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INTEREST RATE–ECONOMIC GROWTH NEXUS UNDER CURRENCY BOARD OPERATIONS

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ABSTRACT

This paper analyses the effect of the prime interest rate as a monetary policy instrument to stimulate economic growth in Namibia, a small open economy that is constrained by currency board operations. A Vector Autoregressive Model (VAR) was used for the period 1980–2019. The result shows that Namibia's prime interest rate has no significant effect on economic growth. This finding remains robust and consistent when impulse response function and variance decomposition are employed. The impulse response function indicates a shock on the prime interest rate exhibits an inverse relationship. However, this effect is insignificant in both short and long-run scenarios. The variance decomposition indicates that the prime interest rate has a strongly exogenous impact, implying it has a weak influence on GDP growth. Policy implication indicates that small open economies under currency board operations need to identify different policy responses to circumvent external shocks and addresses their development needs.

Contribution/Originality: This study contributes to existing literature by analysing the effect of the prime interest rate as a monetary policy instrument to stimulate economic growth in Namibia.

1. INTRODUCTION

Economic literature postulates that the interest rates of any economy are vital to attracting savings and increase investments to spur economic growth. Africa has the lowest domestic resource mobilization track record of any region, with foreign saving funding 35% of the low investment levels according to. According to the African Development Bank factors contributing to low savings are financial exclusion from the financial sector, but this is also characterised by low interest rates to entice the majority of the population to save (AFDB, 2013). Similarly, Mckinnon and Shaw (1973) postulated that higher real interest rates earned on local financial assets increase the enthusiasm to save, thus reducing the savings restraint on capital accumulation, and boosting savings to be channelled to financial assets, in so doing increasing the disposal of investment finance. This implies that high interest rates on deposits will attract domestic savings and low interest rates on loanable funds will entice firms and entrepreneurs to borrow to invest in productive ventures, which will lead to economic growth (Tajudeen, Olusola, & Ademola, 2017).

Monetary policy utilises different channels to achieve or maintain macroeconomic stability and enhance economic growth. This paper focuses on the interest rate channel, with emphasis on how it affects economic

growth. One of the key interest rates that Central Banks (CBs) try to influence is the short-term interest rate, by altering the interest rate at which commercial banks lend from CBs. This interest rate is referred to as the "repo rate". When the CB lowers or raises the repo rate, it makes it less or more expensive for commercial banks to borrow money, which ultimately affects the cost of lending money to consumers, known as the prime lending rate. The prime lending rate influences the short-term interest on credit through the interest rate spread.

For Namibia, this has not been entirely the case. According to Ikhide and Uanguta (2010), interest rate policy might not be effective in stimulating economic growth in Namibia since the Namibian currency is pegged to the South African rand. This leads to Namibia Central Bank monetary policy decision conceding to the South African Reserve Bank monetary policy decisions (Ikhide & Uanguta, 2010). Even if this arrangement leads to lower prices, economies of scale on trading costs, and a large increase in trade volume and importantly cross-border financial transactions, it has resulted in a loss of independent monetary policy decision-making for stabilisation and policy-making purposes (Ikhide & Uanguta, 2010). Studies that examine the relationship between prime interest rates and economic growth are very scanty in Namibia. This paper contributed uniquely to the literature by proving new policy insight to Namibia and other developing countries that are operating under currency board arrangements.

2. LITERATURE REVIEW

2.1. Theoretical Literature

The theoretical literature on the relationship between interest rate and economic growth is not without ambiguities. Whilst most of the researchers agree on an inverse relationship others reported a positive or mixed relationship. According to Mckinnon and Shaw (1973), real interest rates has a positive, but short- and mid-term effect on economic growth. They further theorised that countries should abandon interest rate ceilings and allow interest rates to be determined by free-market conditions, attaining economic growth through financial liberalisation. Therefore, increases in interest rates prompt increased savings and resulting investment and act as a catalyst to stimulate economic growth.

