An Evaluation of Monetary Policy in India: A Sustainable Development Perspective

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1 Introduction

This chapter attempts to evaluate the performance of monetary policy in terms of its effectiveness in influencing the rate of economic growth and controlling inflation. The importance of these two policy objectives comes to the fore, especially when viewed through the lens of the Sustainable Development Goals (SDGs) of the United Nations. Growth is critical for combating poverty and undertaking redistributive measures to mitigate inequality within nations (SDGs 1 and 10), whereas managing inflation, especially food inflation, lies at the core of strategies designed to end hunger and achieve food and nutrition security (SDG 2). The performance evaluation undertaken in the paper is based on a review of relevant literature in the Indian context, focusing especially on the post-liberalization period.

Assessing monetary policy through the lens of sustainable development may be uncommon, but its relevance can hardly be questioned. Given the centrality of monetary policy measures in the Indian government’s response to the economic pandemic wrought by COVID-19, perhaps such appraisal is needed now, more than ever before.

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The discussion is structured as follows. To begin with, a brief overview of the conduct of monetary policy in India provides the necessary background for the remaining analysis (Sect. 1). The effectiveness of monetary transmission in affecting aggregate demand and output in the Indian context, especially in recent times, is examined thereafter (Sect. 2). The phenomenon of inflation, especially food price inflation and the efficacy of monetary measures in controlling it, is discussed next (Sect. 3). Findings from the literature are then used to assess recent liquidity measures of the Indian government for economic revival in pandemic times (Sect. 4). This is followed by concluding remarks.

2 Monetary Policy in India: An Overview

Monetary policy in India has seen it all! It has made a transition from a past marked by financial repression and fiscal dominance to the present where, in keeping with standard international practice, flexible inflation targeting was formally adopted since 2016 (Ray, 2013; Das, 2020; Dua, 2020).

The 1970s and 1980s were marked by fiscal dominance, wherein monetary policy almost entirely played a supporting role in financing fiscal needs. Reforms, introduced in the late 1980s decade, marked a break from the past and ushered in the era of monetary targeting which lasted for a decade, from 1988 to 1998. Under this regime, the central bank strived to maintain a target with respect to the quantum of money in the economy, an effort largely undermined by the issue of ad hoc treasury bills mainly under fiscal pressures. The need for reining in the fiscal deficit was increasingly felt ever since the country introduced sweeping economic reforms since 1991 and opted for a market-oriented, globalized pathway to growth. Monetary reforms kept pace, by freeing the central bank from fiscal dominance and crafting a transition to enhanced reliance on market-oriented, price-based, indirect instruments, from the direct measures used earlier on. These changes marked the Reserve Bank of India’s (RBI) formal adoption of a multiple indicator approach, which lasted from

1Recommendations of landmark committees such as the Chakravarty Committee in 1985, Narasimham Committees (I and II) in 1991 and 1998, the Tarapore Committee in 2006, the Raghuram Rajan Committee in 2008 and the more recent Urjit Patel Committee in 2014 (which led to setting up of Monetary Policy Committee in 2016) have profoundly influenced the path of monetary reforms in India. These have also been shaped by detailed recommendations made by various Working Groups constituted by the RBI from time to time (e.g. Working Group on Sterilization in 2003, Working Group on Operating Procedure of Monetary Policy in 2011, etc.).

2Prohibition on the issue of fixed interest, ad hoc treasury bills since 1997–98, steady reduction in the statutory liquidity ratio or SLR (from 38.5 in 1990 to its statutory minimum of 25% by 1997) and enactment of the FRBM Act in 2003 (which put a stop to direct government borrowing from RBI 2006–07 onwards) were three important milestones that served to limit automatic fiscal accommodation by monetary policy. The first contributed to emergence of a market for government securities and transition to market-based interest rates (even as it raised cost of borrowing for the government). The third enhanced ‘space’ for using monetary policy by reducing the scope for monetization and imposing strict constraints on size of the fiscal deficit (Ray, 2013).
1998 till its official transition to inflation targeting in 2016 (see Dua, 2020). Monetary policy has since, strived to maintain a reasonable output gap (actual minus potential output) along with price and exchange rate stability, no mean challenge, in the face of volatile capital flows in a fast globalizing economy.

The most important development between 1998 and 2016 has been the emergence of interest rates as the chief tool of monetary intervention, a noticeable shift from the prior reliance on bank rate and cash reserve ratio (CRR) by the RBI. Liquidity adjustment facility (LAF), a cornerstone of monetary policy over this period, was used extensively to make temporary and swift adjustments in liquidity within the banking system mainly using the repo and reverse repo rates. This process culminated in the evolution of the repo rate as the benchmark policy rate, determining the baseline cost of borrowing in the economy today.

The theoretical underpinning of the recent policy stance of the RBI can be traced back to the influential Taylor rule, which captures the way forward-looking central banks frame interest rate policies, by taking into account inflationary expectations (based on the Phillips Curve) and the impact of real interest rates on output (based on dynamic IS curve) (Carlin & Soskice, 2015). According to the simple, closed economy Taylor rule, central banks set nominal interest rates to achieve a real interest rate target, as output (especially investments) responds to the real rate, typically with a lag. Therefore, central banks choose nominal policy rates optimally by minimizing the deviation of actual inflation from target, subject to a reasonable output gap. Based on this underlying concept and historical data pertaining to policy rates set by the US Federal Reserve, John Taylor (1993) proposed a rule for setting nominal interest rates. The simplest version of the Taylor rule is captured by the following equation:

\[ i = \pi + r^* + \beta_1(\pi - \pi^*) + \beta_2(y - y^*) \]

where \( i \) is the nominal interest set by the central bank, \( r^* \) is the equilibrium real interest rate, \( \pi \) and \( \pi^* \) are the actual and target rates of inflation, respectively, and \( y \) and \( y^* \) are logarithms of actual and potential output levels (representing percentage change), respectively. According to the original rule, the coefficients \( \beta_1 \) and \( \beta_2 \) are positive and as a rule of thumb, equal in magnitude (i.e. \( \beta_1 = \beta_2 = 0.5 \)). The rule thus proposes setting a higher interest rate, whenever inflation is above its target (i.e. a positive inflation gap \( (\pi - \pi^*) \)), and/or output is above its potential or full employment level (i.e. a positive output gap \( (y - y^*) \)). In other words, it calls for tight money policy when inflation or output gap is positive and monetary easing when the gaps are negative. When the economy experiences ‘conflicting’ goals such as stagflation (i.e. low growth and high inflation), the relative weights vary. The magnitude of the weights assigned to the inflation gap and output gap essentially

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3The repo (short for repurchase) and reverse repo rates are used by the RBI, under the LAF to temporarily inject and withdraw liquidity, respectively, into and from the commercial banking system. The collateralized transactions involve lending to and borrowing from the commercial banks against government securities. These stand reversed within a very short time span as they simply involve digital entries, with no change in title of the holder of the securities used for the transactions.
indicate central banks’ tolerance for deviations of output vis-à-vis inflation from respective targets.\(^4\)

Inflation targeting (IT) has been widely criticized, yet it has been widely adopted by central banks around the world! The theoretical premises of the DSGE (dynamic stochastic general equilibrium) models based on forward-looking agents with rational expectations have borne the brunt of the criticism (see e.g. Blanchard & Gali, 2005). Indeed, ‘real targeting’ of employment growth or real GDP or investment growth has been suggested as alternatives to this approach (Epstein, 2003). By and large, in the developed world, inflation targeting seems to have worked though, especially by keeping fiscal dominance (and political interference) at bay, except for a brief period after the 2008 global financial crisis, when central banks across Europe and the USA opted for unconventional monetary measures (Ray, 2013).

The smooth functioning of IT, it has been repeatedly pointed out, calls for fiscal discipline, central bank autonomy, highly developed financial markets and supporting infrastructure (Hu, 2006; Mishra and Mishra, 2009; Sengupta, 2014). Therefore, IT may be somewhat unsuitable in the context of emerging nations like India (Jha, 2008; Kanan, 1999; Kumail et al., 2012).\(^5\) After the implementation of wide-ranging financial reforms, however, there was greater consensus regarding its applicability in the Indian context (Sengupta, 2014; Singh, 2006), despite significant non-monetary influence on the inflation rate (Katkhate, 2006).

