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THE IMPACT OF MONETARY POLICY ON ZIMBABWE'S ECONOMIC GROWTH

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ABSTRACT

Whereas numerous studies have investigated the impact of monetary policies on economic growth, the Zimbabwe's situation has received far less economic literature attention. This study employed five independent variables namely which are, interest rate, inflation, money supply, exchange rate and investment, and one independent variable that is Gross Domestic Product. To add to the collected works, this research uses monthly time series data covering the period of 1980 to 2021 to study the impact of monetary policies on Zimbabwe's economic growth. Using the ARDL (Autoregressive Distributed Lag) model, Granger Causality test and a regression model, it was discovered that the monetary policy has a short run relationship on Zimbabwe's economic growth. Specifically, investment and money supply have a positive impact on economic growth. Inflation, interest rates, and exchange rate have an inverse relationship with economic growth. Hence, an increase in those variables with an inverse relationship negatively affects economic growth. That is, when they increase, economic growth decreases. The results from this work will help policy makers in decision making.

KeyWords : Exchange rate, Gross Domestic Product, Inflation, Interest rate, Monetary policy.

INTRODUCTION

The monetary policy can be defined as the activity of controlling the money supply done by money authorities like the central bank with the aim of realizing the desired or the stated economic objectives (CBN, 2011). This is done by changing the economy's money supply and/or changing the rates of interest rates with the goal of managing the amount of money circulating in the economy. Hence, the monetary policy is a method of economic management that is used to convey a sustainable economic development and growth. In Zimbabwe, the Reserve Bank of Zimbabwe (RBZ) is the central bank that makes the monetary policies. Most central banks including the RBZ attempt to govern money supply since it is a linked with inflation rate.

In addition, the monetary policies comprise of those actions premeditated to have effect on the monetary segment. Dwivedi (2005) added that the monetary policy is the thoughtful use of monetary instruments both direct and indirect at the disposal of monetary authorities like the nation's central bank to achieve macroeconomic stability. Ayodeji and Oluwole (2018) stated that in most nations, the main objectives of monetary policies comprise of employment promotion, price stability, output growth and sustainable development.

Economic growth is the increase in the quantity of goods and services produced in a nation at a specific point in time. This shows that when a nation's real per capita income rises over time, the economy is growing. An economy that is growing produces goods and services in continual periods showing that the economy's industrious ability is improving. According to Jhingan (2004), economic growth infers to the rising living standards of people and decreasing inequalities of income distribution.

This study aims to investigate the impact that the monetary policy on economic growth in Zimbabwe. The study will also explore other macro-economic factors that have an impact on Zimbabwe's economic growth. A vital economic indicator for assessing the performance of a nation's economic performance is its yearly rate of Gross Domestic Product growth (Adabor, 2022). The variables which are going to the used in this work comprise of Gross Domestic Product as the dependent variable, Money Supply (M2), Real Exchange rate, Investment (FDI), Interest Rate (lending) and Inflation (CPI).

Zimbabwe is categorized as a third world country located in the Southern part of Africa. It is also classified as a developing nation. The Zimbabwean economy is experiencing a mirage of challenges which include hyperinflation, unemployment, and low investment (McIndoe-Calder, 2018). Zimba-

bwe's economic growth continues to be hindered by the instability of prices and exchange rates. Hyperinflation, various exchange rates and unsustainable debt levels have increased production costs. Trade integration has weakened, and foreign direct investment is very low.

Additionally, the country is experiencing unsustainable debt levels and longstanding arrears to IFIs and that limits the nation's growth potential. In the year 2022, the nation's external debt was estimated to be 76% of GDP. The depreciation of the Zimbabwean currency, hyperinflation and higher rates of interest rates have diminished investment and consumption.

To control inflation, the RBZ, tightened its monetary policy, it increased the interest rates from 80% to 200%, introduced gold coins that are now used as a store of wealth and liberalized the forex market.

The official Zimbabwean currency called the Zimbabwean Dollar (ZWD) was introduced in the year 1980. That currency was hit by inflation. In the late 90s and 2000 basic commodity prices were more than a million (ZWD). The RBZ started slashing zeroes to reduce the amounts of money. For example, in the year 2006, 12 zeroes were removed: ZWD 1,000,000,000,000 was redenominated to ZWD 1. This strategy was used more than twice. In the year 2008, the Zimbabwean dollar was abandoned and the RBZ legalized the use of the United States Dollars. However, in the year 2016, the RBZ reintroduced the Zimbabwean Dollar (ZWD).

Despite the various monetary regimes that have been adopted by the RBZ over the years, inflation remains a major threat to Zimbabwe's economic growth and development.

RESEARCH QUESTIONS

- What is the impact of Zimbabwean monetary policy on economic growth?
- What is the causality between the monetary policy variables?
- What is the relationship between GDP and the monetary policy variables?

