TRADE OPENNESS, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: A TRIVARIATE ANALYSIS OF SOUTHERN AFRICAN CUSTOMS UNION (SACU) COUNTRIES

By

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DECLARATION

This study was conducted from October 2015 to May 2016. Solemnly, the contents of this paper are declared to be the original work of the author, except where citations are given to materials adopted from others.

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APPROVAL

This dissertation has been examined and is hereby approved to have fulfilled the partial requirements for the Master of Arts Degree in Economics.

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DEDICATION

I dedicate this work to my beloved family, thank you for always being my pillars of strength.

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LIST OF ABBREVIATIONS

ADF	Augmented Dicker Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributive Lag
AU	African Union
BNLS	Botswana, Namibia, Lesotho and Swaziland
BNLSS	Botswana, Namibia, Lesotho, South Africa and Swaziland
CMA	Common Monetary Area
CPI	Consumer Price Index
DCB	Domestic Credit to Private Sector by banks
EU	European Union
FMOLS	Fully Modified Ordinary Least Square
FPE	Final Prediction Error
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HQ	Hannan-Quinn Information Criterion
HTC	British High Commission Territories (HCTs),
LR	Sequential Modified LR Test Statistic
M2GDP	Money and Quasi-Money (M2) as a percentage of GDP
RMA	Rand Monetary Area
SACU	Southern African Customs Union
SC	Schwartz Information Criterion
TYDL	Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996)

VAR   Vector Autoregressive

VECM   Vector Error Correction Model

WDI   World Development Indicators

ABSTRACT

The primary objective of the study was to investigate the causal relationship among trade openness, financial development, and economic growth in the Southern African Customs Union (SACU) countries. To achieve this, a series of tests were carried out on a panel of the five (5) SACU countries from 1994 to 2012. The results show that trade openness and financial development are significant contributors to growth of the economies. Specifically, long-run cointegration tests show that there is a long-run relationship between trade openness, financial development, and economic growth. Additionally, the Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) causality tests show that the direction of causality depends on the measure of financial development used. As far as domestic credit to private sector by banks is concerned, trade openness leads to financial development via economic growth. However, with the money and quasi-money as the measure of financial development, it is financial development that leads to trade openness via economic growth.

CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY

1.0 Introduction

This chapter justifies the importance of the study undertaken; it is organized in six sections. Section 1.1 outlines the background of the study, section 1.2 outlines the statement of the problem, section 1.3 describes the motivation of the study, section 1.4 outlines objectives of the study, section 1.5 outlines the hypothesis of the study and section 1.6 outlines the significance of the study.

1.1 Background to the study

Many developing countries strive for high levels of economic growth, broader and deeper financial markets, which in turn foster efficiency and improved terms of trade. The role of trade openness and financial development on economic growth gained prominence in the 1990's, with Romer arguing that trade openness has a substantial positive impact on economic growth. Specifically, Romer states that a percentage increase in the ratio of trade to gross domestic product (GDP) would increase per capita income by 1.5 to 2 percent. Trade openness is in turn associated with trade liberalization. The process of liberalization is significant in that it provides a beneficial environment for attracting and endorsing private sector activities (World Bank, 2004). Trade openness extends to different markets. It can be bilateral, between two countries; it can be sub-regional, among groups of countries such as those neighbouring each other, for instance, SACU. It can also be regional such as countries from the same continent, for instance African Union (AU) and European Union (EU). Trade openness can also be global, such as trade between countries beyond the continent.

The study seeks to investigate the causal relationship among trade openness, financial development and economic growth in SACU countries from 1994 to 2012. According to Levine (2005), in promoting growth, financial systems can facilitate trade, diversification and risk management. Therefore, there is a need to promote and develop financial sectors to accelerate economic growth through capital formation, wealth creation and the facilitation of trade. Similarly, Chang and Caudill (2005) argued that trade openness promotes efficiency in resources allocation, the acquisition of knowledge and technical progress thus, promoting competition, locally and internationally. It is, therefore, of paramount importance that trade

openness be linked to the development of the financial system and its effects on it should be considered. Schumpeter (1911) stated that a stable and well-performing financial system leads to sustained economic growth through the efficient channelling of financial resources to the most productive sectors within the domestic economy, whereas trade openness promotes efficiency in resources allocation. Developments of the economic literature points to a variety of benefits that exist and can be reaped from trade and financial openness (Rajan and Zingales, 2003; Law and Demetriades, 2006). According to Fitzgerald (2006), these benefits include access to larger regional markets, bringing with it economies of scale, which in itself enables countries to specialise and develop the adequate productive capacity to compete globally. To achieve long-term sustainable economic growth, ability to raise the rates of accumulation of physical and human capital is needed; there is also a need for efficiency in the usage of the resulting productive assets and to ensure that these assets are available to the whole population. Financial development supports this investment procedure by mobilising foreign and household savings for investment by firms; ensuring that these funds are apportioned to the most productive use. Risk spreading and liquidity is further ensured so that companies can operate the new capacity efficiently. Financial development, hence, involves the establishments and expansion of markets, instruments and institutions that promote this investment and growth process (Fitzgerald, 2006).

Authors (such as Polat, Shahbaz, Rehman, and Satti, 2015; David, Mlachila, and Moheeput, 2014; Harrison, 1996) have agreed on the economic benefits that trade openness brings, such as international competitiveness, efficiency and an increase in trade. For example, Romer (1990) has argued that there exists a positive impact of trade openness on growth. With trade openness, companies can import capital-intensive inputs and export labour-intensive manufactures, thereby creating employment. There is also a reduction in poverty from trade liberalization as consumers benefit from the cheap imports (Kirk and Stern, 2003). Cline (2004) further stated that trade helps with the eradication of poverty by stimulating growth. Studies have supported the latter theory by noticing that there is a close link between poverty reduction and economic growth in developing countries. For instance, Kapunda and Moffat (2012) established a positive correlation between poverty alleviation and economic growth in Botswana. Similarly, a study by Moser and Ichida (2001) confirms a vigorous and robust relationship between poverty reduction and economic growth in Sub-Saharan countries. To reiterate the importance of openness to trade, Cline (2004) uses trade data that shows that there is a correlation between a country's export growths, showing that an additional 1%

increase in export growth leads to a 0.15% growth in GDP. According to Cline (2004), the correlation stems from productivity gains from integration with the world economy; that is that trade openness encourages an upgrade of domestic technology to world-class levels as well as remove local monopolies which hinder growth. Another reason for the correlation is that, with a bigger export base, countries can avoid external debt problems because they receive adequate foreign exchange.

1.2 Statement of the Problem

A vast amount of literature has been dedicated to finding a comprehensive understanding of the importance of financial development and economic growth (Adusei, 2013; Simwaka, Munthali, Chiumia, and Kabango, 2012; Fitzgerald, 2006) and trade openness and economic growth (Nduka, Chukwu, and Ugbor, 2013; Yeboah, Naanwaab, Saleem, and Akuffo, 2012; Andersen and Babula, 2008; Yanikkaya, 2003). In spite of this, it is only recently that the two strands of literature have been merged by looking at the importance of trade openness, financial development and economic growth (Menyah, Nazlioglu, and Wolde-Rufael, 2014; Zghidi and Abida, 2014; Iyke, 2013; Kenani and Fujio, 2012). However, the latest strand of literature still lacks in the sense that the direction of causality among trade openness, financial development and economic growth is not yet conclusively established. The current study, thus hopes to examine not only the causality among trade openness, financial development and economic growth within the context of SACU but also to determine the extent of the long-run relationship between the three variables.

Over the last decade, there has been a line of research that looks at the interaction between international trade and financial development (Baltagi, Demetriades, and Law, 2009; Huang and Temple, 2005). They have suggested that international trade and financial development may be determined concurrently, and the direction of causality between these two variables needs testing. According to Rajan and Zingales (2003), developing financial institutions might not foster the necessary growth without greater integration into the rest of the world due to differing political views. They argued that the dominant incumbents perceive financial development as a threat and usually act against it. Therefore, only if borders are opened simultaneously to trade and capital flows are countries' economies most likely to flourish. Additionally, authors such as Beck, Demirguc-Kunt, and Levine (1999), McKinnon (1973) and Shaw (1973) are in support of a well-structured financial system for the promotion of trade openness; trade will lead to employment, which increases the welfare of individuals

thereby leading to economic growth. Using a cross-country and dynamic panel data technique, Law and Demetriades (2006), found support for the Rajan and Zingales (2003) hypothesis that financial sector development is enhanced when a country opens its borders simultaneously to both capital flows and trade. However, a recent study by Menyah *et al.* (2014) showed that for a sample of the 21 Sub-Saharan African countries, the trade-led hypothesis and the finance-led hypothesis were refuted. Specifically, the study revealed that recent attempts at trade liberalization and financial development have proven to be futile for economic growth.

In addition, two other opposing hypotheses exist in the strands of literature, specifically those focused on financial development and economic growth. On the one hand, McKinnon (1973) and Shaw (1973) looked at the "supply-leading" hypothesis, which postulates that financial development is necessary for economic growth, by channelling public savings to investment. The theory argues that financial sector development leads to economic growth by channelling public savings to investment. On the contrary, the view by Patrick (1966), the "demand-following" hypothesis, postulates that growth in the financial institutions and their financial assets and liabilities are led by the economy's expansion of the demand for financial services, that is, economic growth leads to financial development. It is of interest in the current study to clarify the conundrum that exists in the two strands of literature in the SACU context.

There exists a long history of formal integration arrangement, in the case of SACU countries, such as the Common Monetary Area (CMA), previously known as the Rand Monetary Area (RMA), comprising of South Africa, Namibia, Lesotho, and Swaziland. Another reason for the high level of integration amongst SACU countries is due to the financial systems of the other SACU countries (Botswana, Namibia, Lesotho, and Swaziland, (BNLS)) that are closely linked to the South African financial system. Particularly, since most South African banks dominate their markets. Aziakpono (2006), Sander and Kleimeier (2006) and Nielsen, Uanguta and Ikhide (2005) have looked into the level of integration between these countries and found that the financial systems were highly integrated. The integration is mainly between the BNLS countries with that of South Africa, with the degree of integration, however, varying from country to country. Additionally, the BNLS countries source most of their import from South Africa, despite their exports being more geographically varied. The commodity structure of South Africa's exports to the BNLS differs significantly from its exports to the rest of the world (Kirk and Stern 2003).

Given the level of integration outlined above, the question that comes to mind is, how does this integrated financial system lead to trade? Considering that banking operations, policies and product pricing are in line with the South African market? A well-developed financial system is expected to attract investors, which will improve the trade operations in a given country. Data obtained from the World Development Indicators for the period 1994 to 2014 show that the level of integration in SACU is high, as measured by the trade openness index (imports plus exports as a percentage of GDP), and has been increasing over the years. The increase has also been accompanied by relatively stable financial development as measured by bank credit to private sectors. However, this growth has not translated to economic growth during this period. There have been constant fluctuations over the years with an average of 2%. The questioned posed here, is of how financial development and trade openness is related to economic growth in the context of SACU countries. The above scenario is the basis which necessitated the undertaking the study. The study, thus, investigated whether a policy focus on financial sector development and trade openness is appropriate for fostering development in the SACU countries.

A study by David *et al.* (2014) on the importance of trade openness for financial development in Sub-Saharan African countries revealed that the results do not show a robust link between financial development and trade and capital openness. Although, the study indicated that trade openness is more important for countries with better institutional quality. Notably, the study does not take into account the integration dynamics of some economies and the proposed study, therefore, hopes to highlight how more integrated economies react to trade openness and how that fosters financial development and implicitly economic growth.

1.3 Motivation of the Study

The majority of previous studies done on trade openness, financial development and economic growth, mainly focused on a bivariate framework, looking at financial development and economic growth; trade openness and economic growth; and financial development and trade openness (Saaed and Hussain 2015; Shahbaz, 2012). It has been argued, however, that bivariate causality tests might be invalid due to the omission of relevant variables that affect both the variables included in the causality model. The current study, therefore, extends these studies by considering a trivariate framework among trade openness, financial development, and economic growth.

The studies previously done on trade openness, financial development and economic growth in a trivariate framework have mostly been on country-specific analysis (Rehman, Ali, and Nasir**,** 2015; Dritsaki, 2013; Kenani and Fujio, 2012). However, there are several issues with country-specific studies; the method fails to address potential biases that are induced by endogeneity of the independent variables and the existence of cross-country heterogeneity. These problems may lead to misleading and inconsistent results (Ghirmay, 2004). A few other studies (Zghidi and Abida, 2014; Yanikkaya, 2003) have applied methods of cross-sectional data analysis with the hope of generalizing the causal relationship between the variables of interest. However, when using the cross-sectional method, countries with different stages of trade openness, economic growth, and financial development are grouped together, and the studies fail to take into account the country-specific effects of financial development, trade openness, and economic growth. In particular, the studies fail to address the potential biases that arise from the existence of cross-country heterogeneity, which, if not considered, may lead to inconsistent and misleading estimates (Ghirmay, 2004). This study, therefore, hopes to fill the gap by establishing causal and long-run relationships among trade openness, financial development, and economic growth, using a panel of more integrated countries, while taking into account heterogeneity problems and cross-country dependency.

