

IMPACT OF MONETARY POLICY ON ECONOMIC GROWTH: EVIDENCE FROM PAKISTAN

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ABSTRACT- The objective of this research paper is to investigate the impact of monetary policy on Pakistan's economic growth. We used time series data for the period 1972-2015. The variable of the study were: real gross domestic product, employed labour force, gross capital formation, foreign direct investment, broad money, GDP deflator and exports. The author applied multiple regression method to analyze the data and draw the results. We also used correlation technique to study nature of relationship among variables. We examine long run relationship between monetary policy and the selected variables. We found that monetary policy has significant effect on inflation rate, money supply, employment, gross capital formation, foreign direct investment, saving and other macroeconomic variables. We recommend that central banks should be given free hand to formulate and execute monetary policy but it must have coordination with fiscal policy. In this way, the economy can be managed effectively by economic managers.

Key word: Real GDP, Employed Labour Force, Gross Capital formation, Foreign Direct Investment, Money Supply, GDP Deflator, Export of goods and services.

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1.INDRODUCTION

This research checks the impact of monetary policy on economic growth in Pakistan. The study uses the time-series data covering of 1972 to 2015. The effects of stochastic shocks of each of the endogenous variables are explored using Error Correction Model (ECM). The core finding of this study shows that exchange rate, external reserve and inflation rate are important monetary policy instruments that drive growth in Pakistan. It is recommended that the establishment of primary and secondary government bond markets that can also increase the efficiency of monetary policy and reduce the government's need to rely on the central bank for direct financing.

In monetary policy, the central bank may decide about the money demand and money supply to cope up with these problems. Money demand may be controlled by using price of money that is normally considered as interest rate and money supply can directly be controlled by central bank considering various financial problems of the economy. Money supply defined as total stock of money available in the economy in a given period of time which includes currency in circulation, demand deposits, small time denominations and longtime denominations etc.

Money supply does not directly affect economic growth but it indirectly affects through inflation in the economy. The main cause of inflation is Money supply in the economies. Growth rates are negatively influenced by the higher inflation. Due to inflation, the financial sector development also inversely affected and it resulted in poverty in population. The prices of goods and services would remain stable when households and businessmen control their demand of various goods and services by their decision making power.

According to Keynesian and Monetarists, economic activities are affected by monetary policy through various transmission channels. According to the Schwartz and Friedman (1963), money supply may be increased by central bank through open market operations. It increases commercial bank reserves and credit availability to the public and it also increases money supply multiple times. When central bank decides to reduce money supply, banks and non-bank organizations starts purchasing securities sold by the central bank through open market operations.

The Wikipedia (2015) defined monetary policy as the process by which the monetary authority of a country controls the money supply, which often targets an inflation rate or interest rate to ensure price general trust and stability in the currency. It is maintained through actions such as increasing interest rate, or changing the amount of money banks need to keep in vault.

Like other developing countries, Pakistan government adopts two types of public policies to carry out the objective of allocation of resources and income distribution. These public policy includes: - fiscal policy and monetary policy tools. In Pakistan, government always relied on monetary policy as way of achieving certain economic objective in the economy such macroeconomic objectives include; employment, economic growth and development, balance of payment equilibrium and relatively stable general price level. The reason is to choosing monetary policy is the fact that monetary policy has serious implications for fiscal policy measures.

1.1 OBJECTIVES OF THE STUDY: -

This study has the following objectives.

1. To see cause and effect relationship among macroeconomic variables.
2. To explore the influence of Monetary Policy (Broad Money) on Economic Growth of Pakistan.

3. To see the effect of labor and capital on economic growth of Pakistan by considering Solow growth model.
4. To examine the effect of important macroeconomic variables i.e. GDP deflator, exports and foreign direct investment on Pakistan's economic growth.

1.2 RESEARCH QUESTION:

The study explores following questions to be answered.

1. What is the effect of monetary policy on economic growth of Pakistan?
2. Is there any effect of labor and capital on economic growth?
3. What is role of macroeconomic variables such as inflation, exports and foreign direct investment on economic growth?

