1. Introduction

MONEY, OUTPUT AND PRICES

The question of what effects money exerts upon economic activity and the price level, together with the magnitude of those effects, remains the central issue in monetary economics. Classical monetary theory suggests that monetary expansion, at a rate exceeding the rate of increase of demand for it, first stimulates output and then, over a considerable time lag of unpredictable duration, lowers output and raises the price level and ensures neutrality of money in the long run (Hume, 1752 [1970]; Marquis, 1996; Appendix 8). Modern monetary economists suggest that prices and wages have rigidities and therefore adjust slowly, conferring ‘transitory’ impact of monetary expansion on output – the non-neutrality theory of money.¹ There is substantial debate whether discretionary monetary expansion to achieve temporary economic gains is a sound strategy. The central hypothesis under investigation is that unanticipated monetary expansions create output fluctuations, inflation uncertainty and, over time, higher unemployment.² Modern monetary macroeconomics includes a growing body of literature on monetary theory and policy concerning this and related issues.³ The following discussion reviews the historical debate and suggests its relevance to the design and conduct of monetary policy in the present context.

The Great Depression of the 1930s and the subsequent emergence of Keynesian economics reduced the role of money in economic activity until Milton Friedman and others⁴ in the 1960s were successful in rehabilitat- ing the role of money in income determination.⁵ Friedman and Schwartz (1963a) in particular demonstrated the importance of money in economic activity in their classic A Monetary History of the United States, 1867–1960. They posited the relations among money, output and prices and provided empirical evidence, which is consistent with Classical monetary theory, by studying the turning points in money and output.

Having maintained the proposition of long-run neutrality of money, they suggested reasons behind a short-run causality running from money to economic activity. The New Classical School that invokes the rational expectations hypothesis and became prominent in the 1970s, however, does
not share this view. It suggests that only unanticipated monetary expansion affects output\textsuperscript{6} and only in the short run. Unanticipated monetary expansion, however, does not improve economic welfare, except in the case when the monetary authority possesses more and better information than the public.\textsuperscript{7} Like Monetarists, they suggest that monetary expansion does not raise output in the long run and that a rule-based monetary policy should be deployed to maintain price stability, meaning very low, if not zero, inflation.

Friedman (1960, 1968) provided a monetary framework to justify price stability as the objective of monetary policy. He argued that monetary policy should not be deployed to achieve real objectives, since money does not exert significant long-run impact on real variables, such as output, employment, real interest rates and real exchange rates. This does not, however, prevent monetary policy from playing a catalytic role in economic growth. Monetary policy can create a stable monetary climate that could be ‘favorable to the effective operation of those basic forces of enterprise, ingenuity, invention, hard work, and thrift that are the true springs of economic growth’ (Friedman, 1968, p. 17).

One central issue in short-run macroeconomics is whether monetary policy should be deployed to minimize the business cycle, which is considered a common phenomenon in a capitalist economy. Monetarists rely on the market mechanisms for restoring economic imbalances that are created by random shocks and do not see any need for activist monetary policy to stabilize the economy. Poole and Wheelock (2008, pp. 6–7) put emphasis on price stability as the objective of monetary policy that promotes economic growth and stability:

\begin{quote}
Price stability is the most powerful tool the central bank has to promote economic growth, high employment and financial stability. Price stability also enables monetary authorities to pursue secondary objectives, including the reduction of fluctuations in real economic activity and the management of financial and/or liquidity crises. These are referred to as secondary goals because a central bank is unlikely to succeed at limiting fluctuations in economic activity or containing financial crises unless the price level is stable.
\end{quote}

Therefore, one major theme has emerged that there is a well-defined objective of monetary policy (that is, price stability) and that monetary policy should be conducted in a transparent and predictable way to avoid creating policy uncertainty. Friedman (1960) maintained the view that to sustain price stability, monetary policy should be conducted by following a constant money supply growth rule. He thought this was more efficient than the other available methods of keeping a lid on inflation so as to maintain the nominal interest rate as low as possible. A very low rate of the
nominal interest rate, preferably at a zero level, would increase the holding of real money balances needed for maximizing efficiency of transactions in a monetary economy (Woodford, 1990). Other strategies of monetary policy include pegging the nominal interest rate, or the exchange rate, or leaving the conduct of monetary policy at the discretion of the monetary authority. All these strategies of monetary policy are likely to generate inflation volatility and consequently destabilize the economy (Friedman, 1968).

Friedman (1956a) relied heavily on the modern interpretation of the Quantity Theory of Money as a theory of money demand and then derived a monetary model of inflation for empirical validation with data across countries and over historical periods. Friedman and other monetary economists at the University of Chicago put emphasis on the universal applicability of the monetary model of inflation. The key message that came through from their studies on money demand and inflation for different countries over different sample periods of time was the presence of a stable money-demand function and a linkage between money supply growth and inflation, with causality running predominantly from money growth to inflation.

Therefore, the major contributions of Friedman and his collaborators in the 1960s were the establishment of two monetary propositions on inflation and business cycles (Nelson and Schwartz, 2008). Besides the monetary interpretation of inflation, Friedman and Schwartz (1963a, 1963b) provided a monetary interpretation of the business cycles. Later, Friedman (1973, p. 28) elaborated the monetary view of inflation in the context of developing countries as follows: ‘inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output’. This was in direct contrast with the view that money growth is the effect, not the cause of inflation in developing countries that suffer from myriad structural rigidities. Within Friedman’s monetary framework, inflation represents a steady and sustained rise in prices while suggesting that ‘the reason for the rapid increase in the quantity of money may be different under different circumstances’ (p. 28). Barro (1993) has provided an interpretation of Friedman's monetary view of inflation by incorporating factors that bring changes in money demand and then become a potential or secondary source of inflation. The inclusion of both the demand and supply sides of the money market in an inflation model has allowed monetary economists to explain high and hyperinflations where there is a feedback relation between money supply growth and inflation (Hossain, 2009).

Many studies since the 1960s have validated the monetary interpretation of inflation while acknowledging that non-monetary factors may
have some impact on inflation in the short run (McCallum, 1990). Earlier, Friedman (1983) acknowledged the importance of supply shocks and other non-monetary factors in affecting inflation in the short run while maintaining that inflation cannot be sustained over the long run without monetary accommodation. Monetary accommodation in turn represents a policy decision of the monetary authority that intends to eliminate the short-run impacts of supply shocks on output and employment before completion of adjustment of the economy through the market forces. There is considerable evidence that monetary accommodation led the surge of inflation in many countries following the Organization of the Petroleum Exporting Countries (OPEC) oil price shocks in the 1970s (Cline and Weintraub, 1981).

**Stability of the Money-demand Function and Money Growth-inflation Relationship**

The modern debate on the importance of money as a source of inflation can be understood from two underlying monetary relations. The first is the testable proposition that the demand for money is a stable function of a small number of arguments, such as real income, the interest rate and the expected rate of inflation. The second is the stable relation between money base, which is controlled by the monetary authority, and a broader monetary aggregate that is linked to economic activity, prices and exchange rates. This second relation is debated on the issue of controllability of the money supply and its links with other nominal variables. At an analytical level, the debate is on the proposition that the velocity of money is stably related to the determinants of money holding in a way that produces a causal relationship between money supply growth and inflation.

Economists of the Keynesian persuasion argue that the velocity of money is unstable and therefore no stable relation exists between money and prices. In contrast, Monetarists emphasize that the velocity of money is a stable function of such variables as income, the interest rate and the expected rate of inflation. Any rising or falling trend of the velocity of money does not represent instability of the velocity of money; instead, it reflects a lower or greater than one income elasticity of demand for money and the rising or falling interest rate or the expected rate of inflation.

Statistically, the velocity of money is stationary or trend-stationary while real money balances and real income are, or are most likely to be, non-stationary with a dominant stochastic trend and hence they remain eligible to establish a cointegral relation. An implication is that although the velocity of money is not constant, it remains predictable given the constant unconditional long-run mean and variance of a stationary series.
short-run volatility of the velocity of money in effect reflects the volatility of the interest rate or the expected rate of inflation, which could be due to discretionary monetary policy that the monetary authorities undertake to achieve some real objectives such as raising economic growth or lowering the rate of unemployment. Provided that the monetary authorities deploy a rule-based monetary policy such as a constant money-growth rule, the velocity of money would exhibit stability in a statistical sense; that is, the time-varying volatility of the velocity of money would be predictable although the forecasting error is likely to be larger during periods of high volatility.

The Role of Interest Rate in the Money-demand Function

The early debate on the causal linkage between money and prices focused on the question of whether the nominal interest rate, along with real income or wealth or both, is a determinant of money demand and whether flexibility, not necessarily volatility, of the interest rate makes the velocity of money unpredictable. Friedman (1956a, 1959) downplayed the role of the interest rate in the money-demand function although acknowledging it to be statistically significant. He argued that even when the interest rate is statistically significant, its coefficient value is generally ‘very small’ (roughly within the range −0.5 to −1.0), not infinite, and that this finding does not alter his conclusion on the role and conduct of monetary policy for price stability (Friedman, 1969). It follows that a very high, if not infinite, interest elasticity of demand for money is inconsistent with the Quantity Theory of Money that suggests a zero-degree homogeneity of real money balances with respect to all nominal variables, except the expected rate of inflation, and a causal linkage between money and prices. To maintain the long-run dichotomy between real and nominal variables, Friedman (1992) relied on the Classical view that real income is ultimately determined by real factors on the supply side of the economy and that the price level is the only variable that alters in the long run in the event of monetary expansion adjusted for any increase in output. Equilibrium in the money market requires equality between money demand and money supply and an increase in the money supply does not affect real income or the interest rate, implying that it does not have any impact on long-run money demand.

