

The Effectiveness of Monetary Policy in Balochistan (Pakistan): An Empirical Investigation

Anahita Luni¹ and Dr. Kaneez Fatima²

ABSTRACT

Through this study we have investigated those channels of transmission mechanism that are behind the spread of effectiveness of monetary policy in the economy of Pakistan. These channels include, interest rate, exchange rate, bank lending rate and asset price channel. The study obtained monthly time series data over a period of 1996 to 2017. Considering the endogeneity of variables, we employed vector autoregressive model. The variables used are; output, inflation, call money rate, credit to private sector, Karachi stock exchange index, real effective exchange rate and lending weighted average rates. The results show that in addition to traditional interest rate channel, the credit, exchange and asset price channels actively participate in transmitting the mechanism of monetary policy to the real economy.

JEL Classification: E52, E58, C32

Key words: Monetary policy, transmission mechanism, vector autoregression (VAR)

1.0 INTRODUCTION

Monetary policy is the most widely used measure by the economists to maintain price level in an economy. The central bank of any country is considered to be the sole authority that manages the liquidity to create price stability and economic growth through monetary policy. Different techniques and measures of monetary policy are used by the central bank to regulate money supply in the economy. The primary focus of monetary policy is on promoting economic growth while preventing inflation (Noman and Khudri, 2015). Given the important role of central bank's policy in

¹ MS scholar at Department of Economics, University of Balochistan. Anahitaluni99@gmail.com

² Assistant Professor at IMS Department, University of Balochistan. Fatima.Sohail@hotmail.com

macroeconomic stabilization in many countries, the effectiveness of monetary policy in affecting aggregate demand and prices may vary with country to country or with circumstances in same country but its primary goal remains the same (Mishra and Montiel, 2016).

The primary motive of monetary policy in Pakistan, as laid down in the State Bank of Pakistan Act of 1956, is to achieve the goals put down by the government to regulate inflation and growth. Until 2006, the monetary policy framework of Pakistan was set to target monetary aggregates by using money supply as the monetary tool. Pakistan formally adopted the inflation-targeting policy framework in 2007 (Monetary policy statement, Jul-Dec 2007). Since then, significant moves have been employed to develop the framework that affects the financial situation of the economy. It is now using the monetary policy as a key instrument in controlling inflation.

The State Bank of Pakistan uses various tools to manipulate money supply in order to affect the macroeconomic variables and hence real economy. The instruments or tools are, 'open market operation (OMO), reserve requirement and monetary policy rate'. The State bank cannot control the prices directly, so it adopts the policy of transmission mechanism. It is a process by which the decisions of the State Bank are planned to regulate the aggregate demand, interest rate and money supply. The effectiveness of monetary policy spreads in the economy through different channels of transmission mechanism. These channels are, interest rate, exchange rate, credit and asset price channel. Changes in short-term interest rate affects the real rate of interest, which eventually affects aggregate demand. The bank lending channel influences the accessibility of firms and households to credit. The increased exchange rate tends to increase the relative prices of domestic goods. As these goods become expensive in comparison with imported goods, their demand decreases and ultimately lead to decrease in aggregate output. Asset price channel affects the equity prices, which changes the market value of firms and encourages investment.

In this paper, we have tried to investigate the transmission mechanism of monetary policy in Pakistan through different channels. The remaining portion of this paper include: literature review follows in section 2. Methodology in section 3, and empirical results in section 4. Last section contains conclusion on this study.

1.1 LITERATURE REVIEW

The effects of monetary policy are being investigated in literature for a long time. The empirical studies which used monetarist models suggest that economic activities in almost all countries whether developing or developed, are influenced by monetary policy. Monetary policy transmission simultaneously operates in the economy, through many channels, that is why, it is known as 'black box' [Bernanke and Blinder (1995)]. The basic aim of monetary policy is to achieve full employment level and stable prices in the economy. The tools of monetary policy are applied to attain this purpose. The process starts by changing the nation's monetary resources. To influence these resources or money supply, the central bank works in different ways. It directly controls the rate of excess reserves held by banks, or by selling and buying government securities in an open market. The channels by which transmission of monetary policy takes place are of much importance as described by Mishkin (1995). According to him, the real variables of economy such as, 'aggregate output and employment' are greatly affected by the actions of monetary policy through various channels.

