

Causal linkages between FDI, financial sector development, remittances, domestic savings and economic growth in South Africa

Research Report

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John Mbu

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Supervisor: Dr Sean Gossel

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Glossary

ADF	Augmented Dickey Fuller
AFDB	African Development Bank
AIC	Alkaike Information Criteria
ASEAN	Association of South East Asian Nations
ATM	Automatic Teller Machine
BOPSY	Balance of Payments Statistics Yearbook
CLRM	Classical Linear Regression Model
ECOWAS	Economic Community of West African States
EFPI	Equity Foreign Portfolio Investment
FDI	Foreign Direct Investment
FPI	Foreign Portfolio Inflows
GDP	Gross Domestic Product
GFDD	Global Financial Development Database
GMM	Generalised Method of Moments
HNR	Holtz-Eakin Newey and Rosen
IFC	International Finance Corporation
IMF	International Monetary Fund
IV	Instrumental Variables
JSE	Johannesburg Stock Exchange
LAC	Latin America and the Caribbean
LDC	Less Developed Country
MENA	Middle East and North Africa
MFR	Mixed Fixed and Random
OECD	Organisation for Economic Co-operation and Development

OLS	Ordinary Least Squares
PP	Phillips-Perron
SARB	South African Reserve Bank
SSA	Sub-Saharan Africa
SUR	Seemingly Unrelated Regression
TFP	Total Factor Productivity
TY	Toda Yamamoto
TYDL	Toda Yamamoto and Dolado Lutkepohl
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
WAMU	West African Monetary Union
WDI	World Development Indicators

ABSTRACT

This report examines the causal linkages between FDI, financial sector development, savings, remittances and economic growth in South Africa using annual time series data from 1970 to 2010. The results show that none of the financial sector variables directly lead to economic growth. However, economic growth is found to stimulate FDI and financial sector development.

With regards to the causal linkages between the different financial factors, the results show that savings have highly significant causal linkages with FDI and financial sector development. In addition, the results suggest that savings have a moderately significant causal relationship with remittances. Furthermore, the results indicate that FDI has a weakly unidirectional causal relationship with financial sector development, and the direction of causality runs from FDI. The findings also suggest that remittances have a weakly significant relationship with FDI

Thus, these findings suggest that policy-makers in South Africa should aim principally at increasing domestic savings and economic growth rates since increasing domestic savings will significantly increase FDI, financial sector development and remittances, and increases in the economic growth rates will significantly increase financial sector development and FDI.

Keywords: *Causality, Economic Growth, Financial Capital, South Africa*

1 INTRODUCTION

1.1 Research Area and Problem

The empirical role of finance in enhancing economic growth has attracted keen interest amongst researchers and academics across the world for the past five decades, starting with the seminal studies of Goldsmith (1966), McKinnon and Shaw (1973), and more recently Rajan and Zingales (1998). The financial sector-led growth hypothesis argues that development of the financial sector has a significantly positive effect on the economic growth of a country. In addition to the development of the financial sector, on a stand-alone basis, it is argued that other sources of finance such as capital flows (FDI, portfolio equity flows and debt flows), remittances and savings could also positively impact economic growth.

However, further studies posit that causal linkages between FDI, remittances, savings and economic growth are dependent on the level of development of the financial sector in the recipient country (Alfaro *et al.*, 2004, 2010 ; Chee-Keong *et al.*, 2010; Durham, 2004; Hermes and Lensink, 2003 Giuliano and Ruiz-Arranz, 2009; Mundaca, 2009). Furthermore FDI has been found to be a key determinant factor in the savings- economic growth nexus (Alguacil *et al.*, 2004), and also savings have been found to serve a significant role in the financial deepening-growth relationship (Odhiambo, 2008). This implies that there are many intricate causal relationships between FDI, financial sector development, remittances and savings as well as between each of these financial factors and economic growth.

Despite the intricate causal linkages between FDI, remittances, financial sector development, savings and economic growth, prior studies have focused on examining the causal relationships between just two or three of the financial factors. This therefore leaves many open and unanswered questions on the causal relationships between other forms of finance and economic growth. Hence this research seeks to investigate the causal relationships between all four financial factors and economic growth in South Africa.

1.2 Research Questions

This research seeks to answer the following questions for South Africa using annual time series data between 1970 and 2010:

- i) Is economic growth most significantly associated with FDI, financial sector development, remittances or domestic savings?
- ii) What are the causal relationships between these forms of financial capital?
- iii) What are the policy implications of these results ?

1.3 Research Ethics

This research has not made use of human subjects. All the data that has been used in this research are from secondary sources, which are all available and accessible to the general public. However, in accordance with the University of Cape Town policies, research ethics clearance was obtained.

1.4 Layout of the Research Project

This report is organised as follows: Chapter 2 briefly reviews financial sector development and economic growth in South Africa, Chapter 3 reviews the existing literature, Chapter 4 describes the research methodology and data, Chapter 5 discusses the empirical findings of the research, Chapter 6 discusses the research limitations and Chapter 7 concludes the report and provides avenues for further research.

2 STYLIZED FACTS

2.1 Introduction

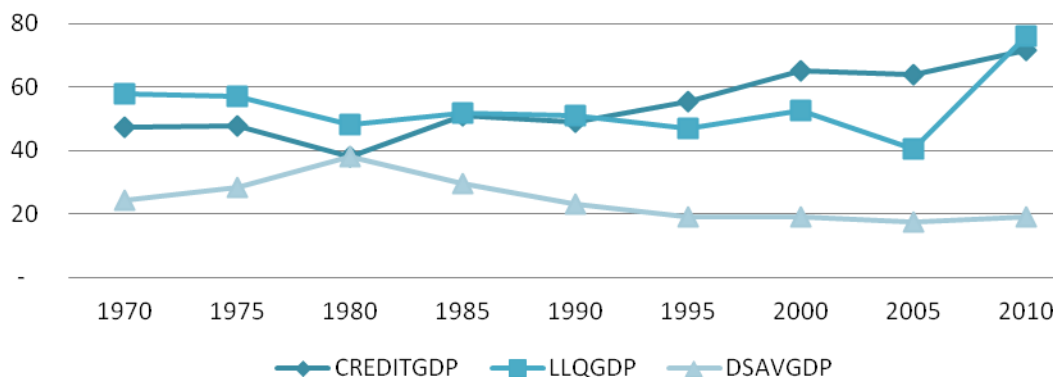
This chapter will discuss the linkages between the financial factors and economic growth in South Africa.

2.2 Discussion of key issues

South Africa is the largest and most financially developed economy in Sub-Saharan Africa (SSA hereafter). All the various financial sector development measures comprised of liquid liabilities of the financial system (M2 to GDP), credit to the private sector by financial intermediaries, ratio of private credit to GDP have experienced marked improvements over the last four decades (Odhiambo, 2004; Ghirmay, 2004; Agbetsiafa, 2004; Odhiambo, 2007). This significant increase in the financial sector development is as a result of the heightened level of sophistication of the South African financial sector. The country has Africa's four largest banks, namely Standard Bank, ABSA, Nedbank and the FirstRand Group as well as 55 locally-controlled banks, 5 mutual banks, 12 foreign-controlled banks and 60 representative offices of foreign banks (Allen *et al.*, 2011). In addition, the country has a well developed equity market. The country's stock exchange; the Johannesburg Stock Exchange (JSE hereafter) was formed in 1887 and is the oldest in Africa. The JSE's market capitalisation was 178% of GDP in 2008 rising to 246% of GDP in 2009 (Allen *et al.*, 2011).

Between 1970 and 2010, private credit as a ratio of GDP increased by 52% (from 47.3% of GDP in 1970 to 71.7% of GDP in 2010) and domestic credit to the private sector rose by over 105% (from 88.6% of GDP to above 182% of GDP over the same period). In contrast, deposit money bank assets as a share of GDP and liquid liabilities as a ratio of GDP did not increase significantly; with deposit money bank assets as a ratio of GDP increasing by 45% and liquid liabilities of the financial system increasing by 31%, respectively. Plots of the financial development measures and those of domestic savings can be seen on figure 2.1(a) below:

Figure 2.1(a) Financial sector development variables and domestic savings (as ratios of GDP)



Source: World Bank World Development Indicators (2012). CREDITGDP refers to private credit to the private sector as a ratio of GDP, LLQGDP is liquid liabilities of the financial system as a percentage of GDP and DSAVGDP is domestic savings as a ratio of GDP

Unfortunately, the increase in financial sector development did not positively stimulate economic growth and FDI (as a ratio of GDP) despite the well-documented hypothesis that FDI contributes to economic growth in countries that have well developed financial systems (Durham, 2004; Chee-Keong, 2010). Per capita annual GDP growth rates, FDI (as a ratio of GDP) and gross domestic savings rates all declined between 1970 and 2010. Net FDI inflows as a ratio of GDP fell by 82% (from 1.87% in 1970 to 0.34% in 2010) meanwhile per capita annual GDP growth rate fell by about half (from 2.99% in 1970 to 1.47% in 2010). Odhiambo (2009) attributes these relatively low economic growth rates to the political unrest, economic and financial sanctions that South Africa experienced during the apartheid years.

