Credit Channel of Monetary Policy Transmission: Evidence from Pakistan

Arif Saleem Cheema[*] and Muhammad Naeem[†]

Abstract

This paper estimates the transmission of monetary policy through bank credit channel in the context of Pakistan. For analysis purpose bound testing co-integration analysis and Error Correction Model is used with General to specific approach. Monthly data for the period of 2002 to 2012 is used in this study. Results of this study appear that bank credit channel does not provide additional leverage to authorities for the conduct of monetary policy. It means that increase in interest rate does not decrease the bank credits because banks make adjustment against monetary policy shocks by using their liquid financial instruments.

Key Words: Bank Credits, Monetary Policy

Introduction

This research examines the impact of monetary policy shocks on bank credits and transmission in the economic system of Pakistan through bank credit channel. Bank credit channel is one of the important channel of monetary policy transmission. Change in policy interest rate demonstrates the signals of monetary policy stance. It is worth mentioning here that accomplishment and achievement of monetary policy targets of development with financial stability would depend on how the interest rate signals are transmitted in the economy and how the businesses and individuals react (Jeevan, 2013). Effectiveness of bank credit channel depends on the stability of financial market of the country. Hence, significance and successful transmission of monetary decisions through credit channel fluctuate from country to country.

Theories of monetary transmission mechanism indicate that there are mainly four channels of monetary transmission such as asset price channel, exchange rate channel, expectation channel and credit channel. Among these channels credit channel is considered most effective channel according to the literature (Mishkin, 1995; Bernanke and gertler, 1995; Cuthbertson,1985).

[*]Arif Saleem Cheema, Ph.D. Scholar, International Islamic University Islamabad. Email: arifcheema33@gmail.com
† Muhammad Naeem, Assistant Professor, Faculty of Management Sciences, Foundation University Islamabad.

This study investigate bank credit channel in detail in the developing country like Pakistan. Pakistan economy is one of the growing economy with strong banking sector, an investigation of its banking behavior and the practicality of its monetary policy present the significant insight into the bank credit channel.

The study help to recognize the relevant financial variables that increase our understanding of the relationship between the financial and real sector of the economy, it also provide a deep and better understanding of transmission mechanism that would help the policy makers to understand the movements in financial variables more accurately. A good choice of targets depend on comprehensive information about the transmission mechanism of monetary policy; if the credit channel is a significant part of monetary transmission system then bank portfolios required more concentration.

Literature Review and Theoretical Framework
Few studies have been conducted in the context of Pakistan on monetary policy transmission mechanism at macro level. Agha et al. (2005) study the channels of monetary policy transmission in Pakistan. The results show that banks play an important role in the transmission mechanism through interest rate channel and in addition asset price channel found to be active but exchange rate channel found to be less significant. Alam and Waheed (2006) has taken first step to investigate the transmission of monetary policy in Pakistan across different sectors of the Pakistan economy. Abdul Qayyum (2002) investigates the demand for bank credit by the private business sector in the context of Pakistan.

Philip and Muibi (2012) investigate the monetary policy transmission channels in Nigeria. Granger Causality and Vector Auto-Regressive methods utilized. Results show that interest rate channel is very significant in manufacturing and agriculture sectors. On the other hand, exchange rate is very effective from monetary policy transmission to wholesale/retail, mining and construction sectors. An important finding with theoretical explanation is that interest rate is fundamental variable in all channels by which monetary decisions transfer through the real sector. on the basis of this fact consequent analysis is represented schematically as:

$$Ms\uparrow \rightarrow i\downarrow \rightarrow PSC\uparrow \rightarrow Ps\uparrow \rightarrow Er\downarrow \rightarrow I\uparrow \rightarrow Y\uparrow$$

$Ms\uparrow$ represent the expansionary monetary policy in which government purchases the securities by open market operation, leading to a decrease in ($i\downarrow$) interest rate, as a result:(a) rise in ($PSC\uparrow$) bank credits to private

business sector; (b) increase in (Ps↑) security prices show the opposite relationship between interest rate and security prices and (c) fall in (Er↓) exchange rate; these results increase the (I↑) investment and output (Y↑).
 In our present context, the credit channel of transmission of monetary policy is examined under equilibrium condition of demand and supply of credit at an aggregated level of all banks for the purpose of generalizability. Further our focus is more on identifying the lag at which the change in policy interest rate gets transmitted to bank credit channel and robustness of that lag (Khan et al., 2013).

