

Impact of Monetary Policy on Loan Availability to Small and Medium Enterprises in Pakistan



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CERTIFICATE

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ABSTRACT

Small and medium enterprises (SMEs) play an integral role in the economic success of a country. However SME sector has not been able to realize its true potential due to policy bias and lack of attention from the government. The following study establishes a relation between changes in Monetary policy and its effect on loan availability to SMEs in Pakistan. Johansen cointegration technique is used to establish a long term cointegrating relationship between the variables, whereas Vector Error Correction Model (VECM) was employed to ascertain the error correction term. The results of the study establishes a positive relationship between Monetary policy and loan to SMEs in Pakistan. Existence of Balance sheet branch of Credit channel of Monetary policy transmission is also established by including government borrowing and loans to large enterprises as variables in our models. In the light of this study policy makers can shift their policies to ensure that SME sector in Pakistan has adequate access to credit and consequently contribute to the national GDP.

CHAPTER 1

INTRODUCTION

1.1 Background

In terms of populace Pakistan is the 6th largest country. It is replete with substantial natural endowments, advantageous climatic condition and a large amount of skilled and unskilled workforce. In spite of all the factor availability Pakistan still struggles to join the group of economically developed nations. The major obstacle towards the economic development has been the use of western approach which is based on capital intensive mechanization. Successive governments over the years have been implementing this policy of capital accumulation but it has only resulted in massive levels of poverty, unemployment and huge current account and budget deficits resulting in alarming debt levels to the economy. On the other hand, the most appropriate approach towards economic growth may be the promotion of small and medium Enterprises (SMEs), which has been largely ignored during the previous years (Metha, 2009).

The western developed nations and Asian tigers (Malaysia, South Korea, Singapore and Japan) owe much of their economic success to SME sector (Kader & Ibrahim, 2007; Esra, 2007). Government attention and favorable policies over the years has led to rapid economic growth of these Nations. It is asserted that entrepreneurship is the main force behind economic success in capitalistic societies and a tool of social change in some developing nations (Andreas and Roy, 2007). According to Nails (2002) and Acs (2004) entrepreneurship provides a significant contribution to economic success of the entrepreneurial economies by permeating knowledge filter and developing ideas as businesses.

In spite of the fact that SMEs can play vital role in the economic growth of the country, their contribution is just 7% to the total GDP in Pakistan (GEM, 2007). The growth of SME sector in Pakistan has remained quite dormant due to policy bias. As a result a large number of SMEs are involved in traditional businesses, lacking access to technology, low levels of productivity and with almost sub-standard products. Therefore, there is a major need to restore this sector.

One of the major obstacles towards SME growth all around the world is access to finance. It is important to mention that SMEs around the world list lack of finance as a major constraint to their growth (World Bank, 2011). According to Nasir (2008) an effective financial system and access to finance are keys to economic development and growth. Limited access to finance can severely constrain the growth of small and medium enterprises. Therefore, investigation of financing channels to SME sector is essential.

A major factor affecting all kinds of credit supply is monetary policy. In this study, we plan to investigate how changes in monetary policy can affect loans to SMEs in Pakistan. The monetary policy transmission mechanism is the procedure through which monetary policy changes affect output and inflation which are the primary goals of monetary policy. In order to study transmission of monetary policy impact on credit availability to SMEs in Pakistan, distinction between the following two channels of monetary policy transmission is needed.

Interest rate channel is the most widely recognized channel of monetary transmission and it relates to demand side of credit market. Transmission through this channel depends upon changes in policy rate and short term real interest rates resulting in changes in cost of financing. On the other hand monetary policy affects the supply side of credit market through credit channel of Monetary policy transmission. Credit channel transmits these changes by affecting the firm's ability to borrow and banks capacity to lend. Balance sheet channel and bank lending channel compose credit channel. Bank lending channel indicates if monetary policy affects total credit supply whereas balance sheet channel determines whether monetary policy redistributes credit supply from risky to less risky borrowers, which in our case from SMEs to large corporations and governments. Therefore, in order to study the relationship between monetary policy and credit to SMEs we investigate the existence of credit channel in Pakistan.

1.2 Motivation of the Study

The primary motivation behind this study is that Pakistan has a huge workforce but lacks capital. Therefore, the most appropriate and quickest strategy to achieve economic growth is to promote the SME sector. The SMEs contribute to the GDP, provide employment to working age population ensures income equality, helps in

reducing poverty and improving the living Conditions of the general population. However, time series data as well as literature is very limited for SME sector in Pakistan.

The environment available to entrepreneurs in Pakistan in general is not very conducive for the growth of SMEs due to certain social and economic factors. The entrepreneurial class is concentrated in a few rich families in Pakistan and majority of businessmen are too small to grow into SMEs. In Pakistan numerous formal institutions are established to finance SMEs but their role has not been very commendable. Most of the small scale entrepreneurs in Pakistan find it impossible to obtain credit from formal institutions due to lack of collateral. A large number of SMEs still remain deprived of access to easy finance.

Numerous studies have been conducted around the world at regional and country level to investigate the financing of SMEs. However, due to the unique environment in Pakistan for SMEs, these studies, generally, become quite irrelevant. Therefore, there is an urgent need to study the factor leading to the availability of credit to SMEs in Pakistan that in turns determines the economic growth of the country. Therefore, the study particularly investigates the availability of credit to SMEs in Pakistan and its relationship to the monetary policy.

1.3 Objectives of the Study:

The primary objectives of the study are:

- 1) To establish a relationship between changes in monetary policy and credit to SMEs.
- 2) To investigate the credit channel of monetary policy transmission and to investigate how it affects credit supply to large enterprises and SMEs.
- 3) To investigate whether changes in government borrowing crowds-out credit to private sector (SMEs)

1.4 Significance of the Study and Contribution

This study is devoted to explain a relationship between monetary policy and credit availability to SMEs in Pakistan. Literature on this topic in case of Pakistan is

almost nonexistent and almost the same is the case with the availability of time series data. According to Snage and Nam (2005) studies available on SMEs in Pakistan are quite insufficient for policy making purposes. Hence, it is highly desirable to address the issues of SMEs and provide guidelines for the designing of effective policies. Therefore, investigation of the credit channels of the monetary policy contributes to the existing literature and adds to the significance of the study.

1.5 Organization of the Study

The study is organized into 6 chapters. Chapter 2 contains literature review of the study. Chapter 3 deals with data and its sources. Analytical framework of the study is given in chapter 4. Chapter 5 deals with empirical results. Finally, chapter 6 concludes the study and outlines policy implications.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Roman (2010) defines Enterprise as a common setup or organization composed of one or more people that perform economic activities utilizing multiple goods and economic methods to derive profit. However when it comes to defining SMEs, we have numerous views. Literature available on SMEs doesn't provide any single or universally accepted definition of the topic. Several approaches are available on categorizing enterprises as small and medium enterprises.

Differences in the economic, cultural and social aspects of countries around the world are reflected in their definition and categorization of SMEs. There are different criteria based upon number of employees, annual sales, turn-over and total assets etc. A few of commonly used benchmarks are number of employees, total assets, investment level and sales (Ayyagari, *et al.*, Beck, Demirguc, 2007)

In USA for a company to be considered SME it should have at maximum 500 employees (Small Business Administration). However, the World Bank defines Small and medium enterprises as:

“Those businesses that have at maximum 300 employees, \$ 15 million in annual revenues and \$15 millions in assets”.

