Monetary Policy Transmission Mechanism and Its Effectiveness in the Banking System of Pakistan

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The role of monetary policy is vague in the sense that the nature of macroeconomic variables is dynamic. This fact of dynamicity has made it difficult to capture the exact notion of the behavior of macroeconomic variables. This study was carried out to evaluate the effectiveness of the monetary policy transmission mechanism in the banking system of Pakistan. The study also looked into the magnitude at which tools of monetary policy transmission mechanism affects economic growth in Pakistan. With the beginning of the era of consumer banking, consumption expenditures have grown rapidly because of increased financial services availability. Such an increase in consumption expenditures increases the aggregate demand over time, thereby creating demand pull inflation which is in contrast to the monetary policy objectives. Therefore, the study sought to provide an intuitive explanation of this contrast in monetary policy measure that encourages inflation, through an indirect transmission mechanism in Pakistan. The hypothetical framework was developed by considering four variables, namely; money supply, real lending rates, inflation rate and real GDP. The techniques of co-integration and granger's causality are applied to the past 35 years of data (1980-2015) to determine the direction and strength of relationships between variables. However, the results are quite disparate to monetary theory; the analysis of data revealed that when supply of money increases in the economy, real lending rate decreases. Consequently, households consume more as credit is available at low cost; thus, they save less and spend more.

1. Introduction

The role of monetary policy is vague in the sense that the nature of macroeconomic variables is dynamic. This dynamicity is responsible for difficulties while capturing the exact notion of behavior of macroeconomic variables. However, past researches and a quick glance of the events succeeding the Great Depression boil down our intuition to the fact that the Monetary Policy has two definite tasks. The first one is to barricade rising inflation in the economy while the other one is to attain growth-oriented objectives (Malik 2007) (Taylor 1993).

The targets of the Monetary Policy are not consistent under stable and unstable monetary and financial situations. In particular, it is more difficult for emerging economies to pinpoint the objectives of the monetary policy and transmission mechanism that are essential for growth-oriented objectives (Frankel 2010). Drastic fluctuations in the monetary policies of East Asian countries support the above statement regarding the accuracy of determining monetary policy objectives in emerging economies (Fung 2002). The emergent economies utilize the monetary policy in its stereotypical frame of mind, that is, policy makers never incorporate policy rules while devising monetary policies. However, in the paradigm of

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globalization, it is of utmost importance to figure out objectives of monetary policy other than the traditional ones.

The study primarily focused on the role of monetary policy and transmission mechanism in banking system of Pakistan after the introduction of financial instruments. However, with the advancement in the financial services that promote consumption behavior; it has become difficult for developing nations to utilize the monetary policy effectively. Increased financial facilities affect aggregate demand in the economy; thus, the effectiveness of the monetary policy transmission mechanism. This study is significant because it attempts to provide an intuitive explanation of this contrast in monetary policy measure that encourages inflation, through an indirect transmission mechanism. Furthermore, econometric analysis was applied on past thirty five years data to provide numeric evidence of the proposed study.

The results suggested that by employing the techniques of Granger Causality and Co-integration, the existence of unique long-run unidirectional association was found between instruments of monetary policy and the economic growth of Pakistan. The results were quite disparate from the objectives of the monetary policy. The data analysis revealed that when the supply of money increases in the economy, real lending rate decreases. As a result, households consume more; credit is available at low cost; thus, they save less and spend more. A decrease in saving leads to a decrease in investment and eventually, output is affected.

The remaining portion of this paper comprises the following sections: Section 2 deals with the review of literature conducted in this regard. Section 3 explains the transmission mechanism of the monetary policy. The innovations in retail banking system of Pakistan and its impact on the economy are discussed in Section 4. In Section 5, the choice of variables is discussed. Section 6 comprises the theoretical framework and methodology employed. Section 7 report estimation and results that were deduced from the analysis of data by employing econometric techniques. The conclusions, limitations and direction for further research are discussed in section 8.

