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**Article**

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## Monetary Policy and Economic Growth: A Review of International Literature

**Abstract:** This paper aims to survey the existing literature, both theoretical and empirical, on the relationship between monetary policy and economic growth. While there has been a wide range of studies on the existing relationship between monetary policy and economic growth, the nexus between the two remains inconclusive. This paper takes a comprehensive view of the theoretical evolution of the relationship and the respective recent empirical findings. Overall, this paper shows that the majority of findings support the relevancy of monetary policy in supporting economic growth, mainly in financially developed economies with fairly independent central banks. The relationship tends to be weaker in developing economies with structural weaknesses and underdeveloped financial markets that are weakly integrated into global markets. This paper concludes that monetary policy matters for growth both in the short-run and long-run despite the prevailing ambiguous relationship. The paper recommends intensive financial development measure for developing countries as well as structural reforms to address to supply side deficiencies.

**Key Words:** Money supply, Interest rates, Output stabilisation, Long run neutrality

**JEL Classification:** E42, E52, E58.

## 1. Introduction

Monetary policy and economic growth theories have evolved rapidly over time, dominated by dissimilarities, obscurities, inconclusiveness and cross currents (Brunner and Meltzer, 1972). Economic growth theories and monetary policy predate as far back to classical quantity theory of money (QTM) (Gali, 2008). However, modern theories only came to the fore in the 1930s, with the Keynesian Liquidity Preference Theory, followed by monetarism (a manifestation from the QTM), and subsequently by several theories, namely: New Classical real business cycles, the New Keynesian Model and New Consensus Model (NCM), which have been at the center of monetary policy analysis over the last two or so decades (Goodfriend and King, 1997; Arestis and Sawyer, 2008). Over the years, the short-run and long-run impact of monetary policy on real variables, in particular on output, has remained ambiguously at the centre of research (Walsh, 2003). Most studies have focused largely on the monetary policy neutrality in the long run and on developed countries (Asongu, 2014). This paper provides an eclectic review of the international literature, both theoretical and empirical, on the impact of monetary policy and economic growth in the short run and the long run. The existing literature shows that different studies focus on different countries and country groups, periods and proxy variables, and different econometric methodologies are used. Section 2 reviews theoretical literature on the relationship between monetary policy and economic growth. Section 3 covers empirical evidence. Finally, the conclusion is presented in Section 4.

## 2. Theoretical Review

The classical monetary theory is the first renowned theory of monetary policy and is enshrined in the Irving Fisher QTM, which lays the foundation for the link between monetary policy (money) and economic variables. In this theory, both velocity of money and output are assumed as constant, thus any increase in the quantity of money will only eventually increase prices proportionally in accordance with the quantity theory. The long run growth was only affected by real factors, and money supply has both short run and long run neutrality (Gali, 2008; Mankiw and Taylor, 2007). Keynes rejected the quantity theory, both theoretically and as a tool of applied policy, in part arguing that velocity of money is unstable and not constant. QTM also assumed the absence of the trade-off between inflation and output (Keynes, 1936). Keynesianism rationalized that prices are rigid and that the quantity of money adjusted rapidly. Money demand was not exogenous but endogenous and is dependent on income and interest rates as

explained in the liquidity preference theory. The theory also assumes a positive relationship between output and interest rate, based on the liquidity preference-money supply relationship, also known as the LM curve. The basic version of the IS-LM model assumes a fixed price level; and thus cannot be used to analyse inflation but output in the short run (Hicks, 1937).

The liquidity preference theory combines money demand with the quantity of money supplied by the central bank to determine the money equilibrium level. This equilibrium makes interest rate a monetary phenomenon. Money supply is assumed to be exogenous and any increase in the money supply will lead to lower interest rate at which the quantity of money demanded equals the supply. Lower interest rates have a positive feedback on marginal efficiency of capital and investment, consequently leading to output expansion. Hicks IS/LM view of the Keynes's general theory was, however, contested empirically (Robinson, 1962; Leijonhufvud, 1968; Backhouse and Bateman, 2011).

