

Does Financial Sector Development Promote Economic Growth in Mauritius? Evidence for ARDL Bounds Test Approach

By

Amit Achameesing^{a1} and Meshach Jesse Aziakpono^{a2}

^aUniversity of Stellenbosch Business School, Carl Cronjé Drive, Bellville 7530, South Africa

ABSTRACT

This paper explores the effects of financial sector development on economic growth in Mauritius using the autoregressive distributed lag model (ARDL) bounds test technique. The analysis specifically focuses on the role of the banking sector for the period: 1970 to 2017. The study employs three measures of financial sector development (FD) –private sector credit (PSC), liquid liabilities of banks (LLB) and commercial bank credit (CBC) all as a ratio of GDP. After controlling for the effects of other growth determining factors, we found strong evidence of long-run relationship between LLB and economic growth, but the results were weaker between PSC and economic growth. We further explore the credit channel through the effect of CBC on economic growth. While some evidence of a long run relationship was found, the effect was weakly statistically significant in the long run and remained insignificant in the short run. This raises serious questions about efficiency of banking intermediation in the country despite the seeming well-developed banking sector

JEL Classification: E52, O23

Keywords: Financial development, economic growth, private sector credit, ARDL, Mauritius

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

1.0 INTRODUCTION

The relationship between financial development (FD) and economic growth in an economy, especially developing countries has important policy implications for financial sector reforms. In Mauritius, financial reforms in 1990s were geared towards the liberalization of the financial system in order to enhance efficiency in the mobilization and allocation of funds in the economy. After the relaxation of credit controls in June 1993, the rise in private sector credit (PSC) has been relentless but during that time, real GDP growth has not followed through. This raises the question about the nature of the effects of FD on economic growth in Mauritius. The relationship between FD and economic growth has been at the center of a very large body of empirical studies (Levine (2005); Aziakpono (2011) for a survey of the empirical literature). Gupta (1984) and Jung (1986) use M2/GDP and find that FD significantly affects growth. After the pioneering cross section study of King and Levine (1993a), the empirical literature became increasingly grounded on the idea that credit to the private sector is a key channel through which the financial system, affect economic growth in a country. Empirical studies for Mauritius also find a significant positive relationship between the measures of FD and economic growth (See Jankee (2006); Nundlall (2006); Seetanah (2009)). However, those time series studies extend as far as 2004 and hence do not capture the most recent structural changes that happened in the Mauritian economy. A more recent study of Nowbuthsing (2010) shows that from 1970 to 2010, both M2/GDP and PSC have significant effects on economic growth. However, the effect of PSC on economic growth is relatively weaker and dies out after seven periods. This finding signals that the credit channel does not strongly support economic growth in Mauritius. In this paper, we investigate the effect on real GDPpc using more recent data. The current study focuses on the effects of bank deposits and bank credit on the real economy in the country from 1970 to 2017. The rest of the paper is organized as follows: section 2 provides stylized facts about FD in Mauritius. Section 3 discusses the theoretical framework and provides a survey of the empirical literature. Section 4 provides the analytical framework and presents the econometrics procedure and discusses the empirical results. Finally, section 5 summarizes the study's major findings and makes policy recommendations.

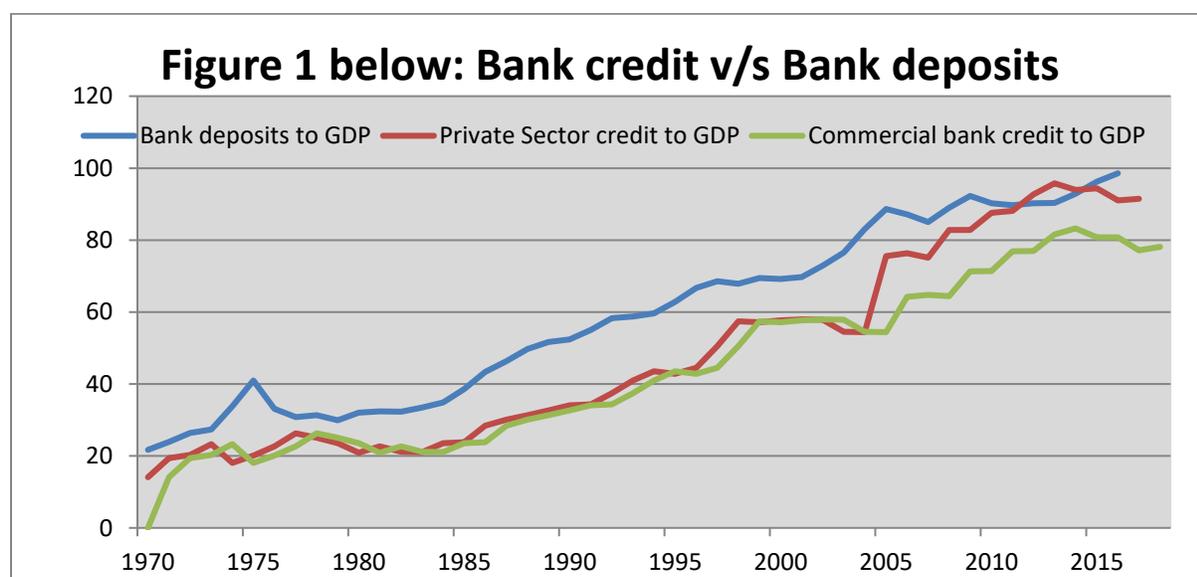
2.0 STYLIZED -FACTS

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

In Mauritius, the financial system has evolved significantly over time but has remained predominantly bank-based with commercial banks playing a key role in allocating private sector credit to support economic growth. Prior to 1991, monetary policy by the Central Bank was carried out primarily by establishing an annual ceiling for the expansion of bank credit. In fact, from 1973-1979, bank credit was regulated and allowed to expand by 15 per cent per annum and from 1979 to 1986, as the country went through the structural adjustment program, an annual credit ceiling continued to be established in consultation with the IMF. After 1986, the Central Bank continued to control the annual credit ceiling for priority and non-priority sectors but in June 1993, all restrictions on the expansion of bank credit were removed (Fry and Roi, 1995).

From 1993 onwards, the rise in PSC has been relentless reaching a peak of around 80% of GDP in 2013. Prior to 1993, commercial bank credit remained relatively low around 30% of GDP. Similarly, private sector credit in Mauritius which includes non-bank credit (non-banking institutions that provides lease financing to households and firms) has also surged dramatically during the past two decades reaching a peak close to 100% of GDP in 2013. A similar trend can be seen in bank deposits to GDP which have also increased consistently over time. In particular, post 1993, there has been a tremendous acceleration of deposits that have been accumulated by banks in Mauritius. Figure 1 below clearly shows that as from the mid-1990s, bank deposits and bank credit have become a major part of the financial system in Mauritius.



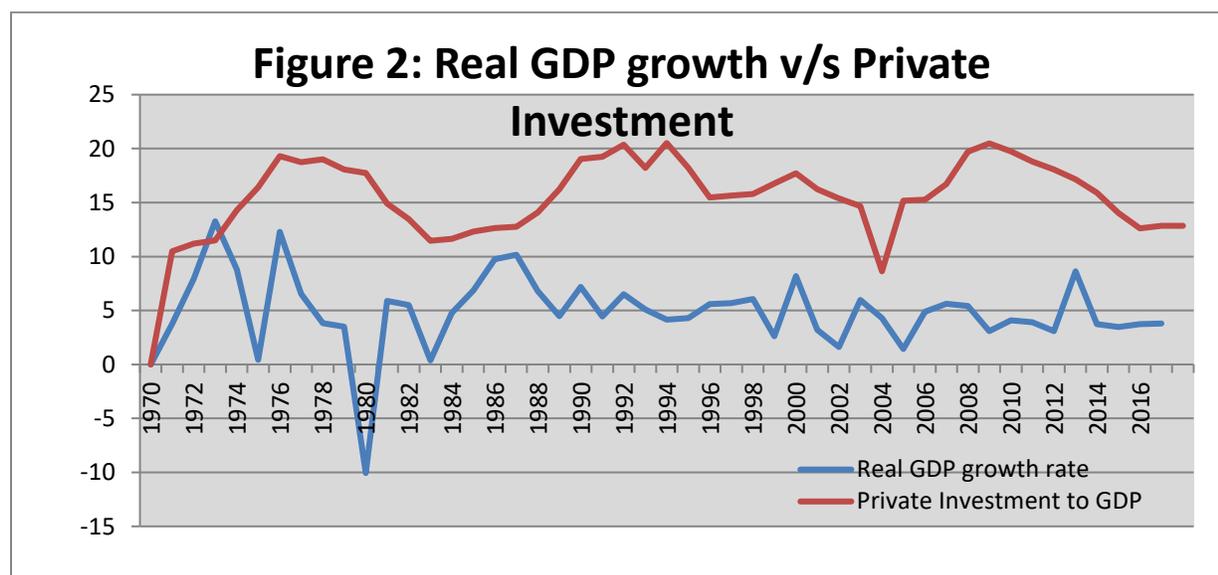
Source: Bank of Mauritius annual reports

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Prior to 1990s, Mauritius had a range of preferential access to trading partners, particularly the European Union (EU), in the sugar, textile and clothing industries. Zafar (2011) explains that those preferential accesses helped to sustain total exports from 1970s to 1990s, and indeed the period from 1984 to 1989 has been dubbed the “economic miracle” in the history of the country. However, with a limited number of new emerging sectors and the phasing out of preferential access, from late 1990s real GDP growth has been low and erratic (see Figure 2 below). In fact, with the rising amount of private sector credit, it would have been quite natural to expect that private investment which is the main driver of real GDP growth to increase over time. However, as can also be seen, in Figure 2, private investment has also been erratic after the 1990s. Thus, there seems to have been a serious disconnect between bank deposits, bank credit, private investment and real GDP growth after the 1990s.



