



RESEARCH ARTICLE

ISSN (P) 2589-9341 | (O) 2277-4939 IF:1.6

Influence of Monetary Policy and Public Investment in Rwanda

¹Vincent NDAYISENGA, ²JULES SIBOMANA

^{1, 2} University of Kigali City: Kigali,
Rwanda

Abstract

This research paper aims at analysing influence of monetary policy and investment using the case of Rwanda data Bank. The research design of this paper was based on quantitative approach. This paper will help the researcher to get academic promotions which will be beneficial for us, for society and for University itself since it will be the academic reference for other scholars. This paper used secondary data, and this was based on a set of observations for 30 years of Rwanda's economic data. The results findings showed that the dependent variable (Investment) and all the independent variables (interest rate, exchange rate, money supply) are not stationary at level. The researcher continued to test them at first difference and therefore all variables become stationary, which indicates that all the variables are integrated of same order at the first difference $I(1)$. The results indicate that there is long run equilibrium in the model. In the first year the real INV (100%) is fully explained by its own innovation which indicates the exogenous nature. However next 9 periods show very little fluctuation and by the 10th year, it is reduced to 52.1%, decomposition of IR indicates (88.7%) effect of its own innovation and INV (11.3%) in the first period and in the last period it is explained only (22.2%) by INV. EXR decreased to (71.8%) in the last period and IR (15.1%), 4.9% for MS and 0.2% for CRED. Innovation in MS for the first period is explained (76.2%) by itself and (10%) by IR and 13% for INV and at the 5th period MS underwent a very little change (32.9%) innovation is explained by IR, EXR and INV respectively affect the innovation by (21.3%), (23.9%) and 14%. Thus, with the conclusions made with respect to the effectiveness of monetary policy components on investment, on the independent variables, the regression indicates that there is a significant positive relationship between the interest rate, money supply and investment. This implies that government should put emphasis on interest rate and money supply sector to enable more people to get loans from commercial banks to continue the improvement of investment to stabilize the level of interest rate to attract even investors from outside. From an evaluation of the overall analysis and results, it can be concluded that the stated independent variables have had significant long-run impacts on investment in Rwanda. Considering this, this paper followed the usual approach in assuming that investment shares a positive relation with monetary policy channels. Based on the findings and their implications reported. This paper recommended the policy measures to help government achieve its investment plans in next generation.

Key words: Investment; Interest rate; Exchange rate; Money supply.

Copyright : © 2022 The Authors. Published by Innovative Journal. This is an open access article under the CC BY-NC-ND license

1 | INTRODUCTION

This research paper intends to analyse the influence of monetary policy on investment in Rwanda using the case of Rwanda. The monetary transmission channels (MTC) describe the dynamic stages in which a central bank's financial coverage is transmitted to real outputs and prices as well as other macroeconomic variables. This capacity that changes in the authentic money fee or suitably defined monetary combination influence modifications in the financial-sector charge and as a result actual output and prices. From this context, the research carried out by Blinder (1998) on economic insurance policies practices that the monetary authorities have by no means been extra powerful than now and he notes that Monetary policy has come to be the fundamental capacity of macroeconomic stabilisation because it approves the whole financial system to breathe, and then in most nations it is entrusted with the accountability of an unbiased authority which the Central bank and as the only institution that adjust the country's forex and concerned in money supply. Researchers like Ireland (2016) summarize the various monetary policy transmission channels through which monetary policy actions affect the macroeconomic variables for instance it is the decision from the monetary authority through Central Bank to decide which interest rate allowed to promote the investment, to money supply, which policy to be taken between currency revaluation and devaluations to promote export or imports? Thus, as mentioned earlier the monetary authority must put the best practices on monetary transmission mechanism to allow the economy to breathe which results the increase in terms of GDP which explains how the economy grows. Price stability mitigates monetary market imbalances and achieves financial stability from different levels. (Schwartz, 1995). At a micro level, low inflation as a proxy for price stability, leads to a reduction in uncertainty and an increase in investment which implies bringing about financial stability. At a micro level, low inflation as a proxy for rate stability, leads to a reduction in uncertainty and an amplify in investment which implies bringing about financial stability. At a macro level, charge steadiness increases the cost of collateral and reduces financial vulnerability which leads to expansion in financial balance (Woodford 2012). Price stability in the price level causes the financial market to function smoothly by ensuring an efficient flow of funds and risk diversification across markets.

However, the 2008 financial crisis raised serious doubts about the role of price stability in ensuring financial stability.

Whilst there are more than a few research on the MTC, most of them focus on developed countries such as the U.S., Australia, and other Western countries. A small open economy is described by Deardorff (2010) as the economic system whose participation in the global markets is small enough so that its policies will not affect the world markets' prices or incomes. Although there have lately been greater studies of small open economies, solely some of them analyse growing countries such as China, Thailand, Indonesia, and Iran. There have no longer been many research of a small, open economy like that of Vietnam, which is still experience the development of financial market and a low independence of financial coverage. Moreover, there are only a few quantitative studies on the MTC for Vietnam by Le and Pfau (2009) and Tran (2009). There are some limitations in these studies, so further explorations are necessary to better examine the monetary transmission channels of the Rwandan MTC on private investment. From Vietnam evidence, as it is an emerging economy, and its economic reforms beginning in 1986 resulted in widespread achievements in financial growth and trade activities. However, there are some weaknesses in keeping sustainable growth, such as excessive inflationary pressures, trade deficits, and an under developed financial system, that could make the Vietnamese economy vulnerable to internal and external shocks. Moreover, Vietnamese monetary coverage plays a critical position in developing the economy. Their desires have been to stabilise the currency's value, ensuring the security of the banking machine and dashing up social economic development.

In Rwanda, the destruction of the economic base that took place during the civil war period (1990-1994) and post Genocide against the Tutsi, the country was forced to adopt the process of economic liberalization regulation through embarking on a program of sustainable economic growth which made the Central Bank in collaboration with World Bank and IMF to revise the monetary policies aiming at achieving the macroeconomic policies including an annual average real Gross Domestic Product (GDP) growth of 8 percent a year during the period started from 1998-2000; and a reduction in inflation to 5 percent by end 1999. In the period 1999-2018, the macroeconomic objectives were to achieve an annual real GDP growth of 6%, while keeping inflation at or below 3%.

During that collaboration between Rwanda and Breton Wood Institutions, the macroeconomic stability was achieved, though that credit policies was put in place to supplement the reduction of inflation rate, the interest rate and thus remarked the development of reserve money and broad money (IMF, 2018).