The current global economic situation underscores the compelling rationale for the development of sound and integrated financial markets in developing economies. In a closely related study, Aziakpono (2004) looked at the importance of financial development for economic growth in the SACU countries. The study found that although financial development is important, for the smaller SACU countries to derive optimal gains from financial development, they would need to take steps in developing their weak financial systems. However, for such policies to be effective, a causal relationship between financial and real sectors needs to be established. The current study, therefore, extends the study by Aziakpono (2004) by incorporating the trade openness component, looking at not only the causal links between trade openness, financial development, and economic growth, but also establishing if, and to what extent, the long-run relationship between these variables are.

1.4 Objectives of the study
Main Objective:

- To investigate the causal relationship among trade openness, financial development, and economic growth of SACU countries

Specific Objectives

- To determine if economic growth and financial development have causal effects on trade openness.
- To determine if trade openness and economic growth have causal effects on financial development.
- To determine if financial development and trade openness have causal effects on economic growth.
- To determine if a long-run relationship exists among trade openness, financial development, and economic growth.

1.5 Hypothesis of the study

- Economic growth and financial development have causal effects on trade openness;
- Trade openness and economic growth have causal effect on financial development;
- Financial development and trade openness have causal effects on economic growth; and
- Long-run relationships exist among trade openness, financial development, and economic growth.

1.6 Significance of the Study

Although endowed with a wealth of natural resources, the SACU countries lack technological efficiency and thus face some limitations in fostering their growth. Therefore, policies would be more efficient if they would target more than one goal.

By establishing the trivariate relationships among economic growth, financial development, and trade openness, policy makers could use the findings of this study to focus on a relevant policy measure that specifically target these variables and develop those sectors. This study, hence, hopes to bridge the gap brought about by a lack of comprehensive investigation on causal and long-run relationships between the two sectors in the SACU countries.

The study has six chapters in total; the current chapter gave the introduction and background of the study. Chapter two looks at the overview of the SACU countries, chapter three outlines the literature review, chapter four gives the methodology used to carry out the study. Chapter five outlines the analyses of the results obtained and finally chapter six gives the conclusions and policy recommendations.

CHAPTER TWO: OVERVIEW OF THE SOUTHERN AFRICAN CUSTOMS UNION (SACU) COUNTRIES

2.0 Introduction

This chapter focuses on the background of financial development, trade openness and economic growth in the SACU countries. Section 2.1 looks at the financial development in SACU, section 2.2 looks at the trade openness in SACU, section 2.3 investigates the economic growth in SACU and finally section 2.4 analyses performances of the individual countries concerning growth and development.

2.1 Financial Development in SACU

SACU is the oldest customs union which dates back as far as 1889 Customs Union Convention between the Orange Free State Boer Republic and the British Colony of Cape of Good Hope. A new agreement which was signed on 29 June 1910 extended to the union, South Africa and the British High Commission Territories (HCTs), that is, Botswana, Lesotho, and Swaziland. Although Namibia was initially a *de facto* member, since South Africa administered it; it became a *de jure* member when it gained independence in 1990. The primary goal of the SACU is to promote economic development through regional harmonization of trade.

The high level of financial integration between the SACU countries is in part due to the membership of the Common Monetary Area (CMA) of the SACU countries, with the exclusion of Botswana, which left in 1976. The most profound characteristic of the SACU is the economic dominance of South Africa in contrast to the size of the remaining four members. The four members depend heavily on South Africa for a significant proportion of their trade, investment and in some cases employment.

The South African banks dominate the banking sector in the SACU countries. The high degree of South African ownership coupled with membership of the CMA warrants that the banking sectors in the other SACU countries shadow South African trends in pricing and product innovation. Nonetheless, there is still a wide disparity in the level of development of financial systems between the other four countries and South Africa. While South Africa has a well-developed, highly competitive and sophisticated banking sector, the other countries lag behind (Aziakpono, 2004).

Although differences are observed between Botswana, Lesotho, Namibia, South Africa and Swaziland (henceforth BNLSS countries), there are a few similarities observed. The money and quasi-money as a percentage of GDP (M2GDP) is one such factor that can be seen to exhibit similar trends within the SACU countries. Figure 2.1 below shows the M2GDP for the SACU countries from 1994 to 2012. The period chosen is to ensure that the analysis is based on a period when all the SACU countries gained independence and to exclude the recent north-African crises.

Figure 2.1: Money and Quasi-Money (M2) (% of GDP)
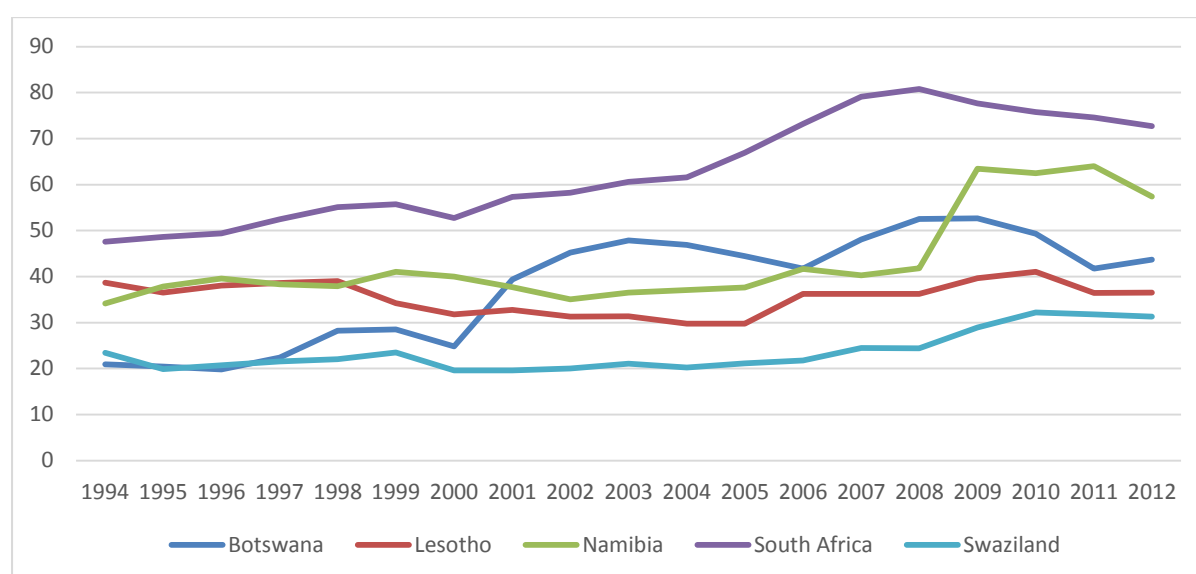
Source: Authors compilation from World Development Indicators

The figure shows that the degree of monetization follows the same trends for all BNLSS countries, although it is higher for South Africa followed by Namibia, Botswana, Lesotho and finally Swaziland. It is evident from Figure 2.1 that the financial development indicator has been gradually increasing since 1994 to 2012. This can be attributed to the level of savings rising in the countries and can be translated to development in the financial sector. Although, there is an evident decline in the ratio since 2009 for the BNLSS economies, this can be due to the 2008 world financial crisis.

Figure 2.2 shows the domestic credit to private sector by banks as a percentage of GDP which also exhibits similar trends to the M2GDP measure of financial development indicator of financial development. However, South Africa has much higher ratios, followed by Namibia, Botswana, Swaziland, with Lesotho having the lowest. The financial crisis in this case mainly affected the larger BNLSS countries, with declining values in South Africa,

Namibia and Botswana in the years 2008 to 2010; however Swaziland and Lesotho reported increases in this indicator between these years.

Figure 2.2: Domestic Credit to Private Sector by Banks (% of GDP)
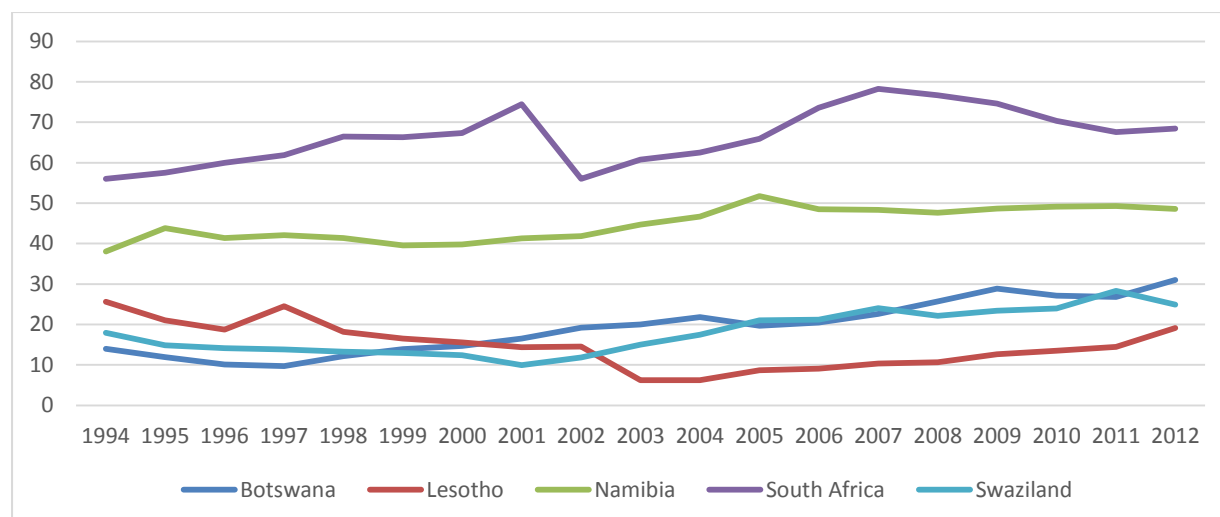
Source: Authors compilation from World Development Indicators

2.2 Trade Openness in SACU

Openness to trade has been used extensively in the economic growth literature as a major determinant of growth performance (Artelaris, Arvanitidis, and Petrakos, 2007; Yanikkaya, 2003; Nguyen, 2011). The expectation is that an economy that is more open to trade and capital flows will grow faster than its counterparts with trade restrictions.

In the case of the BNLS countries, most of their imports are sourced from South Africa, despite the fact that their exports are more geographically varied. The commodity structure of South Africa's exports to the BNLS countries differs significantly from its exports to the rest of the world. Fundamentally, South Africa exports consumer goods and services to the BNLS countries, whereas resource-based goods dictate its export to the rest of the world. Furthermore, South African companies dominate the business landscape in the BNLS (Kirk and Stern, 2003).

Figure 2.3: Openness (Exports plus Imports (% of GDP))
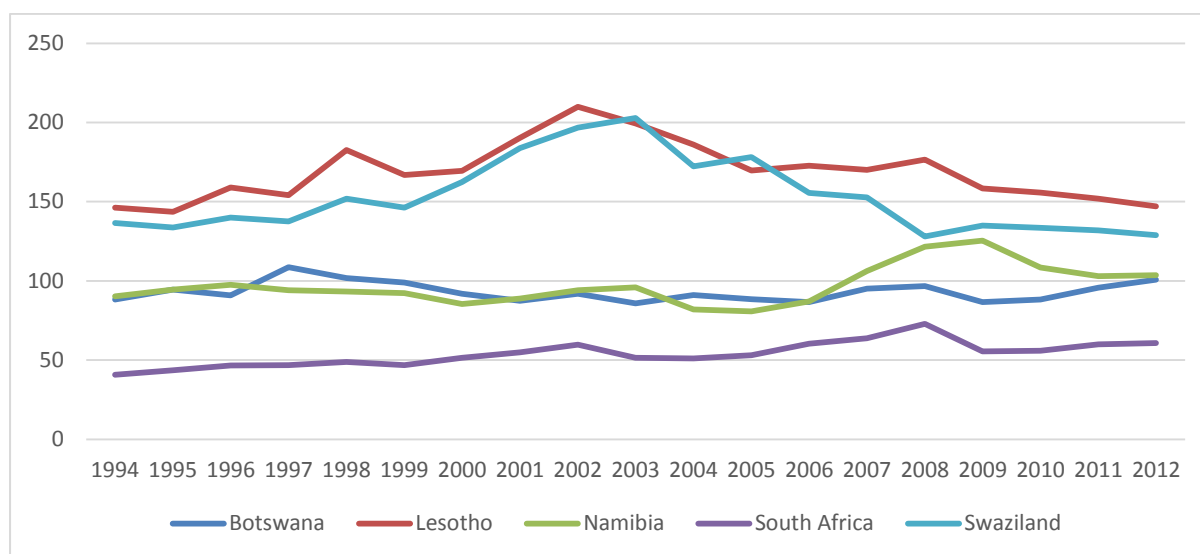
Source: Authors compilation from World Development Indicators

Figure 2.3 shows the trends in trade openness of the SACU countries; it is clear from the graph that Lesotho and Swaziland are the most open of the five countries, followed by Namibia and Botswana, South Africa being the least open. The figure implicitly shows the level of dependence of the BNLS countries on South Africa. It is evident from the figure that the degree of openness has increased over the years for the countries.

2.3 Economic Growth in SACU

Notwithstanding the economic and geographic closeness of the BLNS countries to South Africa, and sharing a common trade policy, the performance and the management of the smaller SACU economies differs markedly from each other and South Africa.

