

## **Economic Development, Technological Change, and Growth**

### **Does Financial Inclusion cause Economic Growth in Zimbabwe? An Empirical Investigation**

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**Abstract:** In this article, the researchers used a multiple linear regression model to examine the impact financial inclusion on economic growth in Zimbabwe during the period 2011 to 2017. To capture the depth and width of financial inclusion in Zimbabwe, financial services, information and communication technology as well as mobile network variables were used as proxies for financial inclusion while gross domestic product was used for economic growth. Secondary data for these variables was extracted from G20 Financial Inclusion, Global Financial Development and World Development Indicators 2019 databases. The empirical findings of this study show that financial inclusion has a positive impact on economic growth in Zimbabwe. These results are relevant despite the economic challenges facing Zimbabwe. The researchers therefore, recommend pro-financial inclusion and pro-free market based financial sector development policies in Zimbabwe in order stir free market based financial sector growth and economic development. Therefore, the article is value to policy makers, researchers and the private sector.

**Keywords:** Financial inclusion; Financial development; Economic growth; Gross domestic product; Economic development; Zimbabwe

**JEL Classification:** F43; G21; O11; O16; O47

## **1. Introduction**

The topic of financial inclusion and its nexus to economic growth has received a lot of attention in recent years from a number of studies in both developing and developed countries. Central to the debate has been the nature of the impact of financial inclusion on economic growth, that is, whether financial inclusion has positive or negative impact on economic growth of a nation. Although orthodox

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wisdom had been favouring the former, a growing number of empirical studies proving otherwise have been on the increase in recent years. Three groups of empirical studies on the inclusivity-growth nexus have emerged over the years. These studies have found (1) a positive nexus between financial inclusion and economic growth; (2) a negative relationship between financial inclusion and economic growth; and (3) no significant relationship. Now, whether financial inclusion has any relationship with economic growth remains an issue for empirical investigation. Regrettably, a number of previous studies on this topic have concentrated mainly on European countries, Asian countries and the United States of America with little coverage afforded to African countries in general and Zimbabwe in particular.

It is against the above background that the current study attempts to empirically investigate the relationship between financial inclusion and economic growth in Zimbabwe. The remainder of the article is organised as follows: Section 1 gives an overview of financial inclusion in Zimbabwe. Section 2 is based on the literature review of the relationship between financial inclusion and economic growth. Section 3 is centred on the methodology, data analysis and interpretation; while Section 4 is on conclusions and recommendations of the study.

## **2. An Overview of Financial Inclusion in Zimbabwe**

As at 30 June 2019, the architecture of the financial services sector in Zimbabwe was structured to comprise nineteen operating banking institutions (19) (comprising thirteen (13), commercial banks, five (5) building societies, and one (1) savings bank), two development financial institutions, six deposit-taking microfinance institutions and 204 credit-only microfinance institutions as shown on the table below. Since 2004 six institutions were placed under liquidation and one under provisional judicial management. The failure to revive these institutions dealt a big blow towards financial inclusion efforts by the authorities as people lost confidence and trust in the formal financial system. As at 30 June 2019 22 697 out of 54 909 depositors had been compensated from the Deposit Protection Fund; representing about \$3.96 million against a total an exposure of \$6.4 million. The low claim rate shows depositor frustration due to loss of value of their savings as well as non-prosecution of executives of these failed institutions with which the public was banking.

**Table 1. Financial Services Sector Architecture in Zimbabwe**

Type of institution	Number
Commercial Banks	13
Building Societies	5
Savings Bank	1
<b>Total banking institutions</b>	<b>19</b>
<b>Other institutions under central bank supervision</b>	
Development Financial Institutions	2
Deposit-taking Microfinance Institutions	6
Credit-only Microfinance Institutions	204
<b>Total</b>	<b>231</b>

Source: RBZ 2019 mid-term monetary policy statement

**Table 2. Financial Inclusion indicators in Zimbabwe from December 2016 to March 2019**

Indicator	Dec 2017	Mar 2018	June 2018	Sept 2018	Dec 2018	Mar 2019
Value of loans to MSMEs	\$146.22 m	\$123.10 m	\$168.25 m	\$131.83 m	\$169.96 m	\$142.38 m
% of loans to MSMEs/ total loans	3.75%	3.19%	3.57%	3.84%	3.94%	3.29%
No. of MSMEs bank accounts	76,524	57,512	81,369	97,527	100,644	99,489
No. of Women Bank Accounts	935,994	99,489	1,612,820	1,528,704	1,736,285	1,814,875
Value of Loans to Women	\$310.78 m	\$316.27 m	\$360.68 m	\$384.55 m	\$432.36 m	\$428.78 m
No. of Loans to Youth	61,529	59,308	68,756	74,165	69,421	176,487
Value of Loans to Youth	\$138.93 m	\$111.70 m	\$126.64 m	\$146.79 m	\$104.43 m	\$282.18 m
Total No. of Bank Accounts	3.07m	5.51m	5.58m	5.81m	5.94m	6.25m
No. of Low Cost Accounts	3.02m	3.16m	3.56m	3.31m	3.88m	4.33m