The empirical findings across countries with data until the 1970s were consistent with Friedman’s proposition that the money-demand function is stable and that the key source of inflation is excess money supply (Friedman, 1991; Laidler, 1993). The nominal interest rate is found not to have an impact on money demand or the velocity of money in a way that invalidates the relationship between money supply growth and inflation.
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Since the 1970s, questions have been raised over the stability of the money-demand function and whether the linkage between money supply growth and inflation has been weakened due to financial deregulation and innovation. Some evidence was provided to suggest that the money-demand function became unstable in developed countries contemporarily with financial deregulation and reform during the 1980s (Goldfeld and Sichel, 1990). Monetary economists argue that any weak linkage between money supply growth and inflation in some countries during the 1980s and 1990s was primarily due to high and volatile money growth and that raised the interest rate and made it volatile. This was the outcome of discretionary monetary policy that aimed at achieving multiple objectives in the midst of financial deregulation. Money-growth instability led to inflation instability, which in turn affected money demand and inflation itself. In the late 1990s, however, following completion of the deregulatory and reform transition, the money-demand function regained stability in developed countries. It was a different story in the developing world, which also implemented economic reforms in the 1980s and 1990s, mainly in the transition from inward-oriented to outward-oriented development strategy. Money-demand functions in developing countries have remained stable throughout. This was one of the suggested reasons for continuation of a stable linkage between money supply growth and inflation in these countries (Hossain, 2009).

Another dimension of the modern monetary literature suggests that the stability of the money-demand relationship is not at all necessary for establishing a link between money supply growth and inflation. Lucas (1980) in particular rejected any dependence of a money growth-inflation linkage on stability of the money-demand function. McCallum and Nelson (2011) have illustrated this view as follows. For example, although a unit root in the error term of the money-demand function, which represents a money-demand shock, violates dynamic stability in the money-demand function, it still implies a first-difference causal link between money supply growth and inflation that exists in most countries across the globe. Likewise, there can be a weak relation between money supply growth and inflation even when the money-demand function remains stable.

McCallum and Nelson (2011) note that one of the factors that can be attributed to the weakening link between money supply growth and inflation in the United States is the non-zero average value for the change in the interest rate over the sample period of study beginning from the 1970s. While such interpretation of weak mapping between the stability of money demand and the closeness of the money growth-inflation relationship could be useful in some respect, it does not diminish the importance of the stability of the money-demand function in a broad macroeconomic context. The presence of a stable money-demand relation provides a theoretical...
foundation for the establishment of a long-run relation among money, output, prices and exchange rates that Classical monetary theory postulates. Modern econometric techniques can establish such structural relations within a cointegration and error-correction modelling framework. Monetary macroeconomics has therefore become empirical-oriented, concerning real-world events and policy issues in maintaining macroeconomic stability in general and price stability in particular.

**Monetary Policy: With or Without Money?**

While the debate continues on the causal linkage between money supply growth and inflation, a body of literature has emerged since the early 2000s that claims that monetary policy does not require the deployment of monetary aggregates to achieve price stability. This theme has emerged in the literature more prominently since the introduction of inflation targeting in some developed countries in the early 1990s. Issing (2013) has been critical of the demise of money in ‘monetary models’ of inflation and business cycles. He writes:

> How long will we have to wait until the neglect of money and credit in monetary (!) theory and policy will be understood as the major source of macro policy mistakes? Is it not strange, to say the least, that in a world in which money, credit and financial markets play a fundamental role, models which give these variables hardly any active role are still dominant . . . Considering the developments that have taken place over the decades, one would expect that the time of ‘monetary’ macroeconomics and monetary policy without ‘money and credit’ will come to an end. (p. 284)

Under inflation targeting, a short-term interest rate is generally used to conduct monetary policy to maintain inflation at a target level, on average. The issue is whether the interest rate has any link with monetary aggregates. A widely held view is that the interest rate and monetary aggregate are two sides of the same coin in so far as monetary management is concerned. Changes in the nominal interest rate are associated with changes in monetary aggregates, due to a change in the monetary base or the money multiplier or both. A short-run negative relation indeed exists between the interest rate and money supply growth while this relation could be positive in the long run (Mishkin, 2013). Whether or not the interest rate or monetary aggregate to be used as an instrument of monetary policy is a tactical issue, it does not necessarily make money redundant in the inflation process. Alvarez et al. (2001) have shown how the use of the interest rate as a monetary policy instrument is consistent with the linkage between money supply growth and inflation.
In the monetary literature, the interest rate is determined in the credit market by the interaction of credit demand and credit supply. A central bank can influence the interest rate because of the central bank’s ability and willingness to take part as a major supplier (or potential supplier) of credit for settlements in interbank markets. The nominal interest rate can be considered a monetary variable because of its ‘one-for-one’ positive relation with the expected rate of inflation. Within a monetary modelling framework, the expected rate of inflation equals the predicted growth of the money supply adjusted for expected economic growth. However, the real component of the nominal interest rate is determined in the long run by real factors, namely the productivity of capital, population growth, the rate of depreciation of capital and the rate of saving (Sorensen and Whitta-Jacobsen, 2005). Changes in the real interest rate affect saving, investment and economic growth. Money growth or inflation does not affect the real interest rate at the steady state unless it leads to a change in wealth or real income.

Whether to use money or credit or the interest rate for the conduct of monetary policy depends on the institutional arrangement within which monetary policy operates and the structural characteristics of the economy. Money and credit, although conceptually different, are highly correlated and both appear with equal prominence in monetary policy analysis. Poole (1970) has demonstrated that whether money or the interest rate is best suited as an instrument of monetary policy to stabilize an economy depends on the economy’s exposure to real shocks or monetary shocks or both.

Therefore, the increasing preference for the interest rate as an instrument of monetary policy can be viewed as tactical; it does not necessarily invalidate the monetary interpretation of inflation or make money unimportant as a source of inflation. Given short-run price rigidities, any change in the nominal interest rate represents a change in the real interest rate. It is the real interest rate that affects both consumption and investment spending. When the nominal interest rate adjusts fully and quickly to the expected rate of inflation, the real interest rate may not change much. A change in the nominal interest rate leads to a change in the real interest rate only when the nominal interest rate does not adjust completely to the expected rate of inflation. The Taylor rule explains how a very short-term nominal interest rate is changed by the central bank in response to changes in the inflation gap and output gap (Taylor, 1993). According to the Taylor principle, a central bank is required to raise the real interest rate to lower the rate of inflation. It indicates that to become effective as a demand management instrument, the nominal interest rate must rise more than proportionately to the expected rise in the rate of inflation.
In the midst of such debate on the relevance of money in monetary policy, there has been a revival of interest in the deployment of monetary aggregates for the conduct of monetary policy. McCallum and Nelson (2011) have provided evidence of a stable causal linkage between money supply growth and inflation. They argue that a causality exists between money supply growth and inflation irrespective of the exchange rate regime and whether that regime makes the money stock exogenous or endogenous and whether there exists a stable money-demand function. They do not see the need for averaging data to extract the relationship between money supply growth and inflation. In their analysis, they have argued for using non-averaged time-series data while allowing for lags explicitly instead of implicitly for tracking the money growth-inflation relationship with historical data.

Given the robust linkage between money supply growth and inflation, a monetary aggregate remains a natural instrument for the conduct of monetary policy within a longer time horizon. Earlier, Friedman (1991) considered a properly defined monetary aggregate suitable to be the intermediate target of monetary policy. Contemporary preference for the interest rate over a monetary aggregate does not indicate the demise of Friedman’s interpretation of inflation as a monetary phenomenon. However, the deployment of the interest rate as an instrument of monetary policy is not innocuous. It has the potential to destabilize the money-demand function, with money-growth volatility leading to inflation volatility, in turn affecting, both positively and negatively, money demand and hence inflation itself. This explains why inflation volatility can be a determinant of money demand, especially in countries that do not follow a binding monetary policy rule to maintain price stability, meaning ‘low and stable’ inflation, not ‘low and unstable’ inflation. Even countries that operate under monetary targeting do not follow a money-growth rule strictly. Consequently, inflation remains high and volatile in most countries, which lowers economic efficiency and growth by making both the real interest rate and real exchange rate excessively volatile. This is one of the major issues under investigation in the present study.

Role of Monetary Policy in Economic Stabilization

Whether or not the interest rate or a monetary aggregate is used as an instrument of monetary policy, most central banks accept price stability as the main, if not the sole, objective of monetary policy. This reflects the emerging consensus on four basic propositions: (1) monetary expansion has a lasting effect only on the price level, not on output or employment; (2) inflation is costly in resource misallocation (efficiency costs), or
in reduced long-term output growth (breakdown of super-neutrality of money), or in both types of opportunity cost; (3) monetary policy has transitory effects on several real variables, but there is imperfect understanding of the nature and the size of such effects; and (4) monetary policy affects inflation with lags of uncertain duration and with variable strength, thereby undermining the central bank’s ability to control inflation on a period-by-period basis (Hossain, 2009). The debate remains whether monetary policy should be used to stimulate economic activity in the short run – emerging consensus item (1) suggests that it has no effect in the long run.

Monetarism suggests that the stimulatory impact of monetary expansion is transitory and has costly destabilizing influence, so that policymakers should avoid the temptation to exploit it (Meltzer, 1998, 2012). New Classicism goes one step further. It asserts that Monetarists are too generous in subscribing to the view that monetary policy is effective in generating economic stimulus. Under the rational expectations hypothesis, monetary policy actions that are anticipated cannot change output even in the short run. Like Monetarists, New Classical economists favour a money supply growth rule over discretionary monetary policy to keep inflation low and stable.

While Monetarists put emphasis on the difficulties in conducting discretionary monetary policy due to, firstly, uncertainty in both the magnitude and the lag-length of monetary policy impacts and, secondly, policymakers’ inefficiency and overreaction that create economic uncertainty, New Classical economists believe that the private sector is efficient and takes countervailing steps to neutralize any impact of systematic monetary policy on economic activity. Consequently, it is not inefficiency of policymakers but efficiency of the private sector that makes monetary policy ineffective in changing real output. In the New Classical view, a further disadvantage of discretionary monetary policy is that it increases output volatility, defined as the variance of output around its natural level.

Contrary to a discretionary monetary policy, a constant money supply growth rule is considered superior because it minimizes the variance of output although this rule may not necessarily be optimal under general conditions. Sargent and Wallace (1975) show that a pegging of the interest rate upholds the policy-ineffectiveness proposition under the rational expectations hypothesis. The price level, however, becomes indeterminate under an interest rate rule. When a country operates under flexible inflation targeting, the deployment of the interest rate as an instrument may keep inflation closer to its target level on average. Under this environment, inflation may, however, become more volatile if the economy experiences shocks, a common feature of developing economies (Frankel, 2011). Inflation also becomes volatile in countries where the monetary authorities
attempt to stabilize output under flexible inflation targeting. Policymakers operate under the belief that a tradeoff exists between inflation volatility and output volatility. Appendix 4 reviews this relationship, known as the Taylor curve relationship. Whether such a tradeoff exists under general conditions remains a debatable issue.