The SACU economies' primary drivers are export-led industries like manufacturing and mining, particularly in commodities like gold, diamonds, and platinum. In 2010 SACU member states experienced a rebound which hindered the growth process. An average growth of 3.8 % and 4.4% was registered in 2011 and 2012 respectively but further declined to 4.2% in 2013. The decline was in line with the global economic slowdown mainly caused by the sluggish growth in the Euro Area, the United States and in the emerging markets, the main

trading partners for the SACU member states. The slowdown was largely felt in the mining and manufacturing industries (SACU Member States Economic Performance, 2013).

Figure 2.4: Real GDP per capita Growth (annual %)
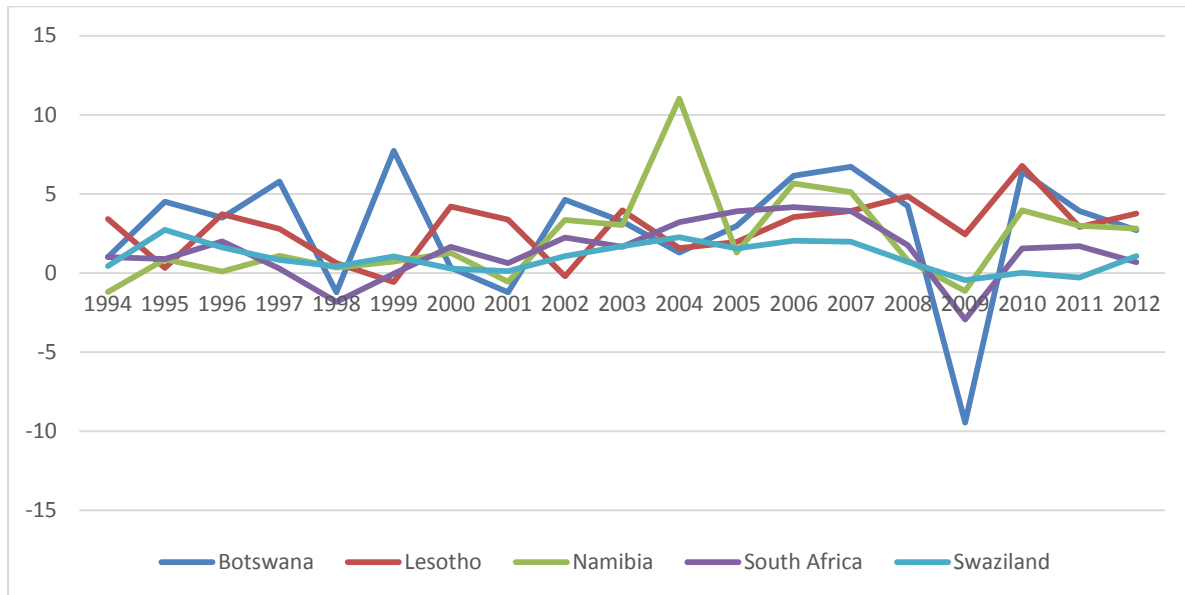
Source: Authors compilation from World Development Indicators

Figure 2.4 shows the economic growth trends from 1994 to 2012 as proxied by real GDP per capita growth. The graph shows remarkable performance by the BNLSS countries, with negative growth rates from time to time. However, a massive drop in GDP growth rates occurred between 2009 and 2010, due essentially to the financial crisis. However, growth rates have since picked up, especially for Botswana, which had the highest drop, which is attributed largely to the collapse of diamond demand, Botswana's biggest economic driver.

2.4 Country Analysis

Botswana

Botswana, unlike most African countries, is a development success story. Having gained independence in 1966, a small landlocked country of approximately two million people, Botswana was one of the poorest countries in Africa with a per capita gross domestic product of about $70. Following the discovery of diamonds in the country, Botswana has been one of the fastest growing economies in the world and gained an upper-middle class status (World Bank, 2014).

Botswana has a small but flourishing financial sector that experienced significant growth in the past decade. This is a reflection of the substantial accumulation of national resources, supplemented by the high degree of liquidity. The country's financial system is populated by an array of financial institutions, with commercial banks and pension funds being the two most important segments of asset size. The government actively supports further growth and development in the financial sector, having identified it as an important driver of economic growth. The financial crisis was, for the most part, indirect on the banking sector; hence, the banks remained fundamentally sound, despite recent increases in non-performing loans in the household sectors (The Partnership for Making Finance Work for Africa, 2016).

As previously stated, Botswana has significantly recovered from the financial crisis. Real GDP per capita growth was recorded at 7% in 2013, the highest in 10years, underpinned by light activity in the mining sector, particularly in the diamond production. This growth is despite bottlenecks in the water and power sectors. However, this growth rate was not maintained, and the growth rate dropped to 2% in 2014. Non-mining activities, mainly the water and electricity sectors account for this slow-down in the growth rate. Inflation pressures, on the other hand, remain within the Bank of Botswana's objective range of 3-6%. The driving factors behind this are the slowdown in the costs of transport and food (African Economic Outlook, 2016).

Lesotho

Lesotho is a small landlocked country in Southern Africa, with a population of approximately 2 million people. It is a constitutional monarchy with limited natural resources and a narrow production base. The agricultural sector is the largest source of employment and sustenance for most of the rural areas; it contributed 8.6% of GDP in 2011. Although the economy is open and well diversified, with imports amounting to around 11.1% of GDP, agriculture, textile manufacturing, and diamond mining dominate output (African Economic Outlook, 2016).

Lesotho, along with South Africa, Namibia, and Swaziland, is part of the Common Monetary Area (CMA), which effectively integrates these countries' capital and financial markets with those of South Africa. Lesotho's currency, the loti, is pegged to the South African rand.

According to a 2008 IMF report, the Lesotho banking system is stable, however, access to banking services for SMEs and households remain limited. The banking system, dominated

mainly by three South African banks, is profitable, liquid and well capitalized; nonperforming loans (NPLs) are moderate and well provisioned.

The global economic and financial crisis had a significant impact on the country, with real GDP growth declining to 3.8% in 2009, it, however, recovered slightly in 2010 and reached 5.2% growth. In 2011, growth was registered at 4.9%, partially due to damaged infrastructure, livestock and crops by floods.

Namibia

Namibia emancipated itself from the oppression of the German and South African rule on 21 March 1990 at which point it gained its independence. Germany colonized Namibia in the 19th Century, and it was known as the German South West Africa. Its neighbour South Africa was declared its administrator in terms of the League of Nations Versailles Treaty. It came about after World War I, at which point, it was identified as an Allied territory. However, due to the region's mineral and diamond wealth, South Africa defied international opinion and declared the territory as its colony. The invasion of South Africa into the country was, however, detrimental to the economy, with the link and significant integration to its oppressor's economy with the Namibian dollar being pegged one-to-one to the South African rand since 1993. This made the economy susceptible to external shocks that may spill over from economic instability in South Africa.

Namibia is classified as an upper middle-income country with an average per capita income of around USD 4,700 (2012). Overall, in 2012, primary industries accounted for 18.6 % of Gross Domestic Product (GDP), which includes fishing and fish processing on board (3%), agriculture and forestry (4.1%), and mining and quarrying (11.5%). The secondary industries accounted for 17.6% (of which 0.11 on-shore fish processing and 0.3% meat processing). The tertiary industries consisting of retail trade and wholesale, financial services, transport and communication, hotels and restaurants, real estate and business services, social and personal service activities, community and government services, accounted for 56.9 percent of GDP. Namibia is endowed with abundant natural resources, a well-developed physical infrastructure, and political stability. Namibia's economy is linked to that of its principal trading partner South Africa, although Europe is increasingly becoming the leading market for fish and meat (Namibia Statistics Agency, 2015).

Namibia is a small open economy, with economic growth of an average of 4.5 % over the past 25 years and public finances are considered well managed. The debt ratio is one of the lowest in Africa, and in the world, and the budget balance hardly out of the fiscal policy so as to cause too much concern. The economy is dominated by the mining sector, with diamonds and uranium exports accounting for a significant share of foreign currency. Namibia is a member of several bilateral and multilateral trade agreements, one of which is the oldest trade agreements, the SACU. It receives approximately 30% of its revenue from the Common Revenue Pool. Its membership to SACU reduces the use of trade policy, particularly, that of customs tariffs, in support of its industrialisation (African Economic Outlook, 2016).

South Africa

South Africa's peaceful political transition was one of the most remarkable political achievements of the past century. The African National Congress (ANC) has been driving the policy agenda since gaining independence in 1994. Classified as a middle-income country and the only African member of the Group of 20, is the largest economy in the continent. However, South Africa's growth continued to slow down in 2014, recording only 1.5% growth, the weakest performance since the global financial crisis. The country's economy was affected by its long-drawn-out industrial action since the end of apartheid and a significantly weak demand from trading partners. Notably inadequate energy supply, various infrastructure gaps, anaemic investment rates and weak domestic demand further contributed to the drag on growth (African Economic Outlook, 2016).

South Africa has a well-developed financial sector, comprising of 30 banks, with thousands of branches across the country, non-banking financial institutions, smaller financial intermediaries and the Johannesburg Stock Exchange. The banking sector is highly concentrated, with four banks accounting for over 80% of the total assets.

Swaziland

Swaziland, a small open economy with a population of approximately 1.1 million, is a landlocked country with a GDP per capita of about $3,000. It is classified as a lower middle-income country (World Bank, 2016). Economic performance in Swaziland, captured by GDP growth slowed half of a percentage point from 3% to 2.5% in 2014. Swaziland was hit by a severe fiscal crisis in 2011, owing to a sharp decline in the SACU revenue, the government's limited access to borrowing and high levels of expenditure. The crisis led to cuts in social and

capital spending, undermining future growth. The country has since not recovered (African Economic Outlook, 2016).

Swaziland has very close links to South Africa, accounting for about 60% of exports and 85% of imports. The European Union is the second largest export market. Despite the country being able to use trade effectively in the past to generate growth, export performances have since weakened in recent years.

Notwithstanding the influx of non-bank financial institutions in the financial system in 2009, due to liquidity surge in which a mandatory repatriation of 30% of pension funds and insurance companies' assets held abroad was implemented. The financial system in Swaziland remains shallow and undiversified. The expansion, however, may lead to an increase in market vulnerabilities, and the government has since taken measures to address the issue. The banking sector is made of 4 commercial banks with various branches across the country. The South African banks still make up the biggest share of the market (African Economic Outlook, 2016).

In summary, the SACU countries are highly integrated, mainly because of the integrated financial system. Also, in part due to the countries relation to the CMA, of which Lesotho, Namibia, South Africa and Swaziland are members. The countries portray high potential for growth and as small-open economies, resources are limited. It is against this background that this study attempts to identify the sectors that affect economic growth performance.

CHAPTER THREE: REVIEW OF THE LITERATURE

3.0 Introduction

The theoretical and empirical literature has dedicated considerable attention to the linkage between trade openness and economic growth, as well as to the connections between financial sector development and economic growth. However, it is recently that studies have focused on the links between trade openness and financial development and how they collectively contribute to the growth the economy. In this chapter, both the theoretical and empirical literature pertaining to the latter is reviewed. The chapter is divided into two sections; section 3.1 gives the theoretical literature review and section 3.2 outlines the empirical literature review.

3.1 Theoretical Literature Review

Krugman (1979) claims that there are two sources of gains from international trade; the first one is the increased varieties of products for consumption, and the other is the benefits from increased competition, such as the reduction of prices. Further, the increased size of the market allows firms to realize economies of scale. Coe, Helpman, and Hoffmaister (1997) find that imports of capital goods have a robust effect on the total factor productivity growth. Openness to the world economy is a significant factor that explains total factor productivity growth. Trade openness increases international connections and can be a source of learning, as technology is often embodied in goods (Grossman and Helpman, 1995).

According to Stiglitz (1998), the financial sector is unique because of the uncertainty and risks faced by both investors and savers. Savers are unable to take advantage of increasing returns to scale in investments, as they are often unable to select the best investment project that best suits their personal risk appetite without pooling their money. Similarly, Levine (2005) proposed to analyse the linkage between financial depth and economic growth. Alternative views on the links between financial development and economic growth focus on the key roles of financial systems in the saving-investment-growth nexus. These include acting as an effective outlet; firstly they channel funds from surplus to deficit units by mobilizing resources and ensuring an efficient conversion of funds into real productive capital. Secondly, financial development transforms maturity of the portfolios of investors and savers, while providing sufficient liquidity to the system as need be. The third function is a reduction of risks from the system through diversification and techniques of risk pooling

and sharing (Nissanke and Stein, 2003). Schumpeter (1911) was among the first to point out that banks facilitate a technological revolution in their role as financial intermediaries. Schumpeter's argument focuses on the ability of banks to allocate savings more efficiently and opposes that services provided by financial institutions are essential drivers for growth and innovation. A well-developed financial system channels financial resources to the most productive use.

In an effort to fill the theoretical gap for the relationships among trade openness, financial development, and economic growth in a multi-causal conceptual framework, Blackburn and Hung (1998) suggest that trade openness may contribute to economic growth by leading to new product development. Trade openness may lead to financial development by encouraging an increase in the number of new producers that need access to finance their activities. In a similar note, Feeney (1994) argues that integration in the financial sector may increase the possibility for risk sharing that allows product specialization and, ultimately, benefits trade. These studies imply an indirect theoretical link between trade openness and financial development via new products.

