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The dynamic relationship between financial development and economic growth: New evidence from Zimbabwe

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ABSTRACT

This study seeks to examine the causal relationship between financial development and economic growth in Zimbabwe, and it follows the works of Furqani and Mulyany (2009). Two models of financial development and economic growth are constructed for the Zimbabwean economy. Time series data is used; all variables are at their end period rates and are all in yearly frequencies. The data set stretches from the year 1965 to 2015, giving a total of 51 observations. According to the results, the direction of causality between these two variables is quite sensitive to the choice of measurement for financial development in Zimbabwe. In consideration of the result findings, the study concludes that the relationship between financial development and economic growth in Zimbabwe confirms the demand-following hypothesis and is through bank deposits. In essence, financial development in Zimbabwe does not automatically guarantee a boost in economic growth. Therefore, the study then suggests that the Zimbabwean government should gear its policies toward boosting its economic performance so as to strengthen and develop its financial sector in the process.

Keywords: Financial Development, Economic Growth, Zimbabwe, ARDL, Supply-leading hypothesis, Demand-following hypothesis, Toda and Yamamoto Granger Causality Analysis

1. INTRODUCTION

The long time pursuit for economic growth and development has triggered a lot of research and examination of various factors which may effectively catapult economies to an arena of economic wealth and better living standards. One of the many factors that have been highly emphasized since the past decades is financial development. Many countries have come to recognize that financial development may well be the main driving force for growth and development.

According to Financial Development Report (2011), financial development is defined as the factors, policies, and institutions that lead to effective financial intermediation and efficient markets, as well as deep and broad access to capital and financial services. Many scholars have conducted research on the relationship between financial development and economic growth on various economies and many of them have confirmed that financial development has a positive and significant effect on economic growth (supply-leading hypothesis). These scholars include the likes of Fritz (1984), Akinboade (1998) and Halicioglu (2007), only to mention a few.

In their research, they argue that financial development stimulates economic growth through technological advancement and intensive capital accumulation by delivering vital investment information, increasing the savings rate, allocating capital effectively, attracting foreign investments and pooling savings. They also further note that countries with more developed financial systems enjoy a sustained period of growth and reduction in poverty. Contrary, other studies argue that it is economic growth that stimulates financial development, thus confirming the demand-leading hypothesis (Kar and Pentecost, 2000; and Ang and McKibbin, 2007). They note that a boom in economic activities would spark a need for financial services, and then easy the improvement of the financial system.

In light of this on-going controversy over the financial development-economic growth nexus, and also as the main purpose of this research, this study seeks to examine the causal relationship between these two variables in Zimbabwe, and also to derive policy implications and recommendations based on the findings of this research that maybe useful for policy-making.

One might ask why this study is so important. Firstly, the fact is that, the poor economic performance of Zimbabwe has been widely explained by a number of elements such as; famine, drought and inflation. Nevertheless, it is also recognized that there are other internal explanations for this low economic growth, such as the dysfunctional nature of financial markets and institutions. Currently, investment levels remain low in the country and there is high capital flight, limiting efforts to diversify economic structures and boost economic growth. The financial sector is failing to provide services to the public and the real sector. The liquid cash reserves of many financial institutions are now virtually depleted and even banks are no longer able to pay out their depositors in cash (Reserve Bank of Zimbabwe, 2016). This has seen many key firms and institutions closing down due to lack of capital and this has kick-started massive unemployment in the country. Poverty and criminality have also set in as well as other shameful and indecorous activities as the citizens try to eke a living. This therefore gives rise to a question if financial sector development can restore order and stimulate growth in the Zimbabwean economy. That is, it is the gist of this study, to find if there is any causal relationship between economic growth and financial development.

Secondly, we are living in a highly dynamic world; economic conditions and policies change as well. The period of most of the studies in Zimbabwe is not recent. There is need to update the data taking into account changes in policies. That is, this study will use data from 1965 - 2015.

Thirdly, the methods used in existing studies suffer from many weaknesses; there are a lot of model mis-specifications, data problems, and wrong estimation techniques in these studies, which could result in unrealistic parameter estimates. Finally, the result findings of this study will aid Zimbabwean policy makers in knowing which variable to target when designing policies to improve economic growth and development. All of these reasons form a justification for conducting this research.

1.1 Background of Study: Zimbabwe's Financial Sector

Zimbabwe has five major agencies which regulate and supervise the financial system. There is the Ministry of Finance, the Reserve Bank, the Securities Exchange Commission, the Deposit Protection Board, and the Insurance and Pensions Commission. The Ministry of Finance is the overall supervisor of the Zimbabwean financial system; it oversees the whole system and delegates authority to the other four agencies. The Reserve Bank of Zimbabwe (RBZ) is responsible for the regulation and supervision of banks (Reserve Bank of Zimbabwe, 2016).