**Political Economy of Economic Stabilization**

The early debate on monetary policy activism raised the issues of whether there is the need for economic stabilization interventions in a market economy with flexible wages, prices and exchange rates and, if needed, how effective government intervention could be. If the prices, interest rates and exchange rates are determined by market forces and there are no rigidities in wage determination, both demand and supply shocks would dissipate quickly without government interventions. Monetarists oppose activist monetary policy to neutralize economic shocks, even while acknowledging some rigidity in wages and prices. They put emphasis on the uncertain magnitude and lag-length effects of monetary policy responses to shocks, which may make the economy more volatile.

Some micro studies of price changes have raised doubt about the assumed price-stickiness in the Keynesian models of monetary non-neutrality (Bils and Klenow, 2004; Klenow and Malin, 2011). Moreover, the real business cycle theory considers economic fluctuations as the outcomes of real shocks, as distinct from monetary shocks (Kydland and Prescott, 1982; Prescott, 1986). The effects of such real shocks do not dissipate but sustain while the effects of monetary shocks dissipate within a short period of time as they are temporary in nature. Consequently, the real business cycle theory does not see any need for monetary policy actions for stabilizing the economy.

One further contentious issue is whether monetary policy ‘surprises’ aimed at raising economic activity or neutralizing shocks are politically motivated. In the literature, there is the suggestion that a linkage exists between fiscal and monetary policies, especially in developing countries (Frankel, 2011). In a competitive political system, politicians make myopic economic decisions to secure voter patronage (Alesina and Stella, 2011). Due to presumed voter aversion to increased taxes, this myopia leads to a policy preference for government borrowing, rather than taxing, to finance increased spending. In developing countries, expansionary fiscal policy generally represents excess borrowing from the banking system, especially from central banks, implying a monetization of budget deficits. Consequently, these countries experience high and volatile inflation, originating from fiscal measures that are funded by money creation. This
The evolution of central banking and monetary policy in the Asia-Pacific indicates that, in the ultimate power politics, the fiscal authority dominates the monetary authority and hence the monetary authority does not have control over inflation. Further, political polarization, political uncertainty and limited commitment and credibility of the monetary authority lead to high and volatile inflation (Cukierman and Webb, 1995; Cukierman et al., 1992). While this analysis suggests that the monetary authority does not often have control over inflation, it does not mean that it cannot prevent inflation if it desires and is allowed to do so (McCallum, 1990).

High and volatile inflation raises economic uncertainty and retards economic efficiency and growth. Once inflation reaches a high level, policy measures to lower inflation, which is inertial, incur huge explicit and implicit costs. Inflation control is difficult without the benefit of a strong and determined government which puts emphasis on steady economic growth in a low-inflationary environment. Central bank credibility, along with the government’s commitment and determination, is considered critical for maintaining low and steady inflation. When society is not prepared to bear the efficiency costs of central bank adoption of accommodative monetary policy to achieve political objectives, costs that are paid in damagingly volatile output, employment and inflation, the central bank can be made operationally independent for the conduct of monetary policy for price stability. Provided that the central bank’s accountability to the public is ensured, its operational independence would improve monetary policy effectiveness by raising policy transparency and credibility. In reality, in most countries, central banks do not have autonomy in conducting monetary policy for price stability. Inflation control therefore remains a costly and time-consuming exercise (Alesina and Stella, 2011; Williamson, 2008). This is reflected in high inflation persistence, irrespective of monetary policy strategy deployed to maintain low inflation on average (Appendix 2).

Assimilation of the rational expectations proposition into mainstream macroeconomics leads the New Classical economists to argue that raised credibility of anti-inflationary monetary policy can lower inflation at little or no cost to output or employment. In contrast, low monetary policy credibility of central banks makes it difficult to lower inflationary expectations. Contractionary measures to control inflation then run the risk of tipping an economy into recession and its subsequent slow recovery. A rise in credibility of monetary policy is therefore expected to lower the degree of inflation persistence. Central banks’ problem is that monetary policy credibility is difficult to achieve. It is subject to technological, administrative (political) and strategic constraints. One path towards gaining credibility is as follows. When low monetary policy credibility originates in dynamic inconsistency of monetary policy within a game-theoretic framework, the
granting of central banks’ independence may raise monetary policy credibility provided that they commit to apply a non-discretionary, binding policy rule to determine monetary policy for price stability.\(^ {19} \)

In contrast, any short-run deployment of monetary policy to achieve real objectives carries the danger that it would create policy uncertainty and the very dynamic, time-inconsistency problem that the monetary policy rule attempts to eliminate. Nevertheless, Keynesian economists continue to prescribe the use of monetary policy to generate real effects in the short run if the economy moves towards recession due to shocks or coordination failure in the private sector.\(^ {20} \) Essentially, the Keynesian prescription is for ongoing policy change in response to disruption in the real sector, compromising its efficiency through continuous volatility of output, employment and inflation. The main concern is that the 2007–09 US-global financial crisis has apparently diminished the independence of central banks across the globe. In an environment of expansionary fiscal measures, central banks have been induced to introduce expansionary, not contractionary, monetary measures to prevent the economies from entering into a deep recession. Therefore, to maintain low and stable inflation over the long run, there is the suggestion for strengthening monetary and fiscal institutions to withstand political pressures and sustain policy rules (Taylor, 2012, 2013). In a relatively low-inflationary environment, policymakers are not inclined to accept this prescription.

The main theme of this book and Hossain (2015) is that central banks should maintain low and stable inflation. Low volatility of inflation would keep the real interest and exchange rates stable and hence avoid boom-bust cycles. Another theme of this book and Hossain (2015) is the recommendation for the adoption of freely floating exchange rates that can absorb economic shocks better in an open economy. A freely floating exchange rate generally would exhibit high variability. A high variability of the exchange rate, however, does not necessarily lead to such high volatility that it may affect trade flows, investment and economic growth. Unexpected large capital flows, however, can raise the volatility of the exchange rate. Highly volatile real interest rate and real exchange rate may also trigger large capital flows. Therefore, some market-based capital control measures may be useful to maintain exchange rate stability for countries where financial stability comes under pressure from large-scale capital movements for both economic and non-economic reasons (Ball, 2011; Frankel, 2011).
MONETARY POLICY IN DEVELOPING COUNTRIES

Historically, the role of monetary policy in developed countries has been associated with taming business cycles, while in developing countries monetary policy has been targeted at promoting economic growth. The dichotomy in the role of monetary policy reflects the differential economic issues and priorities facing the respective policymakers. While the principal preoccupation in developing countries has been rapid economic growth through technical progress-based structural change in the economy, this preoccupation remains closely linked to the concern for price stability and external balances. For example, the experiences of Latin American countries during the 1960s and 1970s suggest that if the inflationary pressure emergent from the development process is ignored, any consequential rapid inflation rises may lead to an inefficient allocation of productive resources. In turn, resource misallocation feeds back counterproductively into impeded economic growth and structural distortion (less efficient structural change). Latin American development experiences also suggest that higher inflation rates in these countries vis-à-vis their trading partners caused their trade uncompetitiveness and worsening balance-of-payments problems. Exchange rate crisis that emanates from deteriorating balance-of-payments triggers capital flight, adversely affecting investment and economic growth (Corbo and de Melo, 1987; Dornbusch, 1993).

In contrast to Latin America, one lesson from the experiences of East Asian industrializing economies (Hong Kong SAR, South Korea, Singapore and Taiwan) and Southeast Asian economies (Indonesia, Malaysia and Thailand) is that steady economic growth and monetary stability are intertwined and reinforcing. Currency crises in several locations around the world, and especially in East-Southeast Asia in the late 1990s and the US-global financial crisis of the late 2000s, further point to problems associated with mismatches between exchange rate regimes, capital flows and monetary policy independence (Frankel, 2011). Therefore the objectives of price stability, balance-of-payments equilibrium and economic growth are interrelated. Any demarcation between the roles of monetary and financial policies in growth and stabilization then seem artificial and may be misleading, especially in developing countries. Nevertheless, the emerging consensus view is that monetary policy cannot target multiple objectives, due to the inefficiency costs imposed by consequent trade-offs and inconsistencies. In addition, having too many objectives assigned to monetary policy is in conflict with the Tinbergen principle.

On the basis of a large body of literature on monetary theory and policy since the 1960s, an emerging consensus view is that the efficient role of monetary policy is the maintenance of price stability. This theme
is established by focusing on varied inflationary experiences, including hyperinflations, in Asia, Europe and Latin America. Accordingly, institutionalization of monetary policy has taken place in some developed countries in the form of inflation targeting or some form of a rule-based monetary policy. In doing so, central banks in these countries have gained autonomy, if not independence, in the conduct of monetary policy for price stability. In developing countries, monetary policy is yet to be institutionalized with checks and balances that succeed in efficiently directing the efforts of the monetary authorities at achieving and maintaining price stability. Following the lead of developed countries, several developing countries have recently moved towards rule-based, price-stabilizing monetary policy; some countries imposing on it the additional burden of promoting economic growth, and some not. Consequent on the rapid growth and associated structural change achieved in the three decades following the transition to outward-oriented economic development, the issue of monetary policy for price stability has gained importance relative to the growth-targeted monetary policy in developing countries across East, Southeast and South Asia, in particular (Hossain, 2009).

In contrast to the structuralist view of inflation that was present in the 1950s and 1960s, developing countries have generally accepted the monetary roots of inflation (Corbo, 1974; Hossain, 2009). Monetary expansion is, however, linked to sustained budget deficits in these countries. Consequently, how much control central banks should exercise over money matters to keep inflation within an efficient limit is yet to be resolved. In general, in a market economy, inflation remains outside the direct control of a central bank. What central banks can do is to target various monetary policy instruments at aggregate demand (and possibly aggregate supply) to influence inflationary expectations. The ways in which monetary policy instruments affect the real economy remain uncertain. Understanding of the transmission mechanisms of monetary policy is therefore crucial for the conduct of monetary policy. Further, there are lags between policy actions and impacts on aggregate demand and aggregate supply. The economy also works differently under different economic states; that is, an economy may react variably in boom (expansionary phase of the business cycle) and in recession (contractionary phase) to a given combination of shocks and policy actions (Boivin et al., 2011). Because policymakers work with imperfect information, their actions may have unintended consequences. Political institutions and overlapping organizational arrangements also make it difficult for the authorities, especially fiscal authorities, to demarcate the jurisdiction of the central bank from other institutions in the country.