2. Literature Review

Akhtar (1983) was the first researcher to discuss financial advancements and their impacts on the monetary policy in a global scenario. His research encompassed major implications of the financial innovations on monetary policy of different countries. A very simple model was adopted to carry out the research. However, the conclusion was significant in the sense that, firstly, it proposed that with the innovations in the financial sector, the monetary policy must not rely on any single variable; rather it would be more effective to devise a policy incorporating several variables. Secondly, the analysis of data showed increasing trends in Interest elasticity of demand; hence, concluding that monetary policy would become more effective with the passage of time.

Lown (1987) contributed significantly to this issue and discussed monetary policy with respect to the financial innovations in a more rigorous manner. In his research, he showed the effects of Financial Innovations and Financial Intermediaries on Federal Reserve's ability to target monetary aggregates. In this regard, Lown (1987) used an extended version of Wood's model (a classical model) and concluded that the presence of financial intermediaries does not affect the effectiveness of monetary policy, and the central banks used it passively as a channel to implement monetary policy. However, the role of financial

intermediaries specified in the classical models was revised significantly after the Global Financial Crisis that erupted in 2007.

Malik (2007) in his paper found that a simple Output-Inflation Taylor rule is insufficient to attain the monetary policy objectives in the current scenario of Pakistan. In his research, several variables other than output and inflation were incorporated, and by employing the techniques of OLS, GMM, VAR and VECM, he found that SBP should also include Trade Deficits and stability of Exchange rate as the objectives of monetary policy because of the statistically significant impact of these variables on monetary policy reaction function. Adrian (2008) and Shin (2010) in their subsequent researches discussed the role of financial intermediaries and their impacts on monetary policy. It was shown that the increased financial activities by the intermediaries have transmuted them into active role players. The transactions of intermediaries affect the economy directly, thereby, altering the effectiveness of monetary policy as well.

The goals of Monetary Policy are not congruent under stable and unstable monetary and financial situations. In particular, it is more difficult for emerging economies to pinpoint the objectives of the monetary policy and transmission mechanism. This is usually because of their proneness to external supply shocks and macroeconomics instability due to which the transmission mechanism is comparatively weaker than that of developed nations (Frankel 2010).

With the growing share of private commercial banks in the banking sector, consumer banking is flooded with a variety of new financial instruments, such as Auto Loans, Credit Cards, Personal Loans, and Home Loans. Technological advancements have made it easier to access plastic money. Credit cards have encouraged consumer spending in the final three decades of the 20th century (Fineberg 2013). Individuals, as well as businesses, in developing nations are now more inclined towards e-banking, as it has made transactions easier and swifter. These factors have fueled up consumption expenditure, as a result of which Aggregate Demand of these economies are more than their potential.

The previous researches by Fung (2002), Malik (2007) and Frankel (2010) discussed the fluctuations in monetary policy and rising inflation as an obstacle to attaining growth-oriented objectives and external shocks to transmission mechanism respectively. Fineberg (2013) studied the impact of credit cards in the United States. However, Hung (2009) studied the interest rate channel in Vietnam. He found that increased consumer financing led to a demand-pull inflation which contrasts with the monetary policy objective of controlling inflation. Therefore, this study is significant because the effectiveness of monetary policy transmission mechanism as discussed by Hung (2009) were not addressed in Pakistan and other developing economies of south Asia. Hence, it would be helpful in finding the gaps and thereby contributing to the existing literature on the subject matter.

3. Monetary Policy Transmission Mechanism

Channelizing the effect of changes in monetary policy to the real sector of the economy by the central bank is known as monetary policy transmission mechanism. The monetary policy shocks cause disequilibrium in the economy. This disequilibrium instigates readjustments until a new equilibrium is attained, this whole process is termed as 'transmission mechanism' (Delakorda 2000). The Monetary Policy is transmitted through central banks by four prominent channels which are interest rate, exchange rate, credit and

asset price channels. However, the impact of these channels is influenced by various factors. The interest rate channel is believed to be the conventional transmission mechanism. Therefore, this study focused on the interest channel of transmission mechanism. The Central bank, through open market operations or bank rate policy, increases money supply in the economy, which lowers the interest rate. Consequently, the investments are boosted up and output level increases. (Aleem 2012).

