

## THE RELATIONSHIP AND IMPACT OF MONEY GROWTH AND BUDGET DEFICIT ON INFLATION IN PAKISTAN

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**ABSTRACT.** *This research study investigates the relationship and the effects of budget deficit and money growth on inflation in the case of Pakistan's economy. The data was gathered from different sectors in Pakistan. The data was collected from yahoo finance, ADB, KSE and State Bank of Pakistan. The period covered by this study is twenty six years starting from 1986-2011. The regression analysis test was used to examine/determine the results that were found/experienced during the research work. In regression analysis ANOVA, correlation of coefficients, and regression model test was used to analyze the results that were applied on the information gathered through secondary sources. The results show that there is a positive association of budget deficit and money growth on inflation. In general the key outcomes indicate that financing and government expenditures could have different effects. Therefore, it is very difficult to differentiate between current and capital expenditures. Budget deficit increase inflation in country and due to this there is decrease in money growth of a country.*

**Keywords:** Inflation, Money Growth, Budget Deficit, Pakistan Economy

**1. Introduction.** The concerns about budget deficit and money growth on inflation have become global concern. Different studies have identified the causal relationships of different variables, either individually or collectively, which has its implications on the inflation in an economy. Although majority of the studies have indicated that budget deficit has been one of the major concerns regarding inflation, others have identified no empirical evidence to assure this fact. The coordinative relationship amongst money, budget deficit, and inflation has been at the core of monetary economics. It is argued that monetization of budget deficit has been the major initiator of inflation in developing countries. Considering the monetary phenomenon, it is argued that when growth rate of money tends to be more than growth of money than inflation takes place. In a given period, when the revenue tends to be lower than the total expenditures then budget deficit arises.

The popular view is that high interest rates are yielded by large deficits which have chronic effects on both the economic growth and productivity. Monetization of certain parts of the deficits is done by the monetary authorities in order to lower the money growth and inflation, which are caused by the high interest rate as a result of high deficits forces (Darrat & Suliman, 1991). In prior research, Sargent and Wallace (1984) have argued that higher inflation rates are negatively generated as a result of tight monetary policy due to large deficit. This has led the economists, practitioners and other government official to devise mechanisms through which they can control and lower the increasing budget deficit.

As identified by Haan and Zelhorst (1990) that the central bank in most developing countries is directly controlled by the central government, where the likelihood is that money creation finances the government deficits. This paper makes an attempt to empirically test the relationship of money growth and budget deficit on inflation within the context of Pakistan, along with determining the causal relationship amongst these variables.

The Section 1 of this paper provides the introduction to this study. It is followed by the literature review in Section 2, and methodology in Section 3. Analysis and discussion of the empirical findings is provided in Section 5. The last section, Section 6 concludes the study under the heading Conclusion.

**2. Literature Review.** Numerous studies were conducted on money growth, budget deficit and inflation. Saleh (2003) deliberates the relationship of macroeconomic variables like growth, interest rate, trade deficit with budget deficit. It is most widely debated topics among Policy makers and economist in developed and developing countries have been widely debating about the topics related to these concerns. Different effects of financing and government expenditures as methods with key outcomes could have different impositions in general. Therefore, when evaluating the impact of financial policy on investment in private sector and growth in output, it is not easy to differentiate between capital expenditures and current expenditures. The relationship between current account deficit and the budget deficit both in developed and developing countries has been the concern of major studies. Current account deficit is caused due to induction in domestic absorption and expansion in imports which leads the budget deficit to increase.

Effects have been evidenced on exchange rate by the budget deficit which is dependent on the deficit funding due to taxation or money growth. Lanzo (2008) on one hand determined a composite relationship between money growth and inflation, and fiscal deficit and money growth on the other hand. The size of long term parameters looks acceptable when compared what it seen in other countries using different techniques. With the help of statistical tests Sergeant and Wallace (1984) hypothesis would be the most appropriate approach to understand the dynamics of these variables.