Interest Rate Channel

The interest rate channel, also called 'the traditional channel', is the foremost method in regular banking system. The focus of this channel is on straight results of monetary policy actions on stable prices and investment. The real rate of interest is directly affected by changes in short term interest rate. These variations eventually affect firm investment and decision of household spending, which ultimately affects the extent of production and aggregate demand. This interest rate channel, due originally to Hicks (1937), lies in traditional Keynesian IS-LM model.

Credit Channel

The credit channel of monetary policy mechanism is another key channel that performs in cooperation with interest rate channel. Contractionary monetary policy is believed to reduce the credit availability to firms and households through the credit channel. Reduction in the availability of credit reduces owner's expenditure and financing which give on to a reduction in production. Monetary policy actions may alter the size of finance premium from outside. These changes in the size of finance premium can take place

via balance sheet and bank lending channel. Kashyap and Stein (1994) reproduced the thoughts on bank lending channel as original were presented by Roosa (1951). The extension of the IS-LM model presented by Bernanke and Blinder (1994) also highlights the importance of this additional channel. Bernanke and Gertler (1995) described that imperfections in money market play an important role in the balance sheet channel. They say that the cost of credit of a firm rises and the strength of its balance sheet decreases if market imperfections prevail. The tightening of monetary policy directly raises the credit of firm to cover its debt.

Exchange Rate Channel

Monetary policy can affect the exchange rate in the economy in two ways. First and the most important, through its effects on exports and secondly, through its effects on companies' balance sheets. The interest rate in a country tends to fall due to expanding monetary policy and it leads to a depreciation in domestic currency. As domestic currency becomes cheap in comparison with foreign currency, more of domestic currency is required to buy the same amount of foreign currency. Highly raised net exports and consequently increased aggregate spending are the results of this depreciation, [see for Fleming (1962), Mundell (1963), and Dornbusch (1976)].

Asset Price Channel

This channel does not affect the economy as the traditional channels do. But it is indeed an important channel. It is the interest rate that affects the price of assets directly. The affected asset prices will in turn affect the economy. There are two ways by which an easy monetary policy can raise equity prices, when interest rate fall, equity prices rises, and also increases the expected earnings of firms as the spending by households increases. Excessive equity prices can influence monetary basis in two ways, they increase the market value of firms comparative to the replacement value of capital, which encourages investment; also, referred to as Tobin's q theory¹. In addition to

¹ Tobin's q theory, as widely covered in the literature, provides a mechanism by means of which monetary policy affects the economy through its effects on the valuation of equities. Tobin defines q as the market value of firms divided by the replacement cost of capital. If q is high, the market price of firms is high relative to the replacement cost of capital, and new plant and equipment capital is cheaper relative to the market value of firms. Companies can

this, increase in value of the shares elevates the finances of household and therefore results in more consumption.¹

Recent studies describe the importance of various channels in transmission mechanism. Several economists have extended their studies and considered various channels. Carlino and DeFina (1997, 1998), Morsink and Bayoumi (2001), Amarasekara (2008), Jinzhao (2012) and Mishra et al. (2016) described the impact of monetary policy on different economies using the above channels. While, Das (2015) and Mengesha and Holmes (2013) examined the working of monetary policy in a particular channel.

There is so much work done in literature on monetary policy functioning in Pakistan. We may not be able to cover all the economists but, Rehman and Ahmed (2002), Asif et al. (2005), Chaudhry et al. (2012), Shabbir (2013), and Dilshad et al. (2016) are few of the numerous economists that established study on the techniques of monetary policy.