Source: Statistics Mauritius

Turner (2014) argues that banks are financial intermediaries that transform deposits of households into loans to businesses, allocating capital for capital investment which in turn should stimulate economic growth. With rising amounts of bank deposits and bank credit and but periods of steep decline in private investment, as what banks did in Mauritius as from the 1990s, this definition seems largely fictional. Indeed, in a fascinating paper entitled “The Great Mortgaging”, Jorda et al. (2016) show that with very few exceptions, the banks’ primary business consisted of non-mortgage lending to companies between 1928 and 1970. By 2007, banks in most countries had turned primarily into real estate lenders. Incidentally, in Mauritius, in the past two decades, there has

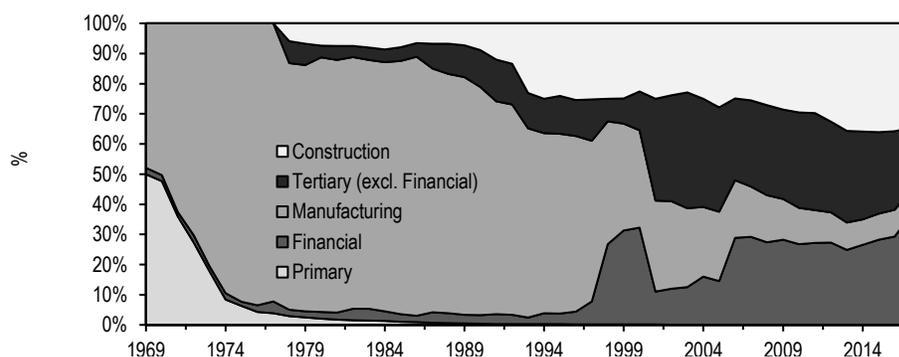
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meshach.aziakpono@usb.ac.za

been a major shift in the allocation of credit by commercial banks to construction and housing. From 5 billion rupees in 1997, this figure stood at 89 billion rupees in 2017; besides the construction of new houses and other property, this figure also includes the buying and selling of existing ones (BOM, 2017). Turner (2014) argues that the construction of new houses and property promote real GDP growth. In contrast, the buying and selling of existing land, housing and property do not have any effect on real GDP. Moreover, it is important to note that bank credit to offshore companies (companies which do most of their business activities abroad) has also surged during the past two decades. Furthermore, bank credit to the tertiary sector (mainly to hotels activities, acquisition and construction) has also increased while bank credit to the manufacturing industry has fallen sharply. Stiglitz and Greenwald (2014) explain the limits of countries that do not have an industrial policy. They argue that countries which achieved high rates of growth promoted industrial technology which increased the pace of learning and learning spillovers across a variety of sectors. Figure 3 clearly shows the shift in the composition of credit towards construction, financial and tertiary sectors as from late 1990s. These changes mean that the liberalization of the financial system in the 1990s might have had limited effects on real GDP growth, and therefore this calls for an in-depth empirical investigation.

Figure 3: Sectoral composition of credit as a % of GDP



Source: Bank of Mauritius annual reports

3. THEORETICAL FRAMEWORK

In the 1970s, McKinnon and Shaw developed a theoretical framework that helped to explain growth-inducing effects of financial liberalization in contrast to financial repression. They argued that the financial sector could raise the volume of savings as well as the quantity and quality of investment. In the 1990s, a part of the growing endogenous growth literature explored the role of

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

FD in generating economic growth through an external effect on aggregate investment efficiency. In this section, we present one such theoretical framework from Pagano (1993). The author uses the endogenous growth model – the AK model of Romer (1986) to explain the effects of finance on growth. Consider equation 1, where aggregate output is a linear function of the aggregate capital stock:

$$Y_t = AK_t \text{-----}(1)$$

Equation 1 implies that output Y depends on technology A and aggregate capital stock K_t . A which represents technology can also be called total factor productivity. A higher A imply that more output is produced for a given level of inputs. Romer (1986) extends Arrow’s reasoning to explain that there are also other types of learning which are external to the firm. When a firm increases capital (K), the firm’s aggregate output (Y) rises but so does the productivity (A) of other firms making the three variables endogenous in the growth model.

Pagano (1993) states that for a simple economy with a stable population and which produces a single good, gross investment can be defined as follows:

$$I_t = K_{t+1} - (1-\delta) K_t \text{-----}(2)$$

Equation 2 implies that the change in capital stock between two periods after accounting for depreciation δ equals to gross investment, I_t .

Furthermore, for a closed economy without government, capital market equilibrium generally implies that gross savings S_t should be equal to gross investment I_t . Pagano (1993) assumes that a fraction $1 - \phi$ of the flows of savings is lost in the process of financial intermediation through bank fees and charges. Therefore, the capital market equilibrium condition is modified and the proportion of savings that flows to investment can be written as follows:

$$\phi S_t = I_t \text{-----}(3)$$

From (1), the growth rate at time $t + 1$ is $g_{t+1} = Y_{t+1}/Y_t - 1 = K_{t+1}/K_t - 1$. Using equation (2) & (3) and denoting the gross savings rate S/Y by s , the steady-state output growth rate can be written as:

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

$$g = A \left(\frac{I}{Y} \right) - \delta = A\phi s - \delta \text{-----(4)}$$

An interpretation of equation 4 reveals that FD can affect economic growth through (i) A i.e the marginal productivity of capital (ii) ϕ i.e the proportion of savings that flows to investment (iii) s i.e the private savings rate. Equation 4 is based on the foundation that banks are financial intermediaries that transform savings (which are in the form of bank deposits) into loans to firms for capital investment. The savings mobilization function relates to the ability of the financial system to mobilize savings i.e increase the saving rate, s . and hence deepen the financial system to make large investment possible (Pagano (1993); Acemoglu and Zilibotti (1997); Dolar and Meh (2002); Levine (2004)). If the financial system was to raise the saving rate by mobilizing saving s for investment, then this will increase g . If that is the case, an increase in deposits should lead to an increase in loans for capital investment and hence to an increase in g . Therefore, by investigating the effects of both bank deposits and bank credit on growth, we can determine if banks are efficiently performing their role as financial intermediaries. Importantly, the magnitude of the increase in g depends on the strength of A and ϕ .

The advocates of financial reforms like Mc Kinnon and Shaw (1973) show that financial liberalization improves the allocation of savings by banks ensuring that the funds are channeled to those projects that have the highest marginal product of capital, A . Thus, financial liberalization increases the marginal productivity of capital, i.e A in equation 4, which, in turn, positively affects g (Pagano, (1993); Acemoglu and Zilibotti (1997); Montiel (2003)). On the other hand, other economists like Turner (2014) argues that if banks allocate credit to the buying and selling of existing assets such as land, housing and property, then this does not add any value to g . In fact, Keynes (1930) explained that these “financial transactions” bears no definite relation to the current rate of production. In the hypothetical case, if all savings by banks are allocated to the mere buying and selling of assets, then it follows that the marginal productivity of capital, i.e A in equation 4 will be zero. This in turn would not lead to any impact on g . Furthermore, if funds are allocated to industries which experience diminishing returns, then increasing the stock of capital in these industries will lead to negative marginal productivity of capital.

An efficient financial system can also increase the amount of savings channeled to investment, i.e. ϕ in equation 4. Aziakpono (2011) argue that under financial repression, there are different costs

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

of financial intermediation like high bank fees and charges, high reserve requirements and controlled interest rates. The author explains that as the financial system develops, the supply of financial services and increased competition among the financial service providers lead to a reduction in the cost of financial intermediation, $1-\emptyset$, which will increase \emptyset and hence g in equation 4.

Thus, even if a more efficient financial system leads to reductions in $1-\emptyset$ and/or improves the savings mobilization function of banks resulting in increases in s , if more funds flow to sectors that have lower marginal productivity of capital, A then the effects on g are likely to remain weak. Other theoretical literature identifies different mechanisms through which banks allocate funds to those projects that have the highest A (Boyd and Prescott (1985); Greenwood and Jovanovic (1990); King and Levine (1993); Thaddeus (1995)). Boyd and Prescott (1985) show that because of information asymmetries it is best for lenders to delegate the acquisition of information to financial intermediaries to avoid the duplication of costly information acquisition. The authors argue that this will reduce screening costs and ensure that funds flow to the projects, which have the highest marginal productivity of capital. On the other hand, there are a number of authors who challenge the efficiency of banking intermediation (Stiglitz and Weiss (1981); Werner (1992); Stiglitz (1996); Turner (2014)). In a seminal paper, Stiglitz and Weiss (1981) show that in the presence of asymmetric information banks allocate funds to those individuals and firms that have the highest ability to repay and not to firms with the most productive projects. More recently, Turner (2014) argues that contrary to pre-crisis orthodoxy, that the allocation of credit should be left to free market forces, banks left to themselves will produce too much of the wrong sort of debt. He explains that lending to finance non-real estate business investment requires complex assessment of future cash flows of projects, and simply taking security against real estate simplifies risk assessment. Thus, theoretically, the effect of FD on growth remains ambiguous.

In the case of Mauritius, it has been observed that banks have channeled a larger amount of bank credit to (i) construction (which includes the buying and selling of existing land and housing) (ii) financial (offshore companies that carry most of their business activities abroad) (iii) tertiary (mainly to hotels activities, acquisition and construction) and less to manufacturing industries. Therefore, it is likely that the relatively lower marginal productivity of capital, A associated with these sectors could have mitigated the positive effects on g .

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3.1 EMPIRICAL REVIEW

Goldsmith (1969) used the value of intermediate assets as a percentage of GDP to proxy for FD under the assumption that the size of the financial sector is positively correlated with the provision and quality of its services. Using data from 35 countries, he shows graphically the presence of a positive correlation between the value of financial intermediaries' assets and economic growth. Gupta (1984) and Jung (1986) use liquid liabilities/GDP and find that FD significantly improves economic growth. After the pioneering work of King and Levine (1993a), the empirical literature became increasingly grounded on the foundation that PSC is a key part of the financial system, and countries which have low PSC should aim to increase it to stimulate economic growth. As a matter of fact, as from 1993, an increasing number of cross section and panel studies have used measures of aggregate credit like PSC as the main proxy for FD and found a consistently positive contribution on economic growth (See Levine and Zervos (1998); Levine et al (2000); Carkovic and Levine (2002); Ndikumana (2005); Law and Singh (2014)). The chronological summary of a number of empirical studies is presented in Table 1 below. It shows that after the work of King and Levine (1993), most studies have increasingly used a credit aggregate to proxy for FD. It also shows that cross-sectional and panel data studies, irrespective of whether they use LLB or PSC, tend to produce significant evidence of a positive relationship between FD and economic growth. In contrast, for country specific studies, neither the monetary aggregates nor credit aggregates show a consistent effect between the proxies of FD and economic growth. Table 1 demonstrates that causality between finance and growth varies across individual countries, and therefore, show the dangers of statistical inference based on cross-section country studies, which implicitly treat different economies as the same.