The Neo-Keynesian model and the neoclassical theory of investment claim that the interest rate's negative influence on firms' cost of capital is a result of the inverse relationship between interest rates and output (Drobyshevsky, Bogachkova, Trunin, & Sinelnikova-Muryleva, 2017). This means that when interest rates are high, the output of firms diminishes, as firms need to repay higher interest rates on debt. This results in firms being unable to invest in an additional capital-intensive project to spur economic growth. Keynes further states that high interest rates lead to lower investments, and thus reduced economic growth (Keynes, 1936).

Moyo and Le Roux (2018) suggest that keeping interest rates low will have an impact on economic growth, therefore having and negative correlation. Blume and Sargent (2015) reviewed the "Essay in Dynamic Theory" by author R. F. Harrod (1939) that real sector development acts as an input product for economic development. The level of savings and productivity of capital explains the economic growth rate. The mobilisation of saving and generation of investment accelerate economic growth, therefore the growth rate of an economy is observed as a direct utility of savings and a converse function of the capital output (Blume & Sargent, 2015). Higher savings leads to investment and lower capital means efficient investments and the growth rate of the economy will be higher (Besomi, 2001).

Keynes' view leads to the "Keynesian Liquidity Preference Theory" which assumes a positive relationship between output and interest rate, based on the liquidity preference money supply relationship, also known as the LM (Lagrange Multiplier) curve (Hicks, 1936). If there is an increase in money supply in an economy, there will not be a demand for loanable funds. Tobin's monetary growth model concurs that a higher interest rate on deposit funds harms demand for loanable funds for investments, as the higher deposit interest rates, the higher loanable funds rates. Monetary authorities can thus affect the level of investment by influencing the supply/demand for

money, thereby changing the interest rate on deposits (Tobin, 1969). Therefore, financial institutions will have to reduce interest rates to entice borrowers to lend funds to entrepreneurs and firms.

Other schools of thought hold that high interest rates will enhance the desire to save. Fisher (1930) argued that the influence of interest rate was subject to two factors: the source of savings and investment demand determined by households, and capital from the commercial sector. He points out that when spending is brought forward (inter-temporal smoothing) instead of channelling income to savings it prompts a positive relationship between the interest rate and economic growth while saving induces a reduction in interest rates.

Although MacKinnon–Shaw and Keynes agree that interest rates affect economic growth, they hold different perspectives on the causal effect of a negative or positive relationship between interest rates and economic growth. The MacKinnon–Shaw view is from a deposit interest rate view while the Keynesian model is from the lending rate view. While, Mundell (1962) and Fleming (1962) in their trilemma hypothesis referred to as the Mundell-Fleming model imply that countries can only at any one time select two out of three policy goals: monetary policy independence, exchange rate stability policies, and financial integration policies. The theory implies that a country with a freely fluctuating exchange rate will experience more volatile capital flows resulting in a moderately less volatile GDP output, than if the exchange rate was fixed. Therefore, CBs can act counter-cyclically by altering interest rates independently to curb excessive capital inflows. High capital inflows result in the appreciation of the domestic currency, making it expensive for foreign investors to invest in domestic capital-intensive projects and to increase output.

2.2. Empirical Literature

For sub-Saharan African (SSA) economies (Tajudeen et al., 2017) studied the structural interaction of the interest rate liberalisation–growth nexus and find that price stability and openness on trade are much more substantial for interest rate liberalisation and economic growth. While for selected West-African economies such as Nigeria, Ivory Coast and Ghana, Owusu and Odhiambo (2016) also found a positive outcome of interest rate liberalisation but with less positive effects on primary commodity exporters.