Corresponding Author: ¹Vincent NDAYISENGA, ²JULES SIBOMANA

^{1,2} University of Kigali City: Kigali, Rwanda

The efficacy of the central bank should be based on accurate implications resulted on its policies on macroeconomic activities to remark the effects that can be occurred for the economic recovery, thus the monetary policy transmission mechanism are based on several channels in relation to Rwanda and other countries. On International level, many studies show that the effectiveness of monetary transmission mechanisms functionment depends on how financial institutions work as well as the level of economic environment (Creel and Levasseur, 2016). Its effectiveness is not applicable in all countries. Thus, in Rwanda, the researcher explained the monetary policy transmission mechanism though the means of interest rate, exchange rate, money supply and domestic credit for private sector: Firstly, on the interest rate means, it is mostly applicable in developed economies due to their strong ability in financial sector in terms of banking sectors and insurance companies which imply the policies adopted by the central banks through the means of interest rate have a positive effect on aggregate demand and as well as on inflation (Mojon and Peersman, 2019). While this policy is applicable in Developed countries, for developing Economies it is totally different due to incompetitiveness level in terms of financial institutions such as the level of banks, the challenges met by those institutions. (Lungu, 2008). The reports from BNR, show that interest Rate in Rwanda remarked an average of 7.05% from 2016 until 2020, reaching an all time higher rate of 9% in September of 2016 and a record low of 4.50% in March of 2020, while Interbank Rate in Rwanda remarked a 7.5% from 2018 until 2020, reaching an all time high of 12.85% in September of 2004 and recorded a low rate of 2.28% in March of 2016. Deposit Interest Rate in Rwanda averaged 7.64 percent from 1980 until 2019, reaching an all time high of 11.01 percent in 1996 and a record low of 5 percent in 1993. The lending Rate in Rwanda showed an average of 16.60% from 2018 until 2020, reaching an all time high of 17.85% in April of 2015 and a record low of 14.16% in November of 2018. While the interest rate has been changing this way, other means are affected for instance the money supply, the money supply is all the currency and other liquid instruments in a country's economy on the date measured. It includes both cash and deposits that can be used almost as easily as cash. Money Supply M1 or simply Narrow money includes bills and checkable deposits with high liquidity recorded an average of 460.50 RWF Billion from 2003 until 2020, reaching an all time high of 1185 RWF Billion in April of 2020 and a record low of 79.50 RWF Billion in January

of 2003, while money Supply M2 and M3 in Rwanda or simply "broad money" as averaged 775.22 RWF Billion from 2003 until 2020, reaching an all time high of 2060.60 RWF Billion in June of 2020 and a record low of 118.20 RWF Billion in January of 2003 for M2 and M3 recorded an average of 984.33 RWF Billion from 2003 until 2020, reaching an all time high of 12749.90 RWF Billion in March of 2015 and a record low of 148.20 RWF Billion in January of 2003 and thus imply that as the Central Bank increase the money supply this has the impact on other macroeconomic variables, for instance the decision for people to invest is practically put in place. Lastly, other policy is through exchange rate means, this results to the change in price that come in when the domestic currency is exchanged with international currencies in terms of goods and services especially on the effect remarked from the trade balance due to the difference of imports and exports and from that, the exchange rate causes the inflation to adjust accordingly. Thus, inflation is a mean that is used to regulate the trade balance.

2 | PROBLEM STATEMENT

Monetary transmission mechanism plays a crucial role in macroeconomic policies. For the governments, working on the money transmission channels helps them to the understanding of the effectiveness of those channels as well as the way the monetary shocks affect the entire economy. Dungey and Fry (2009) conclude that, understanding the effects of monetary shocks via MTM channels contribute to better management of the economy. Since most economies are increasingly integrated with competition through trade and financial flows, there are unique policy challenges in monetary policy that is needed to owe the underdeveloped financial markets and institutions (Hammond et al., 2009). With a well-functioning financial system, changes in the policy rate have a significantly influence upon aggregate demand and thus on the price level (Gerlash and Smets, 1995). The theory of monetary policy asserts that monetary policy components influences the level of economy growth through investment and that it aims at redistribution other than stabilisation of an economy(Tanzi, 2006). However this theory has not explicitly stated the extent to which monetary theory affects investment and other macroeconomic variables.

For, Rwanda as a small open economy, and its economic reforms which began in 1994 after the Genocide against the Tutsi where the reform resulted in significant achievements in economic growth between -50.2% to 9.4% from 1994 to 2019 (World Bank, annual reports). Hence, examining the empirical analysis of monetary policy transmission channels necessary would allowed the researcher to bridge the gap existed in terms of concepts and methodologies by analysing the monetary policy by using data from 1987-2021.

3 | OBJECTIVES

The general objective of this research paper was to examine influence of monetary Policy and investment in Rwanda. The specific objectives of this paper were the following

- i. To examine the impact of interest rate on investment
- ii. To investigate the impact of exchange rate on investment
- iii. To analyse the impact of money supply on investment

4 | LITERATURE REVIEW

4.1 Theory of interest rate channel:

This transmission channel is not yet developed in Rwanda as well as emerging and developing countries, thus it is challenged by in competitiveness of financial sectors whose their levels are still informal (Buigut, 2009). From this channel, a monetary tightening (a reduce in M) effects in an extend in real hobby fee (R), which causes consumption (C) to rise and investment (I) to fall. Aggregate demand (Y) and output (y) decrease, and subsequently mixture prices and inflation (π) decrease. This procedure is denoted as follows:
 $M \downarrow \Rightarrow R \uparrow \Rightarrow C \uparrow (I \downarrow) \Rightarrow Y \downarrow \Rightarrow y \downarrow \Rightarrow \pi \downarrow$, This channel is acknowledged as 'the ordinary Keynesian channel'. In this mechanism, there are some sizeable relationships, together with nominal and actual hobby rates, non-permanent and long-term actual pastime rates, and aggregate demand and output-prices (Loayza & Schmidt-Hebbel, 2018). In the first relationship, the actual pastime rate has a massive effect on consumption and funding decisions. Due to the fact that assumption of constant expenditures in the short run, higher nominal activity quotes normally lead to higher actual pastime rates. This explains funding choices the place the real borrowing price relies upon on the ex- ante actual pastime rate, consisting of the regarded nominal activity price and the uncertain inflation rate. However, the place the assumption of sticky expenses is no longer accepted, the interest fee channel is nevertheless when a minimum in money supply amplifies the real exchange rate, resulting in less spending and output. Second, the term structure of pastime prices dominates the relationship between short run and lengthy run actual interest rates. Third, the combination of a Phillips Curve with transient nominal rate rigidities explains for the hyperlink between output-prices and aggregate demand. (Loayza & Schmidt-Hebbel, 2018) p.4).

4.2 Theory of Exchange rate channel:

The trade price channel transmits economic policy as follows:

$M \downarrow \Rightarrow R \uparrow \Rightarrow$ the actual trade rate (E) $\uparrow \Rightarrow$
internet exports (NX) $\downarrow \Rightarrow Y \downarrow$
An increase in value of domestic foreign currency is denoted by means of $E \uparrow$. This diagram states that when monetary coverage leads to an expansion in the real exchange rate, the consequences are transmitted to net export as well as the country's output.