Since the 1980, the year Zimbabwe got its independence, the country has been experiencing booms and slumps in economic activity associated with a series of financial crises. Soon after independence, the new government that took over embarked on various financial sector reforms. This involved the conversion and creation of new government-owned banks such as Zimbank, and Central Bank of Zimbabwe only to mention a few; as well as the use of a wide variety of instruments intended to alter the direction of bank lending and to increase the supply of long-term finance (Makoni, 2010). The results of such actions were frequently perverse, even in terms of their own objectives, and this bred massive bad debts and insolvency. This made it very complex to achieve the objectives of financial liberalization which were widely adopted as part of structural adjustment programmes in the 1980s and 1990s (Harvey, 1991).

In detail, what occurred is during the 1990s the Zimbabwean government, at the behest of multilateral lenders embarked on an Economic and Structural Adjustment Programme (ESAP). As part of this programme, the Reserve Bank of Zimbabwe (RBZ) started advocating for financial reforms through liberalization and deregulation so as to remove the oligopoly nature in the banking system which had been set after independence; to increase competition in the financial sector; and improve quality in service, innovation and efficiency. Consequently, the Ministry of Finance started issuing licenses to new players as the financial sector opened up. From the mid-1990s to around 2003, there was a flurry of entrepreneurial activity in the financial sector as indigenous owned banks were set up (Reserve Bank of Zimbabwe, 2005).

- **Financial Widening**

The Zimbabwean financial sector has evolved from a relatively shallow regime consisting of a few players operating under a highly regulated environment into a well-diversified and developed sector. Economic reforms introduced in the early 1990's resulted in the relaxation of regulatory controls and triggered the influx of new players and prompted increased competition in the financial sector (Reserve Bank of Zimbabwe, 2005). Although the Zimbabwean financial sector enjoyed relatively optimal growth in the 1990's and during the early new millennium, the sector experienced liquidity and solvency challenges in the last quarter of 2003 which were under-pinned by corporate governance deficiencies. The situation over spilled into the year 2004, which became one of the most eventful years in Zimbabwe's financial services history as financial instability had taken root in the economy since 2003. The turbulent financial environment presented the RBZ with supervisory and regulatory challenges to instill stability in the financial sector. Strengthened supervisory measures were identified and implemented.

In this regard, The Troubled Bank Resolution Framework was implemented to effectively resolve challenges at troubled institutions and formed a commercial bank called ZABG (Zimbabwe Allied Banking Group), after the troubled banks were merged together.

Despite the measures taken during the period, the 2005 to 2008 was the toughest period due to the hyperinflation that set in. The inflation rate grew uncontrollably registering higher figures each day coming. Policies during that time were merely management by crisis based. A lot of currency reforms were done during the period dominated by cancelling of zeroes when issuing new denominations, but it proved useless (Makochekeanwa, 2007). According to Noko (2011), the Zimbabwean dollar had deteriorated to the point where the cost of issuing it in the form of regular notes and coins was greater than its face value, resulting in the government issuing the Zimbabwean dollar by way of time-limited-bearer checks on lower quality paper, with very high denominations.

Since that period, a lot of financial institutions have been closing down, and as of to date, the banking sector is only left with 14 operating commercial banks, 4 building societies, and 168 microfinance institutions. However, despite this, the major role of the financial sector with all its players continues to be the foundation of industrial and economic development of the country through the distribution of financial resources from financial surplus sources to financial deficit destinations (Reserve Bank of Zimbabwe, 2016).

- **Financial Deepening or Financial Sector Growth**

Financial deepening is generally defined as the increased provision of financial services with a wider choice of services geared to all levels of society. In essence, it means an increased ratio of money supply to GDP. The more liquid money is available in an economy, the more opportunities exist for continued growth. Two commonly used indicators of financial development in literature will be discussed below; which are the (i) Total Bank Deposit Liabilities expressed as a percentage of GDP, and (ii) Bank Financing (domestic credit to private sector as a percentage of GDP), so as to try and explore the financial development trend in the Zimbabwean economy.

- (i) **Total Bank Deposit Liabilities**

Generally, bank deposits consist of all money placed into banking institutions for safekeeping. This financial development indicator is a more direct measure of financial intermediation. The diagram that follows shows the trends and changes of total bank deposit liabilities as a percentage of GDP in Zimbabwe from 1960 to 2015.