Source: RBZ 2019 mid-term monetary policy statement

A number of initiatives have been put in place since the launching of the National Financial Inclusion Strategy (NFIS) in March 2016. The areas that are of priority

according to the NFIS include product diversification, innovation and human centered design of financial services and delivery channels, financial literacy, consumer protection, opening of low cost bank accounts, micro-insurance, Ministry of small-to-medium enterprises (MSMEs) product offering, and increased participation of lower income groups on the capital markets. Zimbabwe's NFIS stands on four pillars namely financial innovation, financial literacy, financial consumer protection and microfinance. These pillars, however, depend on a number of variables which include a conducive economic environment, institutional coordination and political commitment, appropriate infrastructure, data availability and supportive policy and regulatory frameworks. The success of the NFIS initiatives is reflected in the progress shown in table 2 and figure 1. Payment systems statistics that were provided by the central bank show that there was a high level of mobile phone penetration in Zimbabwe. The information shows that out of a total number of 1 billion transactions for the period January to May 2019, 85.33% were done through mobile phones, with 14.1% - POS, 0.22% - internet and 0.25% - RTGS. In terms of value, mobile phone transactions amounted to 22.9 billion Zimbabwean dollars while RTGS accounted for 50 billion Zimbabwean dollars. This is thanks to the three mobile network phone providers, Econet (Ecocash), Netone (One-wallet) and Telecel (Skwama) that have provided these innovative mobile money transfer platforms accessible to all cell phone users even in remote areas as well as to partnerships with traditional banks.

Prior and Santomá (2010) see the high penetration rate of mobile financial services as a critical component of financial innovation compared to traditional banking in Zimbabwe. This was enabled by the integration of financial service with mobile communication technology, as a catalyst for financial inclusion. For example, the 2014 Zimbabwe Consumer Survey (ZCS) report by FinScope indicates that the number of adults formally receiving financial services increased from 38% in 2011 to 69% in 2014, due to increased use of mobile money platforms (Bara and Mudzingiri, 2016). Furthermore, the report reveals that the number of adults financially excluded decreased from 40% in 2011 to 23% in 2014. Such an increase in access to financial services boosts economic activity, including in marginalized areas, giving the country an impetus for economic growth. In Zimbabwe, technology and financial innovation have enabled the smooth flow of remittances, which is a major source of income, liquidity, funding and investment for the country (Bracking and Sachikonye, 2010).

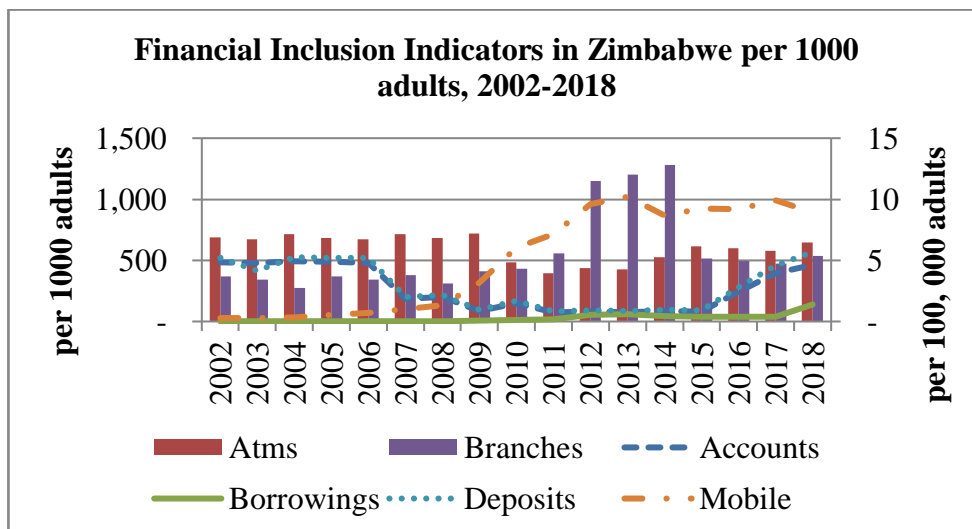
The NFIS targets mainly the youth, women and the rural population that was previously excluded from financial participation in the economy. According to the NFIS 2016 document, women are largely excluded from formal financial services and yet they form the greater part (51.9%) of the 13.1 million population of Zimbabwe. The Finscope Survey of 2012 also revealed that 57% of the business owners were women, and since women constitute the majority of the Zimbabwean

population. Hence financial inclusion cannot be achieved in Zimbabwe without addressing barriers to accessing financial services for women. According to the Finscope Survey of 2014, seventy percent (70%) of the Zimbabwean population resides in rural areas and only 23% of the rural population is formally banked compared to 46% of the urban population. Finscope MSME Survey of 2012 noted that rural areas account for 66% of the MSMEs in the country and of these rural businesses, 47% are financially excluded, compared to 36% in urban areas while, 40% use informal financial products and services only.