Moreover, according to Dennis (2003) this channel is associated to hobby fee effects. Specifically, a tight in cash supply from financial authorities causes an expansion in the domestic real interest rate denoted (R), which makes domestic-currency-denominated property extra eye-catching than foreign-currency-denominated assets. For small open economies with flexible exchange rates, this channel is essential due to fact it influences each aggregate demand and combination supply.

In the case of small, open economies with fixed exchange rates, this channel explains that the interest rate should be adjusted. The global IS-LM type model acknowledged as Mundell-Fleming model analyses policies below bendy and fixed alternate rate. This model is an extension to the open economy system of the IS-LM model, a Keynesian diagram of business cycle which is prolonged with international trade. According to the Mundell-Fleming model (1963), one of the vital relationships is a fine link between the real exchange fee and the actual trade rate. According to Blanchard & Sheen, (2013), under a exchange rate regime, monetary contraction leads to a decrease in output at international level.

4.3 Theory of money supply:

(According to Miskin, 2018), the classical Quantity of Money assumed that V and Y were constant and prices were flexible and in the long run the economy is predisposed to full employment, so this implies that if M doubles than P doubles two. The theory provided that changes in the quantity of money affect the changes in the price level. Also Fischer argued that the theory shows how much money is held for a given amount of money. In the same time, the Cambridge Approach appears with the same equation as the Fischer's equation, but differently argued. The economists, Marshall and Pigou, set the equation asking people how much they were able to hold without being bound by technology and institutions. The Cambridge economists suggested that the level of money is affected by wealth of people; as wealth increases then people tend to hold more money. They concluded that the demand for money is in proportion with income and k is the coefficient. \\

4.4 Tobin Theory:

The schematic diagram below represents the asset price transmission channel:
 $M \downarrow \Rightarrow P_e \downarrow \Rightarrow q \downarrow \Rightarrow I \downarrow \Rightarrow Y \downarrow$
This theory was put in practice by Tobin (1969) to explain how monetary policy affects the economy by considering the impacts on the valuation of firms. The value q denotes the ratio of the market value of firms to the replacement cost of their capital. The basic idea of this channel is that a contractionary monetary policy results in lower stock prices in lower market value, and, in turn, a lower q, because there are more attractive opportunities offered by an increasing market interest rate, and firms can sell stocks for less money to spend. In other words, a lower q leads to less investment. Moreover, Economist Jorgenson (1963) introduced the user cost of capital which is the sum of the real interest

rate and the depreciation rate and its relationship with the optimal size of the fixed capital stock. Changes in the optimal stock lead to investment adjustments. The user cost of capital is included in estimating the neoclassical investment function and 'the higher the real interest rate, the higher the user cost, the lower the level of investment. According to Mishkin(1995), another effect of asset price channels is wealth effects on consumption which originates from the life-cycle hypothesis of Modigliana and Brumberg(1954). This hypothesis implies that consumption is a function of lifetime resources of consumers, so a monetary contraction affects stock prices, implying effects on consumers' wealth, leading to a decrease in consumption and finally, a decrease in aggregate demand.

The life-cycle hypothesis of Modigliana and Brumberg (1954), Ando and Modigliani (1963) and the permanent income hypothesis of Friedman (1957) have the most similar assumption that individuals' utility is maximised by the balance of earnings and consumption. Consumption is an important component of income, so a decrease in consumption leads to a decrease in income, resulting in a decrease in aggregate demand. Changes in asset price could result in financial fluctuations in different agents in the economy, including banks, businesses, and households. These fluctuations, in turn, threaten price and economic stability. The role of the stock price channel has been shown to be more important than other channels, in line with the improvement of capital markets in developing countries found evidence that differences in stock-market responses to a monetary contraction depend on differences in the openness of the particular financial market specifically the response of the U.S. stock market is determined to be larger than that of Canada (Poon,2011).

4.5 Classical model:

This model states that a change in money supply in the economy causes a proportionate change in the price level (Handa, 2009). In the Classical schools, the markets are assumed to be perfectly competitive and trade only occurs when market clearing prices are established (Mishkin,2004). Furthermore, they believe that wages and prices are completely flexible so that the economy has an inherent tendency to operate at full employment equilibrium (Hillier,1992).Additionally, the model believes that due to an expected increase in the money supply, the public uses rational expectations in forecasting the aggregate price level and real output is not affected (Handa, 2000). Likewise, with rational expectations by the public about the price level, new classical economists assume that on average, the actual and expected price levels are close. Thus, the central bank gains little by utilising unexpected changes in the money to stabilise output fluctuations. They recommend that the authorities should leave the economy alone since the use of expansion of the money supply would only affect price level and the nominal national income but not real income or just employment (Handa, 2000).

4.6 Keynesian Model:

Keynes model states that national income equilibrium does not always match the full employment level and when a significant divergence exists between the two, appropriate monetary and fiscal policy will change the output and employment in the economy (Hillier,1992). Hence, Keynesians support the use of discretionary monetary and fiscal policies to reduce deviations from full employment.

Moreover, this model argues that the market for labour is diverse, separated by skills, different firms and with implicit long-term contracts and insider-outsider trading, and so forth, and is therefore considered as being inefficient since it does not have instantaneous market clearance which implies that the market instantly doesn't bring back equilibrium after any change in demand or supply (Handa, 2009).In this Keynesian approach with a closed economy, the primary way that interest rates affect the level of aggregate output is through their effect on planned investment spending (Mishkin, 2004). He stated that he expected real interest rate represents the cost of funds for investment. An increase in the expected real interest rate lowers the demand for investments and therefore the equilibrium level of aggregate demand, while a decrease in the expected real interest rate raises investment spending as well as equilibrium aggregate demand.

The interest rates link between money and output forms a vital component of the transmission mechanism in the Keynesian model (Handa, 2000). This channel through which changes in money supply affect aggregate demand and output is described as the money channel (Hubbard, 2018) or interest rate channel (Angeriz et al., 2008). Under this monetary transmission mechanism, the impact of a change in the monetary policy instrument on intermediate variables increase in the real interest rate is assumed to dampen aggregate demand and thereby reducing the rate of inflation (Amitava, 1990).

4.7 IS-LM Model:

According to Kovanen (2011) the features of financial markets in underdeveloped countries introduce challenges for monetary policy implementation and contribute to the weaknesses in the transmission through the interest rate channel.

Moreover, the IS-LM model assumes that investment depends on interest rates alone. Nevertheless, the investment determination depends on other factors as well. One factor is credit conditions through the willingness of banks to lend, independent of the real interest rate. Low interest rates do not automatically mean that banks will make more loans. Instead, banks care about the risk adjusted spread, the difference between the lending rate and the borrowing rate, adjusted for risk (Colander, 2018).