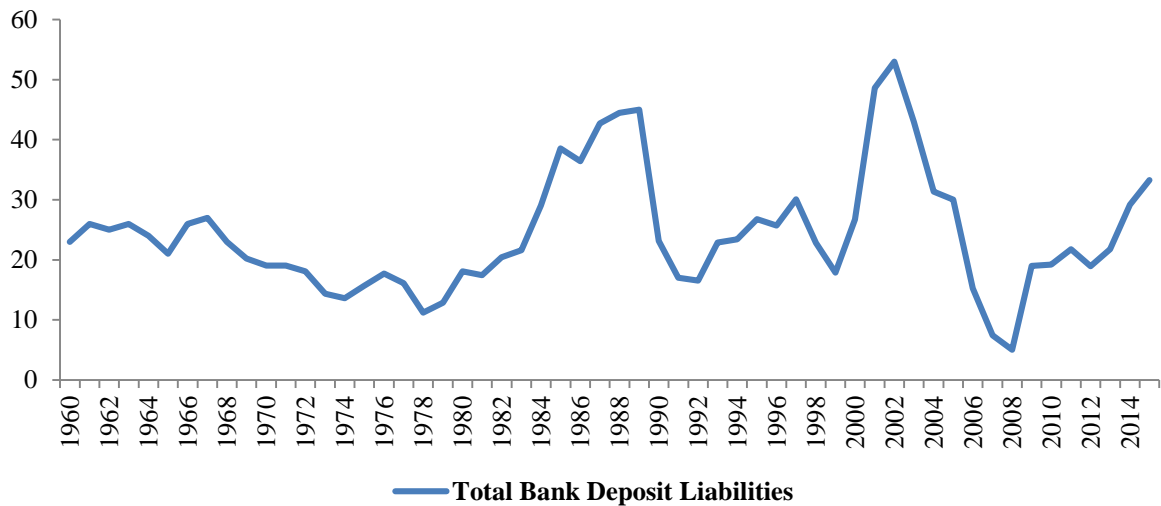


Figure 1: Trends and changes of Total Bank Deposit Liabilities expressed as a percentage of GDP in Zimbabwe from 1960 to 2015.

Source: World Bank Indicators (2016) and ZimStats (2016)

A steady decline in the percentage of total bank deposit liabilities can be seen from 1960 to around 1979; this was during the liberation struggle period. An increase in the percentage of total bank deposit liabilities is realized from 1980 (after independence war) to around 1989 before declining, reaching approximately 19% in 1999. A peak of approximately 53% is seen in 2002 as a result of good governance and entry of foreign banks into the financial system which took place after the uplifting of sanctions which were previously imposed on the colonial government (Noko, 2011). A sharp decline is shown after 2002 up to 2008, owing to the hyperinflation, and an improvement in the percentage of total deposit liabilities is also realized from 2009 (dollarization period) going forth.

(ii) Bank Financing

Banks’ financing refers to the amount of credit availed by the banks into the economy, and this may be credit availed to the private sector or households. However, in this case, the study will concentrate more on the financial resources channeled to the private sector. Although fluctuating, domestic credit to the private sector has been averagely ranging between 15% and 20%.

A highest peak of around 85% was achieved in 2002 as shown on the diagram below. This was during the ESAP period which ushered a favorable environment and encouraged investment in the country.

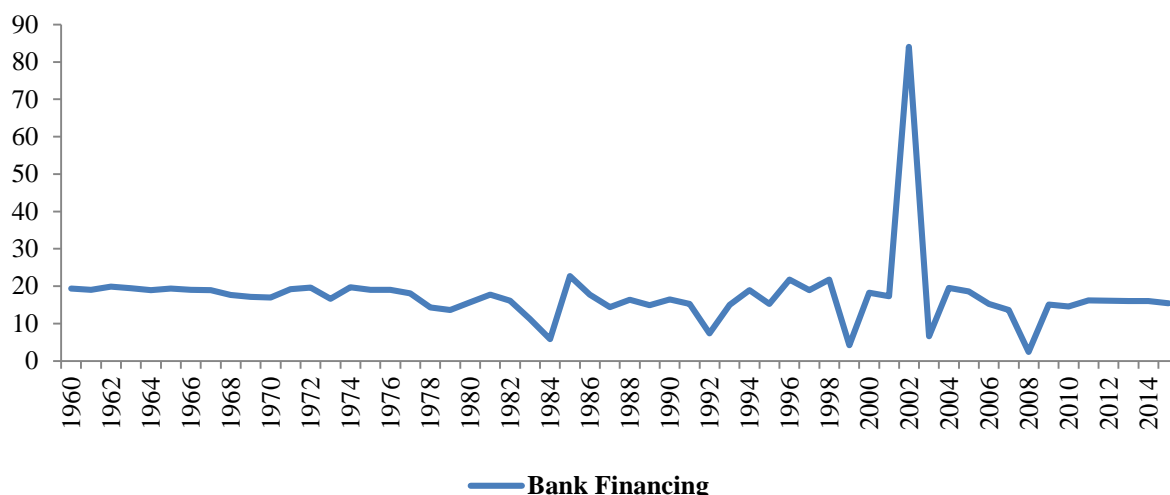


Figure 2: Trends and changes of domestic credit to private sector as a percentage of GDP in Zimbabwe from 1960 to 2015.
 Source: World Bank Indicators (2016) and ZimStats (2016)

Low domestic credit percentages were realized during the drought and inflationary years such as 1984, 1992, 1999, 2003 and 2008. From 2009 going forth, the country was characterized by a fair increase and stability in the credit availed to the private sector. This may have resulted from the dollarization regime which was adopted by the Zimbabwean government starting the year 2009.

Based on the above analysis of the financial sector background and performance, it can be seen that financial development in Zimbabwe has been full of fluctuations triggered by various economic, social and natural causes.

1.2 Zimbabwe Economic Growth

The evolution of economic growth in Zimbabwe has changed since the 1960s and macro-economic policies have changed over time giving rise to a rough business cycle which can be classified into four distinct phases.