While India formally adopted an inflation target of 4% (within a 2% point range of 2–6%) in 2016, in practice, monetary policy seems to have broadly followed the Taylor rule right through the 2000s decade. However, evidence suggests that policy rates in India remained well below levels compatible with the Taylor rule (RBI, 2013), in line with global trends (Hofmann and Bogdanova, 2012), reflecting concerns regarding macroeconomic stability. Large interest differentials with the rest of the world could have triggered volatile capital (especially portfolio) inflows and jeopardized exchange rate and overall financial stability. Indeed, the responsiveness of policy rates to exchange rate fluctuations, rather than to inflation or output gap, has been noted across a wide spectrum of emerging economies (Mohanty and Klau, 2004).

Apart from the exchange rate and financial stability, interest rate setting by the RBI has mainly been shaped by concerns about growth and inflation. Evidence is mixed regarding the relative importance of these two objectives. The literature is replete with studies that have found interest rate movements responding relatively more to the output gap (Banerjee & Bhattacharya, 2008; Chand & Singh, 2006; Inoue & Hamori, 2009; Jha, 2008; Kaur, 2016; Ranjan et al., 2007; RBI, 2002) and even nominal income (Virmani, 2004), in the Indian context. Overall, the change in monetary policy stance with respect to inflation targeting is confirmed. For instance,

\(^4\)E.g. higher magnitude of the weight for inflation gap indicates that the central bank cares more about inflation than unemployment. So it is more likely to raise interest rates to curb inflation when it exceeds target, even if that comes at the cost of lowering output and raising unemployment (Carlin & Soskice, 2015).

\(^5\)It has also been suggested though that Taylor rule is appropriate for emerging economies only after suitable modifications (Taylor, 2000).
an influential study by Mohanty and Klau (2004) finds monetary policy responded more to the inflation gap between 1988 and 89 and 2008–09, compared to the period 1950–51 to 1987–88, when it was more responsive to the output gap. The study also finds asymmetry in policy response, which showed greater sensitivity to positive (i.e. actual inflation higher than target) than negative deviations of inflation from target. There is, however, substantial variation regarding the length of lags in the response of output and inflation to change in policy rates and exchange rates.6 Findings in the literature are influenced by choice of the dataset, precise time period and overall empirical strategies adopted in the paper (more on this in the following section), with some studies recording policy effectiveness (e.g. OstaEraghi, 2015) and others ineffectiveness (e.g. Singh & Kalirajan, 2006), in controlling inflation and the output gap.

There have also been concerns regarding the possible persistence of fiscal pressure on the conduct of monetary policy, despite financial reforms. For instance, RBI (2013) and Raj et al. (2011) both find evidence of a rise in interest rates associated with increases in fiscal deficits. This underscores the need to analyse monetary policy in an expanded Taylor framework that includes both fiscal and exchange rate variables in the Indian context. Kaur (2016) is a recent attempt in this direction.

Challenges facing monetary policy in open economies, with flexible exchange rates and near-perfect capital mobility (especially highly volatile, short-term, portfolio flows), are well understood in theory and clearly articulated in the standard Mundell–Fleming model (see Sikdar, 2013 for a lucid exposition). Time and again, the RBI has risen to the occasion to handle crises, as demonstrated by its response to the 2008 financial crisis and taper tantrum that followed. However, as the following discussion shows, misgivings persist regarding its ability to rein in inflation and influence crucial real sector variables such as private business investments.

3 Monetary Policy: Impact on Aggregate Demand and Output

Discussions on the link between monetary and real variables have a long history. The classical quantity theory of money forged a direct link between money supply and inflation. In the purely classical world, the role of money was ‘neutral’ and output was determined by the forces of demand and supply, under the assumptions of flexible wages and prices. It was the Keynesian analysis that brought to the fore the role of interest rates in linking the monetary and real sectors of the economy.

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6E.g. Lags in the effect of interest rate changes on the output gap range from two to three quarters (Mohanty, 2012; Patra & Kapur, 2010) and on inflation, from three quarters (Mohanty, 2012) to as much as two years (Chand and Singh, 2006). Real appreciation of the rupee has also been found to lower output with a lag of two quarters (Patra and Kapur, 2010).
3.1 Monetary Transmission: Basic Issues and Concepts

Monetary transmission refers to the manifold ways in which monetary variables affect real outcomes (Mishkin, 1995). Traditionally, monetary policy transmission is seen to occur via the interest rate channel. That is, monetary policy expansion lowers the real interest rate, which in turn reduces the cost of borrowing, triggering expansion in interest-sensitive components of aggregate demand, especially business investments and household spending on consumer durables and housing.

Empirical evidence indicates that change in interest rates can also affect the supply side through a change in borrowing costs, leading to the cost channel of monetary transmission, (Barth and Ramey, 2001; Chowdhury et al., 2006; Gaotti and Secchi, 2006; Henzel et al., 2009). A rise in real interest rates can lead to inflation by raising the cost of borrowing, making working capital relatively costly and leading to a rise in goods prices—this is known as the price puzzle. This may also lead to a cutback in output, adding to the contractionary effect from the demand side. However, it may increase the labour intensity of production via substitution effects and contribute to a rise in demand for labour and wages. In turn, this may result in second-round increases in the price of labour-intensive goods, like food. Through this channel, monetary policy may affect output, employment as well as inflation.

The credit channel, which emphasizes the supply of and demand for credit and asymmetric information in financial markets, works through changes in bank credit and via balance sheet effects. Expansionary monetary policy leads to higher deposit creation, enhancing banks’ lending capacity, leading to higher credit disbursement and increases in investment and aggregate output, under the bank credit channel. The balance sheet channel works through the effect of monetary expansion on the borrowers’ balance sheets, i.e. firms’ balance sheets. Typically, firms with low net worth find it difficult to borrow from banks, especially in the presence of information asymmetries that enhance risks due to adverse selection and moral hazard. Monetary expansion lowers interest rates, raises equity prices and hence net worth of firms, making them more credit-worthy. It thereby enhances the flow of credit to firms, raising business investments, output and employment. Monetary easing also improves firms’ cash flows, an important source of financing, leading to higher corporate investments. Internal finance is absolutely critical for investments, especially in the presence of credit constraints.

The asset price channel pertains to the impact of monetary policy on prices of real and financial assets. Expansionary monetary policy (i.e. fall in interest rates) lowers returns on bonds and raises equity prices and price of real assets (e.g. land, housing, etc.). The rise in asset values creates positive wealth effects, raising spending by firms and households, especially on durables and real estate (since borrowing costs are lower). Further, an increase in equity prices raises the market value of firms, leading to a rise in business investments, as explained by Tobin’s q theory, where ‘q’ is the ratio of firms’ market value to the replacement cost of capital. A rise in market value, relative to the cost of capital, induces capital formation (Sikdar, 2006).
The exchange rate channel of monetary transmission has assumed importance with the growing internationalization of economies. In open economies, monetary expansion reduces interest rates on domestic bonds, making foreign bonds relatively more attractive and leading to capital outflows. The resulting depreciation of domestic currency (with flexible exchange rates) raises net exports and output, by giving a competitive edge to domestic goods.

Different channels may assume importance in an economy, depending on the institutional context and extent of financial development. The importance of the Keynesian interest rate channel has been emphasized, especially in the context of developed economies. There is evidence of strong interest rate transmission to aggregate demand in well-functioning, developed financial markets (Bernanke, & Blinder, 1992; Christiano, & Eichenbaum, 1992; Dale, & Haldane 1995; Gerlash & Smets, 1995; Ramaswami & Slok, 1998; Fiore 1998; Favero et al. 1999; Mojon & Peersman, 2001; Smets & Wouters, 2002; Taylor, 1995; Norris & Floerkemeir, 2006). However, the presence of policy shocks and financial frictions can render the interest rate channel ineffective (Bean et al., 2002). Time can also be a factor as Berananke and Gertler (1995) show that the interest rate while effective in the short run may not be so over the long run.

The credit channel has also been found to be very effective (Bernanke & Blinder, 1988). However, with financial deepening and innovations, there is a decline in the importance of banks and the bank lending channel in the process (Romer & Romer, 1990; Edwards & Mishkin, 1995). Empirical evidence supports the greater effectiveness of the interest channel over the credit channel (Ramey, 1993). The importance of the exchange rate channel has also been stressed, especially in studies pertaining to euro areas (Obstfeld & Rogoff, 1995; Adolfson, 2001; Smets & Wouters, 2002; Gali & Monacelli 2005; Jardak & Wrobel, 2009).