Figure 1
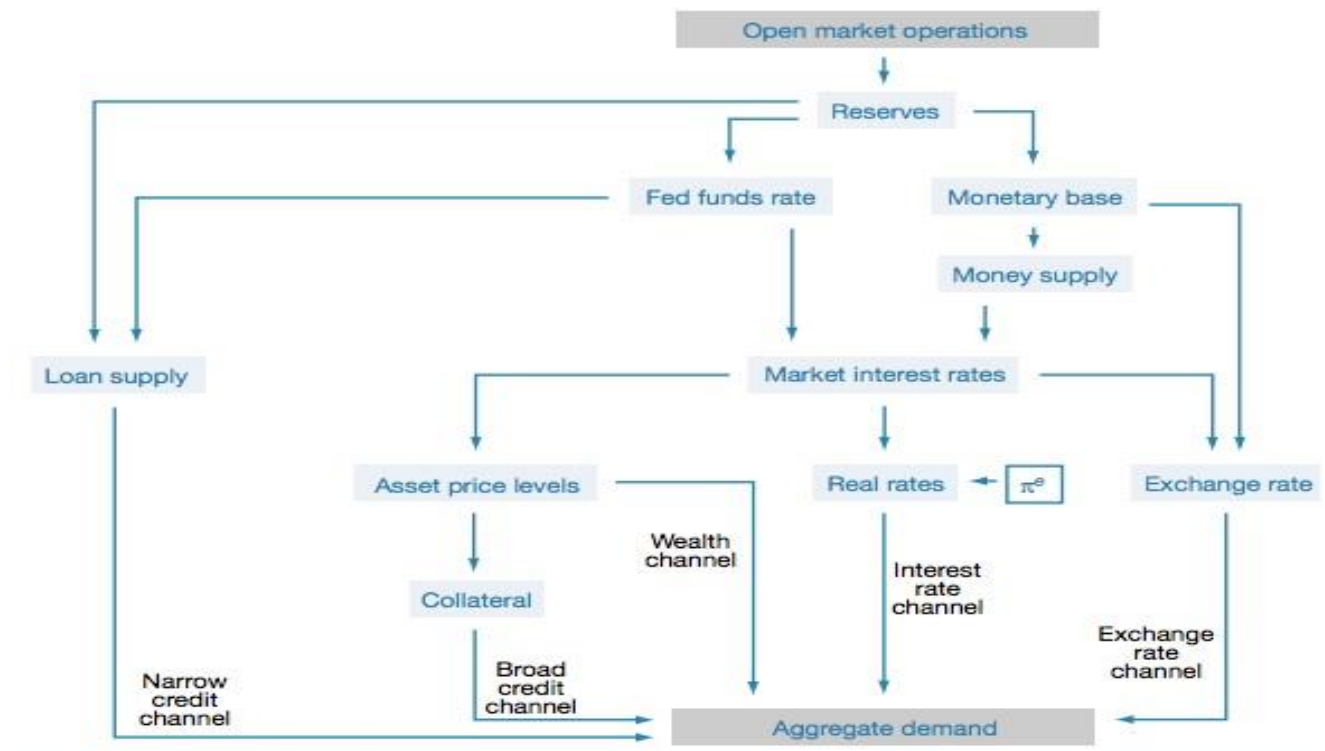
Source: Federal Reserve Bank of New York

4. Retail Banking System and Its Effect on the Pakistan's Economy

The banking system of Pakistan has changed drastically in the past two decades. With the advent of autonomy in State Bank Pakistan (SBP) after the financial reforms of 1990s, the banking sector in Pakistan has been reshaped significantly (Limi 2004). Privatization of Commercial banks, innovations in new financial instruments, easing the barriers to entry of foreign banks in Pakistan and adoption of best practices in the banking sector describes the significant alterations that the banking sector has recently experienced **(See Table 1)**. With these changes in the banking sector, a colossal increase in the activities of the financial sector in Pakistan have been experienced (Di Patti & Hardy 2005).