Renelt (1991) argued that with the emergence of Romer's (1986) endogenous growth theory, financial development might be a key source for the increase rate of return. Financial development, by collecting information on the efficiency of various investment projects and the investors' abilities (King and Levine, 1993), and by diversifying the investors' portfolios more efficiently might positively contribute to economic growth (Levine, 1997). The arguments, based on endogenous growth theories, implicitly assume that financial development promotes economic growth (Hermes, 1994).

3.2 Empirical Literature Review

It is argued that trade openness has a robust positive impact on growth, the view is that trade expansion leads to the increase in the exports sector, capacity utilization and positive externalities on the non-exports (Edwards, 1998). Chang and Caudill (2005) concur that trade openness generates an effective allocation of resources through comparative advantage, allowing the transmission of technological progress and knowledge, and stimulates competition in both the international and national markets. Fontagne and Freudenberg (2001) stated that the benefit gained from international trade creates more efficiency and economies of scale for country's trade relations.

A study by Yanikkaya (2003) supports the hypothesis of the new growth theory where trade encourages growth through technology. The study carried out based on 100 developed and developing countries concluded that the more developing countries trade with the United States, the higher the economic growth of those countries. It is not startling to see the hypothesis that a country which is more open to trade exhibits rapid growth as there has been a wide consensus on the subject matter in the literature.

In a study by Jordan and Eita (2010) in which the study tested the bi-directional causality between economic growth and exports in Botswana, using quarterly data for the period 1996 to 2007. By employing a vector autoregressive (VAR) model and applying the Granger causality test to examine the causal relationship between economic growth and the GDP, the results showed that there is a bi-directional causality between exports and economic growth in Botswana.

Saaed and Hussain (2015) determined the causal relationship among financial development, trade openness, and economic growth using VAR technique in Kuwait for the period 1977-2012. The study found that the Granger causality tests based on VAR models showed that there was a causal relationship between the trade openness of the economy and economic growth and between economic growth and financial development. Therefore, the findings of the study support the trade and growth-led theories. The study also found that money supply was the only instrument of financial development that was seen to cause trade openness.

A study by Iyke (2013), examined the links between financial deepening, trade openness and economic growth amongst selected West African Monetary Zone countries. The study used a panel VAR analysis and found that although financial deepening, trade openness and economic growth were all non-stationary; there were, however, no co-integrating relationships between the variables. The study found a unidirectional relationship that flows from financial deepening to economic growth via trade openness.

Kenani and Fujio's (2012) study explored the possible causal relationships between trade openness, financial development and economic growth in Malawi. The study, using a trivariate VAR model, further explored possible indirect causal effects of finance on growth through trade openness. The cointegration results showed a long-run relationship between the variables of interest. The Granger causality based on the Vector Error Correction Model (VECM) demonstrated that financial development has a single causal effect on economic growth in the short-run. However, trade openness and financial development had short-run

bi-directional relationships depending on the measure of financial development used. The study further found that the indirect causal effect of financial development on economic growth through trade openness depended on the financial indicator used.

Dritsaki (2013) used a bounds testing approach for cointegration and Granger causality methods to examine the relationship between trade openness, financial development and economic growth in Bulgaria. The Granger causality test showed a unidirectional causation from trade openness and financial development to economic growth. The results further showed a unidirectional causation from economic growth and financial development to trade openness in the long-run. In the short-run, a bi-directional causation was observed between trade openness and financial development.

Zghidi and Abida (2014) did a study in which they investigated the causal links between financial development, trade openness and economic growth in a panel of 3 African countries. The study found substantial evidence of a positive relationship between trade openness and economic growth using the Generalized Method of Moments (GMM) panel data analysis. The study also found that trade openness acts as a complement to financial development and that the effects of trade openness is very conspicuous with the presence of the financial development indicator.

Another study by Chukwuma (2010) investigated the indirect and direct causal links among financial deepening, trade openness and economic growth in the Benin Republic for the period 1960-2008. Using the Johansen and Juselius (1990), (henceforth, JJ) cointegration approach and Granger causality test, the study found that the direction of causality between financial development and economic growth depended on the financial development indicator used. The evidence of the study supported the view that financial development promotes economic growth, and economic growth leads to trade openness in the Benin Republic. In a similar study, Chukwuma (2010) investigated the possibility of long-run relationships between the three variables in Botswana for the period 1980-2007. The results showed long-run relationships between financial development and economic growth. The direction of causality between financial development and economic growth was, however, sensitive to the financial development indicator used. The demand-following hypothesis dominates in Botswana according to the study. No causal relationship between trade openness and economic growth could be verified. These results conform to those obtained by Polat *et al*. (2015) for South Africa where the demand-following hypothesis was validated. The study,

using a time series framework in the period 1970-2011, found long-run relationships between the variables and that financial development promotes economic growth. However, the study also found that although capital use adds to economic growth, trade openness impedes on economic growth.

In a Saudi Arabian study by Rehman, Ali and Nasir (2015) existence of long-run relationships were established among the variables using the JJ method of cointegration. The Granger causality test exhibited unidirectional causality running from trade openness to economic growth in Saudi Arabia. The study also showed that economic growth causes financial development. The results are similar to those obtained by Lacheheb, Adamu, and Akutson (2014), in an Algerian study which used an autoregressive distributive lag (ARDL) bounds testing approach to cointegration.

In summary, the relationship among trade openness, financial development and economic growth has been investigated in the most recent literature. These studies have used different econometric techniques to analyse causal and long-run relationship among the three variables. On the issue of long-run relationships; in some studies, positive relationships were established between the variables, in other instances, the studies found negative relationships, and in extreme cases, no relationships could be established between the variables. On the causality issue, the direction of causality has been varying in the literature, where, for example, one study finds causality running from financial development to economic growth; another study would find causality running from economic growth to financial development. Additionally, in other cases, no causation could be established between the variables. The major shortcoming in the literature is the lack of analysis on the magnitude of the long-run relationships. The majority of the literature fails to address this issue; the relationship observed could be so small that it fails to exert the necessary growth developments. The current study, therefore, hopes to fill the gap in that regard by determining the direction and extent of the relationship. Furthermore, the majority of the literature on the subject matter is on country-specific analysis and, as outlined earlier, country-specific studies fail to address potential biases that arise from endogeneity of independent variables. Therefore, the study also adds to the few existing panel studies which, compared to country-specific analysis have the latest estimation techniques, by analysing the impact of trade openness, financial development and economic growth in a panel of five SACU countries.

CHAPTER FOUR: METHODOLOGY

4.0 Introduction

This chapter presents in detail the methodology adopted in conducting the empirical analysis. The chapter is divided into four sections; section 4.1 outlines the theoretical framework, section 4.2 gives the method of data collection and analysis. Section 4.3 explains the model specifications used, it is divided into four sub-sections; section 4.3.1 explains the panel unit root tests, section 4.3.2 explains the panel cointegration tests, section 4.3.3 and 4.3.4 explain the Fully Modified Ordinary Least Square (FMOLS) and the Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) TYDL causality tests, respectively. Section 4.4 presents the discussion of the variables and their expected signs.

4.1 Theoretical Framework

The theoretical background of the linkages among trade openness, financial development and economic growth is based on a simplified version of the paper published by Blackburn and Hung (1998), henceforth the BH model, as simplified by Ginebri, Petrioli and Sabani (2001). The BH model is a modified version of Romer's 1990 model, in the sense that the latter adds financial markets to the former. The hypothesis of the BH model is that, to start their business, producers need external finance.

The model has two production sectors: the producers' goods and the final good.

The equation below depicts the production function of the final good;

$$y_t = L_{y,t}^{1-\beta} \sum_{j=1}^{A_t} k_{j,t}^{\beta}$$

Where:

j indexes the different brands of capital goods that can be used in production; A_t captures the sum of capital goods that have been invented as of time t; $L_{y,t}$ is the amount of labour employed in the final sector.

In each period there are N_t firms that engaged in research activity. A blueprint or design is created to show how to produce the new capital good: a unit of the final good at time t gives a unit of the new capital good at time t+1, $k_{j,t+1}$.

The probability of a research project succeeding is assumed to be related to the amount of labour employed and to the stock of knowledge accumulated A_t, and, therefore, the expected flow of new designs can be written as:

$$A_{t+1} - A_t = \vartheta(A_t L_{A_t})(N_t)$$

The constant ratios show the steady state equilibrium below:

$$n = \frac{N_t}{M_t}$$

$$e = M_t L_{A,t}$$

Where the constant growth rate of variables is given by:

$$g = \vartheta(e)n$$

Growth occurs with the increase in the variety of capital goods associated with an increasing number of firms engaged in research and development.

Trade liberalisation can be considered as two economies that are symmetric and initially isolated. Assuming that the designs for these inputs are non-tradable, the production, therefore, takes place in the original country. Another assumption is that there is no redundancy or duplication in research. The number of intermediate goods available to firms in each country is now $2A_t$. Designers begin to operate at positive expected profits given the drop in the labour cost of developing a new design. This encourages new firms to enter research sectors intensifying the rate of innovation.

The financial sector aspect is seen as each designer having zero wealth and must raise external finance. The assumption is of indirect lending through a financial intermediary. The cost of monitoring the intermediary operator represents the cost of delegation. The cost decreases as the bank failure probability decreases. It is possible to show that the probability of failure reduces to zero as the number of independent projects financed by the intermediary grows without bound. The direct effect of trade is the increase in the number of designers, this, thus, means that the delegated monitoring cost will be reduced. This, thereby, reduces the fixed cost in research due to the need to find external finance, hence promoting growth by encouraging new firms to enter the research sector.

In conclusion, the BH model predicts that trade has a positive effect on growth by promoting product development; product development then promotes financial development through a reduction in the agency cost of external financing. Thus, trade affects the degree of financial activity indirectly through its effect on growth.

4.2 Method of Data Collection and Analysis

The study carries out a panel analysis of all SACU countries and uses annual data from 1994 to 2012. The period chosen is to ensure that the analysis is based on a period when all the SACU countries gained independence and to exclude the recent north-African crises. The latter reason is that countries or customs unions do not exist in isolation. All the data used in the study have been obtained from the World Development Indicators (WDI). The study utilises the E-views software package for the analysis of the variables. The analysis is organized as follows; panel unit root tests is undertaken using primarily the Augmented Dickey-Fuller unit root test to test for stationarity of the variables, the Im-Pesaran-Shin (2003) and the Levin, Lin and Chu (2002) are included for robustness check. If the panel unit root tests establish that the variables of interest are non-stationary, i.e. that they are integrated of order one or two, a cointegration test is conducted using the Pedroni (1999) cointegration method of analysis to see if a long-run relationship between the said variables exists. The Fully Modified Ordinary Least Square (FMOLS) test is then run on the cointegrated variables to determine the magnitude and the direction of the long-run relationship. Once the results reveal that the variables are cointegrated it is imperative that the direction of causality is established, that is, it is necessary to establish which variables cause which, hence the final test done is the Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) TYDL causality tests.

4.3 Model Specification

4.3.1 Panel Unit Root Tests

Macroeconomics time series data tend to exhibit either a deterministic or stochastic trend and therefore, non-stationary. It is then proper to test for the stationarity of data before using it in econometric analysis. This study uses Fisher-Augmented Dicker Fuller (ADF) test proposed by Maddala and Wu (1999) (henceforth, MW) to examine the null hypothesis of non-stationarity against the alternative of stationarity. MW developed the test statistics that is based on combining the p-values of the test statistics from ADF unit root tests (P_i say for the

*i*th cross section, $i = 1... N$). Although there are many tests that can be employed to test the panel unit roots, the study opts to adopt this one because it has the big benefit of being able to handle unbalanced panels[1] (Baltagi *et al.* 2009). Two other tests (the Im-Pesaran-Shin (2003) and the Levin, Lin and Chu (2002)) were conducted solely for comparison and robustness of the results. The number of lag selections is an important part of the ADF test, since inappropriate selections of the lag yield biased estimates. The number of lags included in the ADF test is determined by Akaike Information Criterion (AIC) and Schwarz Criteria (SC) in a simple autoregressive (AR) regression model with a constant and a trend, and without a trend (constant only). The ADF test and the Im-Pesaran-Shin (2003) (henceforth, IPS) tests are similar in their hypotheses testing because they allow p_i to vary across cross-sections. The Fisher test is a non-parametric test that combines the p-values of the test-statistic for a unit root in each cross-sectional unit. It assumes p_i is the p-value from i[th]-test such that p_i is U [0, 1] and independent, and $-2lnP_i$ has a chi-square (χ^2) distribution, with two degrees of freedom. Therefore, the ADF test-statistic is given as:

$$P = -2 \sum_{i=1}^{N} lnP_i \qquad\qquad 4.1$$

The null and alternative hypotheses are defined as:

$H_0 : \rho_i = 1. i = 1, 2, ... , N$ $\qquad\qquad$ 4.2

Against the alternatives

$H_A : \rho_i < 1, i = 1, 2, ... , N_1 ; \rho_i = 1, i = N_1 + 1, N_1 + 2, ... , N$ $\qquad\qquad$ 4.3

On the other hand, IPS is a parametric test which computes t-statistic for the ADF test statistic for different values of the number of lags used and different sample size. The distribution of the t-bars statistic involves the mean and variance of the t-statistics used. The IPS and ADF tests are less restrictive and more powerful compared to the tests developed by Levin, Lin and Chu (2002) (henceforth, LLC) which do not allow for heterogeneity in the autoregressive coefficient. The tests proposed by IPS permits to solve Levin and Lin's serial correlation problem by assuming heterogeneity between units in a dynamic panel framework. Due to this major shortcoming, the basis of the analysis is the ADF test.