RESEARCH METHODOLOGY

The idea that channeled the tactics that were applied in this research study was the positivism approach. The researcher elected to carry out a deductive method centered research. According to Cavana et al., (2001), when conducting a deductive line of attack, we first of all create a concept and then the concept is subjected to examination through theoretical and hypothesis testing established on empirical data. Collis and Hussey (2013) added that, the reductive approach can be well-defined

as a method in which the relationships of the study variables are tested based on some well-known fundamental theory or logic. According to Saunders et al., (2009), in such a research study, the perception is given for a comprehensive subject matter by moving from specific hypotheses to comprehensive simplifications contained by a research area grounded on inferences and conclusions that are created from quantifiable, statistical and or empirical data. Therefore, in this, the investigator adopted a deductive style to discover how the Monetary policy variables which are represented by Money Supply, Interest rate, Inflation, Investment and Exchange rate affect economic growth represented by Gross Domestic Product in Zimbabwe.

The quantitative approach was applied since data gathered was numerical in nature and variables were measurable. Quantitative research is a demonstrable search of settings that can be observed by means of mathematical and statistical methods. Wilkinson, (2012) conditions that quantitative research is based on measurable assumptions. In this type of research, collected data is in from of numbers which can be measured, ranked, and categorized. Quantitative data can be collected through either desk research or questionnaires. In this work, desk research will be used. In this current research study, the quantitative method was used to analyze secondary data attained from various websites.
For this study, secondary data was gathered from reliable sources and websites which include Reserve Bank of Zimbabwe, ZIMSTATS, and FRED. Data used in this study covered the period of between 1980 up to 2021.
The researcher was able to use the data from 1980- 2021 because as for exchange rate, although there are some years that the country abolished the Zimbabwean dollar, the Zimbabwean banks kept the track and records of our currency even though it was not in use, they kept recording the information and rates against the USD, the prices and its expected performance to know how it would perform if it was in use and this information can be found at the Reserve Bank of Zimbabwe, some of which is not easily available because of political reasons. The same applies to inflation, local banks had our currency and kept the records of inflation rate even if the money was not in use so no matter what currency we used, this does not have any effect on the study because the data that was used is related to our Zimbabwean currency, not other currencies that we used.

Table 1.

Variable	Variable type	Description	Expected effect
Gross domestic product (GDP)	Dependent variable	Gross domestic product can be well-defined it as the aggregate ultimate yield manufactured in the national economy regardless of the producers ethnic group. Real GDP is entire goods and services a nation manufactured at any given time retro which adjust for inflation.	Positive or negative
Exchange Rate (ER)	Independent variable	Exchange rate can be defined as the worth of a nation's currency compared to another nation's currency. In this study, the Zimbabwean dollar and the United States dollar exchange rate is used for measuring exchange rate.	Positive or negative
Interest Rate (IR)	Independent variable	Interest rate is the percentage of the loan that the borrower is charged. It is usually expressed as a yearly percentage of the outstanding loan. Lower interest rates promote spending and higher interest rates discourage spending.	Positive or negative
Investment (I)	Independent variable	This is the investment in local businesses and assets of another nation by an extraneous investor. Investment consists of the total of worth of the reinvested remunerations of foreigners, worth of net inter-business and affiliated equity.	Positive or negative
Inflation	Independent variable	Inflation can be defined as the untiring rise in the general price level of services and goods. Inflation can be measured with the	Positive or negative

		Consumer Price Index (CPI). CPI is the basket of goods and services that a consumer can buy centered from the individuals.	
Money Supply (MS)	Independent variable	In the study of macroeconomics, money supply is the sum volume of the money or currency that is held by the economy.	Positive or negative

Model Formulation

We expect GDP or economic growth to depend on interest rate, inflation, exchange rate, lending rate, Money Supply, Investment. The Keynesian IS-LM function works for as a stand on which the empirical model was conveyed. Relating to McCallum (1991), the subsequent equation (for this study) is formulated:

$$GDP_t = \alpha 0 + \alpha 1 MS_t + \alpha 1 ER_t + \alpha 1 Inv_t + \alpha 1 IR_t + \alpha 1 Inf_t + et \quad (1)$$

Where:

GDP denotes to Gross Domestic Product (economic growth); $\alpha 0$ is the error term; ***MS*** refers to Money Supply; ***ER*** stands for Exchange Rate; ***Inv*** symbolizes investment; ***IR*** represents Interest Rate; ***Inf*** indicates inflation rate; et represents the Error Term.

DATA PRESENTATION AND ANALYSIS

Stationarity Test

Before the model was estimated, unit root tests were performed to discover the existence of a unit root. Therefore, the Augmented Dicky Fuller (ADF) was applied to ignore any spurious regression. The ADF results are offered the table 2 below.

