

Chapter Two

REVIEW OF LITERATURE

This chapter presents a brief review of literature in the field of monetary and fiscal policy and its impact on GDP and inflation in middle developed and less developed countries. While some studies are exclusively based on the Indian macro-economic data, others are devoted to macroeconomic analyses of selected African nations, West Asian nations along with a few East Asian nations. Monetary and fiscal studies on SAARC nations outside India are also reviewed. The review leads to identification of the research gaps and aids in framing the objectives and hypotheses of the study.

2.1 Empirical Studies on Growth, Inflation, Fiscal Deficit and Money Supply

Globally, numerous studies with several theories have been carried out, which specifically aimed at examining the relationship between inflation and growth. These empirical studies have attempted to examine whether the relationship between inflation and long-run growth is linear; non-linear; casual or non-existent. Empirical studies in the area of relative effectiveness of monetary and fiscal policy in promoting GDP growth have been conducted on developed nations using the *St. Louis Equation* or some variants of it (**Anderson and Jordan** 1968; **Batten and Haffer** 1983; **Chowdhary** 1988).

Most of these studies show that monetary actions have a stronger and faster impact on economic activities than fiscal actions. Compared to western nations, such studies are

rare in India. The relative effectiveness of monetary and fiscal policies in India was tested by **Chowdhary** (1986), **Upadhyay** (1991) and **Mehta and Kiser** (1993). The results of these studies do not seem to follow any specific pattern. Moreover, they do not necessarily support either monetarism or fiscalism.

The literature on money-inflation nexus in India recognizes that unwarranted growth of money supply has been one of the key factors behind the inflationary spells experienced since the 1950s. Monetary expansion or increase in money supply was triggered by central government borrowings from the Reserve Bank of India (Pattnaik and Samantaraya 2006; Rangarajan 1998; Reddy 1999). Influential Indian economists maintain that the factor primarily accountable for the excessive growth of money supply and thus inflationary spells experienced in India, has been the large scale resort to deficit financing by the central government (Chakravarty, 2007). This argument led to the discontinuation of automatic monetisation of debt by the RBI since 1997.

Among the significant empirical contributions in this area for the Indian economy in recent years, the studies by Rangarajan and Arif (1990), Jadav and Singh (1990), Srimany and Samanta (1998), Parida *et al* (2001), Rangarajan (2001), D'Souza (2003), Mohan (2008), Mishra and Mishra (2009), Singh and Kalirajan (2006 and 2007) are important in view of their economic as well as methodological robustness. However short period analyses in the above studies may question the statistical reliability of the test results as because multiple business cycles are not captured.

A massive upsurge in econometric studies on the causal relationship between money supply and aggregate income (GDP or GNP) began with Sims (1972) following his celebrated paper where he devised an econometric technique to examine causality between money supply and aggregate national income and tested it for U.S. data. His study showed evidence of unidirectional causality from money to income for the US

economy. This was the first ever robust econometric verification of the monetarist claim that money causes aggregate income. Over the past couple of decades there has been substantial empirical work on the interlinkages between money, prices and aggregate real economic activity in developed economies. Unfortunately, econometric studies on money – income and money – price causality in developing nations, especially in south and west Asian nations are still in its early stages of development and only few influential works are available in literature. Studies by Sharma (1984), Singh (1989), Verma and Kumar (1994) are prominent among the few studies conducted on India. Similar studies on Bangladesh were conducted by Jones and Sattar (1988), Parikh and Starmer (1988), and Chowdhury *et.al* (1995). Among the few studies conducted on Pakistan are Jones and Khilji (1988) and Masih and Masih (1997). Sadeghi and Alavi (2011) conducted a similar study for Iran using a VECM approach.

Among the pioneering Indian studies, Ramachandra (1983 and 1986) found that money causes real income and the price level, price level causes real income and nominal income causes money. Sharma (1984) explored the causality between price level and money supply adopting Granger (1969) and Sims (1972) techniques for the period 1962-1980 and established bi-directional causality between M1 and the price level and also between M2 and the price level. Based on quarterly data over the period 1960-1961 to 1981-1982, Nachane and Nadkarni (1985) found unidirectional causality from money supply to price level. But the causality between real income and money stock remained inconclusive. Das (2003) studied the interlinkage between money, price and output in India and concluded that there exists bidirectional causality between money and prices and unidirectional causality between money and output, with causality running from money to output. Ashra, Chattopadhyay and

Chaudhuri (2004) found bidirectional causality from money supply to price level and concluded that money is not neutral and that money is not exogenous in the long-run. Mishra et al. (2010) applied VECM technique to Indian data and found a long-run bidirectional causality between money and output. Furthermore their findings support a long-run unidirectional causality from price level to money and from price level to output. Their findings also revealed short-run bidirectional causality between money supply and the price level and a short-run unidirectional causality running from output to the price level.

In sum, empirical evidences on the causality between money supply and GDP in India are mixed and existing empirical literature is rather unconvincing. Most studies investigate pair-wise causality between money supply, real GDP and the price level ignoring other macroeconomic variables. Arguably, this is problematic and can potentially lead to either misspecification bias or omitted variable bias, since a macroeconomic variable is most likely to be influenced by more than one variable both in the short and long run. But inclusion of additional variables along with their respective lags comes at the cost of sacrificing degrees of freedom thereby narrowing down the possibility of rejecting null hypothesis (critical or tabulated distributional values are absolutely higher for lower degrees of freedom for the same significance level). The key issue addressed in this study is whether there is any bi-directional short run causality between money supply (broad and narrow) and real GDP in India during 1961-2010.

