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# **Impact of Financial Systems Development on Macroeconomic Stability in Zimbabwe**

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## **Abstract**

The study assessed the relationship between financial development and macroeconomic stability. Macroeconomic stability was measured by the 5-year standard deviation of economic growth while financial system development was measured by a financial system development index and three traditional measures of financial development namely: private credit to GDP, total deposits to GDP and stock market capitalisation to GDP. Using an Autoregressive Distributed Lag (ARDL) bound test technique and data covering the period 1980-2019, the results suggest that improvements in financial development as measured by the financial development index has significant impact on macroeconomic stability in both the long and short run. The improvement in financial development significantly reduces standard deviation of economic growth, thus enhancing macroeconomic stability. The policy implication is that it is important to promote efficiency and intermediary role of the financial sector in order to support robust macroeconomic stability in Zimbabwe.

**Key words: Financial development, Macroeconomic stability**

**JEL Classification: E44, E511 & G21**

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## **I. Introduction**

The relationship between financial development and macroeconomic stability has been topical since the work of Schumpeter in 1911. A well-functioning financial system supports sustainable economic growth which is critical for macroeconomic stability. The importance of an orderly financial system on macroeconomic stability gained renewed policy focus following the global financial crisis in 2008. As such since 2008, several papers have emerged challenging the earlier conventional wisdom indicating a positive link between financial development and macroeconomic stability.

A substantial body of empirical work has shown a strong relationship between financial development and macroeconomic stability (Schumpeter, 1911; Goldsmith, 1969; Levine, 1997; McKinnon, 1973). The studies have taken different dimensions including assessing the impact of the entire financial system on macroeconomic stability or only certain components of the financial systems such as banks and stock markets. Theoretically, a well-developed and efficient financial system can support economic stability by providing payment services and reducing transaction costs, pooling savings, thus helping overcome investment indivisibilities, economising on screening and monitoring costs, reducing liquidity risk and assisting in diversifying cross-sectional and inter-temporal risk.

Theory has, however, not been unambiguous regarding the impact of finance on macroeconomic stability. Bencivenga & Smith (1991) argues that in enhancing efficiency in deposit and lending services a robust financial system can depress aggregate savings, thereby negatively affecting investment and growth and hurting long term macroeconomic stability. Bolton, et al., (2016) also contend that a more developed financial system might draw young talent away from the real sector impacting negatively on macroeconomic stability. Importantly, recent studies have shown that there is a non-linearity in the relationship between financial sector development and macroeconomic stability (Cecchetti & Kharroubi, 2015).

Given the renewed and heightened interest on the financial sector development – macroeconomic stability nexus and the ambiguous theoretical and empirical relationship between the two, the objective of this study is to provide empirical evidence on the impact of financial sector development on macroeconomic stability in Zimbabwe. The evidence is critical for developing policies to support macroeconomic stability in the country and the COMESA region, in general. Importantly, the study is critical as the country and the region have witnessed new developments in the financial sector spurred by improvements in information communication and technology (ICT) including digital payment systems, mobile money and other new financial products.

The rest of the paper is organized as follows. Section II discusses evolution of the financial sector and implications for macroeconomic stability while section III provides the literature review. Sections IV focuses on methodology and section V provides the analysis of results. Section VI concludes the paper.

## **II. Stylised Facts of the Financial Sector Development and Macroeconomic Stability**

### **2.1 Evolution of the Financial Sector in Zimbabwe**

#### **2.1.1 Pre-Independence**

Zimbabwe's financial system was relatively well developed by 1960, composed of financial institutions, stock exchange, discount houses, accepting houses and a Postal Bank (Makina, 2009). The country has one of the oldest financial system which dates back to the 19th century (Ndlovu, 2013). Zimbabwe's first bank was established in 1872, under a free banking system, which was replaced by a currency board in 1940, and later replaced by the central banking system in 1956 (Ndlovu, 2013; RBZ, 2013). The stock exchange was established in 1894, and by 1963 it had 98 quoted shares and 13 brokers (ZSE, 2010).

#### **2.1.2 Financial Repression in the First Decade of Independence**

For the period 1980 to 1990, the Zimbabwean financial sector went through years of financial repression, characterized by extensive controls and regulations, controls on interest rates, foreign exchange allocations and highly oligopolistic banking sector, with multinational banks dominating the sector (Sibindi & Bimha, 2014). Controls manifested themselves through ceilings on lending and deposit rates, portfolio restrictions, government-directed lending programmes, selective credit policies and exchange controls (Makina, 2009; Ndlovu, 2013). This resulted in high interest rate spreads which may have led to limited intermediation role of the financial sector.

#### **2.1.3 Financial Liberalization**

The adoption of Economic Structural Adjustment Programme (ESAP) of the 1990s ushered in reforms in the financial sector. These included the liberalization of interest rates, relaxation of entry regulations, removal of controls on bank lending and reforms to the exchange and payments systems. The deregulation of the financial sector resulted in new players entering the sector, new financial products and wide use of technologies. New entrants were into commercial, merchant and discount banking. Finance houses, unit trusts, leasing firms, exchange bureaux and micro-finance institutions were also established. The decontrolling of interest rates led to reduced interest rates spread thereby supporting productive lending and growth. As a result, private sector credit to GDP increased from 16.3% in 1980 to 27.6% in 2000. Real interest rates were negative between 1980 and 1990, the degree of financial deepening as measured by total deposits/GDP was averaging 25.9% rose to 40.7% between 1991 to 2000.