Financial reform studies for individual countries show a positive effect on economic growth, like (Orji, Ogbuabor, & Anthony-Orji, 2015) investigated the impact of financial liberalisation and economic growth for Nigeria. The findings revealed that financial liberalisation and private investment have a positive impact on economic growth. For the Kenyan economy, Nicholas (2009) found that interest rate liberalisation was successful in increasing economic growth through its influence on financial depth. In the same line, Obamuyi and Olorunfemi (2011) examined the implications of financial reforms and interest rates on the economic growth of Nigeria and showed that financial reforms and interest rates have an adequate impact on economic growth. Moyo and Le Roux (2018) studied the impact of interest rate reforms for Southern African Development Countries (SADC) for the period 1990–2015. Their findings using Pooled Mean Group (PMG) estimation technique and ARDL bounds tests for cointegration of the variables indicate that interest rate reforms have a positive impact on economic growth through savings and investments, but that low levels of interest rates may harm economic growth.

Udoka and Anyingang (2012); studied the relationship of interest rate fluctuation on the economic growth and the difference in economic growth before and after the interest rate deregulation regime in Nigeria. Their result confirmed an inverse relationship between the interest rate and economic growth in Nigeria. This finding is consistent with Arhin et al. (2017) in Ghana, Anaripour (2011) for Iran and Algahtani (2015) in Saudi Arabia where a negative relationship between interest rates and economic growth was found.

For developed economies, Hansen and Seshadri (2014) analysed the long-run correlation between real interest rates and output development in the United States of America (USA) using correlation estimation techniques with data from 1901-2011. Their study showed a modest negative correlation between the interest rate and economic growth with a 1 % increase in interest rates leads to a 0.36 % decline in output. They also found that long-run low

interest rates led to increased productivity growth, while high interest rates resulted in low productivity. An IMF study by Leite and Sundararajan (1990) found a negative correlation between interest rates and output for G-7 countries. Empirical evidence indicates that during economic booms interest rates tend to be low and during recessions interest rates were high for periods from 1970–1995. Di Giovanni and Shambaugh (2008) studied the linkage between interest rates and annual real GDP growth in industrial countries and found that high foreign interest rates have a shrinkage effect on the annual real GDP growth rate in the domestic economy and that this effect was stronger in exchange rates regimes.

Other authors found no negative correlation between interest rates and economic growth or their findings were inconclusive. Lee and Werner (2018); King and Levine (1993) studied the association between interest rates and GDP growth in the USA and groups of developed and developing countries respectively. Their study found that there is no real support for concluding a negative relationship between interest rates and growth nor any constant support for arithmetic causality stemming from interest rates to economic growth.

With regard to causality issues, Bashir, Ahmed, and Khan (2017) investigated the causal relationship between the interest rate and economic growth and concluded there is unidirectional causality from economic growth to interest rates. However, Buteau (2011) finds that monetary policy through the interest rate channel in less developed countries is not sufficient to spur economic growth, but is rather effective though the exchange rate channel. This argument is further supported by Lee and Werner (2018) interest rates have fallen over two decades in Japan without impacting economic growth (Lee & Werner, 2018).

The above theoretical and empirical literature has indicated that the interest rate -growth nexus is not without ambiguities. The causal relations between interest rates and economic growth can either be negative or positive and to some extent ambigous. Therefore providing empirical evidence on fundamental evidence of a particular theory is country-specific and can only be ascertained with further empirical work.

3. DATA AND METHODOLOGY

3.1. Research Design

In this paper, a causal-comparative or quasi-experimental research design is used. In addition to this, a quantitative research strategy is employed to investigate the underlying relationship. Time series data of the Namibian prime interest rate and GDP at market prices (proxy to economic growth) was sourced from the Bank of Namibia and the Namibia Statistical Agency for the period 1980–2019.

3.2. Modelling Strategy

Using a suitable methodology for the time series data is the most crucial part of any time series analysis, as an erroneous specification of the model or using an incorrect method provides biased and inconsistent estimates (Shrestha & Bhatta, 2018). To expedite the analysis and testing of the relationship between prime interest rates (PRATE) and GDP in Namibia, the study uses the Vector Autoregressive (VAR) model. The usage of VAR for the economic analysis was made popular after a prominent paper by Sims (1980). This methodology proves to be appropriate as the variable could be mutually reinforcing (endogenous). The time-series property of the data analysis supports the stationary property. However, there is no evidence of cointegration. Therefore, the VAR model is the ideal model to study the interest rate-economic growth nexus issues.