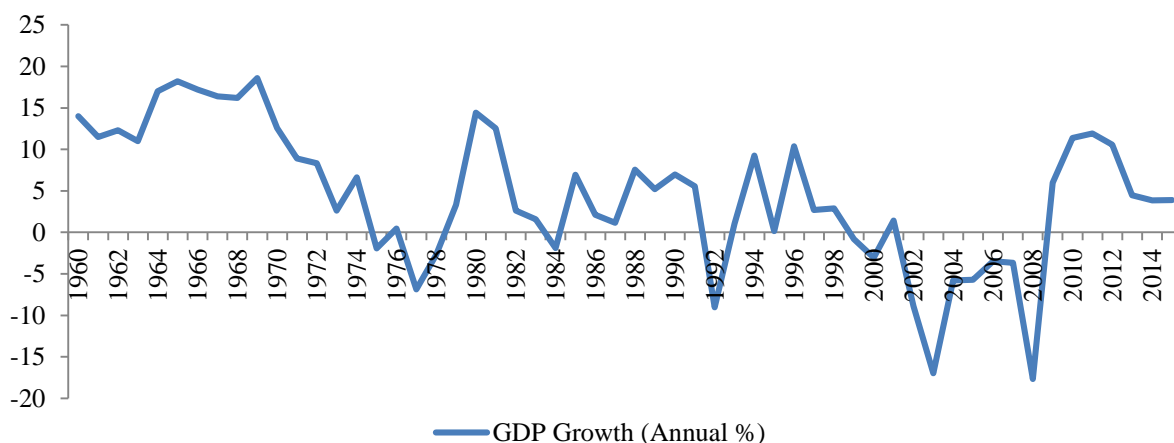


Figure 3: Zimbabwe GDP Annual percentage growth rate from 1960 to 2015.
 Source: World Bank Indicators (2016) and ZimStats (2016)

1960-1970s Phase: This phase was characterized by the independence war and imposition of sanctions on the country (Kurebwa, 2012). This saw a dramatically decrease of economic growth to about -0.7% by the year 1977.

1980-1998 Phase: The 1980 independence gave birth to an increase in economic growth, reaching a peak of approximately 14% in 1980. The newly elected government after independence adopted a highly controlled and inward looking economy that heavily depended on FDI (70%) on the promotion of economic growth (Clarke, 1980). A lot of incentives such as, tax holidays and tariff exemptions were offered to encourage foreign capital investments, technological transfer, utilization of local raw materials, and the use of labor intensive production techniques. Furthermore, the previously imposed economic sanctions which had been haunting the economy during the 1970s were latter uplifted, better fiscal policies started being embraced in the economy, and also external markets began to open up (IMF, 1998). All these positive strides triggered economic growth during the period, although in some of the years like 1984-1985; and 1992 negative growth rates can be seen. This is due to serious droughts that hit the major sectors of the economy, for example, the agricultural sector.

1999-2008 Phase: This phase was composed of economic mismanagement, capital flight, poor land reform practices, loss of support from the international community, low levels of domestic and foreign direct investment, and hyperinflation. The inflation rate increased exponentially, reaching triple figures by the end 2006. It was even fueled further by the increase of money supply into the economy by the Central Bank. The cumulative occurrence of droughts since 2002 did not only entrench poverty but also forced a lot of investors who had put funds in the agricultural sector to pool out (Nangombe, 2014). This explains the decrease in economic growth rate during the phase as highlighted on the above figure. The situation was further aggravated by the imposition of economic sanctions against Zimbabwe, which later precipitated negative perceptions about Zimbabwe, making it extremely complex for the private and public enterprises to secure funding.

Between the period 1980 to 1999, Zimbabwe enjoyed vast amounts of financial assistance from international institutions such as the AfDB, IMF and World Bank, but by 2001 all these institutions had pulled back their support on Zimbabwe. For example, IMF stopped supporting Zimbabwe by way of BoP support in 1999, the World Bank in 2001, and AfDB in 1998. During this period, Zimbabwe was classified as a very risky investment area, and this saw foreign direct investment and economic growth declining (Reserve Bank of Zimbabwe, 2006).

2009 going forth Phase: This is generally referred to as the dollarization era. Beginning of 2009, the Zimbabwean government adopted the dollarization regime to cool down the economy from the effects of the hyperinflation that had melted the whole economy. This saw some positive changes in the economy; the inflation rate decreased to a single digit figure ranging between 3.1% and 3.5% between the year 2010 and 2012.

The severe economic problems which had hampered FDI inflows came to a halt and this revamped the investment confidence level; and this set economic growth on an incremental path (ZimStat, 2013). Overall, the economic growth of Zimbabwe has been fluctuating throughout the period under review. Natural disasters, sanctions, and capital flight contributed much to the negative growth rates.

2. LITERATURE REVIEW

2.1 Theoretical Framework

- **Supply-leading Hypothesis**

These are views which believe that financial development causes economic growth. One of the earliest scholars to write on this issue was Bagehot (1873) in his book *Lombard Street: A Description of the Money Market*. At the height of British industrial power, he asserted that what separated England from all countries was the ability of its financial markets to mobilize savings to finance immense works. Bagehot was the first to define the two primary roles of financial markets: (1) facilitating the accumulation of capital, and (2) managing risk inherent in particular investment projects and industries. Later, other scholars like Schumpeter (1911), McKinnon (1973); Shaw (1973); and King and Levine (1993) to name just a few, followed the same path. They argue that financial development affects economic growth through technological changes (Schumpeter, 1911); through mobilizing savings and channeling them into profitable large-scale investments (McKinnon and Shaw, 1973); and through diversifying portfolios, reducing information costs, monitoring borrowers, and encouraging specialization (King and Levine, 1993).