That spread may vary even when interest rates are unchanged, and banks sometimes change their lending standards without changing the interest rate (Mishkin: 2004). Likewise, the model assumes that borrowers are indifferent to whom they raise funds and regard alternative sources of funds as close substitutes, permitting us to focus on the market for money, where the supply and the demand for money determines the interest rates, which influence spending decisions by households and businesses (Hubbard, 2016).

5 | EMPIRICAL REVIEWS

5.1 Exchange rate and investment:

Tran(2009) conducted the study on Vietnam monetary policy using SVAR 11years starting from 1992 to 2018, using the money supply M1 and M2, CPI, exchange rate, all variables were collected monthly by

examining the domestic international price gap using a Mc Callum interest rate in adjusting the money growth to price fluctuation and exchange rate, from his study he found that the gold price gap has a positive relationship between monetary and exchange rate policy while using Taylor interest rate, he found no relationship.

Cizkowicz (2013), conducted his study using corporate investment and inflation using 21 observations from OECD members from 1960-2016, his empirical study revealed that there is a robust negative relationship between corporate investment and inflation and thus he advised the governments to increase the economic recovery to exploit this negative nexus during the period of slowdown.

Frimpong and Marbuah (2010), conducted their empirical study in Ghana using real GDP, public investment, credits for private sector, inflation, real exchange rate and real interest rate, they sought to find the relationship between private investment and those variables, they found a clear positive relationship and negative relationship when they link private investment with trade openness but for Naa-Idar et Al (2012), he used inflation, GDP, exchange rate and trade openness, his study revealed that private investment and those variables correlate positively.

5.2 Interest rate and investment:

Majed and Ahmad (2010), from their studies, examined the impact on interest rate on investment in Jordania using cointegration analysis from 1990 to 2016, based on their empirical study, they sought whether there is a relationship between the two variables, they found no clear relationship between the two since their empirical investigation revealed that the increase of real interest rate by one unit results the decrease of investment by 44% and thus implies a negative correlation. Claus (2011), using the monetary transmission channels, he chose interest rate as the channel to be used to conduct his study, he found the clear relationship with cost of consumption, the rate of return, and exchange rate. Thus, his empirical study show a positive relationship between interest rate and those variables.

Agu (2015), used interest rate and disposable income and investment on Nigerian Economy from 1970 to 2012, his empirical study revealed that there is a positive correlation between investment and both disposable income and real interest rate of bank deposits and also his study showed that investment decreased due to rise of lending rate, reduction of government spending and national savings and poor infrastructure, thus a negative relationship between investment and those variables.

5.3 Money supply and investment:

Brima (2017), conducted his empirical study on monetary policy 's rate in terms of money supply and domestic saving on investment in Sierra Leone by using the Error Correction Model (ECM) techniques, from Brima's empirical study revealed that there is a positive relationship between private investment and money supply, domestic savings and also revealed that linking investment with inflation, treasury bill and gross domestic debt, his empirical study showed a negative relationship.

5.4 Conceptual Framework statement :

In this study, the conceptual framework uses the diagram of the relationship that exists between study variables.

The dependent variable for the study is the Investment, while the independent variables are the interest rate, the money supply and the real exchange rate. There is a consensus that changes in monetary transmission affect the public investment.

Loayza and Schmidt-Hebbel (2018) confirm that particular features of an economy significantly affect the transmission of channels and the effectiveness of monetary policy.

In the first stage of the MTM, factors including the interest rate, exchange rate and money supply of the economy affect the transmission process from policy instrument to Rwandan financial-market prices. The study by Cecchetti & Krause (2019) conducted a study on the link interest rate and investment and monetary policy using data from the 1998 and, They found evidence that the structure of the banking system and the financial markets dominate the transmission of the interest rate channel to domestic output and prices are linked. Moreover, a decrease in the credit for private sector in the banking system contributes to improved monetary policy efficiency and the macro-economy's stable development. Cecchetti & Krause (2019) explained that if the government controls almost all the banking system, there is little room for the central bank's monetary policy, and the policies' response to market fluctuation is less effective. According to Dennis (2003), an important issue in the literature about small open economies is whether changes in the exchange rate are considered in making monetary policy. Dennis (2003) found that micro-founded sticky-price models applied in studies seem to have little or no evidence that the policymaking process responds to exchange rate changes.

In a study on Georgian monetary policy, Aslanidi (2007) chose the U.S. interest rate and the Russian output in the VAR model for examining external dimensions, and compared the influence on the economy from the U.S. interest rate shocks and domestic monetary policy shocks. Using the U.S. interest rate as the surrogate of foreign monetary policy is similar to the approach of Kim and Roubini (2000) and Afandi (2016). With their model, Raghavan and Silvapulle (2008) aimed to examine the economy's responses not only to domestic shocks but also to foreign shocks. They came to the conclusion that the impacts of foreign shocks on monetary policy in the post-crisis period were stronger than those in the pre-crisis period.

Thus, the researcher adopted the econometrics models that work on empirical analysis of monetary policy transmission mechanism on public investment in Rwanda because of the benefit in analysing the dynamics of a model via subjecting it to an unexpected shock. The difference between those model help to bridge the gap on empirical analysis of monetary policy transmission mechanism in Rwanda using public investment and its determinants which are interest rate, exchange rate, money supply and credit for private sector using time series evidence on data collected from BNR from 1987 to 2021.

Lastly, most studies on small, open economies have focussed on developed countries, or on developing countries with a relatively developed financial market; however, there is a lack of research on the MTM in small, open economies with a developing financial market and a low independence of monetary policy. Thus, studying these cases is necessary for not only theoretical analysis but also practical policy implications.

6 | RESEARCH METHODOLOGY

6.1 Research Design:

A research design was based on strategy of different components mentioned in the study in logical manner to effectively address the research problem, (Kothari, 2004). This research design was based on quantitative research, and it aims at analysing the influence of monetary policy and investment in Rwanda using data from BNR of the period starting from 1987-2021 in the department of Monetary Policy and Research at BNR National Bank of Rwanda.

6.2 Model specification:

The Investment was used as the dependent variable while the interest rate, money supply, exchange rate was used as the independent variables and the error terms were used as the other exogenous variables that were not mentioned in the model thus implied that investment was a function of the above independent variables and thereafter the model specified was tested, regressed and the generated results were the base for conclusion and policy recommendation in chapter five. Thus, mathematically, $INV=f(IR,MS,REER)$. Therefore the model was written as follows:

$\log INV_t = \beta_0 + \beta_1 \log IR_t + \beta_2 \log EXR_t + \beta_3 \log MS_t + \epsilon_t$
Where INV represented the level of investment at the period t , IR represented the interest rate at the period t , EXR exchange rate at the period t , MS represented the money supply at period t .

