & Moheeput (2014) and Mahawiya (2015). They created an indicator that only reflects the financial sector's magnitude in size alone, based on a variety of distinct elements of financial sector development. The underlying assumption is that these studies were using an index that encapsulates only one aspect of financial sector development (depth) as well as an existent failure to capture other aspects. The Financial Augmented Model developed by Cooray (2009) as emulated in this thesis, addresses this gap by constructing composite indices from various measures. Those measures denote the degree of financial sector development while considering all (three) aspects of the financial sector.

1.3. Research Questions

The research questions following the context and background that has been provided in the previous sections, including the identified problem in this study are as follows:

i) What is the relationship between development of the financial sector and economic growth in South Africa?
ii) How does the role of banking sector growth connect to the South African financial sector's development?
iii) Are institutions essential in improving the affiliation between South Africa's economic growth and development of the financial sector?

1.4. Research Objectives

The broad objective of this study is to examine the impact of the financial sector development on economic growth. Specifically, this study intends to:

i) Determine the effect of financial sector development on economic growth;
ii) Examine the role of the banking sector on the development of the financial sector; and
iii) Analyse the role institutional quality plays in the affiliation between financial development and economic growth.

1.5. Contribution of the Study

The study's contribution, specifically with respect to the frame of reference to the replication of the Financial Sector Augmented model by Cooray's (2009), could help to ensure that recent growth policies are followed oriented towards the appropriate connections attempting to influence South Africa's economic growth. Thus, allowing for the creation of protracted, feasible future economic growth. Moreover, the research will aid in effectively appreciating the complexities which influence both South African financial sector development and economic growth, thereby assisting in the achievement of the country's present economic goals, such as poverty eradication, eliminating inequality and ensuring massive job creation through significantly greater stable but sustainably feasible growth.

Despite the important role institutions play in financial sector development, Cooray's (2009) study does not adequately acknowledge their role. It has been acknowledged in empirical studies

extensively that institutions have a critical role to play in the development of the financial sector (Aluko & Ajayi, 2017). In order to address this lacuna, this study has developed and employed an institution's variable, indicating that institutions fulfil an integral role in the development of the financial sector. In light of this, the research further aims to assess the impact of institutions on fiscal growth as well as development of the financial sector. This research further examines the effect of the banking sector on the financial sector.

This study distinguishes itself by critiquing Cooray's (2009) Financial Sector Augmented Model by introducing a variable that accounts for institutions, which allows us to estimate the model's structural parameters. The study examines the contribution of the institutional quality to actual growth and finance in South Africa, so as to provide policymakers with utilitarian elements which can be utilised for reform initiation and sustainable endogenous growth in South Africa.

1.6. Chapter Outline

Following this chapter, Chapter 2 presents a review of the relevant literature. The methodology employed in this study us discussed in Chapter 3, while the empirical results are discussed and presented in Chapter 4. The final chapter provides a conclusion to the study as well as implications for policymakers.

2. LITERATURE REVIEW

This chapter reviews the theoretical, methodological, and empirical literatures associated with the research study. Essentially, theories showing relationship between financial sector development and economic growth are discussed along with numerous methodologies that have been employed and the empirical results obtained.

2.1. Theoretical Review

Mankiw, Romer, and Weil (1992) separate the effects of physical- and human capital on economic growth by using an “augmented version of Solow's growth model” (Ncanywa & Mabusela, 2019). This model is also termed the Mankiw-Romer-Weil (hereafter referred to as MRW) model in deference to all authors (Mankiw et al., 1992). Under the MRW model, output growth is a function not only of physical and human capital, but also of total factor productivity and labour. According to Cuevas-Ahumada and Calderón-Villarreal (2020), MRW supports the idea that differences in population growth rates, saving rates, and education, and are mainly accountable for cross-country gross domestic product (GDP) per capita discrepancies.

Solow and Swan’s (1956) proposed neoclassical growth model contained inherent problems and omissions; thus, Romer (1986) developed endogenous growth theory. As opposed to the traditional neoclassical growth theory, the endogenous theory describes the growth rate of the economy in the long run with the help of endogenous factors, as opposed to exogenous factors (Levine, 1997). In the wake of the discovery of this theory, the role of financial sector support in terms of economic growth has experienced renewed attention (Samargandi et al., 2014). The theory proposes that the financial sector is widely regarded as positively affecting economic growth, through both investment and growth promotion, with financial intermediaries being key to achieving high returns on capital (Samargandi et al., 2014). Based on the aforementioned, monetary intermediaries and the securities market enable emergent business owners and

investors to take part in inventive initiatives that will support economic growth. Generally, inventive initiatives ultimately influence the behaviour of financial sector indicators, either through the issuance of bank credit or by the additions to bank deposits generated by those innovative initiatives. Thus, Rashti, Araghi, and Shayeste (2014, p. 937) propose that financial development will enable one to accurately "predict future economic growth", while bearing in mind that financial intermediaries play an important role in encouraging investment efficiency, thus fostering monetary growth.

The financial development theory argues that markets, institutions, and financial instruments emerge to explain the impacts of transaction- and information costs (Levine, 1997). In an uncertain environment, the financial system's chief goal is ensuring adequate temporal and spatial allocation of resource in order to ascertain that resources are adequately employed. Enhancing and broadening the stipulations of financial services so as to address the needs of economic development in a more efficient and effective way, promotes and supports economic growth. This is known as financial sector development (Mogale, 2014). Levine (2005) notes that financial systems can directly affect savings rates, technological innovation, investment decisions, and, in due course, long-term economic growth.

Schumpeter's (1934) proposed supply-leading concept forms the basis of financial sector development and its link with fiscal growth. According to the Schumpeterian theory, expanding the financial sector will provide funds necessary for the expansion of the real sector. Moreover, in a robust financial sector, note McKinnon (1973) and Shaw (1973), transaction- and monitoring costs are low, and information asymmetry is minimal. Thus, financial sector development enhances the intermediation of financial services, while simultaneously augmenting economic agents' capacity to engage in more productive activities by increasing their access to finance. Adeyeye et al. (2015) propose a two-pronged expansion of the supply-leading hypothesis. First and foremost, financial sector development allows resources to be transferred to contemporary

high-growth sectors from established low-growth sectors. Secondly, this promotes and encourages entrepreneurship to flourish in these modern sectors. The current study then also hypothesises that financial sector expansion promotes economic growth.

The demand following-hypothesis (growth-led finance) developed by Robinson (1952), posits that "increasing the growth of an economy will lead to an increase in the demand for financial services by the real sector, and thus promotes the development of the financial sector" (Taivan & Nene, 2016: p.84). Arestis and Demetriades (1997) state that the rate of advancement in the real sector determines the increase in demand for financial services. Studies, like those by Liang and Teng (2006), Odhiambo (2009), and Akinlo and Egbetunde (2010), provide evidence that supports the demand-following hypothesis, contrary to views espoused by Chang (2002), Christopoulos and Tsionas (2004), as well as Chang and Caudill (2005).

Known also as the "settler mortality hypothesis", the endowment theory stems from the research of Acemoglu et al. (2001). A key part of the theory emphasises the crucial value of both institutions and geography in financial sector development. The endowment theory is one that assumes that institutions established during colonisation continue to prevail even after gaining independence. Beck (2003) notes that preliminary endowments appear to take primacy in describing international disparities in financial sector development, and that nations with poorly endowed geographic regions are more likely to suffer a lower-developed banking sector. In accordance with studies by Anayiotos and Toroyan (2009), Filippidis and Katrakilidis (2014), Demetriades and Law (2006), as well as Le et al. (2016), financial institutions explain financial sector development.

Hassan, Sanchez, and Yu (2011) note that early economic growth theorists argue that economic development is a process of innovations, in which the interactions of innovations in the financial and real sectors serve as a driving force for rapid economic growth.

Based on the new growth theory, markets and financial intermediaries are inherently generated as a reaction to the completeness of the market, contributing to long-term monetary growth. For a financial system to remain efficient and robust, it needs to ensure that resources are directed towards where they can be most productively used, thereby resulting in a more efficient resource allocation (Estrada et al., 2010). The other doctrine with regards to fundamental policy implication, the McKinnon-Shaw school, is that governmental restrictions on the financial sector impede financial development, and, as a result, negatively impact growth. As a consequence, government constraints influence the way in which the financial system operates, ultimately influencing economic "growth (Al-Zubi, Al-Rjoub, & Abu-Mhareb, 2006)."

The law and finance theory, proposed by La Porta et al. (1997), foregrounds legislations' contribution to financial sector development. The theory of law and finance notes that the common law system offers "a better framework for financial development and economic growth than the civil law system" (Aluko & Ajayi, 2017, p. 124). This theory further posits that a country's legal system may influence their economic growth, due to how it favours or hinders financial development. Additionally, financial development is seen to be an essential feature in driving fiscal growth; therefore, the legal system is regarded as a critical contributor to economic development (Graff & Karmann, 2006). According to the theory, the common law tradition dates back to medieval England, while the civil law tradition is more modern, having been classified by French, German, and Scandinavian codifiers during the 19th century. The first element of the theory shows that countries where creditor rights are highly prioritised, and where effective enforcement of contracts is in place, have a stronger financial system (Levine, 1998, 1999; Levine et al., 2000). The second component recognises legal origins or practices as contributing to differences across countries in financial sector development. It is thus theoretically hypothesised that civil law countries are less financially developed than countries with common law legal traditions.

The above-mentioned theory proposes that common law countries afford stakeholders greater legislative security than that of civil law countries (La Porta et al., 1997; 1998). In their study, Chong and Zanforlin (2000) found that countries with civil legislative systems have negative correlations with bureaucratic advances, government integrity, and the absence of corruption. The law and finance theory is supported by empirical studies by scholars such as Cooray (2011), Djankov, McLiesh, and Shleifer (2007), and Levine (1998, 1999). In contrast, Fowowe (2014) shows, through empirical data, that legal origins do not explicate why African countries' banking sectors develops differently. The study anticipates that the legislative system's quality will enhance the South African banking sector's development. Likewise, it is posited that countries with British legislative roots, such as South Africa, will have better-developed banking sectors than sub-Saharan African countries, legislatively rooted in the French legal system.

Scholars McKinnon (1973) and Shaw (1973) developed the McKinnon-Shaw theory of financial liberalisation. According to this theory, development of a country's financial sector requires financial liberalisation, which ultimately produces fiscal growth. It is proposed by the theory that financial liberalisation can support growth rates by increasing interest rates toward their market equilibrium while allocating resources efficiently. Therefore, removing interest rate controls and allowing them to increase could lead to higher levels of savings. Additionally, with the assumption that savings tend to respond strongly to interest rate movements, greater interest rates could likely intensify the level of financial mediation. Financial mediation refers to the number of fiscal assets funnelled through the financial system. The result of financial liberalisation, strictly considered under these conditions, is likely to yield higher savings that, in turn, result in greater economic development through improved investment quality - by allowing resources to be allocated efficiently - and quantity (Andrianaivo & Yartey, 2010; Ang, 2008; Dahir & Tall, 2015; Reinhart & Tokatlidis, 2003; Ang & McKibbin 2007). Khalaf and Sanhita (2009), on the other hand, argue that development of the financial sector does not necessarily follow financial liberalisation.

Since “Rajan and Zingales’ (2003)” contribution on the impact of economic candour in financial development, this issue has received specific consideration. According to their interest group theory, trade and financial openness may significantly reduce the impact of those opposed to economic development. When an economy is closed, incumbent companies profit from financial subjugation, resulting in decreased financial development. This then prevents competitors from entering the market with the necessary financial means. It may be argued that increasing both the openness of commerce and the capital account challenges this existing state of affairs. For incumbents, foreign entry into the domestic goods markets causes a reduction in rents, as well as creating additional investment needs to counter new competition and capitalise on new opportunities. Furthermore, bolstering capital flows hinders financial subjugation, as market access is progressively opened up (Aluko & Ajayi, 2017). Several studies examined the bearing of trade liberalisation and financial candour on financial sector development and liberalisation from a variety of perspectives.

2.2. Empirical Literature

After a period of intense deliberation regarding the connection between financial development and economic expansion, several empirical studies were conducted; these yielded mixed results regarding the link between economic growth and the development of the financial sector. Some experimental studies endeavoured to show a causal link between these aspects, while others go so far as to put forward estimates based on the nature of the connection between the two.

King and Levine (1993) found, in their investigation into 77 countries, spanning the years 1960 to 1989, a statistically positive and significant connection between development of the financial sector and increases in real per capita capital stock, real per capita GDP, and gross national product. Additionally, Beck and Levine (2005) used “generalized method of moments (GMM) and averaged non-overlapping data” from 40 countries between 1976 and 1998; they consequently

established that stock market growth as well as banking sector development showed increased economic expansion.

Saci, Giorgioni, and Holden's (2009) research investigated signs of banking sector development and the stock market. Their study shows that stock market development indicators supports growth. Banking sector development, they concluded, negatively affected financial growth where stock market development indicators are involved. According to Leitão (2010), data gathered between 1980 and 2006 showed a progressive connection between financial development and economic growth for five BRICS and 27 European Union countries. Similarly, by using "dynamic GMM models" (2010, p. 15) for 24 nominated African countries between 1981 and 2010, Adusei (2013) concluded that a positive correlation between economic growth and financial development existed. Additionally, by using "pairwise Granger causality tests", the researcher confirmed the suggestion of bidirectional causation among economic growth and financial development (2010, p. 15).

Following Schumpeter's (1934), Shaw's (1973), and McKinnon's (1973) arguments, a considerable amount of pragmatic research has been conducted on the apparent association between economic growth and financial sector development. Several studies (Christopoulos & Tsionas, 2004; Kar, Nazlıoğlu, & Ağır, 2011; Hsueh et al., 2013, and others) have found supporting proof underpinning the supply-leading hypothesis. A "novel threshold regression", along with "the instrumental variables technique" were used by "Huang and Lin (2009, p. 439)" to re-examine the finance-growth relationship, resulting in the observation that financial sector development has a favourable outcome re economic growth, particularly in low-income countries. Further, Bist (2018, p. 2) employed "panel cointegration and panel unit root analysis" to scrutinise the long-run nexus economic growth and financial sector development in "16 low-income nations (African and non-African). The study indicated that developing the financial sector, as evaluated

in terms of loans extended to the private ownership sector, ultimately significantly bolstered growth.

In the pooled mean group setting, and by making use of the “autoregressive distributive lag model”, Samargandi et al. (2014, p. 83) found what is described as “an inverted U-shaped” nexus between growth and finance over time. However, this connection was, in the short run, insignificant, showing that finance in extremis may have a detrimental effect on middle-income nations’ growth. The dynamic connection between reforms regarding interest rates, financial development, and economic expansion was studied by Odhiambo (2009), whose findings and outcomes revealed a demand-following trend. According to this study, the main factor in increased need for assistance provided by financial institutions remains an upsurge in economic growth. Notably, these outcomes are akin to those observed by Obradović and Grbić (2015), who premised that the economic growth process subsequently influences the economic development process. Additional results garnered from the study upholds the supply-following hypothesis, stating that the establishment of a strong finance sector has the ability to stimulate economic growth (Adusei, 2013).

Levine (1997) notes that nations with more active stock markets and larger banks show faster economic development over time. By comparing 35 developing nations, the study “explored the consequences of financial sector development on economic expansion via domestic capital and total factor productivity (TFP) growth. It is evident from the research that developing the financial sector influences per capita GDP, owing chiefly to its function in resource allocation efficiency, as opposed to through its impact on capital accretion (Ahmed & Malik, 2009).” This implies that a well-functioning monetary system accrues domestic capital, subsequently stimulating economic growth. When all middle-income nations in the study are taken into account, Samargandi et al.’s (2014) findings show that financial development is inversely correlated to economic growth over

time. Similar conclusions were drawn by Loayza and Ranciere (2006); they note that financial sector development is detrimental to economic growth when measure over the short term.

In terms of causation between monetary development and growth, Jung's (1986) work examined the causality of economic development and growth between real and financial variables. His research was based on data collected from 56 countries, including 19 developed industrialisation countries, in the post-war period; the study indicated a bidirectional causation between economic and real variables. King and Levine (1993) found that an end-product of economic growth is not financial development, but rather that finance is a determining factor of economic growth. Moreover, Wachtel and Rousseau (1995) state that financial development is directly linked to Granger-causes growth. Luintel and Khan's (1999) study of a ten-economy sample also confirmed bidirectional causation between monetary growth and economic development. Furthermore, bidirectional causation between each of the economic development variables and monetary growth was also shown in Wolde-Rufael's (2009) research.

In contrast, Demetriades and Hussein (1996), when undertaking a causality analysis, did not indicate a causal connection between economic expansion and financial development. Their analysis indicated that causality arrays fluctuate across countries. In Levine and Zervos' (1998) study, it is shown predictors of capital accumulation as well as monetary and productivity growth are:

i) Stock market revenue ratios;
ii) Bank credit extended to private companies as a GDP proportion; and
iii) Stocks' trading value are.

Further, Bhanumurthy and Singh (2013) also did not report any evidence of parity between Indian bank branches and SDP (state domestic product) in the long run. Furthermore, Menyah,

Nazlioglu, and Wolde-Rufael (2014) indicate that neither economic development nor commerce have any causal relationship with monetary growth.