According to OECD, SMEs are non-subsidary, autonomous enterprises which employ less than a given number of employees. These statistics differ across countries. The most used upper limit labeling a firm as SMEs is 250. In UK a company is defined as SME if it employs less than 250 people, has a revenue of less than 25 million pounds, has gross assets less than 12.5 million pounds or a combination of any of the two given above (Department of Business Innovation and Skills, UK). In Pakistan a firm is considered SME if it employs less than 250 people, has a paid up capital below 25 million rupees and annual revenue up to 250 million RS (SMEDA, 2012).

2.2 SMEs and Economic Growth

With the increase in spread of globalization and capitalism, entrepreneurship has earned significant importance and there is a vital relationship between economic growth of a country and its entrepreneurial activity (Wigwan and Venter, 2004; Gem, 2002).

According to GEM (2002) entrepreneurial activity can explain one third of variation in the economic growth of a country whereas, Metha (2009) explains that the best solution to increase a country's economic growth is to increase the number of entrepreneurs in the society.

In the Netherlands SMEs constitute 98.8% of all the private sector and add 31.6% to GDP and provide employment to 55% of the total workforce (EIM Business & Policy Research, 1999). SMEs provide 35 million dollars in exports and provide employment to 22 million people in Italy (Patrianila, 2003) while in Indonesian SMEs are numbered at 42.4 million and contribute to 56.7 percent of GDP (Blenker & Nielson, 2003). In the European Union, SMEs form 98% of the total enterprises and provide employment to 65 million people (Kader & Ibrahim, 2007; Esra, 2007). In UK SMEs provide employment to 59 % of the total workforce and form 99% of the total businesses. According to Esra (2007) almost 80% of employment in Japan and South Korea is based on SMEs.

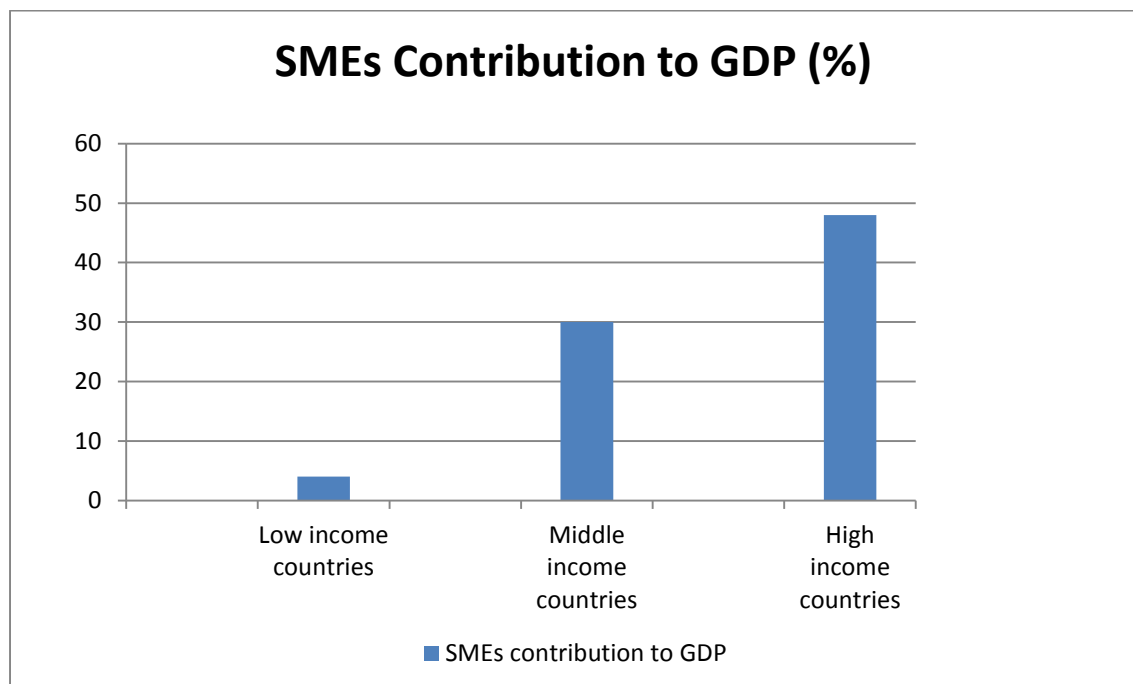
For large companies, the SME is the place from where they came and from where they expect the future competition. They are the first step and first job for most of the people. SMEs are the first step towards entrepreneurship. They benefit the whole economy by being the inception point of new ideas and effective utilization of resources (Zaman, 1999).

To fight poverty and stimulate growth, World Bank group and other international agencies provide assistance to SMEs in developing countries. This policy in favor of SMEs is due to three reasons; firstly SMEs promote competition and entrepreneurial activity consequently benefiting the economy wide innovation, efficiency and aggregate level of production. Secondly SMEs are more efficient as compared to large enterprises but their growth is obstructed by credit constraints and institutional failures. Thirdly it is argued that SMEs are more labor intensive as

compared to large enterprises and hence play an important role in boosting employment (World Bank, 1992, 2002, 2004). Whether referring to a random state or considering globally, small and medium enterprises are effectively the backbone of an economy. SMEs represent a vital source of economic growth in developed as well as in developing countries (Robu, 2013).

More than 95% of enterprises around the world are SMEs and employ 60-70% of workforce (OECD) 0.89 million SMEs are located in the developing world. On average there are 31 SMEs to each 1000 individuals globally. In Japan and China 60% of the addition to GDP comes from SMEs, in the USA that percentage raises to 65%, and in the EU SMEs generate 52% of GDP (The Steering Group, 2011).

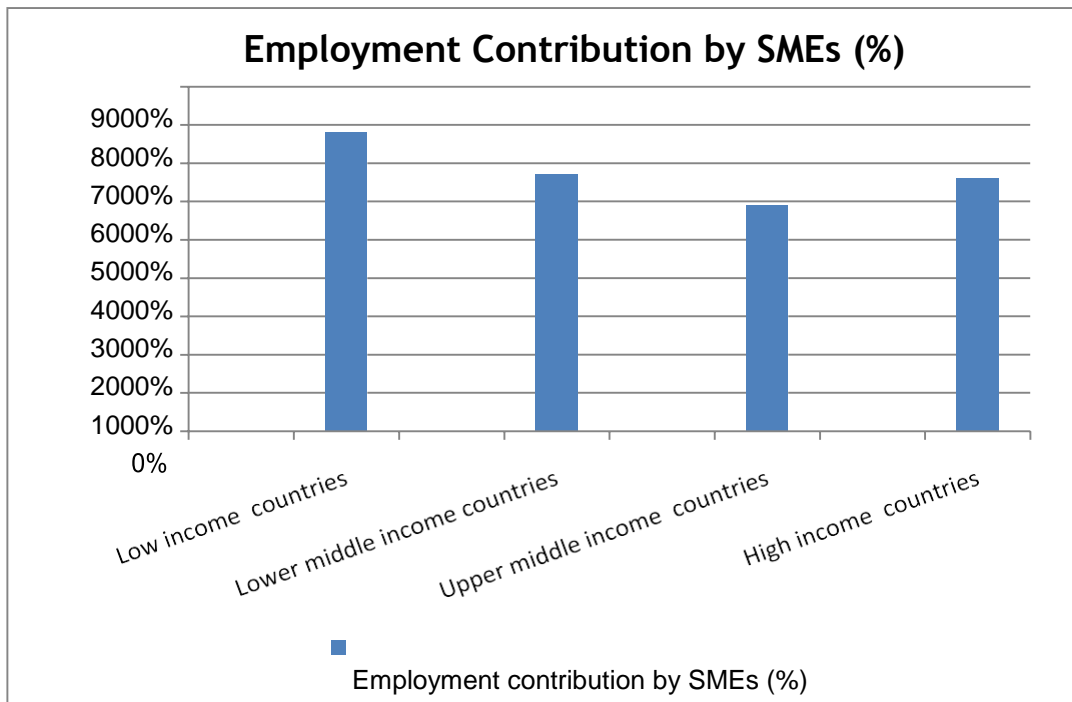
Figure 1: SMEs Contribution to GDP (%)