## 2.1.4 Economic Crisis

The economic crisis which occurred between 2000 to 2008 somewhat reduced the gains made in the financial sector. The number of financial institutions which had increased to about 60 in 2003 declined to 28 by 2008. The decline in the number of financial institutions, in addition to the economic crisis, reflected poor corporate governance practices and inadequate capital (Mashamba & Magweva, 2015). The crisis also resulted in increased spread between deposit rates and lending rates. As a result of the crisis private sector credit to GDP declined from 26.2% in 2001 to 5.2% in 2008.

## 2.1.5 Multicurrency Regime (2009 to 2019)

With a view to consolidate gains in the multicurrency system, some banks merged while others upgraded from merchant banks to commercial banks. Reflecting the impact of multicurrency system and the recent global trends of moving towards universal banking, most discount houses and merchant banks closed down during the period under review. As at end December 2019, there were 19 operating banking institutions (including POSB), comprising of 13 commercial banks, 5 building societies and 1 savings bank. There were also 225 credit-only microfinance institutions, 8 deposit taking microfinance institutions and 2 development financial institutions.

Over the multicurrency era, from 2009 to 2017, financial depth improved from 14.3% in 2009 to 21.6% in 2018. Private sector credit to GDP steadily grew from 7.2% in 2009 to 19.2% in 2014. It however declined to 6.9% in 2019, reflecting macroeconomic challenges which emerged in since 2016 (Table 1).

**Table 1: Summary Macroeconomic and Financial Development Indicators: 1980-2020**

| Variable                         | 1980-1990<br>Financial<br>Repression | 1991-2000<br>Financial<br>Liberalisation | 2000-2008<br>Economic<br>Crisis | 2009-2019<br>Mult-currency<br>system/dollarisation |
|----------------------------------|--------------------------------------|--|---------------------------------|--|
| GDP Growth (%)                   | 4.3                                  | 0.7                                      | -5.6                            | 6.1  |
| Inflation (%)                    | 13.55                                | 31.4                                     | 2,569,111                       | 52.2   |
| Fiscal Deficit/GDP (%)           | -6.3                                 | -11                                      | -4.6                            | -2.4   |
| Number of Banking Institutions   | 21                                   | 29                                       | 34                              | 22   |
| Private sector credit/GDP (%)    | 13.0                                 | 22.1                                     | 20.8                            | 15.3   |
| Total Deposits/GDP (%)           | 53.2                                 | 40.7                                     | 70.4                            | 23.2   |
| Market Capitalisation to GDP (%) | 15.3                                 | 31.2                                     | 43.0                            | 29.2   |

Source: ZIMSTAT, ZSE and RBZ, 2020

## 2.2 Structure of Banking System

The banking sector evolved significantly since 1980. At independence, the country had 4 commercial banks and 4 merchant banks all of which were foreign owned. Table 2 shows the evolving structure of banking system in Zimbabwe.

**Table 2: Evolution of the Structure of Banking System in Zimbabwe**

| Period | Commercial bank | Merchant banks | Building Society | Discount House | Finance Houses | Savings Bank | Total |
|--------|-----------------|----------------|------------------|----------------|----------------|--------------|-------|
| 1990   | 6               | 4              | 3                | 2              | 5              | 1            | 21    |
| 1995   | 5               | 9              | 5                | 4              | 5              | 1            | 29    |
| 2000   | 12              | 6              | 5                | 7              | 6              | 1            | 37    |
| 2005   | 13              | 5              | 4                | 5              | 4              | 1            | 32    |
| 2010   | 15              | 5              | 4                | 0              | 0              | 1            | 25    |
| 2015   | 13              | 0              | 4                | 0              | 0              | 1            | 18    |
| 2019   | 13              | 0              | 5                | 0              | 0              | 1            | 19    |

Source: Reserve Bank of Zimbabwe

As shown financial liberalisation resulted in increased financial institutions from 4 in 1980 to 21 in 1990 and 37 in 2000. In addition, microfinance institutions (both credit-only and deposit taking) also increased from 10 in 1990 to 234 in 2019, mainly to cater for SMEs credit. These institutions are bridging the gap in provision of credit to the small-scale and informal sector who usually fail obtain credit from the banks (Sibindi & Bimha, 2014).

### 2.2.1 Banking Sector Concentration

Bank concentration which is generally considered to reflect market power and, therefore, the degree of competition is important in assessing the importance of financial development on macroeconomic performance. Increased bank competition normally results in increased efficiency and hence improved financial sector intermediary role. Two approaches are used to measure bank concentration. The first approach is the *k*-bank concentration ratio which measures the share of output or assets controlled by a few dominant firms and the Herfindahl–Hirschman index (HHI), which incorporates all banks in the measurement, while assigning greater weight to larger banks' assets as well the HHI. In general, three bank concentration Ratio (CR3) and four bank concentration ratios (CR4) suggest that concentration is significant in the banking industry in Zimbabwe (Mlambo & Mupunga, 2018). Table 3 shows trend in the concentration ratios in deposits, loans and assets.

