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Monetary Policy and Credit Availability to SMEs in Pakistan

Mudassar Ali Khan

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Abstract
In addition to historical perspectives with which the issue of SMEs' access to finance has been brought to light, this paper serves as an attempt to look into the relationship between monetary policy changes and their impact on the size of credit to SMEs in Pakistan. Given the available data, the existence of credit channel of monetary policy transmission mechanism has been explored through running a multiple regression. The redistribution of banks' loan supply determined by the significantly negative relationship between credit to SMEs and credit to Large Enterprises provides reasonable evidence that there exists a balance sheet branch of credit channel.

I - Introduction

Global financial crisis and subsequent economic meltdown, in the last few years, have remained focus of an intense debate among observers and economists worldwide. The enormity of matter not only caused panic in the developed countries but also crept into the domain of emerging economies like Pakistan. Pakistan, being an economy already engaged in overcoming its structural weaknesses, was not equipped to absorb such an exogenous shock and therefore stabilization policies undertaken by major developed economies could not be pursued as a benchmark. In order to dilute the severity of recession preceded by credit crunch, economic managers in the developed world have been urged to call for central banks to relax monetary policy that could lead to greater credit availability. On the contrary, Pakistan has been observing monetary policy tightening leading towards increasing cost of credit. Referring to this global macroeconomic affair in comparison with Pakistan is indeed a preamble to study a similar relationship between monetary policy and credit availability to SMEs in Pakistan.

The monetary transmission mechanism is a process through which monetary policy actions affect the ultimate policy goals i.e. output and inflation. In order to determine the transmission of monetary policy's impact on the availability of credit to SMEs, distinction between the following two key channels to SME sector needs to be established.

Interest rate channel is the most extensively discussed and recognized monetary policy transmission channel and corresponds to the changes in the demand side of credit market.[1] Transmission through this channel hinges on the relationship between changes in the policy rate and short term real interest rate leading towards changes in cost of financing. Moreover, monetary policy can also affect the supply side of the credit market through its credit channel transmitting those changes in monetary policy that affect firms' tendency to borrow money as well as banks' capacity to lend money.[2] In order to ascertain whether monetary policy

[1] B. Bernanke & A. Blinder, "The Federal Funds Rate and The Channels of Monetary Transmission" American Economic Review 82, (1992): 901-921.
[2] B. Bernanke & M. Gertler, "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", Journal of Economic Perspectives 9, (1995): 27-48.

affects the supply side of the credit market for SMEs, this paper investigates the existence of credit channel in Pakistan. Credit channel consists of Bank Lending Channel and Balance Sheet Channel. Bank Lending Channel determines whether monetary policy affects aggregate loan supply whereas Balance Sheet Channel establishes if monetary policy redistributes loan supply from risky borrowers to relatively more secure borrowers[3] (in this case, from SMEs to large enterprises and government).

Literature Review

To identify whether the change in the level of credit is supply side or demand side, primary loan characteristics have to be explained. Commitment loan gives borrower a right to borrow up to certain amount over a fixed period and the bank is committed to lend upon request, regardless of market conditions, therefore, changes in commitment loans are assumed as a demand side shock. On the other hand, spot loan is made when there is no prior commitment and any change in its level is assumed to be a supply side shock[4]. Reduction in spot lending relative to commitment lending indicates a fall in loan supply[5].

Asymmetric information between agents may create financial frictions and hence affect the banks' costs for borrowing as well as lending funds. Monetary policy's impact on credit supply is contingent on the relationship between these frictions and short term real interest rates. Based on two different financial frictions produced by the agency costs, credit channel can be further divided into the bank lending channel and the balance sheet channel[6].