For emerging economies, the evidence is mixed regarding the importance of the interest rate and credit channels, where studies contend, the absence of well-organized financial markets tends to weaken the interest rate channel (Bhattacharya et al., 2019). With banks still being chief sources of credit, the bank lending channel is often quite important in these economies. However, certain structural characteristics, especially the existence of informal markets, place limits on the relevance of formal channels of monetary transmission in such economies.

3.2 The Indian Experience

Monetary policymaking in India has made a gradual, fundamental transition from the pre-1990s regime of administered interest rates to a market-based system today where the repo rate has emerged as the primary tool of monetary intervention. Empirical evidence on the effectiveness of the interest rate channel, however, is mixed, partly due to the sensitivity of results to the choice of the study period and empirical techniques.
The Interest Rate Channel  The importance of the interest rate channel of transmission is well established in the literature on India, especially for the post-LAF period (Anand et al., 2010; Aleem, 2010; Khundrakpam & Jain, 2012; Mohanty, 2012; Patra & Kapur, 2010; Sengupta, 2014; Singh & Kalirajan, 2006), with some estimates attributing to it as much as half the effect of monetary policy on GDP (Khundrakpam & Jain, 2012). However, serious issues have been raised with respect to pass-through of policy rates to lending and deposit rates of commercial banks in India. While few studies do find evidence of significant pass-through of policy rates (Singh, 2011), most others find it very slow, incomplete and asymmetric. In India, commercial banks’ lending rates tend to respond more to policy rate hikes rather than to cuts, and the opposite holds true with deposit rates that respond more to cuts than to hikes in the benchmark policy rate (Das, 2015; Mishra et al., 2016; RBI, 2014).

An interest rate puzzle has also been observed in the case of India (Kaur & Dastidar, 2019). Such a puzzle exists when output is unresponsive to the interest rate, or when higher interest rates and higher growth rates go together, or when a fall in interest rate fails to revive economic growth (Nelson, 2000, 2002; Reinhart & Sbrancia, 2011). This may be observed when aggregate demand is driven by factors other than the cost of borrowing, such as consumer confidence, positive changes in the investment climate, electoral cycles, fiscal expansion in response to global shocks (such as the financial crisis) and so on. However, it may also follow due to misspecification of the IS curve in empirical studies (Furher & Moore, 1995; Nelson, 2002).7

Empirical evidence on the responsiveness of households’ spending decisions to changes in the interest rates is limited in the Indian context. While private savings behaviour has been explored (e.g. Agrawal et al., 2010; Athukorala & Sen, 2004; Loayza & Shankar, 2000), there is a dearth of studies that specifically estimate the interest elasticity of household consumption in India. There is some evidence to indicate that consumption may be substantially affected by the change in deposit rates. A series of policy changes between 2001 and 2004 allowed banks to offer higher interest rates on time deposits held by senior citizens. Analysis of consumption behaviour of households before and after this change found the rise in deposit rate caused a significant dip in the consumption of affected households, in the short run (Kapoor & Ravi, 2009).8 The magnitude of inter-temporal elasticity of substitution

7For instance, results depend on whether a forward-looking or backward-looking specification is used for the IS curve in empirical models. Moreover, use of restricted forms of the IS equation that ignore relevant factors such as real exchange rates and asset prices which also affect aggregate demand (especially private investments) may also lead to misspecification.

8Kapoor and Ravi (2009 and 2010) exploit the natural experiment presented by this policy change and analyse two rounds of NSSO data, classifying households on the basis of age (e.g. households in which the head is a senior citizen and those where the head is below 60 years of age). Using a regression discontinuity approach, Kapoor and Ravi (2009) estimate substantial short-run impact of the hike in deposit rates on consumption expenditure on non-food, non-essential items (including durables, education, clothing, travel, medicine, etc.). However, consumption resumes its average value in the longer run, which they surmise this could be due to income effects (i.e. higher interest income leading to higher consumption in the long run). Using a difference-in-difference estimator, Kapoor and Ravi (2010) compare consumption of two groups of households (those where head is
(which measures the impact of expected real interest rate on current consumption) was estimated to be greater than 1 (Kapoor & Ravi, 2010). This indicates substantial interest sensitivity of consumption, with a reduction in current consumption likely if interest rates on savings and fixed deposits are raised. Does this mean that a cut in deposit rates will necessarily lead to a rise in consumption? This is not at all clear.

In India, a steady fall in deposit rates in recent years has gone hand in hand with a change in financial asset holdings by households (RBI, 2020). There is a rise in the share of mutual funds and insurance products that earn relatively higher returns compared to fixed deposits in banks. Indeed, the participation of small retail investors in equity markets during the recent pandemic indicates that low returns on deposits may be inducing changes in the composition of savings, rather than any change in its quantum. By directing savings towards the equity market, access to savings by the corporate sector is likely to improve. Overall this remains an under-researched area. Apart from the studies by Kapoor and Ravi cited above, which explored a specific instance, there is hardly any empirical analysis of exactly how households’ decision to purchase consumer durables, invest in residential housing, etc., is affected by the change in lending rates in India.

Lending rates affect the user cost of capital, which is an important determinant of investment decisions by firms. However, several other factors (e.g. indirect taxes, import duties, etc.) also affect the cost of capital. Also, other than cost considerations, investment demand is influenced by demand conditions and expectations regarding the future. During the 2007–2008 global crisis, firms faced severe liquidity crunch as uncertainty loomed large and limits of traditional monetary policy, especially the interest channel came to the fore. In the Indian context, this was reflected, especially in the failure of monetary measures to address the prolonged slump in private business investments (Dastidar & Ahuja, 2019; Mallick & Agarwal, 2007; RBI, 2014) which has deepened further due to the COVID-19 pandemic. Indeed, unconventional policies (e.g. quantitative easing) and bold fiscal measures, tried and tested during the global financial crisis (Cecchetti et al., 2009; Walsh, 2009; Bean et al., 2010; Trichet, 2011; Yellen, 2011), are now becoming part of the ‘new normal’ policy response across the globe in response to economic crisis triggered by the Corona pandemic.

**Other Channels of Transmission** Among the other channels of monetary transmission, the asset price channel has been found to be relatively weak (Aleem, 2010), although there is some evidence to indicate it has strengthened in the post-LAF era (Sengupta, 2014; Khundrakpam & Jain, 2012). However, there is empirical evidence supporting the importance of the credit channel in India (Aleem, 2010; Khundrakpam & Jain, 2012; Sengupta, 2014).

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senior citizen vs those where head is not senior citizen). They find that consumption patterns were similar prior to 2001, but differed significantly in 2005 and attribute this difference to the hike in deposit rates for senior citizens between 2001 and 2004.

9See Dastidar and Ahuja (2019) for a recent survey on the determinants of private corporate investments in India.
The credit channel of transmission appears to have important implications for consumption in the Indian context. Availability of credit contributed to increased household consumption in rural India, especially in the short run, in the 1970s and 1980s when significant expansion in rural bank branches took place, after the nationalization of banks in 1969 (Fulford, 2013). More recently, banking and financial reforms over the 2000s decade seem to have alleviated the credit constraint facing households to a considerable extent. The share of personal loans in total bank credit surged from 13% in 2000–2001 to 23% in 2005–2006 and further to 28% by February 2020 (Nagaraj, 2013; Shetty, 2020). Indeed, borrowing by households for investment in housing is by far the most important component of personal loans. It accounted for over half of household borrowings in 2005–06 (Nagaraj, 2013); currently, housing loans have emerged as the single largest sector in terms of credit disbursed, accounting for 15% of total bank credit, compared to 11.3% for infrastructure (Shetty, 2020). In this context, macro-prudential policies may also affect household investments by changing the terms of credit. For instance, home loans surged in 2016, following the increase in loan-to-value (LTV) ratio in 2015.

Traditionally, the banking system has also been an important source of credit to firms in the formal sector in India. Especially, in the pre-liberalization phase, the absence of vibrant equity and corporate debt markets rendered bank credit indispensable, especially for small and medium firms. Large firms could also rely on sizeable operating surpluses for financing investments. Despite substantial financial reforms in the new millennia, the corporate debt market in India has not taken off, and the equity market continues to serve relatively larger firms in the formal sector, leaving out a large body of small and medium enterprises, for whom bank credit is still the mainstay.