Maune (2018) argues that, financial inclusion has attracted a lot of attention globally from policy-makers, governments and researchers as one of the main pillars of economic development. Regionally and nationally, financial inclusion has also been embraced as one of the most important aspects of fostering development. Maune (2018) sees the formation of organizations or networks such as the Global Partnership for Financial Inclusion (GPFI) and the Alliance for Financial Inclusion (AFI) as a result of the realization of the importance of financial inclusion in economic growth and development of a country. However, what remains to be seen is the impact of such efforts on economic growth and development in Zimbabwe. However, it is yet to be seen whether the following NFIS goals are to be achieved by the country in the 21<sup>st</sup> century; (i) to increase the overall level of access to affordable and appropriate formal financial services within the country from 69% in 2014 to at least 90% by 2020 and (ii) to increase the proportion of banked adults from 30% in 2014 to at least 60% by 2020.

The NFIS has given rise to an inclusive financial system in Zimbabwe though it suffered many challenges due to the economic environment. Much of these efforts are hampered by the lack of confidence and trust in the financial system by the public due to the losses suffered after the collapse of several financial institutions since 2004. In the banking sector, the trend is shown by the number of ATMs per 100 000 adults, bank branches per 100 000 adults, bank accounts per 1 000 adults, depositors with commercial banks per 1 000 adults and borrowers from commercial banks per 1 000 adults. Since dollarization in 2009 there was a huge increase in mobile cellular subscriptions per 1 000 people from 318.59 in 2009 to 894.05 in 2018. There has been growth in depositors with commercial banks and bank accounts from 2015. Figure 1 tracks some of the financial inclusion indicators in Zimbabwe during the period 2002 to 2018.

It is against this background that as researchers we sought to establish if the efforts by the Government of Zimbabwe to influence the economy through an inclusive financial system would attain the much positive results of GDP growth.



**Figure 1. Trends in Financial Inclusion indicators in Zimbabwe**

*Source: Authors (Data extracted from world development indicators)*

### 3. Literature Review

From the theoretical front, the connection between financial inclusion and economic growth can be better understood from the financial liberalization theory point of view. Odhiambo (2010) defines financial liberalization as the process of freeing the financial sector of a country. It can also be defined as the process of allowing markets to determine who obtains and grants credit and at what price. Prior to the 1960s, the dominant view in the finance and growth literature was the neo-Keynesian perspective, which argued that interest rates should be kept low in order to promote capital formation. In 1973, the dominant theoretical position was challenged by Ronald McKinnon and Edward Shaw. They termed developing economies “financially repressed” or administered financial systems. Their central argument was that financial repression did indiscriminate “distortions of financial prices including interest rates and foreign-exchange rates” of an economy (Fry, 1995). In other words, financial repression is a combination of heavy taxation, interest rate controls and government participation in the credit-allocation process - that leads to both a decrease in the depth of the financial system and a loss of efficiency, with which savings are intermediated (Sen and Vaidya, 1997).

The proponents of financial reform argue that financial liberalization tends to raise ratios of domestic private savings to income (Shaw, 1973). Therefore, financial liberalization leads to significant economic benefits through more effective domestic

saving mobilizations, financial deepening and efficient resource allocation. To Ronald McKinnon and Edward Shaw, the pursuance of policies such as low and administered interest rates, selective credit control, and concessional credit practices, among others things, led to widespread financial repression in developing countries (Odhiambo, 2010). A repressed financial market system discourages savings, retards the efficient allocation of resources, increases the segmentation of financial markets, and creates financial disintermediation in the banking system (Khan and Hassan, 1998). The essential message of the McKinnon-Shaw thesis is that a low or negative real rate of interest discourages savings, and hence reduces the availability of loanable funds in an economy.

The main objective of financial liberalisation is to build a more efficient, robust and deeper financial system, which can support the growth of the private sector. Overall, financial liberalization is expected to foster development and increases in long-run growth (Levine, 1997 and Demirguc-Kunt and Detragiache, 1998). Through financial liberalization, developing countries can stimulate domestic savings and growth, and reduce excessive dependence on foreign capital flows (Demirguc-Kunt and Detragiache, 1998). According to the proponents of financial liberalization, liberalized financial markets allow a more varied and specialized intermediation between savers and borrowers through use of a multitude of institutions, instruments and products. It also facilitates a freer flow of money to where it can be best invested, that is, in investments with higher risk adjusted rates of return (Kaul, 1999). As in other markets, the "invisible hand" of the financial market under financial liberalization, is expected to know how to match supply and demand efficiently (Kaul, 1999). Kaul (1999) goes further to argue that the "invisible hand" is able to identify who wants to save and/or lend, for what purposes, and who wants to borrow and on what terms. Financial liberalization, therefore, increases savings, improves the efficiency with which resources are allocated among alternative investment projects and, therefore and raises the rate of economic growth (Cobbina, 1999).