- **Demand-following Hypothesis**

These are views which believe that economic growth causes financial development. This view is stressed much in the works of Robinson (1952), and Friedman and Schwartz (1963) which assert that as an economy grows, more financial institutions, financial products and services emerge in markets in response to a higher demand for financial services. Others scholars like Adams (1819) and Hicks (1969) are also convinced that financial development follows economic growth.

2.2 Empirical Literature Review

Table 1: Summary of Empirical Results on Financial Development and Economic Growth Relationship

Author(s)	Data	Country	Method	Results
Fritz (1984)	TS	Philippines (1969 – 1981)	Granger Causality Analysis	A bi-directional causality running from financial development to economic growth
Akinboade (1998)	TS	Botswana (1972 – 1995)	Cointegration Approach, ECM	Bi-directional causality exists
Wang (1999)	TS	Taiwan (1961 – 1999)	Marginal Spill-over method	Financial development granger causes economic growth
Kar and Pentecost (2000)	TS	Turkey (1963 – 1995)	VAR	Economic growth stimulates financial development
Suleiman and Quan (2005)	TS	Egypt (1960 – 2001)	Granger causality, Cointegration, VECM	Financial development has a positive and significant effect on economic growth
Hinaunye (2007)	TS	Botswana (1977 – 2005)	VAR	Financial development granger causes economic growth

Ang and McKibbin (2007)	TS	Malaysia (1960 – 2001)	Cointegration, Causality Analysis	Economic growth leads to financial development in the long-run
Halicioğlu (2007)	TS	Turkey (1968 – 2005)	Cointegration Approach	Unidirectional causation running from financial development to economic growth
Furqani and Mulyany (2009)	TS	Malaysia (1997 – 2005)	Cointegration, VECM	No evidence to explain the relationship
Al-Qudah (2016)	TS	Jordan (1993 – 2014)	Cointegration, VAR, VECM	A bi-directional causality and long-run relationship between the two variables was found
Iheanacho (2016)	TS	Nigeria (1981 – 2011)	Cointegration Approach	A negative and insignificant relationship was found in both short-run and long-run
Demetriades and Hussein (1996)	Panel	16 developing countries	ECM, VAR	Little support was found to support that financial development granger causes economic growth
Thornton (1996)	TS	22 developing countries (1960 – 1990)	Granger causality	Mixed results
Xu (2000)	Panel	41 developed and developing countries (1960 – 1993)	VAR	found strong evidence that financial development is an important stimuli of economic growth
Deidda and Fattouh (2002)	Panel	119 Developing countries (1960 – 1989)	Granger Causality	A positive and significant relationship between financial development and economic growth
Yousif (2002)	Panel	30 developing countries (1970 - 1999)	VAR	A bi-directional causality between financial development and economic growth
Ghirmay (2004)	Panel	13 Sub-Saharan African countries	VAR	Mixed results
Rault (2014)	TS	10 new EU members (1994 – 2007)	Dynamic panel model	Financial development is not statistically significant
Abida <i>et al.</i> , (2015)	Panel	Tunisia, Morocco, and Egypt (1980 – 2012)	Generalized Method of Moment	Strong positive link between financial development and economic growth was found

Notes: TS – Time Series; VAR – Vector Autoregression Model; VECM – Vector Error Correction Model

Despite the voluminous research carried out to test the financial development and economic growth relationship, there seems to be no consensus even for a single country. In addition to the efforts made by previous research, this study makes the following contributions; firstly, most of the research on this area has mostly been limited to developed countries, Asia, Europe, Northern and Western Africa as shown above. Not much research has been done on the Southern Africa region, thus, the paper will close this research gap by critically evaluating the relationship between these two variables in Zimbabwe. Secondly, the study will attempt to improve the quality of the results by using the most recent and advanced econometric models such as cointegration analysis and, Toda and Yamamoto Granger causality test. In recent years,

no studies have used these abovementioned models in investigating the relationship between these two variables in Zimbabwe.

Furthermore, employing such models helps to capture the endogeneity effect between the variables and this will provide a more real insight of the economy and more efficient model estimates than previous studies. Lastly, this study is different from all previous studies like for example, the study of Ndlovu (2013) which have tried to examine this relationship in Zimbabwe, in methodology and analysis. It covers all significant periods which the economy has transversed, that is; the Pre-Independence Period (before 1980 independence), the Post-Independence period (1980-2006), the Hyperinflationary Period (2007-2008) and the Dollarization Period (2009 going forth).