**Table 3: Trends in the Concentration Ratios in Deposits, Loans and Assets**

|      | Three Bank Concentration Ratio (CR3) |         |          | Four Bank Concentration Ratio (CR4) |         |          | Herfindahl-Hirschman Index (HHI) |
|------|--------------------------------------|---------|----------|-------------------------------------|---------|----------|----------------------------------|
|      | Deposits %                           | Loans % | Assets % | Deposits %                          | Loans % | Assets % |                                  |
| 2009 | 55.67                                | 52.33   | 46.98    | 64.64                               | 59.14   | 55.54    | 1335.82                          |
| 2010 | 42.57                                | 41.08   | 41.34    | 52                                  | 47.29   | 48.12    | 1120.36                          |
| 2011 | 42.19                                | 45.58   | 36.61    | 50.46                               | 51.45   | 44.24    | 954.88                           |
| 2012 | 37.78                                | 41.81   | 37.53    | 46.31                               | 48.09   | 44.49    | 898.29                           |

|      |       |       |       |  |       |       |       |         |
|------|-------|-------|-------|--|-------|-------|-------|---------|
| 2013 | 42.26 | 44.72 | 42.14 |  | 50.7  | 51.34 | 49.73 | 925.11  |
| 2014 | 48.68 | 47.54 | 44.58 |  | 55.77 | 53.92 | 52.88 | 899.87  |
| 2015 | 53.07 | 48.71 | 47.62 |  | 59.47 | 55.75 | 54.93 | 1239.46 |
| 2016 | 50.73 | 50.5  | 46.11 |  | 58.22 | 57.31 | 52.56 | 1338.04 |
| 2017 | 50.83 | 48.92 | 46.10 |  | 57.82 | 55.66 | 53.46 | 1159.12 |
| 2018 | 51.54 | 49.38 | 46.61 |  | 58.50 | 56.24 | 53.65 | 1245.54 |
| 2019 | 51.03 | 49.60 | 46.27 |  | 58.18 | 56.40 | 53.22 | 1247.57 |

Source: Adopted from (Mlambo & Mupunga, 2018) and Authors own calculations, 2020

Both CR3 and CR4 show that in 2009 concentration in the deposit market was much higher at 55.7% for CR3 and 64% for CR4. Table 3 also shows the HHI, which measures the market shares of all banks. Overall, the banking sector in Zimbabwe shows moderate to low levels of concentration which may be viewed as conducive to support macroeconomic stability.

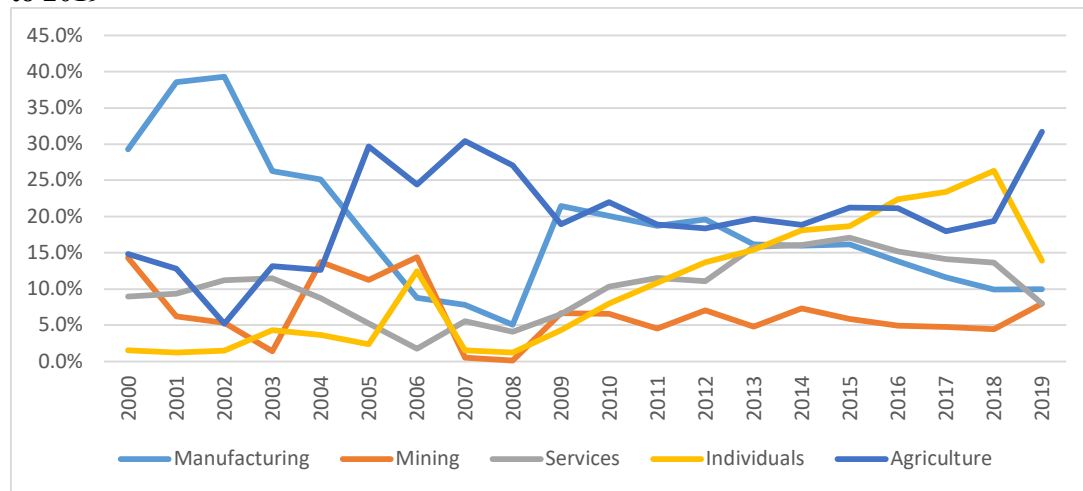
### 2.2.3 Structure of Loans and Advances by Sector

The allocation of lending to different sectors of the economy is also important, with increased lending to productive sectors likely supporting economic stability and growth. Levine (2005) argues that ‘too much household credit’ can actually harm macroeconomic stability. Prior to the crisis, most of the loans and advances were distributed to the agriculture sector but the loan to the sector plummeted from 30 percent in 2007 to 3 percent in 2008 on the background of a hyperinflationary period which made agriculture an unattractive enterprise. The reduced productivity in the agriculture sector may have reduced the effect of increased credit on agriculture on economic stability and growth. Other critical sectors that received considerable allocations of loans include manufacturing and mining, as shown in Figure 1.

The loans and advances to the manufacturing sector peaked at 38.5% of total proportion of credit in 2001 but declined from 21.5% in 2009 to 10% in 2019, due to increased de-industrialization. The short-term nature of credit also discouraged lending to fairly long-term manufacturing activities. The short-dated loans also mean reduced lending to mining projects, which normally have long term gestation period. As such, loans and advances to the mining sector have been low averaging 10% for the period under study.



**Figure 1: Borrowing from Commercial Banks as a Proportion of Total Borrowing, 2000 to 2019**



Source: Reserve Bank of Zimbabwe

Figure 1 also show that the proportion of individuals (households) to total borrowing averaged 3% from 2000 to 2009. Credit to households increased from 8% in 2010 to 26.3% in 2018 before declining to 13.9% in 2019.

### 2.3 Zimbabwe Stock Exchange (ZSE)

By 1987, Zimbabwe had a well-diversified capital market which played a key role in supporting economic development. The ZSE saw increased activity as a result of financial liberalization in the early 1990s with the listed counters increasing from 60 in 1990 to 71 in 2000 and 78 in 2012, before receding to 63 in 2019 as the country faced some heightened macroeconomic challenges. As a result, stock market capitalization to GDP rose steadily from 11.2% in 1987 to a peak of 73.8% in 2002 before declining 18.0% in 2019, as shown in Table 4.