Odhiambo (2010) argues that financial liberalization involves eight main dimensions which are: i) The elimination of credit controls; ii) The deregulation of interest rates; iii) Free entry into the banking sector; iv) Bank autonomy; v) Private ownership of banks; vi) The opening up of the domestic financial market to international capital flows; vii) The removal of exchange controls; and viii) The elimination of any barriers to the entry of foreign banks. Governments, businesses, and ordinary folks alike are increasingly convinced of the importance of financial inclusion and its role in economic growths of nations. But to Wong (2015), how financial inclusion could impact on macroeconomic growth and inequality often remains ambiguous and even confusing. Moreover, clarity on how financial inclusion is linked to economic growth and income distribution is important not only in making the case that financial inclusion is desirable, but also more critically for formulating effective

public policies and implementing strategies for maximizing social welfare among citizens of a country.

Demirguc-Kunt, Klapper and Singer (2017) define financial inclusion as a means that enables adults to have access to and can effectively use a range of appropriate financial services. Such services must be provided responsibly and safely to the consumer and sustainably to the provider in a well regulated environment. At its most basic level, financial inclusion starts with having a deposit or transaction account at a bank or other financial institutions or through a mobile money service provider, which can be used to make and receive payments and to store or save money. In the Zimbabwean context, the Zimbabwe National Financial Inclusion Strategy (ZMFIS) (2016-2020) defines financial inclusion as the effective use of a wide range of quality, affordable and accessible financial services, provided in a fair and transparent manner through formal or regulated entities by all Zimbabweans. This entails access to and usage of a wide spectrum of products and services provided by various players in the financial services sector, including banking, insurance, pension, capital markets, microfinance, developmental financial institutions and payment systems.

Global, regional and national-level policy makers are increasingly embracing financial inclusion as an important priority for fostering economic and social development in a country. These policy makers recognize the strength of financial inclusion as a driver of economic growth. Financial inclusion enables economies to reduce the gap between the rich and the poor populations. Demirguc-Kunt et al. (2017) add that financial inclusion helps reduce poverty and inequality by helping people invest in the future, smooth their consumption, and manage financial risks. Access to formal financial services allows people to make financial transactions more efficiently and safely and also helps poor people climb out of poverty by making it possible to invest in education and business. By providing ways to manage income shocks like unemployment or the loss of a breadwinner, financial inclusion can also prevent people from falling into poverty circles in the first place. This is especially relevant for people living in the poorest households particularly in rural areas. Financial inclusion also benefits the society more broadly. Shifting payments from cash into accounts allows for more efficient and transparent payments from governments or businesses to individuals – and from individuals to government or businesses. Although no conclusive evidence exists at this point, access to the formal financial system and appropriate credit facilities can potentially facilitate investments in education and business opportunities that could, in the long term, boost economic growth and productivity of a country (Demirguc-Kunt et al., 2017).

According to Babajide et al. (2015) there are four distinct channels of economic growth through financial inclusion and these are: (1) providing low cost reliable means of payment to all, especially the low income group; (2) the role of financial



intermediation in increasing the volume of transactions and allocation of resources from the surplus to deficit units of the economy and in the process improve resource distribution (Odeniran and Udejaja, 2010); (3) risk management that the financial system provides by curtailing liquidity risks, thereby enabling the financing of risky but more productive investments and innovations within the economy (Greenwood and Jovanovic, 1990 and Bencivenga and Smith, 1991); (4) providing information on possible investments and availability of capital stocks within the economic system (Levine, 2005).

From the empirical front, the relationship between financial inclusion and economic growth has recently received emphasis from numerous empirical studies globally. Levine (1997) empirically tested the neo-classical view and he finds out that countries with larger banks and more active stock markets grow faster over subsequent decades even after controlling for many other factors underlying economic growth. A research by Carpenter and Petersen in 2002 has shown a positive and significant relationship between the usage of credit and the evolution of enterprises, mostly for smaller companies.

In 2005 Burgess and Pande employed regression analysis using two dependent variables: headcount poverty and rural agricultural wages, and their results show that for every additional bank branch opened in a rural location, it lowers the headcount poverty ratio by 4.10% per 100,000 adults. The evidence suggests that easy access to loans encourages long-term investments, which in turn increases wages for rural agricultural labourers. The key findings of Beck et al. (2007) were that financial inclusion not only reduces income inequality but also benefit the poor disproportionately and is strongly related with poverty alleviation.