Source: World Bank, 2011

SMEs are responsible for the creation of two thirds of new jobs. Small and medium enterprises can create jobs at a lower cost as compared to large enterprises. The main factor determining this difference is the delivery of products and services at lower cost as compared to large enterprises. Lower expenses and higher worker output in the presence of entrepreneur are responsible for low costs of SMEs (Robu, 2011). According to Hallberg (2001) SMEs form the base of private sector-led growth in poor countries are the emerging private sector.

Figure 2: Employment Contribution by SMEs (%)



Source: World Bank, 2011

Another important contribution of SMEs is that they bring about technological innovation pertinent to the economy. In many avenues highly technical SMEs play a vital role in fostering new technologies, which are responsible for creation of new sectors in the economy and incite innovation for the future in economy (Baumol, 2002)

Dellis and Karkalakos (2015), using time series data from OECD countries examine the interrelationship between entrepreneurship, unemployment and economic growth. According to the study there exists a positive relationship for the entrepreneurial activity and GDP per capita growth. The unemployment in OECD significantly decreased due to the opening of new entrepreneurial ventures. GDP growth also has a positive impact of the employment ratio in OECD countries. Hence, we can say that total factor productivity has a positive impact on the employment.

2.3 Small and Medium Enterprises in Pakistan:

According to Snage and Nam (2005) literature available on SMEs in Pakistan is extremely inadequate. Literature that is available for Pakistan business sector is composed of large corporations (Beaver, 2007). Hence there is a great requirement and need to investigate the factors that limit the growth of SME sector in Pakistan and the

factors that promote the growth.

SMEs compose 85% of the private sector in Pakistan and provide employment to 78% of the non-agricultural workforce. However, these businesses are mostly traditional business with lack of technological innovation resulting in low levels of productivity and substandard products (GEM, 2007). Due to this reason these SMEs are stuck in low productivity equilibrium and their sales and profits remain low. As a result the contribution of these SMEs to GDP is only 7%.

In Pakistan there are 3.2 million enterprises out of which 99% are SMEs (Bianchi, Parrilli 2002). Majority of these enterprises have tremendous potential for job creation. They can use techniques which are suited to the local conditions in developing countries as compared to the techniques used by large enterprises. According to Ansir (2011) the most appropriate strategy for improving the economy is to follow domestic low-cost approach of promoting SMEs. The benefit of this strategy are considerable; it employs a lot of labor, consumes local raw material, promotes technology and thereby, income generated has a positive effect on income distribution in the country.

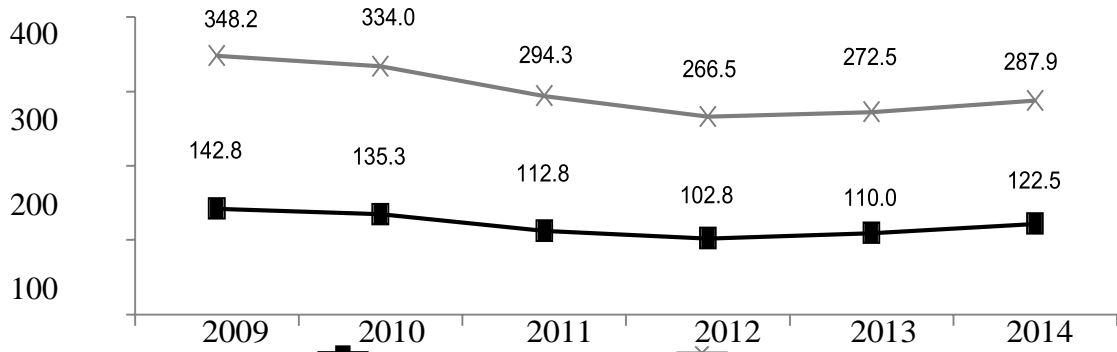
It is important that 87 percent of industrial sector in Pakistan consists of small and medium enterprises. The sector has ample opportunities for its growth and is a source of tax revenue, employment of non-agricultural force and efficient utilization of resources. Due to its significance, SME has become a focal point of government policies for poverty alleviation and employment.

Ali (2013) provides an empirical relationship between small and medium enterprises and poverty alleviation in Pakistan by using time series data for the time period of 1972-2008. According to the study small and medium enterprises plays a significant role in the economic development so they have strong impact on the poverty alleviation mechanism. Keeping in view its relative importance policy makers should work on formulating policies to remove financial constraints to small and medium enterprises sector in Pakistan. By diversifying the availability of credit, reducing the costs associated with credit, and enforcing the credit rights can foster the growth of small and medium enterprises in Pakistan. There is a dire need to focus on the non-material development in Pakistan because technically skilled labor force can help to further enhance the growth of small and medium enterprises in Pakistan.

There are some apparent and some less known obstacles in the growth of SMEs in Pakistan. The major obstacles are law and order situation, credit availability, political instability, energy shortage, labor market issues, taxation problems, lack of information and coordination among different government institutions (Subhan *et al.*, 2014).

The study of Ahmed and Alam (2015) presented the macro aspect of the mechanism of flow of credit to SME's and the role of State bank of Pakistan in this context. The study suggests that credit flow to SMEs and credit to manufacturing SMEs recorded a rising trend in absolute terms after December 2012. But the share of industrial credit has sharply declined in this time period. Moreover, the availability of credit is concentrated in manufacturing sector and in SME's due to lack of diversification. The study further suggests measures that state bank of Pakistan can take to ensure the flow of credit to SME's.

Figure 3: Credit flows to Manufacturing SMES vs. All SMES (PRS BN)



Asif and Ellahi (2016), using provincial and district level data in Pakistan, explore the factors that affect the entrepreneurial ability and how income levels and regional development affect entrepreneurship in Pakistan. According to the study total early stage entrepreneurship activity in Pakistan is quite low so government should introduce set of policies to enhance entrepreneurship in country. Ratio based analysis represent that Pakistan's economy has potential for the generating higher growth of businesses but government should play a vital role by providing capacity to the business community and by implementing the set of policies to attract investment both within and outside the country.

Dar (2017) explores the constraints faced by small and medium enterprises in Pakistan, and why they are not playing vital role in enhancing the GDP of country. According to the study the major hurdles faced by small and medium enterprises in Pakistan related with financial constraints, lack of material development, technological barriers and political instability. The study further provided some policy implications for the government to combat these issues, such as improvement in infrastructure of country, diversification of loan management, providing incentives to small and medium enterprises and providing apprenticeship. Government can also help small and medium enterprises in Pakistan by increasing the research in this field especially to overcome technological barriers.