**Table 4: Indicators of Stock Market Performance**

| Year | Market Capitalisation/GDP | Volume of shares traded/GDP | Listed Counters |
|------|---------------------------|-----------------------------|-----------------|
| 1990 | 19.5                      | 0.9                         | 60              |
| 1995 | 31.6                      | 1.9                         | 65              |
| 2000 | 38.2                      | 2.9                         | 71              |
| 2005 | 26.6                      | 2.6                         | 79              |
| 2010 | 32.0                      | 3.3                         | 78              |
| 2015 | 15.0                      | 1.1                         | 60              |
| 2019 | 18.0                      | 1.3                         | 63              |

Source: Zimbabwe Stock Exchange

### **III. Literature Review**

#### **3.1 Theoretical Literature**

Financial sector development is defined as the improvement in efficiency, quality and quantity of financial intermediary services (Choong & Chan, 2011). Levine (2005) highlights that financial development occurs when financial intermediaries, markets and instruments work to reduce the effects of information asymmetry, transaction costs, enforcement and as a result, improve the provision of the financial functions. In this regard, financial development encompasses the improvement in (i) pooling and mobilisation of savings (ii) facilitation of trading, hedging and diversifying and pooling of risk (iii) allocation of resources to productive sectors; and (iv) facilitate the trade of commodities. These functions influence savings and investment decisions as well as the efficient allocation of the resources in the economy.

Over the past decades, in the economic discourse, the concept of macroeconomic stability has undergone considerable changes. In the post Second World War era, the subject of macroeconomic stability was dominated by Keynesian thinking which basically meant a mix of internal and external balance, which in turn implied, in the first case, full employment and stable economic growth, accompanied by low inflation. In recent times, the issues of fiscal balance and price stability have come to the fore, supplanting the Keynesian emphasis on real economic activity (Ocampo, 2005). Theoretical literature proposes different ways in which financial system development impact macroeconomic stability.

An important theoretical strand on the nature of the relationship between financial system development and macroeconomic stability postulates that there is negative relative between financial sector development and output volatility. Thus, an economy's ability to deal with shocks is dependent on the level of development of its financial system. Using macroeconomic model with micro-underpinnings that made use of unequal access to investment opportunities and imperfections in the financial system, Aghion, et al., (1999) showed that economies that experienced slower growth and tended to be more volatile than those with less developed financial systems.

This view is consistent with the work of Acemoglu & Zilibotti (1997), who postulated that well developed financial systems provide better risk management and diversification platforms that dampen macroeconomic fluctuations. In essence, they argued for a negative relationship between development of the financial system and output volatility. The view is also consistent with Caballero & Krishnamurthy (2001), who argued that economies facing offshore financial constraints can rely on the deeper financial system to alleviate firms' cash constraints and reduce volatility.

Linked to the above, is the essential theoretical work by Levine (1997) and Gertler (1988) who pointed out that by lowering transaction costs as well as the cost of information acquisition, financial institutions help reduce information asymmetries and improve resource allocation in

the economy. Consequently, faster economic growth derives from higher levels of financial system development (Goldsmith, 1969; Greenwood & Jovanovic, 1990; King & Levine, 1993a; King & Levine, 1993b; Boyd & Prescott, 1986; Fischer, 1993).

On the other hand, it is debated that there is a positive relationship between financial system development and output volatility. Kaminsky & Schmukler, (2003), argued that firms in a developed financial system can be vulnerable to higher volatility due to increased leverage. In support of this view, Shleifer & Vishny (2010), argue that as a result of increased financial development, banks can over-leverage while entrepreneurs can assume more risk, which could potentially lead to more volatility in the economy. Wagner (2010) also pointed out the undesirable effects of diversification, a key component of developed financial system, and observed that it could result in higher systemic crises and reduced welfare.

Another important strand of theoretical literature focussed on the impact of imperfections in financial markets and existing information asymmetries on fluctuations in output and not on the level of financial developments. Seminal work by Bernanke & Gertler (1989) as well as Bernanke & Gertler, (1990), pointed out that with underlying imperfections to the credit markets, macroeconomic fluctuations are amplified as a result of shocks to the net worth of non-financial borrowers. The view is supported by Greenwald & Stiglitz (1991) and Kiyotaki & Moore (1997), who employed dynamic general equilibrium models to show that imperfections in financial markets and asymmetric information heighten volatility in the real sector.

### **3.2 Empirical Review**

Empirical evidence on the relationship between financial system on macroeconomic stability in both cross country and in-country studies show an unambiguous impact. Braun & Larrain, (2005) and Raddatz (2006) showed that volatility of output was lowered by financial development, especially in industries that were financially vulnerable. The studies carried across a large cross section of countries employed sectoral valued added data and revealed that financially vulnerable manufacturing industries were more affected in economic downturns if located in countries with less developed financial system. The results showed that at a macroeconomic level, changes in the financial system can come up with critical differences in overall volatility of the economy and that the development of the financial intermediaries was essential than that of equity markets for the lowering of volatility (Raddatz, 2006).

Easterly et al. (2000), investigated the impact of the financial system as the key driver in output volatility and found out there is a U-shaped relationship between the two variables. The findings showed that higher financial depth was generally associated with lower output volatility, but as leverage and the financial system continued to grow, macroeconomic vulnerability also increased. Denizer et al. (2002) employed the fixed-effects estimation with panel data covering the period 1956-98 from 70 countries to investigate the relationship between finance and macroeconomic volatility. According to the authors, consumption and investment volatility could be explained by the importance of banks in the financial system.