Current research theories high light the significance of informational asymmetries in bank credit market and explain how the rise in inflation rate negatively influence the bank credit market and adverse consequence for financial sector performance (Huybens and smith 1998, 1999). The general attribute of these theories is severe informational resistance. Due to this, a rise in inflation rate brings down the real rate of return on assets and money in general. The indirect decrease in real returns worsens the credit market resistance. This credit market frictions show the way of credit rationing grows to more severe when inflation rate increase. Consequently financial sector reduces the loans, resourses distribution becomes less effective and an intermediary activity reduces with negative implications for capital investment. A decrease in formation of capital adversely affects both equity market activities and economic performance (Huybens & Smith, 1999).
H1: There is long term relationship between bank credits and monetary policy shocks
H2: There is short term relationship between bank credits and monetary policy shocks

Research Methodology and Econometric Models
The estimation is done by using monthly data for the period of 2000 to 2012. Bank credit and real effective exchange rate data (REER) is taken from IFS. Pakistan Stock Exchange is collected from yahoo finance. Consumer Price Index (CPI) is collected from Federal Bureau of Statistics (FBS).

Model of this study is derived from Ehrmann et al. (2001), that is based on the model of Bernanke and Blinder (1988).

$$\Delta Lcr_t = \alpha_0 + \alpha_1 Lcr_{t-1} + \alpha_2 Er_{t-1} + \alpha_3 Inf_{t-1} + \alpha_4 Lds_{t-1} + \alpha_5 Rip_{t-1} + \alpha_6 Rksi_{t-1} + \alpha_7 Tb_{t-1}$$

$$+ \sum_{i=0}^{12} \beta\, \Delta Er_{t-i} + \sum_{i=0}^{12} \gamma\, \Delta Infl_{t-i} + \sum_{i=0}^{12} \delta\, \Delta Lds_{t-i} + \sum_{i=0}^{12} \theta\, \Delta Rip_{t-i} + \sum_{i=0}^{12} \vartheta\, \Delta Ksi_{t-i}$$

$$+ \sum_{i=0}^{12} \rho\, \Delta Tb_{t-i} \ldots\ldots\ldots\ldots\ldots. Eq(1)$$

Long run dynamics (ϵ_{t-1}) are captured in ECM Model that is a lag of residuals. These residuals are represented in the long run relationship equation given below equation (2).

$$Lcr_t = \alpha + \beta_1 Er_t + \beta_2 Infl_t + \beta_3 Lds_t + \beta_4 Rip_t + \beta_5 Rksi_t + \beta_6 Tb_t + \epsilon_t \ldots\ldots Eq(2)$$

General model of error correction mechanism is written in equation (3) that represents the both short term relationship and long term relationship.

$$\Delta Lcr_t = \varphi + \sum_{i=1}^{12} \alpha\, \Delta Lcr_{t-i} + \sum_{i=0}^{12} \beta\, \Delta Er_{t-i} + \sum_{i=0}^{12} \gamma\, \Delta Infl_{t-i} + \sum_{i=0}^{12} \delta\, \Delta Lds_{t-i}$$

$$+ \sum_{i=0}^{12} \theta\, \Delta Rip_{t-i} + \sum_{i=0}^{12} \vartheta\, \Delta Ksi_{t-i} + \sum_{i=0}^{12} \rho\, \Delta Tb_{t-i} + \omega\epsilon_{t-1} + \mu_t \ldots\ldots. Eq(3)$$

Testing of ARDL Co integration Analysis
Co integration analysis is performed by using the bound testing approach or ARDL approach with General to Specific methodology to check the long term relationship between dependent variable (LCR) and independent variables (Er, Infl, Lds, Rip, Rksi and Tb). General model for testing cointegration is given in Equation (i).

$$\Delta Lcr_t = \alpha_0 + \alpha_1 Lcr_{t-1} + \alpha_2 Er_{t-1} + \alpha_3 Inf_{t-1} + \alpha_4 Lds_{t-1} + \alpha_5 Rip_{t-1} + \alpha_6 Rksi_{t-1}$$

$$+ \alpha_7 Tb_{t-1} + \sum_{i=0}^{12} \beta\, \Delta Er_{t-i} + \sum_{i=0}^{12} \gamma\, \Delta Infl_{t-i} + \sum_{i=0}^{12} \delta\, \Delta Lds_{t-i}$$

$$+ \sum_{i=0}^{12} \theta\, \Delta Rip_{t-i} + \sum_{i=0}^{12} \vartheta\, \Delta Ksi_{t-i} + \sum_{i=0}^{12} \rho\, \Delta Tb_{t-i} \ldots\ldots\ldots\ldots. Eq(i)$$

ECM model is a category of multiple time series models that directly estimate the speed of adjustment of dependent variable towards the equilibrium due to the change in independent variables. Error correction

model (ECM) with General to Specific methodology is used in this study for the estimation of bank credit channel of monetary policy transmission. General model of ECM include short run dynamics and long run dynamics as well. In short run dynamics all variables are regressed with dependent variable with twelve lag values. In this model ΔLcr represent the first difference of bank credits to private sector that is a dependent variable in this study as used by Jeevan kumar (2013) and Abdul Qayum (2002). In bank credit channel inflation (Infl), bank depostis (ΔLds)/money supply, GDP(Rip) and Interest rate(ΔTb) are investigated in Pakistan context by Abdul Qayyum (2002), Agha et al,(2005) and Safia Shabir (2012). In this study exchange rate (ΔEr) and KSE index (Ksi) is first time regressed with bank credit to private sector in credit channel of monetary policy transmission.