3.2.1. Model Specification

The VAR model permits the reaction or reverse interconnection between the dependent and independent variables through their past values (Shrestha & Bhatta, 2018; Sims, 1980). Therefore a VAR model is a structure of active linear equations where all the variables in the structure are treated as endogenous. The general equation for the VAR model is expressed as:

$$\Upsilon_t = \alpha + \beta_1 \Upsilon_{t-1} + \beta_2 \Upsilon_{t-2} + \cdots + \beta_p \Upsilon_{t-\rho} + \epsilon_t \quad (1)$$

where $\boldsymbol{\Upsilon_t}$ (k x1) is the vector of endogenous variables, $\boldsymbol{\alpha}$ is a k x 1 vector of constant, the intercept, and, $\boldsymbol{\beta_2}$……..$\boldsymbol{\beta_p}$ are the coefficients of the lags of GDP and IR of order p (a time-invariant k x k matrix). Order '$\boldsymbol{\rho}$' means, up to $\boldsymbol{\rho}$-lags of $\boldsymbol{\Upsilon}$ are used and they are the predictors in the equation. The optimal lag length will be determined through the various multivariate of the information criteria. While $\boldsymbol{\epsilon_t}$ is white noise (k x 1 vector of error) or unobserved error term $\boldsymbol{E(\epsilon_{it}) = 0, (i = 1,2)}$

The general or simplest equation for a bivariate VAR model that has two variables where each of the current value is dependent on a different combination of previous $\boldsymbol{\rho}$ values for both variables including error terms is expressed as:

$$\Upsilon_{1t} = \beta_{10} + \beta_{11}\Upsilon_{1t-1} + \cdots + \beta_{1p}\Upsilon_{1t-\rho} + \alpha_{11}\Upsilon_{2t-1} + \cdots + \alpha_1 \Upsilon_{2t-p} + \epsilon_{1t} \quad (2)$$

$$\Upsilon_{2t} = \beta_{20} + \beta_{21}\Upsilon_{2t-1} + \cdots + \beta_{2p}\Upsilon_{2t-\rho} + \alpha_{21}\Upsilon_{1t-1} + \cdots + \alpha_2 \Upsilon_{1t-p} + \epsilon_{2t} \quad (3)$$

Since the multiple time series influence each other, it is therefore modelled as a system of equations with one equation per variable (time series). The specific VAR model that is estimated is expressed as ;

$$\Delta GDP_{1t} = \beta_{10} + \beta_{11}\Delta GDP_{1t-1} + \cdots + \beta_{1p}\Delta \mathrm{GDP}_{1t-\rho} + \alpha_{11}\mathrm{IR}_{2t-1} + \cdots + \alpha_1 IR_{2t-p} + \epsilon_{1t} \quad (4)$$

$$IR_{2t} = \beta_{20} + \beta_{21}IR_{2t-1} + \cdots + \beta_{2p}IR_{2t-\rho} + \alpha_{21}\Delta GDP_{1t-1} + \cdots + \alpha_2 \Delta GDP_{1t-p} + \epsilon_{2t} \quad (5)$$

Where $\boldsymbol{\Delta}$ is the change is current and past value; GDP denotes real gross domestic product; IR represent interest rates; ϵ_{1t} and ϵ_{2t} are stochastic residual terms and the rest are parameters.