In table 2 below, the results from the Augmented Dicky Fuller stationarity test performed were displayed. The stationary test was carried out to ascertain if the variables used in the study do not have a unit root or are stationary. The following decision rule were considered. If the Test static value is less than the critical value at either 1%, 5% or 10% significance level, it means that the variables under

study are stationary. All the Test static values were less that the critical values at 1% level of significance. That means that they maybe evidence that the variables have no unit root.

The outcomes proved that no variable has a unit root. Inflation and Interest rate were stationary initially [I (0)]. Money Supply, Investment, Gross Domestic Product and Exchange rates became stationary at their first difference that is [I (1)]. The p-value must be less than the 5% level of significance for the series to be stationary. All the variables had p-values less than 0.05 that means all of them were stationary.

Table 2 : Unit Root test

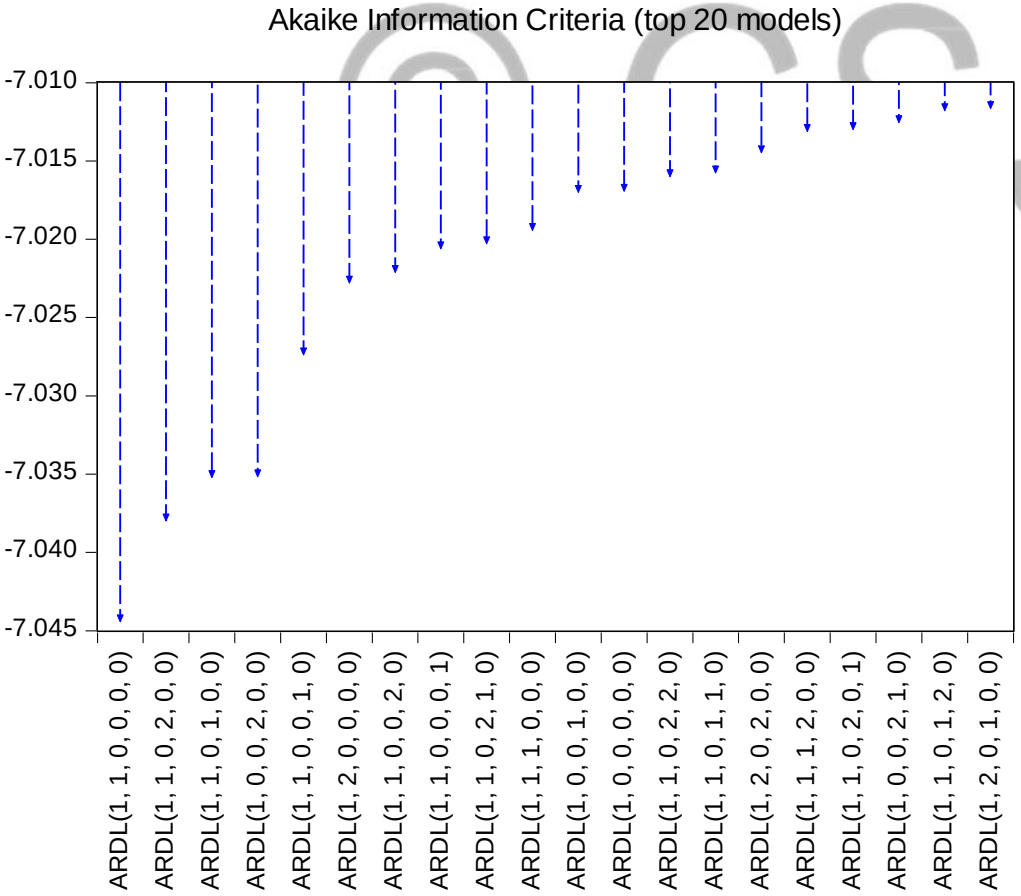
Variable	Test Statistic	p-value	Critical Values		Order of Intergration
Gross Domestic Product (GDP)	-1.8012	0.3798	1%:	-3.4438	
			5%:	-2.8674	
			10%:	-2.5699	
	-4.9376	2.945×10^{-5}	1%:	-3.4438	I(1)
			5%:	-2.8675	
			10%:	-2.5700	
Inflation	-9.6081	1.843×10^{-16}	1%:	-3.4435	I(0)
			5%:	-2.8673	
			10%:	-2.5699	
Interest Rate	-3.4384	0.0097	1%:	-3.4437	I (0)
			5%:	-2.8674	
			10%:	-2.5699	
Exchange Rates	-2.0796	0.2528	1%:	-3.4733	
			5%:	-2.8804	
			10%:	-2.5768	
	-12.5584	2.129×10^{-23}	1%:	-3.4747	I (1)
			5%:	-2.8810	
			10%:	-2.5772	
Money Supply	-1.9114	0.3267	1%:	-3.4436	
			5%:	-2.8674	
			10%:	-2.5699	
	-9.1650	2.473×10^{-15}	1% :	-3.4437	I (1)
			5% :	-2.8674	
			10%:	-2.5699	
Investment	-2.8146	0.05623	1%:	-3.4437	
			5%:	-2.8674	