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[1] Inflation, CPI: Botswana T=19, Lesotho T=16, Namibia T=10, South Africa T=19, Swaziland T=19

4.3.2 Panel Cointegration Tests

The study utilizes Pedroni's cointegration test methodology rather than Fischer and Kao cointegration tests because it is comprehensive and therefore sufficient in the analysis. The panel cointegration tests proposed by Pedroni (1999), much like the IPS and MW panel unit root tests, take into account the heterogeneity by using specific parameters which are allowed to vary across individual members of the sample. It is unrealistic to assume that the vectors of cointegration are identical from one individual of the panel to another individual; therefore, taking into account the heterogeneity is advantageous. The test is, therefore, well suited for the current study given that the five countries are heterogeneous in terms of the levels of growth and size of the economies.

The Pedroni (1999) test derives seven panel cointegration test statistics. The seven test statistics comprise of four tests based on the within-dimension, and three tests based on the between-dimension. The null hypothesis of no cointegration of the within-dimension statistics for the panel cointegration test is:

$$H_0: \gamma_i = 1 \; for \; all \; i$$
$$H_0: \gamma_i = \gamma < 1 \; for \; all \; i$$

The between-dimension statistics, the null hypothesis of no cointegration for the panel cointegration test is:

$$H_0: \gamma_i = 1 \; for \; all \; i$$
$$H_0: \gamma_i < 1 \; for \; all \; i$$

If the p-values obtained from the test are statistically significant at the conventional levels, the implication is that the variables are cointegrated. Therefore, the null hypothesis of no cointegration is rejected. That is, a long-run relationship between the variables is observed, and the variables do not move away from each other over time. If on the other hand, the p-values are not significant, the null hypothesis of no cointegration is not rejected. Inference based on the latter results is that the variables do not move together in the long-run.

4.3.3 Fully Modified Ordinary Least Square (FMOLS)

The study also tests the direction and magnitude of the long-run relationships by employing the panel fully modified ordinary least square (FMOLS) method. The FMOLS was originally proposed by Phillip and Hansen (1990). The method employs the semi-parametric correction

to eliminate the long-run correlation between the cointegrating equation and the innovations. An important convenience of the fully modified approach that was proposed by Pedroni (1999) here is that in addition to producing asymptotically unbiased estimators, it also produces nuisance parameter free standard normal distributions. Inferences can, therefore, be made regarding common long-run relationships which are asymptotically invariant to the considerable degree of short-run heterogeneity that is prevalent in the dynamics typically associated with panels that are composed of aggregate national data.

4.3.4 Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) TYDL Causality Tests

The study undertakes a Granger causality test using Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) TYDL test. The greater part of time series studies have used the Granger causality test to look at the causality between economic variables. The causality concept is originally defined by Granger (1969, 1988) in a bivariate framework. However, numerous studies have argued that Granger causality in a bivariate framework faces the problem of specification bias as a result of omitted variables (Gujarati, 1995; Xu, 1996). Another fundamental issue according to Granger (1988) is that standard Granger causality requires that the variables in question must be integrated of the same order, that is, the number of times a variable has to be differenced until it becomes stationary should be the same.

The TYDL method of causality is superior to the traditional Granger causality in that it can mitigate the shortcomings of the Granger causality method. The flaws include spurious regression and specification bias. The TYDL method is based on the augmented VAR modelling with the introduction of a modified Wald test statistics (MWALD). The TYDL is also more efficient than the Granger causality in that, as stated earlier, it does not require pre-testing for cointegration properties of the system. It, therefore, avoids potential biases that may result from unit roots and cointegration tests because it can be used irrespective of the order of integration of the series.

According to the inference results given by Yamada and Toda (1998), the TYDL is the most stable when compared to other methods of causality such as the vector error correction model (VECM) or the vector autoregressive (VAR) model. The fundamental idea behind the TYDL is to augment the correct VAR order, k, with d_{max} extra lags. The d_{max} is the maximum possible order of integration of the series in the system. The equation is represented as below:

Multivariate TYDL for Trade Openness, Financial Development, and Economic growth:

$$
\begin{aligned}
lnEG_{it} = \beta_{10} &+ \sum_{i=1}^{k} \beta_{11,i}\, lnEG_{t-i} + \sum_{i=1}^{k} \beta_{12,i}\, lnFD_{t-i} + \sum_{i=1}^{k} \beta_{13,i}\, lnOPN_{t-i} + \sum_{i=1}^{k} \beta_{14,i}\, lnX_{t-i} \\
&+ \sum_{i=k+1}^{k+dmax} \beta_{11,i}\, lnEG_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{12,i}\, lnFD_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{13,i}\, lnOPN_{t-i} \\
&+ \sum_{i=k+1}^{k+dmax} \beta_{14,i}\, lnX_{t-i} \\
&+ \varepsilon_{1\,t} \hspace{9cm} (1)
\end{aligned}
$$

$$
\begin{aligned}
lnFD_{it} = \beta_{10} &+ \sum_{i=1}^{k} \beta_{11,i}\, lnFD_{t-i} + \sum_{i=1}^{k} \beta_{12,i}\, lnEG_{t-i} + \sum_{i=1}^{k} \beta_{13,i}\, lnOPN_{t-i} + \sum_{i=1}^{k} \beta_{14,i}\, lnX_{t-i} \\
&+ \sum_{i=k+1}^{k+dmax} \beta_{11,i}\, lnFD_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{12,i}\, lnEG_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{13,i}\, lnOPN_{t-i} \\
&+ \sum_{i=k+1}^{k+dmax} \beta_{14,i}\, lnX_{t-i} \\
&+ \varepsilon_{1\,t} \hspace{9cm} (2)
\end{aligned}
$$

$$
\begin{aligned}
lnOPN_{it} = \beta_{10} &+ \sum_{i=1}^{k} \beta_{11,i}\, lnOPN_{t-i} + \sum_{i=1}^{k} \beta_{12,i}\, lnFD_{t-i} + \sum_{i=1}^{k} \beta_{13,i}\, lnEG_{t-i} \\
&+ \sum_{i=1}^{k} \beta_{14,i}\, lnX_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{11,i}\, lnOPN_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{12,i}\, lnFD_{t-i} \\
&+ \sum_{i=k+1}^{k+dmax} \beta_{13,i}\, lnEG_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_{14,i}\, lnX_{t-i} \\
&+ \varepsilon_{1\,t} \hspace{9cm} (3)
\end{aligned}
$$

Where: EG is economic growth variable, FD is the financial development indicator, and OPN is the trade openness variable, Xs are control variables.

4.4 Justification and Measurement of Variables

All the data are obtained from the World Development Indicators and are expressed in natural logarithms in order to include the proliferate effect of time series data and to decrease the heteroskedasticity problem (Gujarati, 2007).

Dependent Variables

Exports plus Imports (% of GDP) (LOPN)

This is the measure of trade openness. The effect of trade openness on growth is mixed. While the trade-led growth theories suggest that the effects of trade openness on economic growth are positive, empirical evidence has yielded negative results, for example, Polat *et al.* (2015). Several researchers, Kenani and Fujio (2012), Yucel (2009), Siddiki (2002), Murinde and Eng (1994), and King and Levine (1993), have used this indicator as it is deemed the best measure of trade openness. The indicator is expected to exert a positive effect on financial development and economic growth.

Real GDP per capita (LGDPPC)

This is the gross domestic product which is divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is used to measure economic growth following numerous studies reviewed; Chiwira, Bakwena, Mupimpila and Tlhalefang (2016); Law and Demetriades (2006). It is expected that GDP per capita exerts a positive impact on financial development and trade openness (Nduka *et al.*, 2013; Patrick, 1966).

Money and Quasi-Money (M2) as a percentage of GDP (LM2GDP)

This measure is used for financial depth; it is a monetization ratio. The measure has been used by different researchers, such as Levine (1997) and King and Levine (1993). Levine (1997) argues that the larger the size of the financial system, the more it can mobilize savings and channel them towards productive economic activities, which in turn leads to economic growth. The rise in the ratio of broad money to GDP for the SACU countries, it is expected to have a positive impact on economic growth and trade openness. However, this indicator has been criticized by researchers in the past as a poor proxy for financial development. The main reason for the criticism is because the measure is more related to the ability of financial

systems in providing transaction services rather than the ability to channel funds from savers to borrowers (Khan and Senhadji, 2000).

Domestic Credit to private sector by banks (% of GDP) (LDCB)

These are financial resources provided by banks to the private sector. It is another measure of financial development. It is always better to use more than one measure of financial development to ensure the robustness of the results. This is a common measure of financial development used by several researchers, Eatzaz, and Malik (2009), Acaravci, Ilhan and Acaravci (2007), Shan (2005), Aziakpono (2004), Mazur and Alexander (2001) and King and Levine (1993). It is expected to have a positive impact on economic growth and trade openness. The idea is that financial resources like non-equity securities and loans are provided to the private sector by banks. Therefore, the higher the measure is, the higher the financial resources or financing is, thereby leading to greater opportunities and space for growth and development in the private sector (Economy Horizons, 2014).

Control Variables

The study includes variables to control for the possible effects of other growth determining factors. The chosen variables are based on the SACU countries socio-economic characteristics. For instance, as importing countries, more specifically, the BNLS countries, these countries' inflation is mainly imported from South Africa. Consequently, the Consumer Price Index (CPI) is chosen as the proxy for inflation instead of the gross domestic product (GDP) deflator. As developing countries, consumption is high, and inflation is mainly caused by high food prices, captured by CPI. Also, these countries have high levels of government spending, for example, Botswana's government spending has increased to 17949.50 BWP million in 2015 from 10070.54 BWP million in 2006 (Trading Economics, n.d.). The country has taken steps to reduce the size of the government. However, growth determining variables are not limited to those chosen for the study; other growth determining variables include but are not limited to human capital and infrastructure development. Human capital refers to the workers' acquisition of skills and knowledge through education and practical training. Growth theory has emphasized the importance of human capital on economic growth (Barro and Sala-i-Martin, 1995). Infrastructure development has also been advocated in the endogenous growth theories as paramount to the growth of economies (Barro, 1996).

Inflation, consumer prices (annual %) (LINF)

High levels of inflation distort economic activity and reduce investment, thus reducing economic growth. Aziakpono (2004) and Faria and Carneiro (2001) have used this indicator to determine its effects on economic growth. However, some studies that have found a positive relationship between economic growth and inflation. A study by Mallik and Chowdhury (2001) found a positive correlation between inflation and economic growth for four South Asian economies.

General government final consumption expenditure (% of GDP) (LGOVTEXP)

This is the measure of government size. The existing literature presents mixed results on the impact of government size on economic growth. On the one hand, the view by Allen and Ndikumana (1998) is that there is a negative relationship between government expenditure and economic growth because it crowds out private investment and leads to inflationary pressures. Barro (1996) further adds that it also distorts the market. On the other hand, several researchers have found that government spending has positive effects. For instance, efficiency in government spending can be enhanced, either by delivering the same amount of services with fewer resources or using more efficiently existing spending levels (Afonso, Schuknecht, and Tanzi, 2005).

Official exchange rate (LCU per US$, period average) (LXR)

The exchange rate variable is introduced to capture the price distortion effects it may have on an economy. This indicator has been used previously by researchers such as Aziakpono (2004) and Ito, Isard, and Symansky (1999).

CHAPTER FIVE: ANALYSIS OF DATA AND FINDINGS

5.0 Introduction

This chapter presents the results of the estimation of the model presented in chapter four. The estimation is systematically done, starting from section 5.1 which gives a summary of the descriptive statistics of the data, section 5.2 gives the results of the panel unit root test which is the test done to determine the stationarity of the variables. Section 5.3 provides the panel cointegration analysis, section 5.4 provides the FMOLS analysis and finally, section 5.5 provides the results of the TYDL method of causality.

5.1 Descriptive Statistics

The descriptive statistics shows the distribution of the data used in the study. It shows the mean, median, minimum, maximum and standard deviation. The skewness and Kurtosis are also included in the descriptive statistics summary. The skewness measures the symmetry of the data, whereas the Kurtosis measures the flatness or tallness of the distribution. For a normally distributed variable, Kurtosis is 3, known as mesokurtic and skewness is 0. A Kurtosis value < 3 implies a fat or short-tailed distribution, known as platykurtic. A Kurtosis value > 3 implies a slim or long-tailed distribution, known as leptokurtic. A skewness value < 0 is classified as right skewed distribution; a value > 0 is classified as left skewed distribution (Gujarati and Porter, 2009). Table 5.1 below shows the descriptive statistics summary for the data.