3.2.2. VAR Lag Length Selection Criteria

Estimating the correct lag length to use in the VAR model for a time series is a vital process. VAR models are sensitive to lag order selection, as the degree of freedom is lost when the sample size is not sufficiently large and there are many lags, leading to the consumption of various degrees of freedom, generating problems in estimation (McMillin & Fackler, 1984). Under- or overestimating the parameters of a VAR model can lead to estimates that are inefficient, biased or both (Hafer & Sheehan, 1989); increased mean-square forecast errors of the VAR and cause auto-correlated errors (Lütkepohl, 1991); or estimates of VAR that are different from the original lag lengths and are erratic just as the impulse response function and variance decomposition will be (Braun & Mittnik, 1993). In this paper, the optimal lag length will be determined through various lag length selection criteria such as the

Akaike information criterion (AIC) (Akaike, 1973); Schwarz information criterion (SIC) (Schwarz, 1978) and Hannan–Quinn criterion (HQC) (Hannan & Quinn, 1979).

4. EMPIRICAL RESULTS AND DISCUSSIONS

4.1. Descriptive Statistics

The descriptive statistics in Table 1 show the mean of the data values of the Gross Domestic Product (GDP) and the prime interest rate (IR) in Namibia at 82,608.2 and 14.9313%, respectively. The median for GDP is 70,673.22 and for IR 15.0917 and it should be noted that the median is a robust measure of the middle of the scatter that is less sensitive to outliers than the mean. The maximum or highest value during the observation period is 142,436.60 for GDP and 22.33% for IR, while the lowest or minimum values are 43,911.64 and 9.25% for GDP and IR, respectively. The measure of distribution spread in each of the data, the standard deviation, is 35,749.72 for GDP and 4.41307% for IR.

Table-1. Descriptive statistics.

Descriptions	GDP	IR
Mean	82608.29	0.149313
Median	70673.22	0.150917
Maximum	145436.6	0.223300
Minimum	43911.65	0.092500
Std. Deviation	35749.72	0.041307
Skewness	0.592909	0.233850
Kurtosis	1.914784	1.725472
Jargue-Bera	4.306428	3.071940
Probability	0.116110	0.215247
Sum	3304332.	5.972533
Sum Sq. Dev	4.98E+10	0.066546
Observations	40	40

The skewness measured through the asymmetry of the distribution of data around the means of GDP and IR is normal at 0.59 and 0.23, respectively. The peak and flatness of GDP and IR, measured from kurtosis statistics, are 1.9 and 1.7, showing that the variables are platykurtic, that is, below a kurtosis level of 3. Therefore, both series mirror a normal distribution and are platykurtic and have a flat surface.

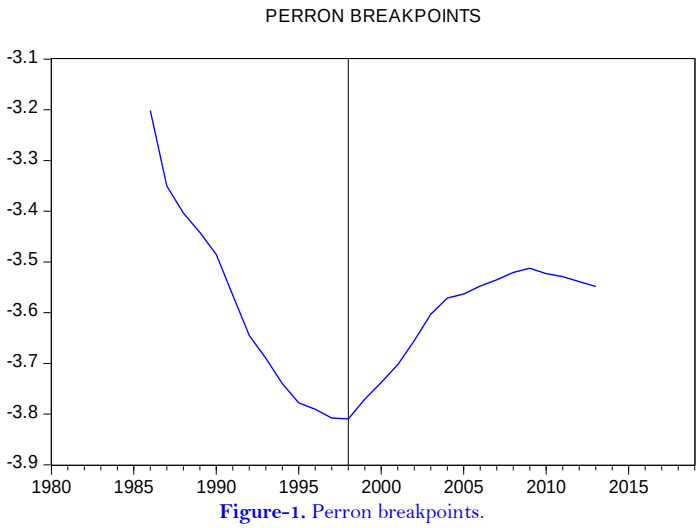

Figure-1. Perron breakpoints.

4.2. Structural Break Analysis

Prior to parameter estimation, diagnostics of data need to be examined for any structural breaks. The "Perron unit root test with breaks" confirms the presence of a structural break in the year 1998 as seen in Figure 1. To address the issues of the identified structural break, a dummy variable is added to the model.