2.4 Credit as a Constraint to SME Growth

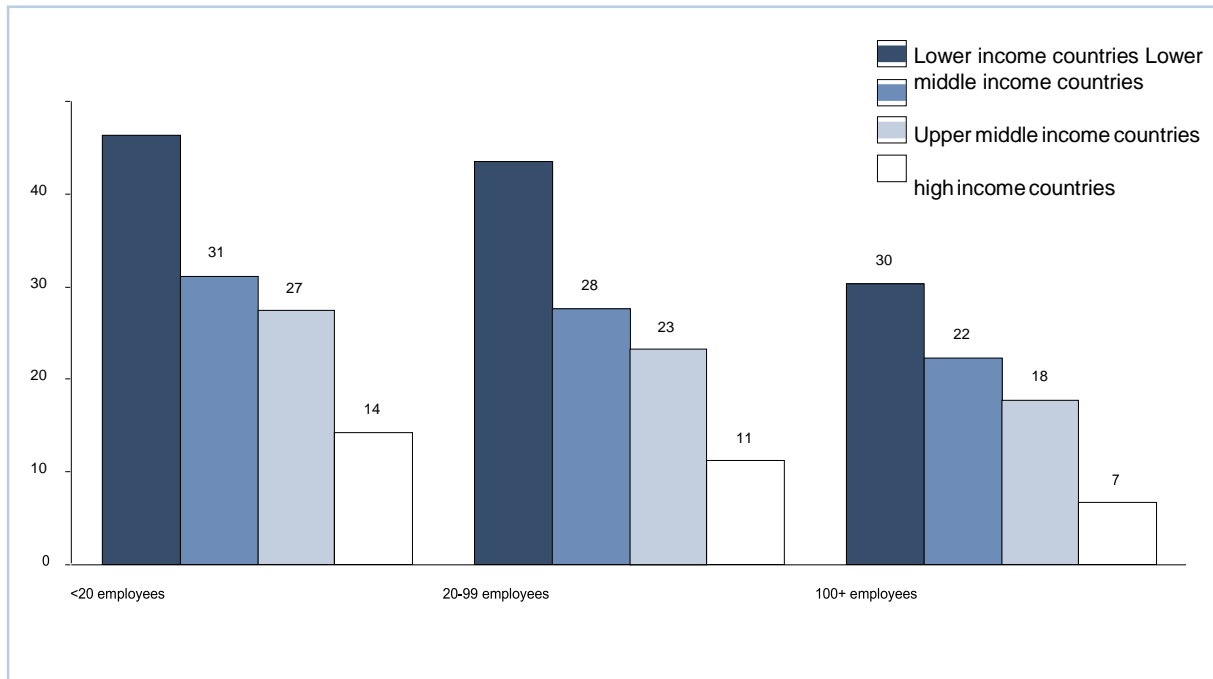
The focus of study is on credit as an impediment towards SME growth and how availability of credit to SMEs is affected by monetary policy. Ayyagari *et al.* (2006) discuss that although, political instability, crime and finance affect the growth rate of firms however, the credit constraint is the most significant variable. Similarly, Abor and Quartey (2010) highlight the socio-economic significance of the SMEs.

Developing countries in general are replete with financial constraints, but these constraints in particular effect SMEs in developing countries lot more due to, high collateral requirements, increased administrative costs and absence of knowledge within financial intermediaries. Economic conditions can be improved in developing countries by increasing access to finance for SMEs that result in innovation, macroeconomic stability and GDP growth.

Availability of credit enables SMEs to make investment for future expansion. According to Maximillian (2013) SMEs depend upon finance to uplift their productivity. Investments ensure access to latest technologies and expansion of the business. This enhances the competitiveness of a company and, resultantly of the economy as a whole. It is reasonable to assume that the performance and economic development of a nation depends a lot on the capacity to create a supportive environment for SMEs.

SMEs usually find it difficult to obtain loans as compared to larger firms. According to Beck, Demirgüç-Kunt, and Maksimovic, (2005) SMEs perceive cost of credit and access to it, as a greater obstacle as compared to large enterprise and this factor also constrain SME growth.).According to Keasy and McGuiness (1990) there is evidence of positive association between external finance and business growth.

Figure 4: Cost of Finance as Major Constraint to Current Operations (%)



Surveys; World Bank

The figure 4 shows the cost of finance as main obstacle to operations for a larger group of countries. In each income group, countries are weighted equally to calculate the overall average for the group. The probability that a small firm lists financing as a major obstacle is 22% compared to 28% for medium-size firms and 31% for large firms for lower middle income countries.

The growth of a business is affected by the availability and cost of finance. On competitive and realistic terms access to credit will not in itself cause a small firm to expand, but the failure to obtain, or restrained availability of finance can constrain growth (Martin and Christin 1996). According to Gertler and Gilchrist (1994), size of a firms may not be a direct measure of access to capital market but it is strongly correlated with factors that do matter. Informational frictions that mainly apply to

younger firms add to cost of external finance, higher degree of risk and firms that are not sufficiently collateralized. All these attributes are on average found in smaller firms.

SMEs are not only more susceptible to financing constraints but they are also more severely affected by financing obstacles. According to Beck et al. (2005) financing constraints have almost twice the effect on growth of small enterprises as compared to large enterprises.

2.5 Monetary Policy and Credit to SMEs

Unlike Bernanke and Blinder (1992), Christiano *et al.* (1994) who use central bank discount rate (Federal Funds Rate) as an indicator of monetary policy stance, we use monetary base as a variable for monetary policy. This implies that we interpret changes in monetary base as shocks to monetary policy and the response of other variable to changes in monetary base as response to unanticipated changes in monetary policy.

The conventional view point is that monetary policy affects the real economy via demand side of economy. Variations in short term real interest affect the cost of capital, which consequently affects business investment and demand for consumer durables. These variations in aggregate demand consequently affect the level of production (Bernanke and Blinder, 1992). Recent research has empirically confirmed the findings of Friedman and Schwartz (1963) that changes in monetary policy are followed by variations in real output that may last for two years or more (Bernanke and Blinder, 1992; Romer and Romer, 1989).

An important variable which affects the availability of loans to private sector businesses is government borrowing. High government borrowing or expansionary fiscal policy can result in crowding out of private sector investment. According to Das (2010) whenever expansionary fiscal policy is discussed there is always question of tradeoff between deficit financed government expenditure and private investment because the investible resources in an economy are limited. Pradha *et al.* (1990) and Mitra (2006) found out that government expenditure has been crowding out private investment in India.

We study the supply side of credit market through credit channel. In the light of credit channel theory; external finance premium augments the effect of monetary policy on interest rate, which is the difference of cost among funds raised externally and funds generated through internal mechanism. A variation in monetary policy that rises or lowers the interest rate results in the external finance premium moving in the same direction and therefore, the influence of monetary policy on cost of borrowing and on real spending is amplified (Bernanke, 1995).

If contractionary monetary policy raises banks external finance premium, the banks react by decreasing the amount of credit they are willing to supply (Stein, 1998). This is the bank lending branch of the credit channel (known as Bank Lending channel) and it proposes a relationship between monetary policy and loan supply. Alternately, monetary tightening can increase the agency cost in lending by reducing the net worth of banks and borrowers. This effect is usually negatively related to a firms net worth and may cause banks to re-direct their credit supply towards large firms (Gertler, 1996). This is balance sheet branch of credit channel (known as balance sheet channel) and it shows that monetary policy effects the allocation of loans across firms of different sizes.

