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Money Supply, Government Borrowing and Inflation Nexus: Case of Pakistan

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Abstract: In the history of Pakistan, for the very first time, democratic government has completed its five-year tenure. While in the last four years, inflation has increased by 76% and M2 to GDP ratio has reached the highest level. This paper tries to explore the empirical relationship of inflation with government borrowing from the central bank and money supply. The paper utilizes Vector Auto Regressive model and Causality analysis using monthly data from January 2008 to February 2013 to check their interdependence. The empirical results are based on Fully Modified Ordinary Least Square (FMOLS) method. These suggest that government borrowing and money supply has a strong effect on inflation in the long-run in case of Pakistan. Study has found that in recent past inflation is largely affected by its lagged values, money supply and government borrowing in Pakistan. This study has also found that bidirectional causality exists between inflation and money supply. However, uni-directional casual relationship is found between government borrowing and inflation as well as in the case of government borrowing and money supply. Keeping in view the results of the study it is suggested that if government of Pakistan wants to control inflation, it must restrict its borrowing from the central bank and money supply.

Key words: Inflation · Government borrowing · Money supply · Granger Causality test · FMOLS

INTRODUCTION

Inflation torments growth when it crosses a specific level of threshold. Many empirical research works have constituted an indirect association between growth and inflation for developing countries. Khan and Senhadji (2001), [1-3, 1] are the few studies, which empirically tested the growth inflation relationship for Pakistan as well as for other developing countries. In the past five years, the GDP growth rate of Pakistan remained too low and all inflation indexes showed a very high trend.

Side by Side, the statistical yearbook of SBP for fiscal year 20011-12 showed a very alarming situation relating to domestic and foreign debt. Public debt-to-GDP has increased to 62.6% in FY12 and crossed the figure of 12.9 trillion. The reason of this huge amount of debt according to this report was the large fiscal deficit. Huge public debt is directly related to the government borrowing from the central bank. As [4] considered borrowing from the monetary authority as a viable source to understand the relationship of inflation with the budget deficit. The report further argued that growth in broad money supply is also mounting. The figures of last five years for Broad money supply are alarming for the ailing economy of Pakistan.

The rising growth trends of inflation-money supply urged us to look back at the theoretical and empirical studies. Following [5-8], the monetarists explained the supply of money as the root cause of inflation. Similarly, [9, 10] concluded that governments who faced continuous budget deficits and financed their deficit with the creation of additional money always faced the problem of inflation. Similarly, empirical literature related to Pakistan explained a positive relationship among inflation and money supply such as [1, 3, 11, 12]. While [13, 1] found out that inflation is affected by one year lagged money supply as well as its own lagged values. However, [14] estimated lag as a two year time period, whereas [15] found a lag of less than one year. Bukhari and Ahmad (2007) concluded that financing fiscal deficit through printing money creates the problem of inflation.

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In Pakistan recently democratic government has completed its five-year period for the first time in the history of Pakistan. While in the last four years, inflation has increased by 76% and M2 to GDP ratio has reached the highest level. All of the above-mentioned studies though showed a positive association between the two discussed variables but with annual data sets. Only [1] out of all these studies have used monthly data but they have also included other fiscal variables. [16] applied a new Keynesian monetary model with inflation targeting monetary policy and found a positive association of money supply with inflation. Haider and Khan (2008) applied GARCH and ARDL approach to analyze the impact of borrowing of the government from SBP on inflation in Pakistan not only in the short run but also in the long run. However, in the last five years the volatility in inflation as well as in the supply of money is of short nature due to uncertain situation prevailing in the economy and requires reassessing the relationship of these variables and lags involved in the relationship of the concerned variables. Therefore, the aim of this paper is twofold. Firstly, to assess the association of Inflation with money supply and government borrowing and secondly, to estimate the appropriate length of lags associated with the impact of supply of money and government borrowing on inflation.

The remaining paper is as follows: a comprehensive literature review is given in the next section. In section three methodology, data description and comprehensive detail of statistical techniques used in this paper are given. Empirical results are discussed in section four whereas in the last section the conclusion of the study is given.

Literature Review: [17] evaluated the budget deficit-inflation relationship in thirteen developing economies of Asia including Bangladesh, India, Malaysia, Indonesia, Nepal and Pakistan. They found a casual association among budget deficit and inflation in the time period 1950 to 1999 by applying Error Correction model,.