4.3. Unit Root Results

Testing for the presence of unit root is necessary to ensure that the parameters used for estimation are of a stationary series and to avert spurious results. The ADF and PP unit root tests examine the order of integration of the variables. Results of the test are shown in Table 2.

Table-2. Augmented Dickey-Fuller (ADF) and Phillips–Perron (PP) unit root tests.

	t-Stat & Prob.	At Level (ADF)		At Level (PP)	
		GDP	**PRATE**	**GDP**	**PRATE**
With Constant	t-Statistic	0.3755	-1.5532	1.2047	-1.9880
	Prob.	**0.9792**	**0.4959**	**0.9976**	**0.2907**
		Non-stationary	Non-stationary	Non-stationary	Non-stationary
With Constant & Trend	t-Statistic	-2.2568	-3.0376	-2.1375	-3.8299
	Prob.	**0.4462**	**0.1361**	**0.5096**	**0.0253**
		Non-stationary	Non-stationary	Non-stationary	Stationary **
Without Constant & Trend	t-Statistic	2.1038	-0.9124	4.6060	-0.3717
	Prob.	**0.9902**	**0.3145**	**1.0000**	**0.5441**
		Non-stationary	Non-stationary	Non-stationary	Non-stationary
		At First Difference (ADF)		**At First Difference (PPP)**	
		d(GDP)	**d(PRATE)**	**d(GDP)**	**d(PRATE)**
With Constant	t-Statistic	-3.3666	-5.5202	-3.2646	-5.3839
	Prob.	**0.0186**	**0.0000**	**0.0238**	**0.0001**
		Stationary **	Stationary ***	Stationary **	Stationary ***
With Constant & Trend	t-Statistic	-3.4552	-5.3731	-3.3936	-6.0283
	Prob.	**0.0591**	**0.0005**	**0.0673**	**0.0001**
		Stationary *	Stationary ***	Stationary *	Stationary ***
Without Constant & Trend	t-Statistic	-1.5807	-5.5727	-2.1435	-5.4776
	Prob.	**0.1060**	**0.0000**	**0.0325**	**0.0000**
		Non-stationary	Stationary ***	Stationary **	Stationary ***

Notes: * Significant at the 10% level ; ** Significant at the 5% level; *** Significant at the 1% level.

At level form I(0), both ADF and PP tests indicate that GDP and PRATE are non-stationary (have a unit root), except for PRATE that is already stationary for the PP test with constant and trend at the 5% significance level. The non-stationary GDP and PRATE are differenced and become stationary in the first differencing I(1), except for D(GDP) that remains non-stationary at no intercept and trend. It can be concluded that the estimated results of the unit root test for both ADF and PP tests indicate that variables become stationary in the first order of integration I(1), and are reported in Table 2. As stated in the methodology section, although the ADF and PP tests perform the same estimation test, ADF has the shortcoming of not identifying any structural breaks, heteroscedasticity or autocorrelations in the time series, which the PP test considers.

4.4. VAR Lag Order Selection

The optimum lag is determined by the AIC, SC and HQ criteria. Table 3 indicates that AIC indicates the lowest optimal lag length of 2.

Therefore, estimating the VAR model uses two lags, including stability and diagnostics test in.

Table-3. VAR Lag order selection criteria.

Endogenous variables: GDP RATE				
Lag	**LogL**	**AIC**	**SC**	**HQ**
1	-255.6264	14.03386	14.20801*	14.09526*
2	-251.3180	14.01719*	14.36549	14.13998
3	-249.9263	14.15818	14.68064	14.34237

Notes: * indicates lag order selected by the criterion.
AIC: Akaike information criterion.
SC: Schwarz information criterion.
HQ: Hannan–Quinn information criterion.

4.5. Johansen Cointegration Test

In determining the number of cointegrating vectors the results are determined through the use of Johansen (1988) maximum likelihood ratio test and the two test statistics.

Table 4 reports the Johansen cointegration test result of the Trace and Max-Eigenvalue statistics.

