

FISCAL DEFICIT AND INFLATION: AN EMPIRICAL MEASURE IN VIEW OF PAKISTAN

¹ AURANGZEB KHAN, ²PROF. DR. MASOOD MASHKOOR SIDDIQI, ³AMEERZAIB KHAN

¹Shaheed Benazir Bhutto Dewan University

aukhan@live.com

²Dean, Management Sciences, and Law, FUUAST

drmasoodmashkooor@yahoo.com

³Research Scholar

ameerzaib@live.com

⁴ Shahbano

Research Scholar

shahbano.786@hotmail.com

Abstract

Much of the literature on macroeconomic issues is devoted to inflation, unemployment, economic growth and budget deficit. This paper contributes by evaluating the relationship of price level with fiscal deficit in case of Pakistan. Fiscal deficit creates more hurdles and narrowing the space for implementing other economic decisions for the betterment of overall economy. Among multidimensional issues of fiscal deficit, inflation is more highlighted in everyday newspapers and political talk shows. During the period of economic downturn, government needs more resources to overcome social and economic problems faced by the society. Presently Pakistan also faces the period of high inflation and trying to ease the negative impact by implementing different social security programs. Expenditures incurred in these policies resulted in fiscal deficit, covered mostly by domestic and international borrowings and high tax rates that in turn may lead to increase inflation. For this purpose, an Autoregressive Distributed Lag Model (ARDL) is applied to time series data time span from 1971 to 2021, collected from various national and international reports and economic issues. The paper concluded that budget deficit and exchange rate are the variables that affect INFL in the short as well as in long-run, whereas MSP has only long run effect on inflation.

Keywords: budget deficit, inflation, ARDL, Pakistan, short-run, long-run

1. INTRODUCTION

The connection between budget deficit (BD) and high general price level is not a conventional fact. By reviewing different theories and research, it is suggested that if the decisions and measures of fiscal authority (fiscal policy) is not communicated with the decisions and measures of monetary authority (monetary policy) may lead to inflation in the economy. Thus, it is explained that monetary authority adopts the restrictive policies through different channels both in short run and long run. As a result of restrictive policy may lead to decrease in national income. Decreases in national income leads to increase in fiscal deficit that needs to be finance by increasing money creation, or by acquiring loans. In the first case it implies an increase in inflation. Secondly, budget deficit may be responsible for higher inflation even when the debt is not monetizing by monetary authority, when the deficit monetizes by business sector. This happens when the financial sector encourages by high interest and attempt to create new interest-bearing assets having the characteristics of high liquidity and risk free. Due to this economic behavior high inflation may persist for long time due to fiscal deficit.

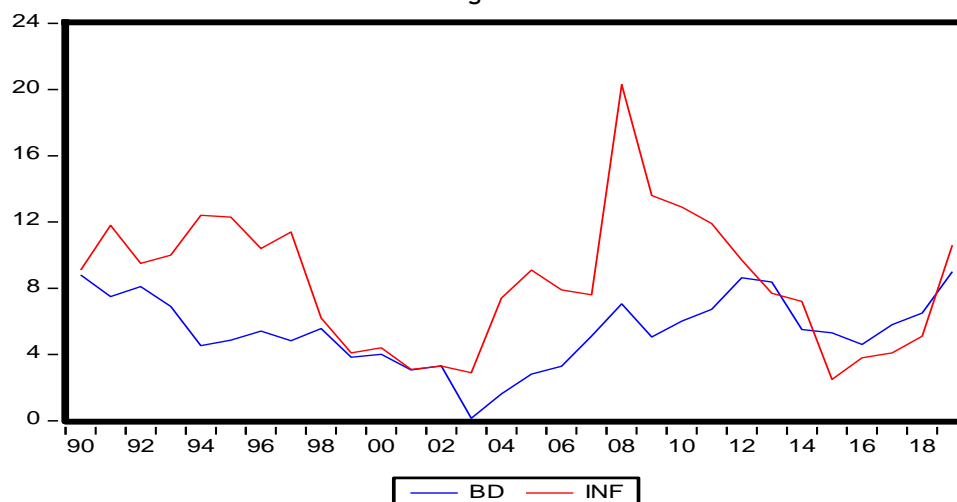
Since independence Pakistan is struggling for development of various sectors of the economy. Among other problems Pakistan faced persistent budget deficit creating less fiscal space for government. Pakistan's economy has faced critical imbalances in budgetary decisions in the era of 1980s and 1990s resulted slowing economic growth accompanied with inflation, low investment and a rise in poverty level. After two decades, Pakistan succeeded to reduce fiscal imbalances to some

favorable level by adopting sound decisions by fiscal authority. Pakistan has succeeded in reducing fiscal deficit from an average of 7.1 (% GDP) in the 1980s and on average 6.9 (% GDP) in 1990s to an average of 4.4 (% GDP) in 2000s. Figure 1 below exhibits the trend of inflation and budget deficit. The trend explains that if budget deficit is increasing, inflation also exhibit increasing trend and if budget deficit decreases, inflation also shows the downward trend. It is also highlighted that this relationship is justified after 1998.