Ncanywa and Mabusela (2019) examined the effects financial sector growth on economic development in five countries in sub-Saharan Africa. In the analysis, “panel cointegration, variance decomposition, panel ARDL, and impulse response” techniques were used (2019, p. 12). From the multiple cointegration tests conducted, resultant findings indicated that there was an extended connection between the two variables; however, one test - the Kao test - did not find a correlating affiliation. ARDL tests conducted revealed that, over an extended period, liquid liabilities and bank loans to private enterprises impact economic growth positively. This lends credence to the supply-following hypothesis, according to which financial sector development causes economic growth. In other words, the growth of the economy will be positively affected by bank loans extended to private enterprises and by liquid liabilities. In terms of domestic savings, the findings indicated its influence on monetary growth is ultimately negative. In the short term, however, opposite results were obtained by gross domestic savings, which spurred on economic growth.

Aluko and Ajayi (2017) conducted a pragmatic study on the features that determine the development of the banking sector in sub-Saharan African nations using a system “GMM estimator” for estimation of the dynamic panel model based on panel data. Furthermore, the study concluded that better institutional conditions, density of the populace, and trade openness positively influence the development of the banking sector by increasing its depth. In addition, the banking sector's development was shown to be improved by the law (quality of laws and legal origins), inflation, and religion, evidenced by an increase in overall efficiency. Conversely, trade openness, income level, and ethnic diversity have negative effects on the banking sector's development.

A review of the main empirical and theoretical research studying the associations between institutions and economic growth and economic development was put forward by Fernández and Tamayo (2017). The survey indicated that institutions can robustly contribute to supporting financial development in two key areas. These areas are, firstly, the enforcement and specification of property rights in financial contracts, and, secondly, the implementation and appropriate design of financial and macroeconomic policies. Consequently, financial development promotes economic growth by providing adequate liquidity, increasing risk sharing, and alleviating financial constraints, which in turn allow for more efficient resource allocation and higher rates of capital accumulation.

2.3. Summary of Lacunae in the Literature

From the literature review in the preceding sections, it is evident that numerous different perspectives on the affiliation between monetary expansion and financial development exist. Additionally, the economic growth/economic development nexus is complex, since it can be influenced by a variety of factors, such as government intervention (taking the shape of reforms), as well as the quality of institutions, amongst other aspects. This is due to the fact that numerous economic sectors rely on the financial growth sector; thus, economic growth without the financial sector's input appears implausible, as no economy can function without finance (Ekmekçioğlu, 2012). In my opinion, this aspect warrants further examination.

3. THEORETICAL FRAMEWORK AND METHODOLOGY

3.1. Introduction

This chapter aims to present an overview of the model used to address the objectives described in the study. The model takes the following objectives into account:

i) Determine the effect of financial sector development on economic growth;
ii) Examine the role of the banking sector on the development of the financial sector; and
iii) Analyse the role institutional quality plays in the affiliation between financial development and economic growth.

First, the researcher establishes the theoretical model for analysing the connection between financial sector development and economic growth. Secondly, the model that will be used to achieve the last two objectives is specified. Thirdly, estimation processes and techniques are ensured; to ensure robust results, appropriate diagnostic tests are presented. Lastly, an abstract description, as well as the source materials for each variable used in the study are provided.

3.2. Theoretical Model

This section serves to establish the model employed in analysing the connection that exists between financial sector development and financial growth. The study refers to works by Mankiw et al. (1992), as well as Cooray's (2009) Financial Sector Augmented Model.

Aggregated production is typified by an ongoing return to scale Cobb-Douglas production function with financial capital, human capital, the labour force , and physical capital, expressed as

$$Y(t) = K(t)^{\alpha} H(t)^{\beta} F(t)^{\gamma} (A(t)L(t))^{1-\alpha-\beta-\gamma} \quad \ldots (1),$$

where Y is output, K is physical capital, H is human capital, F is financial capital, A is the level of technology, and L is labour.

In contrast to the physical capital variable, which includes the value of tangible assets like structures, the financial capital variable reflects the worth of fiscal assets. According to Cooray (2009), elasticity of output with respect to physical capital, elasticity of output with respect to human capital, and elasticity of output with respect to financial capital are all represented by α, β and γ, respectively.

L(t) is predicted to accelerate exogenically at a rate of n, and A(t) is expected to grow similarly at a rate of g. The rate at which capital stock depreciates is indicated by δ. Both g and δ are considered to correspond over countries, as per the MRW model (Mankiw et al., 1992). The steady-state level of per capita output is logarithmically expressible, if the savings rate is signified by sK, sH signifies the accretion of human capital by, and the accrual of financial capital is indicated by sF, as follows:

$$ln\left[\frac{Y(t)}{L(t)}\right] = \ln A(0) + gt + \frac{\alpha}{1-\alpha-\beta-\gamma}\ln sK + \frac{\beta}{1-\alpha-\beta-\gamma}\ln sH + \frac{\gamma}{1-\alpha-\beta-\gamma}\ln sF - \frac{\alpha+\beta+\gamma}{1-\alpha-\beta-\gamma}ln(n+g+\delta)$$

… (2).

Here, A (0) = α_0+μ; α_0 is a constant, and μ indicates a shock. Relaxing the assumption of steady state, convergence rate is expressed by:

$$\frac{d\ln y(t)}{dt} = (1-\alpha-\beta-\gamma)(n+g+\delta) \times \left[\ln(y*) - \ln\big(y(t)\big)\right] \quad \dots (3),$$

Where y is the level of output per effective worker and y* is the steady-state level of output per effective worker. If $\lambda = (1-\alpha-\beta-\gamma)(n+g+\delta)$, then λ can be defined as the economy's speed of convergence (Cooray, 2009; cited in Barro & Sala-i-Martin, 1992; 1999).

From equation (3), it follows that:

$$\ln y(t) = \left(1 - e^{-\lambda t}\right) \ln(y*) + e^{-\lambda t} \ln y(0) \quad \ldots (4).$$

Deducting y (0) from both sides and substituting for y* gives:

$$\ln y(t) - \ln y(0) = \left(1 - e^{-\lambda t}\right) \frac{\alpha}{1-\alpha-\beta-\gamma} \ln sK + \left(1 - e^{-\lambda t}\right) \frac{\beta}{1-\alpha-\beta-\gamma} \ln sH + \left(1 - e^{-\lambda t}\right) \frac{\gamma}{1-\alpha-\beta-\gamma} \ln sF - \left(1 - e^{-\lambda t}\right) \frac{\alpha+\beta+\gamma}{1-\alpha-\beta-\gamma} \ln(n + g + \delta) - \left(1 - e^{-\lambda t}\right) \ln y(0)) \quad \ldots (5).$$

Equation (5) can be estimated as follows:

$$\ln y(t) - \ln y(0) = \alpha 0 + \alpha 1 \ln sK + \alpha 2 \ln sH + \alpha 3 \ln sF + \alpha 4 \ln(n + g + \delta) + \alpha 5 \ln y(0) + \mu \quad \ldots (6)$$

The output per capita's growth rate is determined by the accrual of physical capital, population growth, financial capital, and human capital.

3.3. Model Specification

Equations (5) and (6) predict that countries that use their financial capital efficiently will have higher levels of output per capita than those that don't. Therefore, Cooray's (2009) model also included financial sector efficacy, where BNKE measures the banking sector's efficiency. A key aspect of the present study is that it modifies Cooray's (2009) study by accounting for the institutions in the model. In equation (6), the module is supplemented by the institutions variable. This leads to the following model specification:

$$\ln y(t) - \ln y(0) = \alpha_0 + \alpha_1 \ln sK\mathrm{t} + \alpha_2 \ln sH\mathrm{t} + \alpha_3 \ln sF\mathrm{t} + \alpha_4 \ln(n + g + \delta)\mathrm{t} + \alpha_5 \ln y(0) + \alpha_6 \ln BNKE\mathrm{t} + \alpha_4 \ln INSTS\mathrm{t} + \mu_t \ldots (7),$$

where INSTS measures the quality of institutions.

Furthermore, the study contains the interface terms of financial sector development with institutions. This affords greater depth of description and implies better inferences, since earlier empirical research concluded that economic development depends on and economy's institutional growth (La Porta et al., 1998). Others concluded that economic development can essentially improve institutional growth by inciting unambiguity in the banking system (Dutta and Mukherjee, 2018). The interaction between financial sector development and role of institutions is depicted by the equation below:

$$\ln y(t) - \ln y(0) = \alpha_0 + \alpha_1 \ln sK\mathrm{t} + \alpha_2 \ln sH\mathrm{t} + \alpha_3 \ln sF\mathrm{t} + \alpha_4 \ln(n + g + \delta)\mathrm{t} + \alpha_5 \ln y(0) + \alpha_6 \ln BNKE\mathrm{t} + \alpha_7(\ln sF * \ln INSTS)\mathrm{t} + \mu_t \ldots \quad (8)$$

From the discussion above (*cf.* Sections 3.1 and 3.2), it can be concluded that this research constructed a model supported by the MRW theory, endogenous growth theory, McKinnon-Shaw hypothesis, supply-following hypothesis, as well as law and finance theory.

3.4. Estimation Techniques and Procedures

The main estimation techniques employed in this study are the autoregressive distributed lag (ARDL) estimator and the instrumental variable (IV) method of time series analysis. This study utilises a time series dataset. Lacunae in the dataset were addressed by means of the interpolation method. In regression analysis, it is common practice to average data over static intervals (*cf.* Estrada et al., 2010; Weisberg, 2013; Ayadi, 2013; Beck, Demirgüc-Kunt, & Levine, 2001). It aids in equalising business cycle fluctuations, as well as in reducing the influence of outliers.

Financial development studies rarely use the autoregressive distributed lag (ARDL) model. This model was almost completely dismissed as inaccurate (Zachariadis, 2007; Djoumessi, 2009) after the establishment of co-integration and unit root and methods. This is suggestive that improper

examination of time series properties of variables may lead to spurious regressions. As a result of work done by Pesaran et al. (2001) in the late 1990s, ARDL methods were revived, and several analysts (Harvie & Pahlavani, 2006; Zachariadis, 2006; 2007; Samreth, 2008;) have used it for Granger causality.

Using the ARDL approach affords various advantages. Pesaran et al. (2001) note that, firstly, the ARDL model is applicable, regardless of the stationarity I(0) of the underlying regressors or whether these regressors are incorporated in the first order I(1). In the second place, it makes available two sets of critical bounds, with I(0) indicating the lower bound, and I(1) the upper (Pesaran et al., 2001). Furthermore, in the event that the estimated equation's F value falls outside this bound, one may proceed with the co-integration process, regardless of whether the fractional co-integration, I(O), or I(1) of the underlying variables have been established. The model is also consistent for minor observations, differing from Engler and Granger's (1987). Lastly, ARDL provides largely unbiased estimations of both valid t-statistics as well as the long-run model, also in the case of endogenous regressors (Harris & Sollis, 2003; Djoumessi, 2009;). The generic form of the ARDL equation from (8) is presented in (9) below:

$$\begin{aligned}\Delta lny_t = \vartheta_0 &+ \sum_{i=1}^{p_1} \alpha_i \Delta lny_{t-i} + \sum_{i=0}^{p_2} \beta_i \Delta lnsK_{t-i} + \sum_{i=0}^{p_3} \gamma_i \Delta lnsH_{t-i} + \sum_{i=0}^{p_4} \emptyset_i \Delta lnsF_{t-i} \\ &+ \sum_{i=0}^{p_5} \omega_i \Delta ln(n+g+\delta)_{t-i} + \sum_{i=0}^{p_6} \varphi_i \Delta lny(0)_{t-i} + \sum_{i=0}^{p_7} \rho_i \Delta lnBNKE_{t-i} \\ &+ \sum_{i=0}^{p_4} \tau_i \Delta \ln(sF * INSTs)_{t-i} + \vartheta_1 lnsK_{t-1} + \vartheta_2 lnsH_{t-1} \\ &+ \vartheta_3 lnsF_{t-1} + \vartheta_4 \ln(n+g+\delta)_{t-1} + \vartheta_5 lny(0)_{t-1} \\ &+ \vartheta_6 lnBNKE_{t-1} + \vartheta_7 \ln(sF * INSTs)_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots (9)\end{aligned}$$

3.5. Diagnostic Checks

Extrapolations based on time series data are exceptionally sensitive to model specification; therefore, determining the most applicable estimation method is of utmost concern. Several tests are employed to determine the suitability of an assortment of estimators.

3.5.1. Stationarity and Unit Root Tests

Time series data are used in this study; thus, stationarity should be tested first. A number of studies indicate that models employing non-stationary variables are likely to produce false regressions and render test statistics unreliable. Brooks (2002) contends that the inclusion of non-stationary variables makes the conventional suppositions of large samples invalid, which may lead to a flawed estimation of the considered variable's significance, along with the model's significance in general. Harris (1997) states that stationarity can be achieved if a series is differed a specific number of times. To eliminate serial stochastic trends, all variables are checked for stationarity, and, where necessary, are differentiated in order to induce stationarity. For the purpose of this research, two-unit root tests, namely Augmented Dickey-Fuller and Phillip-Perron, are employed for the stationarity of the dataset.

3.5.2. Cointegration

Due to the pattern of the stationarity of the variables, it is important to determine whether any long-term relationship exists between them is critical; this is also known as the cointegration test. Thus, "two time series integrated in the order *d* are said to be cointegrated if one unique linear combination of these series exists which is integrated in an order inferior to *(d-b)* with *b _ 1"* (Djoumessi, 2009, p.103). Thus, to test variable co-integration, the study employs the ARDL Bound Test.

3.5.3. Endogeneity

According to Aggarwal et al. (2011), the data may be subject to endogeneity issues and omitted variable bias. To mitigate the effect of these error term correlations with the explanatory variable, the instrumental variables technique is used.

3.5.4. Multicollinearity

In a multiple regression equation, multicollinearity exists when there is high correlations between independent variable(s). Statistical significance of an independent variable is undermined by multicollinearity. The study employed variance inflationary factors to check for multicollinearity in the model.

3.5.5. Autocorrelation, Heteroscedasticity and Stability

According to Toll, Mignon and VanZyl (2003) autocorrelation may arise when economic variables exhibit trend and cycles or when certain important variables are excluded from non-linearity in the data. The Breusch-Godfrey serial correlation LM test is applied to test for autocorrelation. Heteroskedasticity refers to situations where the variance of the residuals is unequal over a range of measured values. The study employs White test for heteroscedasticity. The Ramsey Reset is applied in the analysis to detect any functional form problems in the regression.

3.6. Data Description and Sources

Table 3.1 (page 35) presents the definitions of variables *viz*. the main equation specification. The preceding literature review form the basis for the selection of variables. The annual data utilised for the empirical estimation span from 1975 to 2020. Data pertaining to the variables are garnered from a variety of sources, namely World Development Indicators (World Bank, 2022), South African Reserve Bank (SARB, 2022), and World Governance Indicators (World Bank, 2020).

Table 3.1: Data Sources

Variables	Definition	Sources
Dependent Variables		
Y	Real GDP per capita	World Development Reports (World Bank, 2021); Human Development Reports (United Nations, 2022)
Independent Variables		
sK	Share of physical capital to GDP	World Development Indicators (World Bank, 2022)
sH	Human capital, proxied by adult literacy ratio	World Development Indicators (World Bank, 2022)
Financial Development Indicators		
sF1	Money supply to GDP	World Development Indicators (World Bank, 2022)
	Bank's deposit assets to GDP	
	Domestic credit granted by the banking sector to the private sector as %age of GDP	
sF2	Money supply to GDP	
	Bank's deposit assets to GDP	
	Private credit granted by the banking sector and other financial institutions as %age of GDP	
	Assets of other financial institutions to GDP	
sF	sf=(sf1,sf2) Financial development composite indicator is above variables combined	
n	Annual average growth of the labour force	World Bank (2021); South African Reserve Bank (2021)
g+δ	The sum of the growth rate of technology of technology, g, and the rate of depreciation δ	Assumed to be 0.05 as in MRW
Bank Efficiency		
BIM	Bank's net interest margin to total assets	World Development Indicators (World Bank, 2022)
BOC	Bank's overhead costs to total assets	
BCR	Bank's concentration ratio	
BNKE	BNKE= (BIM,BOC,BCR) Bank efficiency is variables above combined	
Institutional Quality		
Pol	Political Stability	Worldwide Governance Indicators (WGI) (World Bank, 2020)
Vac	Voice and Accountability	
Gov	Government Effectiveness	
Roq	Regulatory Quality	
Rol	Rule of Law	
Corr	Control of Corruption	
INSTS	INSTS=(Pol,Vac,Gov,Roq,Rol,Corr) Institutions' composite indicator is variables above combined	

A trans-log production function is employed for examining connection between economic growth and institutional development. GDP per capita, expressed as *Y*, is the dependent variable. According to the production theory, GDP capita captures economic growth using the population participation, reflecting a nation's standard of living.

In this study, the independent variable capital stock to GDP is included, consistent with the theory of production in which an increase in capital stock leads to more investment and, consequently, more growth (Haini, 2019; Solow 1956).

Measured using Lutz et al.'s (2021) human capital index, sH represents human capital. The salience of human capital's influence on economic growth is undeniable (Romer, 1990), and it can help foster inclusive growth together with financial development (Oyinlola & Adedeji, 2019). Nevertheless, there are practical complications in measuring human capital, since different measures of human capital often yield disparate results. This study makes use of a human capital index; this index encapsulates human capital's multidimensional, as it contemplates the adult literacy ratio for all people aged 15 and above.