As part of streamlining the policy-formulation process, an emergent
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generalized monetary policy framework has now been standardized in the literature. Within the framework, policymakers define variables as either operational or intermediate targets and then manipulate these variables to achieve monetary policy goal(s) either required or agreed by the government. For example, policymakers set an inflation target that is socially acceptable and optimal in economic sense. Whether or not a central bank should, or is able to, conduct monetary policy according to a well-defined rule ultimately depends on the underlying country-specific configuration of relationships among money, output and prices via the interest and exchange rates.

At a basic level, developing countries have accepted the fundamental relations among money, output, prices and exchange rates as suggested by Classical monetary theory. Herein lies the importance of empirical analysis of monetary relations with econometric techniques; for example, time-series econometrics. Historical data now available for a longer period can be used for individual countries separately and then jointly by deploying, say, panel regressions. Case studies of the evolution and conduct of monetary policy in this book and in Hossain (2015) are consistent with this approach to, and the requirements of, improved monetary policymaking. This case-study approach is relevant to rapidly growing developing countries in changing policy environments, as discussed in the next subsection.24

Changing Behaviour of Monetary Policy in the Asia-Pacific

Most countries of the Asia-Pacific have experienced low to moderate inflation since the early 1980s, following a period of high inflation in the 1970s originating largely in supply shocks and fuelled by the counterproductive response of monetary accommodation. Although the conduct of monetary policy in most developing countries took the form of monetary targeting from the late 1970s, monetary policy was designed to achieve multiple objectives under a pegged exchange rate system. Exchange rate stability was considered important for both price stability and export promotion. However, due to limited exchange rate flexibility, as well as limited policy control over interest rates, monetary targeting, implicit or explicit, led to inflation volatility (Appendix 7). The consequent high volatilities of real interest and exchange rates adversely affected economic growth and macroeconomic performance.25

High-inflation volatility generated high volatilities in both the real interest rate and the real exchange rate as the authorities failed to promptly and fully adjust the corresponding nominal rates. Moreover, although the pegged exchange rate regime was expected to bring monetary-fiscal discipline, some developing countries introduced expansionary monetary and
fiscal policies, creating policy-induced inflation and balance-of-payments problems. In turn, a new target for monetary policy became essential: the maintenance of large foreign-exchange reserves. Not until the 1990s was monetary policy eventually released for redirection, at least in principle, at its target of comparative advantage: the maintenance of price stability (Hossain, 2009).

Since the mid 1990s, the pegged exchange rate system has generally been untenable in developing countries of the Asia-Pacific. Some countries in the East-Southeast Asian region attracted large-scale capital inflows due to improved macroeconomic performance and high returns on investment, which subsequently led to the watershed currency financial crisis through 1997–98. This ramified throughout the Asia-Pacific with the abandonment by many countries of exchange rate pegging in favour of a range of more flexible systems, including the full float. A floating exchange rate system permits autonomous conduct of monetary policy using one of a range of intermediate targets, such as monetary aggregates or the (expected) inflation rate. Monetary targeting was not generally adopted, since it had by then become ‘unfashionable’. One reason for this was the ascendancy at the time of the argument that the money-demand function had by then been destabilized in developing countries because of the East-Southeast Asian financial crisis and associated financial deregulation and reforms. The sudden spike in the rate of inflation was interpreted as a breakdown of the money-demand relation although this relationship stabilized rather quickly after the crisis was over (Hossain, 2009). Nevertheless, the perception remains that the East-Southeast Asian financial crisis and the subsequent structural and financial reforms have weakened the causal linkage between money supply growth and inflation.

The validity of this proposition remains an empirical issue and is likely to vary from country to country. As a consequence of this uncertain post-crisis stability of the money-demand function, some developing countries in the Asia-Pacific have adopted inflation targeting but have yet to fulfil its key requirements. For example, in Indonesia, a short-term interest rate is used as a policy instrument, although its effectiveness as an instrument of demand management is in doubt. The linkage between the nominal interest rate and inflation is not well defined, as they have a feedback relation. Generally, inflation raises the nominal interest rate with a lag. However, it is not the nominal interest rate but the real interest rate that matters for consumption, investment and trade and capital flows. This is represented in the Taylor principle, which requires a change in the real interest rate to bring changes in aggregate demand, output and prices. The question remains whether the move away from targeting a monetary aggregate to inflation targeting has improved monetary policy in countries which have
made this move. The desirability of inflation targeting in other developing countries is an empirical question. Inflation has been low on average in most inflation targeting countries. However, inflation persistence and volatility have remained high. Price stability, in an operational sense, implies low and stable inflation, not low and unstable inflation. This issue is yet to be adequately addressed to draw policy conclusions.

Finally, with increased volatility of capital flows brought about by the deregulation of capital markets in a number of Asia-Pacific countries, financial stability has come to the forefront as an issue in monetary policy. The widely accepted open-economy trilemma states that only two out of the three major monetary policy goals can be achieved simultaneously. One of the theorem's implications is that under a freely floating – and therefore relatively unstable – exchange rate system, monetary policy can be conducted independently with or without freely mobile capital. However, when money and capital markets are shallow, or underdeveloped, as is characteristic in developing countries, freely mobile capital may cause exchange rate volatility, which may lead to banking and financial crises. As large-scale capital flows are triggered by both economic and non-economic factors, they may defy theory formation and ultimate predictability. This explains why inflation targeting in developing countries is conducted within a framework of explicit or implicit targeting of the exchange rate, with or without some capital controls.

Pegging the exchange rate, however, renders the inflation targeting approach to monetary policy ‘ineffective’ because under a pegged exchange rate system and free capital mobility, the interest rate cannot be delinked from the pegged currency country for deployment as an independent policy instrument. This problem can be resolved somewhat if monetary policy, operating under a floating exchange rate system, is conducted using monetary targeting under capital controls. Administrative or market-based capital controls could be designed to maintain exchange rate stability, while a monetary aggregate, rather than the interest rate, can be used to stabilize the price level.

Developing countries that are not keen to stabilize the exchange rate through capital controls may conduct monetary policy based on the trinity of a flexible exchange rate, an inflation target and a monetary policy rule. Within such a framework, the expected rate of inflation acts as the anchor to prices given the perfect floating of the exchange rate. Inflation targeting is not an alternative to monetary targeting. Taylor (2000) has suggested that under inflation targeting, there is nothing to inhibit substitution of a monetary aggregate for the interest rate as the operational target to achieve the target rate of inflation. Indeed, the use of a monetary aggregate may work better for countries where money and capital markets are not yet
sufficiently developed. Money carries information on output and other macroeconomic developments and hence can be useful to forecasting inflation. The recent trend of downgrading the role of money and credit in monetary theory and policy has therefore come under criticism (Issing, 2013).

CONTEMPORARY ISSUES IN MONETARY POLICY

Friedman and Schwartz (1963a, p. 700), in their classic work on the history of monetary policy in the United States, noted that ‘One thing of which we are confident is that the history of money will continue to have surprises in store . . . – surprises that [the] student of money and the statesman will ignore at their peril’. This section highlights some of the key contemporary issues in monetary policy in the context of the Asia-Pacific region. Given varied inflation experience, exchange rate arrangement, capital movement and monetary policy strategy, monetary policy issues vary differentially among countries and over time, depending for any given country on its stages of financial and economic development. The case studies on monetary policy in this book and in Hossain (2105) cover some of these issues given their relevance to countries of the Asia-Pacific.

Although there is a perception that the recent global and ongoing European financial crises have made monetary policy ineffective, if not redundant, the key features of monetary policy have remained intact. Some new issues in monetary policy have, however, emerged from an environment in which financial stability is identified with price stability as an objective of monetary policy. Coordination of monetary and macro-prudential policies, within a monetary policy framework, both takes on greater importance and becomes orders of magnitude more difficult when the three objectives of price stability, output stability and financial stability are pursued simultaneously (Mishkin, 2012). The following review of the key overlapping monetary policy issues in an historical context is therefore useful to comprehension of the complexity of policy formulation and implementation and macroeconomic developments in the sample countries.

Price Stability: Key or Sole Objective of Monetary Policy

Most countries now recognize that the key objective of monetary policy is price stability.29 In reality, policymakers are not keen to deploy monetary policy to maintain price stability alone. Monetary policy is thought to stabilize the economy, which is then included in the list of monetary policy
objectives. Monetary policy having both price stability and economic stabilization as objectives leads to a time-inconsistency problem that damages economic efficiency through raised volatility, while simultaneously lowering the credibility and effectiveness of monetary policy in its primary task of price stability maintenance. Targeting monetary policy at multiple objectives gives conflicting signals, confuses the public and compromises price stability by creating inflation bias (Issing, 2013). Nevertheless, many central banks maintain that these twin (conflicting) objectives of monetary policy are compatible with their charters, which are frequently broad and sufficiently vague to legitimize this conclusion.

The US-global financial crisis and its ongoing European ramifications have resulted generally in the addition of financial stability to the list of monetary policy objectives. It is increasingly recognized that the policy of benign neglect of asset price build-up is counterproductive: price stability by itself does not, and cannot, deliver financial stability. Accordingly, it is widely felt that the mandate of monetary policy should be broadened beyond price stability to encompass full macro-financial stability. Within an expanded monetary policy framework, the view that policymakers should be empowered to lean against the build-up of financial imbalances, even if near-term inflationary expectations remain anchored, is gaining ground (Mohanty, 2011). However, a problem arises when monetary policy is burdened with the further target of economic growth and stabilization. This induces a central bank to adopt measures that distort prices and creates economic inefficiency. The growth objective of monetary policy represents a normative view. While the growth objective, by itself, is interpreted as fair from a societal viewpoint, the consensus view of mainstream economics is that monetary policy is inferior as a direct instrument and superior in maintaining the stability needed for real sector expansion to attain maximum efficiency. Ultimately, monetary policy-induced volatility can only interfere with economic growth and stability (Poole and Wheelock, 2008).