Mukhtar and Zakaria (2010) argue that a rise in inflation is seen due to high budget deficits with persistency, which cannot be prevented by the monetary policy alone. However such hypothesis is not supported by the empirical evidence. On the contrary empirical findings show that in the long-run budget deficit is not associated with inflation. Rather it is related to money growth, and budget deficit has no relationship as a cause and effect with supply of money. Pollin and Zhu (2005) used the data sample of countries from 1961—2000, and the results showed that moderate increase in GDP is associated with higher inflation. Data arrangement in the groupings by decade, presents us with the results indicating that inflation and growth are highly correlated to the degree that the focus is on demand management as a stimulus to growth in macroeconomic policy.

Concerning the macroeconomic conditions in Pakistan, the fiscal deficit continues to deteriorate, creating issues and risks for sustainability and growth in the long run. In Pakistan a powerful effect has been shown by the fiscal deficit on inflation and in order to eradicate the adverse effects of inflation there is need of coordination between monetary and fiscal policy (Ammama, Mughal, & Khan, 2011).

Fatima, Ahmed, and Rehman (2011) have identified the macroeconomic management in an effective manner to be critical for the generation of growth-induced employment and reduction in poverty. So are the private investments needed to play their role in the economy to improve the living standard of the country. Macroeconomic imbalances in Pakistan are a serious threat for its economic growth and development. Adverse impact of serious nature has been implicated by the fiscal profligacy on physical and social infrastructure in the country. Khalid (2005) says that in order to retain price stability and exchange rate stability in the country, economic growth needs to be maintained. The macroeconomic imbalances in Pakistan is extremely high with foreign (as well as domestic) debt, high budget and current account deficits, extremely low international reserves, high inflation, high nominal interest rates and low economic growth. The average economic growth over 40 years is around 4 percent. Due to macroeconomic imbalances it is almost impossible to achieve a sustainable economic growth.

Agha and Khan (2006) argue that expansion in monetary terms is associated with inflation. As an Asian country, Pakistan has the same inflation experiences as other countries. As a matter of fact, when general price level arises then it can be mapped to growth in money supply. In Pakistan, it is generally argued that an important role is being played by fiscal imbalances in explaining the fluctuation in prices (Chaudhary & Ahmad, 1995). Inflation is burning issue in Pakistan. Public sector used mix of policies to control inflation. Inflation not affect the sectoral allocation,

its create poverty. Budget deficit when backed by domestic financing is specifically from the banking sector in the long-run is inflationary. Government can control the inflation by cutting the size of budget deficit (Chimobi & Igwe, 2010). Through the results using the model of Vector Error Correction (VEC) points out that there is close relation between inflation and money supply.

Budget deficit is determined by the level of money supply as a macro factor of economy, and also estimates if there is or will be budget deficit. Anušić (1994) says that national budget deficit is the amount by which total government expenditures exceeds the total revenue. National economy can be observed by budget deficit. If economic activities in a country are high then budget revenue will grow without fiscal burden. Budget revenue decrease due to erosion of tax while expenditures increase due to population growth. It is common belief that budget deficit is harmful for economy (Sial, Hashmi, & Anwar, 2010).

In long run public and private investment showed a positive impact economic growth but growth is driven by private investment as compared to public investment. Government expenditures economic uncertainty is harmful for economic growth. In short period of time the private investment positively influence the growth and there positive relation between economic uncertainty and GDP (Fatima, Ahmed, & Ur Rehman, 2012). Budget is not important to achieve economic growth of a country but it is necessary. Regression analysis conducted to ascertain the impact of BD on the GDP, and explored a negative impact of budget deficit on the economic growth. Some policies are suggested for the government to avoid certain levels of the budget deficit to achieve desired level of growth.

Pekarski (2007) found that in the economies with extensive inflation there are persistent outbursts that can be analyzed by a particular hysteresis effect. But this analysis would be unjust if the regime shifts between moderate and high inflation economies happens with invisible corrosion in economic finance or sudden changes in monetary and financial policies. In the study of Harko and Fida (2009), the causality links of the deficit have been demonstrated through vector autoregressive model estimation that flows from budget deficits to interest rate to prices to exchange rate to capital flows and to trade deficits. There has been evidence concerning how the level of prices can be controlled with the help of reduction in the budget deficits.

