

Financial Market Developments and Evolution of Interest Rate Channel of Monetary Policy Transmission in India

Summary

How does monetary policy affect output and inflation is an important question? The monetary policy framework of a central bank aims to attain the desired objectives of policy in terms of inflation and growth. Typically, central banks exercise control over the monetary base and/or short term interest rates such as the rate at which the central bank supplies or absorbs reserves to/from the banking system in the economy. How these interest rate actions and liquidity operations of the central banks impact the end-objectives of monetary policy – i.e., price stability and sustainable growth - depends on the underlying monetary transmission, which in turn depends on structure of the economy and the state of development in financial markets.

Transmission Channels

Monetary transmission refers to a process through which changes in the policy get translated into the ultimate objectives of inflation and growth passing through some intermediate process. Traditionally, four key channels of monetary policy transmission have been identified in literature such as (i) money or interest rate channel; (ii) credit or balance sheet channel; (iii) exchange rate channel; and (iv) asset price channel. In recent years, a fifth channel, i.e., expectations channel has assumed increased prominence in the conduct of forward-looking monetary policy.

Interestingly, the channels of monetary transmission are often referred to as a ‘black box’ – implying that we know that monetary policy does influence output and inflation but we do not know for certain how precisely it does so. This is because not only different channels of monetary transmission tend to operate at the same time but also they change over time.

In general, transmission mechanism is largely conditioned by the monetary policy framework, structure and depth of the financial system in which the central bank operates and the state of real economy. While there is vast empirical literature on monetary policy transmission for advanced economies, only a limited number of empirical studies have

examined the monetary transmission mechanisms in emerging markets and developing economies (EMDEs). This is understandable given the underdeveloped nature of financial markets and rapid structural changes in EMDEs. However, since the 2000s, analysis of monetary transmission mechanisms in EMDEs, including India, has gained prominence due to structural and economic reforms and subsequent transitions to market oriented policy regimes. Literature on monetary transmission in India is still in a nascent stage, which makes our research relevant.

Empirical Evidence on Interest Rate Channel in India

The RBI Working Group on Money Supply (Chairman: Y.V. Reddy, 1998) pointed to some evidence of interest rate channel of monetary transmission. RBI (2005) using a VAR framework for the period 1994-95 to 2003-04 found that monetary tightening through a positive shock to the Bank Rate had the expected negative effect on output and prices. Using cointegrated VAR approach, Singh and Kalirajan (2007) showed the significance of interest rate as the major policy variable for conducting monetary policy in the post-liberalised Indian economy. Patra and Kapur (2010) also found that aggregate demand responds to interest rate changes. Pandit and Vashisht (2011) found that policy rate channel of transmission mechanism works in India. Mohanty (2014) found evidence that policy rate increases have a negative effect on output growth and a moderating impact on inflation.

Issues that the Thesis Examined

In this thesis we examined three issues: (i) development and extent of integration in the domestic financial market in India, (ii) evidence of interest rate channel of monetary transmission, and (iii) the impact of liquidity on the interest rate channel of monetary transmission.

We set the context by briefly tracing the evolution of the monetary policy framework since the mid-1980s and how interest rate has formally evolved as the operating target of monetary policy since the 2000s. We review the developments in relevant segments of the financial market. We then empirically test for the integration across segments of the financial market encompassing money, government securities and credit markets. We provide analysis on the basis of monthly data on interest rate/yield in these segments of the market for a period of 17 years from March 1998 to March 2015 broadly coinciding with the period of gradual interest rate liberalisation and market developments.

Apart from correlation, we perform cointegration analysis to formally test for long-term equilibrium relationship among key interest rate. We additionally test for the stability in the cointegrating relationship by estimating a short-term vector error correction model (VECM).

After ascertaining integration in the financial markets, we review both theoretical and empirical literature on monetary transmission with an emphasis on the interest rate channel. We particularly focus on EMDEs including India. We estimate a quarterly model for the 16 year period from 1999-2000:Q₁ to 2014-15:Q₄ coinciding with the period of gradual adoption of interest rate as the key operating instrument of monetary policy in India. Another consideration for the time period was that quarterly gross domestic product (GDP) data are available only towards the latter part of the 1990s.