		10%:	-2.5699	
-9.5453	2.660×10^{-16}	1% :	-3.4437	$I(1)$
		5% :	-2.8674	
		10%:	-2.5699	

Lag order Selection

As soon as the variables integration order has been established there is need to select a suitable model lag length with the aim of testing for the existence of relationships among the study variables. The model selection method was the Akaike info criterion (AIC) used for lag selection. A lag length of 1 for the dependent variable and 1 for the independent variables was selected since that was deliberated as ideal. Maheta (2022) who supports that small lag lengths are ideal since including too many lags in the model will increase chances of multicollinearity in the model so researchers must restrict the number of lags in the model.

Table 3: AIC



After doing and analyzing the Akaike info criterion, as presented in table 3, this study then decided to employ the lag selected by the model which was (1, 2, 0, 1, 0, 0). This was selected because it was

the least compared to others, which is ideal.

ARDL Model

Table 4: ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
L_GDP(-1)	-0.287638	0.082281	-3.538783	0.0005
L_MONEY_SUPPLY	0.103614	0.047566	-2.049891	0.0422
L_MONEY_SUPPLY(-1)	-0.081723	0.050990	-1.602711	0.1112
L_INTEREST_RATE	-0.268814	0.247732	-1.429193	0.0155
L_INTEREST_RATE(-1)	0.168661	0.243127	1.495542	0.0130
L_INFLATION	-2.307563	0.011765	-1.082364	0.0289
L_INFLATION(-1)	0.168661	0.022267	1.387864	0.0472
L_EXCHANGE_RATE	-0.001590	0.002706	-0.587412	0.0078
L_EXCHANGE_RATE(-1)	-0.032782	0.022296	-1.470313	0.0042
L_INVESTMENT	0.213174	0.543017	-1.755203	0.0314
L_INVESTMENT(-1)	0.198044	0.549183	0.360616	0.0489
L_INVESTMENT(-2)	0.391325	0.540672	3.128261	0.0021
C	0.063866	0.534931	0.119393	0.0051
R-squared	0.878625	Mean dependent var		0.068782
Adjusted R-squared	0.835748	S.D. dependent var		1.149470
S.E. of regression	1.055124	Akaike info criterion		3.018998
Sum squared resid	160.3134	Schwarz criterion		3.253602
Log likelihood	-223.4818	Hannan-Quinn criter.		3.114284
F-statistic	3.632587	Durbin-Watson stat		2.185528
Prob(F-statistic)	0.000261			

Table 4 displays the results of the ARDL model, which is a frequently applied econometric method of analyzing the short-run relationship between variables. The estimated values of the coefficients for each variable in the model are displayed in the coefficient row.

The L_GDP(-1) coefficient is -0.287638, which suggests that a unit increase in lagged GDP, that is GDP in the previous period leads to a 0.287638 unit decline in current GDP. This coefficient is statistically significant at a 99% confidence level, shown by the t-statistic of -3.538783 and the p-value of 0.0005.

The coefficient for money supply is 0.103614, demonstrating that a unit rise in the lagged money supply leads to a 0.103614 unit increase in current GDP. A percentage increase in Money supply leads to a 0.103614 increase in GDP. The coefficient is statistically significant at 95% confidence level, signposted by the t-statistic of -2.049891 and the probability value of 0.0422. This suggests that an increase in money supply increases the money for people to borrow so that they use it for investment.

The coefficient for interest rate is -0.268814, implying that a unit increase in interest rate decreases GDP by 0.268814. When interest rates increase, it implies that people will be discouraged from bor-

rowing since the costs of borrowing will be increased. The coefficient is statistically significant at a 98.5% confidence level, indicated by the t-statistic of -1.429193 and the probability value of 0.0155. This outcome is in line with the results attained by Obamuyi and Olorunfemi (2011) who attained that there is an inverse relationship between interest rate and GDP. They added that it is because when interest rates are high companies are discouraged from borrowing and it will mean that they cannot source more money to finance their activities.

The coefficient for investment is 0.213174, indicating that a one-unit increase in lagged investment leads to a 0.213174 unit increase in current GDP. This coefficient is statistically significant at a 96.86% confidence level, indicated by the t-statistic of -1.755203 and the probability value of 0.0314. From the outcome, an increase in investment increases the economic growth in Zimbabwe. This is probably because more means of production will be available and that means that production will be boosted.