Financial development is measured by indices that are considered to reflect a complete picture of an economy's financial development, as they consider depth, the importance of non-bank fiscal intermediaries, and the efficiency of financial institutions. There are many aspects to financial development. This results in the development of financial sectors where both markets and financial institutions can fulfil essential fiscal functions in the economy. Using these indices, allow one to better understand the financial sector's role monetary growth.

Based on Cooray's (2009) work, three composite indices will be used to proxy the financial capital variables s_{F1}, s_{F2}, and s_{E1}. These are defined below.

The dimension and venture of the financial sector are assessed by employing two composite indicators, s_{F1} and s_{F2}, respectively. The s_{F1} indicator is formulated by averaging the biggest four indicators of commercial banking, recommended by Demirgüc-Kunt and Maksimovic (1996). The three indicators are:

> (i) the ratio of M2/gross domestic product (GDP), which is a measure of the size and depth of the banking sector; (ii) the ratio of deposit banks' assets to GDP, which is also a measure of the size of the financial sector; and (iii) domestic credit by deposit banks to the private sector as a ratio of GDP (Cooray, 2009).

This last indicator designates the amount of credit provision by the financial banking sector to the private banking sector and is a measure of financial intermediary activity. King and Levine (1993), Levine and Zervos (1996), Demirgüc-Kunt and Maksimovic (1996), as well as and others, employed all three indicators.

A second index is designed based on that of Demirgüc-Kunt and Maksimovic (1996), *to evaluate the importance of financial intermediaries that are non-bank and the commercial banking sector.* The s_{F2} indicator is designed by averaging

> (i) the ratio of M2/GDP; (ii) private credit by deposit banks and other financial institutions to GDP; (iii) assets of deposit banks to GDP; and (iv) assets of other financial institutions to GDP (Cooray, 2009: p.12).

The *efficiency of the financial sector* is assessed through the s_{E1} indicator. This indicator is derived by averaging

> (i) the value of banks' net interest margin to total assets; (ii) banks' overhead costs to total assets; and (iii) a concentration measure given by the ratio of the assets of the four largest banks' to total banking assets (Cooray, 2009).

In the financial sector, increased competition should decrease interest margins, overhead costs, and the measure of concentration. Thus, low measures or indicators suggest amplified efficacy, and vice versa.

Institutions represent a multidimensional concept, whose nature has been captured by a multitude of empirical studies We have extracted the institutions[1] indicator variables from Worldwide Governance Indicators (World Bank, 2020). Six institution indicators is used as this study's database. Institutional development measures range from poor in quality (-2.5) to good in quality (2.5); the higher the higher value, the better institutional quality. The use of all six indicators at once in an analysis may cause difficulties with multicollinearity, since the variables may show high correlation levels. As such a large number of coefficients need to be estimated, there is also the risk of overidentification. In contrast, employing each one of these variables might result in variable omission bias. In an attempt to attend to these matters, it is possible to synthesise the variables into a single indicator with specifically assigned weights. Such a method would, of course, raise the question of the weightings to be assigned to the variables. A principal component analysis (PCA) is used to avoid any subjectivity in weight definition.

The study employs a variety of control variables that have been used in previous growth regression studies. Both technological growth rate and depreciation rate, presumed to be 0.05 in the MRW, are included as control variables. The variable *n* represents the average annual growth of the labour force.

[1] The World Bank (1997) notes that political stability measures the government's aptitude in its planning implementation, as well as to maintain itself without violence. An indicator of corruption assesses the amount of corruption, as well as the way in which public power is applied for private benefit. A government's ability to respond citizens and construct a culture of democracy is measured by voice and accountability. The objectivity and robustness of the judicial system, as well as citizens'' respect for legislation, ere reflected in rule of law. Government effectiveness refers to the policies a government formulates and implements as well as the integrity in enacting and committing to these policies. Finally, regulatory quality refers to governments' aptitude in conveying and implementing unassailable policies that foster development of the private sector (*cf.* World Bank, 1997).

4. ESTIMATION RESULTS

4.1. Introduction

In this chapter, the empirical results based on the objectives of the study are discussed. The first segment presents summary of statistics, while the discussion of the empirical findings, using the study objectives as starting points, is highlighted in the second section. Post estimation tests are discussed in section three and robust analysis in section four. The final section serves to conclude the chapter.

The study encounters one of the common problems in the time series analysis, which is omission of data. Therefore, interpolation with forwarding and backward options is employed to complete the mission dataset.

4.2. Preliminary Analysis

The estimation technique employed is not only ideally suited to time series analyses, but is also governed the preliminary analyses' outcomes, particularly the outcomes of the formal tests. To start, this section offers a concise discussion on the statistical properties of the series under study. It will focus, firstly, on descriptive statistics, followed by a discussion on the correlation matrix, as well as graphical analysis alongside stationarity tests.

4.2.1. Summary of Descriptive Statistics

Table 4.1 below presents summary statistics of key variables where the log of GDP is with a minimum of 8.33 and maximum of 8.65. Financial sector development ranges from 0.128 to 0.324. The normal skewness is zero, with some variables being less than one (<1), which implies normal skewness; however, the variables are negatively skewed to the extreme left tail. The kurtosis

measures the peakedness of the variables. Some variables are platykurtic, as they are less than three, while others are leptokurtic, because they are greater than three. The summary statistics suggest the absence of normal data distribution. The behaviour of the variables follows an irregular pattern, which suggests a mixture of periods of low and high volatility. This corroborates the trend plots of the variables which also confirm likely unstable pattern as a result of instability in the South Africa economy due to apartheid and global financial meltdown.

Table 4.1: Descriptive Statistics

Variable	Min	Max	Mean	Std.Dev	Skewness	Kurtosis	Jarque-Bera (Prob)	N
Real GDP per capita (Y)	8.340	8.658	8.508	0.100	0.053	1.786	5.931(0.051)	46
Financial Sector Development (sF)	0.128	0.324	0.227	0.055	0.096	1.819	9.369(0.009)	46
Growth rate of technology and rate of depreciation (g+δ)	0.002	0.124	0.062	0.023	0.389	4.051	7.238(0.026)	46
Physical capital to GDP (sK)	0.124	0.341	0.211	0.049	1.029	3.368	1.432(0.488)	46
Growth rate of labour force (n)	-0.048	0.074	0.012	0.023	0.389	4.051	7.238(0.026)	46
Bank efficiency (BNKE)	0.010	0.368	0.280	0.056	-3.798	17.973	571.589(0.00)	43
Human Capital (sH)	0.725	0.954	0.844	0.067	0.135	1.926	405.470(0.00)	46
Voice and Accountability (Vac)	0.570	0.850	0.747	0.106	-0.393	1.428	45.721(0.00)	46
Political Stability (Pol)	-0.540	0.220	-0.270	0.164	-0.965	3.482	23.378(0.00)	46
Government Effectiveness (Gov)	0.290	1.020	0.745	0.290	-0.319	1.442	317.514(0.00)	46
Regulatory Quality (Roq)	0.130	0.800	0.373	0.151	1.149	3.619	30.510(0.00)	46
Rule of Law (Rol)	-0.120	0.270	0.102	0.077	-0.577	5.287	26.419(0.00)	46
Control of Corruption (Corr)	-0.120	0.730	0.478	0.306	-0.688	1.822	34.167(0.00)	46
Institutions (INSTS)	0.000	0.650	0.505	0.204	-1.200	3.223	259.966(0.00)	46
Composition of financial & institution (sF*INSTS)	0.000	0.204	0.108	0.045	-0.491	3.564	40.203(0.00)	46

The above table indicates that South Africa's development is diverse, both across the sample and over time. For instance, regarding the production function variables, South Africa’s real GDP per capita has a mean of 8.51 with a standard deviation of 0.100. This is suggestive of variation in the South Africa’s economic development. In terms of physical capital to GDP, the average is 0.211, and the standard deviation is 0.049, which indicates a high level of variance. Similarly, human capital exhibits a mean of 0.844 with an 0.067 standard deviation, indicating a high variance level. Based on the production and MRW theories, physical capital to GDP and human capital are expected to correlate with the dependent variable in both a significant and positive way.

With respect to the financial development variables, a mean of 0.227 and 0.055 standard deviation are evident in the index. This implies lower variation levels that those of the production function variables. At 0.280, the average bank efficiency index is higher than the financial sector development index, and exhibits a marginally higher degree of variance, with the standard deviation being 0.056. Developing countries' financial sectors are generally dominated by banks (in South Africa, banks dominated the financial sector until the mid-80s and early 90s), so it is not surprising that the banking sector is more developed (Haini, 2020; Rajan, 1992; World Bank, 2016). Nevertheless, it is noted that both the financial development and bank efficiency variables have lower variance levels than the production function variables. This indicates that, despite South Africa having the most sophisticated financial sector, including banks, in the SADC region, its potential to promote economic growth is underutilised (Anchang, 2016; NPC, 2011).

On the other hand, focusing on institutions, the collective mean value regarding the rule of law index – which includes regulatory quality, control for corruption, political stability, and government effectiveness – stands at −0.244, exhibiting a sizeable standard deviation of 0.204. The variances reflect the government's commitment to reform throughout the time period in question, especially after the declaration of democracy in 1994, when the government began to focus on strengthening stability in the financial sector, improving financial inclusion, improving governance, and strengthening democracy (Anchang, 2016; World Bank, 2018).

4.2.2. Correlation Analysis

Table 4.2 (*cf.* page 43) presents the estimated sample correlation matrix. Furthermore, the study employs correlation analysis which unveils linearity relationship between the variables. The variance inflationary factor (IVF) reveals that there is no collinearity or significant outliers. Any variable that is not within the rule of thumb for IVF is likely to be highly linear with another variable in the model.

Using the correlation matrix, we can determine the linear association between two variables. Here, +1 “results in two perfectly positively correlated variables”, while -1 is equal to “two perfectly negatively correlated variables” (Haini, 2020, p. 539). As a result, some insight into the variables employed is gained prior to estimating the time series model.

Physical capital to GDP and human capital is linked to GDP per capita as expected. This is in line with Mankiw-Romer-Weil (MRW) theory and production function, because GDP is a function of both human- and physical capital (Haini, 2019). Nevertheless, other independent variables, with the exception of the sum of the annual average growth of the labour force, as well as technological growth rate and depreciation rate, show a negative correlation with GDP per capita.

Interesting to note is that financial sector development only exhibits a moderate correlation with GDP per capita versus institutions, which might suggest a non-linear relationship between South Africa's financial sector development and economic growth.

While focusing on institutions and the development of the financial sector, the correlation between the two indices is negative. This could be attributed to low institutional quality levels evident in South Africa, resulting from poor government efficacy, corruption control, and accountability. Strongly correlated with GDP are rule of law, regulatory quality, and political stability, which implies that South Africa is not a failed state. South Africa’s democracy is supported by a robust constitution and a remarkably solid matrix of formal institutional checks and balances. With the advent of South African democracy, both political stability and the quality of its judicial foundations were observed to far exceed those of its middle-income countries comparators (Bordo & Levy, 2021).

Further, it is observed that bank efficiency positively correlates to financial sector development, which is indicative of the efficacy of the South African financial sector. A 2016 report states that the South African supervisory framework is both adequately developed and robust, and that both

the banking and non-bank sectors regularly share information with authorities. It also analyses liquidity risk and is developing a framework for examining macro-prudential risk (Bagyenda & Abuka, 2014).

Table 4.2: Matrix of Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Real GDP per capita (Y)	1.000												
(2) Financial Sector Development (sF)	0.175	1.000											
(3) Physical capital to GDP (sK)	0.276	-0.584	1.000										
(4) Human Capital (sH)	0.602	0.708	-0.534	1.000									
(5) Growth rate of labour fource, technology and rate of depreciation (n+g+δ)	0.167	-0.501	0.578	-0.332	1.000								
(6) Bank efficiency (BNKE)	-0.031	0.087	0.202	-0.165	0.149	1.000							
(7) Political Stability (Pol)	0.705	0.553	-0.195	0.756	-0.001	-0.068	1.000						
(8) Voice and Accountability (Vac)	-0.741	-0.615	0.323	-0.887	0.21	0.26	-0.893	1.000					
(9) Government Effectiveness (Gov)	-0.709	-0.69	0.377	-0.911	0.305	0.17	-0.745	0.911	1.000				
(10) Regulatory Quality (Roq)	-0.02	0.313	-0.393	0.319	-0.117	-0.448	0.349	-0.417	-0.352	1.000			
(11) Rule of law (Rol)	-0.12	0.476	-0.292	0.265	-0.256	-0.031	0.092	-0.104	-0.289	0.47	1.000		
(12) Control of Corruption (Corr)	-0.783	-0.533	0.282	-0.888	0.262	0.235	-0.746	0.921	0.929	-0.199	-0.056	1.000	
(13) Institution (INSTS)	-0.283	-0.562	0.354	-0.551	0.371	0.038	-0.288	0.521	0.649	-0.183	-0.295	0.593	1.000

The rule of thumb of Variance Inflationary Factors (VIFs) state that VIFs greater than 10 should be treated with caution to reduce collinearity. VIFs show that there will be no multicollinearity in the estimation; hence, the independent variables are moderately correlated (see table above). However, human capital (VIF = 1.94) and financial sector development (VIF = 2.32) are relatively inflated as compared to the mean VIF, as shown in Table 4.3 below.

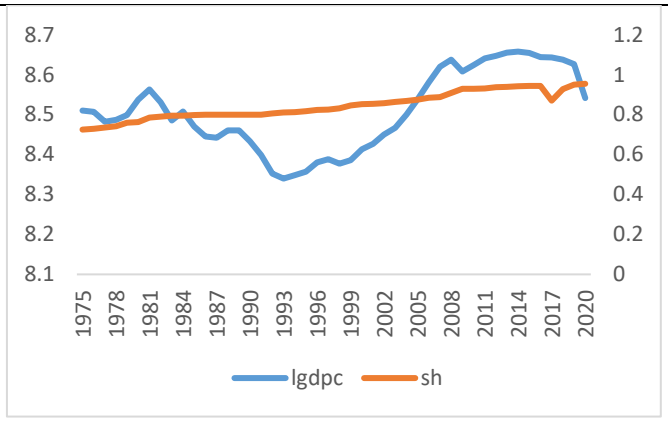
Table 4.3: Variance Inflation Factor

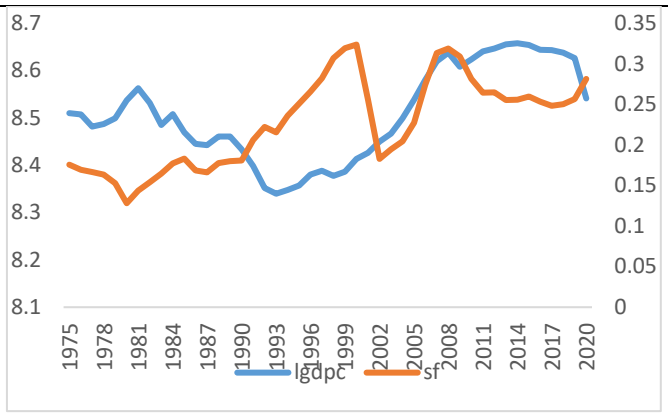
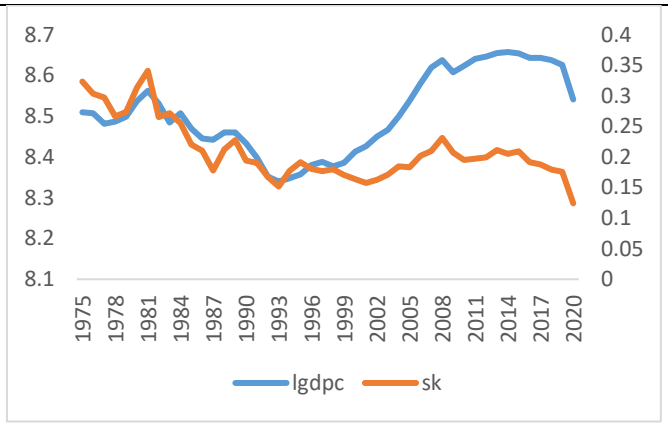
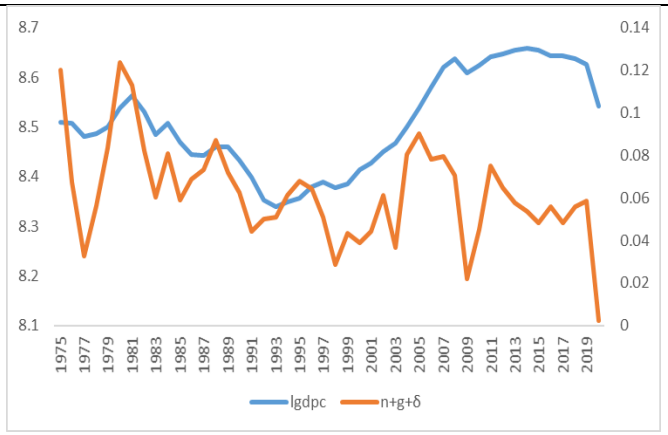
	VIF	1/VIF
Financial Sector Development (sF)	2.318	0.431
Human Capital (sH)	1.935	0.517
Growth rate of labour force, technology and rate of depreciation (n+g+δ)	1.347	0.743
Mean VIF	1.866	0.536