Samimi and Jamshidbaygi (2011) state that in macroeconomics the important issue is the association between inflation and budget deficit. Using simultaneous equation model that includes on structural equation for monetary basis based on money growth, budget deficit and inflation. The result state that there is positive and significant impact on inflation by the budget deficit on monetary variables. Along with the finding of positive and significant impact o budget deficit by price index. Levin (1974) says that when few demanding goods are being chased by too much money then it is the basic cause of inflation. In order to increase or decrease the money circulation Federal Reserve as a tool are used. Money in the hands of general public increases with the rise in deficit.

Akçay, Alper and Özmücur (1996) states that when there is difference in the rates at which money supply grows and the rate with which economy grows then inflation takes place if the rate is higher for the prior. Thus higher the deficit policies the higher are the inflation. If government borrowing requirements increase the net credit demands in the economy drive interest rate and private investment. The result is that the growth rate decrease and increase price level. The other channel through which deficits can lead to higher inflation when Central Banks do not monetize the debt is the private monetization of deficits. This occurs when the high interest rates induce the financial sector to develop new interest bearing assets that are almost as liquid as money and are risk free. Thus, the government debt not monetized by the Central Bank is monetized by the private sector and the inflationary effects of higher deficit policies prevail.

Saunders (1989) says that two closely related theoretical issues within the causality testing framework. First the direction of the causal flow in the deficit nominal interest rate relationship is analyzed. Second the effect of deficits on the two components of nominal interest rate such as the real rate of interest and the inflationary rate are investigated. Taking deficit as an indicator for the presence of disequilibrium and inefficiencies in a country, we could think of it as a factor that could be reducing the effectiveness of time devoted to education and training. Following a simple growth model and allowing for slight changes in the law of human capital accumulation, we reach a point where deficit might sharply reduce human capital accumulation. On the other hand, a deficit reduction carried on for a long time, taking that reduction as a more efficient management of the economy, may prove useful in inducing endogenous growth Prunera (2003).

**3. Methodology/Theoretical Framework.** This research aims to check the both the relationship and the impact of budget deficit and money growth which has influenced the inflation in Pakistan for a period of twenty six years from 1986-2011. This study undertakes the issues that influence the budget deficit and money growth, the statistical tools and techniques are applied to the distributed data used in the study to investigate the relationship between budget deficit, money growth and inflation.

**3.1 Data.** The data for the study have been obtained from yahoo finance, Asian Development Bank (ADB), Karachi Stock Exchange (KSE) and State Bank of Pakistan (SBP). The period covered by this study is twenty six years starting from 1986-2011.

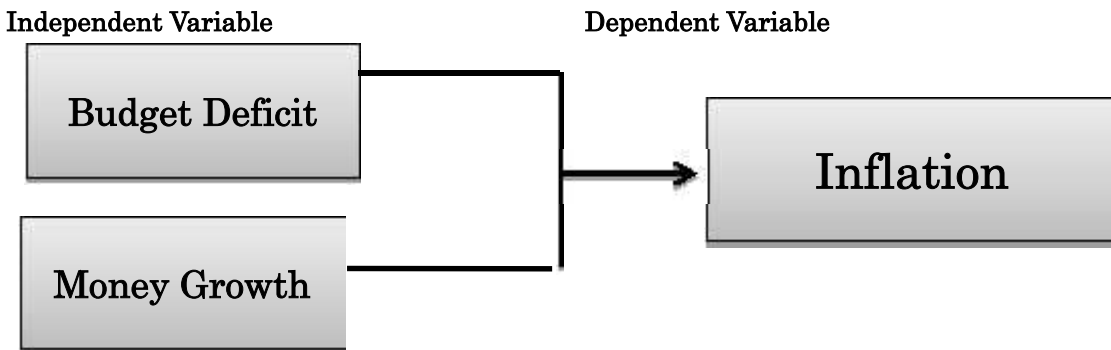
**3.2 Variables.** This study makes an attempt to check the influence of money growth and budget deficit on inflation in Pakistan. The variables used in the study have been given below classified on the basis of dependent and independent variables.