Trade liberalization has come a long way in India since the 1990s. The country experienced phenomenal export growth in the 2000s decade, prior to the global financial crisis and also in its immediate aftermath, as governments responded to the crisis with coordinated fiscal expansion. However, evidence indicates that the exchange rate channel, even though it does exist (Patra and Kapur, 2010), has been weak (Sengupta, 2014; Aleem, 2010; Khundrakpam & Jain, 2012; Mishra et al., 2016). The RBI’s interventions for exchange rate stability (Aleem, 2010) combined with relatively low exchange rate elasticities of India’s trade basket, no doubt, explain this finding. Studies indicate the importance of non-price factors (e.g. infrastructure) in holding back India’s export performance, which explains why a real exchange rate depreciation in itself may not bring about an increase in exports (see Dastidar, 2015 for a survey). It is external demand, rather than price competitiveness, that explains much of India’s phenomenal export growth between 2004 and 2007 (Nagaraj, 2013). India’s export growth slumped since 2011–12, with little signs of picking up, despite

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10 Fulford (2013) also shows that credit availability may have adverse long-run effects by undermining savings and hence future income streams. A theoretical model is used along with empirical analysis based on NSSO data to study the dynamic effects of enhancing access to credit.

11 After the RBI increased the loan-to-value (LTV) ratio to 90% for home loans of up to Rs. 30 lakhs or less (that fall under ‘affordable’ category in urban areas) in 2015, there was a surge in housing loans in the following year (RBI press release 2016–2017/1277).
substantial depreciation of the rupee since then. Indeed, exchange rate depreciation has been associated more with inflation than output growth in an oil-importing country like India (Bhattacharya et al., 2011; Kaur & Dastidar, 2019; Rangarajan & Arif, 1990).

In the Indian context, therefore, the literature indicates the relative importance of the interest rate and credit channels, while asset price and exchange rate channels seem to appear relatively ineffective in affecting aggregate output.

Impediments to Monetary Transmission

Several factors limit the extent of monetary policy transmission to real economic activity (e.g. RBI, 2014; Mishra et al., 2016). Financial and credit market frictions impose severe constraints on the transmission mechanism (RBI, 2014). The economic structure in India, marked by the presence of a large informal sector, inhibits access, especially of smaller firms, to formal sources of credit. In the presence of credit market imperfections (e.g. high degree of information asymmetry, leading to large collateral requirements for loans) and the absence of well-developed corporate bond markets, borrowers face credit constraints. This essentially impairs the smooth intermediation needed to channelize household savings effectively for investments, holding back growth, and employment creation.

The impact of monetary policy on aggregate output is ultimately shaped by the responsiveness of investments (by households and firms) to changes in interest rates, in asset prices (via wealth effects) and to the availability of bank credit. Firms’ cash flow situation and their market value relative to the cost of capital (i.e. Tobin’s $q$) are also important drivers of business investments. Indeed, recent studies have highlighted the importance of business confidence (Anand & Tulin, 2014) and institutional reforms (Sen et al., 2014), rather than the cost of borrowing per se, for reviving business investments. The ongoing investment slowdown in India suggests that while the real interest rate may be important in the short run, uncertainty regarding the future can severely retard investment prospects in the medium run, leading to a prolonged slump (see e.g. Anand & Tulin, 2014; Dastidar & Ahuja, 2019). Expectation about the future is also an important determinant of the demand for housing, just as it is for business investments. For any given cost of borrowing, higher expected growth in house prices and capital gains from house ownership effectively lowers the user cost of housing and raises housing demand (Himmelberg et al., 2005). Indeed house price expectations (e.g. future movement of house prices) seem to have driven the credit-house-price dynamics in India. Analysis of data on credit and house prices from Indian cities reveals causality running from house prices to credit growth and not the other way around (Arora et al., 2020).\footnote{Typically, expectations about future house price are based on the past trends. Using the past housing prices as proxy for house price expectations, Arora et al. (2020) show that real estate prices influence credit markets in Indian cities (Tier 1 as well as Tier 2 cities), with causality running from house price to credit. The result that housing prices are causing credit is indicative of the role of expectations in driving credit demand for housing.}

Overall, therefore, for monetary policy to effectively address consumption, private investments and job creation, the role of supporting institutions and of business and consumer confidence can hardly be overemphasized.
**Methodology and Data issues** A challenge for deriving policy implications from this literature relates to the mixed evidence that emerges from it. Studies focusing on India are almost entirely empirical with results driven by choice of empirical strategy (e.g. technique as well as model specification used to evaluate Taylor rule), study period\(^{13}\) and exact variables analysed. The techniques used range from OLS regression (Patra & Kapur, 2010; RBI, 2013) to time series models such as VAR (Aleem, 2010; RBI, 2013; Singh, 2011), SVAR (Khundrakpam & Jain, 2012), Cointegrated VAR (Singh & Kalirajan, 2007), VECM (Das, 2015), ARDL (Kaur and Dastidar, 2019), Bayesian estimation in a dynamic general equilibrium model (Anand et al, 2010) to mention a few. Moreover, the difference in choice of endogenous vis-à-vis exogenous variables in the class of VAR models creates further differences in results obtained.

The literature on the impact of monetary policy on inflation (discussed in Sect. 3 below) is also empirical in nature, covering different time periods and mainly involving the application of time series techniques. For instance, Alam and Alam (2016) use a bounds testing approach and Goyal and Pujari (2005) use SVAR, while Goyal, (2014) uses Granger causality tests, VECM and estimates demand and supply shocks using a SVAR framework. Chakraborty and Varma (2015) use an ARDL model, while Paul and Zaman (2015) use an ADL model in their study. Bhattacharya and Jain (2020) is a cross-country study, based on a panel of developed and developing economies over the period 2006–2016, using Panel VAR estimation. While both Anand et al. (2014) and Holtemoller and Mallick (2016)\(^{14}\) use Bayesian estimation techniques in a dynamic general equilibrium, New Keynesian framework wherein results are affected by the choice of parameter values.

Therefore, the present chapter has bypassed any discussion on the magnitude of estimated coefficients, which differ widely and are not strictly comparable (owing to different variables and time periods covered in the study) and focused more instead on broad findings with respect to the underlying macroeconomic relationships under investigation. For a detailed discussion on estimation methods and results with respect to empirical evidence on monetary transmission, in the context of both developed and emerging market economies, see Bhattacharya et al. (2019).\(^{15}\)

Efficient estimation using time series techniques relies heavily on the availability of high frequency, sufficiently long data series (e.g. at least 30 years for estimation of long-run effects). The need to control for lagged effects of variables can result in a significant loss in degrees of freedom. However, data may not always be available

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\(^{13}\)Even for studies that focus only on the post-1991 period, there is wide variation in the exact time period covered. For instance, the periods covered in some of the studies are as follows: Aleem (2010)—1996(Q4) to 2007(Q4); Das (2015)—March, 2002 to October, 2014; Kaur and Dastidar (2019)—May, 2001 to March, 2015; Kaur (2016)—1996 (Q1) to 2013 (Q3); Khundrakpam and Jain (2012)—1996–1997 (Q1) to 2011–2012 (Q1); RBI (2013)—2000–2001 to 2010–2011; Sengupta (2014)—1993–2012; Singh (2011)—March, 2001 to June, 2012; to mention a few.

\(^{14}\)Holtemoller and Mallick (2016) also use SVAR model to show the impact of global food prices on food price and wholesale price inflation in India over the period 1996 (Q1) to 2013 (Q2).

\(^{15}\)Bhattacharya et al. (2019) examine evidence on factors that weaken monetary transmission to output and inflation in the context of advanced and emerging economies in a meta-analysis framework.
on the most appropriate variable at the desired frequency. For instance, data on two crucial variables for studying monetary transmission, viz., GDP and gross fixed capital formation (GFCF), is available at quarterly (since 1997) and not monthly frequency. So, the Index of Industrial Production (IIP) is the most commonly used substitute measure of economic activity in empirical analyses based on monthly data. While it shows a high correlation with GFCF and GDP, the problem remains that it is ultimately a measure of outcomes based on investment decisions and real interest rates in the past.\footnote{The RBI regularly conducts various enterprise surveys on capacity utilization, inventories, etc. (e.g. OBICUS or Order Book, Inventory and Capacity Utilization Surveys), to capture investment plans, business confidence, etc. This data can also serve as proxy for investment plans of the private sector. The problem is that this data covers a limited sample with potential issues of inter-temporal comparability owing to changes in the underlying sample and so on. These may be among the reasons that such data is still not widely explored in the empirical literature.}

Further, use of nominal vis-à-vis real interest rates, call rates vis-à-vis repo rates to measure interest rates, GDP vis-à-vis IIP, to measure output, CPI vis-à-vis WPI to measure inflation, also contribute to differences in the results. Yet another problem relates to the recent change in estimation methodology for the latest GDP (Base year 2011–12) series, which has raised serious comparability issues with the past series (Base year 2004–05). ‘The wide differences in the estimates under the two series pose major problems in the choice of data sets for examining the macro behaviour of the economy in recent years’. (Rakshit, 2016, p.81). In view of these underlying methodological differences, great care should be exercised while splicing the different series to create a single long time series.