[18] investigated the nature and direction of causality among the budget deficit and inflation using annual data from the Nigeria economy for the period 1970 to 2005. To determine the relationship among the variables they applied Granger Causality pair wise test and found that the causality was significant from budget deficit to inflation, but on the other hand causality was not significant from inflation to budget deficit. It is concluded that in case of Nigeria, casuality runs only from budget deficit to inflation but not the other way round. Devapriya and Ichihashi (2012) investigated the casual relationship between budget deficit and sources of financing this deficit with the inflation in Sri Lanka. They used annual data ranging from 1950 to 2010 and applied Vector Autoregressive (VAR) model. The study results indicated that there exists a positive association between inflation and domestic deficit while the causality analysis showed a bi-directional casual structure between budget deficit and inflation in Sri Lanka. The results also suggest that three bi-directional causalities existed between budget deficit, supply of money and inflation.

[19] found that a large budget deficit did not precede higher inflation in industrialized countries from 1970 to 2008, mostly because the central banks of these countries conduct sound monetary policy targeted to control the inflation rate.

[20] assessed the impact of domestic debt as well as domestic debt servicing along with the money supply on inflation in Pakistan. They used annual data ranging from 1972 to 2009. The analysis with OLS technique proved that domestic debt, money supply and debt servicing are inflation enhancing variables.

[21] examined the short-run as well the long run relationship between fiscal indicators and inflation in Pakistan using the annual time series data ranging from 1973 to 2003. They concluded that fiscal indicators along with the sources of financing fiscal deficit have significant influence on inflation in Long-run while applying Johanson cointegration analysis. For the short-run analysis, they applied the VECM model. The results showed that in the short-run also inflation is effected by government borrowing for budgetary support along with the fiscal deficits.

Haider and Khan (2007) in contrast to other studies related to Pakistan, by taking the monthly data ranging from 07-1992 to 06-2007 and applied (GARCH) model to analyze the effect of volatility of government borrowing from SBP on inflation in Pakistan. Auto regressive distributed lag (ARDL) and ECM estimates proved the association of both the variables not only in long-run but also in short-run.

MATERIALS AND METHODS

Theoretical Background: [22] proposed five methods of financing the budget deficit, which include borrowing from (i) central bank (ii) commercial banks (iii) non-banking domestic sector (iv) abroad and (v) accumulation of arrears.

In this particular study, we are considering only the first method and assume that Government is borrowing from only the central bank for its budgetary support, which is also named as monetization of the deficit. In the next step government borrowing has the direct relationship with the money growth[1]. While, the link of money supply and inflation is well depicted by the Quantity Theory of Money.

$$MV=PY \quad (1)$$

Where, P, Y, M and V, denotes to the price level, level of income in an economy, money supply and velocity or circulation of money respectively. In this model it is assumed that supply of money is exogenous and determined outside the model by the central bank of the country. Secondly, it is also assumed that velocity of money is also constant to make the model simpler. The quantity theory also assumes that in the long-run full employment level of output is achieved. [23] are of the view that inflation can best explained with equation of exchange as a rudimentary theory of inflation.

Hence, after establishing the relationship between government borrowing and money supply (monetization) and then money supply and inflation, we can assume that these three variables have the power of influencing each other.

The common method to assess the relationship between inflation and some other variable is the single equation method[2]. In this particular study we follow [24] and Imimole and Enoma (2011) with a little change. The model incorporates CPI index as dependant variable as a proxy for inflation (INF) along with Money supply (M2) and Government Borrowing (GB) as an independent variable.

The model in the general form is:

$$INF = f(M2,GB) \quad (1)$$

More specifically

$$INF = \alpha_0 + \alpha_1 M2 + \alpha_2 GB + \epsilon \quad (2)$$

Where, INF, M2 and GB denotes to inflation supply of money and borrowing of the government whereas. α_0 is constant and α_1 , α_2 are coefficients of supply of money and borrowing of the government respectively. The time series properties are required to be checked before testing the short run relationship along with the long run link among variables. First a test of unit root is applied to check stationarity of the variables.

Description of Data: Source of the data is State Bank of Pakistan. For the proxy of inflation, Consumer Price Index is used. While in collection of the data, the problem arises that according to September 2011, the observations for CPI are with the base year as 2000-01 while the observations for October 2011 to onwards were with the base year 2007-08. Therefore, we used splicing method to convert the data with base year 2000-01[3] to base year 2007-08.