The recent global financial crisis (GFC) has challenged the views that more financial deepening is necessarily good for growth. The new literature has found that very high PSC leads to negative effects on economic growth, which in fact has led to more questions raised about the operations of the aggregate credit channel (See Rousseau and Wachtel (2011); Assa (2012); Cecchetti and Kharroubi, 2012, 2013; Turner (2014); Arcand, Berkes, and Panizza, 2015;). For instance, Cecchetti et al (2012) argue that the sustained rise of PSC in developed and emerging economies has competed away a large amount of scarce resources, which could have been used for the real economy, and this situation has not been growth enhancing. Panizza et al (2012), show that there

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

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meshach.aziakpono@usb.ac.za

is a threshold effect for a large number of countries, which means that increasing PSC is good only up to a point, but after it reaches a certain percentage of GDP it starts to become a drag on growth. In the OECD from 1970-2008, Assa (2012) finds a negative relationship between finance and growth. The author shows that each percentage increase in finance in total value added is associated with up to 0.12% of slower growth. Turner (2014) shows that bank credit in the UK today funds mostly the buying and selling of existing assets which does not support economic growth. He shows that credit to finance investment in non-real estate assets accounts for no more than 14% of the total in the UK. Jorda et al. (2016) adds further credence to this view by showing that with very few exceptions, the banks' primary business consisted of non-mortgage lending to companies between 1928 and 1970. By 2007, banks in most countries had turned primarily into real estate lenders. The authors show that financial stability risks have been increasingly linked to real estate lending booms which are typically followed by deeper recessions and slower recoveries.

In Africa, there have been a number of country specific studies, which have examined the relationship between finance and growth but found conflicting results. Abu-Bader & Abu-Qarn (2005) find that from 1960 to 2001, FD strongly improved economic growth in Egypt. In particular, the authors note that the financial reforms in the 1990s have largely promoted financial deepening to sustain long term economic growth. Adusei (2013) studies the relationship between FD and economic growth in Ghana between 1971 to 2010. He finds that FD undermines economic growth and therefore cautions against financial liberalization in Ghana. Puatwoe and Piabuo (2017) investigate the relationship between finance and growth in Cameroon from 1980 to 2014. They find strong support that all indicators of FD affect long term economic growth and hence propose that financial reforms be pushed forward to boost the development of the financial sector to stimulate growth.

The argument that the relationship between finance and growth is greatly influenced by the operations of financial institutions and policies pursued in a country is decisive for Mauritius. As a matter of fact, the country adopted a series of financial reforms in the early 1990s which amongst others led to the abolition of credit controls in 1993 and eventually changed the composition of credit and structure of the Mauritian economy (Figure 3). Jankee (2006) uses bank deposits to GDP and PSC to analyze the effects of banking controls and financial repression on economic growth.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Using the method of principal components, direct measures of banking controls are constructed and used in estimating financial depth and economic growth equations. The results show a significant bi-directional causality between banking sector development and economic growth from 1970 to 2000. The author concludes that the major policy implication of his findings is that the pursuit of financial liberalization and banking sector development is no doubt the right strategy to increase economic growth. Other studies for Mauritius also find a significant positive relationship between finance and growth (Nundlall (2006); Seetanah (2008)). Nundall (2006) investigates causality between economic growth and FD in Mauritius over the annual period 1968-2004. Using the Engle & Granger error correction model, the author finds that financial intermediation has contributed to economic growth in Mauritius. The result identifies a particular channel of growth from financial intermediation to the construction sector. Seetanah (2008) uses the ARDL test to investigate the dynamic link between FD and economic growth from 1952 to 2004. Using M2/GDP and PSC to measure FD, the author finds a significant relationship between FD in both the short run and long run.

The time series studies which have been carried out for Mauritius do not include recent data points which would capture all the recent structural changes that happened in the economy. Interestingly, Nowbuthsing (2010) uses a Vector Correction Model and finds that from 1970 to 2010 the effect of FD as measured by PSC is positive and significant on economic growth in Mauritius, but the Impulse Response Function shows that the effect is weak and dies out after seven periods. In this paper, we use an ARDL bounds test approach for the period from 1970 to 2017 to capture all structural changes that happened to the Mauritian economy. The structural changes mean that the liberalization of the financial system in the 1990s might have had negative effects on real GDP growth, and therefore this calls for an in-depth empirical investigation.

TABLE 1: EMPIRICAL STUDIES

Study	Sample	Estimation Methods	Main Measures	Main Findings
CROSS COUNTRY AND PANEL STUDIES				
DEVELOPED COUNTRIES				
Mehrera and Ghamati (2014)	10 developed countries, 1997-2017	Panel data study	PSC	Positive effects of FD on EG in UK and USA but negative in Germany
DEVELOPING COUNTRIES				

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Fry (1978)	7 developing countries,1962-1972	Pooled time series OLS, 2SLS	Real interest rate and savings ratio	Real interest rate affects savings to affect growth
Gupta (1984)	14 developing countries, 1961-1980 (quarterly data)	VAR and Granger causality	M2/GDP	Causality runs mostly from finance to growth
Ndikumana (2000)	30 sub-Saharan African Countries (included Ivory Coast, Kenya, Nigeria, and South Africa)	Panel Dynamics-Fixed effects estimator	(i) PSC (ii) BLL (iii) BDC (iv) FD index	Positive relationship between domestic investment and different FD measures.
Trabelsi (2002)	69 developing countries, 1960-1990	Cross country and Panel data methods	M3	Financial development significant determines growth
Christopoulos and Tsionas(2004)	10 developing countries including Kenya,1970-2000	Panel Cointegration	LLB	Long run causality from finance to growth.no short run effects
Aslan (2008)	9 middle east countries including Egypt,1990-2003	Panel Cointegration	LLB	Financial development significantly affects economic growth
Kiran et al (2009)	10 Emerging countries including Tunisia and Egypt, 1968,2007	Panel Cointegration	LLB, PSC,BDC	Financial development significantly affects economic growth for all measures
Demetriades and James (2011)	18 SSA countries,1975-2006	Panel Data techniques	LLB, PSC	The link between bank credit and growth is absent
Mhadabi (2014)	21 low-income countries, 1970-2012	Panel, SURE	FD proxy based on size, access and costs	Financial development mostly leads growth and not vice-versa
Bist (2018)	16 low income countries,1995-2014	Panel Cointegration	PSC	FD significantly affects growth in the long run
Guru and Yadav (2019)	BRICS countries, Brazil, China, Russia, South Africa, India, 1993-2014	Panel GMM	Credit to deposit ratio, PSC	Banking development indicators significantly affect growth
DEVELOPED AND DEVELOPING COUNTRIES				
Goldsmith (1969)	35 developed and developing countries, 1949-1963	Cross-Country OLS	M2/GDP	Causal relationship between finance and growth
Jung (1986)	56 developed and developing countries, 1950-1980	VAR and Granger causality	M1/GDP & M2/GDP	Causality between finance and growth
King & Levine(1993a)	80 developed and developing countries, 1960-1989	Cross-Country OLS	LIQUID LIABILITIES %GDP (LLB) & PSC	Strong effect of both measures on growth
Levine and Zervos (1998)	47 developed and developing countries, 1976-1993	Cross Country OLS	PSC	Financial development significantly leads to growth
Ram (1999)	95 developed and developing countries, 1960-1989	Cross Country OLS	LLB	Weak relationship between finance and growth
Carkovic and Levine (2002)	54 developed and developing countries, 1976-1998	Cross country OLS & Panel GMM	PSC	Financial development consistently affects LR growth
Beck and Levine (2004)	42 developed and developing countries,1980-1990	OLS with panel data	CPS, TURNOVER RATIO	Both bank based and market based measures affect growth
Ndikumana (2005)	99 developed and developing countries, 1965-1997	OLS and Panel data fixed effects	LLB, PSC	Financial development affects growth through investment
Demetriades and Law (2006)	72 developed and developing countries,1978-2000	Panel Cointegration	PSC ,LLB	Financial development has larger effects on growth with better institutional framework.
Apergis et al (2007)	15 OCED countries and 50 non-OECD countries,1975-2000	Panel Cointegration	LLB,PSC, BDC	Financial development significantly affects economic growth for all measures

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Leitao (2010)	27 EU countries, 4 BRIC countries excluding South Africa	PANEL GMM	PSC, commercial banks assets/total assets	FD significantly affects economic growth for all measures
Sahay et al (2015)	128 developed and developing countries,1980-2013	Panel GMM	FD index based on size, access stability and efficiency	FD significantly increases growth but relationship is non-linear
COUNTRY-SPECIFIC STUDIES				
DEVELOPED COUNTRIES				
Arestis and Demetriades(1997)	Germany & USA, 1979-1991, quarterly data	VECM/Granger Causality	LLB, PSC	Banking system mostly affects growth in Germany. No such effect for USA
Rousseau and Wachtel (1998)	5 developed countries,1870-1929	VECM/Granger causality	PSC, LLB	Financial intermediation increased industrial transformations in the LR
Arestis et al (2001)	5 developed countries, 1968-1998	VAR cointegration analysis	PSC, LMC(stock market development indicator)	Both indicators of FD support long run growth but effect of PSC is stronger
Yang and Yi (2008)	South Korea,1971-2002	Structural equation method	Sum of loans plus value of securities	Financial development unilateral effect on growth
Vazakidi and Adamopoulos (2011)	UK, 1965-2007	VECM/Granger Causality	PSC	Stock market has more influence on growth than bank credit
DEVELOPING COUNTRIES				
Ang and Mc Kibbin(2007)	Malaysia, 1960-2001	PCA/VECM/Granger causality	PCA measure using M3/GDP, PSC	More evidence that economic growth promotes financial development in LR
Jalil et al (2010)	China,1977-2006	ARDL/PCA	PSC, LLB	Financial development significantly affects growth
Sindano and Kaakunga (2011)	Namibia, 1993-2007	VECM/Granger causality	M2/GDP, PSC	Causality mainly runs from economic growth to financial development
Ndlovu (2013)	Zimbabwe, 1980-2006	VECM/Granger causality	PSC and LLB	Two measures of FD not significant effect on growth
Adu et al .(2013)	Ghana 1961-2010	ARDL & PCA	PSC & M2/GDP	PSC significant effect on growth,not M2
Oliwale Awe et al. (2015)	Nigeria, 1960-2009	Dynamic Linear Model	Money supply	Money supply with capital expenditure best predictor of growth
Iheanacho (2016)	Nigeria, 1981-2011	ARDL cointegration	PSC & LLB	Both have significant negative effects on growth
MAURITIUS				
Jankee (2006)	Mauritius, 1970-2000	ECM, Granger causality	Bank deposits to GDP,PSC	Bi-directional causality between banking sector development and economic growth
Nundlall (2006)	Mauritius, 1968-2004	Engle-Granger ECM	PSC, Stock market capitalization to GDP	PSC affects growth in contrast to stock market measures
Seetanah (2008)	Mauritius, 1952-2004	ARDL/ECM	PSC and M2/GDP	Significant SR and LR effects on growth
Nowbuthsing et al (2010)	Mauritius, 1970--2010	VECM/Granger causality	M2/GDP, PSC	Finance significantly affects growth but effect eventually dies out