In 2011 Andrianaivo and Kpodar investigated whether financial inclusion is one of the channels through which ICT diffusion can influence economic growth. Using the System Generalized Method of Moment (GMM) estimator on a panel of 44 African countries over the period 1988–2007, their results confirmed a positive effect of ICT on growth and showed that the effect of mobile phone development on growth is more important for countries with high level of financial inclusion. Moreover, they concluded that financially well-developed countries tend to grow faster when mobile penetration is high as shown by the positive and significant coefficient of the interaction term between mobile penetration and financial inclusion.

Khan (2011) explains that improved financial services would lead to increased economic activities and employment opportunities for rural households, as more economic activities raise the disposable income, leading to more savings and a robust deposit base for the bank, resulting in inclusive economic growth. Based on the review of financial literacy studies done by Capuano and Ramsey (2011) benefits of financial literacy were divided into three main categories that is individuals, financial system, the economy and the community. They noticed that the benefits of financial

literacy to the economy can be translated through greater competition, market discipline and risk coverage. Hariharan and Marktanner (2012) found a strong positive correlation between a country's financial inclusion and total factor productivity (TFP) and concluded that financial inclusion has the potential to increase the financial sector savings portfolio, enhance efficiency of intermediation, and boost entrepreneurial activities which finally results in economic growth.

Allen et al. (2012) used household surveys and bank penetration data at district level in 2006 and 2009 to explore the effect of Equity Bank's branch expansion in rural Kenya. Using OLS, ordered probit model and generalised method of moment (GMM) to control for endogeneity, the results show that Equity Bank's branch expansion into underserved rural districts had the greatest effect on low income households with no salaried job, who had lower than secondary education and who were homeless. The study further revealed that the penetration of Equity Bank into rural areas increased the chances of having a bank account and securing a loan by 4 and 1% respectively. Bruhn and Love (2013) examine the effects of providing financial services to low-income individuals on entrepreneurial activity, employment, and income. The analysis used cross-time and cross-municipality variation in the opening of Banco Azteca in Mexico to measure the effects with a difference-in-difference strategy. Banco Azteca opened more than 800 branches simultaneously in 2002, focusing on low-income clients. The results showed that the opening of Banco Azteca led to an increase in the number of informal business owners by 7.6%. The research findings showed that expanding access to finance to low-income individuals can have positive effects on economic activities.

Oruo (2013) investigated the relationship between financial inclusion and economic growth in Kenya. She has found that the economic growth had a strong positive correlation with financial inclusion, especially the branch networks of the banking sector, mobile money accounts and the users. Park and Mercado (2015) and García-Herrero and Turégano (2015) examined whether financial inclusion contributes to reduction in income inequality. The former constructed a financial inclusion index which they used to examine the relationship between poverty and income inequality in developing Asia. Their results show that financial inclusion reduces poverty and also lowers income inequality. Meanwhile, the latter measured financial inclusion from various dimensions such as adults with bank accounts, credit to SMEs as percentage of GDP as well as using Honohan's (2007) access indicator and Sarma's (2012) financial inclusion index. After controlling for a host of other factors, their results also revealed that financial inclusion reduced income inequality, whereas private sector credit to GDP did not after controlling for the effect of fiscal policy and economic development.

Sahay et al. (2015) have used macro and micro-econometrics methodologies to study the link between financial inclusion and GDP growth. The results showed that

financial inclusion have a positive impact on GDP growth but must be combined with financial development. However, as more inclusion and financial development increases, the positive effect of inclusion on growth decreases. Onaolapo (2015) studied the effects of financial inclusion on the economic growth of Nigeria. He found a significant positive relationship between financial inclusion and economic growth. The author also showed that financial inclusion greatly influenced poverty reduction and financial intermediation through positively impacted Bank Branch Networks, Loans to Rural Areas and small enterprises.

Babajide et al. (2015) were interested in the impact of financial inclusion on growth of a nation. They found that financial inclusion positively impacted the total factor of production and the capital per worker, which impact positively the final output of the economy. The Outlook Regional Economic (2015) by using a micro-founded general equilibrium model analyzed the impact of financial inclusion on growth in Africa. They showed that lowering credit access constraints and lowering participation costs to market for firms and companies could stimulate growth and productivity and reduce inequality. Sharma (2016) using the Vector auto-regression (VAR) and the Granger causality, have shown that various dimensions of financial inclusion (banking penetration, availability, and usage of banking services) have positively impacted the economic growth. The researcher found a bi-directional causality between the geographical penetration of banking services and the economic development and a unidirectional causality between the number of deposits and the GDP.

Chatterjee and Anand (2017) in their study examined whether ICT development can be an important determinant of financial inclusion by using a fixed effect panel data model. They discovered that ICT is indeed an important determinant of financial inclusion. With the same panel data of 41 countries, the two further tested whether the growth process of the countries were influenced by financial inclusion and ICT diffusion in a dynamic Panel Data Model. They also investigated the role of financial inclusion powered by a better ICT penetration in fostering the growth of nations using system GMM method by incorporating interactions between financial inclusion and ICT indicators. The results suggest that both financial inclusion and ICT individually and together through their close interaction can improve current year's growth.