4 Monetary Policy and Inflation

Concerns about inflation stem from the unequal impact it has on different strata in society. It reduces real wages and enhances inequality between wage and profit shares in national income. The poor are disproportionately affected, especially by food inflation, as food occupies a large share in their total expenditure, in line with Engel’s law. Fall in real incomes impair further, the poor’s limited capacity to save, enhancing vulnerability in the face of negative shocks. Inflation may also benefit the poor who are mostly net debtors, by eroding the real value of their debt, but this effect is not always captured in public perceptions of inflation. A fall in real wages may bring about an increase in employment (Ghura et al., 2002 & Romer and Romer, 1999), but episodes of high and volatile inflation create uncertainty and are detrimental to investments and hence medium-run prospects for output growth and employment. In general, the benefits of low, stable and positive rates of inflation
are widely accepted. Indeed, the dangers of falling prices or deflation were clearly demonstrated during the 2008 global financial crisis. 17

4.1 Inflation: A Few Conceptual Issues

Causes and Implications A clear idea about causal factors behind inflation in an open economy setting provides the necessary background for understanding the potential for monetary tools in controlling it. Broadly, these factors can be classified into those affecting price setting from the demand side and those from the cost and supply sides. Excessive demand pressures can cause inflation, especially when matching increase in supply is not forthcoming either due to binding constraints or because all resources are fully employed. Inflation may be short-lived in the first case, especially when supply constraints are eased in the medium to longer term. When the economy is at full employment, demand expansion may result in a wage-price spiral and accelerating inflation until demand falls back in line with output. Indeed, the argument underlying the Phillips curve, a basic workhorse in macroeconomics for analysing the short-run inflation–unemployment tradeoff, is based on the links between labour and product market (wages and prices) outcomes, as shaped by the state of aggregate demand and overall market structure in the economy.

A rise in the price of key inputs such as fertilizer, energy (oil, power) and telecom services that affect transport and communication costs has a broad-based effect on costs of production and contributes to rise in the general price level. A rise in interest rates, the standard monetary response to control inflation, may itself contribute to inflationary pressures through a rise in the cost of credit (the cost channel of transmission). Also, public perception regarding the sources and duration of inflation shape inflationary expectations may themselves contribute to inflation in an economy.

Public policy can also play a crucial role, both on the demand and supply sides, as far as inflation is concerned. Expansionary fiscal policies in general and monetization of budget deficits, in particular, are typically held responsible for adding to inflationary pressures. Indeed, inflation itself feeds back into fiscal deficits by raising government expenditure to meet rising costs (for which government may borrow and incur further interest cost), even as it provides relief by eroding the real burden of public debt. On the supply side, public provision of infrastructure, both physical (e.g. roads and power) and financial (e.g. access to credit) govern the shape and substance of supply constraints, especially in emerging markets. For instance, farm support and food management policies of the government can play a crucial role in food inflation trends. Further, the policy response to inflation itself plays an important role in influencing inflationary expectations and inflation management.

17 ‘Deflationary’ expectations led to prolonged periods of high real interest rates in a number of industrialized countries, jeopardizing prospects of recovery in business investments and pushing nominal interest rates into the negative zone!
In open economies, exchange rate depreciation can contribute to inflationary pressures by raising the cost of imported inputs, especially in oil-importing open economies. Most emerging countries today have adopted flexible exchange rates, India being no exception. In such settings, large capital outflows can lead to sharp currency depreciation that can unleash inflationary pressures depending on the extent of pass-through to domestic prices.

However, evidence suggests that openness may also mitigate inflationary pressures (Romer, 1993). For instance, imports (e.g. food imports) can help meet domestic supply shortfalls, allow access to efficient and low-cost technologies and usher in price competition in the domestic market (lowering markups and prices charged by domestic firms). Further, capital account convertibility tends to reinforce fiscal discipline by imposing heavy costs on deviations that can spill into the external sector and jeopardize currency stability (Obstfeld & Taylor, 2005). Many of these effects of openness on inflation may be observed only in the long run. However, exchange rate fluctuations and regulation of trade to address domestic production gaps may affect inflation even in the short run.

As far as food inflation is concerned, high food prices may be triggered by supply shocks (e.g. poor harvest due to adverse climatic conditions) or may be the result of institutional factors such as price manipulation and hoarding by traders and middlemen in the supply chain. Given the importance of food in the consumption basket of workers, a rise in food prices tends to have second-round impacts on prices via an increase in money wages. Key issues in this context relate to the pass-through effects of food inflation to the non-food or core sector through wage pressures and the likely cost effects on price setting by firms. Food price management is complex, calling for coordinated efforts in terms of government regulation of food procurement, farm support prices and food subsidies, along with monetary policy actions.

**Controlling Inflation: The Role of Monetary Policy** Inflation control lies at the heart of monetary policy for all inflation targeting economies. The theoretical underpinning of inflation targeting policies that stem from DSGE models stresses the importance of rule-bound, anticipated policy changes for inflationary expectations and for keeping inflation under control. A key question in framing optimal monetary policy is that should central banks target headline or core inflation? While headline inflation includes relatively volatile components of the aggregate price index (i.e. commodity (e.g. food, metals, etc.) and energy prices), core inflation comprises

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18 Periodic episodes of currency crises in Latin America in the 1990s and 2000s decades as well as the Asian crisis of 1997 have demonstrated the difficulties of managing fixed exchange rates with international capital mobility. Fiscal indiscipline and institutional weaknesses (e.g. weakly regulated financial and asset markets) have time and again jeopardized macroeconomic stability in emerging markets, especially in the face of volatile capital flows.

19 E.g. Large fiscal deficits may lead to downgrading of credit ratings by international agencies like Fitch, Moodys, etc., that raises countries’ borrowing costs in international markets.
mainly the prices of non-food components that are slow to change over time. The theoretical premise indicates that targeting core inflation maximizes welfare only under complete financial markets (Aoki, 2001). Headline inflation (which includes food inflation) should be targeted when markets are incomplete (Anand & Prasad, 2010; Anand et al., 2015) and food constitutes a large share of expenditure (Catao & Chang, 2015; Pourroy et al., 2016), as is commonly observed in emerging economies.

In general, central banks respond to a rise in inflation by raising interest rates, an important tool for demand management, when they hold demand-side pressures responsible for inflation (Branson, 1979; Sikdar, 2006). This works by dampening aggregate demand (through the interest rate channel), although the interest rate hike may itself be inflationary (via the cost channel). Exchange rate management and adjusting liquidity and credit availability in the financial system are other measures used to maintain low and stable inflation in open economies. In this context, the composition of the trade basket and its overlap with the basket of goods whose prices are being targeted (e.g. CPI) introduces certain complications. Exchange rate fluctuations can have inflationary effects, as well as terms of trade effects on trade and current account deficits. All of these need to be factored while crafting a monetary response to inflation (Frankel, 2008).

The exact source of inflationary pressures, i.e. whether they originate in the commodities (e.g. food, energy) or in the core (non-food) sectors, has a bearing on central banks’ response to deviations of inflation from target. Factors such as importance of food in the consumption basket, nature of the commodities market, the extent of financial development, etc., together govern the design and impact of monetary response to food inflation. After the global financial crisis, advanced economies seem to be using the policy rate to stabilize the output gap, whereas, in the emerging economies, stabilization of headline inflation, especially food inflation, seems to be a central concern (Bhattacharya & Jain, 2020).