The coefficient for exchange rate is 0.001590 which means that a unit increase in exchange rate leads to a decrease of economic growth or gross domestic product. One increase in exchange rate reduces the gross domestic level by 0.001590 percent. In theory, exchange rate is predicted to negatively impact economic growth. This coefficient is statistically significant at a 97.84% confidence level, indicated by the t-statistic of -0.587412 and the probability value of 0.0078. These findings are in line with those of Akadiri (2021) and Rapetti et al. (2012). However, there are circumstances that an increase in exchange rate leads to the increase in gross domestic product. The insinuation of this outcome is that an upper exchange rate upsurges the domestic goods demand since the foreign goods importation of becomes comparatively expensive. The local firms that maximize profits would upsurge their productivity to meet the local market demand thereby improving the gross domestic product. Accordingly, the local currency depreciation makes foreign goods expensive to importation of and that rises the foreign goods and services prices. As a result, this will increase the local product demand which as a result increase gross the domestic product. This is not the case with Zimbabwe but with the outcome attained by Adewuyi and Akpokodje (2013) in Ghana.

The coefficient for inflation is -2.307563, indicating that inflation indicating that a one-unit increase in lagged inflation leads to a 2.307563 unit increase in current GDP. An increase in inflation results to a decrease of economic growth or gross domestic product. The coefficient is statistically significant at a 95% confidence level, indicated by the t-statistic of -1.082364 and the probability value of 0.0289. This outcome proves that inflation exerts a negative significant impact on the Zimbabwean economic growth. That is, if the prices of goods and services increases by a single percentage, gross domestic

product cuts by approximately 2.307563. The insinuation of this outcome is that inflation rises the raw materials costs and other inputs of production by industries, therefore, reductions in the total output manufactured by factories. Moreover, the effects of inflation are a decrease in the purchasing power of consumers. Hence, the demand for goods and services reduces. Low labor productivity reduces firms' output, therefore, declines the gross domestic product. This outcome supports the results obtained by Sequeira (2021).

The higher the R-squared, the better. R-squared is 0.878625 and the Adjusted R-squared is 0.835748 which are very high, and it means that the model is a best fit. In addition to, the Prob(F-statistic) is 0.000261 which is less than 0.005 which means that the whole model is significant. The model was chosen using the Akaike info criterion.

The results submit that GDP, money supply, interest rate, inflation, exchange rate and investment have significant impacts on economic growth. The R-squared and adjusted R-squared values indicate that the model has a good fit, and the F-statistic suggests that the model is statistically significant overall. These results provide insights into the relationships that exists between economic growth and various economic variables.

Cointegration test

Table 5: F-Bounds Test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	36.53554	10%	1.99	2.94
k	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99
			Finite Sam-	
Actual Sample Size	156		ple: n=80	
		10%	2.088	3.103
		5%	2.431	3.518
		1%	3.173	4.485

From the F-Bounds Test presented by table 5, the F-statistic is greater than the lower bound and upper bound at 5% level of significance. 36.53554 is greater than I(1). According to Pesaran & Shin (1999), the F-statistics are compared to lower and upper bound values. There is cointegration, hence we reject hypothesis (H0) which assumes that there is no cointegration equation and accept hypothesis (H1) which accepts that there is a cointegration equation. This shows that it is possible to test for the long run relationship between the dependent and independent variables or to test if there is a long run equilibrium relationship between variables. It should be known that the model has passed the cointegration test.

The results displayed in the table 5 also shows the critical values for the F-statistic at different levels of significance for both asymptotic and finite sample sizes. For instance, at a 10% significance level and an asymptotic sample size of 1000, the critical value for k=6 is 1.99 for I(0) and 2.94 and for I(1). This implies that if the F-statistic is greater than these values, the null hypothesis can be rejected.

Correspondingly, for a finite sample size of n=80, the critical values for the F-statistic are also delivered at different significance levels. For instance, at a 10% level of significance, the critical value for k=6 is 2.088 for I(0) and 3.103 for I(1). This means that if the calculated F-statistic is larger than these values, we reject the null hypothesis.

Generally, the F-Bounds Test outcomes show that the variables considered in the ARDL model have a long-run association, which is a significant finding in understanding the active connection between the variables. This means that the long-run impacts of deviations in one variable on the others can be estimated, giving useful insights for the researchers and the policymakers.

Table 6: Long run Test

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
L_MONEY_SUPPLY	-0.053043	0.037839	-1.401794	0.1091
L_INVESTMENT	0.613510	0.704198	0.871218	0.9473
L_INTEREST_RATE	-0.002201	0.108099	-0.020365	0.5591
L_INFLATION	-1.42E-13	1.55E-13	-0.913259	0.2766
L_EXCHANGE_RATE	-0.001146	0.002031	-0.564576	0.3252
C	0.066264	0.399023	0.166067	0.9051

The coefficient for money supply is -0.053043, indicating that a unit increase in money supply leads to a 0.053043 unit decrease in the dependent variable in the long run. However, this coefficient is not statistically significant at a 90% confidence level, indicated by the t-statistic of -1.401794 and the probability value of 0.1091.