Classifying both channels in isolation is complicated to the extent that they provide similar empirical estimates regardless of how they operate. Changes in the amount of bank loans relative to commercial paper, a benchmark for loan demand, have been analyzed by Kashyap, Stein, and Wilcox (1993) to identify changes in bank loan supply[7]. The relationship claimed as the bank lending channel by Kashyap, Stein, and Wilcox is considered as the balance sheet channel by Oliner and Rudebusch (1996) as they argue that the former authors are gauging a shift in lending from small firms to large firms[8]. In view of the fact that the balance-sheet constrained borrowers and the bank dependent borrowers

[3] B. Bernanke & M. Gertler, "Agency Costs, Net Worth, and Business Fluctuations", American Economic Review 79, (1989): 14-31.
[4] L. Black & R. Rosen, "The Effect of Monetary Policy on the Availability of Credit: How the Credit Channel Works", FRB of Chicago Working Paper No. 2007-13 (revised) 2011.
[5] G. Sofianos, P. Wachtel & A. Melnik, "Loan Commitments and Monetary Policy", Journal of Banking and Finance 14, (1990): 677-89.
[6] Bernanke & Gertler, "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", 27-48.
[7] A. Kashyap, J. Stein & D. Wilcox, "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance", American Economic Review 83, (1993): 78-98.
[8] S. Oliner & G. Rudebusch, "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Comment. *American Economic Review* 86, (1996): 300-309.

overlap with each other, Gertler and Gilchrist (1994) do not find separating the channels as an appropriate option[9].

Based on the expectation that banks cut back their overall loan supply during tightened monetary policy regime, studies pertinent to the bank lending channel have emphasized on measuring changes in aggregate loan supply. According to Kashyap and Stein (1995), raising wholesale liabilities is more costly for smaller and less liquid banks and therefore loan supply of these banks is more vulnerable to changes in monetary policy[10]. Similarly, the association between monetary tightening and higher expected costs of raising non-reservable liabilities has been established in various other studies.

Whereas studies related to the balance sheet channel have underscored the issue of identifying a redistribution of loan supply. In the periods of tightened monetary policy, banks make relatively more secure loans[11]. As highlighted by the balance sheet channel, banks reallocate their loan supply toward large firms and away from small firms. Furthermore, this channel is reinforced by Bernanke, Gertler, and Gilchrist (1996) who study cross-sectional implications of the balance sheet channel with respect to firm characteristics[12]. One of the findings of this study is that the smaller manufacturing firms that face relatively higher agency costs are more likely to be affected by the economic downturn than the larger manufacturing firms.

Tightened monetary policy results in lower business investment not only because of higher cost of capital but also due to the reduced supply of bank loans mostly to SMEs. Mainly attributable to financial sector reforms and continued expansion of private sector, the impact of credit channel in Pakistan is likely to improve. Moreover, dependence on bank finance may decline due to growing capital market. However, increased emphasis on SMEs in Pakistan outweighs the gradually developing capital market and hence adds to the importance of bank-lending channel. In the presence of information frictions in financial markets, SMEs tend to rely more on bank loans for external finance than issuing securities in the open market[13]. (Agha, Ahmed, Mubarik and Shah (2005)).

[9] M. Gertler & S. Gilchrist, "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms", Quarterly Journal of Economics 109, (1994): 309-340.
[10] A. Kashyap & J. Stein, "The Impact of Monetary Policy on Bank Balance Sheets", Carnegie-Rochester Conference Series on Public Policy 42, (1995): 151-195.
[11] W. Lang & L. Nakamura, "Flight to Quality in Bank Lending and Economic Activity", Journal of Monetary Economics 36, (1995): 145-164.
[12] B. Bernanke, M. Gertler & S. Gilchrist, "The Financial Accelerator and the Flight to Quality", The Review of Economics and Statistics 78, (1996): 1-15.

[13] N. Ahmed, H. Shah, A.I. Agha & Y.A. Mubarik, "Transmission Mechanism of Monetary Policy in Pakistan", SBP Working Paper Series No. 09, (2005).

Macroeconomic Perspective

Prior to moving on towards addressing the main question of this study, it will be useful to look into the credit channel with an overall macroeconomic perspective. Agha, Ahmed, Mubarik and Shah (2005) find that, "monetary tightening leads first to a fall in domestic demand, primarily investment demand financed by bank lending, which translates into a gradual reduction in price pressures that eventually reduces the overall price level with a significant lag. In addition to the traditional interest rate channel, the results point to a transmission mechanism in which banks play an important role"[14].

Financial reforms and crowding-in of private sector credit due to weakening fiscal dominance were amongst the factors that possibly enhanced bank's role[15]. Recent indicators, on the contrary, seem to have completely changed as increased fiscal dominance has triggered higher government borrowing from the central bank leading towards crowding-out of private sector credit. It takes us towards empirically testing if increasing government borrowing has trimmed down private sector's share of credit.