Food inflation can lead to second-round spillover effects and raise prices across the non-food sectors, leading to the persistence of inflationary pressures. The resulting effect on core inflation may be significant, especially in developing nations, where food occupies a large share in consumption baskets of the bulk of the population. Persistent inflation, originating in food price shocks, indicates the presence of strong second-round reactions in terms of an increase in wage demand that calls for monetary intervention (Anand et al., 2014; IMF, 2015). This calls for a calibrated response from the central bank. In case food supply shocks are likely to die out soon, a contractionary monetary policy response may worsen the situation by leading to contractions of supply in non-food sectors (through the cost channel) and adding to output variability (Beddies, 1999). However, ignoring persistent food inflation can disrupt policy design in emerging markets like India where high and volatile

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20 Since commodity markets clear relatively quickly, this shows up in greater price fluctuations, compared to imperfectly competitive goods markets with sticky prices, that respond to cost changes only with lags.

21 E.g. The presence of under-regulated commodity exchanges and futures markets may contribute to speculation and volatility in commodity prices.
inflation can have spillover effects on non-food commodities posing a stiff challenge for macro-management (Walsh, 2011).

Recent empirical evidence from developed and developing economies indicates that monetary tightening in response to food inflation may have a destabilizing impact in the following way (Bhattacharya & Jain, 2020). One-time monetary contraction, in response to food inflation, has demand, as well as cost effects. In emerging economies, weak financial institutions impede interest rate transmission, so that demand-side effects tend to be weak. In such cases, the cost effects may stoke further inflationary pressures in the non-food sectors by raising the cost of capital and prices. The substitution of expensive capital by relatively cheaper labour in production processes may lead to a rise in labour demand and wages. In turn, this can raise costs and prices of labour-intensive goods like food and further feeds into inflation. In developed economies, where interest rate transmission is stronger, sustained increase in interest rates has a dampening effect on aggregate demand; however, the cost effects can contribute to inflationary pressures.

However, monetary policy tightening can also reduce food inflation by enhancing supply, as storage costs or the costs of carrying inventories increase when real interest rates are high (Frankel, 2008). Further, change in real interest rates may also trigger substitution between commodity-based financial instruments and government securities. Prices in the futures markets, that indicate whether or not commodity shocks are likely to persist, influence the magnitude of such effects.

4.2 Inflation: The Indian Experience

Key Drivers of Inflation Studies on inflation for developing economies like India show that it cannot be explained by any single theory of inflation, be it monetarist, structuralist or Keynesian; rather a combination of factors must be used to understand this phenomenon (see e.g. Bhattacharya, 1984).

Just as excessive money supply- and demand-side factors have been found to fuel inflation (Alam & Alam, 2016; Bhattacharya & Lodh, 1990; Brahmananda & Najraj, 2002; Das 2003; Patnaik, 2010, etc.), the importance of supply-side factors has also been noted in the context of India (Balakrishna, 1991; Goyal & Pujari, 2004; Dholakia, 1990; Ramachandran, 2004; Kashik, 2011; Paul, 2009; Goyal, 2014; Chakraborty & Varma, 2015). A comparison of India and Bangladesh finds monetary factors to be the most important cause of inflation in both countries over the period 1970–2010 (Paul & Zaman, 2013).

22Frankel’s (2008) arguments are in context of advanced economies like the USA and a set of emerging economies from Latin America, where he observes fall in inflation, in response to rise in policy rates. However, his finding for Mexico is the opposite, where commodity prices increase following a rise in real interest rates.

23E.g. High price of commodities in the futures markets signals persistence of high commodity prices in times to come (Frankel, 2008).
Inflationary expectations have also been a causal factor behind inflationary episodes in the Indian context (Pahlavani & Rahimi, 2009; Patra & Ray, 2010). High levels of inflation, leading to high inflationary expectations in the future, can create a mechanism for the persistence of inflation. The importance of the central bank’s role in creating a stable anchor for expectations comes to the fore against this background.

Demand-side factors affecting inflation in the Indian context have shown a strong link with fiscal expansion. In the 1970s, especially monetization of budget deficits had become the norm and there is even evidence of a deficit-inflation spiral, with government expenditure more responsive to inflation than revenue (Rangarajan & Arif, 1990; RBI, 2005). The importance of fiscal deficit as a causal factor behind inflation (Dash, 2016; Khundrakpam & Pattanaik, 2010) suggests that inflation management in India should be seen as much as a fiscal responsibility as a monetary one.

On the supply side, the spike in international oil prices, higher import prices resulting from the depreciation of the rupee, rise in the price of key inputs such as fertilizers, coal and tariff on power and telecom services have all contributed to inflation in India both in the pre- and post-reform periods (Alam et al., 2016; Ummat, 1992; Shnkar, 1992; Ghoshal, 1993; Arunachalam & Sankaranarayanan, 1998). Through the 1990s and 2000s decades, greater openness to trade and capital flows have enhanced exchange rate fluctuations which have contributed significantly to inflationary pressures (Pahlavani & Rahimi, 2009). However, it has also been noted that supply-side factors tend to have mainly transitory effects on inflation (Srinivasan et al., 2006).

Time and again, rise in the price of petroleum products has unleashed inflationary pressures, as borne out during the infamous ‘oil shocks’ in the 1970s and 1980s and the Gulf crisis in the early 1990s. Oil prices also drove inflation during the growth phase of 2004–2014 (other than in the crisis period of 2007–2009, when food prices played a relatively important role (Dash, 2016; Malhotra & Krishna, 2015). The asymmetry here is that while domestic oil price typically responds to the rise in international prices, it can remain unchanged or even rise while international prices are falling. Most recently, this was observed during the ongoing Corona pandemic when global oil prices crashed (even hitting the negative zone for a while) without affecting domestic prices. Indeed, domestic prices have steadily risen, as earnings from the levy on petroleum have assumed greater importance, with other sources of government revenue drying up as economic activity came to a standstill during the recent lockdown (Agarwal, 2020).

**Food Inflation** Food inflation matters in India as it is a key component in wage setting and has an important role in shaping inflationary expectations. For instance, as RBI’s inflation expectation survey of households (December, 2012) shows as much as 95% of the respondents related the general price index to food prices, as against other product groups. This follows from the high share of expenditure incurred by average

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24On 20 April 2020, the price of oil (West Texas Intermediate (WTI) benchmark oil price index) became negative (−$37.63) as economic activity came to a standstill and demand for oil crashed due to the global lockdown (Nawaz, 2020).
Indian households on food items (45.1% according to NSSO 68th Round, 2011–12) and highly persistent inflation shocks.

Food and beverages have a weight of nearly forty-six per cent in India’s CPI, and the importance of food prices in driving inflation in India has been widely noted (Sengupta, 1991; Sinha, 1998; Sethuraman, 2005; Pattanaik & Samantaraya, 2006; Chakravarthy, 2007; Balakrishna, 2007; Pant, 2007; Sharma, 2007; Rajwade, 2007; Tuteja, 2008; Chand, 2010). The importance of addressing the supply side, structural issues has been emphasized, especially in the context of India’s move to adopt inflation targeting, wherein monetary policy would be playing a central role in controlling food inflation (Mohan, 2008). The inflation episode around 2007 has been attributed to an upsurge in food prices and used to make a strong case for addressing structural issues in Indian agriculture and improving the government’s food management policies (Mohan, 2008; Balakrishnan, 2007; Chakravarthy, 2007; Chand 2010; Tuteja 2008; and Kumar et al. 2010). An interesting feature of inflation during this period is that it was driven more by prices of processed, rather than of primary food products (Rajwade, 2007). However, the delayed policy response has also been held partly responsible for this inflationary episode, and ultimately, a rise in farm sector productivity is seen as the chief long-term solution to this problem (Tuteja, 2008). Increasing food imports, modernization and entry of modern domestic and foreign retail for enhancing productivity to control the food prices have also been advocated in this context (Kumar et al., 2010).

With economic growth and improvements in standards of living, there has been a substitution of cheaper cereal items by relatively more expensive vegetables, fruits, milk and eggs in the Indian food basket. The gap between demand and supply of these items has contributed to a persistent rise in prices (Mohanty, 2014).

The minimum support prices (MSP) in agriculture have been one of the factors contributing to an increase in food prices (Kumar et al., n.d). These are set by the government, often on the basis of political priorities rather than the economic criterion, given the prevalence of vote-bank politics in a democracy like India. With greater international trade in agricultural goods, especially in the post-reform period, the influence of global prices in the domestic market is inevitable. However, the link between the two has not always been straightforward—this is borne out by evidence from across developed and developing countries (Bhattacharya and Jain, 2020).25 There is mixed evidence from India. While there is empirical evidence indicating pass-through from global to domestic food prices, other factors, such as rainfall and domestic supply, are also quite important in the Indian context (Holtemoller & Mallick, 2016).26 For instance, when world food inflation dropped sharply in the latter half of 2008, in India, it actually rose by 12–15% (Kumar et al., 2010).