Table 5.1: Summary: Descriptive Statistics

	LDCB	LGDPPC	LGOVTEXP	LINF	LM2GDP	LOPN	LXR
Mean	3.24119	7.967619	3.08768	1.944622	3.635615	4.632962	1.827737
Median	3.106441	8.292763	2.993555	1.963983	3.646821	4.629014	1.914357
Maximum	4.360473	8.774883	3.678385	3.520833	4.391976	5.346589	2.355248
Minimum	1.822416	6.35207	2.593758	0.325976	2.977127	3.707921	0.987549
Std. Dev.	0.706566	0.744711	0.287176	0.427344	0.413535	0.443517	0.305479
Skewness	0.085777	-0.97477	0.580005	-0.30668	-0.02737	-0.36607	-0.85614
Kurtosis	1.795655	2.644961	2.347665	6.350211	1.968603	2.071655	3.128381
Observations	82	82	82	82	82	82	82

Table 5.1 shows the descriptive statistics of the variables used in the study for the panel of SACU countries. The skewness indicates that the distribution of most of the variables is right skewed; however LDCB, LINF, LOPN, and LM2GDP are close to symmetry because they are all close to 0. The Kurtosis reveals that the variables LDCB, LGDPPC, LGOVTEXP, LM2GDP, and LOPN are all platykurtic (Kurtosis < 3). However, only LINF is leptokurtic (Kurtosis >3). LXR is clearly normally distributed, with a Kurtosis value of 3.13.

5.2 Panel Unit Root Tests

The problem of using non-stationary variables is likely to lead to spurious regression results which in turn lead to the improper statistical inference, and a spurious correlation among variables. The spurious results indicate that the variance and mean calculated from non-stationary variables (in levels) would be biased estimates of the unknown population mean and variance. Therefore, using one or more non-stationary series in the model results in biased estimates and thereby leading to invalid statistical inference when estimating these series in levels. It is, therefore, imperative to find out if the relationship between economic variables is nonsensical or spurious (Gujarati, 2007; Harris, 1995).

In order to run the specified test, the requirement is either to include a constant, a constant and a linear trend, or neither in the test regression. A traditional approach is to run the model with a constant and constant and a linear trend. However, if irrelevant regressors are included in the regression, it reduces the power of the test in rejecting the null hypothesis of a unit root. Therefore, a way to overcome this problem is based on a graphical inspection of a series (Verbeek, 2004). If the plot of the graph does not start from the original, a constant is included. If a downward or upward trend can be observed from the plot of the graph, a linear trend is included to contain the trend term. Based on the graphs in Appendix A, the analysis relies on the results of only the constant as no trend can be observed in the variables, except LXR, in which case the trend is contained by including the trend term.

The results of the ADF, IPS, and LLC panel unit root test are depicted in Table 5.2. The table shows that the variables are stationary at levels and at first difference, that is, they are integrated of order I (0) and I (1). Only the variable LINF is stationary at levels, whereas the remaining variables, LDCB, LGDPPC, LM2GDP, LGOVTEXP, LOPN and LXR are all

stationary at first difference. The panel unit root test results, therefore, support the hypothesis that time series variables have unit roots.

Table 5.2: Panel Unit Root Tests

VARIABLE	LEVEL	ADF		IPS		LLC		ORDER OF INTEGRATION
		Intercept	Intercept + Trend	Intercept	Intercept + Trend	Intercept	Intercept + Trend	
LDCB	0	7.51095	15.2254	0.64966	-1.0742	0.27880	-0.82564	
	1	51.7699***	37.7131***	-6.29267***	-4.81575***	-6.8471***	-5.90771***	I(1)
LGDPPC	0	1.08642	13.3451	4.40146	-0.69634	2.31663	-0.90266	
	1	41.1072***	28.9581***	-4.94622***	-3.41916***	-5.86453***	-4.30905***	I(1)
LGOVTEXP	0	10.8937	8.59466	-0.64391	0.34424	-0.95734	0.00403	
	1	48.0130***	32.2945***	-5.73575***	-3.76507***	-6.04303***	-5.22409***	I(1)
LINF	0	32.5662***	22.0544**	-3.4034***	-1.54738*	-4.53667***	-2.88142***	I(0)
LM2GDP	0	4.85302	3.89879	0.90976	1.02691	-0.52414	-0.24514	
	1	44.0543***	31.0228***	-5.34062***	-3.84874***	-6.63387***	-5.50205***	I(1)
LOPN	0	15.4476	11.3970	-1.5606*	-0.39855	-1.83094**	-0.32457	
	1	47.7276***	43.5485***	-5.56679***	-5.38255***	-6.41873***	-5.62116***	I(1)
LXR	0	19.2001**	14.0384	-2.08309**	-1.22796	-3.46769***	-1.98635**	
	1		18.5483**		-2.05751**		-4.92053***	I(1)

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively.

5.3 Panel Cointegration Analysis

Evidence from the panel unit root test in Table 5.2 shows that the majority of the variables are integrated of order 1. We can therefore proceed to the next step of testing if a long-run relationship exists between the variables by carrying out the Pedroni (1999) panel co-integration test. In order to test how the different financial development measures react in the cointegration test, a number of tests are carried out systematically; (1) real GDP per capita is the dependent variable with LDCB as the measure of financial development included in the series; (2) real GDP per capita is the dependent variable with LM2GDP as the measure of financial development included in the series; (3) trade openness is the dependent variable with LDCB as the measure of financial development included in the series; (4) trade openness is the dependent variable with LM2GDP as the measure of financial development included in the series (5) LDCB is the dependent variable and; (6) LM2GDP is the dependent variable. Therefore, in total, there are six panel cointegration results.

5.3.1 Economic Growth

Table 5.3: Cointegration Results (1) LGDPPC with LDCB

Pedroni Residual Cointegration Tests	Intercept		Intercept + Trend	
	Test Statistic	P value	Test Statistic	P value
• Panel v-Statistic	0.314938	0.3764	15.86475	0.0000***
• Panel rho-Statistic	-0.381074	0.3516	0.682491	0.7525
• Panel PP-Statistic	-3.518234	0.0002***	-2.442359	0.0073***
• Panel ADF-Statistic	-3.517127	0.0002***	-2.833683	0.0023***
• Group rho-Statistic	0.472933	0.6819	1.784047	0.9628
• Group PP-Statistic	-4.104514	0.0000***	-1.432629	0.0760***
• Group ADF-Statistic	-4.195902	0.0000***	-2.494035	0.0063***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. LDCB is used as a measure of financial Development.

From the results of Table 5.3, the Pedroni test results show that the majority of the tests are significant at conventional levels of significance. This implies that the null hypothesis of no cointegration can be rejected and conclusions can be made that the variables are cointegrated. That is, there is a long-run relationship between the variables. The implication is that the variables move together over time.

Table 5.4: Cointegration Results (2) LGDPPC with LM2GDP

Pedroni Residual Cointegration Tests	Intercept		Intercept + Trend	
	Test Statistic	P value	Test Statistic	P value
• Panel v-Statistic	-0.665965	0.7473	17.42884	0.0000***
• Panel rho-Statistic	0.764850	0.7778	0.892071	0.8138
• Panel PP-Statistic	-0.524063	0.3001	-2.502067	0.0062***
• Panel ADF-Statistic	-0.640295	0.2610	-2.519306	0.0059***
• Group rho-Statistic	1.892646	0.9708	1.987971	0.9766
• Group PP-Statistic	0.363159	0.6418	-1.903556	0.0285***
• Group ADF-Statistic	-0.254623	0.3995	-1.831048	0.0335***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively.LM2GDP is used as a measure of financial Development.

The results from Table 5.4 are unanimous in that the probabilities of the test are insignificant at all levels; therefore, the null hypothesis of no cointegration is not rejected, implying that there is no cointegration among the variables. As stated earlier, no trend is observed in the series. Hence the results from the Intercept + Trend are ignored. The implication, of no cointegration, is that the variables do not move together over time.

5.3.2 Trade Openness

Table 5.5: Cointegration Results (3) LOPN with LDCB

Pedroni Residual Cointegration Tests	Intercept		Intercept + Trend	
	Test Statistic	P value	Test Statistic	P value
• Panel v-Statistic	0.244818	0.4033	-0.57873	0.7186
• Panel rho-Statistic	1.140371	0.8729	1.563861	0.9411
• Panel PP-Statistic	-0.425963	0.3351	-0.744117	0.2284
• Panel ADF-Statistic	-0.830317	0.2032	-0.718921	0.2361
• Group rho-Statistic	1.826116	0.9661	2.170373	0.9850
• Group PP-Statistic	-8.198376	0.0000***	-5.941642	0.0000***
• Group ADF-Statistic	-3.450428	0.0003***	-2.928666	0.0017***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. **LDCB is used as a measure of financial Development.**

Table 5.5 shows only two of the tests from the Pedroni test are significant at the all the conventional levels of significance, therefore leading to failure to reject the null hypothesis of no cointegration.

Table 5.6: Cointegration Results (4) LOPN with LM2GDP

Pedroni Residual Cointegration Tests	Intercept		Intercept + Trend	
	Test Statistic	P value	Test Statistic	P value
• Panel v-Statistic	0.611596	0.2704	0.291491	0.3853
• Panel rho-Statistic	0.560936	0.7126	0.547493	0.7080
• Panel PP-Statistic	-1.426455	0.0769*	-3.338629	0.0004***
• Panel ADF-Statistic	-1.978451	0.0239**	-3.308331	0.0005***
• Group rho-Statistic	1.448077	0.9262	1.636672	0.9492
• Group PP-Statistic	-4.752381	0.0000***	-4.953288	0.0000***
• Group ADF-Statistic	-2.605488	0.0046***	-3.583292	0.0002***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. LM2GDP is used as a measure of financial Development.

Table 5.6 shows that the results from Pedroni's test lead to the rejection of the null hypothesis of no cointegration, this is due to the majority of the tests being significant at the 1%, 5% and 10% level of significance.

5.3.3 Financial Development

Table 5.7: Cointegration Results (5) LDCB

Pedroni Residual Cointegration Tests	Intercept		Intercept + Trend	
	Test Statistic	P value	Test Statistic	P value
• Panel v-Statistic	-0.162355	0.5645	1.485210	0.0687
• Panel rho-Statistic	0.236732	0.5936	1.501278	0.9334
• Panel PP-Statistic	-1.957869	0.0251**	-4.251304	0.0000***
• Panel ADF-Statistic	-1.952284	0.0255**	-3.721819	0.0001***
• Group rho-Statistic	0.409293	0.6588	1.468070	0.9290
• Group PP-Statistic	-4.632685	0.0000***	-6.63988	0.0000***
• Group ADF-Statistic	-5.000379	0.0000***	-5.806434	0.0000***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. LDCB is used as a measure of financial Development.

The results from Table 5.7 show that the null hypothesis of no cointegration is rejected, as the majority of the tests are significant at the 1% and 5% level of significance.

Table 5.8: Cointegration Results (6) LM2GDP

Pedroni Residual Cointegration Tests	Intercept		Intercept + Trend	
	Test Statistic	P value	Test Statistic	P value
• Panel v-Statistic	0.269642	0.3937	-0.295742	0.6163
• Panel rho-Statistic	1.121767	0.8690	1.927141	0.9730
• Panel PP-Statistic	-0.908186	0.1819	-0.479291	0.3159
• Panel ADF-Statistic	-1.654626	0.0490**	-1.369217	0.0855*
• Group rho-Statistic	1.828769	0.9663	2.422297	0.9923
• Group PP-Statistic	-0.750613	0.2264	-1.863902	0.0312**
• Group ADF-Statistic	-1.448161	0.0738*	-1.588975	0.0560*

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. LM2GDP is used as a measure of financial Development.

Table 5.8 shows only two of the tests from the Pedroni test are significant at the 5% level of significance, therefore leading to failure to reject the null hypothesis of no cointegration. The implication of the results is no cointegration between the variables.

5.4 Long Run FMOLS Analysis

The FMOLS is conditional on the establishment of cointegration results in the previous test. Therefore, only in the case where a linear combination of the variables is obtained in the Pedroni cointegration test will there be a need to do the FMOLS. A linear combination of the pooled variables has been established with LGDPPC, LOPN, and LDCB; therefore, the next step is to do the FMOLS analysis with only these three variables. The essence of the FMOLS is to illustrate the direction and the magnitude of the long-run relationship results obtained from the cointegration test.

Tables 5.9, 5.10 and 5.11 show the results of the FMOLS with the baseline model for LDCB, LGDPPC, and LOPN, respectively. The results are specifically for the variables that were

cointegrated in the previous test, interchanging the dependent variables to suit the interest of the study. The test was run initially with a baseline model with only LOPN, LDCB and LGDPPC and then independent variables (LGOVTEXP, LXR, LM2GDP) were added one at a time and then finally all at once.

Financial Development:

Table 5.9: FMOLS results for LDCB

Variables	Baseline Model	Model 1	Model 2	Model 3
LGOVTEXP		1.621122		2.057232**
LGDPPC	0.564711***	8.543189***	7.626178***	7.456104***
LOPN	-2.323502**	-2.854523***	-3.975764***	-4.380490***
LXR			3.266402***	3.490473***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively.

LDCB is the only measure of financial development that was cointegrated in the previous test and is hence the only proxy used in this case as the dependent variable. Table 5.9 shows that the elasticities of all variables are statistically significant at the 5% and 1% level of significance, with the exclusion of Model 1. In Model 1, it can be seen that LGOVTEXP is not significant at all conventional levels of significance. However, with the inclusion of all variables it can be seen from Model 3 that LGDPPC, LOPN, LGOVTEXP and LXR can explain LDCB, the proxy for financial development. Therefore, a percentage increase in LGDPPC will lead to an increase in LDCB by 0.45%; this is consistent with a priori expectation. A percentage increase in LOPN will lead to a reduction in LDCB by 0.74%, which is contrary to a priori expectation. However, a percentage increase in LGOVTEXP will lead to increase in LDCB by 0.49%. On the other hand, a percentages increase in LXR will lead to an increase of LDCB by 0.91%.