Keynes was sceptical on the effectiveness of monetary policy when the economy is in a liquidity trap and also because of uncertainty in the financial markets. The Keynes supported a more pronounced role of the fiscal policy. The assumption of exogenous money supply in both classical and Keynesian theory equally had been challenged and discarded in subsequent and modern theories (Romer, 2006). Prolonged low interest rates in the Keynes's theory are also believed to have distortions in form of unsustainable asset price bubbles (Schwartz, 2009).

Monetarist theory came to the fore in the 1950s, drawing its cornerstone from the QTM and assuming that velocity in the quantity theory of money is generally stable, which implies that nominal income is largely a function of the money supply (Friedman and Schwartz, 1963; Friedman 1968, 1970). Monetarist upheld the principle of trade-off between inflation and output but reformulated the Philips curve in terms of real wage and not nominal wages (Gottschalk, 2005). Equilibrium in labour market is obtained at natural rate and assumptions of sticky wages prevail. The nominal rigidities in wages and prices imply that monetary policy affects real income in the short run (stabilisation); an increase in money stock would have temporary increase in real output (GDP) and employment in the short run, but no impact in long run due to countervailing effect of an increase in the general price. Money supply in the long run is inflationary, thus theory assumed long-run monetary neutrality. There is substantial evidence found in even recent literature to support this (see among others Bernanke and Mihov, 1998; Bullard, 1999; Nogueira, 2009).

Monetarism, however, has since been challenged on grounds of technological developments and the instability of the money demand function (White, 2013). Monetarism also assumed exogenous money supply which has been contested theoretically and empirically (Romer, 2006). The assumption of constant velocity of money has been equally challenged (Mishkin, 2007). Long-run neutrality has also been challenged in empirical literature: Evans (1996) finds that money is not neutral in the long run if it is not in the short run, in particular, if growth is endogenous. If growth is exogenous, long-run neutrality is found.

Post-monetarism has also been largely dominated by real business cycle models, the New Classical Model, New Keynesian Models and the New Consensus Model. The difference between these theories is actually slim and relates to the treatment of nominal rigidities of wages and prices as well the treatment of demand (Goodfriend and King, 1997; Palley, 2007). The New Classical Monetary Model also assumes perfect competition and full flexible prices in all markets. The model also predicts neutrality (or near neutrality) of monetary policy with respect to real variables. The New Classical model has four important assumptions, which are: rational expectations, the natural rate hypothesis, continuous market clearing, and agents having imperfect information (imperfect information drives cycles in these models). The equilibrium dynamics of employment, output, and the real interest rate are determined independently of monetary policy, and variations in technology are assumed to be the only real driving force.

These assumptions laid foundation for the New Classical real business cycle (RBC) theory has two principles: Money is of little importance in business cycles, and secondly, business cycles are created by rational agents responding optimally to real shocks (most importantly the technology) in an environment characterised by perfect competition and frictionless markets. Monetary policy (anticipated) will have no effect on real GDP according to the rational expectations hypothesis and the continuous market clearing assumption. Only monetary policy (unexpected) surprises would have a temporary effect on real variables (Mankiw, 2006). The assumptions continuous market clearing and flexibility of wages and prices along with instantaneous adjustment of the economy to its long run equilibrium were rejected by the New Keynesian theorists (Mankiw, 2006). Many empirical studies also reject the relevance of the theory (Gottschalk, 2005). The integration of sticky prices and monopolistic competition into RBC frameworks became the major distinguishing feature of New Keynesian Economics (Goodfriend and King, 1997).

In new Keynesian models, prices and/or wages are temporarily inflexible so that in response to outside shocks, with changes in fiscal or monetary policy, quan-

tities adjust. Monopolistically competitive firms are price-setters in the goods market, and households are wage-setters in the labour market. New Keynesian Economics refers to the retooling of traditional Keynesian models to be consistent with microeconomic fundamentals. The theory upholds the long run neutrality and posits that monetary policy can only affect output in the short run. Empirical evidence on the use of New Keynesian models remains slim, and that practicality of theory is contested in part on grounds of absence of the role of money (Arestis and Sawyer, 2008).