The bank lending channel of monetary transmission works through Bank's liability side. According to Blinder (1998) contractionary monetary policy reduces reserves from the banks, leaving banks with fewer loan able funds consequently reducing the bank lending.

To figure out whether change in level of credit is demand or supply side phenomena, basic aspects of loan have to be explained. Commitment loan allow borrower to borrow up to a certain limit over a fixed period and the bank is bond to provide the loan regardless of market situation, therefore variations in commitment loans are treated as demand side shock. Contrarily spot loans are made without any prior commitments and variation in its level are considered as shock to the supply side of credit (Black and Rosen, 2011). when spot lending is reduced compared commitment lending it reflects a fall in credit supply. (Sofianos, 1990).

Former studies regarding the credit channel inspect the way aggregate lending replies to monetary lending (e.g. Bernanke and Blinder 1992). With the help of this method, we do not encounter signs of reduction in aggregate loan supply with the strong

effect of monetary policy. Some of the results even depict a little bit rise in loan supply. This is something that is against the logic behind the bank lending channels since the cost of bank's funds rise but still they agree to advance loans.

During times of tightened monetary policy, banks make comparatively more secure loans (Nakamura, 1995). According to Black and Rosen (2011) contractionary Monetary policy causes banks to shift their credit from small firms to large firms. This implies that banks may shift credit towards less risky and transparent firms during times of tight monetary policy as predicted by balance sheet channel. Alternatively if smaller firms are most vulnerable to a credit crunch, then easing of monetary policy remedies the credit problems.

As the balance sheet channel indicates, banks direct their credit supply toward larger firms and aside from small firms. An increase in market interest rate due to tightened monetary policy results in a decrease in business investment not only due to increased cost of capital but also as a result of lesser supply of credit to small and medium sized enterprises (Agha *et al.*, 2005).

Khan (2012) analyses the role of monetary policy on the credit availability to small and medium enterprises in Pakistan. Using multiple regression analysis the study explores a significantly negative relationship between credit availability to SME and large enterprises. However despite of the unavailability of sufficient data an indicative inference can be drawn that small and medium enterprises in Pakistan are crowding out the credit market for private sector as financial sectors in Pakistan consider small and medium enterprises less credible and highly risky.

2.6 Conclusion

Overall literature review documents a negative impact of monetary policy on credit availability to SMEs. A negative relationship is also established between credit to large enterprises and that to SMEs. In the context of Pakistan, there is a large empirical work devoted to check the relationship of SMEs with other factor that effect its growth. But relationship between monetary policy and credit to SMEs remains very deficient in terms of Pakistan. Present study contributes to the literature by analyzing credit to SMEs and factors affecting it namely credit to large enterprises, government borrowing, monetary policy and bank spread linkages for Pakistan.

CHAPTER 3

THEORETICAL FRAMEWORK AND VARIABLES

3.1 Introduction

The study aims to investigate the impact of monetary policy on credit to SMEs in Pakistan. In order to achieve this objective, we explain the theoretical framework of our study. Time series monthly data is used consisting covering time period from January 2012 to February 2018. To meet the objectives of the study secondary data is mined from different reliable sources whereas variables are constructed according to economic theory.

3.2 Theoretical Framework Monetary Policy:

In order to establish a relationship between monetary policy and credit availability to SMEs we study the supply side of credit market, through credit channel of monetary Policy transmission. External finance premium which is the difference of cost between funds raised externally and funds generated through internal mechanism, augments the effect of monetary policy on interest rate. A variation in monetary policy that raises or lowers interest rate results in external finance premium moving in the same direction. (Bernanke,1995).

Credit channel of monetary policy transmission is further divided into bank lending channel and balance sheet channel. According to Bank lending channel, contractionary monetary policy raises bank's external finance premium which results in banks reducing their loan supply (Stein, 1998). Bank lending channel proposes a relationship between monetary policy and loan supply. Alternately, monetary tightening can increase the agency cost in lending by reducing the net worth of banks and borrowers. This effect is usually negatively related to a firms net worth and may cause banks to re-direct their loan supply towards larger firms (Gertler,1996). This is balance sheet branch of credit channel and it shows how monetary policy effects the allocation of resources across firms of different sizes.

3.2.1 Credit to Large Enterprises

Credit to large enterprises affects loans availability to small and medium enterprises. During times of tightened monetary policy, banks make comparatively more secure loans (Nakamura, 1995). According to Black and Rosen (2011) contractionary monetary policy causes banks to shift their credit from small firms to large firms. This implies that banks may shift credit towards less risky and transparent firms during times of tight monetary policy as predicted by balance sheet channel.

An increase in market interest rate due to tightened monetary policy results in a decrease in business investment not only due to increased cost of capital but also as a result of lesser supply of credit to small and medium sized enterprises (Agha, 2005).

3.2.2 Government Borrowing

An important variable which affects loan supply to SMEs is government borrowing. Higher government borrowing or expansionary fiscal can result in reduced supply of loans to SMEs. According to Das (2010) whenever expansionary fiscal policy is discussed there is always question of tradeoff between deficit financed government expenditure and private investment because the investible resources in an economy are limited. Government borrowing also represents an alternative more secure lending option to the banks in times of tighter monetary policy. Pradha (1990) and Mitra (2006) found out that government expenditure has been crowding out private investment in India.

3.2.3 Bank Spread

It is the difference between average lending and average deposit rate. Bank spread represents the overall credit risk in the economy. It is an important variable in determining the effect of monetary policy on loan availability to SMEs. According to the literature banking spread has a negative relationship with credit to private sector.

Table 1: Variable and Theoretical Link

Variable	Theoretical link
Monetary policy	Main independent variable. Explains the effect of monetary policy on loan supply to SMEs.
Credit to large enterprises	It shows better lending options available to the banks in place of SMEs.(Balance Sheet Branch)
Government Borrowing	It shows whether government borrowing crowds out loans to SMEs and also represents safer lending option available to the banks in times of tightened monetary policy (Balance Sheet Branch)
SME non performing loans	This variable shows the effect of different circumstances on bank lending behavior towards SMEs.
Banking Spread	It represents overall credit risk in the economy and how it affects loan supply to SMEs.

3.3 Sources of Data

As our research relates to monetary policy majority of data was extracted from State Bank of Pakistan. State bank monetary policy statements, Economic data archives and Development finance reviews were used as sources for majority of data.

3.3.1 Dependent Variables Loans to SMEs

These include the share of loans to SMEs out of loans given to all the private sector businesses. The data for Loans to SMEs has been taken from economic archives SBP and SBP economic development review. Some of the data points were missing that have been generated through trending.

3.3.2 Independent Variables Monetary Base

A monetary base is the amount of currency that is held by public or by central bank in the form of commercial bank reserves. In our study we have used monetary base to represent monetary base to represent monetary policy. Monthly data for monetary base has been extracted from SBP economic data archives.

3.4 Government Borrowing

It includes all the loans to government from SBP and commercial banks. The data for government borrowing has been taken from economic archives SBP. It used to figure out a relationship between credit availability to SMEs and loans taken by government.

3.5 Loans to private Businesses

These include the loans given to private sector businesses by commercial banks. It are used to represent the loans to large enterprises in our study. The data for private sector loans has been mined from Economic Archives SBP. Loans to large enterprises measure the relatively safer lending options available to the banks in times of tight monetary policy.