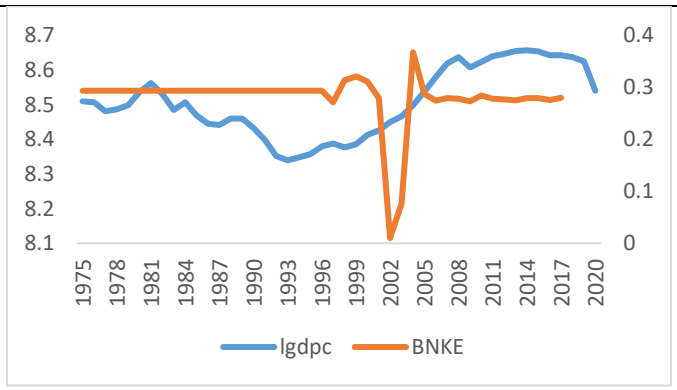
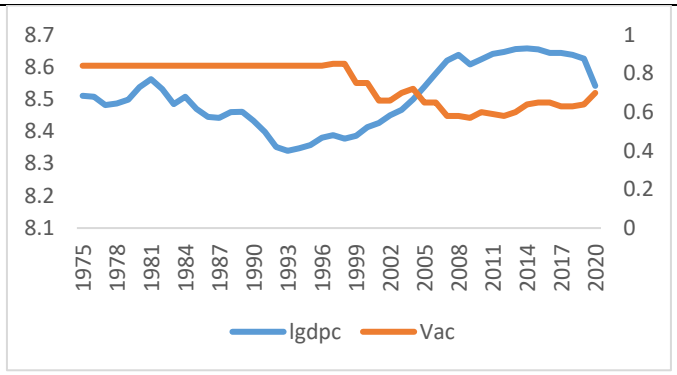
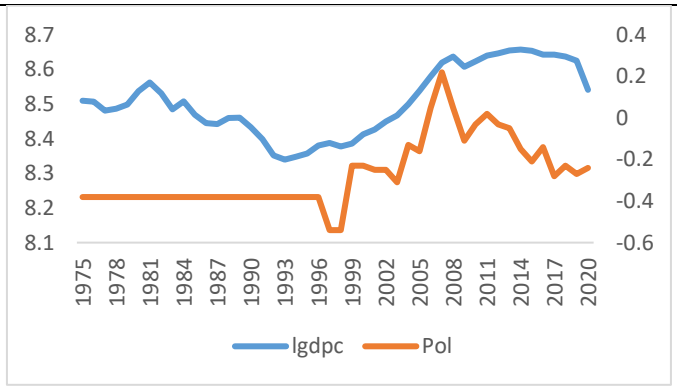
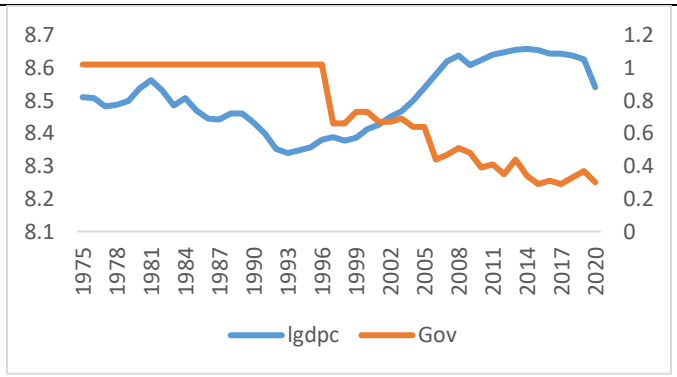
4.2.3. Graphical Analysis

The graphs below (pp. 44-47) show the trend of the log of GDP per capita (dependent variable) and other independent variables over time in South Africa. Since the advent of the democratic era in 1994, the government's primary fiscal objectives have been job creation, poverty elimination, and inequality reduction. With the transition to democracy, South Africa's economic growth improved dramatically, and has remained relatively robust and stable during the democratic period. A significant slowdown in the global economy was caused by the East Asian financial crisis of 1998. The dotcom crisis brought about a similar slowdown. However, South Africa experiences growth from the start of the 2000s due to the global commodity boom, until the global financial crisis began in 2007.

From late 2007 onwards, a lack in electricity supply, rising costs of other administered services, uncertainty in the global economy, and other domestic issues contributed to slower growth.

Trend of GDP Per Capita and Human Capital	

Trend of GDP Per Capita and Financial Sector Development	
Trend of GDP Per Capita and Physical Capital	
Trend of GDP Per Capita and Growth Rate of Labour Force, Technology, and Depreciation	

Trend of GDP Per Capita and Bank Efficiency	
Trend of GDP Per Capita and Voice and Accountability	
Trend of GDP Per Capita and Political Stability	
Trend of GDP Per Capita and Government Effectiveness	

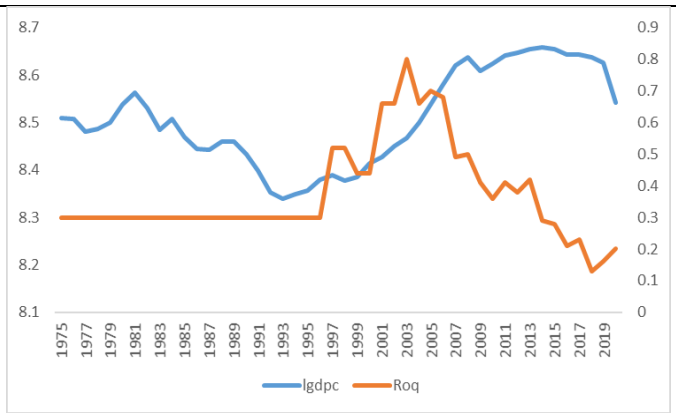
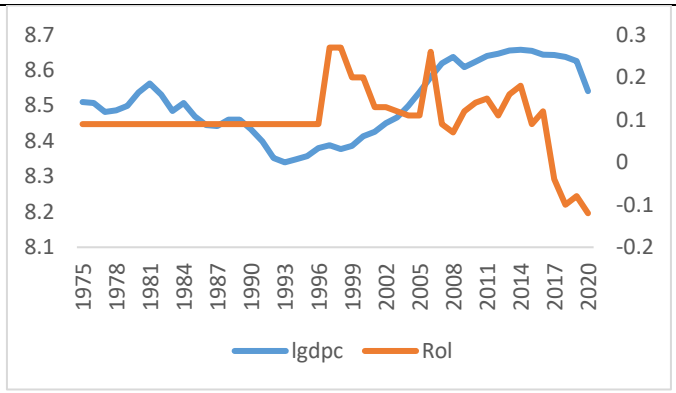
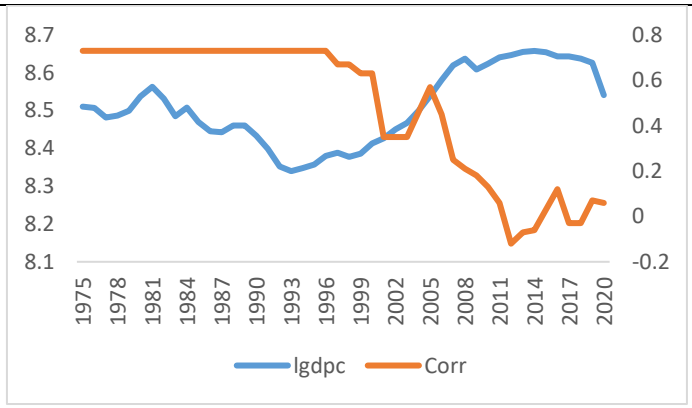
Trend of GDP Per Capita and Regulatory Quality	
Trend of GDP Per Capita and Rule of Law	
Trend of GDP Per Capita and Control of Corruption	

Figure 4.1: Graphical Analysis (World Bank; SARB)

Figure 4.1 evidences the quality of institutions in South Africa is volatile. During the 1990s, South Africa became an iconic example of democratisation. Starting in the mid-2000s, however, strong political institutions collided with massive inequality in the country. The collision deepened throughout the 2010s, leading to economic stagnation and growing threats to institutional veracity.

The ANC's upper echelons competed for resource control and influence, further pressuring institutions. As of 2009, state-owned enterprises became a particularly profitable target for individuals and factions to participate in systematic looting (Bordo & Levy, 2021).

4.2.4. Stationarity Tests

In Table 4.5, two conventional unit root tests , including the Augmented Dickey-Fuller and Phillip-Perron test, are employed for the stationary of the dataset. The unit root test of stationarity includes trends, lag (1), and differences of the variables that are statistically significant. The first difference of the variables involves around zero, and they are stationary. The outcome is reflective of the Phillip-Perron unit root test at first difference. In other words, we assumed the stationarity of variables in first difference; in other words, they are integrated of order one. Interestingly, financial development, growth rate of technology, rate of depreciation, growth rate of the labour force, and bank efficiency are significant at level. This implies that they are stationary even without the first difference.

Table 4.4: Unit Root Tests[2]

Variables	Unit root without structural breaks						Unit root with structural breaks							
	ADF			PP			CMR unit root test				Zivot-Andrews unit root test[b]			
	Level	1st diff	I(d)	level	1st diff	I(d)	Break date	Ceoff	T.stat	AR(I)	Break date	Ceoff	T.stat	AR(I)
Real GDP per capita (Y)	-1.643	-2.910[d***]	I(1)	-1.393	-3.214**	I(1)	2017	0.03727**	-2.479	AR (2)	2004	-4.82	-4.224	I(1)
Financial Sector Development (sF)	-3.934**	-4.343***	I(0)	-2.409	-3.856**	I(1)	1999	-0.00777	-1.199	AR (12)	2001	-4.82 *	-4.884	I(1)
Growth rate of technology and rate of depreciation (g+δ)	-4.514***	-6.136***	I(0)	-4.429***	-6.053***	I(0)	2017	-0.01355	-1.025	AR (4)	2011	-5.57***	-6.202	I(0)
Physical Capital to GDP (sK)	-2.136	-5.029***	I(1)	-2.319	-6.326***	I(1)	2017	-0.01804	-1.397	AR (0)	1988	-5.57***	-6.822	I(0)
Growth rate of labour force (n)	-4.514***	-6.136***	I(0)	-4.429***	-6.053***	I(0)	2017	-0.01355	-1.025	AR (4)	2011	-5.57***	-6.202	I(0)
Bank efficiency (BNKE)	-5.491***	-7.854***	I(0)	-4.613***	-6.651***	I(0)	2000	-0.00257	-0.125	AR (12)	2004	-5.57***	-9.011	I(1)
Human Capital (sH)	-2.825	-5.939***	I(1)	-3.309*	-8.220***	I(0)	2015	-0.00337	-0.455	AR (2)	2013	-5.57***	-8.322	I(0)
Voice and Accountability (Vac)	-1.398	-3.424**	I(1)	-1.453	-6.068***	I(1)	1999	0.00137	0.156	AR (12)	1999	-5.57***	-8.13	I(0)
Political Stability (Pol)	-2.318	-5.989***	I(1)	-2.38	-6.703***	I(1)	2004	-0.0155	-0.561	AR (12)	1999	-5.57***	-7.341	I(1)
Government Effectiveness (Gov)	-2.538	-5.964***	I(1)	-2.667	-7.446***	I(1)	1995	-0.0288	-1.389	AR (12)	1997	-5.57***	-8.207	I(1)
Regulation Quality (Roq)	-0.942	-4.400***	I(1)	-1.17	-7.597***	I(1)	2001	-0.03806*	-1.784	AR (8)	2004	-5.57***	-9.52	I(1)
Rule of Law (Rol)	-1.293	-5.865***	I(1)	-1.738	-7.970***	I(1)	2015	-0.042	-1.592	AR (1)	1999	-5.57***	-8.342	I(0)
Control of Corruption (Corr)	-2.376	-4.987***	I(1)	-2.225	-5.811***	I(1)	1999	-0.02298	-1.029	AR (11)	2006	-5.57***	-6.713	I(0)
Institutions (INSTS)	-2.409	-6.153***	I(1)	-7.125***	-20.299***	I(0)	1995	-0.017	-0.245	AR (12)	1998	-5.57***	-20.637	I(0)
Composition of financial & institution (sF*INSTS)	-2.195	-7.183***	I(1)	-7.423***	-22.974***	I(0)	1995	-0.00644	-0.316	AR (11)	2003	-5.57***	-22.041	I(0)

Researcher's Computations.

[2] Note: The ADF and PP denote the Augmented Dickey-Fuller and Phillip-Perron unit root test denoted. *, **, *** implies series stationary significant level at 10%, 5%, 1% respectively. [t] denote trend in the Augmented Dickey-Fuller unit root test. [d] represents ADF with drift; CMR denoted Clemente-Montañés-Reyes unit root test (Additive Outlier – AO) allow change to take place for a break in the slope. [b] indicates both intercept and trend in the Zivot-Andrews unit root test.

Concerning the structural break test, Clemente, Montañés, & Reyes (1998) expand on the work of Perron and Vogelsang (1992) by referencing two changes in the mean. The breakpoints are the time in which instability, such as the effect of apartheid sanctions, financial crises, and high inflation, among others, affected each variable in the South Africa economy. Perron (1989) emphasises that, without accounting for instability or structural breaks in the unit root test, the outcome may be biased toward the unit root. In other words, without reporting the structural breaks, unit root may just be an academic exercise. Using the Zivot-Andrews unit root test with the structural break, the series reports one break date, t-statistics, lag differences, and critical value. The tests indicate various breaks in the linear variable combination used in the current study, and they are significant at 1%, except for financial sector development at 10%, while economic growth is not significant. Hence, the ARDL and instrumental variable (IV) method of time series analysis are employed here as a robustness check.

4.2.5. ARDL Bounds test

An ARDL bounds test is a powerful statistical procedure for assessing level associations when the underlying property of time series is completely I(0), completely I(1), or jointly co-integrated. When the underlying data generation procedure of a time series is uncertain if it is trend or first difference stationary, bound testing as an extension of ARDL can be used to examine “the significance of the lagged levels of the variables in a univariate equilibrium correction system” (Pesaran et al., 2001, p. 289).

Table 4.5: ARDL-Bounds Test[3]

GDP and FSD Model								
	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP	(8) GDP
F-statistic	5.104**	4.859**	4.832**	5.057**	4.604**	5.139**	4.773**	4.683**
t-statistic	-4.917**	-4.762**	-4.543**	-4.810**	-4.583**	-4.893**	-4.582**	-4.598**
Pesaran et al. (2001)	F		t					
Critical Value	I(0)	I(1)	I(0)	I(1)				
1%	3.964	5.955	-3.598	-5.324				
5%	2.811	4.361	-2.846	-4.406				
10%	2.333	3.696	-2.478	-3.956				
Bank efficeiency and FSD Model								
	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP	(8) GDP
F-statistic	2.707*	1.388	1.757	1.839	1.777	1.636	1.296	1.849
t-statistic	-0.916	-0.599	-0.681	-0.604	-0.091	0.426	-0.296	0.035
Pesaran et al. (2001)	F		t					
Critical Value	I(0)	I(1)	I(0)	I(1)				
1%	4.180	6.076	-3.598	-5.115				
5%	2.963	4.452	-2.863	-4.241				
10%	2.454	3.767	-2.503	-3.810				

Researcher's Computations.

F and t-statistics larger than critical values for I(1) variables are at 5% significance level, indicating a level relationship among the GDP and FSD Model. In the Bank efficiency and FSD model, there is no level relationship, except for set (1), where there is a level of relationship at 10% significance level.

4.3. Results and Discussion

This subsection presents and interprets the results of the ARDL test, which provides long- and short-run relationships. The regression result is partitioned into two. First, it will present the relationship between financial sector development and economic growth with the inclusion of

[3] Notes: *, **, and *** denote significant at 10%, 5%, and 1% levels, respectively. Critical values are obtained from Pesaran et al. 2001).

institutional factors (*cf.* Tables 4.6 and 4.7). Second, the study presents the analysis of the relationship between bank efficiency and financial sector development with the inclusion of institutional factors (see Tables 4.8 and 4.9).

In Table 4.6, the discussion of results is based on columns aligned with two of the three study objectives, namely, to unveil the effect of financial sector development on economic growth, and examine the role of institutional quality on the affiliation between the two. Eight regression sets are estimated for the ARDL model in order to evaluate estimation sensitivity; these should ideally show broad similarities across the regression sets. The columns are demarcated as follows:

i) Column (1) includes political stability;
ii) Column (2) includes voice and accountability;
iii) Column (3) includes government effectiveness;
iv) Column (4) includes regulatory quality;
v) Column (5) focuses on the rule of law;
vi) Column (6) considers control for corruption;
vii) Column (7) and (8) focus on institutions; and
viii) Column (8) includes interaction terms financial sector development and institutions, as depicted by equation 6 and 7, respectively.