Source: Authors own compilation

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

4. ANALYTICAL FRAMEWORK

4.1 MAIN CONTROL VARIABLES- CHANNELS OF FINANCIAL DEVELOPMENT

Typically, authors who study the effects of FD in macro studies use the ratio of private sector credit by commercial banks to GDP and the ratio of liquid liability of banks to GDP to proxy FD (See, King and Levine (1993); De Gregorio, (1998); Nowbuthsing (2010); Adu et al (2013)). Following these studies, this paper distinguishes between two channels through which the financial system affects economic growth in measuring FD namely the aggregate deposit and aggregate credit channels. The aggregate deposit channel is measured by the ratio of bank deposits to GDP (LLB), and the aggregate credit channel is measured by the ratio of private sector credit to GDP (PSC). We further explore the aggregate credit channel by excluding non-bank credit from private sector credit to proxy for commercial bank credit (CBC).

4.2 OTHER CONTROL VARIABLES

This paper uses four control variables as measures of openness namely: real exchange rate (REER), exports (EX), imports (IM) and trade (TRADE) which is measured as the sum of export plus import over GDP. For an open economy like Mauritius a high REER makes exports less competitive while imports become more attractive, and this adversely affects growth. Rodrik (2008) uses a database of 188 countries and find that an undervalued currency significantly improves the growth prospects of an open economy. However, a more open economy with rising imports imports can also improve growth. For instance, open economies also have greater access to cheap imported intermediate goods, larger markets, and advanced technologies. If those benefits are reaped, then EX and TRADE should also improve growth (De Gregorio and Lee (1999); Sachs and Werner (1995); Rodriguez and Rodrik (2001)).

We also included public expenditure as a control variable. A number of studies confirm that public expenditure in non-productive sectors might have negative effects on economic growth in a country (Landau (1983); Barro (1989); Nworji et al (2012)). It has been shown that low inflation reflects sound macroeconomic policies which have positive effects on economic growth. In contrast, high inflation may signal macroeconomic instability due to poor macroeconomic policies, which increases uncertainty and reduce private investment and economic growth (Roubini and Salai Martin (1992); De Gregorio (1996); Barro (1996); Chaturvedi et al (2008)). Hence, we

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

include inflation as a measure of the soundness of macroeconomic policies. Other explanatory variables like gross fixed capital formation to GDP control for the positive effects private and public investment on economic growth (Kuznet (1955); De Long and Summers (1991);(1993); Ongo and Vukenkeng (2014)). Lastly, we included final consumption expenditure as a % of GDP. Furthermore, GDP growth has increasingly been led by consumption credit around the world. However, it has been observed that though credit growth can boost consumption in the short run, the incidence of consumption-led growth and rising debt service ratios significantly dampen growth in the medium to long run (Kharroubi & Kohlscheen, 2017; Lombardi et al (2017)).

4.3 DATA AND SOURCE

The study covers the period from 1970 to 2017 which makes a total of 48 observations. With the exception of the inflation rate, all the variables used for the models were transformed into natural logarithms. Data on RGDP_{pc}, LLB, and the control variables were obtained from the International Financial Statistics of the IMF. Data on PSC and non-bank credit was collected from the Bank of Mauritius annual reports. Commercial bank credit (CBC) was obtained by removing non-bank credit from PSC.

4.4 MODEL SPECIFICATION

A general model including 13 competing regressors is originally specified as follows:

$$\ln RGDP_{pc}$$

$$= f (\ln LLB, \ln PSC, \ln CBC, \ln GFCF, \ln PUC, \ln PRC, GSR, \ln EX, \ln IM, \ln TRADE, INF, \ln RER, POP GRWTH)$$

Where the dependent variable is $\ln RGDP_{pc}$ is log of real gross domestic product per capita,

This paper estimates three groups of models (models A, B and C) based on the three measures of FD. Model A uses the LLB (bank deposits ratio) and model B uses PSC (private sector credit ratio). For Model C we use CBC (commercial bank ratio). To avoid multicollinearity problem simple pairwise correlation test was carried out among the control variables (see appendix). Variables that were highly correlated were not included in the same regression. Hence, for each group of model (A, B, and C) we estimated several models that included only uncorrelated independent variables and the dependent variable. After this exercise, regressions were run between various uncorrelated independent variables and the dependent variable. Those regressions, which exhibit serial correlation and heteroscedasticity were rejected. The 8 models that pass all the diagnostic checks are provided below:

MODEL A (including $\ln LLB$ as the main explanatory variable)

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln LLB + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln EX \dots(6)$$

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln LLB + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln TRA \dots(7)$$

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln LLB + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln IM \dots(8)$$

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln LLB + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln RER \dots(9)$$

MODEL B (including lnPSC as the main explanatory variable)

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln PSC + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln EX \dots(10)$$

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln PSC + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln RER \dots(11)$$

MODEL C (including lnCBC as the main explanatory variable)

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln CBC + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln EX \dots(12)$$

$$\ln RGDP_{pc} = \beta_0 + \beta_1 \ln CBC + \beta_2 \ln INF + \beta_3 \ln GFCF + \beta_4 \ln PRC + \beta_5 \ln PUC + \beta_6 \ln REER \dots(13)$$

4.5 MODEL ESTIMATION AND RESULTS

UNIT ROOT TEST RESULTS

The estimation begins with a unit root test using the Augmented Dickey-Fuller (ADF) test. Table 2 below shows that most of the variables are non-stationary at levels. The results show that after differencing the variables once, all the variables become stationary. *Thus, all the variables used in this study are integrated of order zero or one. In particular, INF, ln GFCF, ln IM, ln PUC and lnRGDpc are I(0) while the rest of the variables are I(1).* Furthermore, additional tests were carried out to check if each variable has an intercept, a trend and intercept or none. For instance, Table 2 shows that INF is I(0). To check whether INF as (i) trend (ii) a trend and/or intercept or (iii) none, we test for all three options at level form. In this case, we find that (ii) is significant at the 5% level and therefore we tick that option. These tests are done to ensure that we identify the characteristics of our data set and hence choose the most appropriate option for our subsequent ARDL bounds cointegration tests. In fact, as Table 2 shows our main variables of interest i.e LLB, PSC and RGDPpc have a trend and an intercept, hence we choose this option in the ARDL bounds cointegration tests.

Table 2 : UNIT ROOT TEST RESULTS

<i>Level</i>	<i>1st Diff</i>	<i>2nd Diff</i>	<i>Order of Integration</i>	<i>Intercept</i>	<i>Trend & Intercept</i>	<i>None</i>
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1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

VARIABLE	T-stats	p-value	T-stats	p-value	T-stats	p-value		
INF. RATE							I(0)	✓
Trend	-4.04	0.00	-2.95	0.05	-4.47	0.00		
Trend&Int	-4.88	0.00	-2.90	0.17	-4.40	0.01		
None	-2.42	0.02	-6.15	0.00	-4.55	0.00		
ln EX							I(1)	✓
Trend	-1.25	0.64	-5.75	0.00	-10.43	0.00		
Trend&Int	-0.61	0.97	-5.97	0.00	-6.52	0.00		
None	-0.22	0.60	-5.82	0.00	-10.55	0.00		
ln GFCF							I(0)	✓
Trend	-3.54	0.01	-4.95	0.00	-11.14	0.00		
Trend&Int	-3.82	0.02	-5.12	0.00	-11.01	0.00		
None	-0.26	0.58	-5.00	0.00	-11.30	0.00		
ln IM							I(0)	✓
Trend	-3.13	0.03	-5.05	0.00	-8.14	0.00		
Trend&Int	-3.27	0.08	-5.04	0.00	-8.04	0.00		
None	-0.18	0.61	-5.10	0.00	-8.24	0.00		
ln LLB							I(1)	✓
Trend	-1.36	0.59	-5.40	0.00	-9.20	0.00		
Trend&Int	-2.03	0.56	-5.43	0.00	-9.09	0.00		
None	2.12	0.99	-4.66	0.00	-9.31	0.00		
ln PRC							I(1)	✓
Trend	-1.14	0.68	-5.39	0.00	-9.22	0.00		
Trend&Int	-1.51	0.81	-5.36	0.00	-9.11	0.00		
None	0.64	0.85	-5.41	0.00	-9.33	0.00		
ln PSC							I(1)	✓
Trend	0.75	0.99	-6.58	0.00	-8.63	0.00		
Trend&Int	-2.51	0.32	-6.69	0.00	-6.81	0.00		
None	4.27	1.00	-2.27	0.02	-8.74	0.00		
ln PUC							I(0)	✓
Trend	-3.70	0.01	-10.65	0.00	12.60	0.00		
Trend&Int	-4.19	0.01	-10.52	0.00	-12.44	0.00		
None	-0.01	0.67	-10.77	0.00	-12.76	0.00		
lnRGDPpc							I(0)	✓
Trend	-0.41	0.90	-6.18	0.00	-9.28	0.00		
Trend&Int	-4.43	0.01	-6.12	0.00	-9.19	0.00		
None	7.75	1.00	-1.76	0.07	-9.38	0.00		
ln Trade							I(1)	✓
Trend	-2.21	0.20	-5.14	0.00	-8.90	0.00		
Trend&Int	-1.99	0.59	-5.22	0.00	-5.14	0.00		
None	-0.20	0.60	-5.20	0.00	-9.00	0.00		
ln REER							I(1)	✓
Trend	-1.81	0.36	-7.12	0.00	-7.81	0.00		
Trend&Int	-1.78	0.69	-7.18	0.00	-7.72	0.00		
None	0.26	0.75	-7.17	0.00	-7.89	0.00		
ln CBC							I(1)	✓
Trend	-1.60	0.47	-8.03	0.00	-6.21	0.00		
Trend&Int	-2.87	0.18	-7.92	0.00	-6.14	0.00		
None	2.52	0.97	-7.21	0.00	-6.28	0.00		