Empirical findings extracted from pre- and post-privatization data of banking sector support the view that privatization improves efficiency. However, Clarke et. al (2005) found that to fully reveal the benefits of privatization government interference should be negligible and competition should be encouraged.
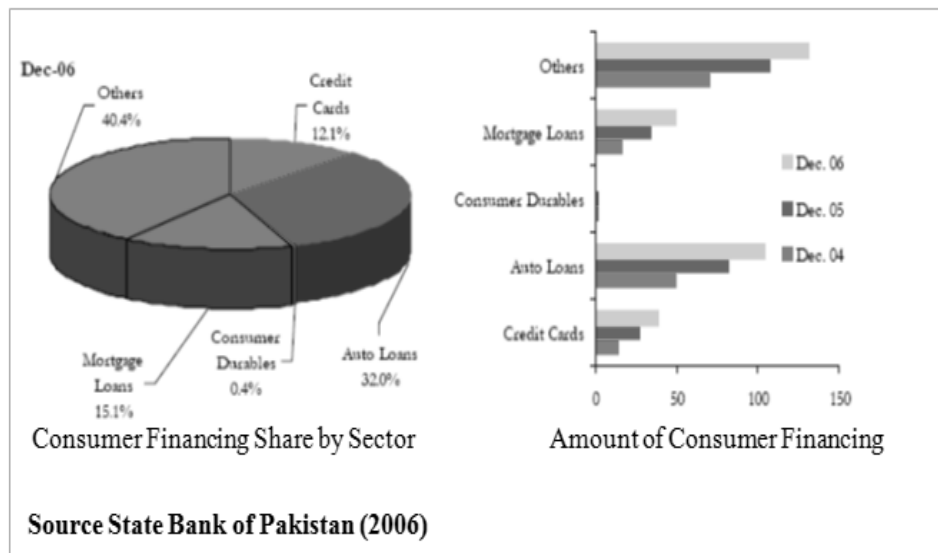
Table 1

	Number		Amount (Rs. Billion)		Share (%)	
	1990	**2002**	**1990**	**2002**	**1990**	**2002**
Assets						
Public	7	5	392.3	877.6	92.2	41.3
Private		16		968.3		45.5
Foreign	17	17	33.4	280.9	7.8	13.2
Total	**24**	**38**	**425.7**	**2126.8**	**100**	**100**
Deposits						
Public	7	5	329.7	721.9	93	43.5
Private		16		754.2		45.4
Foreign	17	17	24.9	184.1	7	11.1
Total	**24**	**38**	**354.6**	**1660.2**	**100**	**100**

Source: State Bank of Pakistan (2000) and (2002)

With the growing share of private commercial banks in the banking sector of Pakistan, consumer banking is flooded with a variety of new financial instruments, such as Auto Loans, Credit Cards, Personal Loans, and Home Loans. Technological advancements have made it easier to access plastic money (See Figure 2). Individuals as well as businesses are now more inclined towards e-banking, as it has made transactions easier and swifter. (See Figure 3 for Volume of Transactions through e-banking in 2011). These factors have fueled up the consumption expenditure radically in Pakistan (Dar 2012), as a result of which aggregate demand of the economy is more than its potential, for the past few years (Khan, Ahmed & Hyder 2007).

Figure 2

Consumer Financing Share by Sector   Amount of Consumer Financing

**Source State Bank of Pakistan (2006)**

J.M. Keynes (1936), in his famous work, proposed the consumption theory that relates consumption to the current disposable income. This theory was verified through empirical evidences from all around the world (Stigler 1954). However, with the advancements and extensions in the hypothesis proposed by Keynes, researchers have discovered many other factors that are vital determinants of consumption expenditure. Consumer behavior has now become a concoction of theory of Consumer Behavior, Expectancy theory and Maslow's hierarchy of need (Azjen 1991). Although, each theory has some of its own

unresolved issues, empirical evidences are strong enough to support the validity of these theories (Blundell 1988) (Van Liere & Dunlap 1980).