However, per capita annual GDP growth for the decade between 2000 and 2010 was 2.14% as compared to the -0.26% rate between 1980 and 1989 and -0.8% between 1990 and 1999 whereas the average net FDI inflows to GDP ratio fell precipitously from 0.49% between 1970 and 1979 to 0.01% between 1980 and 1989 before rising to 0.59% between 1990 and 1999 and then to 1.75% between 2000 and 2010. This shows that despite the general decline in economic growth

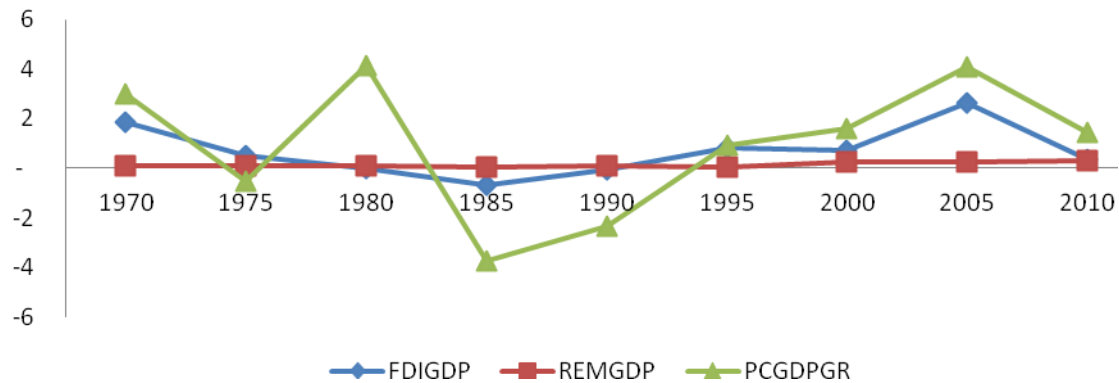
rates and FDI in South Africa between 1970 and 2010, economic growth and FDI net inflows have been higher in the post-apartheid years following the country's socio-economic liberalisation.

From 1970 to 2010, gross domestic savings rate dropped by 21% (from 24.1% of GDP to 19%) This could be attributed to the macroeconomic instability that characterised most SSA countries, including South Africa, from the 1970s until the late 1990s. As Odhiambo (2009) argues, the high rates of inflation in most African countries led to negative real deposit rates, which served as a disincentive to savings.

Thus, only the credit to GDP ratios experienced marked increases in South Africa between 1970 and 2010, as compared to broader measures of financial sector development such as liquid liabilities of the financial system and deposit money banks assets to GDP. This implies that the South African government should work towards increasing other financial sector elements such as time and savings deposits, electronic currency and transferrable deposits, amongst others. These other financial sector elements have the potential to boost economic growth, FDI, and gross domestic savings, which have all fallen in South Africa, between 1970 and 2010.

Although, remittances to GDP rose by 257% over the period 1970 to 2010, this was off a small base (from just 0.09% in 1970 to 0.31% in 2010). Giuliano and Ruiz-Arranz (2009) argue that the level of financial sector development in a country serves as a catalyst in the remittances-economic growth nexus. However, the low remittance ratios indicate that despite the significant increases in financial sector development, remittances do not form a significant part of the country's capital account, and have not played a significant role in stimulating economic growth in South Africa. The plots for FDI, remittances and per capita annual GDP growth in South Africa can be seen on Figure 2.1(b).

Figure 2.1(b) FDI, remittances (as ratios of GDP) and per capita annual GDP growth rates



Source: World Bank World Development Indicators (2012). FDIGDP refers to the net FDI inflows to GDP ratio, REMGDP refers to remittances inflows as a ratio of GDP and PCGDPGR refers to the per capita GDP annual growth rate.

2.3 Conclusion

Thus in summary, financial development increased in South Africa between 1970 and 2010, even though this increase was mostly in terms of private credit, as other broad measures of financial sector development did not increase to the same extent. In addition economic growth, gross domestic savings and FDI, all declined between 1970 and 2010. However, economic growth and FDI rose significantly after the country's economic liberalisation in 1994 while the remittances to GDP ratio remained below 1% over the period 1970 to 2010. Thus the financial liberalisation reforms introduced in the 1980s have led to financial sector development, and liberalisation in the 1990s has triggered economic growth and FDI but not gross domestic savings and remittances.

3 LITERATURE REVIEW

Introduction

The following literature review focuses on the effects of financial movements on economic growth. In particular, the literature review discusses impacts arising from FDI, financial sector development, remittances and domestic savings.

3.1 FDI and Economic Growth

The literature on the FDI-economic growth link is sub-divided into four strands namely; (i) those that investigate the causal links between FDI and economic growth, (ii) those that examine the links between financial sector development and FDI, (iii) studies that examine the link between FDI and Total Factor Productivity (TFP), and (iv) studies of the FDI-economic growth nexus that take account of additional factors that serve as catalysts in the relationship.

3.1.1 Causal Relationship between FDI and Economic Growth

This section reviews cross-country analyses and country-specific analyses that investigate the causal relationship between FDI and economic growth. Usha and Weinhold (2001) investigate the causal links between FDI and growth in 24 developing countries over the period 1971 to 1995 and argue that the growth enhancing effect of FDI is highly heterogeneous across countries. Using the Mixed Fixed and Random model for causality testing, the results show that there is a causal relationship between FDI and growth and that this impact is higher in more open economies.

In addition to Usha and Weinhold, Zhang (2001) also argues that the causal relationship between FDI and economic growth is reliant on the level of trade openness in the recipient country. Zhang examines the causality between FDI and growth in 11 East Asian and Latin American countries over the period 1960-1970. The results show that there is positive causality running from GDP to FDI in Brazil, Korea, Malaysia and Thailand and in Columbia in the long run. Zhang equally espouses that there is short run causality from FDI to GDP in the short run for Singapore, Hong Kong and Taiwan and that there is bi-directional causality for Mexico and

Indonesia. Zhang further argues that that besides trade openness, the FDI-economic growth nexus is reliant on human capital and macroeconomic stability.

Hansen and Rand (2006) examine the causal links between FDI and economic growth in 31 developing countries over the period 1970 to 2000. They find that while there is a strong causal link from FDI to GDP in both the short run and the long run, GDP Granger causes FDI only in the short run. Hansen and Rand also use an alternative FDI measure (FDI as a ratio of gross capital formation) and employ a fixed effects mean group estimator. They then find that FDI causes growth irrespective of the level of development in the recipient economy and/or any country-specific variables. This is in contrast to the argument that the growth enhancing effect of FDI in a country is conditional on the level of economic development (Carkovic and Levine, 2005).

In addition to finding unidirectional causal relationships between FDI and economic growth, some studies find bi-directional causality. Basu *et al.*, (2003) examine the long run cointegrating relationship between FDI and growth in 23 developing countries, including 3 SSA countries (Kenya, Ghana and Nigeria) over the period 1978 to 1996. Basu *et al.*, find that for fairly open economies, there is bi-directionality between FDI and growth in both the short run and the long run meanwhile for fairly closed economies, there is evidence of only unidirectional causality from growth to FDI in the long run and not in the short run. The conclusions of Basu *et al.*, are similar to those of Usha and Weinhold (2001) and Zhang (2001), who argue that trade openness is an important determinant in the economic growth enhancing effect of FDI.

Chowdhury and Mavrotas (2006) explore the causality between FDI and economic growth in Chile, Malaysia and Thailand (three countries that are amongst the top ten recipients of FDI) between 1960 and 2000. Their results show that whereas FDI and growth exhibit a bi-directional link in both Malaysia and Thailand, the relationship in only unidirectional, from GDP to FDI in Chile.

Chowdhury and Mavrotas note that these results have significant policy implications for other developing countries. They argue that countries should rather aim at improving the economic

fundamentals (the financial sector, macroeconomic stability, institutions etc) rather than devoting so much effort in trying to encourage the inflow of FDI as the latter does not always trigger economic growth. Chowdhury and Mavrotas equally prescribe the use of more country-specific or individual studies in the examination of the causal links between FDI and economic growth.