Note that significance is at 5% level with a p-value of 0.05

4.6 ARDL BOUNDS COINTEGRATION TEST

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

The methodology used is the autoregressive distributed lag (ARDL) bounds approach to cointegration proposed by Pesaran et al. (2001). The ARDL bounds cointegration technique has been selected to determine the long run and short run relationships between ln LLB, ln PSC, ln CBC and lnRGDPpc. The choice of this methodology is based on several considerations. First, as shown by Pesaran et al. (2001), the ARDL models yield consistent estimates of the long run coefficients that are asymptotically normal irrespective of whether the underlying variables are I(1) or I(0). Second, Pesaran (1995) shows that the inclusion of the dynamics may help correct the endogeneity bias. Third, ARDL model provides enough flexibility to choose the number of lags that solve the serial correlation problem while allowing a sufficient number of explanatory variables in the regressions (Pesaran et al, 2001). The first step in estimating the ARDL model is to test for the presence of long run relationships among the variables by using the Bounds F-Test. To implement the bound test procedure, the test equation below is estimated.

$$\Delta \ln RGDPpc_t = \beta_0 + \sum_{f=1}^n \beta_f \Delta \ln FD^*_{t-i} + \sum_{g=1}^n \beta_g \Delta INF_{t-i} + \sum_{h=1}^n \beta_h \Delta \ln GFCCF_{t-i} + \sum_{i=1}^n \beta_i \Delta \ln PRC_{t-i} + \sum_{j=1}^n \beta_j \Delta \ln PUC_{t-i} + \sum_{k=1}^n \beta_k \Delta \ln O^*_{t-i} + \phi_1 \ln FD^*_{t-1} + \phi_2 \ln INF_{t-1} + \phi_3 \ln GFCCF_{t-1} + \phi_4 \ln PRC_{t-1} + \phi_5 \ln PUC_{t-1} + \phi_6 \ln O^*_{t-1} + \varepsilon_t \dots\dots\dots(14)$$

(where *FD denotes our main of financial development and O denotes the openness to trade measure)

Where β_0 is a drift component and ε_t is the white noise error. The long run multipliers are represented by the coefficients of the lagged level variables, ϕ^s , while β^s represent the short run impacts on real GDPpc. After this, we test the presence of cointegration by restricting all estimated coefficients of lagged level variables to zero. The null hypothesis of no long run relationships (no cointegration) is as follows:

$$H_0 : \phi_1 = \phi_2 = \phi_3 = \phi_4 = \phi_5 = 0$$

is tested against the alternative hypothesis of long run relationships (cointegration) which is as follows:

$$H_1 : \phi_1 \neq 0, \phi_2 \neq 0, \phi_3 \neq 0, \phi_4 \neq 0, \phi_5 \neq 0$$

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

The value of the F-statistic is compared with the critical values for the lower and upper bounds to determine whether to accept or reject the null hypothesis. The lower bound assumes that all the regressors are $I(0)$, and the upper bound assumes that they are $I(1)$. If the computed F-statistics lies above the upper level of the band, the null is rejected, indicating cointegration. When the F-statistics is in-between the lower and upper bounds, the test is indeterminate. If the calculated F-statistics lies below the lower level of the bound, the null hypothesis should be accepted which mean that there is no cointegration (Pesaran and Pesaran, 1995). Once the long run relationship has been established through the ARDL bounds test, the second step is to estimate the ARDL model which includes the short run coefficients and error correction term (ECT). It is important to mention that the ECT only exists if there is evidence of a long run relationship between the variables. We construct a lagged error correction term to substitute the whole set of lagged level variables. Equation 14 can therefore be rewritten as follows:

$$\Delta \ln RGDPpc_t = \beta_0 + \sum_{f=1}^n \beta_f \Delta \ln FD^*_{t-i} + \sum_{g=1}^n \beta_g \Delta \ln INF_{t-i} + \sum_{h=1}^n \beta_h \Delta \ln GFCF_{t-i} + \sum_{i=1}^n \beta_i \Delta \ln PRC_{t-i} + \sum_{j=1}^n \beta_j \Delta \ln PUC_{t-i} + \sum_{k=1}^n \beta_k \Delta \ln O^*_{t-i} + \varphi ECT_{t-1} + \sigma_t \dots \dots (14)$$

It is important to note that the short run dynamics in the model is expressed through the β^s , while the coefficient of the ECT_{t-1} , φ , is known as the speed of adjustment towards the equilibrium level.

ARDL BOUNDS COINTEGRATION TEST RESULTS

Table 3 below shows the results of the bounds F test procedure where the critical values are reported at the 5% significance level to confirm the long run relationship between the dependent and independent variables. For all model specifications from equations 6 to 13, the bounds F test rejects the hypothesis of no cointegration and hence confirms that there is long run relationship between the variables. Equation 11 and 13 confirms the strongest long run relationships between the dependent and independent variables.

Table 3: ARDL Bounds Test results

MODEL SPECIFICATION	CRITICAL VALUES		F- STATISTIC	H ₀ : No cointegration ACCEPT/REJECT H ₀
	I(0)	I(1)		
Equation 6	3.27	4.39	8.67	Reject
Equation 7	3.27	4.39	8.76	Reject
Equation 8	3.27	4.39	7.76	Reject

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Equation 9	3.27	4.39	7.73	Reject
Equation 10	3.27	4.39	6.97	Reject
Equation 11	3.27	4.39	13.87	Reject
Equation 12	3.27	4.39	9.87	Reject
Equation 13	3.27	4.39	11.56	Reject

The critical values are at 5% significance level

4.7 ARDL MODEL AND DISCUSSION OF LONG RUN RESULTS

Tables 4 reports the ARDL long run results for Models A, B and C for Mauritius. These include the long-run elasticities, the adjusted R^2 , and the residual diagnostic results. Models A, B and C reports the results according to the measures of FD namely, $\ln LLB$, $\ln PSC$ and $\ln CBC$ respectively. Model A shows that $\ln LLB$ has strong significant effects on $RGDP_{pc}$ in the long run. *The strength of the results can be seen from the size of the long run elasticities and p-value numbers of all the coefficients of $\ln LLB$ which are all significant at the 1% level.* The results suggest that the aggregate deposit channel as measured by bank deposits to GDP has a strong significant effect on real $RGDP_{pc}$ in the long run. Figure 1 in the stylized section shows that bank deposits to GDP ratio in Mauritius increased steadily since early 1980s, and there has been a notable acceleration in the 1990s with the ratio exceeding 100% of GDP in 2016. As Pagano (1993), we would expect the persistent increase in the mobilization of savings to sustain growth of national output in Mauritius. Yet, during this period, as Figure 2 shows, there have been sharp upswings and downswings in real GDP growth which remained erratic. Therefore, though the empirical findings point to a strong relationship between bank deposits and real $RGDP_{pc}$, it also suggests that those bank deposits might not have been optimally allocated by banks to the real economy. Therefore, in Model B, we investigate the significance of the aggregate credit channel on $RGDP_{pc}$ by using $\ln PSC$ as the main explanatory variable. *When we use $\ln PSC$ as our main measure for FD, the results become weak. This can be seen by the size of the long run elasticities and p-values of all the coefficients of $\ln PSC$ in Equation 10 and 11.* This result suggests that PSC does not strongly affect real $RGDP_{pc}$ in Mauritius which is similar to the findings Nowbuthsing (2010). The latter finds that the effects of the credit aggregate channel on growth is weak with a PSC increase of 1 percentage point leading to an increase in economic growth of only 0.14. As we discussed in the stylized section, from early 2000s, an increasing amount of bank credit in Mauritius has been allocated to financial transactions which do not affect GDP. In an attempt, to further explore the aggregate credit channel, we remove non-bank credit from PSC to capture its largest component which is commercial bank credit (CBC). CBC consists of around 85% of PSC and this ratio has remained

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

quite stable despite the emergence of a large number of non-banking financial institutions. In Model C, when $\ln CBC$ is used as the main measure of FD, the results become weak. This can be seen in the coefficient of $\ln CBC$ in equation 12 which is strongly significant at the 1% level. In contrast, in equation 13, the coefficient of $\ln CBC$ turns out to be strongly insignificant. Overall, the long run empirical results suggest that the aggregate deposit channel of FD is strongly significant in Mauritius. The results suggest that the credit channel is weaker than the aggregate deposit channel. Hence, our findings give support to the observation that commercial banks in Mauritius have been allocating more funds to sectors which have lower marginal productivity of capital and this has stunted economic growth in the country.

TABLE 4: ARDL LONG RUN RESULTS

Dependent variable: Real GDPpc	Main independent variable for FD			Adjusted R ²	Diagnostic checks	
	$\ln LLB$	$\ln PSC$	$\ln CBC$		Serial correlation	Heteroscedasticity
-	-	-	-	-	-	-
MODEL A	-	-	-	-	-	-
Equation 6	0.98 (0.0032)	-	-	0.72	(0.9412) (0.8611)	(0.9691) (0.9265)
Equation 7	0.99 (0.0010)	-	-	0.72	(0.9604) (0.9039)	(0.8551) (0.7643)
Equation 8	0.94 (0.0002)	-	-	0.72	(0.9365) (0.8427)	(0.8949) (0.8077)
Equation 9	0.90 (0.0002)	-	-	0.69	(0.7144) (0.5045)	(0.9989) (0.9962)
MODEL B	-	-	-	-	-	-
Equation 10	-	0.34 (0.0037)	-	0.77	(0.3888) (0.1431)	(0.1119) (0.1494)
Equation 11	-	0.61 (0.0653)	-	0.75	(0.3122) (0.1288)	(0.7259) (0.6437)
MODEL C	-	-	-	-	-	-
Equation 12	-	-	0.43 (0.0042)	0.76	(0.6960) (0.4441)	(0.1252) (0.1600)
Equation 13	-	-	0.64 (0.3440)	0.74	(0.4103) (0.2143)	(0.2947) (0.2804)

The p value are in parentheses. The p value for F and Chi square tests for serial correlation and heteroscedasticity are given in parantheses. All exceed 5% and therefore we reject the null hypotheses of serial correlation and heteroscedasticity. We assess each variable at 10% level of significance.