The results, therefore, advocate for a long-run relationship between LGDPPC, LOPN, LGOVTEXP, LDCB, and LXR. Hence the variables do not move too far away from each other over time. The estimated long-run relationships imply that economic growth, trade

openness, exchange rate and government spending have positive effects on financial development in the SACU countries.

Economic Growth:

Table 5.10: FMOLS results for LGDPPC

Variables	Baseline Model	Model 1	Model 2	Model 3
LGOVTEXP			-0.136459	-0.331229
LOPN	8.264046***	5.695737***	3.200438***	3.276809***
LXR		-1.066131		-1.094111
LDCB	8.994574***	8.052612***	8.631947***	7.723668***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively.

Table 5.10 shows the results of the FMOLS with LGDPPC as the dependent variable. The results show that in all the models only two variables are statistically significant at the conventional levels of significance. This implies that LOPN and LDCB can explain LGDPPC. A percentage increase in LOPN will lead to an increase of LGDPPC by 1.03%. While a percentage increase in LDCB will lead to an increase in LGDPPC by 1.38%, this is consistent with a priori expectation.

The results suggest that only the variables LOPN, LDCB and LGDPPC would not move far away from each other over time. This is depicted fundamentally from the baseline model. The estimated long-run relationship illustrates that in SACU countries, trade openness, and financial development have a positive effect on economic growth. These results support the trade-led growth theories and the finance-led growth theories.

Trade Openness:

Table 5.11: FMOLS results for LOPN

Variables	Baseline Model	Model 1	Model 2	Model 3
LGOVTEXP			9.564163***	11.53401***
LGDPPC	2.099858**	1.990724**	3.580443***	4.320873***
LM2GDP	-1.400631	-0.363041	-3.259443***	-6.005262***
LXR		3.903966***		5.468647***

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively.

The results in Table 5.11 suggest that fundamentally LGDPPC is important for LOPN, irrespective of the control variables added. On the contrary, LM2GDP does not show the same trend; it is initially not significant at the baseline. It is, in fact, still not significant with the addition of LXR as an independent variable, but it becomes significant with the addition of the LGOVTEXP and LXR as independent variables. However, it consistently shows the wrong sign, implying that LM2GDP reduces trade openness. The results lead to the conclusion that financial development, on its own, is not important for trade openness. It, however, becomes important once other factors, such as government expenditure and exchange rate are considered. Nevertheless, one must be careful in coming to such a conclusion, because as stated earlier, M2GDP has been criticized as a poor proxy for financial development. The results of the estimated long-run relationship in Model 3 show that a percentage increase in LGOVTEXP will lead to an increase of trade LOPN by 1.43%. Implicitly also, a percentage increase in LGDPPC will lead to an increase of LOPN by 0.27%. While a percentage increase in LXR will lead to an increase in LOPN by 0.99%, this is all consistent with a priori expectation. On the other hand, a percentage increase in LM2GDP will lead to a reduction of LOPN by 1.02%, contradicting a priori expectations. The results are similar to those obtained by Yucel (2009).

5.5 TYDL Analysis

As some indication of the existence of a relationship between financial development, trade openness and economic growth has been found, the interest now is to know the causal direction of the relationship. Therefore, the next step is to come to the issue of causality between trade openness, financial development, and economic growth as stated earlier. The TYDL Granger causality method is used to test for causality on the series.

The application of TYDL method of causality involves two steps. The initial step involves determining the lag length, k, of VAR model at level and the maximum order of integration, d_{max}, of the variables in the system. From the unit root test done previously, it has been established that the maximum order of integration is 1, therefore $d_{max} = 1$. As far as selection of the lag length is concerned, there are various criteria for determining the lag length. The following are used in the current study: Akaike Information Criterion (AIC), Schwartz Information Criterion (SC), Final Prediction Error (FPE), Sequential Modified LR Test Statistic (LR) and Hannan-Quinn Information Criterion (HQ). Once the maximum lag length has been determined, the diagnostic check of the VAR model can be done by applying the autocorrelation and normality tests.

The second step is to apply a Wald tests to the first k-VAR coefficient matrix (but not on k+dmax variables) to check for Granger causality among the variables of interest. The TYDL procedure enables the modified Wald statistic to test restrictions on the k coefficients matrix using the standard asymptotic theory.

The study initially ran the Granger causality TYDL test with only the three variables, LOPN, LGDPPC, LM2GDP/LDCB and used this as a baseline; the test was then re-ran with all the variables. In both cases, the models were specified with logs and without logs to select the appropriate variables for the economic models. The results are presented in Table 5.12 (for Granger causality with all variables but with the exclusion of M2GDP/LM2GDP) and Table 5.13 (for Granger causality with all variables excluding (DCB/LDCB).

Table 5.12: Granger Causality Results with DCB/LDCB

Baseline (Panel 1)							
Source of causation				Source of causation			
	DCB	GDPPC	OPN		LDCB	LGDPPC	LOPN
DCB		2.432237	1.474757	LDCB		1.053038	0.501855
GDPPC	4.270907(**)		0.036322	LGDPPC	4.268353(**)		0.152736
OPN	1.094449	1.301551		LOPN	1.608726	3.412914(*)	

Source of causation (Panel 2)						
	DCB	GOVTEXP	GDPPC	OPN	XR	INF
DCB		0.290850	2.516776	1.105709	3.483503	0.004662
GOVTEXP	0.044883		1.972843	0.550408	0.743223	0.002485
GDPPC	2.398347(*)	0.148012		0.048886	0.089881	0.825387
OPN	0.536043	0.756182	0.332259		2.695799	8.164570
XR	0.174658	1.381633	0.453692	3.253433		13.97080
INF	3.167376	0.009176	0.771763	3.483289	19.46979	

Source of causation (Panel 3)						
	LDCB	LGOVTEXP	LGDPPC	LOPN	LXR	LINF
LDCB		1.536358	0.044003	0.229258	2.081241	0.125219
LGOVTEXP	0.106558		2.713956(*)	1.544792	0.520774	0.002081
LGDPPC	1.573326	0.311646		0.000267	0.057956	0.088829
LOPN	0.694575	0.762941	0.370815		2.094067	4.592302(**)
LXR	0.330321	0.460349	3.36E-05	0.119173		6.933793(***)
LINF	0.262286	0.046027	4.132459(**)	1.342282	1.343268	

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. Values in the table are the Wald test statistics.

Table 5.12 shows the variables in Panel 1, 2 and 3 using DCB as the measure of financial development. Lag length chosen based on all LR, FPE, AIC, SC, and HQ is 1. The variables LOPN, LDCB and LGDPPC with and without logs are shown in Panel 1, which is the baseline model. The variables without logs show Granger causality running from GDPPC to DCB only. However, the logged variables show unidirectional causality running from LGDPPC to LDCB and from LOPN to LGDPPC.

Panel 2 and Panel 3 show the variables without logs and with logs, respectively. From Panel 2 we can see causality running from GDPPC to DCB only and no other causality is reported from all other variables. However, in Panel 3, the logged variables, causality can be seen running from LGOVTEXP to LGDPPC but not vice versa. The results are consistent with those obtained by Afonso, *et al.* (2005). There is also one-way causality running from LINF to LGDPPC. Causality can be further seen running from LOPN and LXR to LINF, also only unidirectional.

The results show that the demand-following hypothesis dominates in the SACU countries, that is, economic growth causes financial development. The results support the results obtained by Polat *et al*. (2015) and Chukwuma (2010) for South Africa and Botswana, respectively. The results also show that trade openness is important for economic growth, supporting results obtained by David *et al.* (2014) and Harrison (1996). No causal relationships could be established between trade openness and financial development, supporting the results obtained by Chang (2002), Kenani and Fujio (2012) and Hassam and Islam (2005).

Table 5.13: Granger Causality Results with M2GDP/LM2GDP

Baseline (Panel 1)							
Source of causation				Source of causation			
	M2GDP	GDPPC	OPN		LM2GDP	LGDPPC	LOPN
M2GDP		0.503611	1.267467	LM2GDP		0.434296	0.371431
GDPPC	0.129304		0.090307	LGDPPC	0.693218		43.53893(***)
OPN	0.003076	0.927750		LOPN	0.546068	3.019984(*)	

Source of causation (Panel 2)						
	M2GDP	GOVTEXP	GDPPC	OPN	XR	INF
M2GDP		2.032394	11.57833(*)	18.36269(***)	1.466014	7.538416
GOVTEXP	6.606452		10.02964	20.40789(***)	1.543730	3.880466
GDPPC	2.460469	3.440355		11.91946(*)	0.842715	3.974150
OPN	11.69243(*)	13.24651(**)	19.13560(***)		1.417039	10.24570
XR	4.641858	3.419115	24.93651(***)	24.65894(***)		15.85004(**)
INF	3.990181	4.988852	17.32807(***)	30.12725(***)	1.672452	

Source of causation (Panel 3)						
	LM2GDP	LGOVTEXP	LGDPPC	LOPN	LXR	LINF
LM2GDP		7.306372	5.376474	12.94950(**)	10.36264	184.4036(***)
LGOVTEXP	4.369945		16.79616(**)	3.543416	12.24724(*)	45.82619(***)
LGDPPC	3.016303	8.180782		9.344648	4.646918	38.85563(***)
LOPN	4.287152	7.647255	25.43775(***)		13.94258(**)	85.87643(***)
LXR	2.347488	6.693655	6.385273	17.03256(***)		234.1240(***)
LINF	4.557421	6.531715	11.05482(*)	12.21128(*)	10.60294	

Note: The asterisks ***, ** and * denotes statistical significance at 1%, 5% and 10% levels, respectively. Values in the table are the Wald test statistics.

Table 5.13 shows the variables in Panel 1, 2 and 3 using M2GDP as the measure of financial development. Lag length chosen based on all LR, FPE, AIC, SC, and HQ is 6. The variables LOPN, LM2GDP and LGDPPC with and without logs are shown in Panel 1, which is the baseline. With M2GDP as the measure of financial development, only bi-directional causality can be seen between LOPN and LGDPPC. No causal relationships can be seen with the variables without logs.

Panel 2 and Panel 3 show the variables without logs and with logs, respectively. It can be seen from the results in Panel 2 that there is bi-directional causality between M2GDP and OPN; there is also bi-directional causality between GOVTEXP and OPN. Bi-directional causality can also be observed between GDPPC and OPN; however the causality is stronger for OPN to GDPPC. Unidirectional causality can also be observed from M2GDP to GDPPC. Although XR and INF Granger cause GDPPC, it is only a unidirectional causality and not bi-directional. In Panel 3, only bi-directional causality can be seen running from LOPN and GOVTEXP to LGDPPC and from LINF, LXR, and LM2GDP to LOPN. However, it seems all the variables Granger causes LINF.

The results show that fundamentally, as depicted by Panel 1, 2 and 3 results, trade openness is important for economic growth and vice versa. In all three panels, it can be seen that trade openness Granger causes economic growth and economic growth Granger causes trade openness. Supporting bi-directional results obtained by, Deme (2002), Hye, Wizarat and Lau (2013) and Zghidi and Abida (2014).

Discussion of Results

The results show that financial development acts as a catalyst between trade openness and economic growth. With the DCB measure of financial development, trade openness leads to financial development via economic growth. However, with M2GDPC as the measure of financial development; financial development leads to trade openness via economic growth. One crucial thing to note is that in all cases trade openness is important in the SACU countries; one possible explanation is that as a union, the countries reap the benefits from free trade thus leading to economic growth and financial development, respectively.

Therefore, it is evident that the trade openness, financial development and economic growth are all essential in the SACU countries.

CHAPTER SIX: CONCLUSIONS AND POLICY IMPLICATIONS

6.0 Introduction

The study empirically investigated long-run relationships and the causal links among trade openness, financial development, and economic growth within the SACU countries. This chapter is divided into four sections; section 6.1 presents, therefore, the results and conclusions of the study. Section 6.2 provides policy recommendations emanating from the results obtained in the study. Sections 6.3 and 6.4 give the limitations of the study and areas of further research on the topic, respectively.

6.1 Conclusions

This research study outlined an empirical analysis of the long-run relationship among financial development, trade openness and economic growth in a trivariate panel analysis framework; it further used the TYDL approach to investigate the direction of causality between the variables. The study was based on the assumption of possible benefits of trade openness and financial development on the growth of an economy. Previous empirical studies found positive relationships between these variables (Kenani and Fujio, 2012; Dritsaki, 2013), others found negative relationships (Samargandi, Fidrmuc and Ghosh, 2013; Huchet-Bourdon, Le Mouël and Vijil, 2011; Yucel, 2009), and in some cases no causal relationships could be established between these variables (Caporale, Rault, Sova, and Sova, 2009; Nduka *et al.*, 2013). The study, therefore, tried to ascertain if such relationships exist within more financially integrated economies, the SACU countries.