Long run dynamics ($\in_{t-1}$) are also captured in ECM Model that is a lag of residuals. These residuals are represented in equation (iii).

$$Lcr_t = \alpha + \beta_1 Er_t + \beta_2 Infl_t + \beta_3 Lds_t + \beta_4 Rip_t + \beta_5 Rksi_t + \beta_6 Tb_t + \epsilon_t \dots \dots Eq(iii)$$

Long run dynamics represents that what is the speed of adjustment of errors in long run or how quickly model is going towards equilibrium.

Conclusion

This study estimates the bank credit channel of monetary policy transmission in the context of Pakistan. For this intention we used multi step methodology, that is, initially unit root test is conduct to check the stationarity of the variables, Cointegration analysis by using bound testing approach is applied to check the long run relationship and consequently ECM (Error Correction Mechanism) is used to incorporate the short run relationship and the significance of long run relationship.

The result show that there is a long run cointegration relationship between bank credit to private business sector and inflation, interest rate, bank deposits, exchange rate, industrial production index and asset prices. Moreover, the preferred Error correction model, estimated by the General to Specific approach, is found to be stable throughout the study period. Results of this study appear that bank credit channel does not provide additional leverage to authorities for the conduct of monetary policy. It means that increase in interest rate does not decrease the bank credits because banks make adjustment against monetary policy shocks by using their liquid financial instruments. With the latest developments in financial sector, banks have many newly growing sources of funds that permit them to offset the monetary policy shocks. So Bank credit channel is not found to be effective in the transmission of monetary

policy in the context of Pakistan. This result is found to be consistent with the findings of Yong et al (2007); Romer and Romer (1990).Garretsen and Swank (2003) found that banks are reluctant to reduce bank credits in the result of monetary policy shocks in order to development long term and good relationships with their corporate clients. By making adjustments in liquid financial instruments, banks can avoid the effects of monetary policy shocks at least in short term.

References:
Asif I A, Noor A, Yasir A M and Hashtam S (2005)."Transmission Mechanism of Monetary Policy in Pakistan", *SBP Research Bulletin,* Vol.1, No.1.

Alam, T., & Waheed, M. (2006). The Monetary Transmission in Pakistan. A Sectoral Analysis: Pakistan Institute of Development Economics. *Munich Personal RePEc Archive* (MPRA) No. 2719.

Abdul Qayyum (2002), "Demand for Bank Lending by the Private Business Sector in Pakistan", *The Pakistan Development Review,*pp.149-159.

Bernanke B S and Blinder A S (1988), "Credit, Money and Aggregate Demand", *American Economic Review*, Vol. 78, No. 2, pp. 435-439.

Cuthbertson, K. (1985) Bank Lending to UK Industrial and Commercial Companies. *Oxford Bulletin of Economics and Statistics* 42:2, 91–118.

Ehrmann M, Leonardo G and Jorge Martinez. (2001), "Financial Systems and the Role of Monetary Policy Transmission in the Euro Area", Working Paper Series No. 105, December, European Central Bank.

Huybens, E., & Smith, B. D. (1999). Inflation, financial markets and long-run real activity. *Journal of monetary economics*, *43*(2), 283-315.

Jeevan, K. K. (2013), "credit channel of monetary policy transmission in India, How effective and long is the lag", *Journal of applied economics,* Vol.XII, No.1.

Khan, F., Muneer, S. & Anuar, M. A. (2013). Relationship between Stock Prices and Economic Variables: Sectoral Analysis. *Actual Problems of Economics*, 5(143), 544-553

Mishkin, F. G. (1995) A Symposium on Monetary Transmission Mechanism. *Journal of Economic Perspectives* 9:4, 3–10.

Philip I and Muibi O (2012), "The Monetary Transmission Mechanism in Nigeria: A Sectoral Output Analysis", *International Journal of Economics and Finance*, Vol.4, No.1.

Safia, S. (2012) Balance Sheet Channel of Monetary Transmission in Pakistan: An Empirical investigation.*Research Bulletin SBP,*Vol.8, No.1.