The coefficient for investment is 0.613510, indicating that a unit increase in investment leads to a 0.613510 unit increase in the dependent variable in the long run. However, this coefficient is not statistically significant at a 90% confidence level, indicated by the t-statistic of 0.871218 and the probability value of 0.9473.

The coefficient for interest rate is -0.002201, indicating that a unit increase in lagged interest rate leads to a 0.002201 unit decrease in the dependent variable in the long run. However, this coefficient is not statistically significant at a 90% confidence level, indicated by the t-statistic of -0.020365 and the probability value of 0.5591.

The coefficient for inflation is -1.428131, indicating that inflation may not have a significant impact on the dependent variable in the long run. This coefficient is not statistically significant at a 90% confidence level, indicated by the t-statistic of -0.913259 and the probability value of 0.2766.

The coefficient for exchange rate is -0.001146, indicating that a unit increase in lagged exchange rate leads to a 0.001146 unit decrease in the dependent variable in the long run. However, this coefficient is not statistically significant at a 90% confidence level, indicated by the t-statistic of -0.564576 and the probability value of 0.3252.

The constant term (C) is 0.066264, indicating the value of the dependent variable when all the independent variables are equal to zero. This coefficient is not statistically significant at a 90% confidence level, indicated by the t-statistic of 0.166067 and the probability value of 0.9051.

Overall, the results suggest that none of the independent variables in the model have a significant impact on the dependent variable in the long run. However, the lack of statistical significance may be due to a small sample size or other factors not captured by the model. It can be concluded that the monetary policy in Zimbabwe does not have a long run relationship with economic growth or economic activities.

Table 7: Error correctional Form

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.874539	0.074651	-17.76682	0.0000

R-squared	0.868110	Mean dependent var	0.025473
Adjusted R-squared	0.820483	S.D. dependent var	1.860176
S.E. of regression	0.788146	Akaike info criterion	2.587193
Sum squared resid	67.08685	Schwarz criterion	3.397251
Log likelihood	-151.4523	Hannan-Quinn criter.	2.916318
Durbin-Watson stat	2.212707		

Table 7 shows the results of the Error Correction Model (ECM) regression with a restricted constant and no trend. The ECM model is commonly used to analyze the short-run and long-run dynamics among the variables in an ARDL model.

The coefficient for CointEq(-1)* is -0.874539, which measures the speed of adjustment of the dependent variable towards its long-run equilibrium relationship with the independent variables. This coefficient is statistically significant at a 99% confidence level, indicated by the t-statistic of -17.76682 and the probability value of 0.0000. The R-squared value of 0.868110 indicates that the model explains 86.81% of the variation in the dependent variable. The adjusted R-squared value of 0.820483 takes into account the number of variables in the model and is a better measure of goodness of fit. The F-statistic of 18.87397 and the associated probability value of 0.0000 indicate that the model is statistically significant overall. The S.E. of regression is 0.788146, indicating the average distance that the actual values are from the predicted values. The Durbin-Watson statistic of 2.212707 is a test for autocorrelation, and the value suggests that there is no significant autocorrelation in the model.

Overall, the ECM regression results show that the dependent variable adjusts towards its long-run equilibrium relationship with the independent variables at a significant speed, as indicated by the statistically significant coefficient for CointEq(-1)*. This implies that any deviations from the long-run equilibrium relationship will be corrected in the short run. The high R-squared value suggests that the model is a good fit and can explain a large proportion of the variation in the dependent variable. The statistically significant F-statistic indicates that the model is statistically significant overall, further supporting the goodness of fit. The S.E. of regression is relatively low, indicating that the model is precise in its predictions. Finally, the Durbin-Watson statistic suggests that there is no significant

autocorrelation in the model, which is a desirable property of a well-specified regression model. Overall, these results indicate that the ECM model with a restricted constant and no trend can be used to analyze the short-run and long-run dynamics among the variables in the ARDL model.

Wald Tests

The summarized wald tests for hypothesis testing are shown below in table 8. The F-statistic probability value for money supply is 0.0001 which is less than 0.05, therefore we reject the null hypothesis and conclude that Money supply has a significant impact on economic growth. For investment, the F-statistic probability value is 0.0000 which is less than 0.05, therefore we reject the null hypothesis and conclude that Investment has a significant impact on economic growth.

Interest rates' F-statistic probability value is 0.0088 which is less than 0.05, therefore we reject the null hypothesis and conclude that Interest rate has a significant impact on economic growth. The F-statistic probability value is 0.0000 for exchange rate which is less than 0.05, therefore we reject the null hypothesis and conclude that Exchange rate has a significant impact on economic growth.

As for inflation, the F-statistic probability value is 0.0020 which is less than 0.05, therefore we reject the null hypothesis and conclude that Inflation rate has a significant impact on economic growth.