The literature on empirical testing and validity of Wagner's law and the Keynesian hypothesis is quite extensive and hence a detailed discussion on empirical contributions in this field is beyond the scope of this thesis. Although numerous empirical studies have been carried out on the topic over the years in both developed

and the developing countries, the findings of these studies are rather mixed and no clear consensus on the direction of causality seems to emerge. A few influential works are cited as a build-up to the present study.

Econometric causality between government expenditure and national income was examined by Singh and Sahni (1984) on the basis of Indian data. Their results support neither Wagner's law nor the Keynesian hypothesis. Ahsan et al. (1992) did not find any causality between government expenditure and national income for the United States. No evidence of Wagner's law was found by Afxentiou and Serletis (1996) and Ansari et al. (1997) on the basis of cross-country data. Bohl (1996) tested Wagner's law for the post-World War II period for G7 countries and found it to be valid only for the UK and Canada. In case of Turkey, Bagdigen and Cetintas (2003) did not find any causality between national income and government expenditure. Neither Wagner's law nor its converse was established by Frimpong and Oteng-Abayie (2009) for the West African Monetary Zone nations. According to Verma and Arora (2010) there is no instantaneous impact of increase in government expenditure on GDP in case of India. Similarly, Taban (2010) found no significant relationship between government spending and GDP growth for Turkey.

At the other extreme, studies by Chletsos and Kollias (1997) for Greece, Ghali (1998) for the ten OECD nations, Demirbas (1999) for Turkey, Thornton (1999), besides Chang (2002) for six up-and-coming nations, Kolluri et al. (2000) for G7 nations, Islam (2001) for USA, Al-Faris (2002) for Gulf Cooperation Council countries, Aregbeyen (2006) for Nigeria, Sideris (2007) for Greece, Kalam and Aziz (2009) for Bangladesh and Rehman et al. (2010) for Pakistan found causality between national income and public expenditure. Grullón (2012) and Salih (2012) found Wagner's law to be valid in case of the Dominican Republic and Sudan, respectively. Contrary to

these, the studies by Jiranyakul and Brahmairene (2007) in case of Thailand, Pradhan (2007) in case India, Babatunde (2008) for Nigeria, Magazzino (2010) for Italy and Ighodaro and Oriakhi (2010) for Nigeria established the Keynesian result that public expenditure causes national income. Ayo et al. (2011) in an exceptional result established bi-directional causality between government expenditures and economic growth both in the short and the long run for Nigeria.

A few more studies conducted in this area in recent years are worth reviewing in detail.

Adhikary and Mazumder (2006) estimate both the long run and the short run money demand functions in India over the period 1970-71 to 2002-03 on the basis of appropriate macroeconomic data. A partial stock adjustment principle is used to frame a short run money demand function. The estimated long run as well as short run money demand functions reveal that transaction motive is stronger than the assets motive for holding money. The long run estimates show further that the Indian economy does not suffer from money illusion. The inflationary impact of monetary expansion is estimated econometrically. Long run evidence shows that monetary expansion is inflationary, the impact being felt for over a year. Recent experience however reveals that the inflationary impact is felt over a quarter. Examines the relative effectiveness of fiscal policy compared to monetary policy, employing the St. Louis model. Both the non-nested and nested forms of the St. Louis equation support the superiority of narrow money supply over government expenditure in explaining GDP growth. But the *Granger causality* shows that the causation from GDP to M_1 is more pronounced compared to its contrary thereby establishing the transactions motive for holding money. The strong causation from money to prices is also evident from the test of causality.

Sidrauski (1967) proposed the next major development, with his seminal work on the context of an infinitely-lived representative agent model where money is ‘Superneutral’. Superneutrality, as mentioned earlier, holds when real variables, including the growth rate of output, are independent of the growth rate in the money supply in the long-run. The main result in Sidrauski’s economy is that an increase in the inflation rate does not affect the steady state capital stock. As such, neither output nor economic growth is affected.

Stockman (1981) developed a model in which an increase in the inflation rate results in a lower steady state level of output and people’s welfare declines. In Stockman’s model, money is a complement to capital, accounting for a negative relationship between the steady-state level of output and the inflation rate. Stockman’s insight is prompted by the fact that firms put up some cash in financing their investment projects. Sometimes the cash is directly part of the financing package, whereas other times, banks require compensating balances. Stockman models this cash investment as a cash-in-advance restriction on both consumption and capital purchases. Since inflation erodes the purchasing power of money balances, people reduce their purchases of both cash goods and capital when the inflation rate rises. Correspondingly, the steady-state level of output falls in response to an increase in the inflation rate. The *Stockman Effect* can also operate through the effects on the labour-leisure decision.

Cooley and Hansen (1989) show that the level of output permanently falls as the inflation rate increases. This theoretical review demonstrates that models in the neoclassical framework can yield very different results with regard to inflation and growth. An increase in inflation can result in higher output (Tobin Effect) or lower output (Stockman Effect) or no change in output (Sidrauski, 1967).