The New Consensus Model became a product of the New Classical Model and New Keynesian Model; upholding the rational expectations of the former as well as retaining the wage and price short run rigidities of the latter. It also became a foundation of inflation targeting where price stability was the overriding objective while the other objectives including growth became secondary. Interest rates are also considered the sole monetary policy instrument. The model posits that monetary policy should focus on short-run output stabilization and long-run price stability. The short-run dynamics are premised on the temporal nominal rigidities but due to rational expectations, the market is able to clear and thus no long run economic activity implications. The output stabilization is also traced in the NCM aggregate demand curve, where the level of output is inversely related to the real interest rate. This implies a short term rates monetary policy can affect the demand side of the economy, which eventually converges towards the long run supply side equilibrium (Fontana and Palacio-Vera, 2007)

The NCM, however, faces compelling criticism over its assumptions and its practicability. There is limited empirical evidence to back the theory (Chari et al. 2008; Arestis and Sawyer, 2008). The absence of money and exchange rate roles, inadequate treatment of markets (financial, labour and capital markets), the focus on a single instrument and independent central banks discounts its operation usefulness, particularly for developing countries and open economies (Arestis, 2009; Arestis and Sawyer, 2008; and Fontana and Palacio-Vera, 2007). The NCM may also be inappropriate for economies with persistence of supply driven inflation, and so would be its theorized assumption of inflation elasticity into other variables (Arestis and Sawyer, 2008; and Fontana and Palacio-Vera, 2007). The output stabilisation forward looking targeting has been in some recent literature of Woodford (2007).

The underlying rejection of the NCM not only ignites the debate on the earlier theories but it also raises consensus crisis on the role of monetary policy on output (Fontana, 2010).

### 3. Empirical Literature

Extensive work has been done in an attempt to establish the impact of monetary policy on economic growth, yet with little consensus to date. Some studies have confirmed limited or no impact of monetary policy. Mutuku and Koech (2014) applying the recursive VAR methodology on time series data from 1997-2010 estimated the impact of monetary and fiscal policy shocks on economic growth in Kenya revealed monetary policy (both money supply and short-term interest rates) as insignificant in influencing the real output. They argue that the weak nexus is attributed to weak structural, institutional and regulatory framework. Using the vector auto regressive (VAR) model to measure the effect of monetary policy on economic growth in Kenya, Kamaan (2014) also found that monetary policy does not have an impact on economic growth. The results are corroborated by Montiel et al. (2012) who estimated the Monetary Transmission Mechanisms (MTMs) in Tanzania covering the period 2002m1–2010m9 using both recursive and structural VAR. Monetary policy had no output effects. Using the econometric regression model analysis on a monetarists' approach, Lashkary and Kashani (2011) studied the impact of monetary variables on economic growth in Iran during the period 1959 to 2008 and found no significant relationship between the money volume and real economic variables, economic growth and employment

However, a number of empirical studies confirm that monetary policy is crucial for economic growth. Havi and Enu (2014) examine the relative importance of monetary policy and fiscal policy on economic growth in Ghana over the period of 1980 to 2012. The Ordinary Least Squares (OLS) estimation results revealed that money supply as a measure monetary policy had a positive significant impact on the Ghanaian economy. Vinayagathan (2013) estimates the impact of monetary policy on the real economy using a seven-variable structural VAR model by utilizing monthly time series data from Sri Lanka covering the period from January 1978 to December 2011. The study found that interest rate shocks had a significant impact on output in accordance with the economic theory. It also finds that positive money shock provides significant but inconsistent results on output. Output declines rather than increase.

Kareem et al. (2013) used OLS method and correlation matrix to examine the impact of fiscal and monetary policies on economic growth of Nigeria, with particular reference to the period between 1998 and 2008. They found that monetary variables of narrow money and broad money are significant policy variables that positively affect economic growth (real GDP growth rate) in Nigeria.

Davodi et al. (2013) used three variants of Structural VARs on monthly data sets from 2000 to 2010 to determine MTMs in the East African Community. The study found that MTM tends to be generally weak when using standard statistical inferences, but somewhat stronger when using non-standard inference methods. An expansionary monetary policy (a positive shock to reserve money) increases output significantly in Burundi, Rwanda and Uganda. However, they also found that an expansionary monetary policy (a negative shock to policy rate) increases output in Burundi, Kenya and Rwanda. Berg et al. (2013) used the narrative approach pioneered by Romer and Romer (1989) to examine the monetary transmission mechanisms in the tropics with a focus on four East African countries (Uganda, Kenya, Tanzania and Rwanda). They found that there was clear evidence of a working transmission mechanism: after a large policy-induced rise in the short-term interest rate, lending and other interest rates rise, the exchange rate tends to appreciate, and output growth tends to fall.