ADF Test for Unit Root: Augmented Dicky and Fullar test is based upon the given regression equation.

$$\Delta yt = \square + \Psi Y_{t-1} + \Sigma \beta i \, \Delta Y_{t-i} + \square_t \quad (3)$$

$$\Delta yt = \square + \Psi Y_{t-1} + \Sigma \beta_i \, \Delta Y_{t-i} + l_t + \square_t \quad (4)$$

where time series is denoted by Y, while linear time trend is denoted by t, whereas Δ is the first difference operator, $\square$ is a constant and $\square_t$ is a random term, which is serially uncorrelated. Here equation (3) is a random walk with drift whereas equation (4) consists of linear time trend as well as drift. An interesting parameter in the above regression equations is Ψ. The estimations of the above equations are made using Ordinary Least Square for acceptance or rejection of H0: $\Psi = 0$.

Cointegrationl: When the non-stationary status of the variables is established, then it becomes necessary and very important to check the time series data for the integration. ML procedure of [25, 26] has an advantage over the EG approach [27]. On the other hand, the Johansen's procedure of maximum likelihood (1991, 1995) is based on the principle of likelihood ratio. Superiority of Johansen's approach is reflected by the fact that many conintegration relationships can be estimated while capturing all the properties of time series data. The restrictions imposed by co integration on the unrestricted VAR involving the series are tested by Johansen's method test. Consider a P^{th} order VAR.

$$Y_t = A_1 Y_{t-1} + \ldots\ldots\ldots\ldots + A_p \, Y_{t\_p} + Bx_t + \square_t \quad (5)$$

[1]See Haider and Khan (2007)

[2]Ariyo and Shina (2012) studies inflation budget deficit and inflation relationship and used single equation model

[3]See Asteriou and Hall (2007)

Where Y_t is a k-vector variables of the model which are non-stationary I(1) variables, X_t shows a vector of deterministic variables and $\square_t$ is a vector of error term. We can write the VAR as

$$\Delta y_t = \Pi Y_{t-1} + \Sigma \Gamma_i \Delta Y_t - 1 + \beta X_t + \mu_t \quad (6)$$

$$Where\ \Pi = \Sigma_i A_i - 1,\ i = 1, \ldots\ldots \rho \quad (7)$$

$$\Gamma_i = -\sum_{j-i+1} A_j \quad (8)$$

Representation of Granger's theorem explains that if the coefficient matrix P has reduced rank r, k, then there exist k _ r matrices a and b each with rank r such that P ¼ a and yt is stationary. r is the number of cointegrating relations (the cointegrating rank) and each column of b is the cointegrating vector. Two test statistics are used in Johansen approach to check the number of cointegration vectors named as trace test and maximum eigenvalue. The null hypothesis in the *(λ trace)* implies that the number of cointegrating vectors is equal to or less than γ. While the null hypothesis of the second test states that the number of cointegrating vectors is γ.

Granger Causality Test and FMOLS: After the establishment of cointegration, the question arises that which variables affect the other variables. For this purpose, the most appropriate tests were Granger and Sims tests.

FMOLS by [28] Philips and Moon, (1999), [29, 30] is used to estimate cointegration regression. To achieve asymptotic efficiency, FMOLS modifies OLS to take into account the effects of serial correlation and test for endogeneity in the independent variable that occurs due to cointegration relationships [28], Hansen (1995). The condition for the application of the FMOLS is that the variables of the model must be of I(1).

Empirical Results: It is a fact that time series data has zero mean, its residual term is normally distributed and without examining the unit root properties of the data, estimation will give misleading results. In this study, we used Augmented Dickey Fuller (1981) test. The results indicate that all the three variables of our model have problem of unit root at the level with trend as well as without trend but all three variables become stationary at first difference.

The model's maximum lag is set by applying Vector Autoregressive (VAR) Model. The results are given in table 2. It is confirmed that the maximum lag length of our model is 2 according to LR, FPE, AIC and HQ criterion.