Table 4.6: Estimation of GDP and FSD Using ARDL (Long-Run)[4]

Variables	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP	(8) GDP
Financial Sector Development (sF)	0.0784	0.0677	0.106	0.115	0.109	0.0954	0.124	0.114
	-0.0875	-0.0921	-0.0902	-0.0886	-0.0937	-0.0987	-0.0949	-0.0933
Physical Capital to GDP (sK)	0.812***	0.774**	0.779**	0.759**	0.768**	0.778**	0.756**	0.765**
	-0.284	-0.289	-0.302	-0.289	-0.311	-0.289	-0.311	-0.31
Growth rate of labour force, technology and rate of depreciation (n+g+δ)	0.0222	0.0537	0.081	0.116	0.0959	0.0764	0.104	0.0927
	-0.329	-0.332	-0.344	-0.332	-0.358	-0.343	-0.352	-0.352
Human Capital (sH)	0.969*	0.752	0.866	0.9680	0.882	1.007*	0.96	0.965
	-0.568	-0.575	-0.601	-0.575	-0.642	-0.576	-0.623	-0.623
Bank efficiency (BNKE)	-0.120*	-0.118	-0.125*	-0.123*	-0.126*	-0.144*	-0.0995	-0.116
	-0.0663	-0.0731	-0.0714	-0.0697	-0.0734	-0.0712	-0.0818	-0.0752
Political Stability (Pol)	0.0619							
	-0.0525							
Voice and Accountability (Vac)		-0.264						
		-0.185						
Government Effectiveness (Gov)			-0.0046					
			-0.0688					
Reulatory Quality (Roq)				0.0456				
				-0.0673				
Rule of Law (Rol)					0.02450			
					-0.0966			
Control of Corruption (Corr)						-0.00397		
						-0.0661		
Institutions (INSTS)							0.0408	
							-0.0531	
Composition of financial& institutions (sF*INSTS)								0.123
								-0.184
Constant								
Observations	41	41	41	41	41	41	41	41
R-squared	0.827	0.83	0.821	0.825	0.816	0.827	0.820	0.819

Researcher's Computations

The estimated results provide an interesting insight into the connection between the development of the financial sector development and growth in the South African context. The results show that, ultimately, financial sector development variables are positive and insignificant to economic growth. This implies that the effect of financial sector development on economic growth is not substantial. This finding is compatible with the studies by Bangake and Eggoh (2011), Samargandi et al. (2014), and Beck, Georgiadis, and Straub (2014). In the case of South Africa, the insignificant effects of the financial sector could be attributes to the rapid financial sector development as opposed to the financial markets sector. In the past, South Africa's financial

[4] Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

development and integration policies focused more on stability rather than growth (Almekinders et al., 2015), leading to a fragmented financial sector that is not conducive to growth. To enhance development and success through stronger financial associations, policymakers should consider continuous fortification of the financial sector, as well as the implementation of policies which may bolster further financial sector integration.

For *H, K,* and $n+g+\delta$, the estimated values are consistent with the production theory; these values echo earlier research that underscores the value of labour, human capital, and capital in promoting per capita GDP (Khandker, 2016). In addition, Khandker (2016) emphasises that technology, labour, and physical capital are exceedingly important in explaining economic growth variations between countries. In the estimated results, the k coefficients are significant, and contribute in excess of 75% of the real GDP per capita variances across the eight regression sets.

Examining the bank efficiency variable provides interesting results. Apart from the last two sets, bank efficiency is consistently negative and significant to GDP per capita. This highlights that the banking sector is not a growth driver in South Africa. The banking sector in South Africa has developed rapidly and in a positive direction, but it has not been inclusive. One strategy that can contribute to eliminating poverty and unemployment, as well as to reducing inequality, is financial inclusion. Financial inclusion is a pressing matter when seen in light of South Africa's historical-economic milieu (Mhlanga, Dunga, & Moloi, 2021). In the country, less than 30% of low-income persons - the country's poorest 25% - have access formal bank accounts; in comparison, as much as 91% of adults earning high incomes, the richest 25%, have access to such accounts (Wentzel et al., 2016; Louis & Chartier, 2017). This problem can be partially attributed to the high concentration of the South African banking industry in wealthy regions, limiting capital accesses to primarily the wealthy (Louis & Chartier, 2017; Nanziri & Leibbrandt, 2018; Riley, 2019). In line with its commitment to improving financial inclusion, the South African government has, in the

National Development Plan's (NDP) Vision 2030, involved the critical import of financial inclusion (RSA, 2017). Here, the government envisages that, by 2030, the proportion of the population that can access transactional financial services will increase from 63% to 90% (Mhlanga et al.,2021). This would increase participation and, as a result, boost economic growth.

The effect of institutions is positive and insignificant on GDP per capita. This highlights that institutional quality's contribution to growth in South Africa is positive; however, it is not significant at the conventional level. The effect of institutions is positive and insignificant on GDP per capita. This highlights that institutional quality's contribution to growth in South Africa is positive, yet not significant at the conventional level. Accordingly, the average of the institutions composite indicator is between -1 and 1. Hence, an enhancement in the quality of institutions will embolden growth due to the positive coefficient of institutions (0,0408). This finding contradicts those put forward by Abdelkarim and Atef (2009) as well as Kuipou et al. (2015), who found a significant positive relation between institutions and economic growth.

Economic growth is observed to be positively influenced by the interaction variable amongst financial development and institutions, even though the interaction is statistically insignificant. This contradicts literature on institutions and financial sector development. These results indicate that the amount of work done to strengthen institutions in South Africa has been relatively small and has not given rise to a financial deepening. In addition, these efforts have not contributed to the financial sector's development. So, an improvement in institution quality (political stability, rule of law, control for corruption, voice and accountability, regulatory quality, and government efficacy) will be favourable to economic growth.

Both in the long-run and short-run models, financial sector development variables are positive and insignificant to economic growth, supporting Samargandi et al. (2014), who demonstrate that finance and growth have a negligible connection in the short term.

The short-run model differs from the long-run model in that physical capital, institutions, and the interaction term between FSD and institutions are negatively correlated with GDP. Additionally, n+δ is positively associated with GDP across all eight datasets. Furthermore, when compared to the long-run model, human capital is negative as well as statistically significant to economic growth.

Table 4.7: Estimation of GDP and FSD using ARDL (Short-Run)[5]

Variables	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP	(8) GDP
ΔFinancial Sector Development (sF)	0.168	0.218	0.223	0.244*	0.212	0.218	0.215	0.193
	-0.151	-0.138	-0.146	-0.141	-0.153	-0.157	-0.144	-0.152
ΔPhysical Capital to GDP (sK)	-0.230*	-0.221*	-0.206	-0.219*	-0.195	-0.215	-0.177	-0.183
	-0.128	-0.126	-0.131	-0.128	-0.13	-0.128	-0.129	-0.129
ΔGrowth rate of labour force, technology and rate of depreciation (n+g+δ)	0.680***	0.736***	0.746***	0.750***	0.739***	0.748***	0.735***	0.741***
	-0.209	-0.191	-0.193	-0.19	-0.196	-0.197	-0.191	-0.192
ΔHuman Capital (sH)	-0.898**	-0.748*	-0.793*	-0.887**	-0.822*	-0.837*	-0.864**	-0.868**
	-0.408	-0.41	-0.417	-0.413	-0.427	-0.408	-0.416	-0.419
ΔBank efficiency (BNKE)	-0.011	0.00957	-0.0255	-0.0175	-0.0228	-0.0208	-0.0415	-0.0352
	-0.0489	-0.0545	-0.0492	-0.0485	-0.0498	-0.0482	-0.0532	-0.0519
ΔPolitical Stability (Pol)	-0.0371							
	-0.0275							
ΔVoice and Accountability (Vac)		0.133						
		-0.0916						
ΔGovernment Effectiveness (Gov)			-0.0161					
			-0.0315					
ΔReulatory Quality (Roq)				0.00303				
				-0.0319				
ΔRule of Law (Rol)					-0.00497			
					-0.045			
ΔControl of Corruption (Corr)						-0.0306		
						-0.0370		
Δinstitutions (INSTS)							-0.0153	
							-0.0188	
ΔComposition of financial& institutions (sF*INSTS)								-0.0439
								-0.0661
Constant	0.011	0.0104	0.00457	0.00059	0.00344	0.0103	-0.0046	0.0006
	-0.0262	-0.0261	-0.0261	-0.0282	-0.0268	-0.0272	-0.0289	-0.0271
Observations	41	41	41	41	41	41	41	41
R-squared	0.827	0.83	0.821	0.825	0.816	0.827	0.820	0.819
ECM	-0.763***	-0.763***	-0.723***	-0.748***	-0.712***	-0.750***	-0.701***	-0.705***
	-0.155	-0.155	-0.159	-0.155	-0.155	-0.153	-0.153	-0.153
CUSUM	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
CUSUMQ	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable

Researcher's Computations

[5] Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Δ represents first lag difference.

In Table 4.8 and 4.9 (pp. 57-58), the discussion of results is aligned to the last objective of the study, which is to examine the role of banks in financial sector development. Similar to Tables 4.5 and 4.6, Tables 4.7 and 4.8 estimate eight sets of regression, taking into consideration each of the institutions variables that form the institutions composite indicator.

In the long run, overall column (1) to (8) presents a positive connection between bank efficacy and development of the financial sector, except for column (6), which is statistically significant. This is indicative of the expectation that bank efficiency will increase South Africa's financial sector development. A variety of smaller banks, some investment institutions, several large banks, lending and savings organisations, along with the South African Reserve Bank (SARB), constitute the South African banking system, a system which is said to be adequately regulated and developed (Moyo, 2018; SARB, 2017).

Based on the World Economic Forum's (EWF) Global Competitiveness Report (2020), the South African banking sector is well developed and can be favourable likened with those of the developed world; in terms of financial market development, it ranks 11 out of 138 countries. Among the 138 countries, the country is ranked number two in terms of bank soundness, but number 27 in terms of affordability of financial services. These results reflect that the banking system in South Africa plays a role in financial deepening and contributes to the development of the financial sector. It also indicates that the South African financial sector is efficient.

Similarly, physical capital has a significantly positive connection with financial sector development in columns (1) to (8). Human capital also positively correlates with financial sector development. These results are compatible with the work of Hakeem and Oluitan (2012), who posit that financial sector development is improved by human capital. A structural move directed at a South African service economy has been observed, and high reliance levels on high-skilled financial services is reported (Reddy et al., 2016). The structural incongruity between the demand and supply of labour

is the most noteworthy in the South African milieu, because there is a demand for high-skilled workers (as well as an excess of low-skilled labourers); the financial sector only absorbs highly skilled workers, indicating that human capital will positively impact financial sector development.

When examining the growth rate of labour force and technology over the sample period, it is shown to be negative and insignificant in all of the specifications. The negative relationship implies that labour and technology are not the drivers of financial sector development in South Africa. This contradicts previous studies that suggest that labour and technology capital positively and significantly influences financial sector development (Haini, 2019; 2020). The South African labour forces' educational and skill levels are lower than that of labourers in other productive economies. As little as 20% of the employed population holds a tertiary qualification, and only 32% underwent secondary instruction. Nearly 50% of the workforce has not obtained a Grade 12 qualification, while 60% (roughly 11.75 million) of unemployed individuals obtained certificates below Grade 12 (Reddy et al., 2016). Consequently, this highlights that most of South Africa's labour force is unskilled. Thus, one would expect the growth rate of the labour force not to influence the development of the financial sector in South Africa, given its dependence on highly skilled individuals.

The institutions composite index is negative and statistically insignificant on financial sector development in South Africa, as seen in Table 4.8 below, which indicates that the efforts undertaken to strengthen institutions in South Africa have not resulted in development of the financial sector.

Table 4.8: Estimation of Bank Efficiency and FSD Using ARDL (Long-Run)[6]

Variables	(1) FSD	(2) FSD	(3) FSD	(4) FSD	(5) FSD	(6) FSD	(7) FSD	(8) FSD
Bank efficiency (BNKE)	0.195	0.168	0.210	0.176	0.211	0.222*	0.195	0.208
	-0.137	-0.129	-0.134	-0.138	-0.135	-0.127	-0.139	-0.136
Physical Capital to GDP (sK)	0.843**	0.867**	0.824**	0.857**	0.839**	0.777**	0.853**	0.853**
	-0.372	-0.352	-0.371	-0.369	-0.374	-0.353	-0.373	-0.375
Growth rate of labour force, technology and rate of depreciation (n+g+δ)	-1.781***	-1.764***	-1.711***	-1.775***	-1.750***	-1.663***	-1.744***	-1.746***
	-0.393	-0.369	-0.389	-0.388	-0.392	-0.37	-0.391	-0.392
Human Capital (sH)	0.237	0.327	0.335	0.2540	0.431	0.574	0.325	0.318
	-0.564	-0.526	-0.554	-0.554	-0.605	-0.538	-0.558	-0.560
Political Stability (Pol)	0.0648							
	-0.086							
Voice and Accountability (Vac)		-0.559**						
		-0.252						
Government Effectiveness (Gov)			-0.1020					
			-0.105					
Reulatory Quality (Roq)				-0.115				
				-0.105				
Rule of Law (Rol)					-0.073			
					-0.140			
Control of Corruption (Corr)						-0.215**		
						-0.0961		
Institutions (INSTS)							-0.0188	
							-0.0323	
Composition of financial& institutions (sF*INSTS)								-0.0372
								-0.108
Constant								
Observations	41	41	41	41	41	41	41	41
R-squared	0.549	0.453	0.483	0.489	0.489	0.484	0.447	0.499

Researcher's Computations

The results in the short-run model are largely the same in sign and significance of the coefficients for the long-run model. The noticeable difference is that, in the short-run model, physical capital and institutions variables are negative and positive, reactively, when compared to the long-run results.

[6] Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; FSD is acronym for Financial Sector Development.

Table 4.9: Estimation of Bank Efficiency and FSD Using ARDL (Short-Run)[7]

Variables	(1) FSD	(2) FSD	(3) FSD	(4) FSD	(5) FSD	(6) FSD	(7) FSD	(8) FSD
ΔBank efficiency (BNKE)	0.0807	0.113	0.087	0.0853	0.0904	0.0902	0.0987	0.0596
	-0.0611	-0.0738	-0.0649	-0.0649	-0.0646	-0.0648	-0.0733	-0.069
ΔPhysical Capital to GDP (sK)	-0.113	-0.0993	-0.099	-0.065	-0.0707	-0.0207	-0.0791	-0.0454
	-0.168	-0.186	-0.18	-0.18	-0.178	-0.183	-0.186	-0.177
ΔGrowth rate of labour force, technology and rate of depreciation (n+g+δ)	-0.596***	-0.487**	-0.476**	-0.509**	-0.502**	-0.577**	-0.515**	-0.489**
	-0.204	-0.212	-0.206	-0.205	-0.202	-0.213	-0.212	-0.2
ΔHuman Capital (sH)	0.49	0.755	0.63	0.7830	0.803	0.726	0.716	0.612
	-0.561	-0.617	-0.596	-0.590	-0.592	-0.590	-0.612	-0.587
ΔPolitical Stability (Pol)	-0.0615*							
	-1.820							
ΔVoice and Accountability (Vac)		0.117						
		-0.14						
ΔGovernment Effectiveness (Gov)			0.0596					
			-0.044					
ΔReulatory Quality (Roq)				0.0449				
				-0.0458				
ΔRule of Law (Rol)					-0.09550			
					-0.0616			
ΔControl of Corruption (Corr)						-0.0704		
						-0.0524		
Δinstitutions (INSTS)							0.00538	
							-0.0284	
ΔComposition of financial& institutions (sF*INSTS)								-0.117
								-0.0921
Constant								
	-0.0088	-0.0249	-0.0261	-0.0136	-0.0361	-0.0435	-0.0332	-0.0467
	-0.0336	-0.0373	-0.0338	-0.0362	-0.0335	-0.0361	-0.0399	-0.034
Observations	41	41	41	41	41	41	41	41
R-squared	0.549	0.453	0.483	0.489	0.489	0.484	0.447	0.499
ECM	-0.0783	-0.0575	-0.0608	-0.0537	-0.008	0.0434	-0.0282	0.00308
	-0.0855	-0.0961	-0.0893	-0.089	-0.088	-0.102	-0.095	-0.088
CUSUM	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
CUSUMQ	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable

Researcher's Computations

[7] Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Δ represents first lag difference; FSD is acronym for Financial Sector Development.

4.4. Endogeneity

The tables below test for endogeneity in the estimate models.

Table 4.10: Testing for endogeneity of GDP and FSD

Variables	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP	(8) GDP
Financial Sector Development (sF)	0.843**	0.867**	0.824**	0.857**	0.839**	0.777**	0.853**	0.853**
	-0.372	-0.352	-0.371	-0.369	-0.374	-0.353	-0.373	-0.375
Physical Capital to GDP (sK)	0.195	0.168	0.21	0.176	0.211	0.222*	0.195	0.208
	-0.137	-0.129	-0.134	-0.138	-0.135	-0.127	-0.139	-0.136
Growth rate of labour force, technology and rate of depreciation (n+g+δ)	-1.781***	-1.764***	-1.711***	-1.775***	-1.750***	-1.663***	-1.744***	-1.746***
	-0.393	-0.369	-0.389	-0.388	-0.392	-0.37	-0.391	-0.392
Human Capital (sH)	0.237	0.327	0.335	0.2540	0.431	0.574	0.325	0.318
	-0.564	-0.526	-0.554	-0.554	-0.605	-0.538	-0.558	-0.56
Bank efficiency (BNKE)	-0.120*	-0.118	-0.125*	-0.123*	-0.126*	-0.144*	-0.0995	-0.116
	-0.0663	-0.0731	-0.0714	-0.0697	-0.0734	-0.0712	-0.0818	-0.0752
Political Stability (Pol)	0.0648							
	-0.0857							
Voice and Accountability (Vac)		-0.559**						
		-0.252						
Government Effectiveness (Gov)			-0.1020					
			-0.105					
Reulatory Quality (Roq)				-0.115				
				-0.105				
Rule of Law (Rol)					-0.07260			
					-0.14			
Control of Corruption (Corr)						-0.215**		
						-0.0961		
Institutions (INSTS)							-0.0188	
							-0.0323	
Composition of financial& institutions (sF*INSTS)								-0.0372
								-0.108
Constant	0.284***	0.288***	0.274***	0.289***	0.277***	0.264***	0.282***	0.278***
	-0.0427	-0.0396	-0.0414	-0.0427	-0.0417	-0.0396	-0.0425	-0.042
Observations	41	41	41	41	41	41	41	41
R-squared	0.376	0.442	0.382	0.386	0.371	0.444	0.372	0.368

*Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*

The residuals are statistically significant, which implies that endogeneity is present in the model.