**Financial Stability: The Role of Regulatory and Supervisory Bodies**

Should, indeed, the mandate of monetary policy be broadened to include financial stability? Traditionally, monetary policy maintains price stability, while the prudential regulatory and supervisory bodies maintain financial stability (Svensson, 2011). Some administrations separate responsibility for monetary policy (run by the central bank) from prudential regulation and supervision of financial institutions (run by a separate regulatory body), while maintaining some cross-communication between the two functions. For example, Australian monetary policy is administered by the...
Reserve Bank of Australia (RBA), while the chairman of the Australian Prudential Regulation Authority’s (APRA) Executive Group sits on the RBA’s Payments System Board.

The US-global financial crisis has raised doubt whether a central bank can remain indifferent to events that destabilize the financial sector. Monetary policy actions have their first and strongest impact on the financial system. In the event of a financial crisis, the central bank has responsibility for addressing the problems created by any contributing monetary policy actions and other domestic and external factors. Post-crisis, financial stability is viewed as the responsibility of central banks, although opinion is divided as to what extent it can be considered an objective of monetary policy. There could be a tradeoff between price stability and financial stability when the financial sector remains vulnerable to sharp fluctuations of the interest rate. Therefore, imposing this additional goal upon monetary policy is likely to confuse the public about the central bank’s commitment and ability to control price stability (Mishkin, 2012). This explains why financial sector development is essential for conducting a rule-based monetary policy. A deep financial system allows the operation of a rule-based monetary policy where the interest and exchange rates float freely without causing much damage to the economy. In Australia, a sharp fluctuation of the nominal exchange rate since the 1990s has not required the RBA’s intervention as the impact of the exchange rate movement on prices has been minimal.

**Exchange Rate Stability: Real or Nominal or Both**

Full monetary policy independence requires full international capital mobility and a free-floating currency. In developed countries with deep financial markets, exchange rate flexibility exerts benign impact on the price level and financial stability. The Australian case exemplifies the policy implications of operating under a flexible exchange rate system in a well-developed foreign-exchange market and significant capital mobility. Australia has effective monetary control and autonomy in the conduct of monetary policy. The exchange rate has, however, exhibited considerable volatility, which might have affected foreign trade and capital flows. Stevens (2006) maintains that exchange rate volatility has not damaged Australia’s economy.

In contrast to Stevens’s view and the experiences of Australia, policymakers in developing countries prefer exchange rate stability as a defence against excessive accumulation of external debt and to maintain financial stability. Consequently, such countries maintain either full peg or managed float exchange rate systems. At the official level, these exchange
arrangements are classified as managed or floating. At a policy level, stability of the nominal exchange rate does not guarantee stability of the real exchange rate, noted above as the policy-relevant entity, with the main threat to real exchange rate stability being high-inflation volatility. The real exchange rate affects the volumes of both trade flows and capital flows. Exchange rate stability may stabilize prices in high-inflation economies, but exchange rate flexibility is essential to absorb the periodic shocks to which developing economies are especially vulnerable. In view of all the circumstances, price stability remains the key objective of monetary policy under a flexible exchange rate system. This is achievable through rule-dominated monetary policy formulation. The volatility of real interest rates and real exchange rates under those exchange rate systems that are pegged is an issue of central policy importance for developing countries. The issue is whether the real interest rate and real exchange rate should be kept stable through intervention. For example, within a real exchange rate targeting framework that aims to keep the real exchange rate stable, both inflation and the real interest rate are unbounded, depending on capital restrictions (Calvo et al., 1995).

Asset Prices and Monetary Policy: ‘Leaning Against Wind’ versus ‘Cleaning Bubble’ (The Greenspan Doctrine)

Some challenges remain in the conduct of monetary policy under free capital mobility. While capital market liberalization is generally of greater benefit to countries at higher levels of development, most developing countries with thin financial markets have removed some restrictions on capital flows. Under a deregulated financial system, banks borrow heavily from international capital markets. They provide credits to risky borrowers and raise the risk profile of the financial system. A rapid growth of credit, if unchecked by timely regulatory action, can create asset bubbles. No policy prescription is available for the orderly deflation of an accelerating bubble. Sooner or later it must burst, causing damage to the economy.

One of the questions this raises is whether a central bank should use policy to stem the wash-up cost of bubbles by ‘pricking’ them early. The issue has gained prominence across the globe since the US-global financial crisis. Distinction has been made between credit-led bubbles and equity-type bubbles, in which credit plays only a minor role. Friedman (1981a [1983], 1981b) argued that a credit system is generally unstable. There are two dimensions to this instability. Firstly, the demand function for credit has unstable parameters. Secondly, the supply side of the credit market undergoes frequent shifts because creditors may become over-leveraged and hence go through periods of subsequent retrenchment. Consequently,
arguments are made for ‘leaning against’ credit bubbles and for ‘mopping up’ in the aftermath of equity bubbles (Mishkin, 2011).\textsuperscript{32}

Blinder (2013) suggests that policymakers need to be cautious about ‘bubble activism’ on the grounds that central banks have generally no information advantage and that they lack appropriate instruments to prick bubbles. Therefore, the costs of collateral damage from monetary intervention could outweigh any benefits. Central banks may, however, have some informational and instrumental advantages in dealing with bank-based credit bubbles, through their supervisory role in the banking system. This is the basis for the view that central banks should exercise prudential supervision over the banking system. This argument is compatible with the addition of financial stability as a monetary policy objective. Economists therefore, whether intentionally or unintentionally, advise the overburdening of monetary policy and in the process contribute to inefficiencies in monetary policy regimes.\textsuperscript{33}

**Monetary Policy Strategy**

Choice of the strategy of monetary policy has critical significance for the national growth and development experience. Rule-driven monetary policy has comparative advantage in maintaining low and stable inflation, and is at its most effective when low, stable inflation is its sole target. A rule-based monetary policy is often interpreted as a commitment device. It makes monetary policy transparent with a focus on achieving a long-term objective (price stability). A central bank’s ‘technocratic task’ then is to achieve its objective of price stability without requiring justification of its measures while remaining accountable to the public (Issing, 2013). In developing countries, both ‘discretionary’ exchange rate targeting (nominal or real) and monetary targeting are widely used. Some developing countries have replaced these with inflation targeting over the past decade or so. Considering the complexities of the issues involved, there is no single strategy that has a clear advantage over the others, provided that the strategy chosen is consistently followed through and continuously communicated to the public in a credible and transparent manner. The degree to which any given monetary policy strategy is appropriate depends on economic structure, stage of economic development, level of development of the financial system and the kinds of shocks typically experienced by the economy.

Exchange rate targeting has particular relevance for high-inflationary economies, since it helps to stabilize prices and hence the economy. Monetary targeting is suggested for economies that do not have developed money and capital markets but experience supply shocks more commonly
than either monetary shocks or demand shocks. Inflation targeting is suggested for economies that have relatively well-developed money and capital markets capable of absorbing large fluctuations of the exchange rate. For inflation targeting to be at its most effective in minimizing and stabilizing the inflation rate, countries are required to eliminate or reverse the usual dominance of fiscal over monetary policy. Both the monetary targeting and inflation targeting strategies require flexibility of the exchange rate. If a central bank has credibility and the policy rule remains transparent, inflation targeting can be effective in anchoring inflation expectations (Svensson, 2011).

The recent literature emphasizes the importance of monetary policy credibility. It is now received theory, empirically demonstrated, that monetary policy is not effective in boosting employment in the long run. Given the benefits of price stability, the credibility of monetary policy can be enhanced by using a nominal anchor under a well-defined (transparent and routinely communicated to the public) monetary policy regime (Taylor, 1982). An institutional commitment to price stability via adoption of a nominal anchor provides a counterbalance to the time-inconsistency problem under discretionary monetary policy. A long-run policy focus dampens central bank temptation to pursue short-run expansionary policies. Commitment to a nominal anchor can encourage government in the responsible use of fiscal policy to complement, and thereby enhance the effectiveness of, a monetary policy whose key, if not the sole, target is price stability.

**Exchange Rate Pegging and Boom-bust Cycles**

Some smaller developing countries have consistently, over long periods, pegged their currencies to the US dollar. The policy aim is to maintain international confidence in their exchange rate stability so as to promote trade and investment (Rose, 2000). With no effective controls over capital flows associated with this exchange rate policy and financial integration, these countries sacrifice monetary policy independence, effectively importing the monetary policy of the pegged currency country. While a pegged exchange rate system provides an anchor to domestic prices, the inflation rate often remains high and exhibits high volatility. This is especially so when a country has a large non-tradable goods sector that remains exposed to both demand and supply shocks. Such a configuration can cause a boom-bust cycle if the nominal interest rate and the exchange rate are not regularly adjusted to maintain stability in both the real interest rate and the real exchange rate. Instability in the real interest and exchange rates affects saving, investment and trade flows and destabilizes real output
growth. Exchange rate pegging can therefore be problematic for smaller economies, especially ones that are vulnerable to demand-side or supply-side shocks, or both. Most resource-based or oil-exporting economies of the Gulf region, under a pegged exchange rate system, have exhibited high volatility in both inflation and real output since the early 1970s.

**Interest Rate Targeting and Money-demand Instability**

The role of money in monetary policy has become controversial since the 1990s. The implications of a stable money-demand function are well known since Friedman (1960, 1972) proposed a constant money-growth rule to maintain low and stable inflation. The present debate on monetary policy is whether or not monetary aggregates contain information that can be used to improve inflation predictions under inflation targeting. Economists such as Woodford (2008) argue that they do not, while an alternative view is that monetary aggregates remain important and should be used to improve monetary policy (King, 2002; McCallum and Nelson, 2011). Following the global financial crisis, there is also debate whether a country under recession should follow a monetary policy rule even when the nominal interest rate approaches zero. Taylor (2012) suggests that if, in a recession, a monetary policy rule such as the Taylor rule begins to prescribe a negative target interest rate, then rule-driven policymakers should switch to a money-growth rule.