6.3 Data analysis:

This research paper examined the analysis based on the objectives. The analysis of monetary policy transmission mechanism in Rwanda required testing for the relationships first between the variables under study. This was achieved by using econometrics approach by different tests. Those approaches included time series, stationary test, co integration test, vector error correction and variance decomposition

6.3.1 Time series analysis:

There is crucial tool in empirical modelling especially in correlating the variables, thus its randomness could undermine the usefulness of the standard econometrics rule and thus those methods should be applied with time series properties (Gujarati,1995).

6.3.2 Stationary Test by using Unit root test:

Stationary series are characterized by finite variance and transitory innovations from the mean and a tendency to return to its mean value as opposed to non-stationary series, therefore the estimated variables are characterized by the means and the variance as constant independent variable of time. If OLS is used to estimate the correlation between variables of non-stationary series, there is likelihood to have a false influence which appears as a spurious regression. This implies that ADF and Phillip Perrons root tests were used to test for stationary (Engle & Granger, 1987). Non-stationary variables were said to be co-integrated if they had a long run relationship amongst themselves there is a deviation from their long run where path is stationary of two or more variables that could be stationary but have their difference.

6.3.3 Co-integration techniques and Error Correction Model

Trends whether stochastic or deterministic results into a spurious regression results, un-interpretable t-values and other statistics have too high goodness of fit which make results difficult to evaluate. This was remedied by measuring variables in the level form while maintaining stationary with short run effect and long run properties simultaneously incorporated by the use of the error correction mechanism (ECM) or feedback mechanism in the co-integration analysis. Co-integration solves the problem associated with the loss of information associated with de-trending or to address the stationary through differencing as in the models such as used by (Odedokun, 1993). It rejects spurious regression results but at the same time accepts correlation between non-stationary series where correlation is structural rather than spurious. This Co-integration analysis was developed by among others Granger, (1986) and Engle & Granger, (1987).

6.3.4 Variance Decomposition:

Having investigated the effect of one-time shock to one of the innovations on the current and the future values of the endogenous variable into the VECM components. This paper conducted variance decomposition to determine the proportions of the shocks in economic growth rate that were due empirical analysis on monetary policy and investment in Rwanda.

6.3.5 Vector Auto regression:

VARs model are considered as a kind of systems of equations in which the current level of each variable in the system depends on past movements in that variable and all other variables in the system. They are usually used to describe the behaviour of both economic and financial time series used in forecasting model. Mathematically, consider a set of variables denoted y_t to y_{nt} where $y_t = (y_{1t}, y_{2t}, \dots, y_{nt})'$ denote an $(n \times 1)$ vector of time series variables. Therefore the VAR model are written as follows using the probability of lags

$Y_t = c + H_1 Y_{t-1} + H_2 Y_{t-2} + \dots + H_p Y_{t-p} + s_t, t=1, \dots, T$ where c shows a vector constant, H_i are $(n \times n)$ coefficient matrices, and s is an $(n \times 1)$ a vector of innovations, that is, serially uncorrelated disturbances that have zero mean and a time invariant covariance matrix Σ . The evolution of the vector, which contains the macro economic variables whose behavior we seek to understand, depends on both unexpected disturbances, s_t , and on systematic component, $c + H_1 Y_{t-1} + H_2 Y_{t-2} + \dots + H_p Y_{t-p}$, that determines how the shocks are propagated to the rest of the economy. The estimates of c, H_1, H_2, \dots, H_p , are obtained by applying or ordinary least squares (OLS) to each part of equation (1) separately, and the estimate of $\Sigma \epsilon$ is given the sample covariance matrix of the OLS residuals.

7. DATA PRESENTATION AND DATA FINDINGS

7.1 USED DATA

Below is the table of used data that have been collected from BNR Database from 1987 to 2021 and were time series on the table 1.

Table 1: Used data(Source: WDI Reports)

Obs	INV(LOG)	EXR(LOG)	IR(LOG)	MS(LOG)
1987	2.610070	4.615121	2.628285	3.161247
1988	2.533697	4.471639	2.639057	3.165475
1989	2.493205	4.375757	2.564949	3.178054
1990	2.415914	4.335983	2.484907	3.186353
1991	2.442347	4.383276	2.484907	3.182212
1992	2.681022	4.427239	2.580217	3.194583
1993	2.734368	4.829113	2.944439	3.161247
1994	2.415914	4.897093	2.815409	3.165475
1995	2.451005	4.971201	2.708050	3.169686
1996	2.424803	4.946630	2.821379	3.186353
1997	2.476538	5.574433	2.821379	3.182212
1998	2.533697	5.568726	2.917771	3.190476
1999	2.572612	5.656341	2.785011	3.198673
2000	2.695303	5.653892	2.816606	3.186353
2001	2.576422	5.569108	2.792391	3.165475
2002	2.593761	5.708770	2.802148	3.169686
2003	2.619583	5.743964	2.794228	3.173878
2004	2.601207	5.810842	2.786245	3.186353
2005	2.629007	5.965377	2.771964	3.178054
2006	2.710048	6.254598	2.771964	3.190476
2007	2.758743	6.124246	2.758743	3.161247
2008	2.766319	6.093570	2.825537	2.740840
2009	2.873565	6.304083	2.772589	2.833213
2010	3.109953	6.305545	2.788093	2.747271
2011	3.094219	6.343599	2.816606	2.660260
2012	3.071767	6.412639	2.833213	2.740840
2013	3.092405	6.390073	2.813611	2.933857
2014	3.199897	6.417549	2.815409	2.933857
2015	3.248435	6.476357	2.851862	3.010621
2016	3.133318	6.529127	2.848392	3.077312
2017	3.228826	6.620207	2.852439	3.178054
2018	3.227637	6.617002	2.850128	3.005683
2019	3.171365	6.731734	2.843164	2.980619
2020	3.117950	6.758211	2.870169	2.970414
2021	3.095578	6.801728	2.901422	2.954910

7.2 Unit root test:

To overcome that short fall, the unit root tests were conducted on the variables to ascertain whether they are stationary or non-stationary. The purpose of this research finding is to determine whether the series are stationary or not. Augmented Dickey Fuller unit root test has been used to test the order of integration and to solve the problem of non-stationary of variables. The ADF is conducted at level and at first

difference. The results findings showed that the dependent variable (Investment) and all the independent variables (interest rate, exchange rate, money supply) are not stationary at level. The researcher continued to test them at first difference and therefore all the variables become stationary, which indicates that all the variables are integrated of same order at the first difference I(1).