**3.2.1. Inflation (Dependent variable).** When in a given period of time, the general prices of goods and services fluctuate in a steep or rising manner then it is termed as inflation. With this increase in level of general prices, few goods and services can be bought for each unit of currency. The effects of inflation are reflected in the deterioration of money’s purchasing power which is classified as “a loss of real value in the internal medium of exchange and unit of account in the economy” (Saleem, et al., 2013). Inflation is normally measured using Consumer Price Index (CPI) in terms of inflation rate based on the annual percentage change in the index of general price.

**3.2.2 Budget Deficit (independent variable).** A government budget deficit is the amount by which some measure of government revenues falls short of some measure of government spending. If a government is running a positive budget deficit, it is also said to be running a negative budget surplus (and conversely, a positive budget surplus is a negative budget deficit). Debt differs from deficit in a way that debt is the annual deficit in accumulated form. Deficits in an economy take place when the revenue generated is less than the expenditures by the government. The deficit can be measured with or without including the interest payments on the debt as expenditures (Saleem, et al., 2013).

**3.2.3 Money Growth (independent variable).** The money growth is a policy variable that is controlled by fed. Money growth depends on economic situation of a country. If economic condition of a country will good then his economic growth will increase.

**3.3 Theoretical Model**



**3.4 Hypothesis testing.** Based on the objective of this study, we examine the relationship and the impact of budget deficit and money growth on inflation. The study makes a set of testable hypotheses [the Null Hypothesis  $H_0$  verses the Alternate  $H_1$ ].

$H_0$ : There is no relationship and impact of budget deficit and money growth on inflation in Pakistan.

$H_1$ : There is possible positive relationship and impact of budget deficit and money growth on inflation in Pakistan.

**3.5 Model specifications.** Panel data is used in this study with the regression being run on the combination of time-series and cross-sectional data. Constant coefficient model is used in the study, with the values of coefficient being constant. The data from both the time-series and cross-section is pooled together into one column based on the view that there is no significant cross-sectional data.

In order to check for the relationship and impact of the independent variables on the dependent, procedure of regression analysis are employed. The dependent variable is that whose values we are trying to expect or estimate. The independent variables explain the change in the dependent variable therefore they are not considered to be explained by the model itself.

Simple linear regression in the equation form is given below:

$$Y = a + bX$$

Where “a” is the intercept of the line and “b” is the slope of the line.

The straight line regression model with respect to CPI (inflation proxy), budget deficit and money growth 0-1 can be given as

$$CPI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Where, CPI has been used as a proxy for inflation;  $X_2$  refers to budget deficit and  $X_3$  is the money growth.  $\beta_0$  is the intercept coefficient referring to the coefficient of consumer price index representing the average value of the CPI when  $X = 0$ .  $\beta_1$  is the slope of the regression line for Budget deficit indicating the averaged expected change in CPI due to change in budget deficit, whereas  $\beta_3$  is the coefficient of money growth referring to the average expected change in CPI due to money growth.

**4. Data Analysis and Discussion.** Data analysis involves the use of statistical model to examine the relationship between the variables. The simple regression analysis fit best for our analysis which involves steps to confirm the accuracy of estimated relationship among the variables under study.

#### 4.1 Regression Equation

$$CPI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

The regression equation of the analysis is

$$CPI = 5.180 + (0.756)X_2 + (0.06)X_3$$

This result indicates that for each increase in  $X_1$  and  $X_2$  (budget deficit and money supply),  $y$  (CPI) is affected by -0.756 and -0.006, on the averaged, due to budget deficit and money growth.  $\beta_0$  of 5.180 shows the coefficient’s average value of the dependent variables CPI, when budget deficit and money growth is zero. This shows that there is positive relations with increase in CPI of .7656, .06 because of each unit of budget deficit and money growth respectively.