Monthly data from June 2006 to April 2011 has been mined from SBP's economic data archives and following OLS has been run:

LPB = a + b1 (MP) + b2 (GovtB) + b3 (BSpread)

LPB, here, denotes Loans to Private Businesses. MP, GovtB and BSpread stand for monetary policy, government borrowing and banking spread respectively. The estimated model with R^2 equal to 0.837[16] is as below:

LPB = -0.038 (MP) – 0.684 (GovtB) -0.327 (BSpread)

By looking at the coefficients[17], it can be stated that there seems to be a significantly negative relationship between Loans to Private Businesses (LPB) and Government Borrowing (GovtB). It, therefore, empirically supports the perception that higher government borrowing due to mounting fiscal dominance is munching through private sector's portion of the available credit. This outcome provides substance to our broader macroeconomic standpoint and paves way for examining this transmission mechanism channel further down to the SME sector of Pakistan.

Although the issue of credit availability to SMEs in Pakistan has often been discussed, this paper approaches the issue from a different angle as indicated in the literature review. The Paper is an attempt to contribute to studies that may serve as the basis of future policy formulation.

[14] ibid.
[15] Ibid.
[16] See Annex 1
[17] See Annex 1

Data and Statistics

Quarterly data from March 2008 to December 2010 has been extracted from Monetary Policy Compendiums, Development Finance Review and Economic data archives of State Bank of Pakistan (SBP). In line with the credit channel of monetary transmission mechanism, Real Interest Rate has been taken as a variable to determine the monetary policy trend and is calculated by adjusting nominal interest rate for expected inflation[18]. Statistics for nominal interest rate (policy rate) have been gathered from the monetary policy statements announced during the corresponding period. Current inflation is assumed to be next quarter's inflation. In order to calculate the figure of real interest rate, current inflation (YOY Core Inflation Trimmed) has been subtracted from the nominal interest rate.

The data for Credit to SMEs and SMEs' non-performing loans (NPLs) has been extracted from the quarterly reports of SBP Development Finance Review, whereas indicators like Credit to Large Enterprises, Government Borrowing and Banking Spread have been derived from the Economic Data archives of SBP. It has been assumed that Loans to Private Sector Businesses include Microfinance, Credit to SMEs and Credit to Large Enterprises. In order to arrive at the figure of Credit to Large Enterprises, microfinance and credit to SMEs have been subtracted from loans to private sector business.

Government Borrowing consists of the loans to government from SBP and scheduled banks. Banking spread is assumed to be the difference between Weighted Average Lending Rates (WALR) of Gross Disbursements and Weighted Average Deposit Rates (WADR) of Fresh Deposits.

Methodology

In order to determine how Credit to SMEs (CSME) is affected by changes in monetary policy, the above described data has been tested through the following multiple regression model:

$$CSME = a + b1\,(MP) + b2\,(CLE) + b3\,(GovtB) + b4\,(BSpread) + b5\,(NPL)$$

Real interest rate has been used to measure monetary policy (MP). To incorporate other factors that can influence loan supply and demand, we include Credit to Large Enterprises (CLE), Government Borrowing (GovtB), Banking spread (BSpread), and SMEs' NPLs (NPL). Credit to Large Enterprises and Government Borrowing indicate the relatively better lending options for banks, banking spread indicates the overall risk in the economy, whereas SMEs' NPLs is a variable that shows the effect of conditions on banks' lending behavior towards SMEs.

[18] Black & Rosen, "The Effect of Monetary Policy on the Availability of Credit: How the Credit Channel Works".

Due to the unavailability of data on commitment and spot loans to SME sector in Pakistan, the identification strategy suggested in the literature may not exactly be pursued. Bank lending channel, as it determines whether monetary policy affects aggregate loan supply, may not be established without making a clear distinction between supply and demand sides of Credit to SMEs. Therefore, this paper has only focused on studying the existence of balance sheet channel so as to establish if monetary policy redistributes loan supply from SMEs to Large Enterprises and the Government. This channel can be estimated without essentially distinguishing between supply and demand sides of the credit market. Along with determining the relationship between credit to SMEs and monetary policy, the above equation also demonstrates the connection between the level of credit to SMEs and that of credit to Large Enterprises and the Government. The coefficients b3 and b5 estimated through the above regression may elucidate the relationship among variables and hence the scope of balance sheet branch of the credit channel. To determine such a relationship, following hypothesis is tested:

H_0 : There is no relationship between the level of Credit to Large Enterprises and the level of Credit to SMEs. ($b2 = 0$)

H_A : There is a positive / negative relationship between the level of Credit to Large Enterprises and the level of Credit to SMEs. ($b2 \neq 0$)

Analysis and Findings

Multiple regression[19] has been run to test the level of redistribution of credit from SMEs to Large Enterprises and Government.