2.0 METHODOLOGY

The methodology consists of the following steps:

2.1 Data

To investigate the effectiveness of monetary policy through different channels, we used monthly data on, output (measured from industrial production index, IPI) inflation (measured from CPI), interest rate (call money rate), asset prices (Karachi stock exchange rate), credit to private sector, and broad money (M2). Data on all variables has been obtained from the State Bank of Pakistan except industrial production index, which has been taken from Ejaz and Iqbal (2019).²

then issue equity and get a high price for it relative to the cost of the plant and equipment they are buying. Thus investment spending will rise because firms can buy a lot of new investment goods with only a small issue of equity.

¹ According to Mdigliani's life cycle model, as widely covered in the literature, consumption spending is determined by the lifetime resources of consumers which are made up of human capital, real capital and financial wealth. A major component of financial wealth is common stock. When stock price rises the value of financial wealth increases, increasing the lifetime resources of consumers, thus raising consumption. Similarly, housing and land prices are an extremely important component of wealth and a rise in them increases wealth, thereby increasing consumption.

² Another measurement of output, used in literature is large scale manufacturing (LSM), however, in a recent paper (Ejaz and Iqbal, 2019), estimated IPI and showed that LSM covers only 10% of GDP, while IPI covers about 23% of GDP in Pakistan.

2.2 Econometric Model

As we attempt to investigate transmission mechanism of monetary policy, these variables may not be estimated through linear regression model due to endogeneity problem. Error term will be calculated with explanatory variables. Hence, it is appropriate to estimate simultaneous equation. The vector autoregression model (VAR) is a popular and appropriate approach to estimate simultaneous equation model with long time series data. So, we employ VAR model. The model is written as follows:

$$Y = \beta_0 + \sum \beta_i Y_{t-i} + \varepsilon_t \dots\dots\dots (i)$$

Where, Y= vector of endogenous variables (output, inflation, cmr, cps, ksei, re and m2)

B= parametric matrix,
 ε = error term

Before estimating VAR model, we examined the properties of data by test of stationarity (Augmented Dickey-Fuller test). All the variables have unit root in level but they are stationary in first difference.¹Hence, we estimated VAR on levels.

2.3RESULTS

We have estimatedVAR model for each channel separately as to show the outcome of the monetary policy clearly:

INTEREST RATE CHANNEL

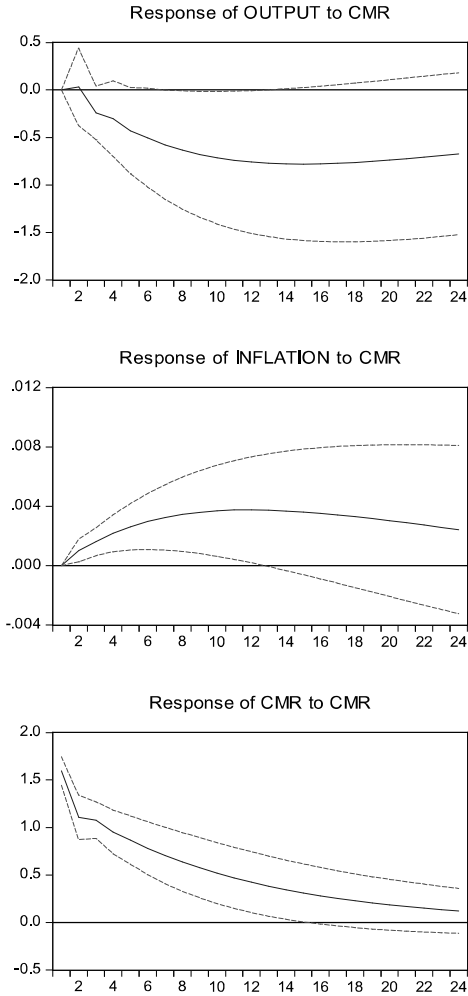
On account of evaluating the effects of monetary policy mechanism through this channel, we have estimated the impulse response functions of interest rate from VAR model. Figure below portrays the response of inflation and output to a change or shock in monetary policy variable (call money rate in our study) up to 24 months with a 95% confidence interval. The dotted lines show the confidence level. The values on the vertical lineconstitutes the variation of the variable from the original level as areaction to a given shock on the policy variable. The time passed after the shock or an innovation occurred often depicted on horizontal lines.As shown in figure 1,outputdeclines with a positive shock in call money rate. Although the