4.8 ARDL MODEL AND DISCUSSION OF SHORT RUN RESULTS

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Table 5 reports the result of the ARDL short run estimation for Models A,B and C. These include the short-run elasticities, the adjusted R^2 , and the residual diagnostic results. We report the results according to the measures of FD. For Model A, Equation 6 to 9 shows that the short run coefficients of LLB have consistently insignificant effects on real GDP per capita. These results contrast the findings of Jankee (2000) who find that bank deposits to GDP significantly affect economic growth in the short run. Our findings also contrast those of Nundlall (2006) and Seetanah (2009) who find a significant effect of liquid liabilities to GDP in the short run. For Model B and C, when PSC and CBC are used as the main explanatory variables respectively, the results remain highly insignificant. These can be seen from equations 10&11 and 12&13 respectively. Overall, the short run empirical results suggest that the aggregate deposit channel and credit channels of FD are insignificant in the short run in Mauritius. These results are in stark contrast with all the previous empirical studies for Mauritius (See Nundlall (2006); Jankee (2006); Seetanah (2009); Nowbuthsing (2010)). *Importantly, we provide additional support to the observation that banking intermediation in Mauritius is weak in both the short and long run.* For all Models, the coefficients of the error correction term have the right signs and are statistically significant. The speed of adjustment of the error correction term directly estimates the speed at which $\ln\text{RGDPpc}$ returns back to equilibrium after a change in the other independent variables. Equation 13 has the fastest speed of adjustment while equation 9 has the slowest. For equations 6 to 9, the speed of adjustment of real GDP per capita to equilibrium ranges from 35% to 41%, while for equations 10 and 11, it ranges from 16% to 35%. For equations 12&13, the speeds of adjustment range are 10% and 34% respectively.

TABLE 5: ARDL AND SHORT RUN RESULTS

<i>Dependent variable: Real GDP per capita</i>	<i>Main independent variable for FD</i>			
	ΔECT	$\Delta\ln\text{LLB}$	$\Delta\ln\text{PSC}$	$\Delta\ln\text{CBC}$
MODEL A	-	-	-	-
<i>Equation 6</i>	-0.35 (0.000)	0.04 (0.4405)	-	-
<i>Equation 7</i>	-0.36 (0.000)	0.02 (0.6990)	-	-
<i>Equation 8</i>	-0.39 (0.000)	0.05 (0.9266)	-	-
<i>Equation 9</i>	-0.41 (0.000)	0.06 (0.2305)	-	-
MODEL B	-	-	-	-

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

<i>Equation 10</i>	-0.35 (0.000)	-	0.06 (0.1056)	-
<i>Equation 11</i>	-0.16 (0.000)	-	0.004 (0.8886)	-
MODEL C	-	-	-	-
<i>Equation 12</i>	-0.34 (0.000)	-	-	0.03 (0.5776)
<i>Equation 13</i>	-0.10 (0.000)	-	-	0.64 (0.3440)

The p-value are in parentheses. We assess each variable at 10% level of significance.

4.9 LONG RUN RESULTS FOR OTHER CONTROL VARIABLES

Regarding the control variables, the long run results are reported in Table 6 below. Equation 6 to 9 also shows that lnGFCF and lnPUC are consistently significant when lnLLB is used as the main measure of FD. The results from equation 6 to 9 for GFCF point to negative effects on economic growth. There are studies, which report negative effects from gross fixed capital formation to GDP (Devarajan et al (1996); Ghali (1998); Lach (2010)). In particular, Devarajan et al (1996) find that government in developing countries has spent excessively in poor infrastructure such that fixed capital is above its growth maximizing level. On the other hand, De Long and Summers (1993) show a strong causal link running from equipment investment to economic growth. Therefore, the negative effects of GFCF for Mauritius shows that government has not spent enough on high quality growth enhancing investment. The negative effects in Mauritius of lnPUC from Equation 6 to 9 are consistent with a large body of work (Landau (1983); Aschauer (1989); Barro (1989); Nworji et al (2012)). These studies confirm that public expenditure in non-productive sectors have negative effects on economic growth in the country. For instance, Aschauer (1989) found that shift in government spending from investment in fixed assets to consumption led to significant decrease in the level of output. Interestingly, equations 10 and 12 report a significant effect of lower inflation on economic growth. This is mainly because lower inflation, reduces volatility and uncertainty and provides a more conducive environment for private investment and economic growth. This view is consistent with a large number of empirical studies (See Fischer (1993); Barro (1995); Quarte (2010)).

TABLE 6:ARDL AND OTHER CONTROL VARIABLES RESULTS

<i>Dependent variable: Real GDP per capita</i>	<i>Other control variables</i>
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1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

	INF	lnGFCF	lnPRC	lnPUC	lnEX	lnTRADE	lnIM	lnREER
<i>Equation 6</i>	-0.004 (0.5288)	-0.459 (0.023)	0.409 (0.2997)	-0.711 (0.0016)	0.066 (0.6974)	-	-	-
<i>Equation 7</i>	-0.005 (0.4609)	-0.476 (0.013)	0.423 (0.144)	-0.690 (0.0007)	-	0.127 (0.456)	-	-
<i>Equation 8</i>	-0.004 (0.4463)	-0.504 (0.0035)	0.329 (0.1051)	-0.650 (0.0003)	-	-	0.284 (0.1155)	-
<i>Equation 9</i>	-0.006 (0.2314)	-0.290 (0.020)	0.157 (0.3774)	-0.612 (0.0002)	-	-	-	0.381 (0.021)
<i>Equation 10</i>	-0.015 (0.036)	-0.126 (0.3004)	-0.329 (0.1896)	-0.019 (0.5796)	-0.190 (0.1815)	-	-	-
<i>Equation 11</i>	-0.047 (0.1161)	-0.123 (0.6109)	0.315 (0.5029)	-0.09 (0.6100)	-	-	-	-0.333 (0.5286)
<i>Equation 12</i>	-0.02 (0.038)	-0.10 (0.4088)	0.052 (0.8650)	-0.127 (0.1209)	-0.111 (0.4658)	-	-	-
<i>Equation 13</i>	-0.07 (0.3324)	-0.568 (0.5132)	1.009 (0.4640)	-0.616 (0.3393)	-	-	-	-1.227 (0.4958)

The p-value are in parentheses. We assess each variable at 10% level of significance.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This paper investigates the distinctive effects of the two main channels of FD on economic growth. To do this, we used three measures of FD namely LLB for the aggregate deposit channel, and PSC & CBC for the aggregate credit channel, and assess their effects on real GDPpc. In the short run, the empirical findings show that the three measures of FD do not significantly affect real GDPpc. However, in the long run, the results show that LLB strongly and significantly affects real GDPpc whereas PSC and CBC show weaker significant effects on real GDPpc. Overall, the results suggest that the aggregate credit channel which tracks mostly bank credit does not operate efficiently in Mauritius. The results confirm the observation that banks have increasingly been allocating credit to sectors which have relatively lower marginal productivity of capital. In this respect, we recommend that pragmatic monetary policy in Mauritius attempt to improve the efficiency of banking intermediation as has been done prior to 1993 in the country. There are numerous examples of countries which adopted successful financial arrangements. Stiglitz (1996) explains that governments in East Asia played an active role in creating an institutional infrastructure which directed bank credit towards priority areas and away from speculative real estate and consumer

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

durables. Similarly, Turner (2014) asserts that neither the Korean or Japanese authorities left bank credit allocation to private decision making driven by profit maximizing objectives. Instead, these countries deliberately directed credit toward desirable investments with the greatest potential to drive growth. Bank credit was made available primarily to manufacturing and export industries, and not real estate development and importers or traders. This direction was achieved by guidance or instructions to the banks motivated by the condition that productive loans could be rediscounted at the central bank. The policy recommendations laid down here can be criticized as dangerously interventionist in that it impedes the free allocation of credit by market forces. However, as in Turner (2014), we are not advocating for a direct intervention in the allocation of credit to particular individuals or businesses. Instead, we propose that market forces which drive the allocation of credit should be shaped by policies that limit the flow of credit towards unproductive sectors.