The size of private credit as a proportion of GDP best explains consumption and output volatility. The findings of the authors suggested the manner in which the financial systems develop matters and that economies with advanced financial systems experienced less output, consumption and investment volatility.

Dabla-Norris & Srivisal, (2013) noted that the changes in the financial system dampened output volatility up to a certain point. Beyond this point, the advanced financial system amplifies volatility of consumption and investment, and this was the case for most advanced economies. The authors carried out an empirical study covering 110 countries (34 high-income countries and 76 middle and low-income countries) over the period 1974-2008 using the dynamic panel analysis methodology. The paper, which examined the effects of financial system development on macroeconomic volatility, also found out that well developed financial systems served as shock absorbers from the impact of negative external shocks on output volatility.

Contrary to the findings of Denizer et al. (2002), Firdmuc & Scharler (2013), found out that banking sector development was not significantly related to the size of fluctuations in the macroeconomy and that countries with well advanced equity markets experienced less pronounced fluctuations. Their paper looked at financial development and magnitude of business cycles, covering the period between 1995 and 2005 for a sample of OECD countries.

Reflecting the differences in empirical work, Acemoglu, et al. (2003) found out that the financial system was neutral in relation to macroeconomic volatility. The authors' findings suggest that the source of differences of the large cross-country macroeconomic volatility was institutional and noted that no standard macroeconomic variables appeared to be the primary channels through which institutional quality led to economic volatility. According to these authors, poor macroeconomic performance reflected symptoms of deep institutional issues. Beck, et al. (2006) corroborated the above view in a study of 63 countries over the period 1960-97, whose findings suggested an unambiguous relationship between the financial system and consumption growth volatility.

### **3.3 Financial Sector Development Measures in Empirical Work**

Financial indicators that have been selected to proxy financial sector development are dependent on the specific characteristics of a financial system. Deriving from the McKinnon-Shaw framework, which postulated that a monetized economy is evidence of a highly developed capital market, most empirical studies have relied on monetary aggregates to nominal GDP as indicators or proxies of financial development (Choong & Chan, 2011). These variables are generally available and used in most empirical literature.

However, there have been criticisms on the use of monetary aggregates that they do not fully represent the effectiveness of the financial system in easing transactions costs, reducing information asymmetries. Thus, other indicators have been put forward. King & Levine, (1993a) provided alternative indicators to the monetary aggregates of which the first covered the relative significance of particular financial institutions, the ratio of deposit money banks

assets to total banking assets. The other indicators developed measure the distribution of domestic assets under which the ratio of proportion of domestic credit channelled to the private sector to GDP and the ratio of claims of non-financial private sector to GDP are covered. King & Levine, (1993a) found a positive and significant relationship between several financial development indicators and growth.

Svirydzenka (2016) contends that financial sector development is multi-dimensional and requires use of multiple indicators. The evolution of financial markets, institutions and the introduction of different products and services has necessitated the need to broaden the measurement of financial development. Multiple indicators are necessary to measure financial development given the diversity of financial systems across countries. Furthermore, in order to circumvent some shortcomings that come with single financial indicators as proxies for financial development, a financial market development index is designed from various financial markets indicators. A typical financial markets development index summarises the developments of both financial markets and institutions in terms of access, depth and efficiency. The IMF has adopted a multi-dimensional approach to measure financial development based on the work of Čihák, et al., (2012).<sup>4</sup>

Financial markets development index captures broader aspects of the financial system than a single financial indicator but does not include underlying drivers or outcomes. Svirydzenka (2016) contends that there are challenges in constructing the index and that some of the variables the index may adopt may overstate the true level of financial development.

#### **IV. Methodology**

Consistent with previous studies, the study used traditional financial development indicators and a financial systems development index. It used monetary aggregates to proxy financial systems development, which are private sector credit to GDP, total bank deposits to GDP and stock market capitalisation to GDP, (Svirydzenka, 2016; Choong & Chan (2011)). The measures show the degree of financial intermediation with total bank deposits of GDP reflecting mobilisation of resources from surplus units while private sector credit shows allocation of the resources to deficits units. The stock market capitalisation to GDP captures the impact of the capital market.

In line with Čihák et al. (2012), the study developed a financial systems development index from three indicators of financial development to have a broad measure of financial sector development. The index was constructed using respective weights of the banking and capital markets activities in the GDP. As such the private sector credit to GDP and total deposits to GDP used weights of 40% each while stock market capitalisation used a weight of 20%. The increase in the financial development index shows improvement in financial development and vice versa. An increase in financial development index denotes increased financial development and vice-versa.

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<sup>4</sup> See details of the index by Čihák, et al., (2012) in Annex 1.

As highlighted by Cariolle, (2012) there is little discussion about the choice of indicator for macroeconomic volatility, because the variables used are closely correlated. As in Dabla-Norris & Srivisal, (2013), macroeconomic stability is measured as a 5-year standard deviation of economic growth from 1980 to 2019. A decline in the standard deviation shows increased macroeconomic stability and while an increase in the standard deviation shows increased macroeconomic instability.

In terms of econometric approach, most of the previous studies utilised the Autoregressive Distributed Lag (ARDL) and variants of vector autoregressive models. In this regard, the study used the ARDL approach (i.e., the bounds testing approach to cointegration) based on data covering the period 1980 to 2019, (Pesaran & Pesaran, 1997; Pesaran and Shin, 1999; Pesaran et al. 2001). The model that used stock market capitalisation to GDP as an indicator of financial development, however, is run from 1987 to 2019 because continuous data on the stock exchange starts in 1987.