Table 2 ADF Unit Root Test

Augmented Dickey-Fuller Test Equation

Method: Least Squares

Date: 04/01/22 Time: 07:45

Sample (adjusted): 1987 2021

Included observations: 35 after adjustments

Variables	Level		1stDifference		Result
	Constant	ConstantandTrend	Constant	ConstantandTrend	
LNINV	-2.485243	-3.467657	-6.597274*	-6.961929*	I(1)
LNIR	-2.406272	-2.331617	-4.583077*	-4.535236*	I(1)
LNEXR	1.311865	-1.127356	-4.075670*	-4.494377*	I(1)
LNMS	-0.916121	-2.246035	-5.461927*	-5.365014*	I(1)

(Source: E-Views)

7.3 Co integration Test:

Since the variables are found to be integrated of same order, the Johansen co-integration test was used to determine the long run equilibrium between variables and it is necessary to establish a long-run relationship. Johansen co-integration is selected since it's a multivariate autoregressive approach and it has chances of dealing with more than one co-integrating factors. The process separates long run relationship with short-run relationship dynamics. In this test the maximum Eigen values are used to test the significance of estimates of Eigen

values. The trace test indicates that there is 3 co-integrating equations at the 5% significance level and even on the maximum Eigen value test indicate that there is 1 co-integrating equation at 0.05 significance level, therefore we reject the null hypothesis of no co-integrating equation because the probabilities for both Trace and Eigen value test are less than 0.05 and accept that of 3 and 1 co-integrating equation. We therefore conclude that there is a long run relationship between variables. As the results show that there is a long run equilibrium relationship, this was done by using the table3.

Table 3: Co-integration test by Eigen values

Date: 04/01/22 Time: 10:24

Sample (adjusted): 1987 2022

Included observations: 35 after adjustments

Hypothesized		Trace	0.05	
No.ofCE(s)	Eigenvalue	Statistic	CriticalValue	Prob.**
None *	0.980473	238.1865	109.6752	0.0000
Atmost1 *	0.894670	170.5368	106.6643	0.0000
Atmost2*	0.810439	108.6887	78.14341	0.0001
Atmost3*	0.748912	65.45022	52.87245	0.0049
Tracetestindicates3cointegratingeqn(s)atthe0.05level				

(Source: E-views)

Maximum Eigen Values

The table 3 and 4 shows the result of Johansen co-integration test. Both the trace test and maximum Eigen value given of Table 3 and 3 indicate four co-integrating equations at 5% level of significance. This indicates that there is long run

equilibrium in the model. Therefore, there was the presence of error correction model which was tested to indicate the short run dynamics of the model. This model talks about the speed by which the model returns to equilibrium for man exogenous short run shock.

Table 4: Co-integration test by Maximum Eigen Values

Date: 04/01/22 Time: 10:24

Sample (adjusted): 1987 2021

Included observations: 35 after adjustments

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.890473	67.65013	48.93586	0.0026
Atmost1*	0.864647	61.69663	43.42077	0.0074
Atmost2*	0.810434	48.32384	38.61635	0.0098
Atmost3*	0.309935	9.71522	17.41769	0.0408
Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

(Source: E-views)

7.4 VAR analysis:

Because there was a long run equilibrium between dependent and the independent variables, the (VAR) model, its purpose was to determine the amount of movement away from the long run equilibrium. The results of the long run analysis are presented.

Table 5: VAR Regression results

Vector Auto regression Estimates

Date: 04/02/22 Time: 09:58

Sample (adjusted): 1987 2021

Included observations: 35 after adjustments

Standard errors in () & t-statistics in []

	INV	EXR	IR	MS
INV_(-1)	0.845157 (0.19737) [4.28209]	0.383374 (8.76247) [0.04375]	0.161369 (0.27395) [0.58904]	0.542340 (0.28492) [1.90351]
INV (-2)	-0.230402 (0.18199) [-1.26603]	7.057764 (8.07952) [0.87354]	-0.094949 (0.25260) [-0.37589]	-0.336490 (0.26271) [-1.28084]
EXR (-1)	0.002266 (0.00452) [0.50161]	0.755272 (0.20058) [3.76548]	0.002516 (0.00627) [0.40120]	0.003898 (0.00652) [0.59775]
EXR (-2)	0.000985 (0.00479) [0.20559]	0.233882 (0.21274) [1.09940]	-0.001604 (0.00665) [-0.24111]	0.001515 (0.00692) [0.21903]
IR (-1)	0.028880 (0.15488) [0.18647]	8.127413 (6.87589) [1.18202]	0.517071 (0.21497) [2.40532]	-0.412898 (0.22357) [-1.84682]
IR(-2)	-0.258391 (0.16878) [-1.53096]	-3.285541 (7.49306) [-0.43848]	0.059990 (0.23427) [0.25608]	0.192362 (0.24364) [0.78953]
MS(-1)	-0.169006 (0.14351) [-1.17769]	-4.512510 (6.37111) [-0.70828]	0.272764 (0.19919) [1.36938]	0.604096 (0.20716) [2.91608]
MS(-2)	0.396054	-0.369333	-0.304547	-0.187278

	(0.14006) [2.82777]	(6.21806) [-0.05940]	(0.19440) [-1.56657]	(0.20218) [-0.92628]
C	2.723557 (3.61642) [0.75311]	20.72000 (160.555) [0.12905]	5.632892 (5.01964) [1.12217]	17.19677 (5.22053) [3.29407]
R-squared	0.965095	0.981321	0.557818	0.951742
Adj. R-squared	0.949229	0.972830	0.356826	0.929807
Sum sq. resids	19.32324	38086.52	37.22788	40.26723
S.E. equation	0.937192	41.60776	1.300837	1.352896
F-statistic	60.82847	115.5790	2.775327	43.38863
Log likelihood	-37.99419	-163.1683	-48.81405	-50.10898
Akaike AIC	2.969345	10.55565	3.625094	3.703574
Schwarz SC	3.468181	11.05449	4.123930	4.202410
Mean dependent	12.98091	421.0012	16.28697	17.08061
S.D. dependent	4.159317	252.4255	1.622029	5.106435
Determinant resid covariance (dof adj.)		6393.038		
Determinant resid covariance		841.8815		
Log likelihood		-345.2629		
Akaike information criterion		24.25836		
Schwarz criterion		26.75254		

(Source: E-Views)

7.5 Impulse response analysis:

We now turn to the impulse response functions from the model, which are presented in appendix. These basically trace out the implied dynamic paths of the endogenous variable in the system following a one-time shock to one of the innovations. They allowed the researcher to see the monetary transmission mechanism unfolding by illustrating the response of the system to a shock in our measure of Rwanda's monetary policy. An unexpected tightening of monetary policy has a lag gives a rise to output in a short run,

This research paper determined the effect of one standard deviation shock to changes on current or future values of all endogenous variables in the equation using impulse responses. Impulse responses of the Investment for 35 years as a result of one standard deviation/ shock of each were presented in figure 4. showing that the changes in independent variables has about a. Then it starts to decline. It was also determined from VAR coefficient results were used as inputs in generation of impulse responses.