3.6 Bank Spread

It is the difference between weighted average lending rate and weighted average deposit rate. WALR is the interest rate charged by reporting commercial banks on loans granted during a given period of time, whereas WADR is the interest rate paid by reporting commercial banks on fresh deposits during a given period of time. It represents the overall credit risk in the economy.

3.7 SME Nonperforming loans:

Loans to SMEs upon which the debtor has not made scheduled payments for a period of at least 90 days. Some of the data points for SME NPL were missing that were generated through trending. This variable shows the effects of different circumstances on bank lending behavior towards SMEs.

Table 2: The Variables and Data Sources

Variable	Definition	Source
Monetary base (Millions)	Total quantity of currency in circulation and in the form of reserves held at central bank.	Economic data archives SBP
Weighted average Lending rate (percentage)	Interest rate charged by commercial banks on loans	Economic data archives SBP
Weighted average deposit rate (percentage)	Interest rate paid by reporting commercial banks on fresh deposits	Economic data archives SBP
Banking spread (percentage)	The difference between WALR and WADR	Economic data archives SBP
Government borrowing(millions)	Loans to government from SBP and commercial banks	Economic data archives SBP
Credit to SMEs(millions)	Loans to SMEs by commercial banks	Economic data archives SBP/Development finance review
Loans to private businesses (millions)	Loans to private sector businesses by commercial banks.	Economic data archives SBP
Non Performing loans	SME loans that have been in default for more than 90 days.	Development finance review

CHAPTER: 4

ANALYTICAL FRAMEWORK

4.1 Introduction

In this chapter a brief description of estimation methodology is presented to empirically examine the impact of monetary policy on credit to small and medium enterprises. This study employs time series data that cannot be handled as ordinary data due to time trends in the series. Due to which the regression results become spurious. Therefore, for the estimation of time series data we will pursue the following strategy. First of all, time series properties of the variables are tested so section 4.2 deals with the brief description of Unit Root tests. The estimation technique used in our analysis Johansen Co-integration is discussed in section 4.3. Whereas, Vector Auto Regressive (VAR) is discussed in section 4.4 while Vector Error Correction Model (VECM) has been discussed in section 4.5. Finally, section 4.6 summarizes the chapter.

4.2 Unit Root Test

To examine the impact of monetary policy on credit to SME's time series data has been taken, which usually encounter with non-stationarity issues, which can lead to the spurious results. This issue arises when mean and variance of the data are not constant over time and the co-variance between the time periods depends on the actual time for which it is computed and not on the lag of two time periods. In other words, results are not generalized and represent only a particular period of time. Therefore, it is necessary to look into the true order of integration of time series data.

To explain that why we need to test the non- stationarity of data following arguments can be provided:

- The behavior and characteristics of time series data are profoundly influenced by the stationarity.
- Due to high R^2 values of the variables trending over time, it can lead to spurious regression results, even if they are totally unrelated.

- Due to non-stationary variables in the data, the assumption of asymptotic analysis becomes invalid. As “T-ratios” do not follow the T-distribution so we can’t take hypothesis test.

To handle this issue, many techniques and tests are suggested in literature among which “Unit Root Test” is widely used. The pioneer work on this test was done by Dickey and Fuller back in 1976. The Objective of the test is to check for the hypothesis $\phi = 1$ in the following equation:

$$Y_t = \phi Y_{t-1} + \mu_t$$

Against the alternative hypothesis, that $\phi < 1$.

To test for the unit root in data, there are many test among which Augmented Dickey Fuller Test (ADF), Phillips Perron test (PP), Dickey Fuller GLS Test and NG-Peron are normally used. However, in this study Augmented Dickey Fuller Test (ADF) and Phillips Perron test (PP) are used to test for the unit root in the data. These tests have been used because of their popularity in time series analysis.

4.2.1 Augmented Dickey-Fuller Test (ADF)

Named after David Dickey and Wayne Fuller, this test is used to check whether Unit root is present in autoregressive model or not. Dickey Fuller (DF) test is based on the assumption that the error terms are serially uncorrelated which is generally violated in complex economic models. That’s why this study incorporate augmented version of this test commonly known as augmented dickey fuller test which basically relax this assumption. So we can apply ADF test for the models where error terms are serially correlated.

The three basic models for testing unit root are:

- No constant, no trend:
$$\Delta Y_t = \phi Y_{t-1} + \mu_t$$
- Constant , no trend:
$$\Delta Y_t = \alpha + \phi Y_{t-1} + \mu_t$$
- Constant and trend:
$$\Delta Y_t = \alpha + \phi Y_{t-1} + \beta_t + \mu_t$$

ADF tests the stationarity of the variable. If the statistics of the test are lying in critical region for specific level, then the series is meant to be stationary and it is assumed to be integrated of order zero (also known as level stationary). In other case, the series is non-stationary. The test is again conducted by taking difference and if the null hypothesis is accepted it is integrated of order 1. If still the series is non-stationary it will be again tested and if null hypothesis is accepted after second difference it is integrated of order 2 and so on.

4.2.2 Philips Perron (PP) Test

Developed by Phillips, P.C.B. Perron, P. (1988) this test is also adjusted for serial correlation of error terms and is same as ADF test. The only distinction is that ADF uses lagged difference terms whereas, PP test uses nonparametric statistical methods to handle auto correlated residuals.

The Z_t and Z_π statistics in PP test under the null-hypothesis has the same asymptotic distributions as of the ADF test statistics made robust by using Newey-West (1987) hetero- skedasticity and autocorrelation consistent covariance matrix estimator. The edge of PP test on ADF test is that the estimates are robust to hetero-skedasticity issue in error term.

4.2.3 Choice of Lag Length

Next step is the choice of lag length, which is very important in case time dependent data. It help to achieve the normally distributed error terms with no autocorrelation and hetero skedasticity problems. There are several ways to choose the optimum number of lags such as Akaike info criteria, Swartz Bayesian information criteria. The model with minimum AIC or SBC or maximum R^2 is chosen for analysis.

4.3. Johansen Co-integration Method:

In economic theory, variables are co-integrated with each other if they have long run relationship between them (Rao, 2007). This cointegrating relationship can be studied using Johansen technique, Engle-Granger technique, or auto regressive distributed lag (ARDL) based on integration of the variables within the model.

If time series data is integrated of order 0 i.e. $I(0)$ than we test time series data with ordinary least square method because the variances and means of data are constant. When we have non stationary time series this assumption is violated and hence the results we obtain are usually biased or misleading. If variables are integrated of order 1 i.e. $I(1)$ then Johansen method or Engel-Granger method is used. But if variables have different level of integration than ARDL method is used for analysis. ADF and PP tests incorporated for time series data suggest that Johansen's technique can be used for analysis as variables are integrated to order 1 i.e. $I(1)$.

Johansen test takes name after its pioneer Soren Johansen (1991). This test allows more than one cointegration relationship, so it is considered generally more practical as compared to Eagle granger causality test, which create problems when more than two variables are used due to the possibility of multiple co-integrating relationships.