In addition to studies that find a bi-directional relationship, an assortment of studies also find that in some countries, there is no causal relationship between FDI and economic growth. Akinlo (2004) investigates this relationship for Nigeria over the period 1970 to 2000. The results suggest that FDI has no impact on economic growth. Akinlo further argues that the negative significance of FDI on economic growth in Nigeria arises because of two country-specific dynamics. First, the bulk of the FDI is in the extractive industry and not in the manufacturing industry as in most other countries where a positive relationship has been established: and second, much of the FDI inflows are in the oil and gas sector in Nigeria which is largely disconnected from the real economy. Lauretti and Postiglione (2005) investigate the impact of FDI on economic growth in 11 Mediterranean countries (Algeria, Cyprus, Egypt, Jordan, Israel, Lebanon, Malta, Morocco, Syria, Turkey and Tunisia) over the decade between 1990 and 2000 using dynamic panel data GMM estimation. The results show that FDI is not a significant determinant of economic growth.

Having explored the literature relating to cross-country studies, the literature review now turns to country-specific studies. In the case of South Africa, Fedderke and Romm (2006) find that FDI has a positive and significant effect on economic growth and that FDI is mainly capital-intensive. They use a VAR/VECM technique to examine the determinants and the growth effect of FDI in South Africa over the period 1960 to 2002. Esso (2010) examines the FDI-economic growth nexus in 10 SSA countries over the period 1970 to 2007 using the ratio of FDI liabilities to GDP and real GDP per capita as measures of FDI and economic growth, respectively. The results show that FDI significantly drives economic growth in Angola, Cote d'Ivoire and Kenya meanwhile economic growth significantly causes FDI in South Africa and Liberia. Gossel and Biekpe (2013) also examine the causal linkages between FDI and economic growth in South Africa over the period 1995 to 2011. Using real GDP per capita and domestic investment liabilities as measures of economic growth and FDI respectively, the findings suggest that economic growth significantly drives FDI.

The literature reviewed thus far suggests that the causal relationships between FDI and economic growth differs across countries; whilst in some countries it is FDI that stimulates economic growth, in other countries, it is economic growth that enhances FDI. The implications of this are that incentive policies to stimulate FDI in a bid to promote economic growth may not always be successful; at times countries may first have to achieve high economic growth rates in order to encourage FDI. Furthermore, there seems to be evidence that the causal linkages between FDI and economic growth depend on some other economic variables such as the level of trade openness, the level of economic development, and human capital.

3.1.2 FDI and Financial Sector Development

Hermes and Lensink (2003) investigate the role of financial sector development in the FDI-economic growth nexus in 70 LDC's over the period 1970 to 1995. The results suggest that financial sector development (precisely private credit loans to GDP, and quasi money to GDP) should have attained a certain threshold in order for FDI to enhance economic growth.

Controlling for the level of human capital (initial level of secondary enrolment rate) and initial level of economic development (GDP per capita), Hermes and Lensink find that financial sector development catalyses the FDI-economic growth link via increases in efficiency.

Alfaro *et al.*, (2004) examine the impact of financial sector development in the FDI-economic growth relationship in several countries by interacting net FDI inflows as a ratio of GDP with three measures of financial institutions development (credit provided by financial intermediaries to the private sector as a ratio of GDP, credit by deposit money banks to the private sector as a ratio of GDP and the ratio of commercial bank assets over the sum of commercial and central bank assets) for 71 countries in SSA, Europe and Asia over the period 1975 to 1995, and with two measures of financial market development (stock market capitalisation and stock value traded) for 50 countries over the period 1980 to 1995. The results show that FDI on a stand-alone basis is insignificant in enhancing economic growth and only after a certain threshold of financial sector development can FDI positively impact economic growth.

Similar to Alfaro *et al.*, (2004), Durham (2004) also finds that FDI and Equity Foreign Portfolio Investments (EPFI) do not have a direct impact on economic growth in 80 countries over the period 1979 to 1998. Durham (2004) finds that the impact of foreign capital flows on economic growth is influenced by the level of financial and institutional development, represented by stock market capitalisation to GDP ratio, the business regulation index, the property rights index and corruption index, in the recipient countries.

Furthermore, Chee-Keong *et al.*,(2010) examine the impact of FDI, portfolio investment and foreign debt flows on economic growth in 51 countries (19 developed and 32 developing) over the period 1988 to 2002.

Chee-Keong *et al.*, interact the foreign capital flows with measures of stock market development (stock market capitalisation as a proportion of GDP and stock value traded as a ratio of GDP) and find that whilst FDI exhibits a positive impact on economic growth, both foreign debt and portfolio investments exhibit a negative impact which could be changed to positive if the stock markets become more developed.

Thus these studies suggest that FDI does not have a direct positive impact on economic growth. The level of financial sector development (both the financial institutions and the financial markets) is a potential catalyst in the relationship. This implies that countries should first develop their financial sectors so as to achieve the highest economic growth enhancing role of FDI.

3.1.3 FDI and Total Factor Productivity (TFP)

Most of the studies above that examine the role of financial sector development in the FDI-economic growth link assume implicitly that FDI impacts capital accumulation, both physical and human. Alfaro *et al.*, (2009) however argue that FDI rather impacts Total Factor Productivity (TFP) improvements and not capital accumulation.

Alfaro *et al.*, investigate the impact of FDI on TFP in 62 countries over the period 1975 to 1995. The findings indicate that FDI improves TFP and that this nexus is conditional on the level of financial sector development (credit provided by financial intermediaries to the private sector) as well as the quality of institutions and the level of human capital.

Prasad *et al.*, (2009) examine the impact of FDI on TFP growth in 21 industrial and 46 developing countries over the period 1966 to 2005. Using both system GMM and fixed effects models and controlling for trade openness, changes in terms of trade, financial sector development, population growth and institutional quality, Prasad *et al.*, find that FDI has a strong and significant effect on TFP growth.

Thus, these studies suggest that the impact of FDI on TFP is conditional on financial sector development, level of human capital and level of trade openness, as is the case with the impact of FDI on capital accumulation.

3.1.4 FDI and Economic Growth Relationship reliant on Other Factors

The impact of FDI on economic growth is reliant on several other factors, amongst which is institutional quality. Alguacil *et al.*, (2011) examine the FDI-economic growth relationship in the 26 largest recipients of FDI in Latin America and Asia over the period 1976 to 2005. The findings suggest that the impact of FDI on economic growth is significantly dependent on the quality of institutions, the macroeconomic environment and structural variables (the growth of the urban population and the quality of local infrastructure).

In addition, Alguacil *et al.*, separate the 26 countries in their study into 13 low and lower middle countries and 13 upper middle income countries. The findings further indicate that FDI more effectively enhances growth in countries that have attained a certain significant level of economic development, suggesting that the growth enhancing effect of FDI is heavily dependent on economic development. This is in contrast to Hansen and Rand (2006), who argue that the growth-enhancing role of FDI is not dependent on the level of economic development in the recipient country.

In addition to institutional quality, there is equally human capital which is important in the FDI-economic growth nexus. Borenztein *et al.*, (1998) investigate the FDI-economic growth relationship in 69 developing countries over the period 1970 to 1989. The findings suggest that neither FDI on its own nor financial sector development (as measured by the liquid liabilities of the financial system) nor macroeconomic or political stability do trigger economic growth but

rather it is the interacted variable between FDI and human capital which stimulates economic growth.

Furthermore, Li and Liu (2005) examine the FDI-economic growth relationship in 84 countries over the period 1970 to 1999. Controlling for macroeconomic stability, interest rate and foreign exchange rate risk, the results suggest that the level of human capital, otherwise known as the technological absorptive capacity, is very significant in the FDI-economic growth relationship. In contrast, Rami and Zhang (2002) examine the effect of FDI on economic growth in 85 countries over the period 1990 to 1997. Using three different measures of FDI (as a stock, as a flow and as a percentage of GDP), the results show that FDI has an overall positive effect on economic growth and that this effect is not reliant on the level of human capital in the recipient country.

Hence, the literature reviewed thus far suggests that the relationship between FDI and economic growth could flow either from FDI to economic growth or from economic growth to FDI. Moreover, the review suggests that the economic growth could occur either by capital accumulation or by total factor productivity. Lastly, the review suggests that the links between FDI and economic growth are reliant on several other factors such as macroeconomic stability, the level of human capital and the level of economic development.

3.2 Financial Sector Development and Economic Growth

The literature on the causal links between financial sector development and economic growth is divided into four groups: (i) those that hypothesize the supply-leading relationship, which argues that financial sector development leads economic growth, (ii) those that argue that the relationship is demand-following, whereby economic growth rather causes financial sector development, and (iii) remaining studies that argue in favour of bi-directional causality, mixed results and no causality

3.2.1 Financial Sector Development and Economic Growth Supporting the Supply-Leading Hypothesis.

This section of the literature review commences with the cross-country studies before moving to

the country-specific studies that examine the causal linkages between financial sector development and economic growth.

Zu (2000) investigates the financial sector development-economic growth nexus in 41 countries over the period 1960 to 1993. Employing liquid liabilities of the financial system as a proxy for financial development, the results suggest that financial sector development causes economic growth and that this effect is reinforced by investment.