Table-A

YEAR	budget deficit (% of GDP)	Consumer Price Index	YEAR	budget deficit (% of GDP)	Consumer Price Index
1990	8.8	9.1	2005	2.81	9.1
1991	7.5	11.8	2006	3.29	7.9
1992	8.1	9.5	2007	5.12	7.6
1993	6.9	10.0	2008	7.06	20.3
1994	4.53	12.4	2009	5.05	13.6
1995	4.87	12.3	2010	6.01	12.9
1996	5.41	10.4	2011	6.73	11.9
1997	4.83	11.4	2012	8.63	9.7
1998	5.57	6.2	2013	8.37	7.7
1999	3.83	4.1	2014	5.5	7.2
2000	4.01	4.4	2015	5.3	2.5
2001	3.06	3.1	2016	4.6	3.8
2002	3.31	3.3	2017	5.8	4.1
2003	0.15	2.9	2018	6.5	5.1
2004	1.62	7.4	2019	9	10.6

Figure-1



2. LITERATURE REVIEW

Many researchers discussed this relationship in view of different school of thoughts by utilizing data comprises of different economies. This section comprises of existing literature in this regard. (Levin et al. 2002) discussed as the Classical school of thought and their advocates suggested the concept of balanced budget and support the argument of little importance of demand side policies on price level. In contrast, Keynesian school of thought and their advocates support the argument of aggregate demand policies on price level. (Gupta 2013) discussed as follows that when fiscal imbalances increases by more expenditure, it will cause to shift aggregate demand curve



accordingly and causes overall national income and price level with the assumption of perfectly elastic and inelastic supply curve.

(Hamburger and Zwick 1981) viewed that price level determination is purely a monetary phenomenon as suggested by monetarist school of thought. Monetarist argued that deficit financing by increasing money supply leads to increase in aggregate demand that puts pressure to hire more resources such as labour to increase production and meet the existing demand. This behavior will lead to increase wages that further responsible for creating high general level of price with economy back to its natural level of output. In view of monetarist and their advocates, if BDs are monetized by economic agents, this behavior causes INFL in the economy. Marco (2006) Hamburger and Zwick (1981) explained that many of these research studies applied single equation econometric model by maintain inflation as dependent and fiscal deficit as independent variable using OLS regression method. Yet, such approach rules out the probability of two-way dependency. Recent studies of Ndanshau (2012) and Ekanayake (2013) applied the technique of co-integration with ECM for the purpose of identifying long-run and short run link between inflation and fiscal deficit. The paper concluded that the relationship is statistically significant.

Kurayish Ssebulime & Bbaale Edward (2019) utilized data of economy of Uganda by applying Granger-causality-test, concluded that BD granger cause INFL in the economy of Uganda. They further argued that ECM identified the existing of short run impact of BD on INFL. Similarly the paper also concluded the effect of money supply and exchange rate is statistically significant.

Hosseini-Ali Fakher (2016) studied the relationship between inflation and fiscal deficit in Asian countries by applying PMG model of ECM and GMM method time span from 1993-2013. The paper concluded that both techniques identified the said relationship is statistically significant.

Khieu Van, Hoang (2014) studied the nexus between budget deficit and inflation and other independent variables such money supply, exchange rate and GDP growth. The study uses monthly data from January 1995 to December 2012 by applying SVAR model in case of Vietnam. The study concluded that budget deficit does not cause inflation in Vietnam whereas, other variables are statistically significant

Hemantha K.J. Ekanayake (2014) this study checked the hypothesis of link b/w BD and INFL in case of developing countries such as Sri Lanka. The paper uses the technique of ARDL time span from 1958 to 2008. The paper supports the hypothesis in case of Sri Lanka.