The ARDL has a number of favourable properties that tend to support its use. The most important is that the model can be used whether the variables are I(1) or I(0) and this entails that the pre-test unit root tests are not compulsory. Though in most cases it's still important to undertake unit root tests to ensure that there are no I(2) variables which make the ARDL not applicable. In addition, the ARDL is also even efficient in small and finite sample. The long-run parameters of independent and valid t-values can be accurately estimated even if the variables are endogenous. Lastly, the endogeneity bias tends to be reduced with the application of optimally and sufficiently large lags. As proposed by Pesaran and Shin (1999), the study first test the existence of cointegration based on the bounds test utilising the following equation:

$$\Delta Y_t = \alpha_0 + \delta_0 Y_{t-1} + \sum_{j=1}^k \delta_j Z_{j,t-1} + \sum_{i=1}^p \lambda_{0,i} \Delta Y_{t-i} + \sum_{j=1}^k \sum_{i=0}^q \lambda_{j,i} \Delta Z_{j,t-i} + \varepsilon_t \dots \dots (1)$$

Where  $Y_t$  is the dependent variable,  $\alpha_0$  is a constant term; and  $\delta_i$  and  $\lambda_i$  are coefficients;  $Z$  is a vector of  $k$  determinants of  $Y_t$ ;  $p, q$  are optimal lag orders;  $\Delta$  denotes difference operator, and  $\varepsilon_t$  is the white noise error term

In this paper, the dependent variable is the standard deviation of economic growth while independent variables will include the financial systems development index and three indicators of financial development which are considered separately. Other control variables considered in the model include trade openness and investment. Trade openness has been included in most studies on macroeconomic volatility as most developing countries are exposed to external shocks (Karras, 2006). Trade openness can promote macro stability by guaranteeing stable and sustainable GDP growth. On the other hand, trade openness can result in increased macroeconomic instability as the economy becomes prone to increased external shocks. Fluctuation in investments tend to be associated with macroeconomic variability, (Denizer et al., 2002).

The F test to the bounds test in equation 1 is used to test whether there is cointegration or not and if the calculated F- statistic is lower than the lower critical bound, it suggests that there is no cointegration and if the values are greater than the upper bound critical values, it suggests that there is cointegration. If the F-statistic lies in between the lower and upper bound the results are inconclusive. If cointegration is affirmed, the study can proceed to estimate the long run equilibrium relationship among the variables and the error correction model for the variables as shown in equation 2 and 3.

$$Y_t = b_0 + \sum_{i=1}^p \delta_i Y_{t-i} + \sum_{j=1}^k \sum_{i=0}^q \beta_{ji} Z_{j,ti} + \mu_t \dots \dots \dots (2)$$

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \lambda_{0,i} \Delta Y_{t-i} + \sum_{j=1}^k \sum_{i=0}^q \psi_{j,i} \Delta Z_{j,t-i} + \lambda ECM_{t-1} + \varepsilon_t \dots \dots \dots (3)$$

Equation 3 shows that a negative and significant coefficient  $\lambda$  of the error correction term means that any short-term changes from the equilibrium would be corrected and the system would converge back to the long run steady path.

#### 4.1 Data Sources and Description

Data used in this study was obtained from various agencies. Real GDP, population, real investment and trade openness were obtained from Zimbabwe National Statistics Agency (ZIMSTAT) for the period 1980 to 2019. Real investment is real gross fixed capital formation. Trade openness is defined as the ratio exports and imports over GDP. Private sector credit to GDP and Total deposits to GDP for the period 1980 to 2019 was obtained from the Reserve Bank of Zimbabwe (RBZ). Lastly, stock market capitalisation to GDP for the period 1987 to 2019 was obtained from the Zimbabwe stock exchange (ZSE). Table 4 shows the variables and variable notation used in the financial development –macroeconomic stability regressions.

**Table 5: Variables, Variable Notation and Description**

| Variable  | Notation in Model | Description   |
|---|-------------------|---|
| Macroeconomic stability -Standard deviation of Real GDP growth rate | LRGDP             | 5 year Standard deviation of real GDP growth rate   |
| Logged Real Investment  | LINV              | Constant Gross fixed capital formation  |
| Openness  | LOPEN             | Nominal exports plus nominal imports divided by nominal GDP                                     |
| Financial development index   | FININDEX          | Financial systems development index   |
| Total Deposits to GDP   | FINDEP            | The ratio of gross deposits to GDP, obtained by dividing nominal total deposits by nominal GDP. |

|                                    |         |   |
|------------------------------------|---------|---|
| Private sector credit to GDP       | PVTGDP  | The ratio of private sector credit to GDP, obtained by dividing nominal private sector credit by nominal GDP. |
| Stock market capitalisation to GDP | MRKTCAP | The ratio of private sector credit to GDP, obtained by dividing nominal private sector credit by nominal GDP. |

## V. Empirical Results

This section discusses the findings of the study including cointegration test results as well as the model results.<sup>5</sup> Table 6 shows the results of the ARDL Bounds tests for the financial development index and the three financial development variables.