Christopoulos and Tsionas (2004) investigate the causal links between financial sector development and economic growth in 10 developing nations (Columbia, Paraguay, Peru, Mexico, Ecuador, Honduras, Kenya, Thailand, Jamaica and Dominican Republic) over the period 1970 to 2000. The results of Christopoulos and Tsionas (2004) show that financial sector development, proxied by bank deposit liabilities to GDP causes economic growth.

Furthermore, Habibullah and Yoke-Kee (2006) examine the relationship between financial development and growth in 13 Asian countries (Bangladesh, India, Indonesia, South Korea, Laos, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka and Thailand) over the period 1990 to 1998. Using the ratio of domestic credit to GDP as a measure of financial sector development in a dynamic panel GMM estimation framework, they find that financial sector development stimulates economic growth, thus lending support to the supply-leading hypothesis.

In the same vein, Abu-Bader and Abu-Qarn (2008) investigate the finance-growth relationship in six MENA countries (Algeria, Egypt, Israel, Morocco, Syria and Tunisia) over the period 1960 to 2004 using four different measures of financial development, namely, M2 to GDP, M2 minus currency to GDP, the ratio of bank credit to the private sector to GDP and the ratio of credit issued to non-financial private firms to total domestic credit. The findings suggest that using at least one of the above measures, financial sector development causes economic growth in five of the countries except in Israel where there is small support for economic growth Granger-causing financial sector development.

Country-specific studies have tended to find support for finance-led economic growth. Choe and Moosa (1999) find support for finance-led economic growth in Korea over the period 1970 to

1992. They use measures of finance from the household and business sector (demand deposits, insurance and pension securities and stocks).

Craigwell *et al.*, (2001) examine the finance-growth nexus in Barbados using annual data over the period 1974 to 1998 in a multivariate VAR framework. Using two proxies for financial sector development (ratio of total commercial banks deposits to nominal GDP at market prices and ratio of total deposits of the financial system to nominal GDP), the results suggest that there is unidirectional causality running from financial development to economic growth.

Moreover, Bhattacharya and Sivasubramanian (2003) examine the causal relationship between economic growth and financial sector development in India between 1971 and 1999. Using the M2 to GDP ratio as a measure of financial sector development, the results show that financial sector development enhances economic growth in India.

Chang and Caudill (2005) examine the finance-economic growth nexus in Taiwan between 1962 and 1998. Using the M2 to GDP ratio as a proxy for financial sector development, the results show that financial sector development causes economic growth.

In the case of Africa, Odhiambo (2005) examines the causal linkages between financial sector development (M2 to GDP, total currency to narrow money stock and bank claims on the private sector to GDP) and economic growth in Tanzania over the period 1960 to 2000. The findings indicate that there exists bi-directional causality but with stronger support for the supply-leading hypothesis. Odhiambo further espouses that when M2 to GDP is used as a proxy for financial development, the causality clearly runs from economic growth to financial development meanwhile when the other two measures are used, there is proof of bi-directional causality.

3.2.2 Financial Sector Development and Economic Growth Supporting the Demand-

Following Hypothesis

As aforementioned, there is a body of the literature that argues that the causal relationship between financial development and economic growth flows from economic growth to financial sector development rather than the other way round. However to date the results are not as conclusive as the supply-leading hypothesis.

Ghali (1999) investigates the causal linkages between financial sector development (the ratio of bank deposit liabilities to GDP and the ratio of bank claims on the private sector to GDP) and economic growth in Tunisia over the period 1963 to 1993. The findings show support for the demand-following hypothesis.

Shan and Morris (2002) examine the financial development-growth nexus in 19 OECD countries (France, Greece, Ireland, Netherlands, New Zealand, Norway, Spain, Switzerland, United Kingdom, Australia, Denmark, Japan, United States, Canada, Italy, South Korea, Finland, Portugal and China) over the period 1985 to 1998. Using the TYDL methodology and employing the total credit to GDP ratio and the interest rate spread as proxies for financial development, the results suggest greater support for the demand-following hypothesis even though the strength of the link tends to vary depending on the particular country circumstances.

Lastly, Odhiambo (2004) investigates the causal relationships between financial sector development and economic growth in South Africa over the period 1968 to 2000. Using three proxies for financial sector development (M2 to GDP, the ratio of currency to sum of currency and demand deposits and the ratio of bank claims on private sector to GDP) and real per capita GDP as a proxy for economic growth, the results show that economic growth drives financial sector development.

3.2.3 Financial Sector Development and Economic Growth-Mixed Results

A selection of studies also finds that the causal links between financial development and economic growth are bi-directional. Demetriades and Hussein (1996) investigate the links between the development of the financial sector and economic growth in 16 countries over the period 1960 to 1990. The results show that while financial development causes economic growth in three countries, notably Honduras, Spain and Sri Lanka, there exists bi-directional causality in Guatemala, Honduras, India, Korea, Mauritius, Thailand and Venezuela meanwhile growth causes financial development in El-Salvador, Greece, Pakistan, Portugal, South Africa and Turkey. In addition, the findings indicate that the causality varies significantly across the different countries.

Luintel and Khan (1999) also find bi-directional causality between financial sector development and economic growth in 10 developing countries (Costa Rica, Columbia, Greece, India, Korea, Malaysia, Philippines, Sri Lanka, South Africa and Thailand) over the period 1960 to 1996, using the ratio of total deposit liabilities of deposit banks to GDP as a proxy for financial sector development.

Al-Yousif (2002) investigates the financial development-growth nexus in 30 developing countries between 1970 and 1999. Employing both the ratio of currency to narrow money stock and the ratio of broad money stock to nominal GDP as proxies of financial development, the findings indicate that when the ratio of currency to narrow money stock is used, there is bi-directional causality in 8 countries, economic growth stimulates financial sector development in 10 countries, financial sector development triggers economic growth in 4 countries and in 8 countries, there is no relationship at all. Conversely when the ratio of broad money stock is used, there is bi-directional causality in 10 countries, economic growth stimulates financial sector development in 9 countries meanwhile financial sector development triggers economic growth in 4 countries and there is no relationship in 7 countries.

Furthermore, Apergis and Economidou (2007) investigate the financial sector development-economic growth nexus in 15 OECD and 50 non-OECD countries over the period 1975 to 2000. Using three measures of financial sector development (liquid liabilities of the financial system to GDP, credit by deposit money banks and other financial institutions to private sector as a ratio of GDP and credit by deposit money banks to the private sector as a ratio of GDP), the findings indicate that the causality is mostly bi-directional.

Moreover, Shabri *et al.*, (2007) examine the finance-growth nexus in four ASEAN countries (Malaysia, Indonesia, Thailand and the Philippines) over the period 1997 to 2006 using the ratio of total bank deposit liabilities to nominal GDP as a proxy for financial sector development. The results show that there is no causality at all in Indonesia, there is evidence of the finance-led growth hypothesis in Malaysia, whilst in Thailand and Philippines there is bi-directional causality.

Handa and Khan (2008) also investigate the causal links between financial sector development

and economic growth in 13 developed and developing countries over the period 1960 to 2002. Using two measures of financial sector development (deposit liabilities of the commercial banks to GDP ratio and claims by commercial banks on private sector to GDP), the results show that economic growth enhances financial sector development in Bangladesh, Sri Lanka, Brazil, Malaysia, Thailand and Turkey meanwhile there exists bi-directional causality in Argentina, Germany, the USA, Japan and the UK. Handa and Khan also argue that the direction of causality between financial development and economic growth in a country depends on its stage of economic and financial development.

In the case of SSA, Ghirmay (2004) examines the finance-growth causality in 13 SSA countries (Benin, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Rwanda, South Africa, Tanzania, Togo and Zambia) over the period 1970 to 2000. Using credit to the private sector by financial intermediaries as a proxy for financial sector development, the results confirm the supply-leading hypothesis in 8 of the 13 countries (Benin, Ethiopia, Ghana, Kenya, Malawi, Tanzania, Rwanda and South Africa) meanwhile the demand-following hypothesis is confirmed in 9 countries (Cameroon, Ethiopia, Kenya, Malawi, Mauritius, Nigeria, Tanzania, Togo, Rwanda and South Africa) and there is significant evidence of bi-directional causality in six countries (Ethiopia, Kenya, Malawi, Tanzania, Rwanda and South Africa).

Furthermore, Agbetsiafa (2004) examines the financial sector development-economic growth nexus in eight SSA countries (Ghana, Ivory Coast, Kenya, Nigeria, Senegal, South Africa, Togo and Zambia) between 1963 and 2001. Using five different measures of financial development (ratio of broad money to GDP, ratio of banking deposit liabilities to GDP, private sector credit to GDP, share of private sector credit in domestic credit, ratio of domestic credit to GDP), Agbetsiafa (2004) argues that all five measures of financial development cause economic growth in Ghana, Nigeria, Senegal, Togo and Zambia, whereas economic growth causes financial development in Ivory Coast and Kenya and there is bi-directional causality using at least one of the five measures of financial sector development in Kenya, South Africa, Zambia, Ghana and Togo.