We first set out an empirical model in an unstructured Vector Auto Regression (VAR) framework. With the insight from the unstructured VAR coupled with theoretical underpinnings, we proceed to develop a structural VAR (SVAR) to examine the interest rate channel of monetary policy. Our representative economy-wide model is specified in three variables: (i) policy rate, (ii) GDP growth rate and (iii) headline inflation rate broadly in a New Keynesian framework. In the model, we additionally try to control for liquidity as an exogenous dummy variable to show the efficacy of transmission under varying liquidity conditions.

Key Findings of the Thesis

First, the development of the money market and refinement of operating procedure of monetary policy have moved in tandem. A number of new instruments such as market repo, CBLO, CP and CDs were introduced in the money market. Auction based pricing of government securities added depth to the bond market. More recently the volume of the corporate bond is also expanding. Secondary market transactions have also been increasing. Financial sector reforms along with Reserve Bank's emphasis on development of various segments of financial market enabled shifts in operating procedures based on direct quantity-based instruments to indirect interest rate-based instruments. The Reserve Bank has been able to better transmit monetary policy signals in the money market through a single policy repo rate.

Second, we formally test for integration in the financial market across its key segments and along the yield curve. The cointegration results suggested a single cointegrating equation among a very short-term interest rate of Treasury Bills with a residual maturity of 15-91 days, the yield on government security with a residual maturity of 10-years and a measure of weighted average bank lending rate. Once we establish this long-term relationship, we test for the stability of this relationship by estimating a vector error correction (VEC) model, which showed that not only was the error correction term statistically significant but also had a negative sign suggesting convergence of the system to equilibrium in the event of temporary deviation.

Third, since the Treasury Bill rate with a residual maturity of 15-91 days shadows the policy rate one could surmise that a long-term relationship exists among policy rate and other key market rates. These findings prompt us to infer that there is a stable long-term relationship among interest rates in the major segments of the financial markets which augurs well for considering interest rate as a key instrument of monetary policy. This finding in an important way establishes the first stage of interest rate channel of monetary transmission from the policy rate to the broader financial markets.

Fourth, our SVAR model shows that monetary policy impacts growth and inflation with lags. A change in policy rate has a negative relationship with growth and inflation. It first impacts growth with a shorter lag of two quarters, which persists till the 7th quarter. Once growth is impacted inflation gets impacted from the 3rd quarter, which persists till the 8th quarter. Thus, the full impact of monetary policy action on growth and inflation persists for two years.

Fifth, at its peak a one-percentage point change in policy rate shaves off ½ percentage points each from growth and inflation. The reduction in inflation follows a fall in output growth validating the simple New Keynesian formulation of interest rate channel of monetary transmission. Liquidity has a statistically significant impact on monetary transmission with liquidity deficit strengthening monetary transmission.

Sixth, Granger Causality test show that policy rate has an influence on both output and inflation. At a shorter lag length policy rate has a relatively stronger impact on output than on inflation. On the other hand, at the longer lags policy rate has a stronger impact on inflation. Thus, monetary policy acts on the end objectives of inflation and growth with

variable lags. While there is a trade-off between growth and inflation in the short-run, in the long run lower inflation has a positive impact on growth.

Policy Relevance of the Findings

The findings of this research have significant policy relevance. It suggests that financial sector reform has resulted in integration across market segments underscoring the need for continuation of reform in the financial market. It provides robust evidence that interest rate channel of monetary transmission is effective. Thus it lends support to the current framework of monetary policy, which relies on interest rate (repo rate) as the principal instrument of monetary policy of the Reserve Bank of India. Our findings also suggest caution in using interest rate to contain inflation given its short-term significant negative impact on growth.

Suggestion for Further Research

Our finding validates interest rate channel of monetary transmission to wholesale price index (WPI) inflation, which was considered headline inflation during the period of our study till 2014-15. Now that the Reserve Bank of India has switched to a flexible inflation-targeting regime with the consumer price index (CPI) inflation as the headline inflation, future research should test the efficacy of interest rate channel of transmission to CPI inflation.