CSME= 0 - .009 (MP) - .969 (CLE) - .023 (GovtB) - .014 (BSpread) - .007 (NPL)

The coefficient of determination R^2 measures the proportion of the total variation in the dependant variable (Y) explained by the independent variable (X). According to the above regression model, R^2 of 1.00 indicates that the regression line perfectly fits the data.

Due to the constraint of not being able to differentiate between the supply and demand of credit to SMEs (CSME), we are only relying on the logic that any significant evidence on the trade off between credit to SMEs and credit to Large Enterprises is indicated by banks' redistribution of loans and is therefore a supply-side phenomenon. Beta of credit to Large Enterprises (CLE) provides sufficient evidence in this regard and explains an inverse relationship with credit to SMEs (CSME), implying that one unit increase in the level of credit to large enterprises decreases the level of credit to SMEs by .969 units. Moreover, null hypothesis of no relationship between the level of credit to large enterprises and

[19] See Annex 2

the level of credit to SMEs (b2=0) is rejected as the calculated t statistic[20] (-44.083) of the corresponding coefficient (-0.969) is greater than $\mathbf{t_{\alpha/2\ ,\ df}}$ **(2.201)** where α=0.05 and df = 11.This statistic gives legitimacy to the argument that SME sector in Pakistan is being crowded out against the large enterprises as banks redistribute their loan supply from risky borrowers to the ones who are relatively more secure and therefore substantiates the existence of balance sheet channel as a monetary policy transmission mechanism in the credit market of Pakistan.

On the other hand, the coefficient of the real interest rate, -0.009, indicates that monetary policy has an insignificant relationship with the level of credit to SMES regardless of making distinction between its supply and demand. Although the coefficients of Government Borrowing, Banking Spread and SMEs' NPLs do not indicate any significant link, they at least reinforce the notion of negative relationship between their corresponding variables and Credit to SMEs.

Conclusion

Pakistan, due to its inherent structural inadequacies, continues to be labeled as a high inflation and high interest economy. Emergence of market based money and foreign exchange markets following financial sector reforms in 2000s substantiates the role and effectiveness of monetary policy in Pakistan. As domestic and global price pressures began to upsurge, SBP changed its monetary policy stance in 2005 and loose monetary policy along with other structural measures to open up the economy were replaced by a tight monetary policy regime.

In the wake of international financial crisis and turbulent economic state of the country, this paper serves as an attempt to explore Pakistan's credit market from the avenues that have been slightly overlooked so far. Beyond investigating the traditional demand oriented changes in the credit to SMEs through interest rate channel, this study seeks to establish the existence of supply side through balance sheet branch of the credit channel. Data, with all its constraints, has been collated from various publications and reports of the State Bank of Pakistan (SBP). An OLS (Ordinary Least Squares) approach has been adopted to run the Multiple Regression. Relying on the statistics, this paper manages to establish a significantly negative relationship between the levels of credit to SMEs and Large Enterprises. Such relationship substantiates the redistribution of banks' loan supply from SMEs to large enterprises and hence the balance sheet channel of monetary policy transmission mechanism. Referring back to the estimates under Macroeconomic Perspective reinforces the notion that Government being relatively more secure borrower than private sector takes away latter's share of credit. Although no strong inference can be drawn due to insufficient observations, there is some indicative evidence that explains SME sector's crowding out of credit market for private sector as banks and financial institutions

[20] See Annex 2

find small and medium businesses rather riskier and less credible. However, longer data period and further research may provide more definitive results and shed light on the existence of balance sheet channel of monetary policy transmission mechanism.