Lucas (2007) suggests that inflation targeting does not invalidate the view that inflation is a monetary phenomenon and that inflation is linked to money supply growth. Although monetary policy can be conducted without explicit reference to money, there exists in the steady state a causal linkage between money supply growth and inflation. Under inflation targeting, either monetary aggregate or the interest rate can be used to conduct monetary policy. While the use of interest rate may keep inflation at the target level on average, the volatility of money growth arising from deploying the interest rate as an instrument would be reflected in inflation volatility. McCallum and Nelson (2011) suggest that the long-run relation between money supply growth (adjusted for output growth) and inflation, derived from a money-market equilibrium condition, remains valid irrespective of whether or not the money-demand function is stable and whether the money supply is exogenous or endogenous. The role of money in monetary policy therefore cannot be ignored irrespective of the strategy of monetary policy deployed for price stability.

The question of whether the interest rate or a monetary aggregate is more effective as an instrument of monetary policy is a tactical, not a strategic, issue. When shocks are predominantly monetary, the interest
rate may perform better while a monetary aggregate may perform better against real shocks, whether to demand or to supply (Poole, 1970). As Poole’s analysis suggests, deployment of the interest rate as a policy instrument under inflation targeting is likely to create inflation volatility when the shocks are most commonly real. Inflation volatility has therefore become an issue in monetary policy under flexible inflation targeting as developing economies in particular often experience supply shocks and remain reluctant to adjust both the interest and exchange rates in response to inflationary developments. The resultant inflation volatility may have an independent impact on money demand (Appendix 5).

Use of the interest rate as an instrument of monetary policy, say under inflation targeting, may lead to instrument volatility (high interest rate volatility). This also makes money growth highly volatile. Money-growth volatility is not benign, it remains linked to inflation irrespective of the exchange rate regime and whether money demand is stable or not. Money-growth volatility is reflected in inflation volatility irrespective of the strategy of monetary policy. When the money-demand function is stable, it provides a basis for estimating whether the prevailing money-growth rate is compatible with the inflation target. Any monetary overhang would sooner or later translate into inflation.

**Inflation Targeting and Inflation Volatility**

While inflation targeting keeps the inflation rate low on average, it does not necessarily lower costly inflation persistence and volatility. By design, inflation targeting attempts to keep inflation within a range over the business cycle. Kilian and Manganelli (2007, 2008) have developed a theoretical framework on the basis of risk management in monetary policy. They observe that a central bank reacts to keep economic growth in line with inflation depending on whether the forecast distribution of inflation lies within the prearranged lower and upper limits. Their empirical results suggest that a central bank does not respond linearly to the conditional mean of inflation. Rather, it allows inflation to fluctuate within a band that remains unknown to the public. This raises inflation uncertainty, especially when the central bank’s policy actions lack transparency or, more broadly, the central bank lacks policy credibility (Westelius, 2005).

Some recent theoretical work on monetary policy suggests that central banks operating under inflation targeting adjust their inflation targets non-linearly (Martin and Miles, 2004; Orphanides and Wieland, 2000). They either stabilize or stimulate output when inflation is well within the target range but pursue inflation aggressively when inflation deviates far from the target. Inflation then fluctuates widely at low level and exhibits
a random, non-linear character under inflation targeting (Aksoy et al., 2006). Contrary to the expectations, inflation therefore remains highly persistent, with a near unit root characteristic.

**Monetary Policy, Inflation Targeting and Supply Shocks**

Monetary policy in general, and the inflation targeting strategy in particular, are problematic for economies that experience frequent supply shocks. Adverse supply shocks reduce output and raise prices. If monetary policy is to be targeted at correcting this, then conflicting policy actions are indicated. The loss of supply requires lowering the interest rate for output stabilization; while inflation control requires an increase in the interest rate. If the interest rate is increased, it may lower output that, by then lowering money demand, can raise the price level.

Some economists suggest that if a developing country experiences an adverse supply shock, it should introduce contractionary monetary policy to dampen inflationary expectations (Fender, 2012; Hossain, 2009). Monetary accommodation, following supply shocks, carries the danger of igniting inflation although a rise in the unemployment rate is costly too.

There is a third view: that of the Classicists, who would recommend a policy of neither fiscal nor monetary intervention, since, *ceteris paribus*, the economy will re-equilibrate over a few accounting periods. The optimal monetary policy therefore remains uncertain and subject to judgement (Stevens, 2003). Monetary policy is generally not effective in stabilizing output when an economy suffers from supply shocks and inflationary expectations are built in the system from such shocks. Structural reform and commercial policy may be useful for addressing supply disruptions and their impact on inflation and output. Flexibility of the interest and exchange rates would dampen price instability caused by supply shocks.

**Deflation, Inflation Targeting and Zero-bound Interest Rate**

Inflation targeting is viewed as a monetary policy strategy that raises policy credibility and keeps inflation low and stable. Problems emerge, however, in the event of a supply shock, as just implied, or when inflation reaches zero or turns negative. The Japanese experience since the early 1990s has raised questions over the conduct of monetary policy in a deflationary environment (Stevens, 2003). This requires some discussion on the problem of how the inflation targeting strategy of monetary policy can respond to deflation.

When an economy exhibits a deflationary trend, the authorities aggressively reduce the interest rate to raise aggregate demand, and hopefully
prices, in an attempt to maintain expectations within the target range or return measured inflation to that range. If the nominal interest rate is sufficiently positive, there is scope for the central bank to lower the interest rate, at least a few times, to prevent the economy from falling into deflation. When the nominal interest rate is very low, the real interest rate could remain positive but low if there are deflationary expectations. Low real interest rates are generally expected to raise consumption and investment and hence aggregate demand.

In sharp contrast to the literature on credit rationing when the interest rate is high, low nominal interest rates do not necessarily reduce adverse selection and moral hazard problems, so that they may fail to raise the quality of lending. Low nominal interest rate may lead to excessive risk-taking by financial institutions for at least two reasons. Firstly, low interest rates raise the incentives for asset managers to search for higher yields, thereby increasing the general level of risk-taking in financial markets. Incentives may come from contractual arrangements that compensate asset managers for returns above a minimum level, often zero. With a very low nominal interest rate, only high risk investments bring high compensation for asset managers. Incentives come also from fixed-rate commitments, such as those provided by insurance companies, forcing firms to seek out higher-yielding, riskier investments. Incentives may, furthermore, have a source in money illusion, whereby investors may treat low nominal rates as low real returns and buy riskier assets to obtain higher returns. Secondly, a low interest rate may promote excessive financial risk-taking through the mechanism of income and valuation effects. When firms borrow short and lend long, low short-term interest rates increase net interest margins. This increases the value of these firms, which raises their leverage and induces them to take on risky assets (Mishkin, 2013).

Monetary policy can encourage risk-taking in two further ways. Relatively more predictable monetary policy action lowers uncertainty, which in turn induces asset managers generally to underestimate risks. Monetary policy designed to clean up financial disruptions by lowering interest rates, named the ‘Greenspan put’, can fuel the moral hazard problem as financial institutions expect monetary policy to help them recover from bad investments. The Greenspan put increases systemic risk, since it is exercised only when most financial firms are in trouble simultaneously. This encourages many firms to pursue similar investment strategies, which raise the correlation of returns and lowers the advantage of asset diversification (Mishkin, 2011).

This suggests that both very high and very low interest rates raise the incidence of adverse selection and moral hazard problems. The presence of low inflation does not of itself improve the ability of economists to
understand the behaviour of inflation. Low but unstable inflation makes both estimating and forecasting it harder. Demand and supply side shocks both impact short-run inflation, and central banks find the prediction of inflationary behaviour challenging.

Then how to conduct monetary policy in the face of a zero nominal interest rate? In such circumstances the Taylor rule, for example, prescribes a negative interest rate target to pursue. Taylor’s counter-prescription is that the authorities switch, in a transparent and credible manner, to a constant money-growth rule. Deployment of the interest rate as an instrument of monetary policy, then, necessarily implies a zero interest rate as a potential constraint on monetary policy. There are other alternative instruments of monetary policy that can be used without referring to the nominal interest rate.

McCallum (2000) argues that a realistic policy option for a central bank in an economy when the policy rule has reached zero is to manipulate the nominal exchange rate via large-scale unsterilized foreign-exchange intervention. This option arises from the theoretical framework in which Treasury bills and base money are perfect substitutes at the zero lower bound, but money and foreign exchange are not.

When the interest rate is abandoned as an instrument of monetary policy, the central bank can switch to unconventional monetary policy instruments by adjusting the monetary base to hit the price level target. The message implicitly conveyed to the public by such a policy switch is that the central bank will do whatever is necessary to maintain price stability, including buying assets other than Treasury bills. Until 2014, central banks such as the Fed and the Bank of Japan were heavily engaged in non-traditional monetary policy, whereby they were expanding their respective monetary bases through adding to their traditional portfolio mixes a range of novel assets.

Taylor (2011, 2012) argues that whether or not such programmes ultimately work, the process of implementation has the undesirable effect of compromising the central bank’s independence. The programmes are not monetary policy as conventionally defined. Rather, they are in the nature of fiscal policy actions. Other terms that could plausibly describe them include ‘credit allocation policy’ or ‘industrial policy’. These programmes attempt to assist some firms or sectors but not others and are financed through money creation rather than through taxation or public borrowing. Unlike monetary policy, there is no established rationale that such policies should be run by an independent agency of the government. By taking these extraordinary measures, the Fed has risked losing its monetary policy independence.

A further major problem is the risk of inflation. If a central bank such as
The Fed finds it politically difficult to reduce the size of its balance sheet as the economy recovers and as the level of government debt rises, then inflationary pressures will emerge. Taylor (2012) argues that rather than a discretionary use of the nominal interest rate, the requirement for rule-driven monetary policy should be legislated. This would bolster central bank independence by increasing its accountability to the public and reducing its ability to implement discretionary policy that is essentially fiscal in nature.

**THIS BOOK AND CENTRAL BANKING AND MONETARY POLICY IN MUSLIM-MAJORITY COUNTRIES**

As reviewed in an earlier section, since the US-global financial crisis, originating in the United States in 2007 and contributing to the development of the ongoing Eurozone malaise, a wide range of issues in monetary policy have come to the forefront of policy debate. The debate is primarily focused on the design and conduct of monetary policy in the United States and its implications for macroeconomic management across the globe. Significantly, most developing countries in the Asia-Pacific have differed from the United States and other developed countries in their policy responses to the global financial crises. Nevertheless, with monetary policy issues now at the forefront of economic analysis, it is at least relevant, if not critical, to review in an historical context the evolution of inflation and monetary policy across a judicious selection of countries.