In the same vein, Atindehou *et al.*, (2005) examine the causal links between financial sector development (measured by domestic credits, liquid liabilities and liquid reserves) and economic

growth in the 16 ECOWAS states (Benin, Burkina Faso, Cape Verde, Ivory Coast, Ghana, The Gambia, Guinea-Conakry, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone and Togo) over the period 1960 to 1997. The results show weak evidence of finance-led growth. In addition, the results differ across the different countries depending on the particular measure of financial sector development that is used. Only in Mauritania, is there clear positive causality, running from all the three financial sector development measures to economic growth.

Odhiambo (2007) investigates the causal linkages between financial development and economic growth in Tanzania, Kenya and South Africa over the period 1980 to 2005. Employing the ratios of currency to narrow money stock and the bank claims on the private sector to GDP as measures of financial sector development, Odhiambo (2007) posits that though the causality is highly influenced by the particular measure used and is country-specific, there seems to be evidence of a stronger demand-following hypothesis in Kenya and South Africa, meanwhile there is a stronger supply-leading hypothesis in Tanzania.

Eita (2009) explores the causal linkages between finance and growth in Namibia over the period 1980 to 2007 using three financial development measures (M2 to nominal GDP, the ratio of private sector credit to non-mineral GDP and the ratio of bank deposits liabilities to non-mineral GDP) and growth in non-mineral GDP as a measure of economic growth. The results show that when M2 as well as the ratio of the bank deposits liabilities to non-mineral GDP are used as proxies for financial sector development, the causal links flow from financial sector development to economic growth, hence lending support to the supply-leading hypothesis meanwhile when the ratio of private sector credit is used, there is evidence of economic growth rather Granger causing financial sector development.

In addition to the above studies, Akinlo and Egbetunde (2010) investigate the causal relationship between financial sector development and economic growth in 10 SSA countries over the period 1980 to 2005. Using the M2 to GDP ratio as a proxy for financial sector development, the findings suggest that whilst financial sector development Granger-causes economic growth in Central African Republic, Congo Republic, Gabon and Nigeria, economic growth rather causes financial development in Zambia and there is bi-directional causality between the two variables in Kenya, Chad, Sierra Leone, Swaziland and South Africa.

Fowowe (2011) investigates the causal linkages between financial sector development and economic growth in 17 SSA countries (Botswana, Burkina-Faso, Burundi, Cameroon, Gabon, Ghana, Kenya, Madagascar, Niger, Nigeria, Senegal, Seychelles, Sierra Leone, Swaziland and Togo) over the period 1975 to 2005. Using the ratio of credit provided by banks to the private sector to GDP and the ratio of bank deposit liabilities to GDP as proxies for financial sector development, the results suggest bi-directional causality between financial sector development and economic growth.

In the case of North African countries, Abu-Bader and Abu-Qarn (2008) find evidence of bi-directional causality between financial sector development and economic growth in Egypt over the period 1960 to 2001 using four measures of financial sector development (the ratio of money stock to nominal GDP, the ratio of M2 minus currency to GDP, the ratio of bank credit to the private sector to GDP and the ratio of credit issued to non-financial private firms to total domestic credit). Abu-Bader and Abu-Qarn further argue that financial development affects economic growth through capital accumulation or enhancing investment efficiency.

Furthermore, Baliaoune-Lutz (2008) investigate the financial sector development-economic growth causality in Algeria, Egypt and Morocco over the period 1960 to 2001 using four measures of financial development (the ratio of deposit money bank claims on domestic non-financial real sector to the sum of domestic money banks and central bank claims on domestic non-financial real sector, the ratio of deposit money bank assets to GDP, the ratio of liquid liabilities to GDP and the ratio of private credit by deposit money banks and other financial institutions to GDP). The results are generally mixed and varied, depending on the particular financial sector development measure used. Only with the use of liquid liabilities of the financial system is there a clear finance-led growth relationship.

However, some studies do not find any causal links at all between financial sector development and economic growth. Quartey and Prah (2008) examine the causal relationships between financial sector development, proxied by four measures (M2 to GDP ratio, domestic credit to GDP ratio, private credit to GDP and private credit to domestic credit ratio) and economic growth in Ghana over the period 1960 to 2004. The results indicate a slight causal link from economic growth to financial development when M2 to GDP ratio is used though in general,

there is very little evidence of strong causal relationships between financial sector development and economic growth in Ghana.

Moreover, Gries *et al.*, (2009) investigate the linkages between financial deepening, trade openness and economic growth in 16 SSA countries (Burundi, Cameroon, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Kenya, Madagascar, Mauritius, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, the Gambia and Togo) over the period 1964 to 2004. Using Principal Component Analysis to aggregate three financial development measures, namely liquid liabilities of the financial system as a ratio of GDP, private credit by money taking banks to GDP and commercial banks assets to (commercial banks + central bank) assets, into one composite index, The findings show little evidence of any causal relationships between financial deepening and economic growth.

Lastly, Al-Jarrah *et al.*, (2012) examine the financial sector development-economic growth nexus in Jordan over the period 1992 to 2001 using four financial sector development measures (ratio of currency outside banks as a percentage of narrow money supply, M2 as a ratio of GDP, ratio of banking sector assets as a percentage of GDP and the ratio of private sector credit as a percentage of total banking sector credit). The results show that there are no causal linkages between financial sector development and economic growth in Jordan.

Thus the literature reviewed thus far suggests that although in some cases financial sector development stimulates economic growth (supply-leading hypothesis) and in others, economic growth rather stimulates financial sector development (demand-following hypothesis), in the majority of cases, the results of studies that explore the finance-growth nexus are mixed and tend to vary, depending on the particular measure of financial sector development used.

3.3 Remittances and Economic Growth

The literature on the remittances-economic growth link considers two sub-themes (i) those that investigate the direct causal links between remittances and economic growth, and (ii) those that examine the indirect causal links between remittances and economic growth

3.3.1 Direct Causal Links between Remittances and Economic Growth

Gytsos (2002) examines the impact of remittances on economic growth in 11 transition Central and Eastern European countries over the period 1990 to 1999 using a fixed effects panel data model and controls for real output growth, real interest rate and initial GDP per capita. The results show that remittances have a positive effect on the investment output ratio, measured by the gross fixed capital formation to GDP ratio.

Pradhan *et al.*, (2008) examine the remittances-economic growth nexus in 39 developing countries between 1980 and 2004. Using variables averaged over five-year non-overlapping periods, the results show that remittances do have a positive effect on economic growth even though the impact is not very significant.

Furthermore, Siddique *et al.*, (2012) investigate the causal links between remittances and economic growth in Bangladesh, India and Sri Lanka over the period 1976 to 2006. The findings indicate that there is a one-way causal relationship from remittances to growth in Bangladesh, a two way causal relationship in Sri Lanka and no relationship at all in India.

Even though the authors argue that the reasons for the absence of any causal links between remittances and economic growth is open for future research, the growth in remittances in India has been remarkably lower than has been the case in both Bangladesh and Sri Lanka. Precisely, Siddique *et al.*, (2012) state that while the ratio of remittances to GDP in India has risen from 0.7% to 3.5% between 1976-2006, in Sri Lanka and Bangladesh, it increased from 0.5% to 8.1% and from 0.8% to 8.8%, respectively.

Furthermore, the authors argue that the reason for the two way causation in Sri Lanka is because most of those who receive the remittances are not poor and thus do not use these for subsistence. These recipients rather use the remittances to educate their family members and invest and consequently the investments increase output in the country and hence makes it possible for other family members to travel and they in turn send back more remittances home. Therefore, in a way, it is those at higher levels of income that receive more remittances. As concerns

Bangladesh, the one way causation is because the growth in remittances inflows exceeds the growth in GDP per capita.

In contrast, Chami *et al.*, (2003) analyse the causes and effects on economic growth of remittances in a unified model for 113 countries over the period 1970 to 1998. Using an IV technique in a panel data framework, they results suggest that remittances have a negative effect on growth as a result of moral hazard. Chami *et al.*, further argue that even in the presence of right economic policies, it will be fairly challenging for remittances to result in long run economic growth.

Chami *et al.*, state that the reason for this negative link is because most remittances inflows are used as compensatory income, mainly to smooth out consumption, and not as investments and thus, it is relatively difficult for such capital inflows to enhance economic growth.

Moreover, Barajas *et al.*, (2009) investigate the effects of foreign remittances on economic growth in 84 countries between 1970 and 2004 using both OLS-IV and fixed effects- IV panel data methods. The results show that remittances have a negative impact on economic growth and the effect only becomes positive when remittances are interacted with a measure of financial sector development (M2 to GDP ratio).