References

Ahmed, N., H. Shah, A.I. Agha, & Y.A. Mubarik. “Transmission Mechanism of Monetary Policy in Pakistan”. *SBP Working Paper Series No. 09,* (2005).

Bernanke, B., & A. Blinder. “The Federal Funds Rate and the Channels of Monetary Transmission”. *American Economic Review* 82, (1992): 901-921.

Bernanke, B., & M. Gertler. “Agency Costs, Net Worth, and Business Fluctuations”. *American Economic Review* 79*,* (1989): 14-31.

Bernanke, B., & M. Gertler. “Inside the Black Box: The Credit Channel of Monetary Policy Transmission”. *Journal of Economic Perspectives* 9, (1995): 27-48.

Bernanke, B., M. Gertler, & S. Gilchrist. “The Financial Accelerator and the Flight to Quality”. *The Review of Economics and Statistics* 78, (1996): 1-15.

Black, L., & R. Rosen. “The Effect of Monetary Policy on the Availability of Credit: How the Credit Channel Works”. *FRB of Chicago Working Paper No. 2007-13* (revised2011).

den Haan, W., S. Summer, & G. Yamashiro. “Bank Loan Portfolios and the Monetary Transmission Mechanism”. *Journal of Monetary Economics* 54, (2007): 904-924.

Gertler, M., & S. Gilchrist. “Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms”. *Quarterly Journal of Economics* 109, (1994): 309-340.

Kashyap, A., & J. Stein. “The Impact of Monetary Policy on Bank Balance Sheets”. *Carnegie-Rochester Conference Series on Public Policy* 42*,* (1995): 151-195.

Kashyap, A., & J. Stein. “What Do a Million Observations on Banks Say About the Transmission of Monetary Policy?”. *American Economic Review* 90, (2000) 407-428.

Kashyap, A., J. Stein, & D. Wilcox. “Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance”. *American Economic Review* 83, (1993): 78-98.

Lang, W., & L. Nakamura. “Flight to Quality in Bank Lending and Economic Activity”. *Journal of Monetary Economics* 36, (1995): 145-164.

Oliner, S., & G. Rudebusch. “Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance: Comment”. *American Economic Review* 86, (1996): 300-309.

Romer, C., & D. Romer. “New Evidence on the Monetary Transmission Mechanism”. *Brookings Papers on Economic Activity,* (1990): 149-198.

Sofianos, G., P. Wachtel, & A. Melnik. “Loan Commitments and Monetary Policy”. *Journal of Banking and Finance* 14, (1990): 677-89.

State Bank of Pakistan. *Development Finance Review (Various Issues).*

State Bank of Pakistan. *Economic Data.*

State Bank of Pakistan. *Monetary Policy Compendium (Various Issues).*

Tasneem, A. & M. Waheed. “Sectoral Effects of Monetary Policy: Evidence from Pakistan”. *Pakistan Development Review, Volume 45, No. 4, Part II Winter,* (2006).

Annex 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.915[a]	.837	.829	1.71651		

a. Predictors: (Constant), BSpread, MP, GovtB

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	835.029	3	278.343	94.468	.000[a]
	Residual	162.053	55	2.946		
	Total	997.082	58			

a. Predictors: (Constant), BSpread, MP, GovtB

b. Dependent Variable: LPB

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	61.994	2.121		29.234	.000
	MP	-.001	.002	-.038	-.681	.499
	GovtB	-1.193	.124	-.684	-9.605	.000
	BSpread	-1.959	.415	-.327	-4.726	.000

a. Dependent Variable: LPB

Annex 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	1.000[a]	1.000	1.000	.02856		

a. Predictors: (Constant), NPL, MP, BSpread, GovtB, CLE

b. Dependent Variable: CSME

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.755	5	6.951	8.524E3	.000[a]
	Residual	.005	6	.001		
	Total	34.760	11			

a. Predictors: (Constant), NPL, MP, BSpread, GovtB, CLE

b. Dependent Variable: CSME

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	99.713	1.791		55.661	.000
	MP	-6.191E-5	.000	-.009	-1.215	.270
	CLE	-.996	.023	-.969	-44.083	.000
	GovtB	-2.545E-7	.000	-.023	-2.095	.081
	BSpread	-.044	.027	-.014	-1.616	.157
	NPL	-.002	.007	-.007	-.254	.808

a. Dependent Variable: CSME