Iqbal and Sami in 2017 investigated the impact of financial inclusion on economic growth over a period of seven years using secondary data analyzed through a multiple linear regression model. The results of the study show a positive and significant impact of number of bank branch and Credit deposit ratio on GDP, whereas an insignificant impact was observed in case of ATMs growth on Indian GDP. Maune (2018) examined the effect of financial inclusion in the trade-growth nexus in Zimbabwe using time series data collected from the World Bank databases

from 1980 to 2016. The study precisely examined whether financial inclusion is a passage within which trade openness impacts growth in Zimbabwe. Also examined was the complementarity effect of financial inclusion and trade openness on growth. The study found a negative significant effect of financial inclusion and trade openness on growth in Zimbabwe. Moreover, the findings show a complementary, strong and positive nexus linking financial inclusion and trade openness on economic growth in Zimbabwe.

However, contrary to all the above mentioned studies that show a positive effect of financial inclusion on economic growth, Barajas, Chami and Yousefi (2011) found negative effect of private credit on growth in Mena region. Estimation results by Sassia and Goaid (2012) also show a meaningful negative effect of bank development on growth on Mena countries. They have tried to explain that by the comparative lack of competition in MENA banking systems and the lack of capital account openness and privatization. According to Duflo et al. (2013), specific empirical updates from the Spandana study, Hyderabad in India show no improvement in the welfare of participants. Fifteen to eighteen months after gaining access, households are less likely to be entrepreneurs but they invest more in existing businesses. Moreover, average profit increased only for businesses that had already been established before the launch of the microcredit programme, and increases generally concentrated on bigger businesses suggesting widening income inequality.

Nkwede (2015) investigated the influence of financial inclusion on economic growth in Nigeria using time series covering the period between 1981 and 2013. Multiple regression models anchored on Ordinary Least Square technique were adopted in estimating the contributions of the variables. The results show that financial inclusion has significant negative impact on the growth of Nigeria economy over the years. The researcher attributes the result to high level of financial exclusion of bankable adult citizens in Nigeria. Demircuc-Kunt et al. (2017), however, argue that the relationship between financial inclusion, inequality, and macroeconomic growth is not yet well understood, and there is relatively limited research on the topic. One reason why this relationship is not yet well understood is data unavailability. Establishing such a relationship requires a sufficiently long time-series on financial inclusion measures. Another reason why the outcomes remains unclear is that national policies aimed at increasing financial inclusion are for the most part very recent, and assessing their impact on country-level growth and inequality will take time.

#### 4. Research Design and Sources Of Data

Wegner (2000) defines a research design as a plan, structure or strategy of investigation used to obtain information needed in answering given research study questions. The study employed a quantitative research design to present, analyze and interpret secondary data drawn from ZIMSTATS. The study examined the impact of financial inclusion on gross domestic product (GDP) growth rate for Zimbabwe for the period 2011-2017. The secondary data used in the study were analyzed using an E-Views 8 regression model. The variables drawn into analyzing the impact of financial inclusion on GDP growth rate in Zimbabwe were account holding, active accounts, internet access, deposits, mobile banking, auto-mated teller machines (ATMs), adult loans, mobile advances and mobile transactions. The above variables were aggregated from specific variables that were grouped into income levels for the poorest and richest, gender-based transactions and people's age groups namely those less than 15 years, 15-34, 35-59 and 60 or more year olds.

##### 4.1. Specification of the Model

The study came up with a multiple linear regression model (MLRM) of the form;

$$gr_{GDP} = \beta_0 + \beta_1 AH + \beta_2 AA + \beta_3 AL + \beta_4 BA + \beta_5 ATM + \beta_6 DEP + \beta_7 IAC + \beta_8 MAD + \beta_9 MT + e_t, \text{ where;}$$

$gr_{GDP}$  = The annual growth rate in Zimbabwe's GDP for 2011 – 2017,

$\beta_s$  = regression coefficients,

AH = Account holding,

AA = Active accounts,

AL = Adult loans,

BA = Branch accounts held by the public,

ATM = ATM transactions made in the period,

DEP = Deposits made by the public,

IAC = Internet access,

MAD = Mobile advances,

MT = Mobile transactions and

$e_t$  = The random or error term.

The above financial inclusion variables were drawn into the model based on the breadth and depth of the volumes of transactions accumulated over the period 2011-

17 in the desire to examine their impact on explaining the country's GDP growth rate.

## **5. Findings, Analysis And Discussions**

The findings of the study are presented and analysed on the basis of descriptive statistics (appendix I), multicollinearity (appendix II), unit root tests (appendix III) and the multiple linear regression model (appendix IV) generated using E-Views 8 statistical package.