Table 4.11: Testing for endogeneity of Bank efficiency and FSD

Variables	(1) FSD	(2) FSD	(3) FSD	(4) FSD	(5) FSD	(6) FSD	(7) FSD	(8) FSD
Bank efficiency (BNKE)	-0.204***	-0.221***	-0.240***	-0.221***	-0.225***	-0.250***	-0.227***	-0.226***
	-0.0707	-0.073	-0.0753	-0.0727	-0.074	-0.0781	-0.0741	-0.074
Physical Capital to GDP (sK)	0.654***	0.683***	0.673***	0.676***	0.673***	0.662***	0.680***	0.680***
	-0.114	-0.117	-0.116	-0.117	-0.117	-0.117	-0.117	-0.117
Growth rate of labour force, technology and rate of depreciation (n+g+δ)	-0.0413	-0.0412	-0.0158	-0.0281	-0.0174	-0.0065	-0.0241	-0.0186
	-0.0438	-0.0444	-0.044	-0.0455	-0.0444	-0.0448	-0.0455	-0.045
Human Capital (sH)	-0.0091	0.0845	0.0997	0.0589	0.134	0.216	0.0843	0.0812
	-0.18	-0.182	-0.182	-0.183	-0.199	-0.19	-0.183	-0.183
Political Stability (Pol)	0.0710**							
	-0.027							
Voice and Accountability (Vac)		-0.297***						
		-0.096						
Government Effectiveness (Gov)			-0.0725*					
			-0.0361					
Reulatory Quality (Roq)				-0.0346				
				-0.0354				
Rule of Law (Rol)					-0.034			
					-0.046			
Control of Corruption (Corr)						-0.107***		
						-0.0391		
Institutions (INSTS)							-0.0084	
							-0.0108	
Composition of financial& institutions (sF*INSTS)								-0.0179
								-0.036
Constant	0.0626***	0.0648***	0.0623***	0.0628***	0.0604***	0.0607***	0.0629***	0.0612***
	-0.0187	-0.0197	-0.0193	-0.0197	-0.0192	-0.0192	-0.0197	-0.0194
Observations	41	41	41	41	41	41	41	41
R-squared	0.654	0.633	0.635	0.633	0.630	0.630	0.630	0.630

*Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*

The residuals are statistically significant, which implies that endogeneity is present in the model. The endogeneity problem has led us to employ the instrumental variable (IV) time series technique to correct for endogeneity, which is discussed in detail below.

4.5. Robustness Analysis

To validate the main estimation and determine that the outcomes are highly sensitive to the level and first lag difference of the variables as revealed from the unit root test, robustness tests are conducted. As mentioned earlier, the instrumental variable (IV) technique of time series analysis is utilised.

The data might contain nationwide or country time-specific effects, such as population trends or fluctuation in the business cycle, details uncaptured by any of the explanatory variables. These could be termed endogeneity issues, as the explanatory variable may directly impact economic growth. To mitigate the effect of these error term correlations with the explanatory variable, the instrumental variables technique is used. This is used to investigate a robustness test of previous (ARDL) results by using first lagged and second lagged difference of economic growth as an instrumental variable (IV), following examples by Helms (1985) and Jalil, Mahmood, and Idrees (2013).

Table 4.12 (next page) presents the impact of financial sector development on economic growth using an internal instrument in time-series analysis The results are largely the same in sign and significance as the coefficients for the ARDL model. The only slight differences noticeable relate to the IV model's significance in explaining the nexus between FSD and GDP, physical capital and GDP, growth of labour and technology and GDP, as well as bank efficiency and GDP. In addition, it is noticeable that the institutions and human capital variables are negative and statistically insignificant on economic growth, when compared to the main model in Table 4.6. In all, the large correlation between the estimates of the main regression and the robustness checks indicates that the analyses are sufficiently robust to justify the authenticity of the research findings.

Table 4.12: Estimation of Economic Growth and Covariates Using an IV[8]

Variables	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Δ Real GDP per capita	-0.318	-0.327	-0.375	-0.256	-0.324	-0.332	-0.328	-0.328
	-0.477	-0.477	-0.507	-0.407	-0.477	-0.489	-0.482	-0.481
FSD	0.357**	0.356**	0.371**	0.359**	0.367**	0.362**	0.367**	0.367**
	-0.162	-0.154	-0.159	-0.144	-0.156	-0.150	-0.156	-0.157
Physical Capital to GDP	0.246	0.251	0.236	0.229	0.239	0.241	0.24	0.24
	-0.152	-0.154	-0.154	-0.149	-0.153	-0.153	-0.153	-0.153
Bank efficiency	-0.181**	-0.177*	-0.183*	-0.156**	-0.176*	-0.175*	-0.178*	-0.177*
	-0.086	-0.090	-0.093	-0.076	-0.090	-0.089	-0.093	-0.091
Human Capital	-0.038	-0.004	0.016	-0.014	-0.016	0.007	-0.007	-0.008
	-0.248	-0.238	-0.246	-0.225	-0.252	-0.261	-0.24	-0.239
Growth rate of labour, technology and rate of depreciation	1.121**	1.136**	1.193**	1.137***	1.158**	1.154**	1.158**	1.159**
	-0.456	-0.428	-0.452	-0.4	-0.433	-0.428	-0.433	-0.434
Political Stability	0.026							
	-0.038							
Voice and Accountability		-0.044						
		-0.106						
Government Effectiveness			-0.042					
			-0.046					
Regulatory Quality				0.037				
				-0.0447				
Rule of Law					0.003			
					-0.052			
Control of Corruption						-0.011		
						-0.045		
Institutions							-0.002	
							-0.012	
Composition of financial& institutions								-0.004
								-0.040
Constant	-0.0961**	-0.0981**	-0.104**	-0.105**	-0.102**	-0.101**	-0.102**	-0.102**
	-0.0469	-0.0426	-0.0439	-0.0427	-0.0429	-0.0419	-0.0422	-0.0427
Observations	40	40	40	40	40	40	40	40
R-squared	0.58	0.569	0.562	0.604	0.568	0.566	0.567	0.567

Researcher's Computations.

Below, Table 4.13 presents that bank efficiency significantly influences financial sector development in the overall results, after controlling for endogeneity. This is in accordance with previous results using ARDL, where bank efficiency positively affects financial sector development, yet is insignificant, except for column (6). It is also noted that institutions essentially complement financial sector development; however, the influence is insignificant, as indicated by column (7).

[8] Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; FSD is acronym for Financial Sector Development.

Table 4.13: Estimation of FSD and Covariates Using an IV[9]

Variables	(1) FSD	(2) FSD	(3) FSD	(4) FSD	(5) FSD	(6) FSD	(7) FSD	(8) FSD
ΔFSD	0.806***	0.802***	0.802***	0.803***	0.812***	0.805***	0.811***	0.823***
	-0.0773	-0.085	-0.0775	-0.0764	-0.0785	-0.0863	-0.0786	-0.0773
Bank efficiency	0.164**	0.171***	0.172***	0.153**	0.174***	0.174***	0.177***	0.182***
	-0.0613	-0.0617	-0.0604	-0.0614	-0.0609	-0.0612	-0.0625	-0.0599
Physical Capital to GDP	0.244	0.25	0.239	0.255	0.244	0.245	0.241	0.224
	-0.177	-0.181	-0.177	-0.175	-0.178	-0.179	-0.179	-0.175
Human Capital	0.133	0.173	0.183	0.141	0.134	0.180	0.167	0.156
	-0.253	-0.253	-0.250	-0.247	-0.274	-0.262	-0.252	-0.246
Growth rate of labour, technology and rate of depreciation	-0.359	-0.348	-0.332	-0.363	-0.329	-0.34	-0.331	-0.309
	-0.222	-0.231	-0.219	-0.218	-0.222	-0.226	-0.222	-0.218
Political Stability	0.0341							
	-0.039							
Voice and Accountability		-0.034						
		-0.133						
Government Effectiveness			-0.0451					
			-0.0475					
Regulatory Quality				-0.0632				
				-0.0471				
Rule of Law					0.0219			
					-0.0636			
Control of Corruption						-0.007		
						-0.0512		
Institutions							0.00404	
							-0.0147	
Composition of financial& institutions								0.0554
								-0.0483
Constant	0.0224	0.0203	0.0183	0.0263	0.0164	0.0185	0.0157	0.0105
	-0.0315	-0.034	-0.0309	-0.0314	-0.0313	-0.0324	-0.032	-0.0311
Observations	41	41	41	41	41	41	41	41
R-squared	0.879	0.876	0.879	0.882	0.877	0.876	0.877	0.882

Researcher's Computations

4.6. Post Estimation Tests

Table 4.14 and 4.15 present diagnosed tests for ARDL error correction models Cumby-Huizinga and Durbin-Watson d-statistic tests for autocorrelation, respectively, as well as White's test (with Cameron & Trivedi's decomposition of IM-test). There is no serial correlation in the model for the impact of financial development on economic growth. Moreover, it can be noted that there is no heteroscedasticity from the White test results (i.e. the variance of error term is constant for each observation). The p-value of the Ramsey RESET test shows that there it is not statistically

[9] Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1; FSD is acronym for Financial Sector Development.

significant, which implies there are no omitted variables in the models and that the models are stable. The table below presents results of Cumby-Huizinga test for autocorrelation, a diagnosis performed after time series IV.

Table 4.14: Post-estimation of GDP and FSD

Model	Cumby-Huizinga test for autocorrelation (p-value)	Remarks	White's (1980) test for heteroscedasticity (Prob > chi2)	Ramsey Test (stability) RESET
Column 1	0.2701	No serial correlation	0.9069	0.0732
Column 2	0.169	No serial correlation	0.8138	0.0453
Column 3	0.1614	No serial correlation	0.7924	0.0332
Column 4	0.1662	No serial correlation	0.7982	0.0416
Column 5	0.1697	No serial correlation	0.8512	0.0507
Column 6	0.1673	No serial correlation	0.8198	0.0416
Column 7	0.1679	No serial correlation	0.8263	0.0482
Column 8	0.169	No serial correlation	0.7093	0.0471

Researcher's Computations.

Table 4.15 presents post-estimation for the impact of bank efficiency on the financial sector development. There is no serial correlation in models, after performing the Durbin-Watson d-statistic for autocorrelation. While there is no heteroscedasticity from the White test outcomes. Also, using a significance p-value of the Ramsey RESET test, there is no omission of variables in the models.

Table 4.15: Post-estimation of Bank efficiency and FSD

Model	Durbin-Watson d-statistic for autocorrelation	Remarks	White's (1980) test for heteroscedasticity (Prob > chi2)	Ramsey Test (stability)
Column 1	0.6994	No serial correlation	0.7356	0.8144
Column 2	0.8662	No serial correlation	0.6279	0.2918
Column 3	0.7611	No serial correlation	0.6909	0.9629
Column 4	0.7295	No serial correlation	0.7046	0.8242
Column 5	0.6818	No serial correlation	0.8135	0.8951
Column 6	0.9247	No serial correlation	0.7676	0.3329
Column 7	0.7217	No serial correlation	0.1365	0.9205
Column 8	0.6957	No serial correlation	0.4084	0.9366

Researcher's Computations.

4.7. Synthesis of Empirical Results and Research Objectives

The empirical findings overwhelmingly suggest that financial sector development, on average, contributes positively towards economic growth, as shown through the ARDL and IV regression models. The results also show that banking efficiency has a positive association with financial sector development. While there seems to be a positive contribution in terms of bank efficiency to financial sector development, the contribution is significant. These results are also reflected in the IV estimations, after controlling for endogeneity. Institutions correlate negatively with the financial sector development economic growth nexus, after controlling for endogeneity.

5. CONCLUSION

5.1. Introduction

Using the findings analysed in the previous chapter, this chapter presents a summary of findings and conclusions, along with some policy implications. The focus of the current research is on the relationship between institutions, bank efficiency, financial sector development, and economic growth in South Africa. Ultimately, the major objective of the study is to determine whether financial sector development are a sine qua non for economic growth in South Africa.

For this study, robust ARDL and IV estimators were used to establish the association between institutions, bank efficiency, financial sector development, and economic growth. This study contributes to the growing literature on the nexus between economic growth and FSD, and specifically adds to the scant extant literature related to institutional factors of financial sector development in South Africa.

The next section summarises the study and presents empirical findings.

5.2. Summary and Conclusion

The analysis focused on time series data for South Africa over the period of 1975 to 2020. Cooray's (2009) Financial Sector Augmented Model is referenced in the study. Cooray (2009) developed a variable for financial capital and incorporated it into the MRW (Mankiw et al., 1992) structural model. Financial capital is proxied by the financial sector, and the research explicitly centres on the consequences of financial sector development on economic growth. Examining the impact of the financial sector's size, activity, and efficacy indicates that these factors contribute to economic growth. In this study, Cooray's (2009) study was modified by accounting for

institutions in the model. Having high-quality institutions creates a favourable environment for financial development, which in turn leads to economic growth.

Initially, the effect of institutions by investigating corruption control, rule of law, regulatory quality, government efficacy, political stability, as well as voice and accountability on financial development was analysed. Subsequently, the researcher examined the impact of institutions, financial development, and their interaction on economic growth. Also covered in this study is the connection between banking sector development, via banking efficiency, and financial sector development.

A positive and significant direct effect of the composite financial development index on economic growth is shown through robustness checks, indicating that financial sector development in South Africa is essential to boosting economic growth, espousing preceding studies cited in the literature review. The findings also show that, via banking efficiency, the banking sector significantly affects GDP per capita negatively. It can be concluded that the banking sector in South Africa does not contribute to growth, probably because it is not completely inclusive, as supported by the literature (Mhlanga et al., 2021).

In contrast to Abdelkarim and Atef (2009) and Kuipou et al.'s (2015) findings, the robustness checks revealed a negative and insignificant effect of the composite institutions indicator on economic growth. Given that the average of all institutions indicators is between 0 and -1, the negative impact of the institutions composite indicator variable demonstrates that South African institutions' quality is poor. Improvements in the quality of institutions would have a favourable effect on economic growth. In addition, institutions do not complement financial sector development, as their interactions with financial sector development are not significant or beneficial to economic growth. The study contradicts previous empirical findings that indicate the complementary role of institutions and finance on growth (Pattanaik and Nayak, 2014; Aluko and

Azeez, 2018). Consequently, it seems that the efforts taken on regarding strengthening institutions in South Africa are insignificant and do not result in financial deepening. These efforts also do not result in the development of the financial sector. Further findings show that the banking sector promotes financial sector development through bank efficiency. This reflects the role of the banking system in the growth and development of the financial sector in South Africa.

This study shows that physical capital and growth of both the labour force and technology are significant factors in influencing growth, as echoed by MRW (Mankiw et al., 1992). Based on robust checks, human capital, on the other hand, does not support growth, contrary to what MRW concluded. It is evident that human capital has an insignificant and negative impact in South Africa, exemplified by the high levels of inequality and poverty, the low quality of basic education, and the disparity between labour supply and demand (Markle & Cilliers, 2020). As a result of this incongruity, economic growth shows a preference for high-skilled workers, in spite of the fact that most employed and unemployed people have low-level skills.

5.3. Policy Implications

The study has several policy implications. Despite the contribution of financial sector development to economic growth in South Africa, policymakers should continue to improve financial inclusion, which could potentially spur on economic growth in South Africa. It may be necessary for the government to boost human capital levels by creating more on-the-job training opportunities through partnering with the private sector or and improving the quality of education. As education is a crucial element in raising the income of a society, increasing skill levels and educational opportunities will promote economic growth.

In addition, policymakers should improve the quality of institutions, such as voice and accountability, corruption control, and government effectiveness. Therefore, we recommend enhancing voice and accountability, and government effectiveness, which may stimulate financial

sector development. These various measures, then, represent the challenges that South Africa will have to meet in order to develop its financial system and its economy.

5.4. Study Limitations

The study focuses mainly on bank-based intermediation, omitting other components of the financial system, such as stock markets, pension funds, bond markets, insurance companies, and so on. Despite South Africa's relatively developed market-based financial sector, as compared to those of other developing nations, disregarding these intermediaries may result in underestimating of the level of financial sector development in South Africa. The inclusion of market-based proxies in the valuation could provide a more "complete" picture of FSD. Exploring how financial intermediaries manipulate the financial sector (counting both market-based and bank-based intermediation) is another research angle that could be explored.

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ADDEDUM A: EDITING DECLARATION



DECLARATION: 22 FEBRUARY 2022

Hereby I, Johanna Gertruida (Hanta) Henning, declare that I completed editing of the research dissertation titled *Financial Sector Development and Economic Growth in South Africa: Role of the Banking Sector* by Kabelo Precious Monareng, A research (ECON7052A) report submitted towards the fulfilment of the requirement for a Master of Commerce degree by coursework in the field of Applied Development Economics (CCA01), at the University of the Witwatersrand.

Based on the nature of the services performed, the editor cannot be held liable for any of the following:

i. The accuracy of the material contained in the thesis;
ii. The accuracy of material as gathered from sources contained in the thesis;
iii. Any plagiarism that may be present in the thesis;
iv. Any factual errors that may occur in the thesis; and/or
v. Any changes made by the candidate after editing was completed.

A full report of the edited document can be provided upon request.