Fasanya et al. (2013) examined the impact of monetary policy on economic growth in Nigeria using the Error Correction Model (ECM) on time-series data covering 1975 to 2010. They revealed that a long-run relationship exists among the variables and that inflation rate; exchange rate and external reserve are significant monetary policy instruments that drive growth in Nigeria in accordance with theoretical expectations. Money supply was found to be insignificant.

Onyeiwu (2012) examining the impact of monetary policy on the Nigerian economy using the OLS method to analyse data between 1981 and 2008, found that monetary policy proxied by money supply exerts a positive impact on GDP growth.

Milani and Treadwell (2012) used a small-scale DSGE model to disentangle unanticipated and anticipated monetary policy shocks and study their effects. The estimation used likelihood-based Bayesian methods on US data from 1960:q1 to 2009:q1 on the output gap, inflation, and the federal funds rate as observable variables. They showed that the unanticipated monetary shocks have a smaller and more short-lived impact on output and a large, delayed, and persistent effect due to anticipated policy shocks. The overall fraction of economic fluctuations that could be attributed to monetary policy remained limited.

Chaudhry et al. (2012) investigated long-run and short-run relationships of monetary policy, inflation and economic growth in Pakistan using co-integration technique and the ECM for the period from 1972 to 2010. They found that monetary policy variable of call money was insignificant in the short run but positively significant in the long run. Mugume (2011) utilised the five-variable

non-recursive VAR to estimate monetary transmission mechanisms in Uganda using quarterly data between 1999q1 and 2009q1. Using broad money and three-month T-bill rate (lending rate) as proxies of monetary policy, the results showed that a shock to interest rate (91-day T-bill rate) was considered as the monetary shock and it was found that a contractionary monetary policy reduced economic growth lasting up to two quarters while innovation in broad money M2 had no statistically significant effect on output.

Coibion (2011) estimated the effects of monetary shocks on the US economy for the period from 1970 to 1996, using the standard VAR against the large effects from the Romer and Roemer (2004) approach (R and R). The study found that with the standard VAR approach, the monetary policy shocks appear to account for very little of the fluctuations in the real economy, measured either via industrial production or unemployment. It was also found that the 1980-1982 and the 1990 recessions could not be explained by the standard VAR. When a DSGE model by Smets and Wouters (2007) was estimated, it accounted for medium-sized effects of the monetary shocks on real variables, including output.

Jawaid et al. (2011) probed the effect of monetary, fiscal and trade policy on economic growth in Pakistan, using the annual time series data from 1981 to 2009. They employed the co-integration and ECM revealing the existence of positive significant long-run and short-run relationship between monetary policy (money supply) and economic growth. Senbet (2011) also investigated the relative impact of fiscal versus monetary action on output in the USA using the VAR approach and revealed a positive significant impact of money supply on economic growth. Their findings are congruous with Adefeso and Mobolaji (2010) that also studied the relative effectiveness of fiscal and monetary policy on economic growth in Nigeria using the co-integration technique and error correction mechanism, based on annual data from 1970-2007.

Employing the OLS approach, Nouri and Samimi (2011) examined the relationship between money supply and economic growth for the period during 1974 to 2008 in Iran. They found a positive significant relationship between money supply and economic growth. Ogunmuyiwa and Ekone (2010) investigated the relationship between money supply and economic growth in Nigeria between 1980 and 2006. The OLS and ECM revealed a positive impact of money supply on economic growth both in short run and long run.

Moursi and El Mossallamy (2010) analysed monetary policy in Egypt and its effect on inflation and growth by using the Bayesian approach to estimate a dynamic stochastic general equilibrium (DSGE) model for a small closed economy.

Monthly time series data for the sample period 2002 to 2008 was utilised. They found that the impact of monetary policy negative shock is relatively more significant on output than on inflation, indicating that expansionary monetary policy is capable of stimulating economic growth without imposing too much pressure on prices.