#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Prob.
		B	Std. Error	Beta		
1	(Constant)	5.180	3.981		1.301	.006
	Budget Deficit	.756	.553	.274	-2.366	.0001
	Money Growth	.06	.143	.009	-3.043	.0009

a. Dependent Variable: Consumer Price Index

This table shows that the fitted line has value of coefficient of constant CPI as 5.180 and coefficient of budget deficit and money growth as  $\beta_1$  and  $\beta_2$  to be 0.756 and 0.006, respectively. The standard error for c is 3.981, for  $B_1$  is 0.553, and for  $B_2$  it is 0.143 which is the dispersion of variables estimates around their means. The p-values from the above table suggest that at 1% level of significance we have  $\beta_2$ 's p-value as 0.0001 and of  $\beta_3$ 's p-value as 0.009. This suggests that the coefficients of the independent variables do have significant impact on the dependent variable in the model.

**4.2 Measure of variation.** While mounting a regression model to forecast the dependent variable with the help of independent variable, focus will be on a few measures of variations. Total Sum of Square (TSS) can be partitioned into two parts: Variation which can be attributed to the relationship between x and y is referred to as explained variation or regression sum of square (ESS). The second part which is unexplained can be attributed to factors other than the relationship between x and y, and is referred to as error or residual sum of squares (RSS).

$$\text{Total sum of squares (TSS)} = \text{Regression sum o squares (ESS)} + \text{error sum of squares (RSS)}.$$

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.499	2	18.249	.933	.008 <sup>a</sup>
	Residual	449.851	23	19.559		
	Total	486.350	25			

a. Predictors: (Constant), Money Supply, Budget Deficit

b. Dependent Variable: Consumer Price Index

This table demonstrates the values of total sum of squares, regression sum of squares and error sum of squares according to the data. The TSS is the total deviations in the dependent variable consumer price index; the variation within the values of y is described by the ESS, and it shows the sum of the squared difference between y values and the mean value of y. The squares are taken to `remove` the sign (+ or -) from the residual values. The RSS describes the variation within the values of y, and is the sum of the squared difference between each value of y and the mean of y.

F-statistics is used in the analysis to determine the overall significance of regression model in regression. The value of f statistic here is 0.933 which is significant.

**4.3 Coefficient of Determination.** Coefficient of Determination, denoted by  $R^2$ , for regression models is used to explain how much of the variation in the dependent variable is due to the independent variables in the model. It is the ratio of regression sum of squares (ESS) to total sum of squares (TSS), it's values ranges from 0 to 1.

**Regression Statistics**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.274 <sup>a</sup>	.75	-.743	4.42253

a. Predictors: (Constant), Money Supply, Budget Deficit

This table of regression statistic shows that for consumer price index, budget deficit and money growth. The R-square's value of .075 indicates that 75 percent variation in consumer price index is because of budget deficit and money growth. The only difference between R square and adjusted R

square is that its values based on degree of freedom. The degree of freedom associated with confidence interval and level of significance testing for Linear Regression is  $n - 1$  which is 449.851. In general, the result of regression analysis shows that there is a positive relationship and impact of budget deficit and money growth on CPI in Pakistan.

## Regression

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Consumer Price Index	26	4.20	21.40	8.2089	5.23547
Budget Deficit	26	-8.70	-2.30	-5.8385	1.59977
Money Supply	26	4.30	35.20	16.1308	6.17815
Valid N (listwise)	26				

5. **Conclusions.** The purpose of the study was to check the relationship and the impact of budget deficit and money growth on inflation in Pakistan. The results show that there is positive relationships and impact of budget deficit and money growth on inflation. When inflation rises in the country then money growth of a country decreases, showing an inverse relationship. The main concern of the paper is that if there is budget deficit and money growth in an economy then how does it affect the inflation in an economy, and the responsibility falls on the central bank and other financial institutions if they are not independent and do not make an attempt to curtail the budget deficits. The alternate hypothesis of the study is supported by the empirical findings of the study based on panel data.