Table 1: ADF Unit Root Test Result

	ADF (Level)		ADF 1ST DIFFERENCE	
Variable	Without trend	With trend	WITHOUT TREND	WITH TREND
Cpi	-1.51	-2.46	-6.78	-6.96
M2	0.62	0.45	7.62	7.95
GB	0.33	0.12	9.16	9.08
	ADF (Level)		ADF 1ST DIFFERENCE	
Variable	Without trend	With trend	WITHOUT TREND	WITH TREND
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Note: 1%, 5% and 10% critical values for ADF tests are 3.54, 2.91 and 2.59 for *without trend.* 1%, 5% and 10%critical values for *with trend* are 4.11, 3.48 and 3.17. Source: Author's own calculation using Eviews 7.1.

Table 2: lag length selection

VAR Lag Order Selection Criteria

Lags	Log L	LR	FPE	AIC	SIC	HQ
0	1750.61	NA	3.18e+23	62.62	62.73	62.67
1	1606.71	267.22	2.57e+21	57.81	58.24*	57.97
2	1592.25	25.31*	2.12e+21*	57.61*	58.37	57.91*
3	1590.74	2.48	2.79e+21	57.88	58.96	58.30

LR: sequential modified LR statistical test (each test at the 5% level)
FPE: Final prediction error
AIC: Akaike Information Criterion
SIC: Schwarz Information Criterion
HQ: Hanan - Quinn Information Criterion
Source: Calculation of the author himself using eviews 7.1.

Table 3: Johansen Trace Test: lcpi, lm2, lgb

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.361944	41.80217	29.79707	0.0013
At most 1 *	0.212848	15.74103	15.49471	0.0459
At most 2	0.031555	1.859673	3.841466	0.1727

Source: Author's own calculation

Table 4: Johansen Maximum Eigenvalue Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.361944	26.06114	21.13162	0.0093
At most 1*	0.212848	14.88136	14.26460	0.0574
At most 2	0.031555	1.859673	3.841466	0.1727

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 5: Granger Causality Test Results

Null Hypothesis:	F-Statistic	Prob
LM2 *does not Granger Cause* LCPI	4.72623	0.0048
LCPI *does not Granger Cause* LM2	9.13095	0.0004
LGB *does not Granger Cause* LCPI	1.97203	0.1491
LCPI *does not Granger Cause* LGB	5.75334	0.0054
LGB *does not Granger Cause* LM2	4.26486	0.0459
LM2 *does not Granger Cause* LGB	0.43330	0.6506

Source: Author's own calculation using Eviews 7.1.

Table 6: FMOLS results

Variable	Coefficient	t-Statistic	prob
Logcpi(-1)	0.98	106.01	0.00
LogM2	0.04	2.17	0.08
LOGGB	0.02	2.21	0.03
C	0.11	2.49	0.01

Adjusted R^2= 0.99 D.W test stat= 1.87

Source: Author's own calculation using Eviews 7.1.

When the hypothesis of non-satationarity is confirmed, then it becomes necessary and very important to check the data for conintegration. [31] established the fact that ignorance of cointegration when it is there can create serious misspecification of the model. For this purpose we have applied the [29, 30] method of maximum likelihood due to the fact that it is based on the procedure of maximum likelihood which is well-established. It takes two test statistics for the number of cointegrating vectors: the maximum eigenvalue (λmax) test and trace test (λtrace). The null hypothesis (H0) that the number of distinct cointegrating vectors is less than or equal to r against the alternative hypothesis of more than r cointegrating vectors is tested by λtrace statistic. Maximum eigenvalue (λmax) test the null hypothesis (Ho) that the cointegrating vectors are r in numbers against the alternative of r +1 cointegrating vectors.

Table 3 and 4 showed the results of Johanson Trace Test and Maximum Eigen Statistics. The figure depicts the fact that there exists one cointegration equation according to Trace statistics as well as Maximum Eigen value test. Hence, it could be stated that inflation, money supply and government borrowing have long run relationship among them.

The results of pair wise Granger causality between inflation, money supply and government borrowing are depicted in Table 3. The length of lag is selected as two according to criterions explained in table 2. The significance level of 5% is chosen for the acceptance or rejection of the null hypothesis.

The results given in table 4 assert that bidirectional causality exists between money supply, which is proxied by M2 and inflation, which is proxied by consumer price index. On the other hand unidirectional casual relationship exists between CPI to GB, which means that inflation causes government borrowing. While government borrowing granger causes money supply. The Granger causality analysis explained that the nature of the relation is in the type of a triangular starting from money supply to inflation and then to government borrowing. That is government borrowing caused money supply while money supply exerted inflation in the last five years in Pakistan economy.