3. ECONOMETRIC MODEL:

This segment of the paper comprises the discussion related to econometric model applied in order to make the decision regarding hypothesis constructed in the above section. The aim of investigation is to quantify the short-run and long-run dynamics of factors concern. To achieve this aim there is a need to apply technique that is more appropriate and reliable in terms of statistical theory. An ARDL method for this purpose is chosen because of having many advantages as compare with other techniques. Econometric theory defines that time series variables are not often stationary and different tests should be applied to make them stationary before identifying any relationship. Other techniques require prerequisite testing but an ARDL does not require any prerequisite The econometric model to be estimated can be presented by equation:

$$\text{inflation}_t (\text{INFL}) = \beta_0 + \beta_1 \text{remittances}_t (\text{REMT}) + \beta_2 \text{money supply}_t (\text{MSP}) + \beta_3 \text{exchange rate}_t (\text{ER}) + \beta_4 \text{budget deficit}_t (\text{BD}) + u_t \tag{1}$$

The equation below is an ARDL form of eq. 1:

$$\Delta \text{INFL} = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta \text{INFL}_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta \text{REMT}_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta \text{MSP}_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta \text{ER}_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta \text{BD}_{t-i} + \beta_1 \text{INFL}_{t-1} + \beta_2 \text{REMT}_{t-1} + \beta_3 \text{MSP}_{t-1} + \beta_4 \text{ER}_{t-1} + \beta_5 \text{BD}_{t-1} + e_t \tag{2}$$

Where,

“Δ” is the first difference operator

“α₀” is the drift parameter



" e_t " is white-noise error term

The equation 2 explains mathematical connections among variables. This mathematical statement captures the estimation procedure of short run and long run dynamics of variables adopted by ARDL model. The parameters in the equation 2 from α_0 to α_5 explaining the short run behavior as well as parameters of the said equation from β_1 to β_5 captures the long-run behavior of equation.

4. RESULTS & DISCUSSION

Table No.1 Selection of lag Estimates for model (2,0,1,0,0)

Variables	Coefficient values	St. Error values	T-value (Probab.) values
INFL(-1)	1.220	0.118	13.033 (0.000)
INFL(-2)	-0.340	0.166	-3.990 (0.000)
REMT	0.029	0.187	0.187 (0.840)
MSP	0.041	0.091	0.547 (0.750)
MSP(-1)	0.292	0.080	3.663 (0.001)
ER	0.235	0.053	5.567 (0.000)
BD	3.266	1.097	3.066 (0.005)
T	-0.299	0.131	-2.442 (0.000)
Const.	-0.215	0.133	-2.554 (0.011)
$R^2 = 0.9994$ $R(B)^2 = 0.9993$ $F\text{-stat. \& (probab.)} = 7544.7 (0.000)$ DW value = 2.03 Serial Corr. value = 0.067 (0.788) Functional Form. = 1.885 (0.192) Het. = 2.043 (0.170)			

Source: estimated and compiled by author

For the purpose of estimation, first step is to select lags of variables that make the model best for estimation. Table No. 1 highlighted the procedure and selected lags by using the method of Schwarz Bayesian Criterion (SBC) adopted by ARDL approach. It is shown by the table that two lags of inflation, MSP with I(1), ER, budget deficit and REMT at I(0), is selected for further estimation of concerned variables. For the purpose of acceptability of the model other statistical tests for serial Correlation, correct functional form and heteroscedasticity are also calculated in this step of estimation. The above table compiled values that are used to decide about these problems. In view of these values the author is able to reject the existing of serial correlation. Similarly, the hypothesis of "not correct functional form" and "presence of heteroscedasticity" are also rejected. Moreover, the value of R(squared) that explains the explained part of the model shows the value 99% meaning that the model chosen is capturing the 99 percent change in dependent variable by independent variables. The question of "overall acceptance" of model is also answered by above table by showing the probability value based on F-statistic.

Table No. 2 Long run estimates of the Model (ARDL)

Variables	Coefficient values	St. Error values	t-value (Probab.) values
REMT	0.0299	1.908	0.177 (0.666)
MSP	3.278	1.200	2.789 (0.005)
ER	2.567	0.678	2.888 (0.000)
BD	40.564	18.278	2.110 (0.044)
TIME TREND	-2.588	1.786	-1.798 (0.077)
CONSTANT	-170.00	1.476	-1.777 (0.075)

Source: estimated & compiled by author (s)

For the purpose of measuring long run estimates, ARDL method calculated long run coefficients compiled in table No.2, it is estimated that remittances does not affect INFL in the longrun. Moreover, Money supply, exchange rate, budget deficit affect INFL in the longrun.

Table No.3
Shortrun estimates of the Model

variables	Coefficient values	St. Error values	T-stat values	Probab. Values
D(INFL((-1)))	0.399	0.104	3.888	0.000
REMT	0.027	0.180	0.191	0.840
MSP	0.039	0.050	0.345	0.660
ER	0.310	0.39	5.576	0.000
BD	3.333	1.077	3.087	0.004
D(C)	-14.001	2.898	-4.676	0.000
D(T)	-0.563	0.120	-2.578	0.012
Ecm(-1)	-0.092	0.026	-3.330	0.002
R-Squared=0.904 R(Squared)=0.89 DW value=2.05 F-Statistic(46.073)= 0.000				

Source: estimated & compiled by author(s)


Short run estimates of the model is compiled in table No.3, highlighted that the short-run behavior is significant as the values of short-run parameter (Ecm(-1)) is consist of negative sign and statistically acceptable at 1 percent level of significance. The short-run model explained that budget deficit and exchange rate affect the inflation in the short run whereas money supply and remittances are not significant in the short run.