2.LITERATURE REVIEW:

Investigation of linkage between money supply and inflation was attempted by Qayyum (2006) in Pakistan by using time-series data over the period from 1960 to 2005. The study concluded that growth of income was negative with growth of price while growth of money supply and growth of velocity were increased growth of price in Pakistan during this period.

Awan (2016) contends that monetary policy has slight effect on macroeconomic variables while in the long run its effect is significant. Awan (2015) says that central banks must be given free hand to execute monetary policy and failure of monetary policy in Pakistan most of the time was the result of political intervention.

Relation between money supply, inflation and government expenditure with economic growth was analyzed by Mohammad et al. (2009). The study concluded that money supply, price level and government expenditure turned out to be positive with economic growth of Pakistan in the long run.

Hameed and Amen (2011) applied regression analysis to measure the impact of monetary policy on gross domestic product. The regression results revealed that money supply was accelerated gross domestic product while interest rate was negatively affected domestic product of Pakistan during this period.

Najmi et al. (2013) used Johansen co-integration technique to observe impact of inflation on real GDP of Pakistan. The results show that employed labor force, government revenue and price level have negative relation with real GDP while investment and government expenditure had positive relation with real GDP in the long run.

Sultan and Shah (2013) employed regression analysis technique for long run results to study the existence of inflation on economic growth for the economy of Pakistan. The results revealed that money supply and per capita income were positively associated with economic growth.

The co-integrated causal and relationship of food inflation, health and education with economic growth was examined by Afzal et al. (2013). The study has two-way causality between education and economic growth; food inflation and education and food inflation and economic growth.

Ihsan and Anjum (2013) analyzed the role of money supply on gross domestic product of Pakistan using time series data from 2000 to 2011. The findings of the study concluded that inflation rate reduced and interest rate and consumer price index increased gross domestic product of Pakistan.

Caporin and Maria (2002) analyzed the relationship between inflation and growth for time period of 1979 and 1997. The results revealed that GDP, inflation, public expenditure and population were negative with per capita GDP growth rate

while investment, net exports and imports were positive with per capita GDP growth rate in industrialized countries.

The causal effect of money growth, inflation, devaluation on economic growth was investigated by Akhtar (2005) in Indonesia using time series data over the period from 1954 to 2002. A variety of variables were considered like consumer price index and money supply which revealed that there did not exist any causal effect from inflation on economic growth.

Owoye and Onafowora (2007) explored the impact of money supply on real GDP growth rate in Nigeria over the quarterly data from 1986 to 2001. The study revealed that domestic interest rate, inflation rate and exchange rate were positive with real output growth while foreign interest rate was negative with real output growth in Nigeria.

The relationship between inflation with economic growth was ascertained by Chimobi (2010) in Nigeria using time series data over the period of 1970 to 2005. The study concluded that unidirectional causality was running from inflation to economic growth.

Ogunmuyiwa and Ekone (2010) applied ordinary least square method and causality analysis to explore the impact of money supply on economic growth for the economy of Nigeria. the study revealed that interest rate was positive related with real per capita gross domestic product in the long run.

Bittencourt (2010) took panel data of Latin American countries between 1970 and 2007 to investigate the role of inflation in macroeconomic performance. The result of fixed effect and random effect models revealed that inflation rate, liquid liabilities to GDP, structural development and political regimes were inversely related with growth rate while government's share to real GDP, ratio of exports to imports to

real GDP and ratio of investment to real GDP were positively influenced real gross domestic product.

Babatunde and Shuaibu (2011) estimated a monetary growth model for Nigeria by examining the existence of a significant long time relationship between money supply, capital stock, inflation and economic growth which revealed that money supply and gross fixed capital formation were positive with economic growth while inflation was negative with economic growth in Nigeria.