Table 6: Impulse response from VAR

RE.INV	IN	EXR	IR	MS
1	0.937192	0.000000	0.000000	0.000000
2	0.837011	0.116037	-0.003932	-0.233151
3	0.602307	0.310861	-0.160269	0.096916
4	0.511634	0.266297	-0.338378	0.423141
5	0.461141	0.182016	-0.421881	0.400913
6	0.283680	0.101353	-0.341960	0.265778
7	0.140216	0.085563	-0.266828	0.219424
8	0.081611	0.110319	-0.226836	0.139351
9	0.038883	0.160109	-0.148137	-0.002636
10	0.018758	0.243470	-0.044128	-0.112228

Re. EX	IN	EXR	IR	MS
1	13.96028	39.19587	0.000000	0.000000
2	5.076769	27.09280	11.16952	-4.010226
3	11.47770	27.67526	11.10342	-2.053434
4	16.30163	29.33216	9.823778	-9.200727
5	15.79229	31.11901	12.44535	-12.61301
6	18.38558	34.21871	12.06380	-9.183678
7	22.83464	36.38669	10.04487	-7.570667

8	25.22739	37.51731	9.589219	-7.640448
9	26.64214	38.44443	9.221936	-5.882094
10	28.36304	39.06965	7.790123	-3.687433

Re. IR Period	INV	EXR	IR	MS
1	0.029976	0.358395	1.250132	0.000000
2	0.345835	0.407228	0.657771	0.319531
3	0.292882	0.196926	0.298337	-0.049310
4	0.041356	0.131002	0.260655	-0.180482
5	-0.006051	0.139520	0.162759	-0.012973
6	0.074694	0.139668	0.047425	0.001813
7	0.069486	0.124494	0.056649	-0.086187
8	0.050014	0.132335	0.084151	-0.068294
9	0.083590	0.145774	0.059598	-0.020345
10	0.109418	0.144591	0.040049	-0.024708

Re. MS Period	INV	EXR	IR	MS
1	0.500943	0.427351	0.050395	1.180769
2	0.795394	0.210186	-0.467054	0.733208
3	0.241407	-0.021579	-0.237614	0.038357
4	-0.107696	0.023002	-0.116800	0.163052
5	-0.031251	0.118195	-0.233710	0.183819
6	-0.024485	0.188331	-0.144312	-0.151108
7	-0.078049	0.317520	0.070106	-0.318714
8	0.023838	0.492311	0.170042	-0.303624
9	0.192944	0.641516	0.219197	-0.345354
10	0.316836	0.760218	0.294345	-0.387645

Interpretation from impulse response:

The results from VAR model made by the endogenous growth models with respect to the effectiveness of monetary policy on investment. On the independent variables, they indicate that there is a long run relationship between the interest rate, money supply and investment. Considering this, the study follows the usual approach in assuming that investment shares as positive relation with monetary policy transmission channel.

The results revealed that from the analysis was made up by multiple graphs representing the response of the explanatory variables to Y the dependent variable, the blue line is the impulse response function while the red line is the 95% confidence intervals, therefore, this shows response of INV which stands for investment to Investment, where from the period 1 the shock was positive for the five years and negative from the 6th to 10th year. For response of INV-INV, for the response of INV- IR, the shock was positive from the year one to year 10, for response for INV- EXR, the shock was positive and stable from the year 1 to year 10., for response INV-MS the shock was positive and it underwent an increase for the first four years and decrease from the year 6 to year

The response of IR-INV, for the first year there was a decrease shock, and from the following periods, there was a positive shock because there was an increase, thus IR has as positive impact on investment in the long run

The response of EXR-INV, for the first year, there was a positive shock which showed an increase, for the three years from year 2, there was a decrease shock, and from the following years the shock was positive at the constant rate.

The response of MS-INV, for the first year, there was a positive shock, from year 2 to year 7, there money supply did not impact the investment, and finally from the next periods, it impacted the money supply. (Figure 4)

7.6 Regression analysis:

$$\log INV_t = \beta_0 + \beta_1 \log IR_t + \beta_2 \log EXR_t + \beta_3 \log MS_t + \varepsilon_t \dots$$

The estimated model: LNINV=-5.97+0.008LNIR-0.29LNEXR+0.58LNMS

Using probability, interest rate, the money supply and credit for private sector are statistically significant since their probability values are less than 0.05.

They are explained by their values which are 0.0047 for IR, 0.0001 for MS

Using coefficient,

Objective one: Contribution of interest rate to investment, the coefficient is positive (0.008), it implies that, if we increased 1% of LN (IR) on average, the investment would increase by 0.8%. This implies that the contribution of interest rate to investment is too small.

Objective two: The contribution of Exchange rate to investment, the coefficient is negative (-0.29), It implies that if we increase 1% of LN (EXR) on average, this will negatively affect investment by 29%.

Objective three: The contribution of LN (Money supply) to investment, the coefficient is positive (0.58), it implies that one 1% of money supply on average, the investment will be increased by 58%.

Table 7: Regression analysis

Dependent dDV: INV
 Method: Least Squares
 Date: 04/02/22 Time: 09:01
 Sample: 1987 2021
 Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	0.008016	0.002625	3.053779	0.0047
EXR	-0.287355	0.206771	-1.389724	0.1748
MS	0.580260	0.129209	4.490854	0.0001
C	-5.964683	4.650479	-1.282595	0.2095
R-squared	0.862257	Mean dependent var		12.87057
Adjusted R-squared	0.843892	S.D. dependent var		4.062139
S.E. of regression	1.604974	Akaike info criterion		3.915655
Sum squared resid	77.27821	Schwarz criterion		4.137848
Log likelihood	-63.52397	Hannan-Quinn criter.		3.992356
F-statistic	46.94936	Durbin-Watson stat		0.856909
Prob(F-statistic)	0.000000			

7.7 Error auto correlation t:

Table 8: Error autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	6.429664	Prob. F(2,33)	0.0050
Obs*R-squared	11.01527	Prob. Chi-Square(2)	0.0041

Test Equation:

Dependent Variable: RESID
 Method: Least Squares
 Date: 04/02/22 Time: 11:08
 Sample: 1987 2022
 Included observations: 35
 Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR	-0.000722	0.002277	-0.317307	0.7534
IR	0.096187	0.179279	0.536524	0.5958
MS	0.003165	0.111616	0.028356	0.9776
C	-0.092177	4.021863	-0.022919	0.9819
RESID(-1)	0.632151	0.191932	3.293621	0.0027
RESID(-2)	-0.081372	0.199679	-0.407515	0.6867
R-squared	0.314722	Mean dependent var		1.27E-16
Adjusted R-squared	0.167877	S.D. dependent var		1.507610
S.E. of regression	1.375254	Akaike info criterion		3.652010
Sum squared resid	52.95706	Schwarz criterion		3.963080
Log likelihood	-56.91018	Hannan-Quinn criter.		3.759392
F-statistic	2.143221	Durbin-Watson stat		1.846540
Prob(F-statistic)	0.079610			

Interpretation: Since the p for all variables is greater than 0.05, Serial Correlation was conducted to check respectively if there was a relationship between errors and if the variance of

errors is constant. The null hypotheses state that there is no serial correlation between the errors and the errors are homoscedastic. As indicated by table 8, the probability value

of Chi-Square of the tests is greater than 5% significant level which confirms that we accept or fail to reject the H_0 and concluded that there is no serial correlation between the errors.