Omoke and Oruta (2010) attempt to offer evidence on the causal long term relationship between budget deficit, money growth and inflation in Nigeria. The test for stationarity using Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) test carried out to test the stationarity of the variables used in the work proved that the variables were stationary, though not in levels, but in first difference. The Johansen cointegration test employed suggests there is at least one cointegration vector among these variables. Under such circumstances, we employed a vector error correction model (VECM). The results point to a close long-term relationship between inflation and money supply. With regard to the role of the fiscal deficit, the VEC estimates provide evidence that a one percentage point increase in the fiscal deficit (as a share of GDP) leads an increase of almost 0.94 percentage points in the M_2 growth rate. The causal long term relationship between budget deficit, money growth and inflation was tested using Pair wise Granger causality test. The result from the test indicated that Money supply causes Budget deficit which means that the level of money supply in the Nigerian economy will determine whether there has been or there will be budget deficit. Inflation and budget deficit revealed a bilateral/feedback causality proving that the changes that occur in inflation could be explained by its on lag and also the lag values of budget deficit and in the same vein changes that occur in budget deficit is explained by its lagged values and the lagged values of inflation. Money supply on its relation to Inflation solely indicated a uni-directional causality running from it to inflation.

Ignacio Lozano (2008) analyzed the evidence of the causal long-term relationship between budget deficit, money growth and inflation in Colombia considering the standard (M1), the narrowest (M0-Base money) and the broadest (M3) definitions of money supply. Using a vector error correction (VEC) model with quarterly data over

the last 25 years, the study found a close relationship between inflation and money growth on the one hand, and between money growth and fiscal deficit, on the other.

Cevdet, Emre and Ozmucur (1996) using annual Turkish data analyzed the existence of a stable long-run relationship between budget deficits, money growth and inflation; and the results according to them was affirmative. Using the cointegrating vectors found in the study, they concluded that a significant impact of budget deficits on inflation cannot be refuted under the assumption long-run monetary neutrality. However, utilizing an unrestricted VAR model using quarterly data corresponding to the post-bond financing period, the results were suggestive of a weakened link from the other variables to inflation. A further check using an ARIMA approach validated the same result and it is shown that the inertia in the inflation process was increasing over time. The availability of bond financing after 1986 might account for the weakening in the link from the budget deficits to inflation to a certain extent.

Tekin-Koru and Özmen (1998) investigated the long-run relationships between budget deficits, inflation and monetary growth in Turkey considering two alternative trivariate systems corresponding to the narrowest and the broadest monetary aggregates. They found out that while the joint endogeneity of money and inflation rejects the validity of the monetarist view, lack of a direct relationship between inflation and budget deficits makes the pure fiscal theory explanations illegitimate for the Turkish case. Consistent with the policy regime of financing domestic debt through commercial banking system, budget deficits lead to a growth not of currency seignorage but of broad money in Turkey. This mode of deficit financing, leading to a creation of near money and restricting the scope for an effective monetary policy, may not be sustainable, as the government securities/broad money ratio cannot grow without limit.

De Haan and Zelhorst (1990) analysed the relationship between government budget deficit and money growth in the developing countries. The overall conclusion of this study did not provide much support for the hypothesis that government budget deficit influences monetary expansion and, therefore, create inflation.

Mohammad and Ahmad (1995) studied Money Supply, Deficit, and Inflation in **Pakistan** based on the monetarist and quantity theory approach to inflation and came out with the findings that suggest that the domestic financing of budget deficit, particularly from the banking system, is inflationary in the long run. The results provided support for a positive relationship between budget deficit and inflation during acute inflation periods, i.e., 1970s. They also found that money supply is not exogenous; rather it depends on the position of international reserves and fiscal deficit, and it has emerged as an endogenous variable.

Mishra, Mishra and Mishra (2010) the study of the relationship between money, price and output is significant for a developing country like India as this relationship reveals the appropriate monetary policy as well as its effectiveness. Thus, this paper investigated the dynamics of the relationship between these macro-economic aggregates for India over the period 1950-51 to 2008-09. The estimation of vector error correction model based on VAR indicates the existence of long-run bidirectional causality between money supply and output and unidirectional causality from price level to money supply and output. But, in the short-run the bidirectional causality exists between money supply and price level and unidirectional causality exists from output to price level. The results infer that money is not neutral. Furthermore, inflation is a short-run monetary phenomenon.

Lee and Li (1983) examined causality among money, income and prices in Singapore and provided the evidence of bidirectional causality between income and money and

unidirectional causality from money to prices. **Ramachandra** (1983, 1986) using annual data for the period 1951-71, found that money causes real income and price level, price level causes real income and nominal income causes money. **Nachane and Nadkarni** (1985) found unidirectional causality from money stock to prices based on their study on quarterly data over the period 1960-1961 to 1981-1982. In this study the causality results between real income and money stock remained inconclusive.

Khan and Siddiqui (1990) showed unidirectional causality from income to money and bidirectional causality between money and prices in Pakistan. **Tan and Cheng** (1995), using Geweke's approach to Wiener-Granger causality, found the bidirectional causation between money supply and nominal output for Malaysia. **Rangarajan** (1998) modelled the relationship between money, output and prices; the study depicted the relationship between money and real output covering the period 1970-71 to 1992-93 in form of simple real money demand function on the basis of the assumption that the elasticity of price with respect to money was unity and established that it was possible in the Indian context to predict the average inflation rate in the medium term on the basis of the reduced form money demand equation. **Bengali et al** (1999) pin pointed a bidirectional causality between money and income and unidirectional causality from money to prices in Pakistan.

Aziakpono (2003) presents and tests a model to determine either or both anticipated or unanticipated money affects real output and inflation in Nigeria. The evidence reveals that while anticipated money affects real output, the unanticipated money did not. Thus, the tests contradict the policy ineffectiveness proposition. **Das** (2003) examined the long-run relationship between money price and output in India and provided the evidence that (i) both money and price affect each other and there exists

bidirectional causality; (ii) output affects price and there is feedback causation between price and output; and (iii) money unidirectionally affects output. **Ashra et al** (2004) examines the relationship between money, output and price level for the case of a developing country, i.e., India and indicates that there exists bidirectional causality between money and price level and that money is non-neutral so that it is not exogenous in the long-run.