Ibarra and Trupkin (2011) investigated the negative effect of inflation on economy when inflation was above its threshold level. On the other side, inflation rate, initial GDP, population growth rate and terms of trade were negative with per capita GDP while investment to GDP ratio and trade openness were positive with per capita GDP. The relation between money supply with economic growth was examined by Nouri and Samimi (2011) in Iran which revealed that growth rate of labor and government expenditure to GDP ratio reduced GDP while growth rate of exports, investment to GDP ratio and growth rate of money supply were increasing gross domestic product of Iran.

Tabi and Ondo (2011) analyzed the relationship between money supply, inflation and economic growth. The results concluded that inflation and money supply were increasing economic growth of Cameroon.

The linkage between inflation with economic development was empirically analyzed by Umaru and Zubairu (2012) for the economy of Nigeria. The authors included a range of macroeconomic variables such as inflation as explanatory and gross domestic product as a dependent variable. The results revealed that inflation reduced economic growth of Nigeria.

Jayathileke and Rathnayake (2013) empirical study concluded that inflation appeared to have negative relationship with economic growth in China, India and Sri Lanka in the short run. On the other side, Economic growth granger caused by Inflation rate in case of China and India. Moreover, there did not exist any causality among economic growth and inflation in case of Sri Lanka.

Bittencourt et al. (2013) investigated the role of inflation rates to determining economic growth in sub – Saharan African countries. The results revealed that inflation rate, government consumption expenditure and money supply had negative relation with economic growth rate and gross fixed capital formation to GDP, number of teachers per 100 pupils in secondary education, economic openness and political regime variables were positively linked with growth rate.

Agbonlahor (2014) investigated empirically the impact of monetary policy on economic growth in United Kingdom The long run results suggested that money supply, bank rate, price level and exchange rate were positive with real gross domestic product while inflation and current account deficit were negative with real gross domestic product of United Kingdom during the period of study.

Sturgil (2014) examined the impact of money supply on economic growth. The results provided that initial income, investment share and nominal money growth appeared to have positive relation with real gross domestic product per worker and depreciation had negative linkage with real gross domestic product per worker.

The estimation of short run and long run relationship was conducted by Biswas and Saha (2014) for macroeconomic determinants of country's economic growth. The results of the study revealed that gross domestic capital formation, employment in public and private sectors, exports of goods and services, foreign direct investment and broad money were positively linked with gross domestic

product while whole sale price index and gross fiscal deficit were inversely related with gross domestic product in the long run.

El-Seoud (2014) determined the relationship between real gross domestic and real money supply product in Bahrain economy The results concluded that long run relationship was existed between money supply and economic growth and there existed one-way causality running from real GDP to real money supply in the long run.

Olu and Idih (2015) examine the effect of inflation rate on economic growth in Nigeria. this study concluded that inflation, exchange rate and inputs of capital turned out to be negative with growth rate while inputs of labor appeared to be positive with GDP growth rate in Nigeria during this period.

The linkages of money supply with economic growth was studies by Chaitip et al. (2015) The study included three variables i.e. GDP growth rate, money supply and demand deposits. The results concluded that money supply was positively related with GDP growth rate while demand deposits were negatively associated with GDP growth rate in the long run.

Nibeza and Tumusherure (2015) focused on examining the impact of monetary policy on macroeconomic variable on Rwanda's economy The results of the study revealed that all the variables were stationary at first difference so Johansen co-integration test would be the most suitable in this situation. The study concluded that money supply and exchange rate caused of higher gross domestic product in Rwanda.

Jelilov et al. (2016) determined relationship between, unemployment, economic growth and inflation. The study concluded that inflation and unemployment was reduced gross domestic product in this region.

Lupu (2016) highlighted the existence of interdependencies between inflation and growth. The results show that the effect of inflation on economic growth did not increase and inflation was positively related with economic growth in Romania during this period.

Denbel-et-al.(2016) examine existence of causal relationship between inflation, economic growth and money supply for Ethiopia. The study concluded that consumer price index and money supply were increasing real gross domestic product in the short run. Uni-directional causality was analyzed running from real gross domestic product to consumer price index.