**Key Themes**

The countries selected in this book and in Hossain (2105) for a review of inflation and monetary policy have varied characteristics with respect to the stage of development, development strategy, economic openness, inflation history and the strategy of monetary policy. Therefore, these two books do not develop a set of common themes other than highlighting some core areas for discussion in different contexts. Furthermore, rather than becoming prescriptive in most respects, some broad policy issues are reviewed and any consensus reached on those issues is highlighted.

**Objectives of Monetary Policy**

As highlighted in different contexts, there remains debate on whether monetary policy should attempt to achieve a single or multiple objectives. This debate is more intense in developing countries because it is difficult,
if not impossible, to demarcate monetary policy from fiscal policy given the institutional and organizational constraints within underdeveloped political systems (Aghevli and Khan, 1978, 1980). Therefore, monetary policy is not generally viewed in isolation. Fiscal policy remains closely related to the design and conduct of monetary policy. This is essential for maintaining effective coordination between monetary and fiscal policies to establish macroeconomic stability. The key issue is the need for or desirability of monetary accommodation of fiscal deficits and supply shocks as they may lead to a financial, if not an economic, crisis. While fiscal policy is critical for maintaining monetary stability, achieving price stability is not an end in itself; rather, it is seen as a facilitator of steady economic growth. Poole and Wheelock (2008, p. 8) have expressed a firm view on this matter: ‘Maintaining low and stable inflation is central to achieving maximum employment and the highest possible rate of economic growth. Price stability also tends to promote financial stability and enhance the central bank’s ability to respond to financial disruptions that do occur.’

Problems arise when monetary policy instruments are deployed directly to promote economic growth. Even when an implicit growth objective is targeted, the authorities maintain ambiguity in the design and conduct of monetary policy. This could be ‘deliberate’, not due to lack of understanding of issues in monetary policy. Experiences of different countries suggest that the multiple objectives of monetary policy, including price stability, financial stability, exchange rate stability and economic growth, lead to ad hoc, faulty design of monetary policy. Most monetary policy issues therefore turn out to be political and institutional rather than technical. Ambiguity in the conduct of monetary policy then becomes acute when monetary policymakers take into account the ‘myopic preferences’ of political leaders and create a time-inconsistency problem that undermines the central bank’s autonomy and its ability to control inflation.

The recent financial crises across different regions have highlighted the importance of financial stability. Although monetary policy has some impact on financial stability, there is debate whether financial stability should be included in the list of monetary policy objectives. Central banks generally have a supervisory and regulatory responsibility of both banking and non-banking financial institutions. It is not clear how such responsibility can be reconciled with monetary policy for price stability. Although price stability is important for maintaining financial stability, it may not be sufficient because most financial institutions remain exposed to both domestic and external shocks. As most conventional banks are vulnerable to shocks and the sharp movements of the interest rate and exchange rate, there is increasing demand for equity-based financial products. Islamic banks and financial institutions have therefore gained
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importance in recent years as they provide equity-based and morally, ethically based financial products.

Monetary Policy Strategy

Although many issues in the choice of monetary policy strategy for price stability are yet to be resolved, there is broad consensus that a rule-based monetary policy is superior to discretionary monetary policy. The recent experiences of the United States and Japan suggest that discretionary monetary policy carries the danger of a boom-bust cycle (Ito, 2010). There is, however, no clear choice among the rule-based monetary policy alternatives. A pegged exchange rate-oriented monetary policy is generally considered appropriate for countries that are inflation-prone. The risk is that sustained exchange rate pegging may lead to a boom-bust cycle in an environment when there are large-scale capital flows. Monetary targeting and inflation targeting are considered two alternatives under a flexible exchange rate system. There is no clear choice between these two. The key factor that determines the effectiveness of monetary policy in lowering inflation is the credibility of the central bank in its commitment and ability to maintain low and stable inflation. A rule-based monetary policy generally reduces the time-inconsistency problem and raises the credibility of a central bank.

The main criticism against a rule-based monetary policy is that it may appear rigid and could be costly in terms of a loss of output if inflation is controlled strictly. Friedman (1960) advocated a constant money-growth rule to avoid policy-induced economic uncertainty. He did not consider such a rule optimal but argued it to be necessary for transparency and accountability of central banks in their conduct of monetary policy. McCallum (1989) has suggested a variant of the money-growth rule that allows adjustment of the money-growth rate for any shift in the velocity of money. As the velocity of money may exhibit conditional volatility, it can be accommodated in the money-growth rule to keep inflation low and stable over the long run. Such an adjustment is non-activist; it does not represent an attempt to achieve any pre-set real economic goals (Appendix 10).

Inflation Volatility and Economic Growth

Irrespective of the strategy of monetary policy, one desirable goal of monetary policy is that inflation remains low and stable, not low but unstable. In addition to supply shocks, inflation volatility may originate from the particular strategy of monetary policy adopted to achieve a single or
multiple objectives. Supply shocks could be random and raise inflation volatility around a target level that could be maintained over the medium run. Policy-induced inflation volatility is added to volatility originating from any unavoidable exogenous shocks and hence irreducible. Sustained inflation volatility is created when the interest rate and the exchange rate are controlled and when there is monetary accommodation of both demand and supply shocks. Controls over interest and exchange rates prevent the economy from adjusting in the event of supply shocks. Further, a monetary accommodation of supply shocks links the inflationary expectations with shocks that may not otherwise exist under a rule-based monetary policy strategy.

A non-transparent and loose form of monetary targeting may lead to excessively volatile money growth under a pegged or managed float exchange rate system. This is usually the case in most developing countries that operate under a pegged or managed float exchange rate system. In these countries, the monetary base remains linked to balance-of-payments. Large and speculative capital flows, if not effectively sterilized, lead to monetary growth volatility. Furthermore, large budget deficits (often procyclical) lead to excessive money growth and make the authorities’ stance on monetary policy unpredictable. Consequently, as inflationary expectations change, inflation becomes unstable and hence unpredictable.

A common theme in the literature is that inflation volatility is costly and should be kept to the ‘irreducible’ minimum. High inflation and its volatility create economic uncertainty that lowers real investment and retards economic growth. Friedman (2006) argued that there could be a positive, not negative, relation between inflation volatility and economic-growth volatility. As they reflect a sub-optimal monetary policy, it is possible to reduce volatilities of inflation and output growth by improving the design and conduct of monetary policy (Appendix 4).

Inflation volatility is in particular a problem for developing countries. As the interest rate and the exchange rate are not often determined by market forces, the high volatility of inflation in these countries leads to high and volatile real interest rate and real exchange rate (Appendix 6). This makes the people hostile towards both the government and central bank. The central bank then becomes ineffective in controlling inflation and maintaining financial stability. Consequently, high volatility of inflation adversely affects economic growth.

**Exchange Rate Flexibility**

Monetary policy independence can be gained under a flexible exchange rate system. Monetary policy independence can also be gained under
a fixed pegged exchange rate system if there are strict capital controls. Exchange rate flexibility is considered essential for absorbing shocks to an open economy. The main concern is whether a flexible exchange rate system leads to excessive volatility of the exchange rate. Exchange rate volatility in developing countries reflects thin and inefficient foreign-exchange markets that operate unpredictably when there are large-scale capital flows in an uncertain environment. Although the pull factors may be important, aggressive monetary policy in both developed and developing countries makes capital markets unstable. Nevertheless, there is the suggestion that a freely floating exchange rate system is not appropriate for developing countries. A fixed exchange rate system is not again a viable alternative as it may lead to boom-bust cycles when there are no effective restrictions on capital flows. Since the East-Southeast Asian financial crisis of the late 1990s, it is suggested that a managed float exchange rate system, with market-based capital controls, suits a developing economy better. Krugman (1991) suggests that a target zone for the exchange rate is compatible with the uncovered interest rate parity.

Money Growth and Inflation

The money-demand function is generally found to be stable in most countries in the Asia-Pacific. A long-run causal linkage also exists between money supply growth and inflation. Despite these findings, there is an apparent neglect of monetary aggregate in some countries in the design and conduct of monetary policy. To the extent that inflation is determined by money growth, inflation volatility reflects money-growth volatility. Inflation volatility in turn makes the exchange rate volatile. High volatility of inflation affects money demand. This may further raise the volatilities of inflation and the interest rate.

The monetary aggregate and its growth rate have therefore remained important in monetary analysis. A money-growth rule-based monetary policy has some useful properties that can improve the conduct of monetary policy for price stability (McCallum, 2012). Issing (2013) argues in favour of a money-based monetary policy following the US-global financial crisis. Although under inflation targeting the interest rate has been the preferred choice as monetary policy instrument, it is unwise to ignore monetary aggregate to maintain long-run price stability. This is especially the case for developing countries. Even in developed countries the linkage between money growth and inflation is more robust than the linkage between the interest rate and inflation. For example, the Reserve Bank of New Zealand (RBNZ, 1985, p. 627) notes that "empirical linkages between interest rates and inflation are less well-established than linkages between
monetary growth and inflation'. Similarly, Wallich (1985, p. 40) suggested that the ‘impact on inflation of a given level of interest rates, nominal or real . . . is far less predictable’ than any relationship between inflation and prior monetary growth (McCallum and Nelson, 2011).

**Capital Flows, Monetary Policy and Boom-bust Cycles**

Foreign capital is highly beneficial for developing countries. Large-scale foreign-capital flows to these countries, however, can create macroeconomic problems. Frankel (2011) has identified three types of problems associated with large-scale capital flows to developing countries. Firstly, capital often flows uphill, that is, from developing to developed countries. Secondly, capital flows are pro-cyclical. Thirdly, capital flows lead to financial crisis. Recent financial crises across the globe suggest that monetary policy becomes difficult to conduct in an environment that leads to large-scale capital flows. For example, one of the policy measures available for policymakers in developing countries is to sterilize foreign-capital flows to neutralize their impact on the monetary base. Although this could be effective in the short run, they create a quasi-fiscal problem for the central bank that sells government bonds and consequently the interest rate rises. Higher interest rates encourage more foreign capital and create an overheated economy. This problem can be avoided somewhat under a flexible exchange rate system. If this is not adequate, market-based capital control measures may be introduced.