Table-4. Trace and Max-Eigenvalue test statistics.

Unrestricted Cointegration Rank Test (Trace)				
Hypothesised		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None	0.318244	14.20086	15.49471	0.0776
At most 1	0.000724	0.026790	3.841466	0.8699
Trace test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon, Haug, and Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesised		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None	0.318244	14.17407	14.26460	0.0517
At most 1	0.000724	0.026790	3.841466	0.8699
Max-eigenvalue test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon et al. (1999) p-values				

The hypothesis of no cointegration vector is not rejected for the Trace and Max-Eigen statistical values at 14.20 and 14.17, respectively. The statistical values are less than their critical value at the 5% level of 15.49 for Trace statistics and 14.26 for Max-Eigen statistics.

Accordingly, the confidence level at 0.0776% (Trace test) and 0.0517 (Max-Eigen test) are more than 5%, therefore the non-cointegration equation/vector is not rejected. Therefore, the Johansen cointegration test implies there is no long-run relationship between GDP and prime interest rate.

The Engle-Granger cointegration test was further used to serve as a robustness check. It confirms the absence of cointegration between variables, as the residual series is not stationary at levels. In this light, the unrestrictive VAR model is the best fitting model.

4.6. Empirical Results

Table 5 presents the parameters of the VAR model. It shows that the GDP values are both statistically significant in the model at p-values less than the 5% significance level, while both the prime rate values are insignificant. The dummy variable accounting for structural breaks is also insignificant. As the paper seeks to examine the relationship between prime interest rate and GDP growth, the estimate shows that interest rate does not have explanatory powers over GDP. To examine if they are significant jointly to influence GDP, the Wald test is utilised. The result of the chi-square fails to support the hypothesis of joint significance. Therefore, Namibia's prime interest rates do not have explanatory powers over GDP. The findings are consistent with Buteau (2011) finding that monetary policy through the interest rate channel in less developed countries is not sufficient to spur economic growth.

Table-5. VAR estimation model.

	Coefficient	Std. Error	t-Statistic	Prob.
GDP (-1)	1.348589	0.179992	7.492491	0.0000
GDP (-2)	-0.372746	0.178519	-2.087988	0.0448
PRATE (-1)	-12354.99	19061.42	-0.648167	0.5215
PRATE (-2)	4662.060	17463.00	0.266968	0.7912
DUMMY	2257.754	1380.853	1.635043	0.1118
CONSTANT	3451.284	4023.352	0.857813	0.3974

4.6.1. Impulse Response Analysis and Variance Decomposition Analysis

Impulse response analysis and variance decomposition analysis in a VAR is used to investigate the relationship between the prime interest rate and GDP growth and whether there is any significant impact from shocks or innovation in the Namibian prime interest rate on GDP growth.

Table 6 summarises the IRFs using the Cholesky degree of freedom adjusted and the variance decomposition variables, with Figure 2 giving a visual display of the result. For the IRF, one standard deviation shock (innovation) in prime interest rate has no effect on GDP growth during the first period, with only a gradual negative response in the second period.

During period three the negative response continues but remains stable during period four and moves slightly upwards during period five. Therefore, a positive shock on the prime interest rate will have no short-run or long-run impact on GDP growth. This is consistent with empirical results in Table 5 as well as the variance error decomposition result reported in Table 6. Furthermore, Table 6 shows that the prime interest rate has a strongly exogenous impact, implying it has a weak influence on GDP growth.

Table-6. Impulse response and variance decomposition.