APPENDIX

CORRELATION RESULTS

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Covariance Analysis: Ordinary														
Date: 05/20/19 Time: 17:52														
Sample: 1970 2017														
Included observations: 48														
Correlation														
t-Statistic														
Probability														
GROSS_SEC_RATIO	INF_RATE	LN_EX	LN_GSR	LN_GFCF	LN_IM	LN_LL_B	LN_PRC	LN_PSC	LN_PUC	LN_RGDPPC	LN_TRADE	LN_REER	POP_GR_RATE	
1														

	1													
	-0.36453	1												
	-2.655049	-----												
	0.0109	-----												
			1											
	0.353148	-0.222912	1											
	2.560122	-1.550888	-----											
	0.0138	0.1278	-----											
				1										
	0.990287	-0.332794	0.416754	1										
	48.30658	-2.393549	3.109468	-----										
	0	0.0208	0.0032	-----										
					1									
	-0.201586	0.352977	0.338207	-0.118063	1									
	-1.395882	2.558706	2.437469	-0.806383	-----									
	0.1695	0.0139	0.0187	0.4242	-----									
						1								
	0.34932	-0.040186	0.735571	0.380241	0.508912	1								
	2.528486	-0.272778	7.364232	2.788364	4.009683	-----								
	0.015	0.7862	0	0.0077	0.0002	-----								
							1							
	0.947598	-0.3805	0.523441	0.956227	-0.057327	0.476397	1							
	20.11781	-2.790581	4.166537	22.16286	-0.38945	3.674902	-----							
	0	0.0076	0.0001	0	0.6987	0.0006	-----							
								1						
	0.433262	-0.034041	-0.460914	0.379789	-0.407646	-0.069349	0.301115	1						
	3.260433	-0.231013	-3.522552	2.784489	-3.027781	-0.471483	2.141658	-----						
	0.0021	0.8183	0.001	0.0078	0.004	0.6395	0.0376	-----						
									1					
	0.984612	-0.423177	0.37174	0.965779	-0.201357	0.396252	0.960422	0.416405	1					
	38.21308	-3.167744	2.715897	25.25478	-1.394228	2.927122	23.38497	3.10631	-----					
	0	0.0027	0.0093	0	0.1699	0.0053	0	0.0032	-----					
										1				
	0.157305	0.091104	0.020315	0.171949	-0.063096	-0.009018	0.16235	0.088928	0.133789	1				
	1.080343	0.620477	0.137813	1.183849	-0.428791	-0.061162	1.115914	0.605538	0.91563	-----				
	0.2856	0.538	0.891	0.2426	0.6701	0.9515	0.2703	0.5478	0.3646	-----				
											1			
	0.980742	-0.413555	0.41599	0.977446	-0.160659	0.407964	0.978565	0.394792	0.98719	0.13319	1			
	34.05726	-3.080647	3.102569	31.39141	-1.103983	3.030616	32.22758	2.914337	41.96466	0.911462	-----			
	0	0.0035	0.0033	0	0.2753	0.004	0	0.0055	0	0.3668	-----			
												1		
	0.377996	-0.151218	0.94619	0.430355	0.443311	0.915117	0.538797	-0.307451	0.41116	0.007848	0.44282	1		
	2.769141	-1.037544	19.83048	3.233565	3.354291	15.39387	4.337782	-2.191376	3.059164	0.05323	3.349672	-----		
	0.0081	0.3049	0	0.0023	0.0016	0	0.0001	0.0335	0.0037	0.9578	0.0016	-----		
													1	
	0.066101	-0.036403	-0.65206	0.018241	-0.542664	-0.591618	-0.118715	0.503396	0.030231	0.092996	0.01284	-0.667402	1	
	0.449298	-0.247061	-5.833127	0.123738	-4.381841	-4.977003	-0.810896	3.951363	0.205133	0.633477	0.08709	-6.07836	-----	
	0.6553	0.806	0	0.9021	0.0001	0	0.4216	0.0003	0.8384	0.5296	0.931	0	-----	
														1
	-0.71975	0.408139	-0.161937	-0.676834	0.462149	-0.190845	-0.716946	-0.550038	-0.764905	-0.004498	-0.754947	-0.187643	-0.057982	1
	-7.031619	3.032177	-1.113003	-6.235961	3.534551	-1.318607	-6.975129	-4.466967	-8.053863	-0.030505	-7.807875	-1.295673	-0.393913	-----
	0	0.004	0.2715	0	0.0009	0.1938	0	0.0001	0	0.9758	0	0.2016	0.6955	-----

REFERENCES

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Abu-Bader, S. and Abu-Qarn, S. 2005 “Financial development and economic growth: time series evidence from Egypt”, Discussion Paper No.05-14, July 2005, pp.1- 35.

Acemoglu, D and Zilibotti, F 1997, “Was Prometheus Unbound by Chance? Risk, Diversification, and Growth”, *Journal of Political Economy*, 105: 709-775

Adusei, M. 2013, Financial development and economic growth, Evidence from Ghana, *The International Journal of Business and Finance Research*, v. 7 (5) p. 61-76.

Ang, J., 2008, A survey of recent developments in the literature of finance and growth, *Journal of Economic Surveys*, pp. 536–576.

Arcand, J., Berkes, E., Panizza, U., 2012, Too Much Finance? IMF Working Paper 12/ 161

Arestis, P. Demetriades, P., 1997, "Financial Development and Economic Growth: Assessing the Evidence." *Economic Journal* 107, pp. 783-99.

Aschauer D.A., 1989, Public Investment and Productivity Growth in the Group of Seven, *Economic Perspectives*, 13, pp.17–25

Assa J., 2012, ‘Financialization and its Consequences: the OECD Experience’, Vol. 1, No1 January 2012, New School for Social Research

Aziakpono, M., 2011, Financial development and economic growth: Theory and a survey of Evidence, *J.Stud. eco.econometrics*, 2011, 35(1)

Barro, R.J. (1989a). Economic Growth in a Cross Section of Countries, NBER Working Paper, No. 3120

Barro, R. and J. Lee (1994), "Sources of Economic Growth," *Carnegie-Rochester Conference Series on Public Policy*, 40: 1-46.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Barro, R. J. 1995, "Inflation and Economic Growth", National Bureau of Economic Research (NBER) Working Paper, No. 5326

Beck, T., Levine, R. and Loayza, N., 2000, Finance and the sources of growth. *Journal of Financial Economics* 58: pp. 261–300

Beck, T., Buyukkarabacak, B., Rioja, F., and Valev, N., 2009, "Who gets the credit? and does it matter? household vs. firm lending across countries," Policy Research Working Paper Series 4661, The World Bank.

Beck, T., Degryse, H., Kneer, C., 2012, Is More Finance Better? Disentangling Intermediation and Size Effects of Financial Systems, Center for Economic Research, Discussion Paper No. 2012-060, Tilburg University.

Carkovic M., Levine R., 2002, Does Foreign Direct Investment Accelerate Economic Growth? Institute of International Economics Press, Washington DC, pp. 195-221.

Chang, T., Caudill, S.B., 2005, Financial development and economic growth: the case of Taiwan, *Applied Economics*, 37, pp. 1329-1335.

Cechetti, S. Kharroubi, E., 2012, "Reassessing the impact of finance on growth", Bank of International Settlements, BIS Working papers No381, July 2012.

Cecchetti, S., Kharroubi, E., 2013, 'Why does financial sector growth crowd out real economic growth?' Finance and the Wealth of Nations Workshop, Federal Reserve Bank of San Francisco & The Institute of New Economic Thinking, Sept 27, 2013.

Chaturvedi, V. et al. 2008, "Inter-relationship between economic growth, savings and inflation in Asia", Indian Institute of Management: Research and Publications, Ahmadabad, India.

Christopoulos, D., Tsionas, E., 2004, Financial development and economic growth: evidence from

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

panel unit root and cointegration tests. *Journal of Development Economics*: pp. 55–74.

Chukwu, J., Agu, C., 2009, Multivariate causality between financial depth and economic growth in Nigeria, *Africa Review of Money, Finance and Banking*, pp 7-21

De Gregorio, J., Guidotti, P., 1995, Financial development and economic growth. *World Development* 23: pp. 433–448.

De Long; B. and Summers, L. (1991), Equipment investment and economic growth, *Quarterly Journal of Economics*, vol. 106, no 2, May, pp. 445-502.

De Long; B. and Summers, L. (1993), How strongly do developing economies benefit from equipment investment?, *Journal of Monetary Economics*, vol. 32, pp. 395-415.

Demetriades, P., Hussein, K., 1996, Does financial development cause economic growth? Time-series evidence from sixteen countries, *Journal of Development Economics* 51: pp. 387–411.

Demetriades, P., Law, H., 2006, Finance, institutions and economic development, *International Journal of Finance and Economics*, 11(3), pp. 245-260.

Demetriades, O., & James, G. 2011, Finance and Growth in Africa: The Broken Link, *Economic Letters*, 113.

Demetriades, P., Rousseau, P., 2015, The Changing Face of Financial Development, University of Leicester, Department of Economics, Working paper 15/20

Devarajan S., Swaroop V., Zou H.F., The Composition of Public Expenditure and Economic Growth, *Journal of Monetary Economics*, 1996, 37, 313–344.

Dolar, V and Meh, C., 2002, “Financial Structure and Economic Growth: A Non-Technical Survey” Bank of Canada Working Paper No. 2002-24.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Fetahi-Vehapi, M., Sadiku, L., Petkovski, M., Empirical Analysis of the Effects of Trade Openness on Economic Growth: An Evidence for South East European Countries, *Procedia Economics and Finance* 19 (2015) 17 – 26

Fink, G., Haiss, P. Mantler, C., 2005, The Finance-Growth Nexus: Market Economies vs. Transition Countries, University of Economics and Business Administration Vienna, Working paper 64.

Fischer, S. 1993, “The Role of Macroeconomic Factors in Growth”, National Bureau of Economic Research (NBER) Working Paper, No. 4565

Fry, M., 1978, Money and Capital or Financial Deepening in Economic Development?, *Journal of Money, Credit, and Banking*, 10(4), pp. 464–475

Fry, M., Roi, R., 1995, “Monetary policy-making in Mauritius” Bank of Mauritius quarterly review; Vol 12, pp.11-16

Ghali K.H., 1998, Public Investment and Private Capital Formation in a Vector Errorcorrection Model of Growth, *Applied Economics*, 30, 837–844

Goldsmith, R.W., 1969, *Financial Structure and Development*, New Haven, CT: Yale University Press.

Greenwood, J and Jovanovic, B., 1990, Financial Development, Growth and the Distribution of Income, *Journal of Political Economy*, 98, pp. 1076-1107.

Gupta, K., 1984, *Finance and Economic Growth in Developing Countries*, London: Croom Helm

Guru, B., Yadav, I., 2019, "Financial development and economic growth: panel evidence from BRICS", *Journal of Economics, Finance and Administrative Science*, Vol. 24 Issue: 4

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Halicioğlu, F., 2007, The Financial Development and Economic Growth Nexus for Turkey, Economics and Econometrics Research Institute, Working paper no. 6/07

Hassan, I., Wachtel, P., Zhou, M., 2009, Institutional development, financial deepening and economic growth: evidence from China. *Journal of Banking & Finance* 33 (1), pp. 157–170.

Hassan, K., Sanchez, B., Yu, J., 2011, Financial development and economic growth: New evidence from panel data, *The Quarterly Review of Economics and Finance*, pp. 88-104.

Iheanacho, E., 2016, The Impact of Financial Development on Economic Growth in Nigeria: An ARDL Analysis, (Multidisciplinary Digital Publishing Institute), 7 November 2016.