Herwartz and Reimers (2006) analyse the dynamic relationships between money, real output and prices for an unbalanced panel of 110 economies and found that particularly for high inflation countries homogeneity between prices and money cannot be rejected. The study suggests that central banks, even in high inflation countries, can improve price stability by controlling monetary growth.

Abbas and Husain (2006) examine the causal relationship between money and income and between money and prices in Pakistan. The co-integration analysis indicates, in general, the long-run relationship among money, income and prices. The error correction and Granger causality framework suggest a one-way causation from income to money in the long-run implying that probably real factors rather than money supply have played a major role in increasing Pakistan's national income. Regarding the causal relationship between money and prices, the causality framework provides the evidence of bivariate causality indicating that monetary expansion increases, and is also increased by inflation in Pakistan. However, money supply seems to be the leader in this case.

Majid (2007) examines the causal relationship between monetary aggregates, output and prices in the case of Malaysia. The study used a Vector Autoregression (VAR) model applying the Granger no-causality procedure developed by Toda and Yamamoto (1995). The results indicate a two-way causality running between

monetary aggregates, M2 and M3 and output which is consistent with theoretically conjecture by Keynesian and Monetarist views whereas there is a one-way causality running from monetary aggregate, M1 and output. In addition, the results suggest that all monetary aggregates have a strong one-way causality running from money to prices but no evidence for the opposite causality. Thus, the results add the empirical support to the argument in the literature that inflation is a monetary phenomenon.

Saatcioglu and Korap (2008) examine the long-run relationships between monetary aggregates, prices and real output level in the quantity theory of money perspective for the Turkish economy. The results reveal that monetary aggregates seem to have an endogeneity for the long-run evolution of prices and real income. **Chimobi and Uche** (2010) examine the empirical relationship between money, inflation and output in Nigeria. The findings reveal no existence of a co-integrating vector in the series used. Money supply was seen to Granger cause both output and inflation. Also, the study finds empirical support in context of the money-prices-output hypothesis for Nigerian economy that M2 appears to have a strong causal effect on the real output as well as on prices.

Sharma, Kumar and Hatekar (2010) examine the issue of money, price and output relationship using a bi-variate methodology developed by **Lemmens et al** (2008). It concludes that there is the evidence for money-output trade-off over the short -run, but in the long -run, money supply determines prices, not output. The empirical results also indicate that output and prices does not Granger cause money supply reflecting exogeneity of money supply. It is thus, clear that the available studies provide mixed results in context of money, output and price causality direction and strength. Therefore, the present study is an effort to re-examine money, price and output relationship in the context of the Indian economy.

Srinivasan (2010) investigates the causal nexus between public expenditure and economic growth in India using cointegration approach and error correction model. The analysis was carried out over the period 1973 to 2012. The Cointegration test result confirms the existence of long-run equilibrium relationship between public expenditure and economic growth in India. The empirical results based on the error-correction model estimate indicates one-way causality runs from economic growth to public expenditure in the short-run and long-run, supporting the Wagner's law of public expenditure.

Sharma et al (2010) studied whether money supply Granger causes, 'output and prices' has been intensively investigated in the Indian context. However, the question involves settling of the issue over the short -run, business cycle as well as in the long -run, because the behavior of the Phillips curve depends upon whether a long -run or a short -run relationship is being investigated. In this paper, we examine the issues using a bivariate methodology developed by Lemmens et al. (2008) in order to decompose Granger causality between money supply, prices and output in frequency-domain. We conclude that there is evidence for money-output trade-off over the short -run, but in the long -run, money supply determines prices, not output. The empirical results also indicate that output and prices does not Granger causes money supply reflecting exogeneity of money supply.

Akash et al (2011) explores the short and long term dynamic relationship between macroeconomic variables and stock returns (KSE) for the period from January 1999 to December 2008. Macroeconomic variables include money supply, consumer price index, treasury bills rates, exchange rate, industrial production and reserves. The time series data have been used to examine by employing Johansen and Juselius multivariate cointegration, bivariate cointegration and Granger causality which

indicates long term relationship among money supply, consumer price index and industrial production. Granger Causality test provides evidence about lead lag unidirectional relationship between macroeconomic variables and stock returns (KSE). Vector error correction model explores the short term dynamic negative significant relationship among interest rate, exchange rate and also inflation on Karachi Stock Exchange. Money supply has a positive impact, creates the liquidity and accepts the null hypothesis of positive impact on equity market. Variance decomposition test determined that macroeconomic variables are an important source of volatility for the Karachi Stock Exchange. The contribution of this research is used to identify macroeconomic variables that are considerable factors and determinants of Karachi Stock Exchange movements. It also indicates that policy makers should be more careful and watchful about the sensitivity in designing the monetary policy.

Al-Fawwaz and Al-Sawai's (2010) examines the relationship between real gross domestic product and government expenditures in Jordan for the period 1990-2010 by using vector autoregressive model (VAR). The empirical results indicated that there is a unidirectional effect from real government expenditures to real gross domestic product. This result does not support Wagner's law, but support the Keynesian's hypothesis, which indicated that expenditure is a part of the effective demand, which affects the gross domestic product.

Omuru and Tizhe (2014) examine the dynamics between money supply and inflation in Nigeria using the TodaYamamoto causality test and the error correction methodology from the period of 1980-2012. Causality is found to run from money stock to output and inflation within the confines of the Nigerian economy. The estimated inflation elasticity of money stock is 1.002. Accordingly, increase in money supply is proportionately matched by the increase in inflation rate in Nigeria.