## REFERENCES

- [1] Agha, A. I., & Khan, M. S. (2006). An Empirical Analysis of Fiscal Imbalances and Inflation in Pakistan. *SBP Research Bulletin* , 2 (2), 343-362.
- [2] Akcay, O. C., Alper, C. E., & Ozmucur, S. (1996). Budget Deficit, Money Supply and Inflation: Evidence from Low and High Frequency Data for Turkey. *Working Papers 1996/12, Bogazici University, Department of Economics* .
- [3] Ammama, Mughal, K., & Khan, M. A. (2011). Fiscal deficit and its impact on inflation, Causality and Co-integration: The Experience of Pakistan (1960-2010). *Far East Journal of Psychology and Business* , 5 (2), 51-62.
- [4] Anuši , Z. (1994). BUDGET DEFICIT AND INFLATION. *Croatian Economic Survey* , 1, 21 - 35.
- [5] Chaudhary, M. A., & Ahmad, N. (1995). Money Supply, Deficit, and Inflation in Pakistan. *The Pakistan Development Review* , 34 (4), 945 - 956.
- [6] CHIMOBİ, O. P., & IGWE, O. L. (2010). Financial Innovations and the Stability of Money Demand in Nigeria. *Banking and Finance Letters* , 2 (1).
- [7] Darrat, A. F., & Suliman, F. O. (1991). Have budget deficits and money growth caused changes in interest rates and exchange rates in Canada? *North American Review of Economics & Finance* , 2 (1), 69-82.
- [8] Fatima, G., Ahmed, M., & Ur Rehman, W. (2012). Consequential Effects of Budget Deficit on Economic Growth of Pakistan. *International Journal of Humanities & Social Science* , 3 (7), 204.
- [9] Haan, J. D., & Zelhorst, D. (1990). The impact of government deficits on money growth in developing countries. *Journal of International Money and Finance* , 9, 455 - 469.
- [10] Hakro, A. N., & Fida, B. A. (2009). Trade and Income Convergence in Selected South Asian Countries and Their Trading Partners. *Lahore Journal of Economics* , 14 (2), 49-70.
- [11] Khalid, A. M. (2005). Economic Growth, Inflation, and Monetary Policy in Pakistan: Preliminary Empirical Estimates. *The Pakistan Development Review* , 44 (4), 961-974.
- [12] Levin, J. (1974). Budget Deficits and Inflation. *Financial Analysts Journal* , 30 (4), 44-47.
- [13] Lozano, I. (2008). Budget Deficit, Money Growth and Inflation: Evidence from the Colombian Case. *BORRADORES DE ECONOMIA 005127, BANCO DE LA REPÚBLICA* .

- [14] Mukhtar, T., & Zakaria, M. (2010). Budget Deficit, Money Supply and Inflation: The Case of Pakistan. *Privredna kretanja i ekonomska politika* , 122, 53-67.
- [15] Pekarski, S. (2007). Budget deficits and inflation feedback. *Working Papers from Laboratory for Macroeconomic Analysis No WP13\_2007\_12* .
- [16] Pollin, R., & Zhu, A. (2005). Inflation and Economic Growth: A Cross-Country Non-linear Analysis. *Political Economy Research Institute Working Paper Series 109* .
- [17] Prunera, M. C. (2003). Deficit, human capital and economic growth dynamics. *PePEc - Research Papers in Economics* .
- [18] Saleem, F., Haider, Z., Shoukat, S., Shafiq, S., Zahid, A., Shahzad, A., et al. (2013). Determinants of inflation in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business* , 4 (9), 245-252.
- [19] Saleh, A. S. (2003). The Budget Deficit and Economic Performance: A Survey. *University of Wollongong Economics Working Paper Series* , 1-53.
- [20] Samimi, A. J., & Jamshidbaygi, S. (2011). Budget Deficit and Inflation: A Sensitivity Analysis to Inflation and Money Supply in Iran. *Middle-East Journal of Scientific Research* , 8 (1), 257-260.
- [21] Sargent, T. J., & Wallace, N. (1984). *Some unpleasant monetarist arithmetic*. In *monetarism in the United Kingdom*. London: Macmillan.
- [22] Saunders, P. J. (1989). Federal Budget Deficits, Interest Rates, and Inflation: Their Implication for Growth. *Eastern Economic Journal* , XV (3), 213-219.
- [23] Sial, M. H., Hashmi, M. H., & Anwar, S. (2010). Role of Investment in the Course of Economic Growth in Pakistan. *World Academy of Science, Engineering and Technology* , 66, 160 - 164.