Hanta Henning

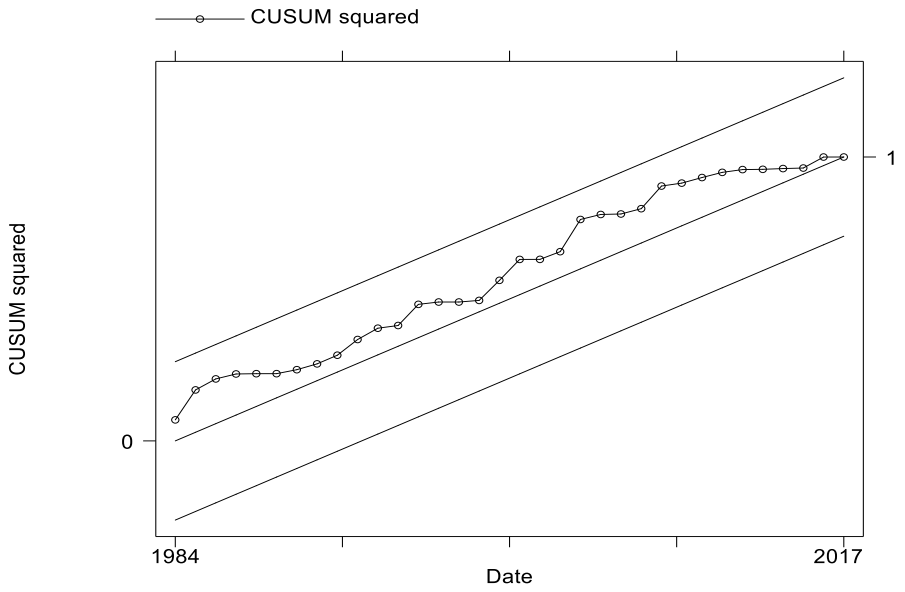
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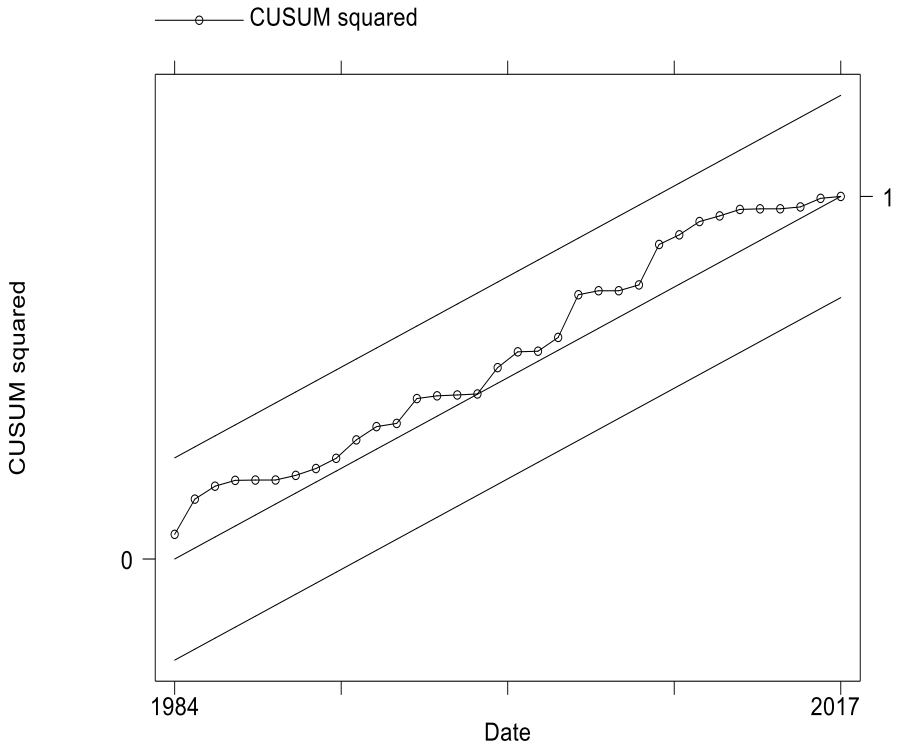
ADDEDUM B: CUSUM GRAPHS

GDP and FSD Model

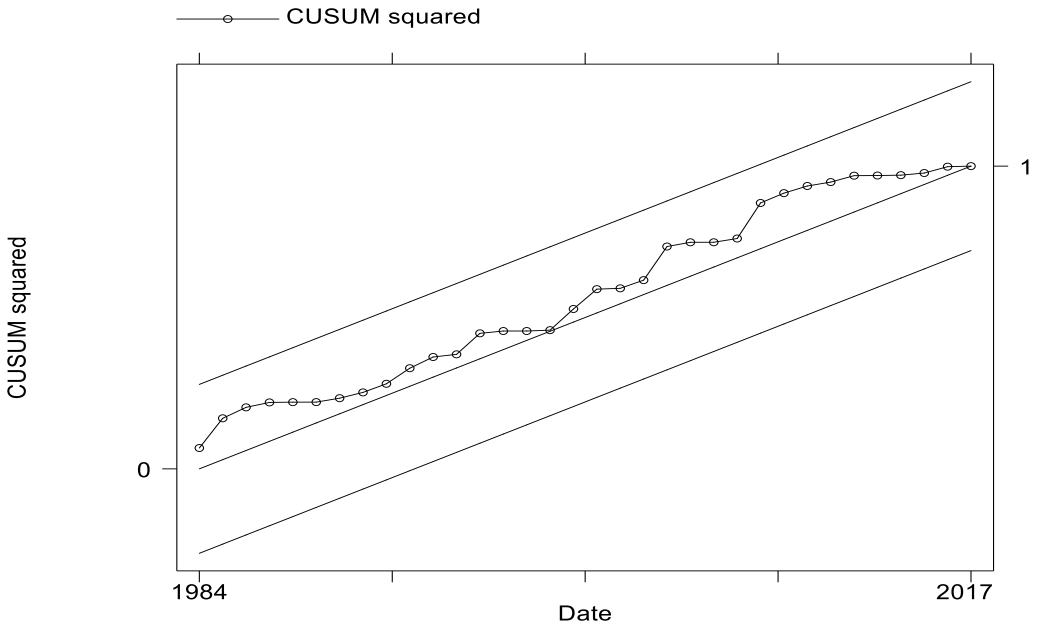
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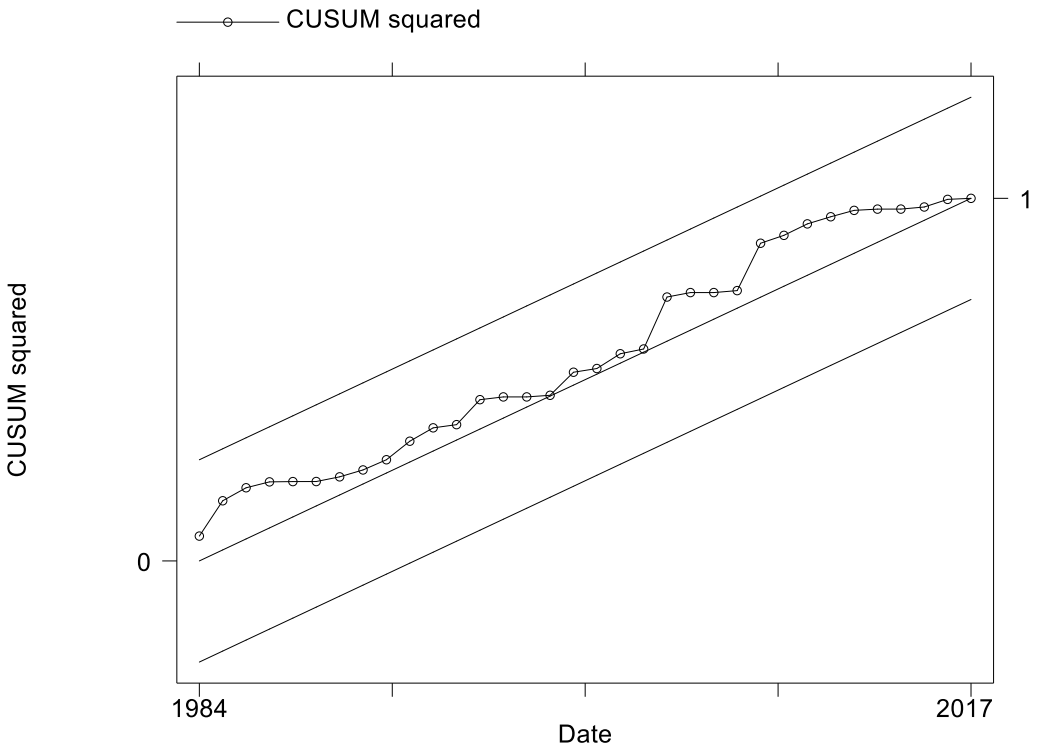
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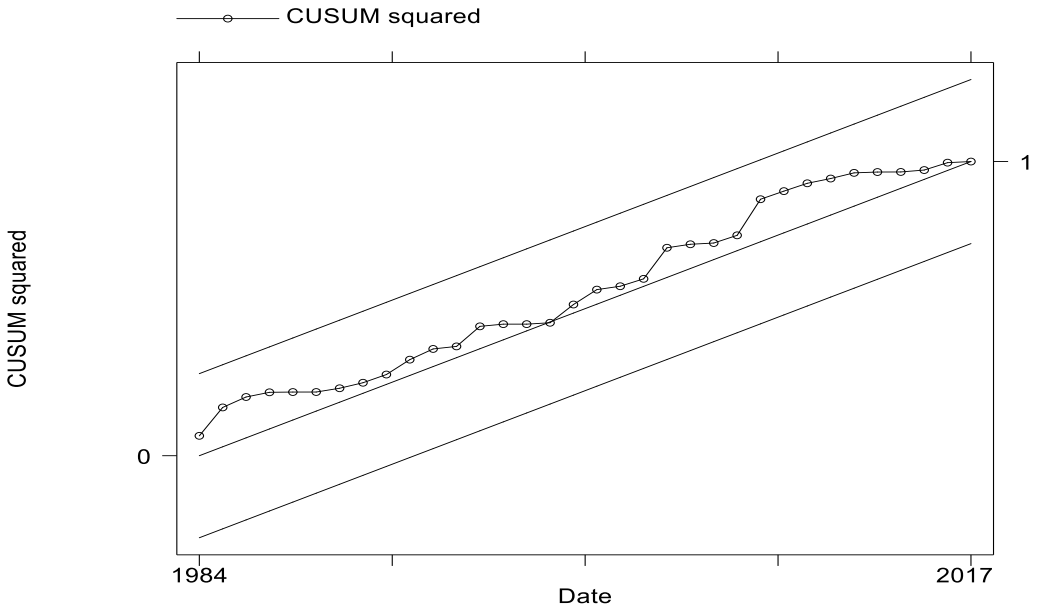
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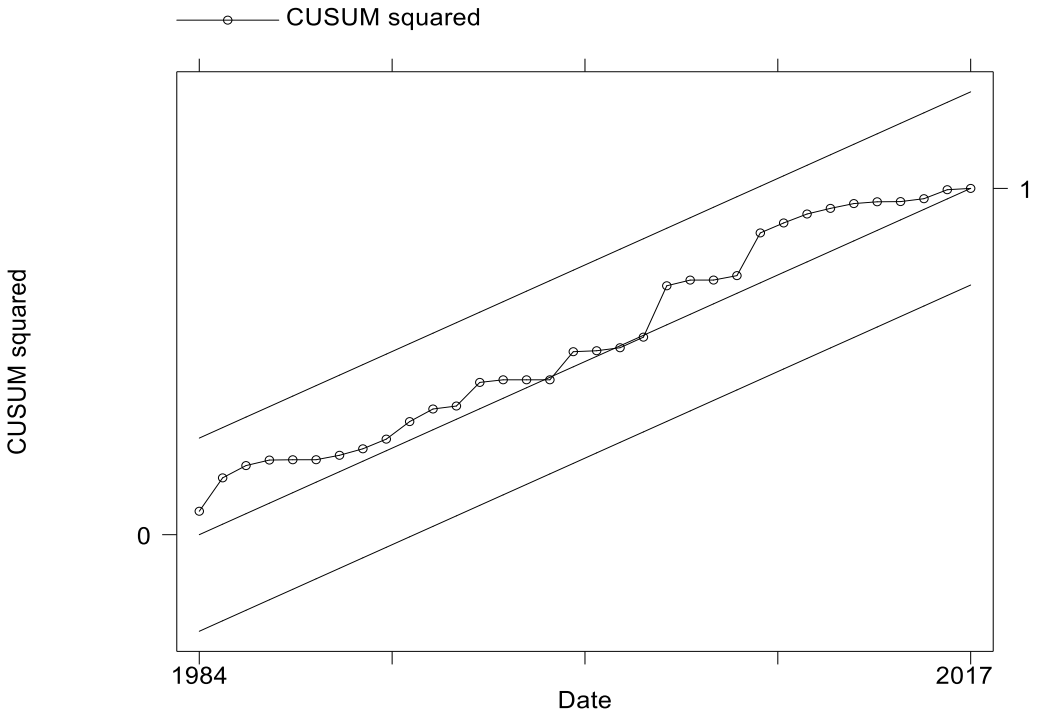
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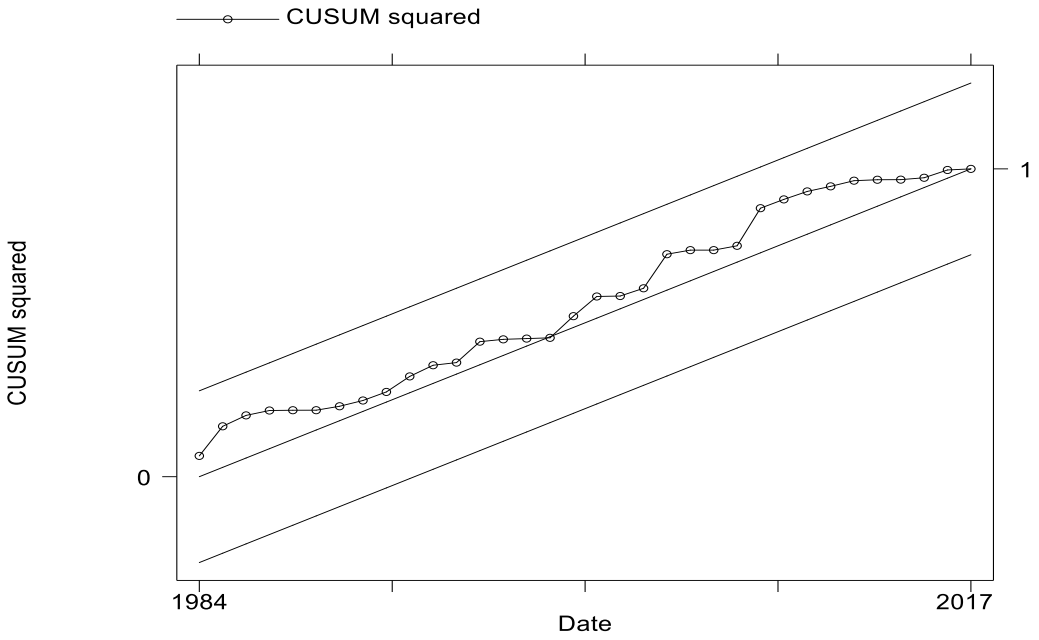
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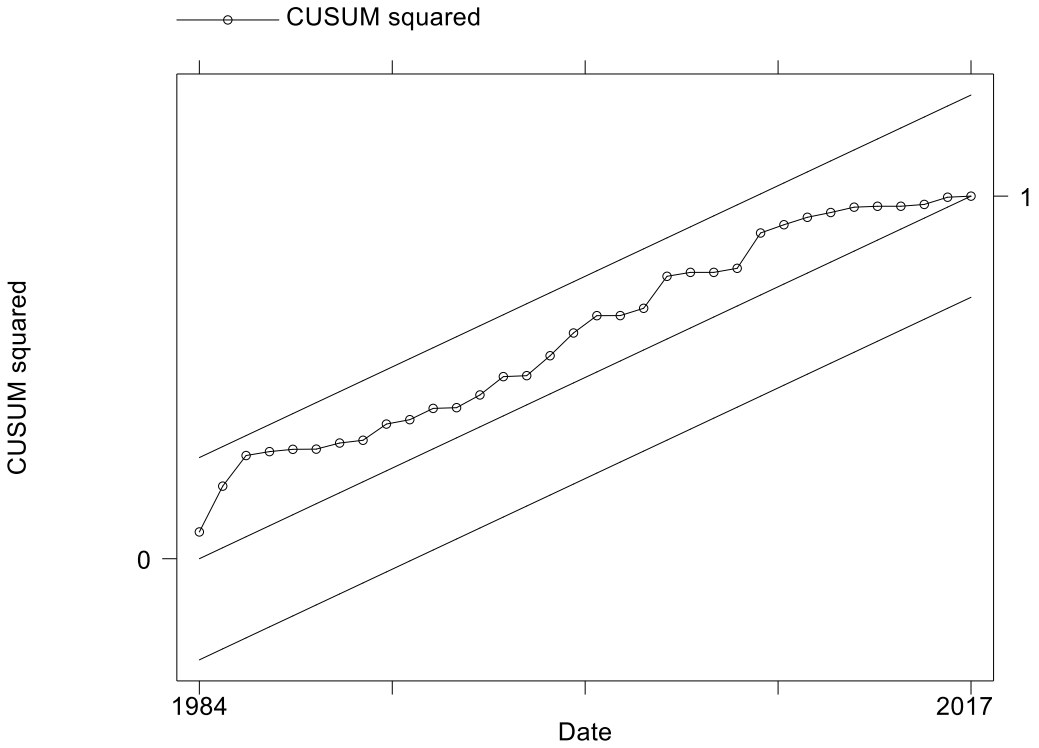
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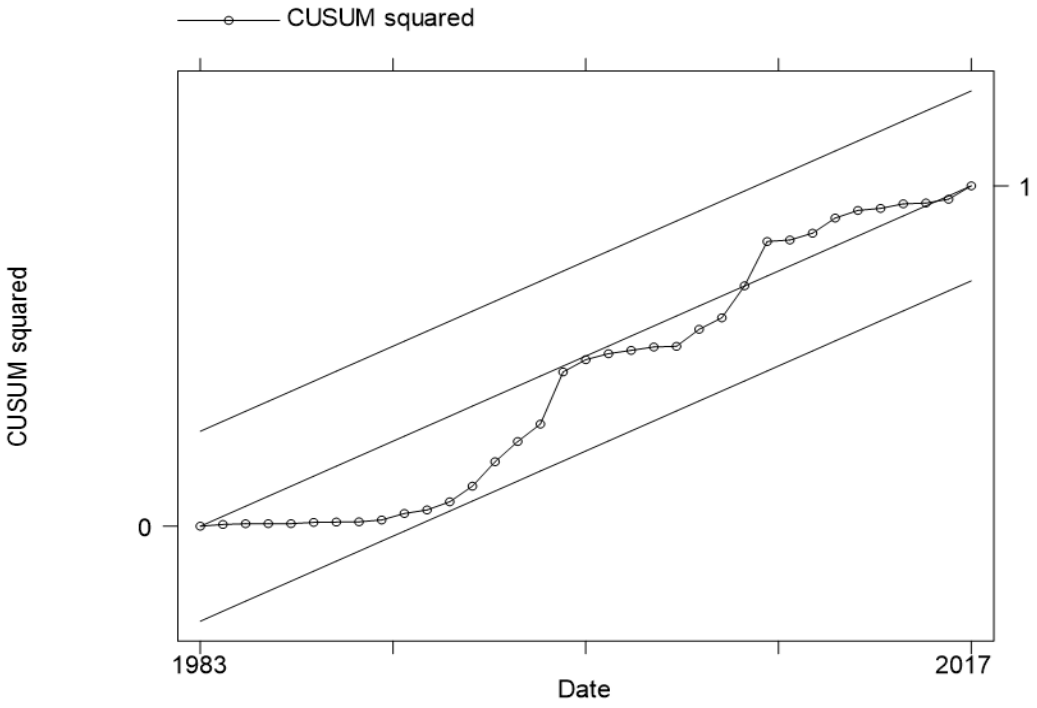