**Role of the RBI** That RBI has an important role in demand management and inflation control in the presence of supply constraints, has been well acknowledged (Acharya,
Indeed, better monetary management in the post-reform era has contributed to improved inflation control by the RBI (Pattnaik & Samantaraya, 2006; RBI, 2005). In particular, monetary reforms under the LAF reduced fiscal pressures, imparted greater autonomy to the RBI and contributed to better inflation management than in the past (Bhusnurmath, 2008; Rangarajan, 2006). However, the RBI’s interest rate policy has also been held responsible for contributing to inflation by enhancing the cost of credit (Joshi, 2012).

The importance of food inflation has been duly acknowledged in policy circles. ‘If food inflation is high, as is typically the case in many low-income countries including India, then we would be underestimating inflationary pressure on a systematic basis. That would mislead policy prescriptions’. (D.Subbarao, cited in Anand et al, 2014). The Urjit Patel Committee report (2014) also recognized the role of headline (food and fuel) inflation in contributing to inflationary expectations and dynamics as against core (non-food and non-fuel) inflation.

The RBI officially shifted to inflation targeting in 2016 and chose headline CPI (that includes food prices) as the most feasible and appropriate measure of inflation for the conduct of monetary policy. Commitment to an explicit inflation target can play a critical role; by providing a firm anchor for inflationary expectations, it can prevent transient supply shocks from having second-round effects that can raise costs and prices in the rest of the economy. According to former RBI Governor, D. Subbarao, ‘…the direct role of monetary policy in combating food price pressures is limited, but in the face of sustained high food inflation, monetary action may still be warranted to anchor inflation expectations’. (cited in Mohanty, 2014).

The ineffectiveness of monetary policy in controlling inflation originating in food and oil prices has been acknowledged in the popular press (Aiyar & Anklesaria, 2008) and in policy discussions (Rajwade, 2007). However, rigorous studies on the effectiveness of monetary policy in controlling food inflation in India are quite sparse (Anand et al., 2014; Holtemoller & Mallick, 2016). Food shocks have been found to be persistent, with core inflation catching up with and feeding into headline inflation quickly, indicating strong second-round effects of food on non-food prices (Anand et al., 2014). In view of this, it has been strongly suggested that monetary policy should respond to food price shocks. Indeed, monetary tightening has been found effective in controlling food inflation, indicating the importance of demand pressures behind such inflation (Anand et al., 2014). However, it is also found that monetary tightening in response to food price shocks does have a negative impact on the real sector (Holtemoller and Mallick, 2016). In contrast, recent empirical evidence indicates that in India, unlike in many other nations, the policy rate responded negatively to food inflation over the period 2006–2016, indicative of an accommodating monetary stance (Bhattacharya & Jain, 2020).

As far as nutritional security is concerned, controlling prices of fruits, pulses, vegetables, dairy and poultry products are critical. After all, access to affordable sources of protein can be an important agent of nutritional transformation in society, for which supply management and farm sector policies have a far more important role to play. However, monetary policy does have an indirect role via easing credit
constraints on the supply side, especially targeting enterprises active in these sectors across rural India.

Using monetary policy to control inflation may unleash contractionary effects on the core sector, with negative consequences for output and employment. However, a positive impact on employment may also ensue owing to the substitution of capital by labour. Overall, this remains an area with ample scope for further research to inform the policy debate on this issue.

5 Sustainable Development, COVID-19 and Role of Monetary Policy

The ongoing COVID-19 pandemic presents perhaps the biggest challenge ever to achieving the SDGs with respect to mitigating poverty, inequality and ensuring food and nutrition security. The massive disruptions in global production, supply chains, trade and tourism caused by the pandemic are creating extreme volatility in financial markets and severely affecting global commodity prices. Close and complex inter-linkages among economies, sectors and individuals in a globalized world are having a cascading effect, magnifying the stress in financial economic conditions. Economists have warned of deep economic depression due to lockdown imposed the world over to combat the pandemic and due to second-round effects via collapse of global trade networks.

5.1 Key Policy Issues

The entire world (with the lone exception of China, where data as of July 2020 shows growth revival has been stronger than expected) today is reeling under large-scale multiplier effects of Keynesian supply shocks, that seem to be triggering changes in aggregate demand which appear larger than the shocks themselves (Guerrieri et al., 2020). Aggregate demand is being affected by the supply shocks as workers in the affected sectors are losing income and reducing consumption. The negative demand effects are large, especially when workers face credit constraints and have high consumption propensities. The extent of the resultant fall in demand depends on the type of market, where impact tends to be maximum when markets are incomplete. For the economy to stabilize, workers in unaffected sectors need to compensate by increasing their demand for other goods. But this is useful only in the presence of a high degree of substitution across sectors, which may be quite unlikely. As such aggregate demand is contracting more than supply, so that employment in

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27 Quarterly growth of the Chinese economy reported in July, 2020 was just over 3%, exceeding the 2% recovery that was expected in the post-COVID scenario (Mc Donald, 2020).
initially unaffected sectors may also fall, enhancing the size of the negative impact and ushering in overall recession in the economy.

Fiscal policy seems to be the obvious choice for an immediate policy response to arrest the fall in aggregate demand and help revive economic activity (Baldwin & Mauro, 2020; Gourinchas, 2020; Krugman, 2020; Posen, 2020). Indeed, Modern Monetary Theorists (Kelton, 2020) argue running large budgetary deficits should not be a concern at a time like this when unemployment is high and monetization of the deficit is unlikely to cause inflation. However, it has also been pointed out that there may be sharp limits to the effectiveness of fiscal expansion in the current situation (Guerrieri et al., 2020). Monetary policy is being expected to play a supportive role, via money-financed fiscal interventions or unrepayable funding by the central bank of the additional fiscal transfers (Benassy-Quere et al. 2020; Gali, 2020a, b; and Gourinchas, 2020). This is a kind of ‘helicopter money’, to be used only in cases of exceptional emergencies such as the present one.

Other than this, the role of monetary policy lies in increasing the optimal and efficient use of credit, avoiding any tightening of policy and preventing bankruptcies. Indeed, at present, monetary policy must be unconventional if needed, to prevent deflationary expectations, and maintain easy liquidity in the economy, preempting any tendency for the real interest rate to rise. That is, a deflation trap is to be avoided at any cost. Banks should give sufficient relaxations in the redemption of loans and capital requirements with special efforts from public sector banks to maintain adequate liquidity in the system in the interest of supporting investment activities (Odendahl & Springford, 2020).

Monetary policy, therefore, has an important role in flattening the recession curve by ensuring easy and sufficient liquidity in the economy, so that people have money to spend even if they are unemployed. Three important elements of monetary policy in the present situation are: ‘First, safeguarding liquidity conditions in the banking system through a series of favourably priced long-term refinancing operations (LTROs); second, protecting the continued flow of credit to the real economy through a fundamental recalibration of the targeted longer-term refinancing operations (TLTROs); and third, via an increase in the asset purchase programme, preventing that financing conditions for the economy tighten in a pro-cyclical way’. (Phillip Lane, 2020; p. 141)

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28The operation of the Keynesian multiplier may be impaired during the pandemic as marginal propensity to consume (MPC) may be unusually low. Further, the second and subsequent rounds of the multiplier may be severely limited in the presence of large-scale job losses, especially if these are concentrated in sectors where MPC is relatively high. Those losing jobs may receive transfer payments, but spending out of such transfers would not be coming back as income to the unemployed, limiting the effectiveness of the multiplier.
5.2 The Indian Experience

In India, monetary policy has been entrusted with a central role in the task of economic revival, supported by a slew of fiscal, mainly tax relief, measures. The RBI has taken some special measures (see Appendix for details) to combat the severity of a potential recession looming large in the horizon. Its recent Statement on Developmental and Regulatory Policies spells out several measures to address financial stress caused by COVID-19 (RBI Press Release, 2019–20). These include: (i) maintaining adequate liquidity to enable financial markets and institutions to function normally despite severe dislocations caused by the pandemic; (ii) improving access to bank credit on easier terms, especially to the affected groups; (iii) extending a moratorium on loan repayments and easing access to working capital to reduce financial distress; and (iv) strengthening financial markets in the face of high volatility and uncertainty brought on by the global pandemic.