3. DATA AND METHODOLOGY

3.1 Model Specification

This study follows the works of Furqani and Mulyany (2009), and it constructs the following two models of financial development and economic growth for the Zimbabwean economy:

Financing Model

$$\ln RGDP_t = \alpha_0 + \alpha_1 \ln FINC_t + \varepsilon_t \quad [1]$$

$$\ln FINC_t = \beta_0 + \beta_1 \ln RGDP_t + \varepsilon_t$$

Deposit Model

$$\ln RGDP_t = \delta_0 + \delta_1 \ln DEPT_t + \varepsilon_t \quad [2]$$

$$\ln DEPT_t = \gamma_0 + \gamma_1 \ln RGDP_t + \varepsilon_t$$

Where **lnRGDP** represents economic growth measured using Real Gross Domestic Product per capita, **lnDEPT** is the ratio of Bank Deposit Liabilities to Nominal National Income, which is a more direct measure of financial intermediation, and **lnFINC** is the ratio of banks' financing (to the private sector or to households) to Nominal National Income, which is another competing alternative of financial deepening. An increase in the ratios may indicate a situation of a more financial deepening. ε is an error term which captures all other factors excluded from the model.

3.2 Data Sources

Time series data on all the variables is used in this study and is collected for the Zimbabwe economy from the World Bank Statistics, Reserve Bank of Zimbabwe Reports and International Monetary Fund. This kind of data is preferable mainly because it is easily accessible and time saving, but on the other hand, it may be plagued with errors of data collection measurements. All variables are at their end period rates and are all in yearly frequencies. The data set stretches from the year 1965 to 2015, giving a total of 51 observations. E-views 9 is employed to estimate the model.

3.3 Estimation Procedure

- **Unit Root Test**

Before estimating a model, its adequacy is evaluated before it can be used for forecasting and other purposes. One of the tests carried out in this study is the unit root test. The Augmented Dickey Fuller test is employed to test for stationarity and is as follows:

$$\Delta \ln \mathbf{RGDP}_t = \omega_0 + \omega_1 \ln \mathbf{RGDP}_{t-1} + \theta t + \sum \omega_2 \Delta \ln \mathbf{RGDP}_{t-i} + \mu_t \quad [3]$$

Where the lagged difference term of the series, $\sum \omega_2 \Delta \ln \mathbf{RGDP}_{t-i}$ takes care of possible autocorrelation in the residuals. The ω_0 and θt represent the deterministic and the trend in the data generating processes.

The number of augmented lags is determined by minimizing the Schwartz Information Criterion (SC). Alternatively, the lag is determined by the starting at sufficiently large enough lags and dropping until the last lag is statistically significant.

The ADF is left-skewed and hence the hypothesis

$$\mathbf{H}_0: \omega_1 = 0 \text{ (unit root)} \quad \mathbf{H}_0: \omega_1 < 0 \text{ (stationary)}$$

Once a series is found to have a unit root in the levels, it is made stationary by differencing. However, to establish the correct data generating process, the \mathbf{H}_0 is constructed under three null hypotheses: (1) with drift and deterministic trend as shown above, (2) with only drift, or (3) without drift and deterministic trend.

- **Cointegration Test**

Once the series is found to be non-stationary, then a cointegration analysis should be performed to verify if the series have any long-term relationship among them. This analysis is based on the assumption that long-run structure of non-stationary series can be stationary (Gujarati and Porter, 2009). In this study, the Autoregressive Distributed Lag (ARDL) approach is applied. This testing technique has received greater emphasis since couple of years back due to its ability to return both short-run and long-run multipliers, and its ability to estimate both I(0) and I(1) series in the same model (Pesaran *et al.*, 2001). The ARDL specification of the unrestricted error correction model for our finance-growth nexus is presented below.

Financing Model

$$\Delta \ln \mathbf{RGDP}_t = a_0 + a_1 \ln \mathbf{RGDP}_{t-1} + a_2 \ln \mathbf{FINC}_{t-1} + \sum a_{3i} \Delta \ln \mathbf{RGDP}_{t-i} + \sum a_{4i} \Delta \ln \mathbf{FINC}_{t-i} + \mu_t$$

$$\Delta \ln \mathbf{FINC}_t = b_0 + b_1 \ln \mathbf{FINC}_{t-1} + b_2 \ln \mathbf{RGDP}_{t-1} + \sum b_{3i} \Delta \ln \mathbf{FINC}_{t-i} + \sum b_{4i} \Delta \ln \mathbf{RGDP}_{t-i} + \psi_t \quad [4]$$

Deposit Model

$$\Delta \ln \mathbf{RGDP}_t = c_0 + c_1 \ln \mathbf{RGDP}_{t-1} + c_2 \ln \mathbf{DEPT}_{t-1} + \sum c_{3i} \Delta \ln \mathbf{RGDP}_{t-i} + \sum c_{4i} \Delta \ln \mathbf{DEPT}_{t-i} + \omega_t$$

$$\Delta \ln \mathbf{DEPT}_t = d_0 + d_1 \ln \mathbf{DEPT}_{t-1} + d_2 \ln \mathbf{RGDP}_{t-1} + \sum d_{3i} \Delta \ln \mathbf{DEPT}_{t-i} + \sum d_{4i} \Delta \ln \mathbf{RGDP}_{t-i} + \varphi_t \quad [5]$$

Consequently, the above equations are estimated by OLS method and the test for long-run cointegration is carried out by conducting a joint F-test of significance on the coefficients of the lagged level variables. The computed F-statistics are then compared to the critical lower and upper bound values. The decision rule is that if the F-statistics exceed the critical upper bound value, then the null hypothesis of no cointegration is rejected; if the F-statistics is below the critical lower value, then the null hypothesis of no cointegration is accepted; but if the F-statistics falls between the critical lower and upper values, then knowledge of the order of integration is required or else it is inconclusive (Pesaran *et al.*, 2001).