Aslam (2016) investigated the influence of money supply, exchange rate, exports, imports, and consumer price index on gross domestic product for Sri Lanka economy. The results concluded that money supply and exports appeared to be positive with gross domestic product while imports, consumer price index and exchange rate turned out to be negative with gross domestic product.

3.METHODOLOGY AND DATA:

3.1 HYPOTHESIS OF THE STUDY:

The study hypothesizes some relationships of variables given below;

- [H1]: There exists positive relationship between labor force participation and real GDP of Pakistan.
- [H2]: It has positive relationship between gross capital formation and real GDP of Pakistan.
- [H3]: There is negative linkage among monetary policy and real GDP of Pakistan.
- [H4]: Price level is inversely connected with real GDP of Pakistan.
- [H5]: Exports is expected to be positively linked with real GDP of Pakistan.
- [H6]: Foreign direct investment is brought directly effect on real GDP of Pakistan.

3.2 Econometric Model

To determine economic growth and its variable, there are many models. But here we will use regression analysis and following equation is derived;

$$EG = \beta_0 + \beta_1L + \beta_2K + \beta_3FD + \beta_4MP + \beta_5PR + \beta_6X + e$$

Where;

EG	Real Gross Domestic Product
L	Employed Labour Force
K	Gross Capital
FD	Foreign Direct Investment
MP	Monetary Policy
PR	Price Level/GDP Deflator
X	Export of Goods and Services
E	The Error Term
β_i	Elasticity of Real GDP with respect to each variable

For the purpose of this study the data on stated variables has been collected from 1972-2015. The major source of data collection is State Bank of Pakistan. Different other websites like Ministry of Finance and Pakistan Statistical Bureau are also used for this study.

3.3 Summary of Statistics used in Regression Analysis

Table 1: Descriptive Statistics

	EG (B)	L (B)	K (B)	FD (B)	MP (B)	PR	X (B)
Mean	5,220	0.04	1,00 0	5,330	2,560	88.79	672
Median	4,830	0.03	1,08 0	3,220	661	55.01	236
Maximum	11,200	0.06	1,70 0	31,60 0	14,600	323.1 2	3,080
Minimum	14,40	0.02	344	72	27	6.65	6.36
Std. Dev.	2,880	0.01	420	7,250	3,880	87.39	915
Skewness	0.44	0.53	-0.04	2.32	1.74	1.31	1.53
Kurtosis	2.03	2.12	1.86	8.01	4.97	3.73	4.12

Note: EG = Real Gross Domestic Product, L = Employed labor force, K = Gross capital formation, FD = Foreign Direct Investment, MP = Broad Money, PR = GDP Deflator, X = Exports of Goods and Services, B = Billions. Kurtosis < 3: Platy Kurtic, Kurtosis = 3: Lepto Kurtic, Kurtosis > 3: Meso Kurtic.

3.4 Descriptive Analysis:

In descriptive statistics, various statistics techniques like, Median, Mean, Maximum, Minimum, Skewness, Standard Deviation, , Probability values, Kurtosis, and Jarque Bera were used. The results show that average value of real gross domestic product is 5220 billion rupees, the median value is 4830 billion rupees, the maximum value of real GDP is 11200 billion rupees, and minimum value of real GDP is 1440

billion rupees. The value of standard deviation for real GDP is estimated 2880. Real gross domestic product is positively skewed. According to value of kurtosis, real GDP is Platy Kurtic.

Average value of employed labor force is 0.04 billion, the median value is 0.03 billion, the maximum value of employed labor force is 0.06 billion, minimum value of employed labor force is 0.02 billion. The value of standard deviation for employed labor force is estimated 0.01. Employed labor force is positively skewed. According to value of kurtosis, employed labor force is Platy Kurtic.

Average value of gross capital formation is 1000 billion rupees, the median value is 1080 billion rupees, the maximum value of gross capital formation is 1700 billion rupees, and minimum value of gross capital formation is 344 billion rupees. The value of standard deviation for gross capital formation is estimated 420. Gross capital formation is negatively skewed. According to value of kurtosis, gross capital formation is Platy Kurtic.