Therefore, the study concludes that inflation is a purely monetary phenomenon in Nigeria as the coefficient of broad money supply is equals unity.

Omar Mahmoud and Abu-Eideh (2015) explore the causal relationship between public expenditure and the GDP growth in the Palestinian territories over the period of 1994-2010. For this purpose trends in both public expenditure and GDP growth in Palestine are discussed, the paper also explored the relevant literature regarding Wagner's Law and the recent related empirical studies in various countries of the world. The study has adopted recent advances of econometric techniques. For this purpose, stationarity properties of the data and the order of integration of the data are empirically investigated by the Augmented-Dickey Fuller (ADF) test in the first place. Hypothesis of a long-run relationship between public expenditure and GDP growth has been tested by Engle-Granger cointegration test. Depending on the co-integration results of the six versions of Wagner's Law, the findings reveal that there is a co-integration between public expenditure and GDP growth. Such results indicate that there is a long-run relationship between public expenditure and GDP growth for the Palestinian case. On the basis of the Granger causality tests, we also found that both public expenditure and GDP have a cause effect on each other, the findings also suggest that both public expenditure and GDP are growing substantially and hence validate Wagner's Law in the case of Palestine.

Bagdigen and Cetintas (2003) takes into account recent advances in econometric techniques and examines Wagner's Law of long-run relationship between public expenditure and GDP for the Turkish case over the period of 1965-2000. The relationship is supposed public expenditure to be an outcome, not cause, of growth in GDP. Causality must run from GDP to public expenditure, not other ways around. Using the co-integration test and the Granger Causality test, they empirically find no

causality in both directions; neither Wagner's Law nor Keynes hypothesis is valid for the Turkish case.

Mishra and Mishra (2010) studied the empirical VAR literature on identification and measurement of the impact of monetary policy shocks on the real side of the economy is fairly comprehensive for developed economies but very limited for emerging and transition economies. In this study, they propose an identification scheme, for a developing economy taking India as a case study, which is able to capture the monetary transmission mechanism without giving rise to any empirical anomalies. They use a VAR approach with recursive contemporaneous restrictions and identify monetary policy shocks by modelling the reaction function of the central bank and structure of the economy. The effect of monetary policy shocks on the exchange rate and other macroeconomic variables is consistent with the predictions of a broad set of theoretical models. This set-up is used to build a hypothetical case of inflation targeting where the monetary policy instrument is set after looking at the current values of inflation only. This is in contrast with the "multiple indicator approach" currently followed by Reserve Bank of India. This hypothetical scenario of inflation targeting suggests a sharper response of the interest rate (monetary policy instrument) to shocks and strengthening of the exchange rate channel in transmission of interest rate impulses. This study also provides some useful implications on the type of theoretical framework which can be used to model the evolution of monetary policy for a developing economy like India.

Ghazali et al (2008) examines the relationship between money and prices in Malaysia. Their research considers monthly data of money supply M1, M2 and M3 and consumer price index (CPI) from January 1974 to September 2006. The Johansen cointegration method suggests that there is a long-run equilibrium relationship

between money supply with prices. Toda-Yamamoto causality tests find that there is uni-directional causality running from money supply to CPI. Therefore, the empirical evidence from Malaysia supports the quantity theorist's view.

Parida et al (2001) examines the dynamic relationship between fiscal deficits, money supply and price level in India during the period 1960-61 to 1999-2000. Using vector autoregression (VAR) econometric methodology, which allows variables to be treated as potentially endogenous; their study finds that fiscal deficits and money supply are both influenced by each other. Further, it reveals that the price level does not influence either the fiscal deficit or money supply but rather is being influenced by both the variables.

Koyuncu (2010) investigates that economists have different theories about the inflation, have a common view about the ultimate cause of inflation. Inflation is a monetary phenomenon and the budget deficits can cause inflation, only if it reflected in monetary aggregates. The finance of budget deficit by central bank will cause inflation through increasing liquidity. Reviewed empirical research shows that depending of which methods the budget deficits finance inflationary impact changes. In this study was used the Time-Series approach to investigate the impact of budget deficit and money supply on inflation in Turkey for the period of 1987-2010.

Waingade (2011) examines the relationship between money supply and price level in the context of India reveals that, over a long period, there exists a positive correlation between growth in money supply and price level. The association between the two has however not been proportional. The growth in money supply has most of the time exceeded the growth in price level. The gap between the two has been explained by the growth in real national income. If the combined growth in price level and real national income over a long period is considered, then it comes very close to the

growth in money supply, implying a near proportional relationship between the two. This means the impact of change in money supply gets distributed between the change in price level and change in real national income, depending upon the state of the economy. A poor state of the economy as implied by the poor real national income growth causes the price level to carry the major part of the impact of change in money supply. This appears to be true in the case of India. The discrepancy observed with regard to the growth in the broad measure of money supply (M3) and the combined growth in WPI inflation and real national income has been found to be the result of fall in income velocity of money for M3

Dogan (2006) determines the direction of causality between national income and government expenditures for Indonesia, Malaysia, Philippines, Singapore, and Thailand. Granger causality tests are used to investigate the causal links between the two variables. Times series data covering last four decades are used. Support for the hypothesis that causality runs from government expenditures to national income has been found only in the case of Philippines. There is no evidence for this hypothesis and its reverse for the other countries.