The study utilized panel data analysis to investigate the relationships using recent econometrics techniques. The study used two measures of financial development for robustness of the results, domestic credit to private sector by banks (DCB) and money and quasi-money (M2GDP); export plus imports as a percentage of GDP was used to capture trade openness and real GDP per capita was used as the measure of economic growth. The study also used other growth determining variables as control variables.

The evidence from the econometric analysis revealed the existence of the long-run cointegrating relationships among trade openness, financial development, and economic growth. The results, therefore, support the theory that trade openness and financial development drive economic growth in developing countries. However, DCB was found to

have positive effects on economic growth; a direct relationship could not be established between M2GDP and economic growth. The causality findings suggest that financial development and trade openness are important factors in explaining economic growth, which is consistent with previous studies. In the case where the DCB measure of economic growth is used, causality runs from economic growth to financial development. Implying that the demand-following hypothesis dominates in the SACU countries, these results clearly support the findings of two different studies done for South Africa and Botswana by Polat *et al.* (2015) and Chukwuma (2010), respectively. On the other hand, with M2GDP as the measure of financial development, bi-directional relationships can be seen between trade openness and financial development. Bi-directional relationships between economic growth and trade openness were also observed, however, causality was stronger from trade openness to economic growth, implying that trade openness is more important for economic growth than economic growth is for trade openness. The results clearly support the trade-led growth theories. M2GDP drives economic growth indirectly through trade openness.

If both measures of financial development are taken together, the results depict that financial development and trade openness have a significant impact on economic growth. The findings are compatible with the major portion of the literature (Asghar and Hussain, 2014; Dritsaki, 2013; Diaz and Delgadillo, 2013; Kenani and Fujio, 2012).

6.2 Policy Recommendations

In light of the empirical results obtained, some policy recommendations can be made.

The study found that trade openness is important for SACU countries; therefore, policy measures that strengthen the customs union would be paramount for the growth of the economies. A major issue that has been pending in the SACU customs union is that of the revenue pool. Negotiations of a new revenue sharing formula have been in the pipeline and if not urgently resolved may impede the growth of member states. Thus, it is important that the negotiations bring about a formula that benefits most, if not all parties. Additionally, it is recommended that the countries in the customs union optimally utilise the benefits that come with been in a trade block such as access to free markets without incurring any cost or restriction on imported or exported goods. Moreover, trade liberalization should be diversified and not limited to the SACU customs union. The individual countries should improve trade liberalization within their countries. An increase of trade among SACU

countries will imply either an openness of southern African market, a change in specialization of SACU countries or a reduction of protection on sensitive goods like agricultural commodities. In overcoming obstacles for promoting greater trade, the quality and strength of effective institutions in SACU is also essential. This helps in facilitating the implementation of trade protocol and achieving its final goals at the scheduled time. A reduction in tariff barriers and non-tariff barriers within the region will also raise intra-regional trade in the SACU region. It is also recommended that an elimination of structural rigidities and trade barriers originating from adverse political relationship could also lead to substantial increase in intra-SACU trade.

Financial liberalization policies would be necessary to make the economic growth and trade openness nexus sound as financial sector development leads to exports. Trade openness promotes economic growth, and the reverse is also true.

A stable macroeconomic environment needs to be stabilized to foster the development of financial sectors. Stable, efficient and accountable institutions tend to broaden the appeal to risk-averse investors. Political risk is then reduced over time. It is, therefore, recommended that economic policies should aim at removing growth obstacles that will in turn help in promoting financial development, thus helping to overcome financial system deficiencies and benefiting finance-growth dynamics. Such development strategies are greater macroeconomic and political stability or improved institutional quality, all of which could in turn positively impact financial development (Montiel, 2003). Thus, a general approach taking into account fundamental determinants of development seems to be more appropriate.

6.3 Limitations of the Study

The major limitation of the study is the availability of data, especially for two of the SACU countries (Lesotho and Namibia). The preferred method of panel analysis is a balanced panel. Unfortunately, in the absence of a complete data set, the more advantageous balanced panel data could not be used in the study.

6.4 Areas of further research

The study recommends more comprehensive measures of financial development. A look into the capital and stock markets would also be beneficial for further studies as this was beyond the scope of the study. The study also attempted to test empirical evidence of cointegration

and causality for each country and compare the results to those obtained from the panel analysis. However, the sample size was too small for a time-series analysis. Thus, the results were inconclusive. Further research could, therefore, expand the sample size (once complete data is available) and rerun the model and compare the panel and time-series results for robustness.

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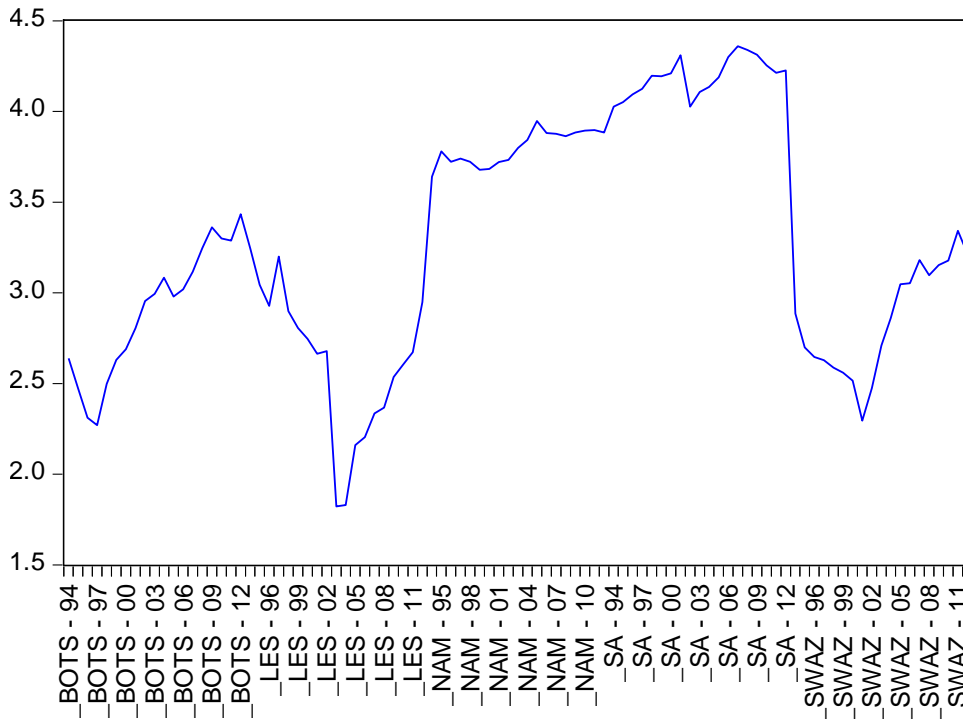
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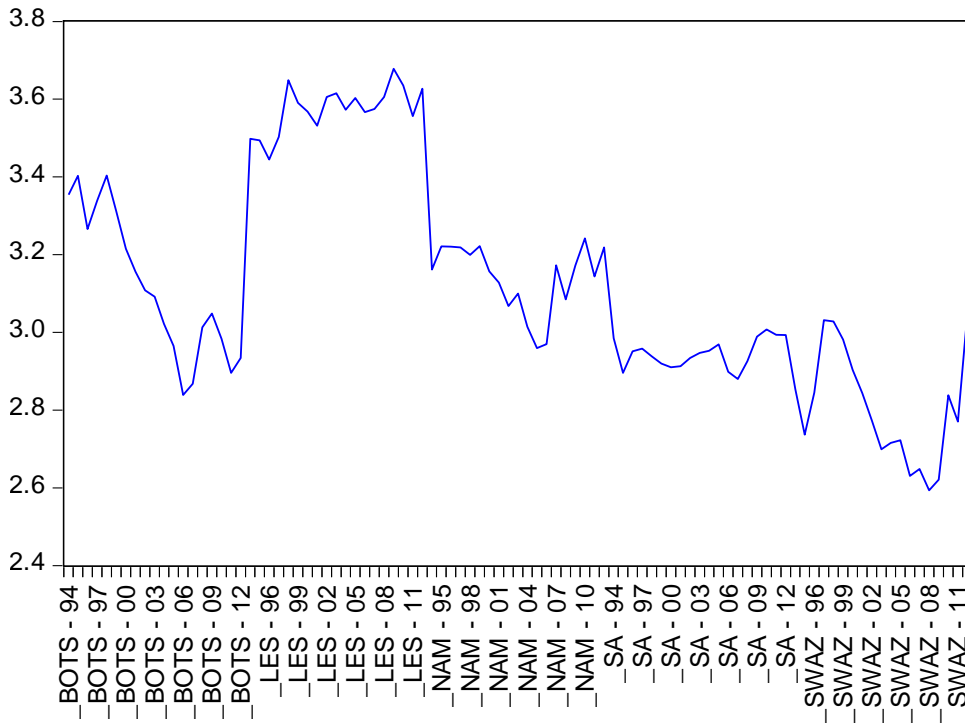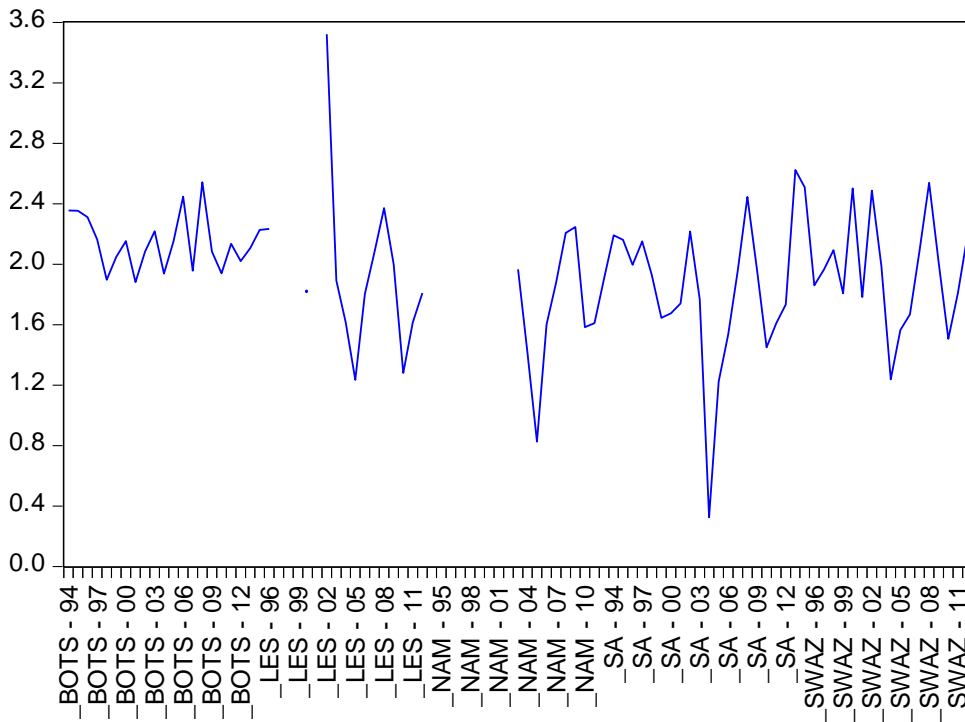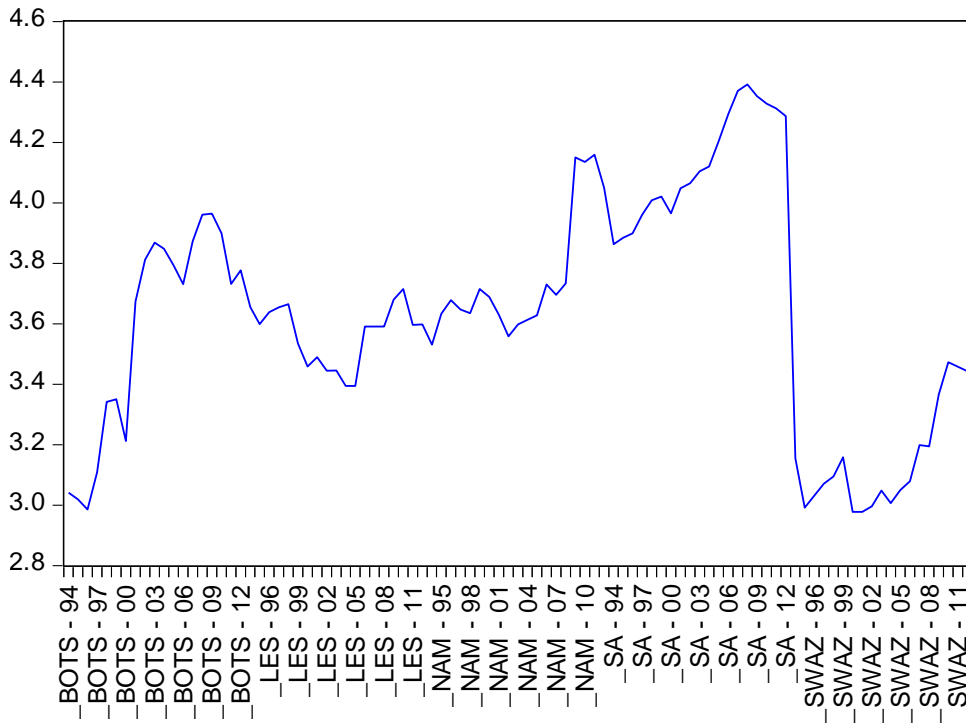
LDCB

LGDPPC

LGOVTEXP

LINF

LM2GDP

LOPN

LXR