Figure 3
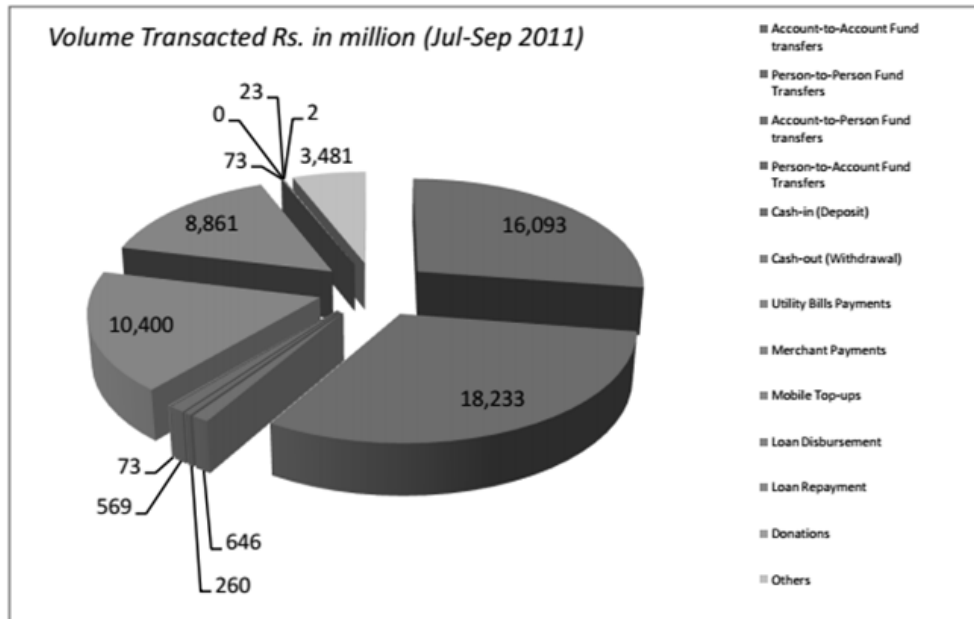
Source: Awareness of Electronic Banking in Pakistan, Dar (2012)

The trends of consumption and investment in Pakistan for the past few years are alarming. Theoretically, developing economies require large investments for the sake of sustained growth and to cover the leakages in the economy; however, the economy of Pakistan has relatively lower injections of investments (Zakaria 2008). With the advent of the era of banking innovations, consumption expenditures have grown rapidly because of increased credit availability to the consumers. Consumer financing at lower interest rates are easily accessible to the consumers who have discouraged savings in the economy. Introduction of lucrative financial instruments in consumer financing turned out to be an economic nudge for the consumers, who have now started preferring consumption over savings.

Such an increase in consumption expenditures increases the aggregate demand over time; thereby, creating a demand-pull inflation. This seems to be the possible reason for the contrasting results found in the empirical results. The effects of such exorbitant borrowings by the consumers have adverse impacts on the economy. The economy of Pakistan is a developing economy and it must not be consumption-oriented. This intuitive explanation was investigated in this study using econometric techniques to verify whether it has some significance or not.

5. Data Collection

In this analysis, four variables are selected which are; real gross domestic product as dependent variable, consumer price index to measure price levels adjusted at 2007-08 as base year, real lending rate as proxy for interest rate calculated by subtracting the rate of inflation for the same period and broad money as proxy for money supply. The year-wise data of Pakistan from 1980 to 2015 of these variables was obtained from various authentic sources, like Pakistan Bureau of Statistics, State Bank of Pakistan and World Development Indicators. The Financial reforms in Pakistan started from 1980s; therefore, the data from the 1980s is considered.