Therefore, the literature reviewed thus far suggests that the relationship between remittances and economic growth varies across the different countries. Whilst in some countries they have a positive impact on economic growth, in other countries the effect is rather negative. The main reason for this negative impact is the fact that some times, remittances are used for consumption rather than for investment. When this is the case therefore, it is difficult for remittances to positively impact economic growth. This argument highlights the fact that the extent to which remittances can enhance economic growth is dependent on both the circumstances in which the remittances are used, as well as on other factors, which shall be discussed in the next section.

3.3.2 Links between Remittances and Economic Growth Reliant on Other Factors

A section of the literature indicates that the growth enhancing role of remittances is reliant on factors such as financial sector development and the institutional quality. Giuliano and Ruiz-

Arranz (2009) examine the impact of remittances on economic growth in 73 countries over the period 1975 to 2003. Interacting the remittances to GDP ratio with several measures of financial sector development (deposit to GDP ratio, M2/GDP ratio, loans to GDP ratio and credit to GDP ratio) and controlling for trade openness, macroeconomic stability, total investment ratio, human capital and population growth, the results show that that the level of financial development is a determinant factor in the remittances-economic growth relationship.

In addition, the findings indicate that remittances boost growth in countries with less developed financial systems by providing an alternative way to finance investment. In particular, the study finds that the interaction term between remittances and measures of financial development has a negative coefficient in countries where the financial development measures are low, implying that remittances come to serve as a substitute for the low level of financial sector development.

Furthermore, Mundaca (2009) examines the remittances-economic growth relationship in 25 Latin American countries over the period 1970 to 2002. The findings suggest that the effect of remittances on economic growth is stronger when the financial sector development (measured by private credit provided by banking sector as a ratio of GDP) is high.

In addition to financial sector development, institutional quality is also an important factor in the relationship between remittances and economic growth. Catrinescu *et al.*, (2009) investigate the remittances-economic growth nexus in 162 countries over the period 1970 to 2003. Using both cross-section estimation OLS and dynamic panel estimation, the results indicate that remittances are able to enhance long term economic growth in countries with better institutions and sound economic policies.

The literature reviewed thus far suggests that remittances do not have a direct effect on economic growth, and that financial sector development and institutional quality are significant catalysts in the growth-enhancing role of remittances.

3.4 Domestic Savings and Economic Growth

This section discusses the studies that have investigated the causal linkages between savings and economic growth on a regional and country specific basis.

Agarwal (2001) investigates the savings-growth relationship in seven Asian countries (Korea, Thailand, Singapore, Indonesia, India, Malaysia and Taiwan) over the period 1960 to 1994. The results show that there is no causal relationship in Korea, but economic growth causes savings in all the other six countries, and savings cause economic growth in Indonesia, Malaysia and Thailand. Thus, Agarwal (2001) concludes that in Asia, there is more evidence of economic growth rather causing savings than the other way round.

Moreover, Anorou and Ahmed (2001) examine the causal links between domestic savings and economic growth in seven African countries (Congo, Cote d'Ivoire, Ghana, Kenya, South Africa, Niger and Zambia) using the VECM technique over the period 1960 to 1997. The results suggest that savings Granger-cause economic growth in Congo, while economic growth causes domestic savings in Ghana, Kenya, Niger and Zambia and there is bi-directional causality in Cote d'Ivoire and South Africa.

On a country-specific basis, Thanoon and Baharumshah (2007) investigate the savings-growth nexus for Malaysia over the period 1960 to 2000. The results show that the relationship is unidirectional from savings to economic growth. In addition, the results show that FDI complements domestic savings in the long run and substitute domestic savings in the short run.

Furthermore, Sinha and Sinha (2008) investigate the causal links between savings and economic growth in India over the period 1950 to 2001. The findings indicate that the causality runs from economic growth to savings. Odhiambo (2008) examines the causal links between financial sector development (specifically the M2 to GDP ratio) and economic growth in Kenya over the period 1969 to 2005 and integrates savings as an intermittent variable. The results show that economic growth Granger-causes savings and that savings in turn Granger-cause financial development.

In another study, Odhiambo (2009) investigates the causal links between savings and economic growth, including foreign capital inflows in South Africa over the period 1950 to 2005. The results show that there is bi-directional causality between savings and economic growth in the short run and a unidirectional causal link from growth to savings in the long run. Odhiambo

(2009) also argues that foreign capital flows and savings Granger-cause each other whilst economic growth Granger-causes foreign capital inflows.

Thus, the literature reviewed thus far suggests that in several countries, the Solow hypothesis, which argues that savings causes economic growth is rejected. In such countries, economic growth rather causes savings. This therefore implies that in some countries, it is important to aim for high economic growth rates so as to boost domestic savings, instead of boosting savings so as to enhance growth.

3.5 Conclusion

As can be seen from the above discussion, the relationships between financial factors and economic growth are varied. In the case of FDI and remittances, there is limited proof of a direct association with economic growth. In addition, a large section of the literature points to the fact that the impact of FDI and remittances on economic growth is reliant on factors such as financial sector development, institutional quality and the level of human capital.

There is ample evidence of economic growth causing savings in most studies. The implications of this are that countries may need to seek to achieve high rates of economic growth so as to boost domestic savings instead of increasing gross domestic savings so as to trigger economic growth. In the case of the financial sector development-economic growth nexus, there seems to be more evidence of mixed results and to an extent proof of financial sector development enhancing economic growth. This implies that the nature of the relationship and the direction of causality between financial sector development and economic growth are country-specific. Countries should therefore thoroughly examine their financial and economic structures before deciding whether it is developing the financial sector that will stimulate economic growth or whether it is achieving high economic growth rates that will enhance financial sector development.

4. RESEARCH METHODOLOGY AND DATA

4.1 Research Approach and Strategy

This research uses quantitative techniques to investigate causal relationships between economic growth and four financial factors (FDI, financial sector development, remittances and savings). The research design thus constitutes an experimental study because the empirical approach seeks to measure the impact that one or more variables has on a dependent variable using time series data (Leedy and Ormrod, 2010).

4.2 Data

The data used to conduct the empirical analyses is annual time series data for South Africa from 1970 to 2010 sourced from the World Bank World Development Indicators. The econometric analyses were conducted using Eviews 7 student version software. The key variables used in the research consist of the following:

4.2.1 Economic Growth (GDP)

Economic growth is measured by the log of GDP per capita in current \$US. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. This measure of economic growth has been used extensively in the literature (for example in Choe, 2007; Miguel et al., 2009; Siddique et al., 2012).

4.2.2 Foreign Direct Investment (FDI)

This variable is measured by the log of net FDI inflows as a percentage of GDP. FDI refers to the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less

disinvestment) in the reporting economy from foreign investors, and is divided by GDP. Studies that use this measure of FDI include Esso (2010), Choe (2007) and Adam (2011).

4.2.3 Financial Sector Development (FSD)

Financial sector development is measured by the log of total private credit provided by deposit money banks and other financial institutions, as a percentage of GDP. There are several proxies for financial sector development and there is no consensus yet as to which of them is the most appropriate. In this study, financial sector development is represented by total credit provided by the deposit money bank assets and other financial institutions as a ratio of GDP because this measure is broader than other measures such as credit provided by the banking sector to GDP or credit provided by the banking sector to the private sector as a ratio of GDP, that have been used in other studies. Studies that use the ratio of total credit provided by the deposit money bank assets and other financial institutions as a ratio of GDP include Quartey and Prah (2008), Apergis et al., (2007) and Habibullah et al., (2006).

4.2.4 Gross Domestic Savings (GDS)

In accordance with Sahoo et al., (2001), this variable is measured by the log of gross domestic savings in current \$US and is calculated as GDP less final consumption expenditure (total consumption).

4.2.5 Remittances (REM)

This variable is measured by the log of remittances inflows in current US dollars. It comprises current transfers by migrant workers and wages and salaries earned by non-resident workers. Data are the sum of three items defined in the fifth edition of the IMF's Balance of Payments Manual: workers' remittances, compensation of employees, and migrants' transfers. Remittances are classified as current private transfers from migrant workers resident in the host country for more than a year, irrespective of their immigration status, to recipients in their country of origin. Migrants' transfers are defined as the net worth of migrants who are expected to remain in the host country for more than one year that is transferred from one country to another at the time of migration. Compensation of employees is the income of migrants who have lived in the host

country for less than a year. Other studies that use this measure of remittances include Pradhan et al., (2008) and Giuliano and Ruiz-Arranz (2009).

4.3 Research Criteria

This study meets the criterion of validity as data were collected from well known sources, precisely, the World Bank World Development Indicators and the Global Financial Development Database. This therefore limits the possibility of data measurement errors. Furthermore, all academic literature was properly cited using the American Psychological Association (APA) method.