Ismihan, M., Dinçergök, B., Cilasun M., 2010, Revisiting the finance–growth nexus: the Turkish case, 1980–2010, *Journal of Applied Economics*, pp. 1737-1750.

Jalil, A., Ma, Y., 2008, Financial Development and Economic Growth: Time Series Evidence from Pakistan and China, *Journal of Economic Cooperation*, 29(2), pp. 29-67.

Jalil, A., Abu, W. N., & Shahbaz, M., 2010, Financial Development and Growth: A Positive, Monotonic Relationship? Empirical Evidences from South Africa

Jankee, K., 2006, “Banking controls, financial deepening and economic growth in Mauritius”, *African Review of Money Finance and Banking Review of Money Finance and Banking* (2006), pp. 75-96

Jorda, O. & Schularick, M. & Taylor, A., 2016, "The great mortgaging: housing finance, crises and business cycles," *Economic Policy*, Volume 31, Issue 85, pp. 107 – 152.

Jun, S., 2012, Financial development and output growth: A panel study for Asian countries, *Journal of East Asian Economic Integration*, Volume 16, Number 1, pp. 97-115.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Jung, W.S., 1986, Financial development and economic growth: international evidence. *Economic Development and Cultural Change* 34: pp. 333–346.

Kagochi, J., Nasser, O., Kebede, E., 2013, Does financial development hold the key to economic growth? The case of Sub-Saharan Africa, *Journal of Developing Areas*, Volume 47, Number 2, pp. 61-79.

Keynes, J. M., 1930, *A Treatise on Money – The Pure Theory of Money*, *Collected Writings V*; Macmillan, 1971. First published in 1930

Khan, A., 2008, Financial Development and Economic Growth in Pakistan: Evidence Based on Autoregressive Distributed Lag Approach, *South Asia Economic Journal*, pp. 375-391.

Kharroubi, E., Kohlscheen, E., 2017, Consumption led expansions, *BIS Quarterly Review*, March 2017

King, R., Levine, R., 1993, Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108: pp. 717–737.

King, M., 2012, Twenty years of inflation targeting. The Stamp Memorial Lecture, London School of Economics, 9 October 2012.

Kuznets, S., 1955, International Differences in Capital Formation and Financing" in: *Capital Formation and Economic Growth*, pages 19-111, National Bureau of Economic Research, Inc.

Lach, L., 2010, Fixed capital and long run economic growth: evidence from Poland, MPRA paper, No. 52280

Landau, D. ,1983, Government Expenditure and Economic Growth: A Cross Country Study, *Southern Economic Journal*, 49 (3), pp. 783-792.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Law, H., Singh, N., 2014, Does too much finance harm economic growth? *Journal of Banking and Finance* 41, pp. 36-44.

Levine, R. Zervos S., 1998, Stock markets, banks and economic growth, *American Economic Review*, 88, pp. 537–58.

Levine, R., 2004, Finance and growth: theory and evidence, *Handbook of Economic Amsterdam*: Elsevier Science.

Liang, Q., Teng J.Z., 2006, Financial development and economic growth: evidence from China. *China Economic Review*, 17(4), pp. 395-411.

McKinnon, R., 1973, Money and capital in economic development, *Brookings Institution*, Washington DC

Minsky, H., 1986, *Stabilizing an Unstable Economy*, New Heaven: Yale University Press

Montiel, J P., 2003, *Macroeconomics in Emerging Markets*. Cambridge: Cambridge University Press.

Ndikumana, L., 2000, Financial determinants of domestic investment in sub-Saharan Africa: evidence from panel data. *World Development* 28 (2), pp. 381-400

Ndikumana, L., 2005, Financial development, financial structure, and domestic investment: International evidence, *Journal of International Money and Finance*, pp. 651-673

Ndlovu, G., 2013, Financial Sector Development and Economic Growth: Evidence from Zimbabwe, *International Journal of Economics and Financial Issues* Vol. 3, No. 2, pp. 435-446.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Nowbutsing, B., Ramsohok, S., Ramsohok, K., 2010, A Multivariate Analysis of Financial Development and Growth in Mauritius: New Evidence, *Global Journal of Human Social Science*, 10(1), pp. 2-13.

Nundlall, V. 2006, "Causality in Finance and Growth: The Case of a Small Open Economy, International Business School, Brandeis University Waltham

Nworji, D., Okwu, T., Obiwuru, T., Nworji, O. ,2012, The effects of public expenditure on economic growth in Nigeria, A disaggregated time series analysis, *International Journal of Management Sciences and Business Research*, 2012, Vol. 1, Issue 7

Oluitan, R.,2012, Financial Development and Economic Growth in Africa: Lessons and Prospects *Business and Economic Research* ISSN 2162-4860 2012, Vol. 2, No. 2

Ongo, E., Vukenkeng, A., 2014, "Does gross capital formation matter for economic growth in the CEMAC sub-region?, *Euro Economica*, Issue 2(33)/2014 ISSN: 1582-8859

Pagano, M., 1993, "Financial Markets and Growth: An Overview". *European Economic Review*, 37, pp. 613-622.

Pal, M., 2014, Finance-Growth Nexus in India: An Evidence from Co-integration & VECM, The Indian Econometric Society (TIES), Central University of Rajasthan, 2013. edition

Pesaran and Shin 1995, 'An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis', *DAE Working Papers*, 9514

Pesaran, H. Shin, Y. and Smith, R. 2001, 'Bound testing approaches to the analysis of level relationships', *Journal of Applied Econometrics*, 16, pp. 289-326

1 Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

2 Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Puatwoe, J., Piabuo, S., 2017, Financial sector development and economic growth: evidence from Cameroon, *Financial Innovation*, Springer; Southwestern University of Finance and Economics, vol. 3(1), pages 1-18, December

Quartey, P. 2010, "Price Stability and the growth maximizing rate of inflation for Ghana", *Modern Economy*, pp.180-194

Ram, R. 1999, 'Financial development and economic growth: additional evidence', *Journal of Development Studies*, 35(4): pp. 164–74.

Ray, S., 2013, Does Financial Development Promote Economic Growth in India? *International Journal of Economic Practices and Theories*, Vol. 3, No. 3, 2013

Reinhart, M., Rogoff, K. 2013, "Banking Crises: An Equal Opportunity Menace," *Journal of Banking & Finance* Vol. 37, November, pp. 4557–573.

Rodriguez, F. & Rodrik, D. "Trade policy and economic growth" A skeptic's guide to the cross national evidence, *NBER Macroeconomics Annual 2000*, Volume 15

Rodrik, D., 2008, "The real exchange rate and economic growth", *Brookings Paper on Economic Activity*, 39, 2, pp. 365-439

Romer, P., 1986, Increasing returns and long run growth, *Journal of Political Economy* vol. 94, No. 5 (Oct., 1986), pp. 1002-1037

Roubini, N. and X. Sala-i-Martin, 1992, "Financial repression and Economic Growth," *Journal of development Economics*, 39: pp. 5-30

Rousseau, P.L., Wachtel, P., 2002, Inflation thresholds and the finance-growth nexus. *Journal of International Money and Finance* 21, pp. 777–793.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za

Rousseau, P.L., Wachtel, P., 2011, What's happening to the impact of financial deepening on economic growth, *Economic Inquiry*, Vol. 49, No. 1, pp. 276-288, 2011

Sachs, J. D. and Warner, A. M. 1995 „Economic convergence and economic policies“, *Brookings Papers in Economic Activity*, (1), pp. 1–95.

Sahay, R., Cihak M., N'Diaye P., Barajas A., Bi R., Ayala D., Gao Y., Kyobe A., Nguyen L.,

Saborowski C., Svirydenka K., Yousefi R., 2015, “Rethinking Financial Deepening: Stability and Growth in Emerging Markets.” *IMF Working Paper*, 15/08.

Seetanah, B. 2008, Financial development and economic growth: An ARDL approach for the case of the small island state of Mauritius. *Appl. Econ. Lett.* 2008, 15, pp. 809–813.

Shan, J. 2005, Does financial development lead economic growth? A vector autoregression appraisal, *Applied Economics*, 37, pp. 1353-1367

Shaw, E S.,1973, *Financial Deepening in Economic Development*. New York: Oxford University Press.

Shen, C.H., Lee, C.C., 2006, Same financial development yet different economic growth – why? *Journal of Money, Credit and Banking* 38 (7), pp. 1907–194

Stiglitz, J., Weiss, A., 1981, Credit rationing in markets with imperfect information, *American Economic Review*, pp 393-410

Stiglitz, J., 1996, Some lessons from the East Asian Miracle, *The World Bank Research Observer* Vol. 11, No. 2 (Aug., 1996), pp. 151-177

Stiglitz, J., 2010, *Freefall: america, free markets, and the sinking of the world economy*. New York, Norton & Company.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail: meshach.aziakpono@usb.ac.za

Stiglitz, J., Greenwald, B., 2014, *Creating a learning society, A new approach to growth, development and social progress*, Columbia University Press, 2014.

Thaddeus, E., 1995, Long-term Contracts, Short-term Investment and Monitoring, *Review of Economic Studies*, 62(4), 557-575.

Trabelsi, M., 2002, *Finance and Growth: Empirical Evidence from Developing Countries, 1960–1990*. Chapter 13, Centre inter-universitaire de recherche en économie quantitative (CIREQ), Université de Montréal, and IHEC, Carthage, May 2002.

Turner, A., 2014, *“Between Debt and the Devil: Money, Credit, and Fixing Global Finance”* Princeton University Press.

Werner, R., 1992, *Towards a quantity theory of disaggregated credit and international capital flows*. Paper presented at the Royal Economic Society Annual Conference in York, April 1993

Zafar, A., 2011, “Mauritius: An Economic Success Story.” in *Yes Africa Can: Success Stories from a Dynamic Continent*. (eds. Chuhan-Pole, P. and M. Angwalo) World Bank Group: Washington D.C.

Zhang, K., 2003, “Does Financial Development Promote Economic Growth in the East Asia?” *China Journal of Finance*, 1(2), pp. 1-10.

¹ Ph.D. Student, University of Stellenbosch Business School, South Africa, Email: amitachameesing@gmail.com

² Professor of Development Finance, University of Stellenbosch Business School, P.O. Box 610, Bellville 7535, South Africa, Tel: +27 (021) 918 4261, E-mail:

meshach.aziakpono@usb.ac.za