Side-by-side, the financial system would need strengthening, including tightening of prudential supervision and regulation to prevent banks and other financial institutions from taking excessive risk that triggers a credit boom. Aggressive monetary policy actions in developed countries also trigger capital flows to developing countries. Although capital inflows are relatively easy to control, there are no effective controls over capital outflows. Foreign investors generally demonstrate herd behaviour and their sentiment on investment in emerging countries change quickly, without showing much relation with economic fundamentals. How to conduct monetary policy under the condition of freely mobile capital therefore remains an important issue for developing countries.

**NOTES**

1. Blanchard (1990, p. 785) writes: ‘movements in money lead to a slow adjustment of prices and wages, a long-lasting effect on output and little or no movement in real wage along the way’. Here Blanchard argues that money is ‘long-run’ non-neutral, thereby
flying in the face of the well-established, even in 1990, mainstream theoretical and empirical consensus that money is neutral in the long run. The main policy implication of long-run monetary neutrality is simple and powerful: those short-run ‘surprise’ policy expansions of the money supply may impose larger economic costs by creating boom-bust cycles than any benefits they confer. For historical discussion on money neutrality, see Patinkin (1972, 1992) and references therein.

2. Inflation uncertainty is usually measured in statistical form. If inflation is a stationary process, then it will have constant unconditional mean and variance. The question is whether the irreducible level of inflation variance, determined mostly by demand and supply shocks, can be brought to the minimum. The conditional variance of inflation may vary widely and change with the rate of inflation. When inflation exhibits high volatility, it cannot be predicted easily. Consequently, the actual outcome of inflation may ‘surprise’ markets, causing unanticipated capital gains and losses. In such an environment, inflation has real effects via changes in the relative preferences for real assets vis-à-vis financial assets. Real assets in particular become preferred inflation hedgers in an inflationary environment. A consequence is financial disintermediation, in which the financial sector is dominated by fixed-currency value assets. For detailed discussion on this and related issues, see Cagan and Lipsey (1978).

3. For details, see four volumes of *Handbook of Monetary Economics* (Friedman and Hahn, 1990; Friedman and Woodford, 2011).

4. Nelson and Schwartz (2008) have made a review of the contributions of Friedman and his collaborators in monetary theory and policy. Their article lists Friedman's publications in monetary theory and policy.

5. Keynesian economists maintain that monetary expansion is not effective in raising output during recession. An IS-LM model is employed to illustrate this proposition. Within this modelling approach, when the nominal interest rate falls to a very low level, the LM curve becomes highly elastic. This reflects a situation termed the (Keynesian) liquidity trap. In addition, the IS curve is assumed interest inelastic. Under these conditions, monetary expansion exerts little or no effects on either the interest rate or output. Keynesians therefore recommend expansionary fiscal policy, which they expect will shift the IS curve outwards, raising output without raising prices or the interest rate. Monetarists argue, on the contrary, that even at a very low interest rate, monetary expansion raises output through the real balance effect. Higher inflationary expectations also raise the demand for those assets, both real and financial, which are interest-sensitive. For further discussion, see Hossain and Chowdhury (1998).

6. New Classicists argue that, under rational expectations, anticipated monetary expansion does not have any significant impact on output. For details, see Barro (2008).

7. If policymakers do not possess more information than the public, unanticipated monetary changes become uncorrelated with other shocks. This increases noise and makes signal extraction more difficult for individuals and firms, lowering the allocative efficiency of the price system. When policymakers possess more information than the public, money can be used to offset other shocks and improve welfare. However, a more efficient way of achieving this outcome is to make such information available to the public (Blanchard, 1990).

8. Political, institutional and pragmatic reasons are used to justify Friedman's (1960) choice of a constant money-growth rule. It was not meant to be mechanical without scope for modification. The ultimate objective of the money-growth rule was to make monetary policy transparent and predictable, leaving out policymakers' discretion in changing policy stance on political and other grounds. Central banks are viewed as mysterious institutions, having archaic rules and procedures for monetary management, credit allocations and banking regulations. Moreover, central bankers are not elected and remain unaccountable for most of their actions. A constant money-growth rule is therefore considered an improvement to reduce economic volatility over discretionary monetary policy that makes monetary policy non-transparent and ineffective (Friedman, 1962).
9. Some of these studies were undertaken at the University of Chicago within the auspices of the famous Money and Banking Workshop. The monetary interpretation of inflation contradicted with the then prevailing view that inflation in developing countries originates from structuralist sources, often termed the structuralist view on inflation (Corbo, 1974).

10. This included a monetary interpretation of hyperinflations in Europe and other regions (Cagan, 1956; Sachs and Larrain, 1993).

11. Judd and Scadding (1982) have provided the statistical conditions for stability of a money-demand function. Friedman (1956b) refers to Cagan's (1956) study of hyperinflation as an extreme test of stability of money-demand function in a highly unstable condition. Also, see Hossain (2009) for an elaboration of this concept in the context of developing countries of the Asia-Pacific region.

12. In determining the direction of causality, exogeneity of the money supply is determined by observing historical events and statistical techniques. In hyperinflationary episodes, a feedback relation exists between money and prices. McCallum and Nelson (2011) suggest that causality between money growth and inflation does not require the existence of a stable money-demand function or exogenous money supply. A causal relationship between money growth and inflation is given a meaningful long-run interpretation within a cointegration and error-correction modelling framework for variables such as money, output, prices and exchange rates.

13. There is no general agreement that financial deregulation and reforms led to instability in the money-demand function. Various studies suggest one-off change in money holdings due to financial reforms. The long-run money-demand function remained broadly stable although there was some structural change in the money-demand relationship in a deregulated environment as the interest and exchange rates started to play a role in the money-demand function (Hossain, 2009; Laidler, 1986).

14. For further discussion, see Poole (1970) and McCallum and Nelson (2011).

15. If a central bank increases the growth rate of the money supply to lower the rate of unemployment, it may work only if the growth rate of the money supply is significantly higher than what the people expected and then used for entering into wage contracts. This may lower the rate of unemployment in the short run until the people find out the truth and adjust their behaviour and renegotiate wage contracts. Lucas (1996) has summarized this proposition in his Nobel Lecture. Anticipated monetary expansion has an inflation tax effect. It adds inflation premium to the nominal interest rate. In the recent literature, unanticipated monetary changes are shown to have liquidity effects that benefit liquidity-constrained firms who are mostly active in financial markets (Fuerst, 1992; Grossman and Weiss, 1983; Lucas, 1990; Rotemberg, 1984).

16. As Cagan and Lipsey (1978) suggest, instability in inflation in a large part is due to gyrations of aggregate demand management policy in which the economy is first restrained to reduce inflation and then stimulated to overcome the contractionary effect of the restraint imposed earlier.


19. Most monetary policy rules are not intended to be used in a mechanical way. They transparently and credibly communicate to the public monetary policy decisions and their intended impacts.


21. Monetary stability is generally defined in a way that is consistent with both internal and external balances. In a limited sense, monetary stability and price stability are used synonymously.

22. The Tinbergen principle requires the number of independent instruments to be equal to the number of objectives to be achieved (Sachs and Larrain, 1993). Monetary policy has a comparative advantage in achieving price stability rather than a real objective alone or jointly with other policies. This indicates that monetary policy should be used to achieve price stability rather than economic growth or employment.
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23. This refers to the transmission mechanisms of monetary policy that vary from country to country depending on the structural characteristics and institutional arrangements of the economy.

24. Due to the space constraint, no panel regression analysis is conducted for this study.

25. High volatility of real interest and exchange rates is found to affect real output and its growth under a pegged exchange rate system (Ghosh et al., 1995).

26. Three desirable goals of economic policy are exchange rate stability, monetary policy independence and international capital mobility, implying no sovereign portfolio capital flow controls.

27. The prerequisites for inflation targeting include both a freely floating exchange rate system and developed money and capital markets.

28. One strategy to avoid the open-economy trilemma is to adopt a managed floating exchange rate system and then attempt to achieve all the three objectives simultaneously but only partially. Whether this would improve macroeconomic performance is difficult to predict as such an approach to economic policy creates ambiguity and uncertainty. Most developing countries have introduced managed float, mostly due to ‘fear of floating’. The finance ministers and governors of central banks are generally blamed for currency devaluation (Frankel, 2011). Although this was the case until the 1990s, the political sensitivity of exchange rate movement has apparently diminished under the present deregulated environment.

29. There is no clear definition of price stability. Is it zero inflation or 1 to 2 per cent inflation or a much higher rate of inflation? Some economists suggest optimal inflation as a rate that maximizes output or keeps the unemployment rate lowest in a way that avoids a zero-bound nominal interest rate. Schmitt-Grohe and Uribe (2011) have summarized monetary theories and suggest that the optimal rate of inflation ranges from minus the real rate of interest to numbers insignificantly different from zero.

30. The suggested measures include credit allocation and rationing, manipulation of interest rates and exchange rates and capital controls. These measures create financial repression, which retards saving, investment and economic growth (Fry, 1998).

31. Alan Greenspan, former Chairman of the Federal Reserve System, developed the idea that monetary policy should not lean against any asset price bubble but should clean up any mess that is created after the bubble bursts. This doctrine is established on five elements. Firstly, asset price bubbles are difficult to identify. Secondly, any sharp rise in interest rate to prick the bubble may not be effective because the buyers of assets expect higher and higher rates of return from buying bubble-driven assets. Thirdly, many asset prices indicate bubble behaviour at a particular point in time. As monetary policy instruments could be blunt to deal with such situation, monetary policy actions may affect all asset prices rather than solely those in the bubble. Fourthly, a sharp rise in the interest rate may cause a bubble to burst severely and suddenly. This may cause major damage to the economy. Fifthly, as long as policymakers respond in a timely fashion and in an aggressive form after the asset bubble bursts, the harmful effects of a bursting bubble can be kept to a manageable level (Mishkin, 2013).

32. Mishkin (2012) suggests that monetary policy leaning against credit bubbles can be viewed as taking out insurance against the high costs of bubbles when they burst.

33. In Australia, the RBA, for example, takes into account asset prices in its formulation of monetary policy. Over the past decade or so, housing bubbles and commodity booms triggered the RBA to raise the interest rate in a credible fashion to avoid creating boom-bust cycles. The RBA considers such actions pre-emptive and necessary to maintain the economy along the steady path. In the United States, the pre-crisis view was, however, that the housing bubble should continue its course.
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