In addition, the study meets the criterion of reliability as the Eviews 7 software that was used contains all the functions that were needed to perform the required econometric tests and analyses (unit root tests, diagnostic tests, Wald tests etc). All the steps for these tests were described in details and thus, the same can be done using this data or data for any other countries and periods and the results are sure to be consistent.

5 ANALYSES AND DISCUSSION

5.1 Methodology

The causal relationships between economic growth and the financial factors (FDI, financial sector development, gross domestic savings and remittances) are empirically investigated using a Vector Autoregressive (VAR) model. A VAR is a multivariate simultaneous equation model, which was popularised by Sims (1980). In a VAR model, each variable is explained by its own lagged values plus current and past values of the remaining variables in the model. The VAR equation is as follows:

$$y_t = A_1 y_{t-1} + \dots + A_p y_{t-p} + B X_t + \varepsilon_t \quad (1)$$

where y_t is a k vector of endogenous variables, X_t is a vector of exogenous variables, A_p and B are matrices of coefficients to be estimated and ε_t is a vector of error terms that are uncorrelated with their own lagged values and all of the right hand side variables.

In this research, the empirical model that is used to examine the causal relationships between economic growth and various financial factors can be represented using the following matrix form:

$$\begin{bmatrix} GDP_t \\ FDI_t \\ FSD_t \\ GDS_t \\ REM_t \end{bmatrix} = A_0 + A_1 \begin{bmatrix} GDP_{t-1} \\ FDI_{t-1} \\ FSD_{t-1} \\ GDS_{t-1} \\ REM_{t-1} \end{bmatrix} + \dots + A_p \begin{bmatrix} GDP_{t-p} \\ FDI_{t-p} \\ FSD_{t-p} \\ GDS_{t-p} \\ REM_{t-p} \end{bmatrix} + \varepsilon_t \quad (2)$$

where GDP is economic growth, FDI is foreign direct investment, FSD is financial sector development, GDS is gross domestic savings and REM is remittances; A_0 is a vector of constant terms, A_{t-1}, \dots, p are matrices of parameters, p is the number of lags for the VAR and ε_t is a vector of Gaussian error terms.

According to Brooks (2008), VAR modelling has the following advantages; first it does not require the researcher to specify which variables are exogenous and which others are endogenous as all the variables are treated as endogenous; second, VAR models are able to capture more features of the data as they allow the value of a variable to depend on more than just its own lags or combinations of white noise terms; and third, forecasts generated by VAR models are usually better than those of traditional structural models, often as a result of the restrictions placed on these structural models.

However, despite the aforementioned advantages, VAR models have some demerits which include the following; first, they usually contain many parameters¹; second, VARs are sometimes a-theoretical as the models are often specified without due consideration of the theoretical relationships that exist between the variables (Brooks, 2008); third, VAR models often require the component variables to be stationary which is often done by differencing the data but this could mean some information on the long-run relationships between variables could be lost and lastly, the choice of optimal lag length for a VAR is often based on the arbitrary choice of information criteria as chosen by the researcher. ¹

In addition, in the context of causality testing, Sims et al (1990) and Toda and Philips (1993) argue that the traditional F-tests and Wald tests which are used to ascertain if VAR parameters are stable and jointly zero are not valid for I(1) processes because test statistics do not have standard distributions.

Thus Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) recommend an alternative approach (TYDL hereafter) that makes use of non-causality tests rather than standard Granger (1969) causality tests in order to guarantee the (Chi-Square distribution) of the Wald statistic

The first step in conducting TYDL non-causality tests is to determine the maximum order of integration ($d (max)$). This involves testing for the presence of unit root tests, otherwise known as tests of non-stationarity, in the variables. It is usually important to test for stationarity in

¹ For instance if there are n equations with p lags of each of these variables in each equation, $(n+pn^2)$ parameters will have to be estimated and many degrees of freedom could be used up for relatively small samples.

variables as the inclusion of non-stationary variables in a multivariate model could lead to spurious results because if a variable is non-stationary, then its t-ratios will not follow a t-distribution and its F-statistic will not follow an F-distribution too (Brooks, 2008). The two approaches that are commonly used to tests for non-stationarity are the augmented Dickey-Fuller (1979, 1981) and the Phillips-Perron (1988) unit root tests. The equation for the augmented Dickey-Fuller (1981) unit root test is as follows:

$$\Delta y_t = \mu + \beta_t + \alpha_j y_{t-1} + \sum_{j=1}^p c \Delta y_{t-j} + \varepsilon_t \quad (3)$$

where Δy_t =the first difference, t =the time trend, α =the test of the unit root, and ε_t = the error term

The Phillips-Perron (1988) unit root test is similar to ADF but in addition, allows for auto correlation and heteroskedasticity in the residuals. The Phillips-Perron (1988) equation is as follows:

$$\Delta y_t \Delta_t = \beta' + \pi y_{t-1} + \varepsilon_t \quad (4)$$

where Δy_t = the first difference operator, π =the test of the unit root, t =the time trend, and ε_t = the error term

The next step of the TYDL procedure involves determining the optimal number of lags (p) for the level VAR and thereafter, the level VAR model is produced and assessed for stability. Having produced the level VAR, the next step is to produce a lag-augmented VAR with $p+d(max)$ lags before Wald tests are conducted on the first p lags to determine the significance of causality between the different financial factors.

5.2 Analyses

In this research, the relationships between the various financial factors and economic growth are assessed using TYDL non-causality tests. The first step of the TYDL approach is to determine $d(max)$, which in this research was achieved using the augmented Dickey-Fuller (1979, 1981) and Phillips-Perron unit root tests. The results of the tests are shown in Table 5.1 below and show that all the variables are I (1) and thus $d(max)=1$.

Table 5.1 Unit Root Test Results

Variable	ADF Test			PP Test		
	I(0)	I(1)		I(0)	I(1)	
GDP	-1.780	-4.677	***	-1.575	-4.572	***
FDI	-2.101	-9.157	***	-2.840	-9.157	***
FSD	-0.113	-5.011	***	-0.280	-4.938	***
GDS	-2.093	-4.647	***	-2.060	-4.941	***
REM	0.646	-5.256	***	-0.335	-4.579	***

The ADF and PP tests both include a constant. The ADF unit root test includes a maximum of 4 lags chosen on the basis of the Akaike Information Criterion (AIC). ***, **, and * represent significance at the 1%, 5%, and 10% level respectively.

In the next step of the TYDL approach, the optimal number of lags (p) for inclusion in the VAR is found to be 2 based on the Akaike Information Criteria (AIC). Having determined $d(max)$ and p , the level VAR was then produced. Analysis of the residuals found that 0/1 binary dummy variables are necessary, occurring in 1985, 1997, and 2008. These dummy dates relate to periods of financial and economic crises.

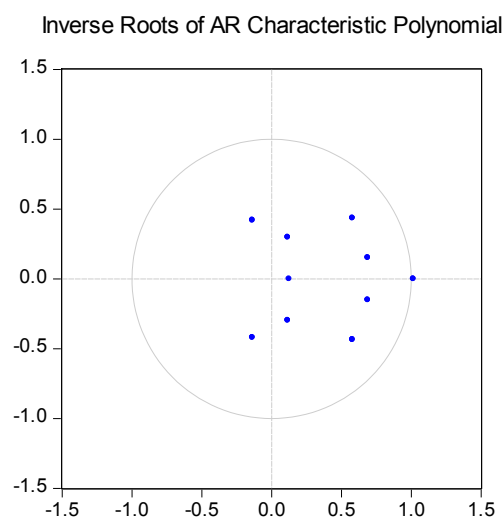
The VAR model was then checked for stability using a range of diagnostic tests. The results presented in Table 5.2 show that there is no significant auto-correlation up to 5 lags, no heteroskedasticity and that the residuals are normally distributed (with a mean of 0 and variance σ^2). In addition the graph of the inverse roots of the AR characteristic polynomial presented in Figure 5.1 below show that the model is stable as all the points lie on and within the circle.