6. Theoretical Framework and Methodology

The theoretical framework used for this study was based on Keynesian IS-LM model and the monetary theory. According to conventional Keynesian economics, an increase in the real rate of interest hinders investment, consequently, output decreases; while an increase in money supply decreases real interest rate and increases output level. The monetary policy creates impact on the economy using two main instruments, that is, money supply and rate of interest. These are considered as the main policy tools of monetary policy; therefore, to study policy block following empirical model is formulated as;

$$RGDP = f (M2, RLR, CPI)$$

Where,

RGDP = Real gross domestic product (constant price, LCU)
M2 = Broad money (billions LCU)
RLR = Real lending rate (percent per annum)
CPI = Consumer Price Index (2007-08=100)

This model depicts the effect of money supply, interest rates and inflation over Real GDP of the country. Since the interest rate channel of monetary policy transmission mechanism is under consideration, the inclusion of interest rate and money supply is inevitable. Furthermore, in order to explore the reasons behind the contradiction in monetary policy objectives and rising inflation in Pakistan, CPI was also included in the model. The econometric model followed can be written as;

$$RGDP = \beta_1 M_2 - \beta_2 RLR + \beta_3 CPI + \mu_0$$

Where,

β_1, β_2 & β_3 are the coefficients of independent variables and μ_0 is the stochastic error term. The expected signs of β_1 & β_3 are positive, whereas the sign of β_2 is expected to be negative as suggested by the theory (Hasanov & Omay 2011).

The methodology employed in this research consisted of three steps. Firstly, to check the presence of unit root, the Augmented Dickey-Fuller (ADF) test is applied. Once the presence of unit root is rejected at first difference, then to determine the presence of co-integrating vector, Johansen & Juselius (1990) methodology was employed.

If r = 0 is rejected, then VAR is used and If r = 0 is not rejected, then VEC model is applied to study the long-run equilibrium relationship between variables. The study preferred Johansen-Juselius methodology over Engel & Granger because of its several shortcomings. Granger's causality test was carried out because if the presence of co-integration in the long run is revealed, then there should be some directional causality between variables.

7. Results

The model is based on the fact that when supply of money changes, it affects the real interest in the economy; consequently, investments that can ultimately affect the growth of the economy are affected. The following section summarizes the estimation of the techniques applied.

Shakir

Table 2 demonstrates summary of descriptive statistics of annually data for real gross domestic product, money supply, real lending rate and rate of inflation of Pakistan.

Table 2

	RGDP	MS	RLR	ROI
Mean	57.1475	42.9571	1.1138	2101.437
Median	54.44542	35.38376	1.109273	1073.34
Std. Dev.	23.8896	34.0733	0.0178	2492.63
Skewness	0.347153	1.199731	-0.0233	1.405115
Kurtosis	1.968828	3.53984	3.300574	3.955676
Jarque-Bera	2.189281	8.569192	0.131067	12.48184
CV	0.418	0.7932	0.016	1.1862

Source: Author's Computation 2015

Table 3 reports unit root test results. All the variables are found to be at first difference i.e. I(1).The results of Granger causality test are reported in Table 4. In case of price level (CPI) and output (RGDP), bidirectional causality at 5 percent significance is found. Same is the case with real lending rates (RLR) and output (RGDP) which signify the importance of interest rate channel in Pakistan. However, money (M_2) Granger causes price levels (CPI) which is in accordance with the monetary theory, but money (M_2) does not Granger causes output.

Table 3

Variables	Intercept	Trend and Intercept	Order of Integration
RGDP			
Level	1.7694	0.7135	I(1)
1st Difference	-5.5291*	-5.5078*	
M2			
Level	4.9591	4.8931	I(1)
1st Difference	-3.3185**	-6.6578*	
RLR			
Level	-2.5487	-2.5538	I(1)
1st Difference	-4.4339*	-4.3627*	
ROI			
Level	1.6305	-0.0773	I(1)
1st Difference	-6.9209*	-6.8766*	

* & **denotes rejection of the hypothesis at the 5 % and 10 % respectively based on Mackinnon critical values.
Source: Author's Computation 2015

Table 4

Dependent variable: D(RGDP)				Dependent variable: D(CPI)			
Excluded	Chi-sq	D$_f$	Prob.	Excluded	Chi-sq	D$_f$	Prob.
D(CPI)	14.94269	2	0.0006	D(RGDP)	0.621091	2	0.7330
D(RLR)	7.582075	2	0.0226	D(RLR)	41.49399	2	0.0000
D(M2)	9.458250	2	0.0088	D(M2)	0.293686	2	0.8634
All	18.92071	6	0.0043	All	61.26280	6	0.0000