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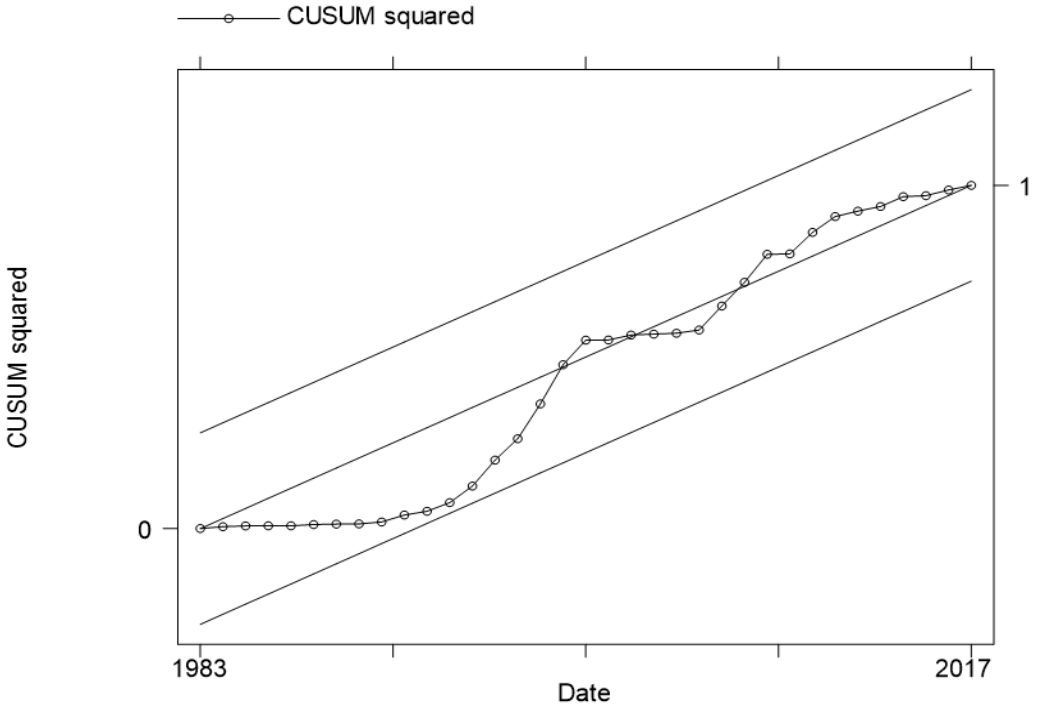


Bank efficiency and FSD Model

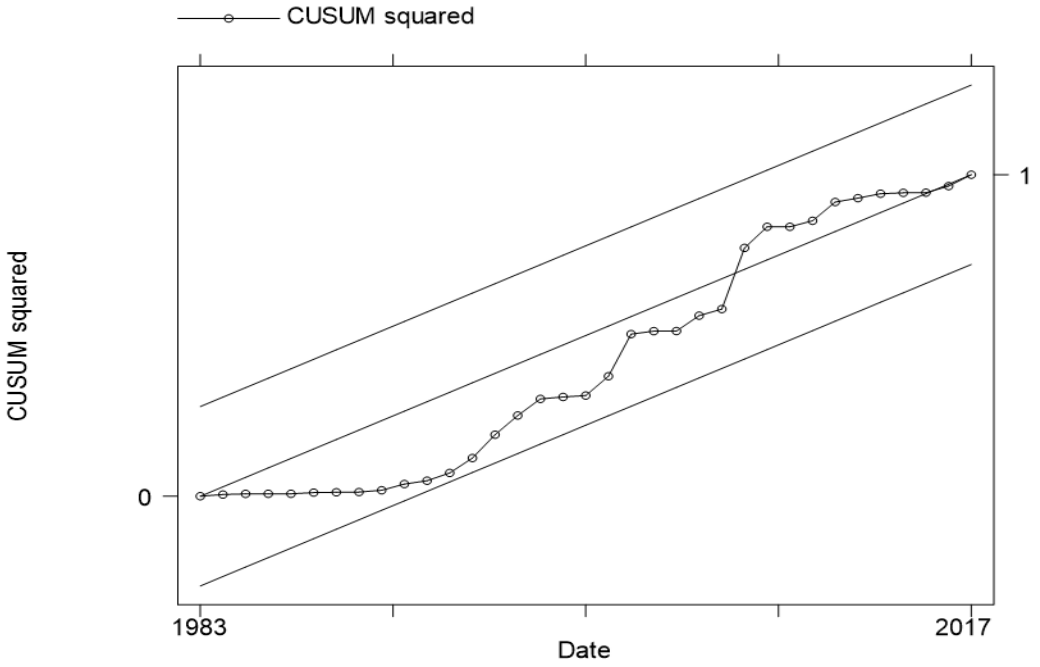
Column 1



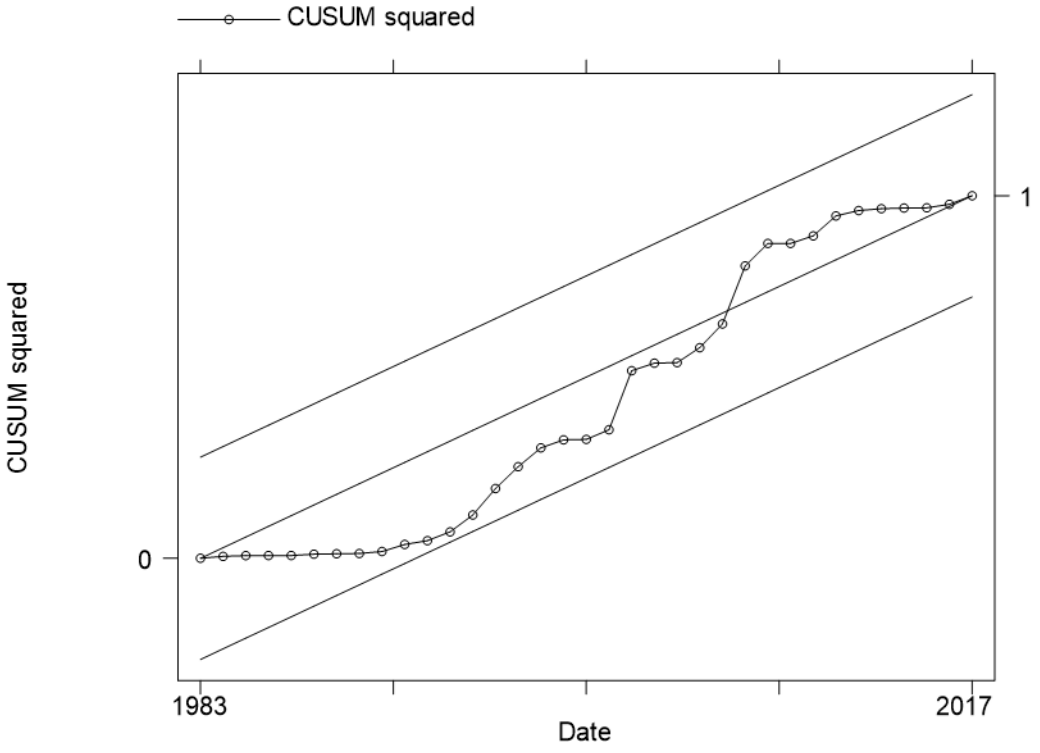
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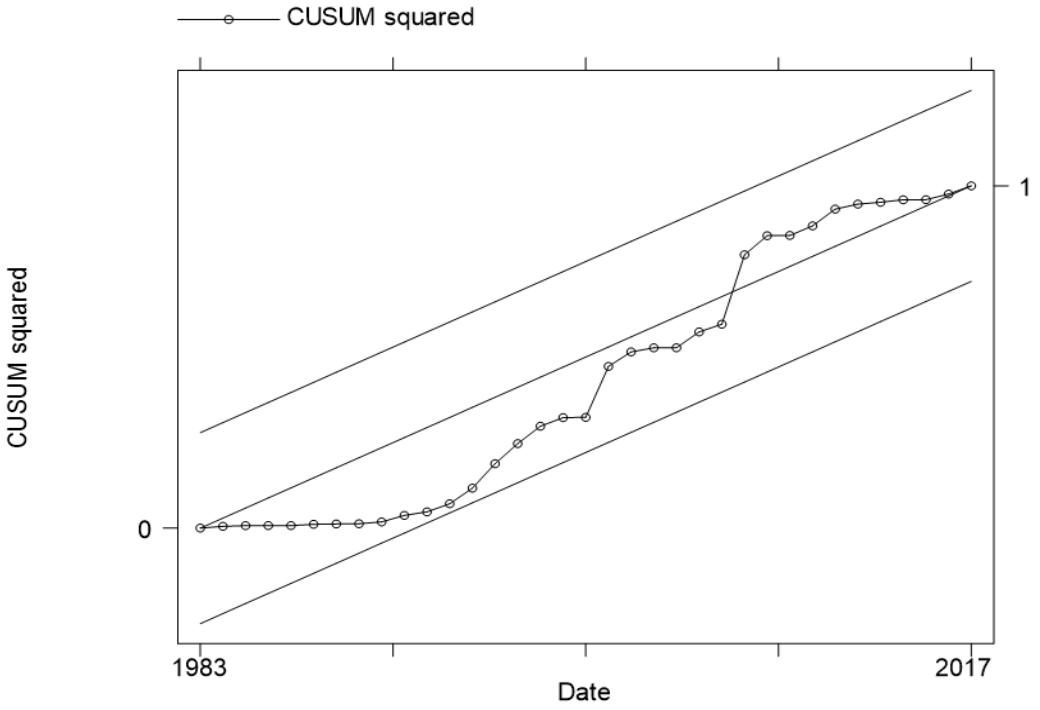
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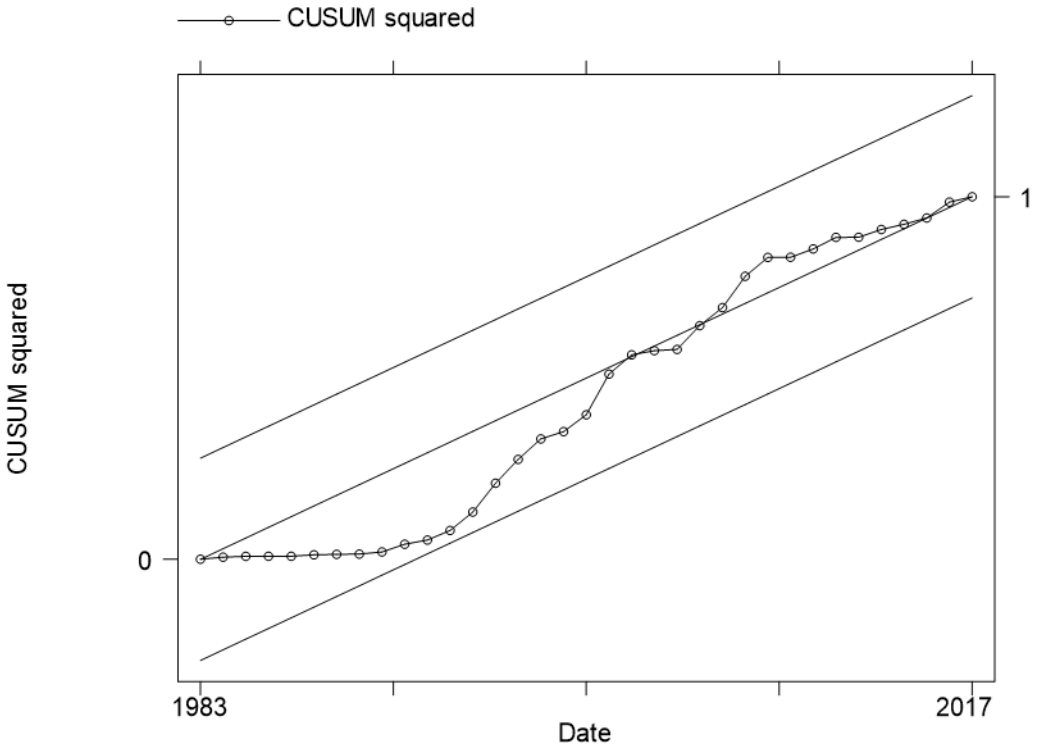
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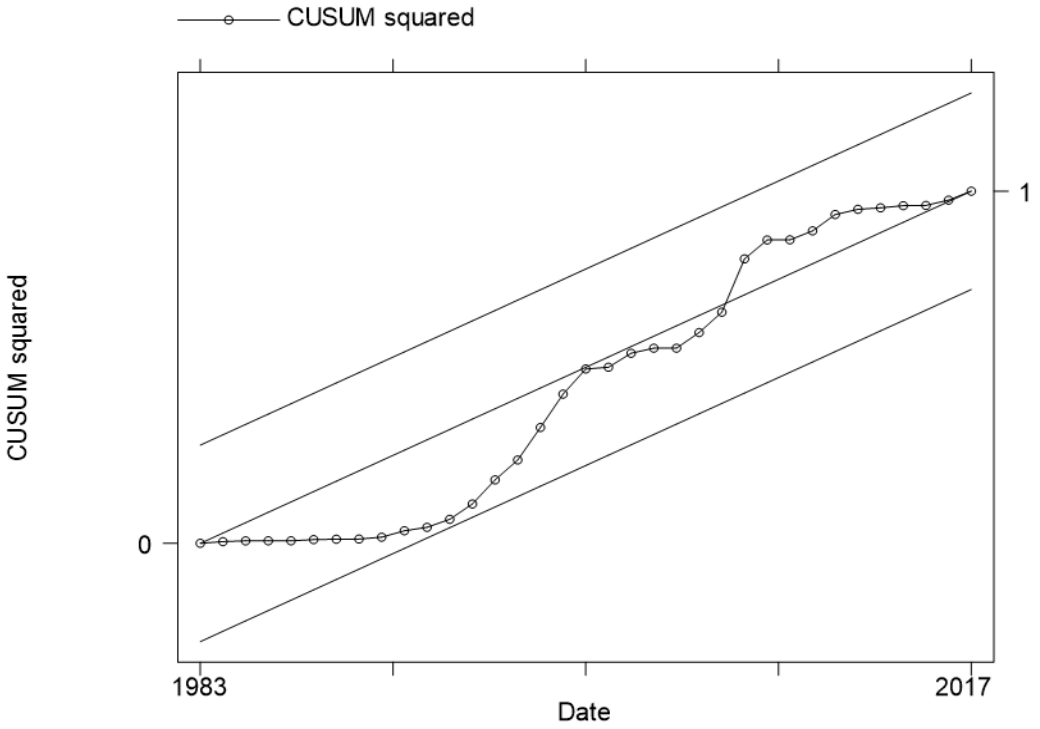
Column 5



Column 6



Column 7



Column 8