¹ To test for the long run relationship, we employed Johanson Cointegration test. The lag length of cointegration test was selected on the basis of AIC. We found that the variables are cointegrated.

decline is small, it seems persistent. The response of prices to call money rate is quite opposite to output. As interest rate rises, it gives rise to prices in the beginning, but quite persistently, they get close to the baseline in two years.

Fig 1: Response of output and inflation to call money rate

Response to Cholesky One S.D. Innovations \pm 2 S.E.

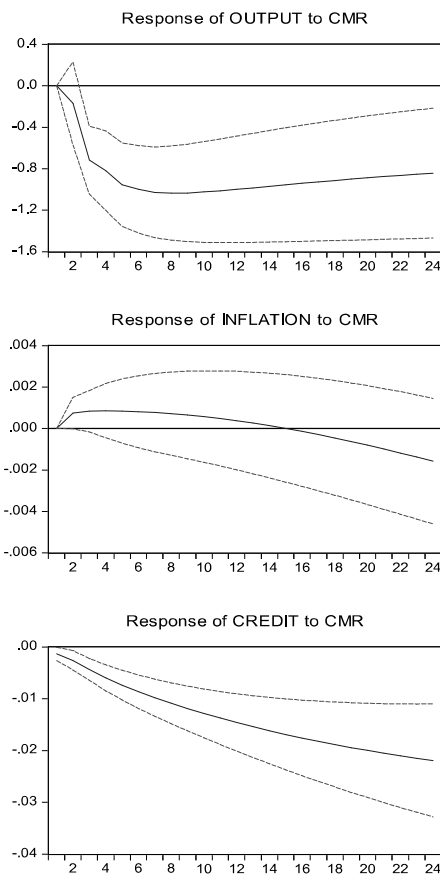


BANK CREDIT CHANNEL

To calculate the effects of bank credit channel, we added credit to private sector (CPS) to our previous VAR model to estimate the reaction of output and inflation. The following figure represents the impulse responses of all mentioned variables to an innovation in interest rate. Output falls with the tightening of monetary policy. Although the decline is very small, it seems persistent. Output rises again after 10th month. The inclined trend in output continues throughout the forecasted period. The prices increase a little in the beginning but tend to decrease in the 5th month and become negative after 15th month.

Fig 2: Impulse response of credit to private sector

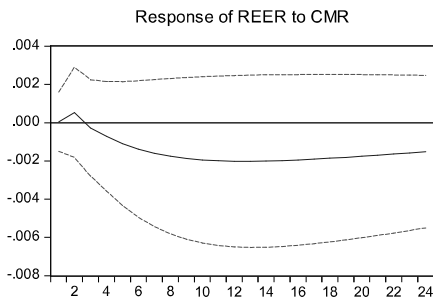
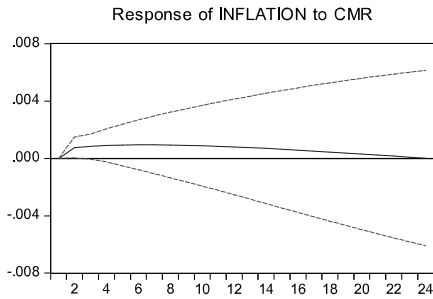
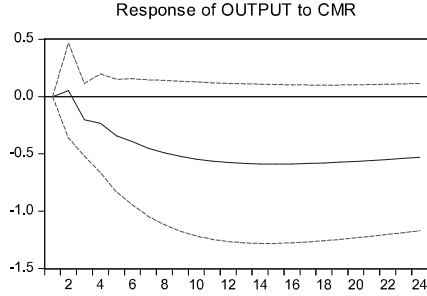
Response to Cholesky One S.D. Innovations \pm 2 S.E.