As time series data may have deterministic, stochastic trends as well as non-zero means. The cointegration equations similarly might also have deterministic trends and intercepts. The distribution of LR stats for cointegration lacks the usual χ^2 distribution and relies upon the assumptions regarding the deterministic trends. Therefore, in order to carry out the test properly one needs to make some assumptions regarding the trends and intercepts. In this study, we consider case 2 and case 3 for Johansen co-integration. Here, case 2 shows the specification where the error correcting equation includes an intercept but no trend, while (VAR) model includes no intercept or trend. Similarly, the case 3 shows the specification where the error correcting equation includes an intercept but no trend, while VAR model includes an intercept but no trend.

4.4. Vector Auto Regressive Model (VAR):

Sims (1980) introduced Vector Auto Regressive model to investigate the linear interdependencies among multiple time series. Conventionally vector auto regressive models (VAR) are used for stationary variable without unit root and time trends. Trending behaviour can be captured by including deterministic polynomial terms. However with the development of co integration by eagle granger (1987) and Johansen (1997) and the discovery of the vitality of stochastic trends in economic variables led

to finding that these stochastic trends can also be captured by VAR. If some of the variables have time trends it is convenient to separate the short run dynamics from the long run relations of the generation process of set of variables.

VAR models are perfect instruments for forecasting. Because using these models the present values of a set of variables can be interpreted by older values of the variables involved. Investigation of structural economic hypothesis is the basic endeavor of structural VAR processes. Forecast error variance decompositions, historical decompositions, impulse response analysis and analysis of forecast scenarios are the instruments that are used for disentangling relationships between variables in a VAR model.

4.5. Vector Error Correction Model:

Vector error correction models are used to test whether the long run established equilibrium is stable or not. This analysis incorporate restricted VAR technique i.e. Vector Error Correction Model. In this technique the variables are regressed on its own lags and on the lags of variables incorporated in analysis to measures the speed at which the dependent variable comes back to equilibrium after variation in other variable. In other words, VECM measures the speed of convergence.

4.6. Conclusion:

A brief methodology used in empirical analysis is discussed in this chapter. The reasons why this study incorporates these econometric approaches have been discussed. Analyzing the time series trends will help us to investigate the root cause of impact of monetary policy on credit to small and medium enterprises.

CHAPTER 5

RESULTS AND DISCUSSION

5.1 Introduction

In this chapter description of empirical results has been provided to explain the relationship between credit to small and medium enterprises (SMEs) and monetary policy with reference to Pakistan. The chapter is structured as follows: section 5.2 contains results for Augmented Dickey Fuller (ADF) test and Philips Perron (PP) test. While section 5.2 discusses the results of Johansen co-integration test. The results for Vector Auto regressive (VAR) and Vector Error Correction Model (VECM) are discussed in section 5.3 and 5.4, respectively. Finally, section 5.5 provides a summary and conclusion of the chapter.

5.2 Unit Root Test Results

ADF and PP test are applied to investigate order of co integration of our data series. All the variables are found to be integrated of order I (1) by including the trend and intercept term.

Table 3 : ADF Test Results

Variable	level	1 st diff.	Critical value 5 %	Critical value 1 %	Order of integration
CSMEs	-1.968	-6.512	-3.47	-4.09	I(1)
MP	-1.258	-9.610	-3.47	-4.09	I(1)
LPB	1.185	-5.420	-3.47	-4.09	I(1)
Spread	-1.667	-9.374	-3.47	-4.09	I(1)
CI	-2.089	-6.405	-3.47	-4.09	I(1)
GB	-1.962	-10.483	-3.47	-4.09	I(1)
Spread	-1.553	-9.580	-3.47	-4.09	I(1)
LLB	-0.541	-5.833	-3.47	-4.09	I(1)
NPL	-2.014	-4.610	-3.47	-4.09	I(1)

Table 4: PP Test Results

Variable	level	1 st diff.	Critical value 1%	Critical value 5 %	Order of integration
CSMEs	-1.549	-6.497	-4.089	-3.473	I(1)
MP	-2.127	-14.307	-4.089	-3.473	I(1)
LPB	-1.423	-7.847	-4.089	-3.473	I(1)
Spread	-3.748	-15.667	-4.089	-3.473	I(1)
CI	-1.709	-6.405	-4.089	-3.473	I(1)
GB	-3.343	-12.815	-4.089	-3.473	I(1)
Spread	-3.918	-16.559	-4.089	-3.473	I(1)
LLB	-2.442	-7.278	-4.089	-3.473	I(1)
NPL	-2.620	-4.745	-4.089	-3.473	I(1)

The ADF tests as well as PP test confirms that the variables are integrated of order one. Therefore, these results provide ground for the application of Johansen's cointegration technique.

5.2 Johansen Co-integration Results

In the light of the unit root test results given above, since each of our time series is stationary at first difference, this implies that our variables are co-integrated of order one. According to Eagle-Granger (1987) there exists a long run relationship or equilibrium between time series if they are integrate of the same order.

Since all of our time series are integrate of order one so we apply Johansen and Juselis (1990) co-integration technique. The Johansen (1988) and Johansen and Juselius (1990) maximum likelihood cointegration technique tests both the existence and the number of cointegration vectors. Johansen's technique has two maximum likelihood ratio tests namely, maximum Eigenvalue test and trace test. The study proceeds to apply maximal eigenvalue and trace tests. We conduct the tests at lag length of four while the number of lags is selected by using the Schwarz Bayesian Criterion (SBC). The results for maximal Eigenvalue and trace tests for case 2 are given below in Table 3.

Table 5: Co-integration Results

Hypothesis	Max Eigen value tests	Critical value	Trace test	Critical value	Prob.
None *	58.69796	40.9568	137.7277	103.8473	0.0001
At most 1 *	34.88514	34.80587	79.02973	76.97277	0.0346
At most 2	20.49256	28.58808	44.14459	54.07904	0.2821
At most 3	13.15659	22.29962	23.65203	35.19275	0.4853
At most 4	6.998844	15.8921	10.49544	20.26184	0.5912
At most 5	3.496594	9.164546	3.496594	9.164546	0.4922

The null hypothesis of no co-integration (using both tests) is conclusively rejected for case 2 implying that there is at least one co-integrating vector in our case. Similarly, the results for maximal Eigenvalue and trace tests for case 3 are given in Table 4.

Table 6: Co-integration Results

Hypothesis	Max Eigen value tests	Critical value	Trace test	Critical value	Prob.
None *	53.53024	40.07757	115.2245	95.75366	0.0009
At most 1 *	24.77521	33.87687	61.69430	69.81889	0.4004
At most 2	18.37862	27.58434	36.91909	47.85613	0.4639
At most 3	11.40213	21.13162	18.54047	29.79707	0.6072
At most 4	6.982203	14.26460	7.138344	15.49471	0.4913
At most 5	0.156141	3.841466	0.156141	3.841466	0.6927

Once again the null hypothesis of no co-integration is rejected for case 3 implying that there is at least one co-integrating vector.

The Table 5 shows the results for long-run relationship. Our empirical results show a positive relationship between monetary policy (MB) and credit to SMEs. The coefficient value of 6.12 shows that one unit increase in monetary base (monetary

policy) increase credit to SMEs by 6.12 units. These results show that expansionary monetary policy leads to an increase in level of credit availability to SMEs.