### **5.1. Descriptive Statistics**

The descriptive statistics generated through E-Views 8 package (appendix I) revealed that mobile transactions, public deposits, active accounts and account holding charges were the main drivers of the country's GDP growth rate in the period under review. The least contributor out of the nine measures of financial inclusion was loans by adults with only \$0.3 million value over the seven year period. The study also measured the peakedness or kurtosis of the normal curves drawn from the input variables. It was discovered that deposits had the highest kurtosis of 4.62 units, followed by account holding with 2.4 and lastly branch accounts with 1.76 measures. The variables' contributions towards GDP growth rate were estimated using classical probability. The study found that internet and active accounts contributed 40.20% each, deposits 0.00% while the other six variables had an aggregate contribution of 19.80%.

### **5.2. Multicollinearity of Variables**

The findings of the study on multicollinearity of the variables were that all of them had measures below 0.800 or 80% (Appendix II). Any measure of collinearity before 0.80 depicted absence of multi-collinearity among the input variables. In other words the variables used to explain growth rate in Zimbabwe's GDP were independent of each other and hence satisfied the independence assumption required under multiple linear regression models.

### **5.3. Unit root Tests**

The study discovered that AA, AL, BA, IAC and MT achieved stationarity conditions after the first difference integration (Appendix III). On the other hand the last four input variable namely AH, ATM, DEP and MAD were observed to achieve stationarity conditions at all levels of integration (Appendix III). Hence the satisfaction of the above unit root tests by all input variables made the use of MRLM possible in analyzing the impact of financial inclusion on Zimbabwe's GDP growth over the period under review. Unit root tests of model variables meeting the

theoretical conditions above were also essential in order to avoid coming up with nonsensical results from the applied statistical regression model.

#### 5.4. Multiple Linear Regression Model Coefficients

The E-Views MLRM resulted in the specific model of the form:

$$gr_{GDP} = 9.60 + 0.49AH - 0.04AA - 0.44AL + 0.46BA + 0.39ATM + 0.0045DEP + 4.87IAC + 4.65MAD + 1.63E^{-0.6}MT.$$

The country's GDP growth rate had an autonomous rate of 9.60% that was independent of the input variables used in the study. On the other hand a 1% increase in AH resulted in a 0.49% increase in the GDP rate over the period investigated. However, a 1% change in AA and AL gave decreases of 0.044% and 0.46% in GDP rate respectively. When variables such as BA, ATM and DEP were adjusted by 1%, this brought about effects of 0.46%, 0.39% and 0.0045% to the country's GDP rate sequentially. The study also discovered that 1% additions to IAC, MAD and MT values gave rise to 4.87%, 4.65% and 0.895% respectively. Therefore, all variables drawn into the model contributed positively to Zimbabwe's GDP growth rate in the period reviewed except AA and AL whose contributions were negative. The major contributing factors to the country's GDP rate of growth were IAC and MAD with 4.87% and 4.65% and the least was DEP with 0.004% contribution rate. The findings in this study are in line with both theoretical and empirical evidence. Empirically, the findings are supported by Oruo (2015), Sahay et al. (2015), Babajide et al. (2015) and Iqbal and Sami (2017) who also found positive relationships between financial inclusion and economic growth.

#### 6. Conclusions and Recommendations

Based on the above findings, the study concluded that IAC and MAD had a significant contribution to Zimbabwe's GDP growth rate in the period under investigation. The variables of the participants in the economy were age, gender and income levels. It was concluded that despite the majority of the country's participants falling in the age range 20-60 being unemployed, their influence on economy activity remained indispensable regardless of their gender. Furthermore, the study concluded that income levels contributed by the richest and poorest of our society had insignificant impact on the economy's GDP rate of growth. This was attributed to the fact that the poor people did not have access to income while the rich were known for externalization of finances to the detriment of the economy. The study recommended that the country should have a total independent and autonomous central banking system whose policies are developmental if it is to deliver its mandate to the nation of empowerment, growth and sustainable development.

The other main conclusion of the study was that the country's GDP growth rate had a positive relationship with all variables except AA and AL. In other words this testified that financial inclusion in general was responsible for dictating the growth rate of the economy. However, variables such as BA, ATM and DEP contributed insignificantly to the country's GDP growth rate mainly due to the repressed nature of the country's financial system. The researchers, therefore, recommend that authorities of the day should try and separate political activities from government business in order to grow them independently. Overlapping policies gave rise to a system of administered finance rendering the central bank being neither non-independent nor autonomous culminating into the financial sector failing to meet its mandate.