Table 5.2 VAR Diagnostics

Lags	Statistic	Prob.
<i>Residual Serial Correlation Tests (LM-Stats.)</i>		
1	15.447	0.930
2	24.928	0.466
3	22.753	0.592
4	17.617	0.858

5	26.389	0.387
<i>Residual Heteroskedasticity Tests (Chi-Stats.)</i>		
Joint	356.701	0.321
<i>Residual Normality Tests (Joint Chi-Stats.)</i>		
Skewness	0.659	0.985
Kurtosis	5.625	0.345
Jarque-Bera	6.283	0.791

Figure 5.1 Inverse Roots of AR Characteristic Polynomial



Having produced a stable level VAR, the next step is to produce a lag-augmented VAR with 3 lags (derived from $p+d(max)$) lags, and thereafter, Wald tests are conducted on the first p lags to determine the significance of causality between the different financial factors. The results for the Wald tests are shown in Table 5.3 below:

Table 5.3 TYDL Results

Dependant Variable	Modified Wald Statistics				
	GDP	FDI	FSD	GDS	REM
	1	2	3	4	5
GDP		17.816	35.504	1.693	1.669
		0.000 ***	0.000 ***	0.429	0.434

FDI	0.354		4.344	0.806	2.013
	<i>0.838</i>		<i>0.114</i>	<i>0.668</i>	<i>0.366</i>
FSD	2.352	2.591		2.494	1.169
	0.309	<i>0.274</i>		<i>0.287</i>	<i>0.558</i>
GDS	1.096	17.152	19.756		5.772
	<i>0.578</i>	<i>0.000</i> ***	<i>0.000</i> ***		<i>0.056</i> **
REM	2.199	4.487	1.005	2.258	
	<i>0.333</i>	<i>0.106</i>	<i>0.605</i>	<i>0.323</i>	

Notes: The $[p + d(max)]$ th order level VAR was estimated with $d(max) = 1$ for the order of integration and lag length selection of $d = 2$. Reported estimates are asymptotic Wald statistics. Values in *italics* are *p*-values. ***, **, and * represent significance at the 1%, 5%, and 10% level respectively.

5.3 Discussion of Findings

Overall, the results show that none of the financial sector factors has have a causal relationship with economic growth (Column 1). The results in Column 2 show that FDI in South Africa is driven by both economic growth and domestic savings. This implies therefore that South Africa has growth-led FDI and not FDI-led growth. Hence, the relatively low levels of FDI to South Africa could be attributed to the low levels of economic growth (per capita GDP growth dropped from 3% in 1970 to 1.5% in 2010). This finding of growth-led FDI accords with Esso (2010) and Gossel and Biekpe (2013) but differs from Fedderke and Romm (2006). The findings that savings drive FDI also suggests that increases in the amounts of domestic savings in the South Africa will encourage the inflows of more FDI into the country. A possible reason for this association is that savings serve as the basic source of funds for both ‘Greenfield’ and ‘Brownfield’ FDI.

Similarly, column 3 shows that financial sector development is once again significantly driven by economic growth rather than vice versa, as well as by domestic savings. Thus, this finding supports the demand-following hypothesis and suggests that increasing the amount of economic growth in South Africa will significantly increase the amount of financial sector development (Odhiambo, 2004 and 2007) and Ghirmay (2004). The finding that domestic savings unidirectionally cause financial sector development accords with prior expectations since increased amounts of domestic savings will increase the amount of finance available for

intermediation in the economy and thus increase the level of financial sector deepening (Odhiambo, 2008).

The results in Column 4 further show that there is no causal association between domestic savings and economic growth, nor between domestic savings and the other financial factors. This result is contrary to Anorou and Ahmed (2001) and Odhiambo (2009), and indicates that the lack of a significant causal relationship suggests that the low economic growth rate in South Africa has not been sufficient to trigger high domestic savings. In addition, the insignificant causal relationships between domestic savings and FDI, and financial sector development in Column 4 compared to the significant associations between these factors in Column 2 and 3 indicates that the causality is unidirectional and runs from domestic savings to FDI, and from domestic savings to financial sector development.

Finally, the findings in Column 5 also show that there is no significant association between economic growth and remittances in South Africa. This accords with Giuliano and Ruiz-Arranz (2005 and 2009), who find that remittances stimulate economic growth only in countries that have poorly developed financial sectors, as these remittances serve as a substitute for financial sector development. However, the results show that there is a weak significant unidirectional causal relationship running from domestic savings to remittances, which indicates that increasing the levels of savings in South Africa could increase the amount of remittances inflows to South Africa that are only about 1% of GDP at present.

The policy implications of these results for South Africa are that the country cannot achieve higher economic growth rates because economic growth attracts FDI rather than FDI driving economic growth. In addition, higher economic growth rates will also increase financial sector development but not the reverse.

Furthermore, the findings imply that increasing domestic savings in South Africa would significantly increase financial sector development and FDI and to a lesser extent increase remittances. In addition, the results imply that enacting measures to encourage FDI inflows will also boost financial sector development.

Thus, overall the results of this study imply that the South African government should aim principally at increasing domestic savings and economic growth rates since increasing domestic savings will significantly increase FDI, financial sector development and remittances (which will in turn increase FDI) and increases in the economic growth rates will significantly increase financial sector development. In addition, increases in economic growth will also increase FDI inflows, which will in turn stimulate financial sector development.

6 RESEARCH LIMITATIONS AND ASSUMPTIONS

6.1 Limitations

The study has been limited by the following data limitations.

6.1.1 Data Limitations

The study used annual data from 1970 to 2010, and thus comprises 41 observations. Increasing the start date to much earlier could have increased the number of observations and possibly improved the quality of inference drawn from the results. However, for many of the variables, data is not available prior to 1970.

In addition, the use of quarterly data could have also increased the number of observations for this study. However, apart from FDI and possibly economic growth for which quarterly data is available for South Africa, only annual data is available for all the other variables.

6.2 Assumptions

The study assumed that the Toda and Yamamoto (1995) and the Dolado and Lutkepohl (1996) non-causality tests are appropriate to investigate the causal relationships between the financial factors and economic growth in South Africa.

The study assumed that the period 1970 to 2010 was a long enough period to investigate the causal linkages between the four financial factors and economic growth in South Africa.

The study has assumed that there are no significant structural breaks associated with the country's turbulent apartheid period, and no break associated with the country's democratic transition.

7 CONCLUSION

This study investigated the causal relationships between FDI, financial sector development, savings, remittances and economic growth in South Africa, using Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) (TYDL) non-causality tests covering the period of 1970-2010.

This study aimed at investigating the following research questions: i) Is economic growth most significantly associated with FDI, financial sector development, domestic savings or remittances? ii) What are the causal relationships between these forms of financial capital? iii) What are the policy implications of these results?

The results show that none of the financial sector variables directly lead to economic growth. However, economic growth is found to stimulate FDI and financial sector development. With regards to the causal linkages between the different financial factors, the results show that savings have highly significant causal linkages with FDI and financial sector development, thus implying that increases in the amount of savings in South Africa will deepen the financial sector and will encourage the increased inflow of FDI. In addition, the results suggest that savings have a moderately significant causal relationship with remittances, thus indicating that an increase in the amount of domestic savings will stimulate the inflow of remittances into the economy.

Furthermore, the results indicate that FDI has a weakly unidirectional causal relationship with financial sector development, and the direction of causality runs from FDI. Hence, this suggests that increased FDI inflows are associated with improvements in financial sector development. The findings also suggest that remittances have a weakly significant relationship with FDI, thus implying that increases in remittances inflows will encourage more FDI into South Africa.

Thus, these findings suggest that policy-makers in South Africa should aim principally at increasing domestic savings and economic growth rates since increasing domestic savings will significantly increase FDI, financial sector development and remittances, and increases in the economic growth rates will significantly increase financial sector development and FDI.

7.1 Directions for Future Research

7.1.1 Capital Flows

This research examined the linkages between only two capital flows, notably, FDI and remittances on economic growth in South Africa. Future research could examine the effect on economic growth of other capital flows such as debt flows in South Africa and/or in any other SSA country or countries for which data is available.

Furthermore, the study used the FDI inflows to GDP ratio as a proxy for FDI. Although several other studies use this measure (for instance Choe, 2007; Ezzo, 2010), an alternative that could be considered is FDI as a ratio of gross capital formation, which would isolate the ‘know-how’ and composition effects of FDI (this measure has been used by Henrik and Rand, 2006).

Lastly, this study used the general and broad definition of remittances which includes workers’ remittances, compensation of employees and migrant transfers rather than isolating one or two as advocated by Giuliano and Ruiz-Arranz (2009). Hence, the effect of the remittance components on economic growth could be examined using the approach of Giuliano and Ruiz-Arranz (2009) instead.

7.1.2 Financial Sector Development

This study has focused on the causal linkages between only one measure of financial sector development, notably, private credit provided by deposit money banks and other financial institutions and economic growth. Further research could be done using other measures of financial sector development such as stock market capitalisation and liquid liabilities of the financial system, amongst others.

7.1.3 Savings

This research also used gross domestic savings in current US dollars as a proxy for savings in South Africa. Future research could break down savings into private and public savings and examine the links with each of these have on economic growth in South Africa and/or in any other Sub-Saharan African country for which data is available.

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APPENDIX 1 Correlation Matrixes

	GDP	FDI	FSD	GDS	REM
GDP	1				
FDI	0.08	1			
FSD	0.66	0.59	1		
GDS	0.98	-0.02	0.61	1	
REM	0.87	0.39	0.86	0.85	1