- **Granger Causality Analysis**

Toda and Yamamoto (1995) proposed an interesting yet simple procedure requiring the estimation of an augmented VAR which guarantees the asymptotic distribution of the Wald statistic (an asymptotic χ^2 -distribution), since the testing procedure is robust to the integration and cointegration properties of the process. This model avoids the problems associated with the ordinary Granger causality test by ignoring any possible non-stationary or cointegration between series when testing for causality. The Toda and Yamamoto (1995) approach fits a standard VAR model in the levels of the variables (rather than first differences, as the case with Granger causality tests) thereby minimising the risks associated with the possibility of wrongly identifying the order of integration of the series (Mavrotas and Kely, 2001).

Two steps are involved with implementing the procedure. The first step includes the determination of the lag length (k) and the second one is the selection of the maximum order of integration ($dmax$) for the variables in the system. Measures such as the Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), Final Prediction Error (FPE) and Hannan-Quinn (HQ) Information Criterion can be used to determine the appropriate lag order of the VAR. Once this is done, a $(k+dmax)$ th order of VAR is estimated and the coefficients of the last lagged $dmax$ vector are ignored. A bivariate VAR $(k+dmax)$ comprising of economic growth and financial development variables, following Yamada (1998) is specified below;

$$Y_t = \omega + \sum_{i=1}^k \theta_i Y_{t-i} + \sum_{i=k+1}^{k+dmax} \theta_i Y_{t-i} + \sum_{i=1}^k \delta_i X_{t-i} + \sum_{i=k+1}^{k+dmax} \delta_i X_{t-i} + v_{1t} \quad [6]$$

$$X_t = \psi + \sum_{i=1}^k \phi_i X_{t-i} + \sum_{i=k+1}^{k+dmax} \phi_i X_{t-i} + \sum_{i=1}^k \beta_i Y_{t-i} + \sum_{i=k+1}^{k+dmax} \beta_i Y_{t-i} + v_{2t} \quad [7]$$

Where \mathbf{Y} = Economic Growth variable and \mathbf{X} = Financial Development variable, and ω , θ 's, δ 's, ψ , ϕ 's and β 's are parameters of the model. $dmax$ is the maximum order of integration suspected to occur in the system; $v_{1t} \sim N(0, \Sigma_{V1})$ and $v_{2t} \sim N(0, \Sigma_{V2})$ are the residuals of the model and Σ_{V1} and Σ_{V2} are the covariance matrices of v_{1t} and v_{2t} , respectively. The null of non-causality from financial development to economic growth can be expressed as $H_0: \delta_i = 0, \forall i=1, 2, \dots, k$.

4. EMPIRICAL RESULTS

4.1 Descriptive Statistics

Table 2: Descriptive Statistics Results

	Economic Growth lnRGDP	Bank Financing lnFINC	Bank Deposits lnDEPT
Mean	3.814587	1.965510	1.774885
Median	3.811784	1.899754	1.768137
Maximum	3.882133	2.204459	1.907411
Minimum	3.733033	1.745075	1.658011
Std. Dev.	0.038442	0.153517	0.060460
Skewness	0.165793	0.184879	0.518812
Kurtosis	2.292074	1.372991	2.625871

From the descriptive table results above it can be seen that all variables' distributions are positively skewed. This is evidenced by positive Skewness values. As a rule of thumb, when a distribution is symmetric, the mean = median, when the distribution is positively skewed the mean > median and when the distribution is negatively skewed the mean < median.

The other feature worth noting from the above results is the peakedness of the distributions. This is measured by the kurtosis statistic. Positive kurtosis indicates a relatively peaked distribution. Negative kurtosis indicates a relatively flat distribution. Applying the same rule of kurtosis, all of the above distributions are relatively peaked. This is shown by the positive kurtosis values.

4.2 Unit Root Test Results

The other main reason for conducting unit root test in this study is to determine the extra lags to be added to the vector autoregressive (VAR) model for the Toda and Yamamoto Granger causality test.

Table 3: Augmented Dickey-Fuller Unit Root Test

Variable	ADF Statistic	Critical Values	P-value	Order of Integration
Economic Growth lnRGDP	-4.365782***	1% -3.571310 5% -2.922449 10% -2.599224	0.0	I(1)
Bank Financing lnFINC	-6.750841***	1% -3.581152 5% -2.926622 10% -2.601424	0.0	I(1)
Total Deposits lnDEPT	-5.767617***	1% -3.571310 5% -2.922449 10% -2.599224	0.0	I(1)

Source: Eviews 9

Notes: *** denotes the significance at 1%, 5% and 10%, level

Based on the unit roots test, all variables were non-stationary at levels and were made stationary by differencing I(1). This stationarity is now confirmed the significant p-values and ADF statistic values which are now greater than critical values (in absolute terms).