As the Indian government announced total lockdown of the economy (barring essential services) in March 2020, the Monetary Policy Committee (MPC) in its meeting on 27 March 27 2020 reduced the policy rate under the LAF by 75 basis points29 and announced its decision to remain committed to an accommodative stance. Monetary policy was to try and mitigate the impact of COVID-19 on the economy, focusing on reviving growth, while ensuring inflation remained within the target. Essentially, it communicated its willingness to ‘Act fast and do whatever it takes’ (Baldwin & Mauro, 2020). The RBI announced the second set of relief measures for ensuring adequate liquidity on 22 May 2020, aimed at incentivizing bank credit flows, easing financial stress and enabling smooth functioning of capital markets. An attempt to ensure easy and adequate provision of credit to all the stakeholders, especially to the most affected MSME sector, lies at the heart of these measures (see Appendix).

Can monetary policy revive aggregate demand at the current conjuncture? There is evidence of a rise in household savings, with rampant uncertainty marking the jobs’ scenario amid the ongoing slowdown intensified, by the lockdown. Any turnaround in the housing sector which has been going through a prolonged slowdown seems unlikely in the near future. Further, with construction activity at a standstill, even as the lockdown eases, it is expected that households will shift from physical to financial assets, and house price expectations and housing demand are likely to remain subdued (RBI, 2020). However, a pick-up in spending on personal vehicles (especially in the second-hand market), in view of the changed circumstances with respect to public transport in post-COVID times is evident. Overall, this appears to leave monetary policy with relatively little room for manoeuvre in reviving household spending.

The entire might, especially of the local level government machinery, has been used to contain and prevent the spread of the pandemic as much as possible and to directly provide access to food and prevent hunger. However, there has been an

29 The repo rate was reduced from 5.15 to 4.40% from with immediate effect. The marginal standing facility (MSF) rate and bank rate was reduced to 4.65% from 5.40%, and the reverse repo rate under LAF was reduced by 90 basis points to 4.0%.
overall failure to control food inflation in the open market, where prices of vegetables and fruits have soared. This is likely to have jeopardized nutrition security, especially among lower-income groups and informal workers, who may technically be above the poverty line but have lost jobs and suffered massive losses in regular income flows. Within such households, the most vulnerable, especially women, children and the elderly, are likely to bear the brunt of this crisis, whose full impact will only be visible over time. In this context, it is worth pointing out that the virtual collapse of the hospitality services sector (restaurant, hotels, etc.) during the lockdown has resulted in a glut in supply in certain food sectors (e.g. milk). This calls for imaginative use of public initiatives to channelize such surpluses to areas of need to address hunger in these challenging times.

India has used fiscal policy to respond directly to the public health emergency and to maintain food and nutrition security among the poorest of the poor (e.g. landless labour and casual workers in the informal sector), who have been frontline warriors in the economic pandemic wreaked by COVID-19 and the consequent lockdown. However, in India, by and large, the demand generating potential of fiscal policy has remained unexploited, especially when compared with developed countries like the UK and the USA. These nations made substantial direct income transfers to the private sector, especially to mitigate losses faced by small private enterprises. In India, while employment guarantee schemes like the MGNREGA are running full steam and some direct transfers have been made directly to poor women, the size of the fiscal stimulus at 3.5% of GDP is among the lowest in the G 20 group of nations.

6 Concluding Remarks

The literature review carried out in this paper shows that inadequate financial development is a key factor underlying relatively weak monetary transmission in India, especially via the asset prices channel. Even though India has made impressive strides with respect to financial liberalization, it still has a long way to go on this front in terms of improving market quality and reducing adverse selection and moral hazard in financial markets. Emergence of a vibrant corporate debt market, for instance, can certainly contribute to the revival of private investments in India, inter alia by easing access to and cost of credit for firms and providing a direct link between savings and investment.

In India, today, the banking sector still plays a crucial role in channelizing savings for investments, so the importance of the bank lending channel remains

30Rs. 500 per month is being transferred to the bank accounts women holding Jan Dhan Accounts (meant for those below poverty line(BPL)) for three months.
31The fiscal stimulus in other large emerging nations stands at 4.4% for Indonesia, 4.9% for Argentina and 11% for Brazil (https://www.statista.com/statistics/1107572/covid-19-value-g20-stimulus-packages-share-gdp/).
Efforts being made by the central bank towards pass-through of policy to lending rates, ensuring ease of access to credit, re-capitalization and restructuring of public sector banks heavily burdened with non-performing assets (NPAs), are all very welcome steps likely to strengthen monetary transmission. However, the success of the best-laid plans lies one hundred per cent in their implementation. Procedural simplifications, especially aimed at reaching out to small businesses and entrepreneurs via secure, mobile-based digital means, may well hold the key to success in this context. Moreover, the literature also indicates that immense benefits can be reaped through institutional reforms that cut ‘invisible costs’ by reducing corruption, delays in decision-making processes and boosting business confidence.

As far as food inflation is concerned, the RBI definitely has a role in keeping it under control with a timely, adequate and well thought-out response that reflects a clear understanding of the complexity of the phenomenon. However, the ultimate responsibility for keeping food prices affordable, especially the price of nutrient-rich fruits, vegetables and dairy products, lies at the door of specific public policies that govern supply responses in the farm sector. So far as investments, output growth and employment generation are concerned, monetary policy can play a far more active role than it has done so far.

The Corona pandemic has unleashed corporate restructuring in India as never before. India must seize this opportunity to incentivize the adoption of green technologies across the board by making imaginative use of credit policies. After all, raging wildfires in the Arctic Circle (in Siberia), in the summer of 2020, are an urgent reminder that time for action on climate change is in the here and now.

**Appendix**

Details of measures adopted by the RBI to deal with the economic situation due to COVID-19 on May 22, 2020

- RBI announced a new Targeted Long-Term Repo Operation (TLTRO 2.0) of Rs 50,000 crore (in several tranches, and further possibility of expansion if needed) for mid- and small-sized nonbank financial companies (NBFCs) and microfinance institutions (MFIs) which have been more severely impacted by the disruptions of pandemic due to COVID-19.
- The RBI Governor, Shaktikanta Das announced a reduction in the repo rate by 40 basis points, from 4.4 to 4% and reverse repo rate to 3.35%, which would help in releasing surplus funds for providing higher credit for investment in the productive sectors of the economy.
- A special refinance facility of Rs 50,000 crore for National Bank for Agriculture and Rural Development (Rs 25,000 crore), the Small Industries Development Bank of India (Rs 15,000 crore) and the National Housing Bank (Rs 10,000 crore) to meet sectoral credit needs since they are facing difficulties in raising finances from the market.
• Ways and Means Advances (WMAs)\textsuperscript{32} limit of states and union territories has been increased by 60\% over and above the limit as on March 31, 2020, in order to provide greater comfort to states to deal with the present crisis.
• A major relaxation has been given in the asset classifications norm, wherein the moratorium period will be excluded while considering the 90-day NPA norm for those accounts for which lending institutions decide to grant moratorium or deferment and which were standard as on March 1, 2020. The NBFCs are thereby allowed to grant relaxed NPA classification to their borrowers and; the banks will need to maintain additional provisioning of 10\% on standstill accounts.
• An extension has been given for the implementation of a resolution plan for stressed assets (or likely NPAs) by 90 days. Under this, now the banks need not maintain additional provisioning of 20\%, which they did earlier within 210 days of such default. LCR requirement was brought down from 100 to 80\% with immediate effect.
• In order to enable banks to save on capital in the present uncertain times, the RBI has decided that scheduled commercial banks and cooperative banks shall not make any further dividend pay-outs from profits pertaining to FY 2019–20. This may be reviewed based on the financial position of banks at the end of the second quarter of the financial year 2019–20.
• The liquidity coverage ratio\textsuperscript{33} for scheduled commercial banks has been brought down from 100 to 80\% in two phases.
• NBFCs’ loans to delayed commercial real estate projects can be extended by a year without restructuring. Additionally, these loans to be given similar benefits as given by scheduled commercial banks.

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\textsuperscript{32}\textbf{Ways and means advances (WMA)} are temporary advances (maximum expiry of three months) by the RBI to both the Central and State governments to meet temporary mismatches/shortfall in revenue over expenditure.

\textsuperscript{33}\textbf{The liquidity coverage ratio}, introduced as part of Basel III reforms on Banking supervision, requires banks to hold enough high-quality liquid assets such as short-term government debt (which can be sold off) to meet short-term debt obligations.
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