Table 5 exibites the FMOLS regression results. In the model we have included the lagged inflation also. The results indicate that lagged inflatio has a significant coefficient. Similarly the money supply as well as government borrowing has a positive significant impact on inflation.

Now we are going to discuss the impulse response functions for the variables of the model, that is how variables react in response to shocks occurred by the variables under discussion in an economy as proposed

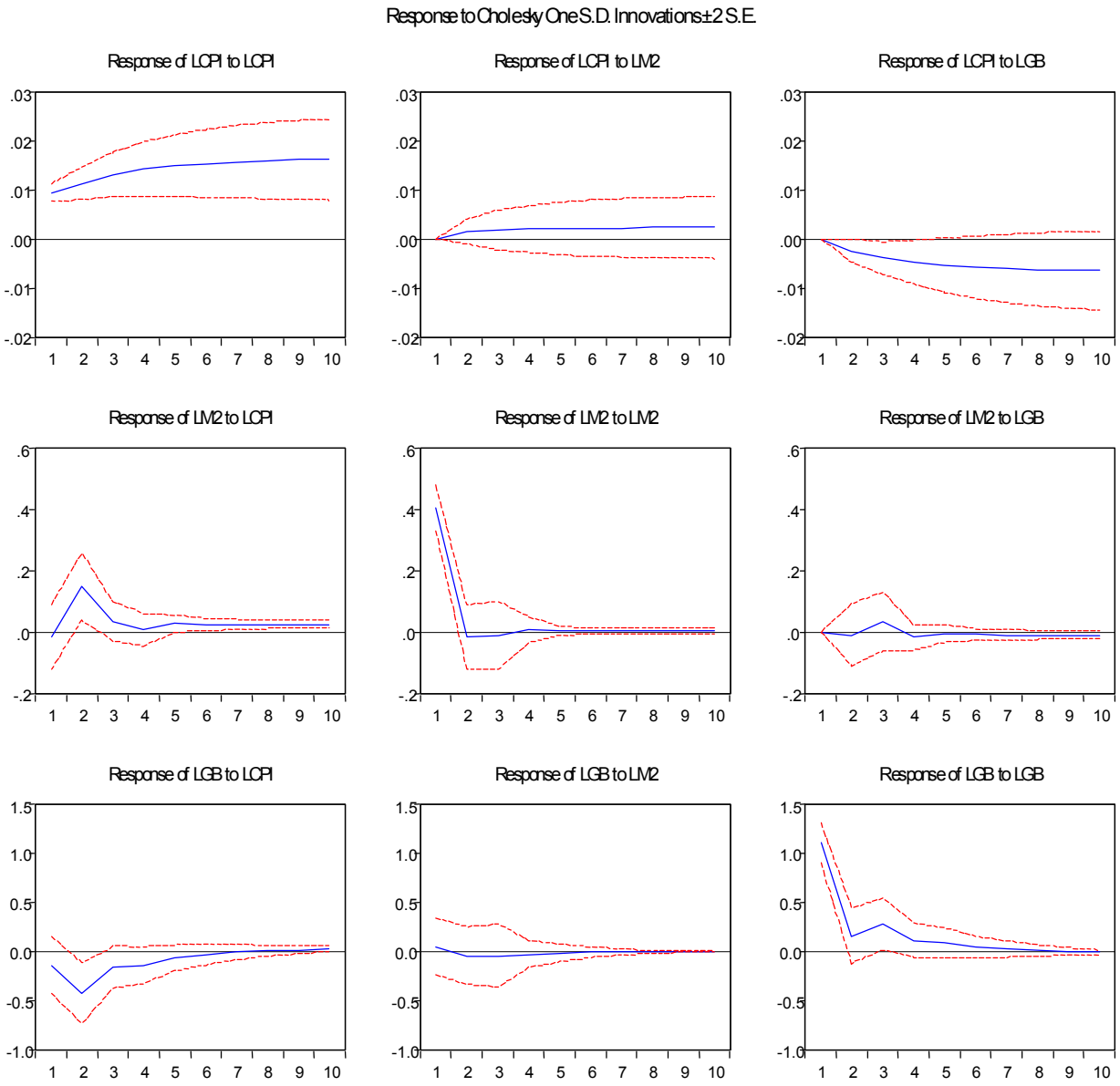

Fig. 1: Impulse Response Function

by [32, 33-41]. The results are according to shock of a magnitude of one (estimated) standard deviation in each case. Impulse response to a shock in endogenous variable is depicted in figure 1. The figure explains that two standard deviation shock to the money supply (M2) has a permanent increase in inflation (CPI) and nominal effect is seen in government borrowing. While two standard deviation shock to government borrowing has also a permanent negative impact, on the other hand government borrowing increases and reached its maximum level in the third month after the shock and then the effect vanishes in the fourth quarter.