Period	Impulse Response	Variance Decomposition GDP		Variance Decomposition PRATE	
	PRATE to GDP	on *GDP PRATE*		on *GDP PRATE*	
1	0.000000	100.0000	0.000000	4.121999	95.87800
2	-242.8978	99.66066	0.339335	9.286235	90.71376
3	-401.5333	99.29140	0.708605	13.69939	86.30061
4	-415.3099	99.13313	0.866868	15.54225	84.45775
5	-361.5953	99.11541	0.884594	16.44500	83.55500

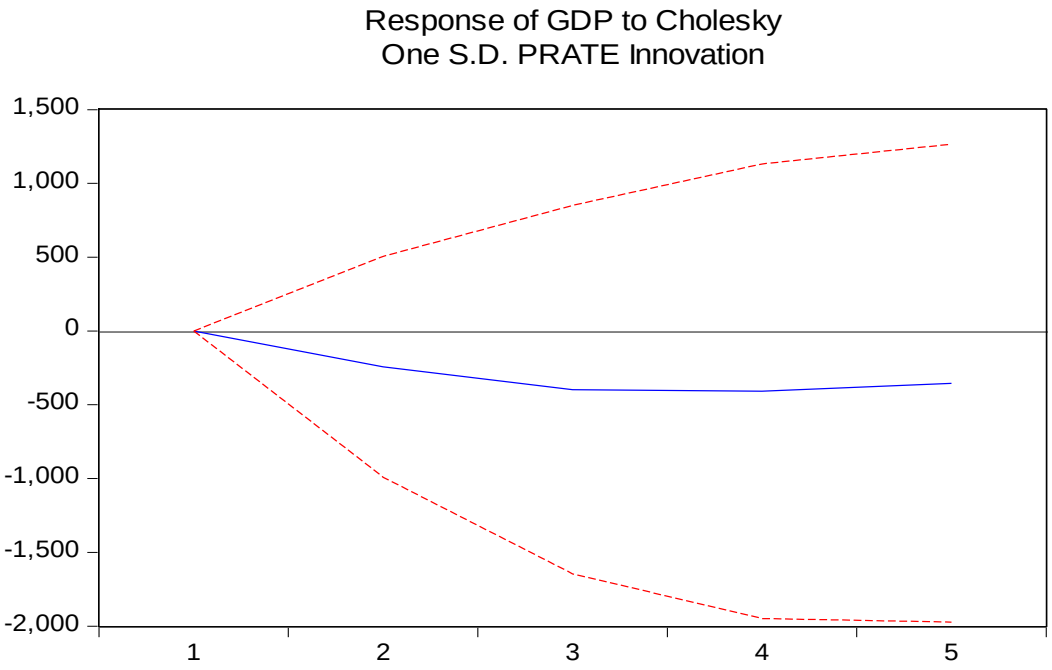

Figure-2. Impulse response function: PRATE to GDP.

5. CONCLUSION

Various empirical studies have concluded that interest rates influence GDP growth, but for countries under currency board arrangements like Namibia, this has been refuted. To examine this relationship, the study used annual data from 1980-2019 in VAR framework.

There is supporting evidence that Namibia prime interest rates have no regulatory power to spur economic growth.

This conforms to the Mundell–Fleming model hypothesis, as Namibia is operating a fixed exchange rate regime pegged to the South African rand. The findings are consistent with Buteau (2011) results which conclude that monetary policy through manipulating interest rates in less developed countries is not sufficient to spur economic growth.

Policy implications emanating from this study indicates that monetary policy in terms of interest rate is ineffective in addressing Namibia's much needed economic growth. This implies that efforts aimed at stimulating GDP through lower interest rates would result in an inflationary increase.

In the same line, during low interest rate periods, the banking sector may tighten credit extension due to low unattractive saving rates.

These low savings levels, in turn, diminishes much-needed capital intensive project to spur GDP. Furthermore, commercial banks would tighten lending standards to both corporates and households, thus be more concerned with counterpart risk and their balance sheets.

To overcome monetary policy ineffectiveness, Namibia policymakers should adopt developmental policies through investment promotion strategies that encourage greenfield investment from foreign and domestic investors. These investment policy strategies will facilitate FDI enterprises, which will move the Namibian economy to higher performance and promotes private sector and entrepreneurship-led growth, making Namibia a competitive knowledge-based economy, and encouraging social transformation and logistical integration.

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