The use of surrogate currencies by the country such as bond notes was born out of the failure by the government of the day to separate political activities from government business thereby causing the failure of the financial sector to perform as the engine of economic growth and development. Overall, the study concluded that financial inclusion backed by gender, age groups and access to incomes by the rich and poor people had direct impact on the country's GDP growth rate and growth towards self-reliance, sufficient capitalization, investment and sustainable development. It is recommended that the country's economic activities should be driven by policies targeting STEM, that is, science, technology, engineering and mathematics. This will culminate into creativity, innovation, industrialization and high technology development if the country is to empower all its platers towards effective contribution towards sustainable development and self-reliance and sufficiency in the 21<sup>st</sup> century.

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## APPENDICES

### Appendix I. Descriptive Statistics of the Data

	AA	AH	AL	ATMS	BA	DEP	IAC	MAD	MT	GDP
Mean	222.40	458.7276	0.318571	5.102857	8.097143	157.0657	179.3000	290.0817	2451521	4.9200
Median	222.40	327.5500	0.320000	5.240000	5.550000	124.8900	179.3000	351.8700	1980166	2.380
Maximum	420.93	1056.080	0.380000	6.150000	12.81000	392.4100	226.6000	492.2200	7765825	16.67
Minimum	23.870	198.0777	0.270000	3.930000	4.420000	84.66000	132.0000	37.45000	272859.0	0.760
Std. Dev.	134.78	298.4720	0.034180	0.867533	3.557909	100.9527	32.11197	179.6317	2427600.	5.1904
Skewness	-4.94E-17	1.078201	0.373350	-0.101370	0.295894	1.789872	1.02E-16	-0.383734	1.355972	1.596
Kurtosis	1.7500	2.726753	2.343455	1.314237	1.167674	4.618977	1.750000	1.464649	3.727420	4.144
Jarque-Bera	1.8229	5.512190	1.153382	3.363384	4.325571	18.00827	1.822917	2.946310	9.197748	13.419
Probability	0.4019	0.063539	0.561754	0.186059	0.115004	0.000123	0.401938	0.229201	0.010063	0.001
Sum	6227.2	12844.37	8.920000	142.8800	226.7200	4397.840	5020.400	6961.960	68642588	137.76
Sum Sq. Dev.	490487.3	2405310.	0.031543	20.32057	341.7854	275169.1	27841.83	742154.0	1.59E+14	727.40
Observations	28	28	28	28	28	28	28	24	28	8

**Appendix II. Collinearity Among the Regression Variables**

	AA	AH	AL	ATMS	BA	DEP	IAC	MAD	MT
AA	1.000000								
AH	0.611036	1.000000							
AL	0.733457	0.375386	1.000000						
ATMS	0.458492	0.363037	-0.294487	1.000000					
BA	-0.754760	-0.738435	0.028205	-0.844006	1.000000				
DEP	0.589277	0.778084	0.666150	0.420882	-0.431822	1.000000			
IAC	0.760000	0.311036	0.433457	0.558492	-0.754760	0.479277	1.000000		
MAD	0.460194	0.703591	-0.044776	0.659193	-0.747624	0.364261	0.260194	1.000000	
MT	0.556522	0.449404	0.543521	0.703840	-0.722374	0.439454	0.356522	0.77304	1.000

**Appendix III. Unit Root Tests of the Regression Variables**

Variable	Order of Integration	Decision
AA	I(1)	Stationary after first differentiation
AH	I(0)	Stationary in all levels
AL	I(1)	Stationary after first differentiation
ATMS	I(0)	Stationary in all levels
BA	I(1)	Stationary after first differentiation
DEP	I(0)	Stationary in all levels
IAC	I(1)	Stationary after first differentiation
MAD	I(0)	Stationary in all levels
MT	I(1)	Stationary after first differentiation

**Appendix IV. Regression Analysis Coefficients**

Dependent Variable: GDP\_\_\_

Method: Least Squares

Date: 01/20/20 Time: 12:48

Sample: 2011Q1 2017Q4

Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.572500	2.980706	3.211488	0.0037
AH	0.486577	0.488756	1.486540	0.0482
AA	-0.041632	0.015571	-2.673713	0.0133
AL	-0.435237	0.245794	-3.654321	0.0364
BA	0.462356	0.462286	0.774249	0.0126
ATM	0.389642	0.445378	2.45986	0.0482
DEP	0.003923	0.018988	0.206583	0.4381
IAC	4.873247	2.238754	8.768458	0.5068
MAD	3.64664	1.21875	1.678548	0.6452
MT	1.63E-06	1.30E-06	1.251546	0.2228
R-squared	0.842771	Mean dependent var		4.920000
Adjusted R-squared	0.271867	S.D. dependent var		5.190450
S.E. of regression	4.429046	Akaike info criterion		5.945809
Sum squared resid	470.7949	Schwarz criterion		6.136124
Log likelihood	-79.24133	Hannan-Quinn criter.		6.003990
F-statistic	4.360386	Durbin-Watson stat		1.524964
Prob(F-statistic)	0.013794			