**Table 6: ARDL Bounds Test for Co-Integration Analysis**

| Equation                    | Lag Length | F-statistics |
|-----------------------------|------------|--------------|
| LRGDP/LOPEN, IINV, PVTGDP   | 3          | 3.571696**   |
| LRGDP/LOPEN, IINV, DEP/GDP  | 3          | 9.201657***  |
| LRGDP/LOPEN, IINV, MRKTCAP  | 3          | 6.469455***  |
| LRGDP/LOPEN, IINV, FININDEX | 3          | 3.982803**   |

\*\*\* significant at 1% level of significant; \*\*significant at 5% level of significant

Table 6 shows that ARDL bounds tests confirm the existence of cointegration for the four models used to analyse the financial development - macroeconomic stability nexus in Zimbabwe. The calculated F-statistics for all the three regression results are above the upper bound critical values of Pesaran (2001), which means that the null hypothesis of no cointegration cannot be accepted. Given that the study has established that there is co-integration between financial development and macroeconomic stability, the study proceeds to estimate Error correction regression for the four models. First the study estimates the long-run regressions as shown in Table 7.

<sup>5</sup> The unit root test results are reported in Annex 2. The results show that some variable are I(1) and others are I(0), validating the appropriateness of ARDL approach.



**Table 7: Long-run Models for Financial Development and Macroeconomic stability**

Dependent Variable: Real GDP Standard Deviation

| Variable | Model 1<br>Private Credit/<br>GDP | Model 2<br>Total Deposits to<br>GDP | Model 3<br>Market<br>Capitalisation/<br>GDP | Model 4<br>Financial<br>Index/<br>GDP |
|----------|-----------------------------------|-------------------------------------|---|---------------------------------------|
| C        | 6.107<br>(0.422)                  | 9.676<br>(0.561)                    | 12.847<br>(0.156)                           | -31.086*<br>(0.017)                   |
| LOPEN    | 2.462**<br>(0.042)                | 0.334<br>(0.911)                    | 2.389<br>(0.577)                            | 6.886***<br>(0.015)                   |
| LINV     | -0.0715<br>(0.901)                | -0.795<br>(0.309)                   | 2.319<br>(0.229)                            | 0.799<br>(0.362)                      |
| FINDEP   | -0.014<br>(0.4711)                |                                     |   |                                       |
| PVTGDP   |                                   | -0.199<br>(0.311)                   |   |                                       |
| MRKTCAP  |                                   |                                     | 1.078<br>(0.402)                            |                                       |
| FININDEX |                                   |                                     |   | -0.295***<br>(0.008)                  |

Source: Authors computations

\*\*\* significant at 1% level of significant; \*\*significant at 5% level of significant

In table 7 and table 8, private sector credit to GDP, total deposits/GDP, market capitalisation to GDP and the financial development index are considered as independent variables and estimated separately in models 1, model 2, model 3 and model 4, respectively. In table 7, the results show that financial systems development as measured by the financial development index has a significant negative coefficient, which shows that improvement in financial development reduces the variability of economic growth and therefore enhances macroeconomic stability. The results depict that enhancing financial system efficiency and development is critical for long run macroeconomic stability.

The long-run regressions for the separate financial indicators, however, show a negative but insignificant effect on macroeconomic stability. This may reflect the fact that these indicators fail to fully capture financial development aspects in the long run. As such, the results show that the nexus between financial development and macroeconomic stability is also affected by measurement of financial development, with less broad measures resulting in likely insignificant relationship in the long run.

The results of the ARDL error correction model, however, show that financial development have a negative and significant effect on macroeconomic instability in the short run for the financial development index and the separate financial development indicators as shown in Table 8.

**Table 8: ARDL Error Correction Regressions Results: Dependent Variable: Change in Standard Deviation of GDP growth**

| Variable           | Model 1<br>Private Credit/<br>GDP | Model 2<br>Total deposits<br>to GDP | Model 3<br>Market<br>Capitalisation/<br>GDP | Model 4:<br>Financial<br>Index/GDP |
|--------------------|-----------------------------------|-------------------------------------|---|------------------------------------|
| C                  |                                   | -6.107***<br>(0.000)                | -4.278***<br>(0.001)                        | -31.084***<br>(0.000)              |
| DLOPEN             |                                   | -0.639<br>(0.674)                   | 2.772<br>(0.212)                            | 0.352<br>(0.703)                   |
| LOPEN(-1)          |                                   |                                     | -8.975***<br>(0.006)                        | -3.429*<br>(0.090)                 |
| DLINV              |                                   |                                     | 4.109***<br>(0.008)                         |                                    |
| DLNV(-1)           |                                   |                                     | 10.694***<br>(0.001)                        |                                    |
| DLINV(-2)          |                                   |                                     | 8.720<br>(0.000)***                         |                                    |
| DLINV(-3)          |                                   |                                     | 4.293***<br>(0.011)                         |                                    |
| DPVTGDP            | -0.072*<br>(0.065)                |                                     |   |                                    |
| DPVTGDP(-1)        | -0.120***<br>(0.005)              |                                     |   |                                    |
| DPVTGDP(-2)        | -0.184***<br>(0.000)              |                                     |   |                                    |
| DPVTGDP (-3)       | -0.145***<br>(0.003)              |                                     |   |                                    |
| DFINDEP(-1)        |                                   | -0.033*<br>(0.078)                  |   |                                    |
| DFINDEP(-2)        |                                   | -0.008***<br>(0.000)                |   |                                    |
| DFINDEP(-3)        |                                   | -0.061***<br>(0.000)                |   |                                    |
| DMRKTCAP           |                                   |                                     | 0.0.148<br>(0.729)                          |                                    |
| DMRKTCAP(-1)       |                                   |                                     | -0.031<br>(0.934)                           |                                    |
| DMRKTCAP(-2)       |                                   |                                     | 1.154***<br>(0.000)                         |                                    |
| FININDEX           |                                   |                                     |   | -0.295***<br>0.008                 |
| CointEq(-1)*       | -0.459***<br>(0.000)              | -0.748***<br>(0.000)                | -0.7814***<br>(0.000)                       | -0.679***<br>(0.000)               |
| Adjusted R-squared | 0.536                             | 0.710                               | 0.733                                       | 0.713                              |