4.3 ANALYSIS OF THE FINANCING MODEL

- **Cointegration Analysis: ARDL Approach**

Table 4: Cointegration Results

k	F-statistic	Lower Limit*	Upper Limit*
1	2.504573	3.62	4.16

Source: Eviews 9

*Pesaran et al, (2001): Critical values are selected for a significance level of 5%.

According to the above table results, it can be seen that there is no cointegration, that is, there is no long-run relationship among the series. This is evidenced by the F-statistic value (2.50) which is below the lower bound limit (3.62).

- **Lag Determination**

For the purpose of making sure that the error term is white noise, it is necessary to determine the appropriate lag length which is optimal for deducing the causality results. In model specification, if too few lags are included, the size of the test varies in an unknown way, and, if too many lags are included, the power of the test is reduced (Pesaran, 2001). As a result, in this study the optimal lag length k is determined by using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SC). The AIC and SC suggest that the appropriate lag length is arrived when the AIC and SC are lowest.

Table 5: Lag Determination Results

Lag	Akaike Information Criterion	Schwarz Information Criterion
0	-4.911709	-4.828963
1	-10.68321*	-10.43498*
2	-10.62879	-10.21506
3	-10.55059	-9.971366
4	-10.43774	-9.693020

Source: Eviews 9

Notes: * indicates lag order selected by the criterion

The above table reports the optimal lag length of 1 out of a maximum of 4 lag lengths as selected by Schwarz Information Criterion (SC) and Akaike Information Criterion (AIC).

- **Toda and Yamamoto Granger Causality Test**

Table 6: Granger Causality Test Results

Null Hypothesis	Chi²	P-value	Decision
lnFINC does not granger cause lnRGDP	1.11	0.29	Do not reject
lnRGDP does not granger cause lnFINC	0.03	0.86	Do not reject

Source: E-views 9

Based on the results, it can be seen that there is no granger causality between Bank Financing (**lnFINC**) and Economic Growth (**lnRGDP**). This is confirmed by p-values of more than 0.05. Therefore, we do not reject the null hypothesis. That is, bank financing is not a significant driver of economic growth in the economy of Zimbabwe.

4.4 ANALYSIS OF THE DEPOSITS MODEL

- **Cointegration Analysis: ARDL Approach**

Table 7: Cointegration Results

k	F-statistic	Lower Limit*	Upper Limit*
1	4.194051	3.62	4.16

Source: E-views 9

*Peseran et al, (2001): Critical values are selected for a significance level of 5%.

Based on the above results, it can be seen that there is long-run relationship among the series. This is evidenced by the F-statistic value (4.19) which exceeds the upper bound limit (4.16).

- **Lag Determination**

Table 8: Lag Determination Results

Lag	Akaike Information Criterion	Schwarz Information Criterion
0	-7.609074	-7.530344
1	-11.50883	-11.27264
2	-11.69613*	-11.30248*
3	-11.57148	-11.02037
4	-11.53877	-10.83020

Source: E-views 9

Notes: *denotes the optimal lag length

Looking at the above table, the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SC) suggest a maximum lag of 2.

- **Toda and Yamamoto Granger Causality Test Results**

Table 9: Granger Causality Results

Null Hypothesis	Chi²	P-value	Decision
lnDEPT does not granger cause lnRGDP	2.48	0.29	Do not reject
lnRGDP does not granger cause lnDEPT	9.27	0.01	Reject

Source: E-views 9

A unidirectional causal relationship is shown on the above table running from economic growth (**lnRGDP**) to bank deposits (**lnDEPT**). That is, as far as the Deposits Model is concerned, the relationship between financial development and economic growth in Zimbabwe is a demand-following one. These results are supported by Robinson (1952), Friedman and Schwartz (1963), among other demand following theories.

5. CONCLUSIONS

The empirical results show that the direction of causality between these two variables is quite sensitive to the choice of measurement for financial development in Zimbabwe. For example, when bank financing (the ratio of credit to private sector to GDP) is used, no causality is found between the two, but when the ratio of bank deposits to GDP is alternatively used, the causality runs from economic growth to financial development. In consideration of these results, the study concludes that the relationship between financial development and economic growth in Zimbabwe confirms the demand-following hypothesis and is through bank deposits. In essence, financial development in Zimbabwe does not automatically guarantee a boost in economic growth.

The insignificance of financial development in stimulating economic growth in Zimbabwe maybe attributed to a lot of reasons. Firstly, it may be due to the lack of collateral security by many individuals which makes it complex to for them to secure loans from banks no matter how much banks are willing to lend. Secondly, the hostile economic environment currently obtaining in Zimbabwe has hampered investment plans of many people. People no longer borrow from banks to invest because the environment is no longer conducive. Thirdly, liquidity crunches as well as the increase in the vulnerability of the banks in Zimbabwe have weakened the availing of credit. Overall, the financial system of Zimbabwe is not well-developed to stimulate the real sector.

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