5. CONCLUSION & POLICY RECOMMENDATIONS

Every economy has its own characteristics and problems such as low productivity, high unemployment, high inflation, budget deficit and financing. This paper is also an attempt to contribute in this regard. This contribution concluded that budget deficit and exchange rate plays significant role in the short run in determination of inflation. Whereas, except remittances all the selected variables such money supply, exchange rate and budget deficit affect the inflation in the long run. Budget deficit can be reduced by generating more revenues, for this purpose taxes collected by government is an important source but it should be collected by implementing the policy of broad tax base. More taxes on narrowed tax base may cause increase in prices of commodities. Central bank is another important authority to tackle such issues. Monetary policy is an effective policy if implemented wisely by deciding rate of interest and supply of money and maintain financial stability in the economy.

REFERENCES

- [1] Levin A, Lin C, Chu C (2002) *The economics of internet markets*. NBER Working Papers: 16852. National Bureau of Economic Research, Inc., pp 27-33
- [2] Gupta P (2013) *The impact of expectations of reduced federal reserve security purchases on emerging markets*. MPRA Paper from University Library of Munich, Germany, pp 18-19
- [3] Hamburger, M.J. & Zwick, B. (1981) "Deficit, money and inflation", *Journal of Monetary Economics*, 7.
- [4] Kurayish Ssebulime and Bbaale Edward (2019) *Journal of economic structures : JES; the official journal of the Pan-Pacific Association of Input-Output Studies (PAPAIOS)*. - Heidelberg : SpringerOpen, ISSN 2193-2409, ZDB-ID 2679924-8. - Vol. 8.2019, 3, p. 1-24
- [5] Ndanshau MA (2012) *Inflation, deficit and capital accumulation under a finite horizon*. *J Monet Econ* 8:247-260
- [6] Ekanayake HK (2013) *The link between fiscal deficit and inflation: do public sector wages matter?* ASARC Working Paper 2012/14, pp 9-10

- 
- [7] Kurayish Ssebulime & Bbaale Edward (2019) Budget deficit and inflation nexus in Uganda 1980-2016: a cointegration and error correction modeling approach, *Journal of Economic Structures* volume 8, Article number: 3 (2019)
- [8] Hossein-Ali Fakher (2016) *The Empirical Relationship between Fiscal Deficits and Inflation (Case Study: Selected Asian Economies)* Volume 20, Issue 4 Autumn 2016 Pages 551-579
- [9] Khieu Van, Hoang (2014): Budget deficit, money growth and inflation: Empirical evidence from Vietnam. <https://mpra.ub.uni-muenchen.de/id/eprint/54488>
- [10] Hemantha K.J. Ekanayake (2014) *The Link between Fiscal Deficit and Inflation: Do public sector wages matter?* https://crawford.anu.edu.au/acde/asarc/pdf/papers/2012/WP2012_14.pdf
- [11] Olivera T (1967) Money, prices and fiscal lags: a note on the dynamics of inflation. *Banca Nazionale del Lavoro Q Rev* 20:190-207
- [12] Rwegasira JC (1974) Monetary stability and economic development in Uchumi, vol 1, no. 2, pp. 114-135
- [13] Rehman Fu, Ahmed KA, Ali S (2008) The impact of budget deficit on inflation in Pakistan: (1970-2004). *Eur J Sci Res* 20(3):715-720
- [14] Sargent T, Wallace N (1981) Some unpleasant monetarist arithmetic: Federal Reserve Bank of Minneapolis. *Q Rev* 5:1-17
- [15] Shabbir T, Ahmed A (1994) Are government budget deficits inflationary, evidence from Pakistan. *Pak Dev Rev* 109:1113-1119
- [16] Solomon M, Wet WA (2004) The effect of budget deficit on inflation: the case of Tanzania. *SAJEMS NS* 7(1):100-116
- [17] Tanzi V (1991) *Public finance in developing countries*. Edward Elgar Publishing Limited, Cheltenham, pp 55-58
- [18] Bwire T, Nampewo D (2014) Fiscal deficits financing: implications for monetary policy formulation in Uganda. *J Appl Finance Bank* 4(2):125-138

List of Abbreviations

ARDL: Autoregressive and Distributed Lag Model

INFL: Inflation

MSP: Money Supply

ER: Exchange rate

BD: Budget deficit

REMT: Remittances