Average value of foreign direct investment is 5330 billion rupees, the median value is 3220 billion rupees, the maximum value of foreign direct investment is 31600 billion rupees, and minimum value of foreign direct investment is 72 billion rupees. The value of standard deviation for foreign direct investment is estimated 7250. It is positively skewed. According to value of kurtosis, it is Meso Kurtic.

Average value of broad money is 2560 billion rupees, the median value is 661 billion rupees, its maximum value is 14600 billion rupees, its minimum value is 27 billion rupees. The value of standard deviation for broad money is estimated 3880. It is positively skewed. Value of kurtosis is 4.97 shows Meso Kurtic. Average value of GDP deflator is 88.79 points, the median value is 55.01 points, its maximum value is 323.12 points, its minimum value is 6.65 points. The value of standard deviation

for GDP deflator is estimated 87.39. It is positively skewed. Value of kurtosis is 3.73 shows Meso kurtic. Average value of exports is 672 billion rupees, the median value is 236 billion rupees, its maximum value is 3080 billion rupees, its minimum value is 6.36 billion rupees. The value of standard deviation for exports is estimated 915. It is positively skewed. Value of kurtosis is 4.12 shows Meso Kurtic.

3.5 Correlation Analysis:

Table 2 : Correlation Matrix

Variables	LEG	LL	LK	LFD	LMP	LPR	LX
	1.00						
LEG	-----						

	0.99	1.00					
LL	38.10	-----					
	0.00	-----					
	0.98	0.95	1.00				
LK	34.73	19.67	-----				
	0.00	0.00	-----				
	0.91	0.87	0.94	1.00			
LFD	14.54	11.49	18.10	-----			
	0.00	0.00	0.00	-----			
	0.99	0.99	0.96	0.89	1.00		
LMP	51.22	75.03	21.93	12.35	-----		
	0.00	0.00	0.00	0.00	-----		
LPR	0.99	0.99	0.96	0.87	0.99	1.00	

	44.67	48.54	21.44	11.63	67.25	-----	
	0.00	0.00	0.00	0.00	0.00	-----	
	0.99	0.99	0.97	0.90	0.99	0.99	1.00
LX	78.34	40.18	25.29	13.19	62.45	56.52	-----
	0.00	0.00	0.00	0.00	0.00	0.00	-----

Note: EG = Real Gross Domestic Product, L = Employed labor force, K = Gross Capital Formation, FD = Foreign Direct Investment, MP = Broad Money, PR = GDP Deflator, X = Exports of Goods and Services, $r < 0.41$: Low Correlation, $r > 0.80$: High Correlation, $0.40 < r < 0.80$: Moderate Correlation.

To see association among each set of two variables, the study uses correlation matrix. The results of correlation matrix are provided in table 2. There may be three types of association among each set of variables i.e. low correlation, moderate correlation and high correlation. The results show that the value of correlation between economic growth and employed labor force is 0.99, t – statistics is 38.10 and its probability value is 0.00 which shows that there exists high level of correlation among real GDP and employed labor force.

The results show that the value of correlation between economic growth and gross capital formation is 0.98, t – statistics is 34.73 and its probability value is 0.00 which shows that there exists high level of association among real GDP and gross capital formation. The results show that the value of correlation between economic growth and foreign direct investment is 0.91, t – statistics is 14.54 and its probability value is 0.00 which shows that there exists high level of association among real GDP and foreign direct investment.

The value of correlation between economic growth and GDP deflator is 0.99, t – statistics is 44.67 and its probability value is 0.00 which shows that there exists high level of association among real GDP and GDP deflator. The value of correlation between economic growth and exports is 0.99, t – statistics is 78.34 and its probability value is 0.00 which shows that there exists high level of association among real GDP and exports.