Dependent variable: D(RLR)				Dependent variable: D(M2)			
Excluded	Chi-sq	D$_f$	Prob.	Excluded	Chi-sq	D$_f$	Prob.
D(RGDP)	12.01163	2	0.0025	D(RGDP)	1.566162	2	0.4570
D(CPI)	8.126936	2	0.0172	D(CPI)	3.580934	2	0.1669
D(M2)	0.080076	2	0.9608	D(RLR)	7.032576	2	0.0297
All	17.87595	6	0.0065	All	28.70304	6	0.0001

In order to find out the presence of co-integrating vectors, Johansen & Juselius co-integration technique was used. Particularly, trace and maximum eigenvalue test was applied to the model using the recent critical values of MacKinnon et al. (1999). The result of trace test on the model as well as the maximum eigenvalue test is presented in Table 5 and 6, respectively. Because of some inconsistencies of maximum eigenvalue statistic, trace test was considered to be a better option. In case of a conflict, Owoeye and Onafowora (2007) recommended trace test over max eigenvalue. The results of trace test affirmed that two co-integrating equations exist at 5 percent significance level; hence, there is no sufficient evidence to accept the null hypothesis of zero co-integrating vectors. Therefore, a unique association in the long-run was found.

Table 5

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob. **
None *	0.789442	88.32217	47.85613	0.0000
At most 1 *	0.518823	38.46634	29.79707	0.0039
At most 2	0.375229	15.05767	15.49471	0.0581
At most 3	0.000182	0.005824	3.841466	0.9384

* denotes rejection of the hypothesis at the 5 %
Source: Author's Computation 2015

Table 6

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob. **
None *	0.789442	49.85583	27.58434	0.0000
At most 1 *	0.518823	23.40867	21.13162	0.0235
At most 2 *	0.375229	15.05185	14.26460	0.0375
At most 3	0.000182	0.005824	3.841466	0.9384

* denotes rejection of the hypothesis at the 5 %
Source: Author's Computation 2015

Shakir

There is a significant impact of monetary policy on output through interest rate channel. A significant impact of lending rates is always found on developing countries' economy (Obamuyi 2009). The coefficients of normalized co-integrating equation are statistically significant at 5 percent.

Table 7

RGDP	CPI	RLR	M2
1.000000	-3.398197*	793.0407*	0.025390*
	(0.31670)	(114.484)	(0.00483)

* & ** denotes rejection of the hypothesis at the 5 % and 10% respectively
Source: Author's Computation 2015

According to the suggestion of Soyibo and Olayiwola (2000), the adjustment to long-run equilibrium and to imply policy interactions in the short-run are both important. Therefore, the vector error correction model (ECM) is applied to study the short-run dynamics. Table 8 shows the results of ECM regression analysis. The value of error correction term (ECT_{t-1}) was also significant at 10 percent significance level with a negative sign. If the value of error correction term lies between 0 and 1, they were considered to be more appropriate compared to values above 2.

Table 8

Dependent Variable: RGDP
Method: Least Squares

	Coefficient	Std. Error	t-Statistic
D(RGDP(-1))	0.165773	0.22651	0.73187
D(RGDP(-2))	-0.437011***	0.24217	-1.80456
D(CPI(-1))	-0.187756	0.15404	-1.21889
D(CPI(-2))	-0.511667**	0.20333	-2.51644
D(RLR(-1))	70.84949**	26.4963	2.67394
D(RLR(-2))	31.07324	23.0534	1.34788
D(M2(-1))	-0.000624***	0.00223	-1.79782
D(M2(-2))	-0.001367	0.0029	-1.47225
ECM_{t-1}	-0.073723***	0.04104	-1.79628
R-squared	0.783890		
Adjusted R-squared	0.675835		
Durbin-Watson stat	2.360009		

** & ***denotes rejection of the hypothesis at the 5 % and 10 % respectively
Source: Author's Computation 2015

The absolute value of the coefficient of the error-correction term indicated that 7.37 the percent disequilibrium was adjusted within the period of one year. To attain equilibrium, price levels (CPI) and money (M2) would increase while real lending rate (RLR) would decrease by 7.37 percent.