8 | CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

In general, the results of the bounds test for co-integration proved that the monetary transmission mechanism components variables affected the investment in the long run. It indicates that the investment on monetary transmission mechanism is not only a short-term phenomenon but also a long term one as well. This is in line with the conclusions made by the endogenous growth models with respect to the effectiveness of monetary transmission components on investment. On the independent variables, the regression indicates that there is a significant positive relationship between the interest rate and investment. This implies that government should put emphasis on both interest rate, money supply to enable more people to continue the improvement of investment by stabilizing the level of interest rate to attract even investors from outside.

From an evaluation of the overall analysis and results, it can be concluded that the stated independent variables have had significant long-run impacts on investment in Rwanda. Considering this, the study follows the usual approach in assuming that investment shares as positive relation with monetary policy channel.

8.2 Policy implications and recommendations

Based on the findings and their implications reported. The study recommended the following policy measures to help government achieve its investment plans in next generation. The following are the recommendations:

- To continue the improvement of foreign policy to improve the level of investment in different domains.
- Policy maker should improve the level of exports which makes the currency stability of national currency against the international currencies given that there was a negative impact of exchange rate on investment.
- Focus on money supply given that there is a positive impact for money supply and investment, this can be done by continue dealing with the bond markets to strengthen the level of investment.

9 | REFERENCE

I. Books

- Acha I. A. & Acha C. K. (2011). *Interest Rates in Nigeria: An Analytical Perspective*.
- Ando, A. & Modigliani, F. (1963). 'The "Life Cycle" Hypothesis of Saving: Aggregate Implications and Tests', *The American Economic Review*, 53(1): 55- 84.
- Bibi, S., Khan, U. A., & Bibi, A. (2012). *Determinants of Investment in Pakistan*.
Academic Research International, 2 (2), pp. 517-524.
- Blinder, A. S. (1999). *Central Banking in theory and practice*. Massachusetts: The MIT Press
- BNR(2015) *Monetary policy in Rwanda*
- Buigut, S. (2009). *Monetary transmission mechanism: Implications for the proposed East African Community (EAC) Monetary Union*. Mimeo.
- Cizkowicz, P., & Rzonca, A. (2013). *Does inflation harm corporate investment? Empirical evidence from OECD countries*. *Economics*, 7(16), 1-41.

Creel, J. & S. L'vasseur (2016). *Monetary policy transmission mechanisms in the CEECs: How important are the differences with the euro area*

Dennis, R. (2003). 'Exploring the role of the real exchange rate in Australian monetary policy' *Economic Record*, 79(244): 20-38.

Friedman, M. (1957). *A theory of the consumption function*, Princeton: Princeton University Press.

Gujarati, D. N. & Porter, D. C. (2009). *Basic econometrics*, McGraw-Hill Irwin, Boston.

Ireland, P. N. (2006). *The monetary transmission mechanism*, FRB Working Paper.

Jorgenson, D. W. (1963). 'Capital Theory and Investment Behavior', *The American Economic Review*, 53(2): 247-259.

Kothari, C. (2004). *Research Methodology*, New Age International Publishers, India.

Loayza, N. & Schmidt-Hebbel, K. (2018). 'Monetary policy functions and transmission mechanisms: an overview', in *Monetary Policy: Rules and Transmission Mechanisms*, edited, Central Bank of Chile, Santiago, Chile.

Mishkin, F. S. (1995). 'Symposium on the monetary transmission mechanism' Modigliani, F. & Brumberg, R. (1954). 'Utility Analysis and the Consumption Function in Post-Keynesian Economics', edited by K. Kurihana, Rutgers University Press

Nguyen; P. L. (2010). *Monetary transmission mechanism in Vietnam under the quantitative approach (in Vietnamese)*, The State Bank of Vietnam.

Soffer; Y. (2006). *Exchange rate pass-through to the consumer price index a micro approach*. Bank of Israel Foreign Exchange Discussion Paper Series, 2.06.

Taylor; J.B. 2000. "Low Inflation, Pass-Through, and the Pricing Power of Firms.

European Economic Review 44: 1389-1408.

Taylor; J. B. (2018). 'The monetary transmission mechanism and the evaluation of monetary policy rules', in *Monetary Policy Rules and Transmission Mechanisms*, edited, Central Bank of Chile, Santiago, Chile.

The Open-Access, Open-Assessment E-Journal, 3(2009-16): 1.

Tovar; C. E. (2009). 'DSGE Models and Central Banks', *Economics*

Tran; K. V. (2009). *Monetary policy in Vietnam: evidence from a structural VAR*, viewed 31/10/2011

2. Journals

(Agu, O. C. 2015) *Determinants of Private Investment in Nigeria an Econometric Analysis*. *International Journal of Economics, Commerce and Management* 3: 1-14.

Research Journal of Finance and Accounting, IISTE, Vol 2, No 3 ISSN (Paper)

Bernanke, B. S. & Gertler, M. (1995). 'Inside the black box: the credit channel of monetary policy transmission', *Journal of Economic Perspectives*, 9(4): 27.

Brima (2017). *Monetary policy effect on private sector investment: Evidence from Sierra Leone*.

International Journal of Economics and Financial Issues 7: 476-88.

Frimpong, J. M., & Marbuah, G. (2010). *The Determinants of Private Sector Investment in Ghana: An ARDL Approach*. *European Journal of Social Sciences*, 15 (2), pp. 250-261.

Gilchrist, S. & C.P. Himmelberg. 1995. "Evidence on the Role of Cash Flow for Investment."

Journal of Monetary Economics 36: 541-72.

Mundell, R. A. (1963). 'Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates', *The*

Canadian Journal of Economics and Political Science / Revue canadienne d'Economie et de Science politique, 29(4): 475-485.

Tobin; J. (1969). 'A General Equilibrium Approach To Monetary Theory

Journal of Money, Credit and Banking, 1(1): 15-29.

3. Dissertation/ Thesis

Afandi, A. (2016). 'Monetary policy transmission mechanism and structural breaks in Indonesia', PhD thesis, University of Wollongong, New South Wales