Source: Authors own computations

\*\*\* significant at 1% level of significant; \*\*significant at 5% level of significant

The results of the error correction for all the four models suggest that financial development reduces the variability of growth in the short run. In the short run, a 1 percent increase in financial sector development as measured by the financial development index reduces the standard deviation of economic growth by 0.29 percent. In addition, the coefficients for private sector credit to GDP, total deposits to GDP and market capitalisation are also all statistically

significant. This may mean that the finance –macroeconomic stability nexus is stronger in the short-run and possibilities of thresholds beyond which particular components of financial development cease to have a significant effect. The equilibrium cointegration coefficients are also negative and significant confirming that the system reverts to back long-run equilibrium in the event of a shock for all the models.

The results are in tandem with empirical work of Nyasha & Odhiambo (2015), who found that an efficient, liberalised and developed financial system was essential for economic stability especially in the early stages of the growth process, which is also consistent with Patrick (1966), hypothesis of stage development.

## **VI. Conclusions**

The study investigated the relationship between financial development and macroeconomic stability in Zimbabwe during the 1980-2019 period using the ARDL Bound test technique. The study used a financial development index to measure financial system development and a 5-year standard deviation of economic growth to measure macroeconomic stability. The study also used private sector credit to GDP, total deposits to GDP and stock market capitalisation to GDP as other alternative separate indicators of financial development. The results show that financial development significantly lead to macroeconomic stability. The separate indicators of financial development because of their narrow nature tend to show insignificant relationship in the long run.

In the short run, however, all the indicators of financial development are negative and significant showing that improvement in financial sector lead to reduced macroeconomic variability. This would be implying possibilities of thresholds in the financial development-macros stability nexus in the long run. Nevertheless, the results suggest a need to enhance the optimal functioning of the financial system so as to boost the role of finance in the short term. The study recommends that future research focuses on, among other areas, the channels through which financial sector impact on macroeconomic stability as well as the importance of the structure of credit in terms of long term and short term and its importance on macroeconomic stability.

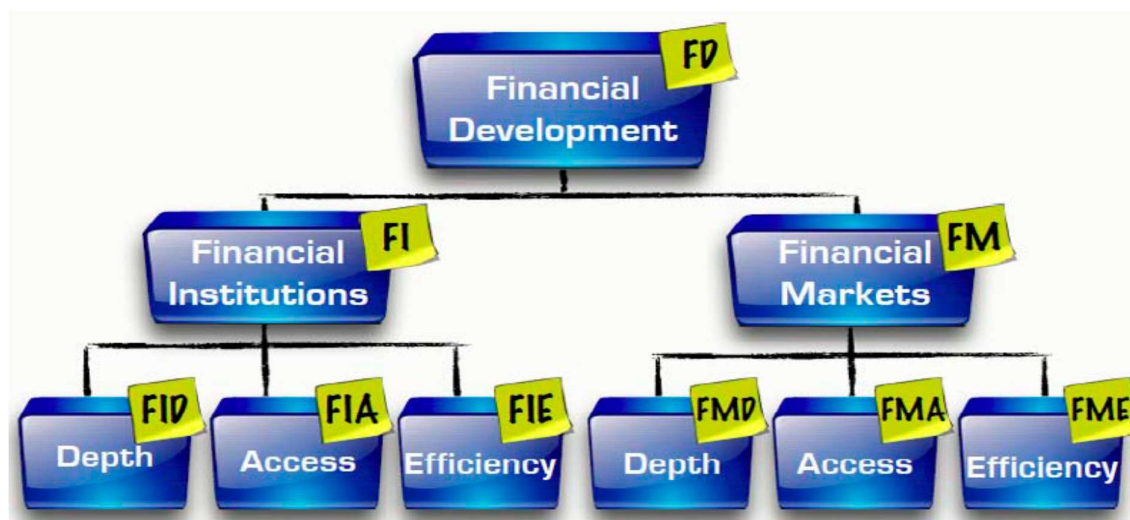
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## **Annex 1: Financial Development Index Pyramid**



Source: IMF staff, based on Čihák et al. (2012)

### Annex 2: Unit Roots Tests Results

| Variable                                   | In levels             | 1st difference           | Order of Integration |
|--|-----------------------|--------------------------|----------------------|
| Standard deviation of Real GDP Growth rate | -2.836211<br>(0.2791) | -6.315894***<br>(0.0000) | I (1)                |
| Private sector Credit to GDP               | -2,5721<br>(0.2361)   | -7,0949***<br>(0.0001)   | 1(1)                 |
| Trade Openness                             | -1,9810<br>(0.1543)   | -6,1565***<br>(0.0004)   | 1(1)                 |
| Log Real Investment                        | -4,1426**<br>(0.0253) |                          | 1(0)                 |
| Financial development index                | -1,2843<br>(0.3974)   | -3,4258***<br>(0.0007)   | 1(1)                 |
| Total deposits/GDP                         | -3, 0468<br>(0.1332)  | -7,7769***<br>(0.0000)   | 1(1)                 |
| Stock Market Capitalisation/GDP            | -3,0806<br>(0.1096)   | -4,2427**<br>(0.0185)    | 1(1)                 |

\*\*\* significant at 1% level of significant; \*\*significant at 5% level of significant