CONCLUSION

The objective of this paper was been to find out the answer of the question that whether inflation is enhanced with the increase in money supply as well as in government borrowing in the era of PPP's Government who have just completed five years period of its tenure for the first time in the history of Pakistan. Investigations were made with the help of most modern statistical techniques to solve the nexus. Study has found that in the recent past inflation is largely effected by its lagged values, money supply and government borrowing in

Pakistan. The paper has also found that a bidirectional relationship exists between inflation and money supply. However, unidirectional casual relationship is found between government borrowing and inflation as well as in the case of government borrowing and money supply. Keeping in view the results of the study it is suggested that if Government wants to control inflation, it must restrict its borrowing from the central bank and money supply. It is also suggested that central bank should be an autonomous body in a developing nation like Pakistan, so that it could take decision of creation of the money according to prevailing economic situation of the country and not be dictated by the higher authorities. In our view, future research on the link between inflation money supply and government borrowing should focus on the threshold level of money supply and government borrowing for the efficient working of the economy and to restrict inflation within certain limits.

REFERENCES

1. Khan, M.S. and A. Schimmepfennig, 2006. Inflation in Pakistan: Money or Wheat?, IMF Working Paper, WP/06/60.
2. Mubarik, Y. Ali, 2005. Inflation and Growth. An Estimate of the Threshold Level of Inflation in Pakistan. SBP-Research Bulletin, 1: 1.
3. Hussain, Manzoor, 2005. Inflation and Growth: Estimation of Threshold Point for Pakistan, Economic Policy Department, State Bank of Pakistan.
4. Sill, K., 2005. Do Budget Deficits Cause Inflation, Federal Reserve Bank of Philadelphia Q3 2005, Business Review.
5. --------1971. "The Role of Monetary Policy". Journal of Political Economy, 58: 1-17.
6. 1960. A Progress for Monetary Stability, New York.
7. Friedman, M., 1956. Studies in the Quantity Theory of Money. University Press, Chicago.
8. Cagan, P., 1956. The Monetary Dynamics of Hyperinflation in Milton Friedman (ed.) Studies in the Quantity Theory of Money, University Press, Chicago.
9. Sergent, T.J and N. Wallace, 1981. Some Unpleasant Monetarist Arithmetic. FRBM Quarterly Review, 5(3): 291-307.
10. Lucas, Robert E. Jr., 1987. Models of Business Cycles. Oxford: Basil Blackwell.
11. Bilquees, F., 1988. Inflation in Pakistan: Empirical Evidence on the Monetarist and Structuralist, Hypotheses, in The Pakistan Development Review, 27(2): 109-130.
12. Khan, A.H. and M.A. Qasim, 1996. Inflation in Pakistan Revisited, The Pakistan Development Review, 35(4): 747-759.
13. Naqvi, S.N.H. and A.H. Khan, 1989. Recent Inflationary Upsurge in Pakistan, Pakistan Development Review, 28(4): 762-791.
14. Husain Fazal and Abdul Rashid, 2006. Significant Shift in Causal Relations of Money, Income and prices in Pakistan: The price hike in early 1970" PIDE working Papers 2006:8 Pakistan Institute of development Economics.
15. Ali, Hamza Malik, 2006. Monetary-Exchange Rate Policy and Current Account Dynamics SBP-Research Bulletin, 2(1): 23-57.
16. Farrah Yasmin and M. Afzal, 2012. New Keynesian Monetary Model: Evidence from Pakistan. International Journal of Research in Social Sciences, (ISSN: 2249-2496), 2(12): 98-124.
17. Habibullah, M.S., C. Cheah and A.H. Baharom, 2011. Budget Deficit and Inflation in Thirteen Asian Developing Countries. International Journal of Business and Social Sciences, 2(9): 192-204.
18. Oladipo, S.O. and J.O. Akinbobola, 2011. Budget Deficit and Inflation in Nigeria: A Causal Relationship. Journal of Emerging Trends in Economics and Management Sciences, JETEMS, 2(1): 1-8.
19. Bassetto, M. and R.A. Butters, 2010. What is the relationship between large deficits and inflation in industrialized countries, Economic Perspectives-Federal Reserve Bank of Chicago, pp: 83-100.
20. Ahmad, M.J., M. Ramzan, Shaikh and Khadija, Tariq, 2012. Domestic Debt and Inflationary Effects. An Evidence from Pakistan International Journal of Humanities and Social Science, 2: 18.
21. Agha, A.I. and M.S. Khan, 2006. An Empirical Analysis of Fiscal Imbalances and Inflation in Pakistan, State bank of Pakistan Research Bulletin, 2(2): 343-362.
22. Ouanes, Abdessatar and Subhash Thakur, 1997. Macroeconomic Accounting and Analysis in Transition Economies, Washington, D.C.: International Monetary Fund.
23. Ajuzie, I.S. Emmanuel, M. Felix, Edoho, Wensheng Kang, N. Matthew, Uwakonye and Ghebre, Y. Keleta, 2008. Import Response and Inflationary Pressures in the New Economy: The Quantity Theory of Money Revisited. Journal of Business and Economic Research, 6(5): 125-139.