The value of correlation between employed labor force and gross capital formation is 0.95, t – statistics is 19.67 and its probability value is 0.00 which shows that there exists high level of association among employed labor force and gross capital formation.

The value of correlation between employed labor force and foreign direct investment is 0.87, t – statistics is 11.49 and its probability value is 0.00 which shows that there exists high level of association among employed labor force and foreign direct investment. The value of correlation between employed labor force and broad money is 0.99, t – statistics is 75.03 and its probability value is 0.00 which shows that there exists high level of association among employed labor force and broad money.

The value of correlation between employed labor force and GDP deflator is 0.99, t – statistics is 48.54 and its probability value is 0.00 which shows that there exists high level of association among employed labor force and GDP deflator. The value of correlation between employed labor force and exports is 0.99, t – statistics is 40.18 and its probability value is 0.00 which shows that there exists high level of association among employed labor force and exports.

The value of correlation between gross capital formation and foreign direct investment is 0.94, t – statistics is 18.10 and its probability value is 0.00 which shows that there exists high level of association among gross capital formation and foreign

direct investment. The value of correlation between gross capital formation and broad money is 0.96, t – statistics is 21.93 and its probability value is 0.00 which shows that there exists high level of association among broad money and gross capital formation.

The value of correlation between gross capital formation and GDP deflator is 0.96, t – statistics is 21.44 and its probability value is 0.00 which shows that there exists high level of association among gross capital formation and GDP deflator. The value of correlation between gross capital formation and exports is 0.97, t – statistics is 25.29 and its probability value is 0.00 which shows that there exists high level of association among gross capital formation and exports.

The value of correlation between foreign direct investment and broad money is 0.89, t – statistics is 12.35 and its probability value is 0.00 which shows there exist high-level of association among foreign direct investment and broad money. The value of correlation between foreign direct investment and GDP deflator is 0.87, t – statistics is 11.63 and its probability value is 0.00 which shows that there exists high level of association among foreign direct investment and GDP deflator.

The value of correlation between foreign direct investment and exports is 0.90, t – statistics is 13.19 and its probability value is 0.00 which shows that there exist high-level of association among foreign direct investment and exports. The value of correlation between broad money and GDP deflator is 0.99, t – statistics is 67.25 and its probability value is 0.00 which shows that there exists high level of association among broad money and GDP deflator.

The value of correlation between broad money and exports is 0.99, t – statistics is 62.45 and its probability value is 0.00 which shows that there exists high level of association among broad money and exports. The value of correlation between GDP deflator and exports is 0.99, t – statistics is 56.52 and its probability

value is 0.00 which shows that there exists high level of association among GDP deflator and exports.

4.CONCLUSION:

Descriptive analysis illustrates that mean values for real gross domestic product, employed labor force, gross capital formation, foreign direct investment, broad money, GDP deflator and exports are respectively 5220 billion rupees, 0.04 billion, 1000 billion rupees, 5330 billion rupees, 2560 billion rupees, 88.79 points and 672 billion rupees. Real GDP, Employed labor force, Foreign direct investment, Broad money, GDP deflator and Exports are positively skewed while Gross capital formation is negatively skewed variables. On the other hand, Real GDP, Employed labor force and Gross capital formation are having Platy Kurtic distribution while Foreign direct investment, Broad money, GDP deflator and Exports are having Meso Kurtic distribution.

The results of correlation analysis shows that there exists high level of association among various sets of variables like Real GDP and Employed labour force; real GDP and gross capital formation; real GDP and foreign direct investment; real GDP and broad money; real GDP and GDP deflator; real GDP and export employed labor force and gross capital formation; employed labor force and foreign direct investment; employed labor force and broad money; employed labor force and GDP deflator; employed labour force and exports; gross capital formation and foreign direct investment; gross capital formation and broad money; gross capital formation and GDP deflator; gross capital formation and export foreign direct investment and broad money; foreign direct investment, GDP deflator; foreign direct investment and exports; broad money and GDP deflator; broad money and exports; and GDP deflator and exports.

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