Waheed et al (2006) examines the unit root properties of eleven Pakistani macroeconomic series using annual data. Along with traditional unit root tests, they use the procedure developed by Zivot and Andrews to test the null of unit root against the break stationary alternative. Conventional unit root tests indicate that all variable are non stationary at the levels. Results from Zivot and Andrews test suggest that they can reject the null of unit root for CPI and WPI at 5 percent significance level while we fail to reject the unit root hypothesis for the remaining 9 series. At the same time, the Zivot and Andrews test identifies endogenously the point of the single most significant structural break in every time series examined. The results show that ten of

the eleven series studied bear witness to the presence of a structural break during the period 1972 to 1976.

Prusty (2012) explored the relationship between each state fiscal policy and inflation in India by using panel data during the period 1989-90 – 2009-10. The Granger causality test result suggests that there exists a bi-directional causality between real GDP growth and inflation, and gross fiscal deficit and inflation. However, panel regression fixed effects result confirms that gross fiscal deficit of each state government is positively and significantly influencing inflation in India during the period. The above result suggests prudent state fiscal policies to control inflation in India.

Mehrara and Musai (2011) examines dynamic causal relationships among money, GDP and prices for Iran using annual data over the period 1960-2008. The Gregory-Hansen (1996) cointegration technique, allowing for the presence of potential structural breaks in data, is applied to empirically examine the long-run co-movement between the variables. The results suggest that there is a long-run relationship between these variables. The Granger Causality test indicates a strong unidirectional effect from GDP and prices to money supply, with weak feedback effects from money to prices in short run. The evidence for Iran clearly supports the 'classical duality' between nominal variables and real ones.

Ebaidalla (2010) examined the nature and direction of causality between government expenditure and national income in Sudan using Granger causality test and Error Correction Model (ECM) for the period 1970-2008. The result of cointegration test shows a long-run relationship between government expenditure and national income in Sudan. The causality test indicates that the direction of causality running from government expenditure to national income, both in the short and long-run. Thus, the

results support the Keynesian proposition, which states that public spending is an important exogenous factor for stimulating national income. Moreover, the study concludes that fiscal policy in Sudan plays a vital role in stabilizing the economy and achieving economic goals.

Rami (2010) examined the relationship between money, price and output is one of the most debated issues among different schools of thought of economics particularly between the Monetarists and Keynesians. The Monetarists argue that money influences the prices and the output, whereas the Keynesians argue that money does not influence the same. Direction of causality among these three and selection of appropriate lag length are widely debated issues in the literature. This study examines the relationship between money, price and output using pair wise. Granger causality test on annual data of the Indian economy covering a period from 1951 to 2005. Lag length is selected using standard criteria – LR, FPE, AIC, SC and HQ through VAR estimation. The results strongly support the monetarists view and partially supports the Keynesian view. However, these relationships are sensitive to the lag length selections.

Chimobi (2009) examines the direction of causality between Government expenditure and National Income in Nigeria using annual data for the period 1970-2005. The econometric methodology employed was the Cointegration and Granger Causality test. First, the stationarity properties of the data and the order of integration of the data were tested using both the Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test. They found that the variables were non-stationary in levels, but stationary in first differences. They applied the Johansen multivariate approach to cointegration to test for the long-run relationship among the variables. Their result shows no long-run relationship between Government expenditure and National

Income in Nigeria. The Granger Causality test reveals that causality runs from Government expenditure to National Income. This result shows that Government expenditure plays a significant role in promoting economic growth in Nigeria.

Minella (2003) investigated monetary policy and basic macroeconomic relationships involving output, inflation rate, interest rate, and money in Brazil. Based on a vector autoregressive (VAR) estimation, it compares three different periods: moderately increasing inflation (1975–1985), high inflation (1985–1994), and low inflation (1994–2000). The main results are the following: monetary policy shocks have significant effects on output; monetary policy shocks do not induce a reduction in the inflation rate in the first two periods, but there are indications that they have gained power to affect prices after the Real Plan was launched; monetary policy does not usually respond rapidly or actively to inflation rate and output innovations; in the recent period, the interest rate responds intensely to financial crises; positive interest-rate shocks are accompanied by a decline in money in all the three periods; the degree of inflation persistence is substantially lower in the recent period.

Cheng (2006) examines the impact of a monetary policy shock on output, prices, and the nominal effective exchange rate for Kenya using data during 1997–2005. Based on techniques commonly used in the vector autoregression literature, the main results suggest that an exogenous increase in the short-term interest rate tends to be followed by a decline in prices and appreciation in the nominal exchange rate, but has insignificant impact on output. Moreover, he finds that variations in the short-term interest rate account for significant fluctuations in the nominal exchange rate and prices, while accounting little for output fluctuations.

Sola and Peter (2012) examine money supply and inflation rate in Nigeria. Secondary data that ranged between 1970-2008 were sourced from the CBN

Statistical Bulletin. They used Vector Auto Regressive (VAR) model. The stationary properties of the model were also explored. Their results revealed that money supply and exchange rate were stationary at the level while oil revenue and interest rate were stationary at the first difference. Results from the causality test indicate that there exists a unidirectional causality between money supply and inflation rate as well as interest rate and inflation rate. The causality test runs from money supply to inflation, from the interest rate to inflation and from interest rate to money supply. They concludes that government should use the level of inflation as an operational guide in measuring the effectiveness of its monetary policy.