Amarasekara (2009) utilised both recursive VAR and semi-structural VAR methodology on monthly data for the period from 1978 to 2005 to assess the effects of monetary policy on economic growth and inflation in the small open developing economy of Sri Lanka. The results from recursive VAR were consistent with results from the semi-structural VAR and they revealed a negative significant impact of interest rate on growth. Positive innovations decreased GDP growth. However, when money growth and exchange rate are used as policy indicators, the impact on GDP growth contrasts the established findings/theory. Suleiman et al. (2009) employed the Johnson co-integration test to investigate the long-run relationship between money supply (M2), public expenditure, and economic growth in Pakistan using annual data for the period 1977-2007. They found a positive relationship between money supply (M2) and economic growth in the long-run.

Buigut (2009) assessed the importance and similarity of the interest channel for EAC countries using the VAR model in assessing the similarity of transmission mechanism in the EAC (Uganda, Kenya and Tanzania). Rwanda and Burundi were excluded due to data challenges. The annual data on three variables (real GDP, CPI and Interest rates) used in different countries varied – Uganda (1984-2005), Kenya (1984-2006), and Tanzania (1984-2005). No co-integration among the variables was found. He found out that the interest rate transmission mechanism was weak in all three countries and that a shock to the interest rate had no statistically significant effect on real output.

The results of the Autoregressive distributed lag model employed by Ali et al. (2008) to examine the effects of fiscal policy and monetary policy on economic growth in South Asian countries using annual data from 1990 to 2007 indicated that money supply had a positive and significant effect on economic growth in the short and long run. Rafiq and Mallick (2008) examined the effects of monetary policy shocks on output in the three euro-area economies – Germany, France, and Italy (EMU3) – by applying a new VAR identification procedure. The results showed that monetary policy innovations are at their most potent in Germany. However, apart from Germany, it remained ambiguous as to whether a rise in interest rates coincides with a fall in output, showing a lack of homogeneity in the

responses. They concluded that monetary policy innovations play a modest role in generating fluctuations in output for the EMU3.

Dele (2007) examined the monetary and macroeconomic stability perspective of West African Monetary Zone Countries using quarterly data sample spanning 1991:1 to 2004:4. The regression results indicate that monetary policy, as captured by money supply and credit to government, hurt real domestic output of these countries. The study also shows that interest rates policy had adverse effects on GDP contrary to the theoretical expectation of an inverse relationship and that exchange rate devaluations have no effect on output.

Smets and Wouters, (2007) developed and estimated a DSGE model with sticky prices and wages for the euro area. The model was estimated with Bayesian techniques using seven key macroeconomic variables: GDP, consumption, investment, prices, real wages, employment, and the nominal interest rate. In addition, they introduced ten orthogonal structural shocks (including productivity, labour supply, investment, preference, cost-push, and monetary policy shocks) that allowed for an empirical investigation of the effects of such shocks and of their contribution to business cycle fluctuations in the euro area. They found monetary policy shocks are important in driving variations in the euro area output.

Khabo and Harmse (2005) estimated the impact of monetary policy on South Africa, using OLS on the annual data series from 1960 to 1997 and found that money supply (M3) and inflation significantly related to economic growth in accordance with economic theory.

#### 4. Conclusion

This paper has explored both theoretical and empirical literature on the relationship between monetary policy and economic growth. The paper has also provided an overview of how monetary policy transmits to economic growth. Although there is a wide range of studies on the existing relationship between monetary policy and economic growth, the nexus between the two remains inconclusive. Overall, the findings of this paper show that the majority of the previous studies tend to support a positive impact of monetary policy on economic growth mainly in financially developed economies with fairly independent central banks. The relationship tends to be weaker in developing economies with underdeveloped financial markets and weakly integrated into global markets. The study has also revealed that the relationship between monetary policy and economic growth is largely explained by, *inter alia*, the size of and competition within the financial

sector, the monetary and exchange rate regimes, and the degree of openness. This paper concludes that monetary policy matters for growth both in the short-run and long-run despite the prevailing ambiguous relationship. The paper recommends intensive financial development measures for developing countries as well as structural reforms to address to supply side deficiencies.

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