24. Oladipo, S.O. and 2T. O. Akinbobola, 0000. Budget Deficit and Inflation in Nigeria: A Causal Relationship Journal of Emerging Trends in Economics and Management Sciences JETEMS, 2(1): 1-8.
25. Johansen, S., 1991. Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models, Econometrica, 59: 1551-1580.
26. Johansen, S., 1995. Likelihood-based Inference in Cointegrated Vector Autoregressive Models Oxford University Press.
27. Enders, W., 1995. Applied Econometric Time Series, New York: Wiley.
28. Phillips, P.C.B. and B. Hansen, 1990. Statistical inference in instrumental variables regressions with I(1) processes, Review of Economic Studies, pp: 99-125.
29. Pedroni, P., 1999. Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and Statistics, 61: 653-670.
30. Pedroni, P., 2000. Full modified OLS for heterogeneous cointegrated panels. Nonstationary Panels Panel Cointegration and Dynamic Panels, Advances in Econometrics, 15. JAI Press, pp: 93-130.
31. Toda, H.Y. and P.C.B. Phillips, 1993. Vector Autoregression and Casuality. Econometrica, 59: 229-255.
32. Koop, G., M.H. Pesaran and S.M. Potter, 1996. Impulse Response Analysis in Nonlinear Multivariate Models, Journal of Econometrics, 74: 119-147.
33. Pesaran, M.H. and Y. Shin, 1998. Generalized Impulse Response Analysis in Linear Multivariate Models, Economics Letters, 58: 17-29.
34. Adnan, S. Bukhari and Safdar ullah Khan, 2008. Does Volatility In Government Borrowing Leads To Higher Inflation? Evidence From Pakistan" Journal of Applied Economic Sciences, Spiru Haret University, 3(5): 187-202.
35. Emmanuel, I.S. Ajuzie, *et. al* 2008. Import Response and Inflationary Pressure In the New Economy: The Quantity Theory of Money Revisited, Journal of Business & Economics Research, 6(5): 125-140.
36. Engle, R.F. and C.W.J. Granger, 1987. Cointegration and error–correction: representation, estimation and testing, Econometrica, 55(2): 251-276.
37. Granger, C.W.J., 1988. Some recent developments in a concept of causality, Journal of Econometrics, 39: 1-2.
38. Tharaka Niroshan Devapriya, K.P.N. and Masaru Ichihashi, 2012. How does the budget deficit affect inflation in Sri Lanka IDEC Discussion Paper 2012, Hiroshima University.
39. Phillips and Hansen, 1990. Statistical Inference in Instrumental Variables Regression With I(1) Process, Review of Economic Studies, 57: 99-125.
40. Protopapadakis, A.A. and J.J. Siegel, 1987. Are Money Growth and Inflation Related to Government Deficits: Evidence from Ten Industrialized Economies, Journal of International Money and Finance, 6: 31-48.
41. Naqvi, S.N.H. and A.H. Khan, 1989. Recent Inflationary Upserge in Pakistan, Pakistan development Review, 28(4): 762-791.

Appendix A