The coefficient of determination (R^2) presents information about the overall goodness of the model. In this paper, the value of R^2 is 0.7838 which indicates that 78.38 percent of the variation in output is accounted for by the independent variables used in the model. Still, other factors also influence growth of an economy, predominantly in developing countries,

74

like Pakistan. The Durbin Watson statistics is found to be 2.36, which is quite close to 2.0, the accepted benchmark. Therefore, it can be safely concluded that the estimated model is free from problems, like auto-correlation and serial correlation; hence, the assumption of linearity is maintained in the model.

The traditional Keynesian economics has a view point that when there is an increase in real interest rate, investments are discouraged which lead to decreased output. Hence, there is an inverse relationship between real interest rate and output. The findings in the case of Pakistan are found to be different from Keynesian opinion. According to monetary theory, when supply of money in the economy increases, the output also increases and so does the price levels, suggesting a positive relationship between them. However, the outcomes of this research are contradictory to the monetary theory. The money supply and price levels presented significant inverse relationship with GDP. While there a direct relationship was revealed between real lending rate and real output level.

8. Conclusion

The subject of major concern of developing countries is to formulate monetary policy. In the long run, the goal of a prosperous economy is to attain the stability of macroeconomic variables and promote growth. This analysis illustrates that monetary policy has significant impact on output through interest rate channel. Dimitrijevic & Lovre (2012) suggested that the supply of money has an ability to cover all the inflationary pressures on the economic growth. Interest rates and money supply are important tools of monetary policy and they are statistically significant at 5 and 10 percent levels of significance. However, a negative association of money was found with economic growth which is opposite to the notion of the monetary theory. In this analysis, increase in money led to a decrease in output, (Mallet & Keen 2012). Furthermore, over the period of the last 10 years, GDP growth rate and money supply move in opposite directions in the UK.

According to Mishkin (2006), in case of expansionary monetary policy, interest rate channel of the transmission mechanism follows the path in which increase in money supply direct the real interest to fall. This, in turn, causes increase in investment from the business sector because of the decline in cost of borrowing. On the other side, there is an increase in expenditure from the household sector. This leads to an increase in aggregate demand; hence, output level rises. In case of Pakistan, it is evident that the economy is consumption-oriented and people prefer to spend more than to save, and it is a well-known fact that savings are channelized into investments. The result of the data analysis showed that, when supply of money increases in the economy, real lending rate decreases. As a result, households consume more because credit is available at a low cost. They consequently save less and spend more. Decrease in saving leads to a decrease in investment and eventually affects the output.

In a nutshell, innovations in the banking system and financial sector of Pakistan have reshaped the role of monetary policy. The analysis of data exhibits the fact that tools of Monetary Policy are functional and still have significant impact. However, the monetary policy of Pakistan needs to be thoroughly revised in accordance with the prevailing environment of the economy. The State Bank of Pakistan can achieve the objectives of high growth rates with the tools of monetary policy if it discourages consumption expenditure of financial instruments by households through charging higher lending rates on personal financing.

This study is limited by hypothesizing the possible reason of contrasting results on the basis of this estimation. These estimations can be further strengthened with an in-depth study of consumer behavior theories, and through secondary research with the consumers. The consumer behavior theories can be used as a deduction alternative and concrete data analysis in this respect will go to further validate the case.

Individuals, as well as businesses, in developing nations are now more inclined towards e-banking, as it has made transactions easier and swifter. These factors have fueled up consumption expenditure. Consequently, the aggregate demand of these economies is more than their potential. Therefore, this research can be extended to study interregional comparison among other South Asian developing economies. The consumption behavior of households and businesses in these economies in comparison with Pakistan can be analyzed likewise.

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