Nwosa and Oseni (2012) attempted to re-examine evidences from empirical literature on the nexus among monetary policy, exchange rate and inflation rate have been mixed. This issue in Nigeria for the period spanning 1986 to 2010. In contrast to previous studies, this paper employed a Co-integration and Multi-Variate Vector Error Correction Model approach to examine both the long run and the short run nexus among monetary policy, exchange rate and inflation rate. Based on this approach, the paper found that there exist at least a co-integrating vector among the variables and the VECM estimate showed that a uni-directional causation exist from exchange rate and inflation rate to short term interest rate (measure of monetary policy) while a bi-directional causality exist form inflation rate to exchange rate. No evidence of causality was observed in the from short term interest to exchange rate and from interest rate to inflation rate. The theoretical transmission nexus deduced from the VECM estimate further revealed that changes in macroeconomic variables such as exchange rate and inflation rate granger caused a change in monetary policy stance and not otherwise. Based on these findings, this study recommends appropriate control and management of both the exchange rate and inflation rate.

Chuku (2011) uses post independence quarterly data to examine the validity of two long-run neutrality propositions in Nigeria. Over-all, there is qualified evidence that suggests the existence of long-run monetary neutrality and evidence that refutes the existence of the long-run Fisher relation between prices and interest rates. The evidence on long-run monetary neutrality is qualified because it holds under assumptions of contemporaneous money exogeneity and contemporaneous money neutrality. As a consequence, our results inform our deductions about the ineffectiveness of the Monetarist anti-inflationary prescriptions for managing the macroeconomy of a developing economy like Nigeria. Pursuing a synchronized and coordinated fiscal monetary policies framework is likely to yield the desired results on real economic variables.

Loizides and Vamvoukas (2005) seek to examine if the relative size of government (measured as the share of total expenditure in *GNP*) can be determined to Granger cause the rate of economic growth, or if the rate of economic growth can be determined to Granger cause the relative size of government. For this purpose, they first use a bivariate error correction model within a Granger causality framework, as well as adding unemployment and inflation (separately) as explanatory variables, creating a simple 'trivariate' analysis for each of these two variables. The combined analysis of bivariate and trivariate tests offers a rich menu of possible causal patterns. Using data on Greece, UK and Ireland, the analysis shows: i) government size Granger causes economic growth in all countries of the sample in the short run and in the long run for Ireland and the UK; ii) economic growth Granger causes increases in the relative size of government in Greece and when inflation is included, in the UK.

Hossain (2005) uses annual data for the period 1954-2002 to investigate the causal relationship between money growth, inflation, currency devaluation and economic

growth in Indonesia. Three testable hypotheses are investigated: (1) does the money supply growth Granger-cause inflation? (2) does currency devaluation Granger cause inflation? (3) Does inflation affect economic growth? The empirical results suggest that there existed a short-run bi-directional causality between money supply growth and inflation and between currency devaluation and inflation. For the complete sample period, the causality running from inflation to narrow money supply growth was stronger than that from narrow money supply growth to inflation. This result is consistent with the view that in a high-or hyperinflationary economy, inflation does have a feedback effect on money supply growth and this generates a self-sustaining inflationary process. The short-run bi-directional causality between currency devaluation and inflation was, however, weak or not so robust for the complete or any shorter sample period. On the relationship between inflation and economic growth, the results suggest that there was no short-run causality from inflation to economic growth for the complete or any sub-sample period.

In a recent study Akter (2016) examined the dynamic causality and linkages between money supply and inflation using annual time series data for the period between 1980 and 2011 in Bangladesh. For statistical evidence, formal statistical tests on the correlation of the movement of one variable with another have been used. This causal linked has been tested by the econometric tests such as the Augmented Dickey-Fuller (ADF) test, the Phillip Perron (PP) test, and the Granger causality test. Both Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) test reveal that the time series growth of money supply, GDP growth rate, growth of foreign remittances and growth rate of inflation are stationary. Multiple regression analysis applies to explain the existence of a significant long run relationship among the considered variables. It found that the relationship between inflation and growth of money supply is positive.

Inflation would be increased by 0.1327 unit if one unit of money supply is increased and vice-versa. The equations data are quite well as indicated by the value of R^2 , F and t statistic. The Granger causality test indicates that it has some evidence in favor of the fact that the growth of money supply influences (in Granger Causality sense) the estimated increase of inflation. The results highlight the very important role of Quantitative Theory of Money and have important monetary policy implications for the country. It interprets the result to imply that inflation is largely a monetary phenomenon in Bangladesh.

Denbel *et al* (2016) observe that the Ethiopian economy has the feature of low and stable inflation before the period 2002/03. However, in the post 2002/03 period continuous rise in the prices level along with rapid economic growth has been emerged. On the basis of this situation, this study has examined the existing causal relationship between inflation and money supply and between inflation and economic growth in Ethiopia for the period 1970/71-2010/11. The Johansen co-integration test indicates the presence of one co integrating vector and the VECM demonstrate that the existence of long run bi-directional causality between inflation and money supply and uni-directional causality from economic growth to inflation. In the short run one way causality were found from money supply and economic growth to inflation. Therefore, the key findings of the study are inflation is a monetary phenomenon in Ethiopia and inflation is negatively and significantly affected by economic growth. Thus, based on the results of the study, monetary policy should be planned to maintain price stability by controlling the growth of money supply in the economy. Also combined efforts should be made by policy maker to increase the supply of output so as to reduce the prices of goods and services and boost the growth of the economy.