Table 8: Wald tests results

Variable	F-statistic P value
Money supply	0.0001
Investment	0.0000
Interest rate	0.0088
Exchange rate	0.0000
Inflation	0.0020

Granger Causality

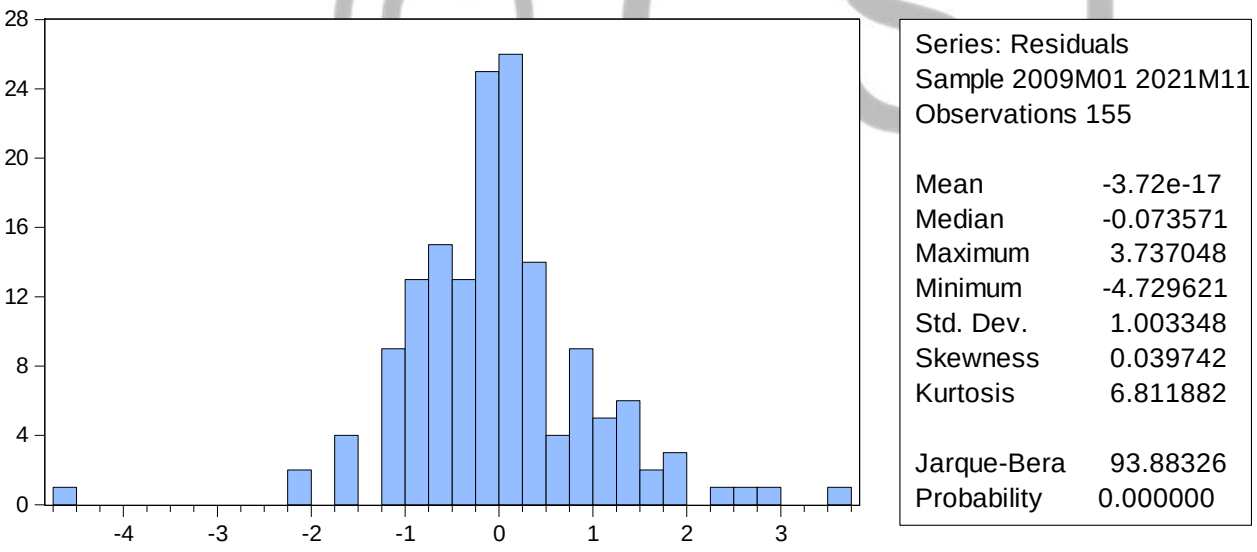
In the study, the existence of the causality was tested, as the research study suggested that they existed a causal relationship between gross domestic growth and other variables. The investigator had the desire to assess if the connection was bidirectional or unidirectional. For that purpose, granger cau-

sality was applied. The null hypothesis for the Granger causality submits that there exists no presence of a causal relationship between the study variables. On the other hand, the alternate hypothesis submits that there is presence of a causal relationship.

Centered on the results and with respect to investigating the causality between Money Supply, Exchange Rate, Investment, Interest Rate, and Inflation rate on economic growth, it has been found that money supply has a causation effect on gross domestic product, on the other hand, Interest rate does not granger cause GDP. Focused towards investigating the impact of exchange rate on economic growth, exchange rate does not granger cause GDP and vice versa. The causality also shows that investment does granger cause GDP. On the other hand, GDP does not granger cause investment. Lastly, inflation rate granger causes gross domestic product. On the other hand, gross domestic product does not granger cause Inflation.

Normality Tests

Figure 1: Normality test



As presented by figure 1, the probability value is 0.0000 which is less than 0.05 which shows that the residuals are normally distributed therefore we reject the null hypothesis which states that the residuals are not normally distributed. Null: Residuals are normally distributed. Alt: Residuals are not normally distributed. This situation is not desirable for our analysis.

Table 9 Breusch-Godfrey Serial Correlation LM Test:

F-statistic	15.82766	Prob. F(2,142)	0.2921
Obs*R-squared	28.25467	Prob. Chi-Square(2)	0.2488

The Breusch-Godfrey Serial Correlation LM Test is a statistical test used to determine if there is significant autocorrelation (serial correlation) in the residuals of a regression model. The null hypothesis for this test is that there is no autocorrelation in the residuals.

In the output provided, the F-statistic is 15.82766, and the associated probability value (Prob. F(2,142)) is 0.2921. This indicates that the null hypothesis of no autocorrelation cannot be rejected at the 90% confidence level. Therefore, there is no significant evidence of autocorrelation in the residuals of the model.

The Obs*R-squared value is 28.25467, and the associated probability value (Prob. Chi-Square(2)) is 0.2488. This value is the Lagrange multiplier statistic for testing the null hypothesis of no autocorrelation. The probability value suggests that the null hypothesis cannot be rejected at the 90% confidence level. This further supports the conclusion that there is no significant autocorrelation in the residuals of the model.