EXCHANGE RATE CHANNEL

To estimate the effects, we added real effective exchange rate in our VAR model. The results are depicted in figure below. The response of output is same as the previous models. It decreases in the beginning as interest rate increases, then tends to rise in 18th month. Prices decrease with the tightening of monetary policy, but they remain positive throughout the forecasted period.

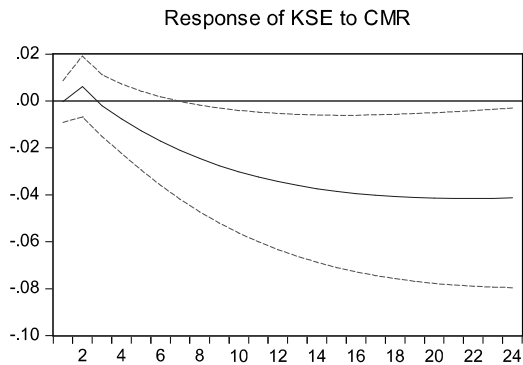
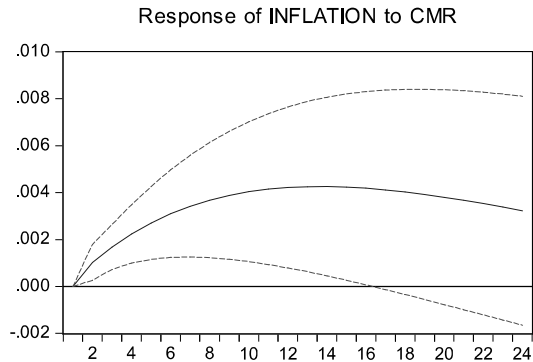
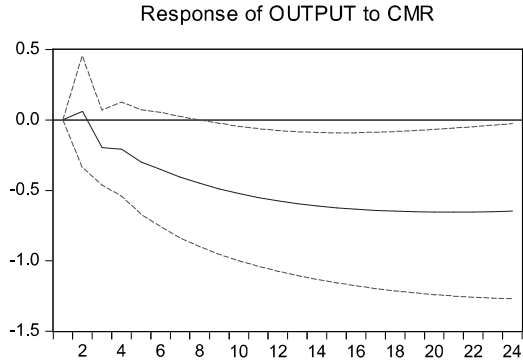
Response to Cholesky One S.D. Innovations \pm 2 S.E.



ASSET PRICE CHANNEL

We added log of Karachi stock exchange index to our model to show the effectiveness of monetary policy through asset price channel. The figure below shows the results of output and inflation after a shock in interest rate. With the tightening of monetary policy, output tends to decrease. The response of prices is positive and increasing in the beginning, they tend to fall at the end of 2nd year.

Response to Cholesky One S.D. Innovations \pm 2 S.E.



3.0 DISCUSSION

Our article analyses the monetary transmission mechanism in Pakistan. We have attempted to unfold the various channels of monetary mechanism in our analysis with the aid of the vector autoregression (VAR) approach. The VAR model enables us to study and explain the methods through which the monetary policy influences the economy. We estimated a model as our main model consisting of output, inflation and interest rate. To investigate the relative importance of other channels, we extended the main model by including different variables as monetary variables corresponding to the respective channel of monetary transmission. Then, we calculated the response of output and prices in each channel.

The reaction of output in all channels is negative in relation with contractionary monetary policy which is consistent with the theory. The reaction of prices is also consistent as they rise with the reduction in interest rate.

4.0 CONCLUSION

All the findings in our conclusion are consistent, however the financial system in Pakistan is not fully developed, the outcomes of monetary policy disappear through the economy in relatively shorter period of time. In addition to traditional interest rate channel, we have found that credit, exchange and asset price channels actively participate in affecting the economy of Pakistan through transmission mechanism.

DECLERATIONS

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Conflict of Interest: The author declares no conflict of interest.

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