Jaradat *et al* (2014) attempt to examine and study the possible of existing relationship between Interest rate and Inflation within Jordan economy over the period of time (1990-2012), firstly by testing the impact of inflation, economy growth, money supply and budget deficit on the interest rate in order to determine the relationship between interest rate and inflation, secondly by investigating the causal relationship between these two variables, using multiple regression, correlation, unit root tests, co-integration tests and causality tests, as well as the trends, graphs and charts of the variables to analyze the variables under study. The empirical results of this study show that there is a positive relationship between inflation and interest rate also there is a bidirectional causality relationship between inflation and interest rate in Jordanian economy over the period of time (1990-2012). Thus the policy makers should pay attention to this kind of relationship between these two such important economic variables.

Georgantopulos and Tsamis (2012) investigate the short run as well the long run relationships between money supply, inflation, government expenditure and economic growth by employing the Error Correction Mechanism (ECM) and Johansen co-integration test respectively for the case of Cyprus using annual data from 1980 to 2009. Collectively, empirical results imply that public spending promotes economic development in Cyprus. However, deficit financing by the government causes more liquidity effects but also inflationary pressure in the economy. Results show that inflation negatively effects economic growth probably due to adverse supply shock. Money supply should be allowed to grow according to the real output of the economy but excess growth of money causes inflationary pressure in case of Cyprus. Therefore, this paper suggests that the government should control its current expenditure that

stimulates aggregate demand and to focus more on development expenditure which stimulates aggregate supply and increases real output level.

In sum over the last few decades, empirical macroeconomic literature has provided a vast number of instruments of fiscal and monetary policies regarding almost every country in order to achieve macroeconomic goals such as development, growth, redistribution of income, financial stabilization, job opportunities etc. However, economists still argue on the basic dilemma, whether more government expenditure can finally boost economic growth, or appropriate contractionary policy measures are the key for long-term economic development and financial stability. In this aspect, policy makers are usually interested in demanding management policy and supplying side policies. Change in money supply will affect the liquidity position in financial institutes and private spending of the economy, while the public expenditures affect public spending of the economy.

The theory of Money is based on two core elements for policy purpose; the quantity theory of money and the natural rate of unemployment. Monetarism derives from the quantity theory of money and states that variation in the money supply has major influences on national output in the short run and the price level over longer periods and that objectives of monetary policy are best met by targeting the growth rate of the money supply. Assuming that the velocity of money is constant and the output is not influenced by money supply, increases in the money supply proportionally raise inflation level. The long run evidence behind monetarism is compelling but the short run support is weak. According to the monetarism, money supply is changed by monetary authority. As money supply increases, prices also rise proportionally (with all other things remain constant). So, inflation rises as monetary authority increases money supply. On the other hand, the hypothesis of natural rate of unemployment

suggests that this rate is determined by the central institution of the national economy. Any increase in money supply that causes output level above natural level in the short run will cause a proportionally increase in prices (i.e. inflation) in the long run. It is also suggested that instead of following up full employment objective, macroeconomic policy should be concentrated on achieving the constant rate of monetary growth. However, monetarists ruled out the possibility that demand management can impact either on real economic growth or employment in the long run. It was argued that the above analyzed policies did not generate employment; on the contrary, they created only inflation in the economy. This methodology of demand management critically spoiled the free market mechanism where price stability is a necessary base. A second feature of the monetarists' approach to the monetary policy was to focus on supply side economy. They ruled out any discussion for demand management policies but they agreed upon that government can take a severe initiative to enhance economic efficiency by macroeconomics instruments and policies in order to influence households and industries from the supply side.

One example of this approach is the policy of reducing marginal tax rates for those who have high incomes. This was initiated under the assumption that entrepreneurs will lead the way to long term economic growth. On the other hand, for those who have low incomes, the corresponding incentives were to be obtained by the reduction of unemployment and earnings-related payments (i.e. wages). Nevertheless, during the last decade central banks did not predict the increasingly important role of investment banks and hedge funds in the global financial system, which was extended with participation of funds outside the regulatory framework of traditional commercial banks. The global financial crisis that followed the shortness of liquidity in the banking system of the United States necessitated government intervention to

direct provision of funds, bringing the monetarist model in second place, and fears of destabilization of the economy and inflation emerged. Fears judged to be minor compared to the effort of governments, central banks and other policy makers to address the prolonged downturn in the global economy that began in 2008 and continues until present (Georgantopoulos and Tsamis, 2012).

After a brief over view of empirical research on money, deficit, inflation and output the gaps in existing literature are highlighted below.

2.2 Literature Gap - Identifying Neglected Areas

The following gap in literature is identified from the above review.

1. Studies on the relative strength of monetary and fiscal policies in India are rare. That is the same studies do not separately estimate the relative strengths of money-GDP and public spending – GDP causalities. Actually studies devoted to deficit – money supply and inflation do not focus on effectiveness of fiscal expansion or its converse, the Wagner's Law.
2. Most studies associate inflation with monetary expansion while examining money-GDP causality but do not bring government budgetary deficits into the picture. This is especially true for Indian studies in this area.
3. Most Indian studies using causality do not consider budgetary deficits as the root cause of monetary expansion.
4. The econometrically robust modified Granger causality test is not considered in most Indian studies.
5. Long run data is usually is trended and contains structural breaks. Most studies undermine structural breaks in long run data. More over working with de-trended

series is also rare. Determination of structural breaks is important from the point of view of knowing the features of the time series in question.

6. Rising budgetary deficit as the root cause of inflation is undermined.
7. Most studies cover 30 to 40 years at the most. The majority of the studies do not cover longer time periods.

Contradictory views exist among Indian economists, econometricians, and the RBI regarding the effect and duration of monetary and fiscal policies. It is hoped that the present study will fill up these gaps to a large extent.