Overall, the results of the Breusch-Godfrey Serial Correlation LM Test suggest that there is no significant autocorrelation in the residuals of the regression model. This is a desirable property of a well-specified regression model because it indicates that the error terms are not systematically related to each other. Therefore, the coefficients estimated from the model are more reliable and can be used for inference and prediction with greater confidence.

Table 10 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.532686	Prob. F(10,144)	0.8648
Obs*R-squared	5.529232	Prob. Chi-Square(10)	0.8531
Scaled explained SS	13.86798	Prob. Chi-Square(10)	0.1791

The Breusch-Pagan-Godfrey Heteroskedasticity Test is a statistical test used to determine if there is significant heteroskedasticity in the residuals of a regression model. Heteroskedasticity refers to the situation where the variability of the residuals is not constant across all levels of the independent variables.

In the output provided, the F-statistic is 0.532686, and the associated probability value (Prob. F(10,144)) is 0.8648. This indicates that the null hypothesis of no heteroskedasticity cannot be rejected at the 90% confidence level. Therefore, there is no significant evidence of heteroskedasticity in the residuals of the model.

The Obs*R-squared value is 5.529232, and the associated probability value (Prob. Chi-Square(10)) is 0.8531. This value is the Lagrange multiplier statistic for testing the null hypothesis of no heteroskedasticity. The probability value suggests that the null hypothesis cannot be rejected at the 90% confidence level. This further supports the conclusion that there is no significant heteroskedasticity in the residuals of the model.

The Scaled explained SS value is 13.86798, and the associated probability value (Prob. Chi-Square(10)) is 0.1791. This value is the sum of the squared residuals scaled by the estimated variance function. The probability value suggests that the null hypothesis of no heteroskedasticity cannot be rejected at the 90% confidence level. This is another way of testing for heteroskedasticity, and the result indicates no significant evidence of heteroskedasticity in the residuals of the model.

Overall, the results of the Breusch-Pagan-Godfrey Heteroskedasticity Test suggest that there is no significant heteroskedasticity in the residuals of the regression model. This is a desirable property of a well-specified regression model because it indicates that the variance of the error terms is constant across all levels of the independent variables. Therefore, the standard errors of the estimated coefficients are unbiased and efficient, and the coefficients can be used for inference and prediction with greater confidence.

CONCLUSIONS

Summary

In this research, data was presented, analyzed, and discussed. Secondary data used which covered the period of 1980 to 2021. The outcomes depicted that of all the variables that represent monetary policy have an impact on economic growth. Money Supply, and Investment positively affects economic growth, and all other variables have an inverse relationship with economic growth. Hence, if investment and money supply are increased, economic growth increases. It should be noted that an increase in money supply increases economic up to a certain level and if it exceeds that level, it will

decrease economic growth (Takahashiii, 1979). Additionally, investment contributes positively to economic growth since it adds to the capital stock so it's a crucial economic growth determinant (Murdoch, 2005). On the other hand, interest rate, exchange rate, inflation rate and lending rate have a negative impact on economic growth. An increase in these variables with an inverse impact led to a decline in economic growth. Lastly, there is a short run relationship between economic growth and the monetary variables and there is no long run relationship between the monetary policy and economic growth in Zimbabwe.

Suggestions

The focus of this study is to look at the monetary policy on Zimbabwe's economic growth, established on the outcomes the subsequent recommendations can be drawn. The nation needs to impose policies that attract foreign investors to boost investment in the economy. The government must also support its residents through training potential entrepreneurs and implementing programs that equip potential local investors. To add on, interest rates need to be reduced to improve economic growth, but the trends need to be closely monitored since this can boost the inflation rates. The policy makers must closely monitor the supply of money in the economy. There are moments when there is a need to increase the supply of money in the economy to promote economic activities. This is a short run measure since excessive money supply increases inflation in an economy. The outcome from this study proved that an increase in money supply improves economic growth, this only applies in the short run.

Zimbabwe should bring back the use of foreign currency as its official currency and completely abolish Zimbabwean dollar because ever since Zimbabwe got independence and introduced its local currency, there have been high levels of inflation and the economy will be affected by it, so using foreign currencies officially will help.

Limitations

This study depended on secondary data attained from different repositories, which may perhaps have crooked or tainted because of different reasons like political reasons. These outcomes might not be applicable to other settings since they are limited to Zimbabwe between the years 1980 to 2021 only. Significant factor conceptualization of factors may possibly have narrowed the investigation, which may possibly shake the outcomes dependability. To deliver a comparative investigation, the investigation may possibly be extended to take in other countries. Zimbabwe as a nation has passed

through different phases between the considered time periods like changing of currency so some of the data from the local banks might not be accurate as they were estimations during the time that the country was using foreign currency and some of this data can only be found in local banks.

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