Table 7: Long-run Co-integration Results

Variables	Case 2		Case 3	
	Coefficient	t-statistic	coefficient	t-statistic
MP	6.1227	6.0486*	4.6702	6.1873*
LPB	-7.9674	-5.7738*	-6.2769	-6.1003*
GB	-1.8661	-3.4457*	-1.4948	-3.7015*
Spread	2.0755	5.4680*	1.8001	6.3608*
NPL	-10.8936	-3.6300*	-9.8130	-4.3964*

Furthermore a negative coefficient for LPB and GB reinforces the existence of credit channel in Pakistan. LPB which is a proxy for credit to large enterprises changes by 7.96 units due to one unit change in credit to small and medium enterprises. A negative coefficient for NPL show banks do not prefer risk and reduce their credit supply to SMEs when NPL are increasing. Similarly a negative coefficient for government borrowing strengthen our stance that in time of tightened monetary policy banks transfer their loan able funds from risky borrowers (SMEs) to less risky borrowers i.e. large enterprises and government. It also reinforces our view that government borrowing crowds out the private share of investment as loan able funds in the economy are limited. Exactly same information are provided by the case 3.

5.3 VAR Results:

Vector auto regression (VAR) is often utilized for forecasting interrelated time series and studying the impact of random disturbances on the system of variables. The vector auto regression sidelines the necessity for structural remodeling by treating each endogenous variable in the model as a function of lagged values of every endogenous variable in the model. The results for VAR model are given in Table 6.

Table 8: Vector Auto Regression Model

Variable	coefficient	standard error	t statistic
CSMES(-1)	1.184512	(0.14458)	[8.19258]
CSMES(-2)	-0.256982	(0.13456)	[-1.90985]
MB(-1)	0.171134	(0.12765)	[1.34065]
MB(-2)	0.141233	(0.11284)	[1.25157]
LPB(-1)	-0.654743	(0.21056)	[-3.10961]
LPB(-2)	0.365194	(0.21593)	[1.69130]
GB(-1)	-0.181626	(0.25380)	[-0.71562]
GB(-2)	0.171083	(0.23217)	[0.73688]
SPREAD(-1)	0.043997	(0.03455)	[1.27361]
SPREAD(-2)	0.003419	(0.03022)	[0.11315]
NPL(-1)	-0.075361	(0.38359)	[-0.19646]
NPL(-2)	0.225821	(0.40392)	[0.55908]
C	-0.456314	(1.55035)	[-0.29433]

R-squared 0.980335 and Adj. R-squared 0.976335

The results of vector auto regression show that past two months values of credit to SMEs affect the current level of credit to SMEs both positively and negatively. Both one and two months lagged values of MB (monetary Policy) affect the current value of credit to SMEs positively and the t-stats are significant. One month lagged value of Loans to large enterprises effect current value of credit to SMEs negatively (significant T stat), whereas two months lagged value has a positive impact on credit to SMEs. One month lagged value of Government borrowing negatively impacts current level of credit to SMEs whereas two months lagged value positively impacts but the t ratios for both the values are insignificant. Both past two months values of spread positively affect current level of credit to SMEs but the t ratios are insignificant. One month lagged value of nonperforming loans negatively impacts current level of credit to SMEs whereas two months lagged value has a positive impact, however t ratios are insignificant.

5.4 VECM Results:

As our variables are integrated of order I (1) this implies that there exist a long run and/or equilibrium relationship between them. According to Eagle-Granger theorem if variables are co integrated then the relationship between them can be expressed as error correction model (ECM). It measures the speed of convergence and short run relationship between co integrating variables.

Table 9: Vector Error Correction Model (ECM) Results

Variable	Coefficient	Standard error	T-ratio
D(CSMES(-1))	0.193699	0.12611	-5.00594
D(CSMES(-1))	0.070523	0.12175	0.57926
D(MB(-1))	-0.236897	0.12053	-1.96542
D(MB(-2))	-0.147613	0.11012	-1.34045
D(LPB(-1))	-0.08328	0.19991	-0.41658
D(LPB(-2))	-0.110273	0.18834	-0.58549
D(GB(-1))	-0.064188	0.21935	-0.29263
D(GB(-2))	-0.310339	0.22612	-1.37244
D(SPREAD(-1))	-0.10391	0.03658	-2.84066
D(SPREAD(-2))	-0.089499	0.02902	-3.08396
D(NPL(-1))	-0.436706	0.38785	-1.12596
D(NPL(-2))	0.575779	0.39089	1.473
C	0.006102	0.00193	3.16434
ECM (-1)	-0.190438	0.03804	-5.00594

According to the theory of error correction model the sign of the Error Correction Model lagged term should have a negative sign and be significant. ECM (-1) reflects how quickly the series returns to its long run equilibrium and also the speed of this readjustment process. Long term equilibrium association among the variables is confirmed if the coefficient of the lagged ECM term is of high significance (Banerjee, 1998). The present results show that the speed of adjustment

coefficient is -0.1904 which is a clear evidence that if the time series diverges from its equilibrium path, it will swiftly return to its equilibrium with an adjustment speed of 0.1904 which shows that the divergence of previous time period is ameliorated with an adjustment speed of 19.04 percent per month.

5.5 Conclusion:

The empirical results we obtained in this chapter match the results from the economic theory. We had applied unit root test which showed that all of our variables were integrated of order one. Because all of our time series were integrated of order one so we applied Johansen co- integration test to test our variables for long run co-integrating relationships. Finally we applied VAR and VECM to figure out short run relationships among our variables and to find out the speed of convergence of our system. A negatively value for error correction term established that our system of variables is stable. The results obtained showed a positive relationship between monetary policy and credit to SMEs, and also established the presence of balance sheet channel of monetary policy transmission in Pakistan.

CHAPTER 6

CONCLUSION AND POLICY RECOMMENDATIONS

The important feature of the study is that it has come up with the conclusion that monetary policy has a positive effect on credit availability to SMEs. An increase in monetary base (MB) i.e. expansionary monetary policy results in increased credit to SMEs in Pakistan. The results also establish the existence of credit channel of monetary policy transmission in Pakistan. A contractionary monetary policy results in decreased credit to SMEs because banks transfer their loan able funds from risky borrowers (SMEs) to relatively safer lending options (government and large enterprises). This confirms the existence of balance sheet channel (Part of credit channel) in Pakistan. The study also establishes a negative relationship between credit to SMEs and government borrowing. This relationship reflects the crowding out of private sector investment by the government sector.

In the wake of turbulent economic condition of Pakistan, this paper is an effort to study the credit market of Pakistan from channels that have been slightly ignored until now. The growth of SME sector and its contribution to GDP in Pakistan has been deficient due to shortage of credit. A policy of easy monetary policy would go a long way in ensuring adequate credit availability to small and medium enterprises in Pakistan. Formal institutions shall be setup by federal and provincial government to ensure the access of smaller entrepreneurs to cheap credit. Adequate credit to SMEs would result in their growth which in turn will effect the overall growth of the economy.

Similarly government being relatively safer lending option for banks as compared to small and medium enterprises takes away major chunk of credit from the latter. There is a great need to formulate policy that prevents crowding out of private sector's investment by government sector.

Large Corporation find it relatively easy to obtain credit but their benefits to the economy are far less as compared to a thriving SME sector. Policies should be enacted that ensure that large corporations do not take away all the credit that is available to the private sector.

Finally the government should work on improving the entrepreneurial environment that surrounds the SMEs in Pakistan. Incubation Centers shall be established all around the country with sufficient funding to promote entrepreneurial culture in Pakistan. With its huge workforce, Pakistan is destined for economic prosperity with the help of a thriving SME sector.

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