



AN ECONOMIC ANALYSIS OF THE DETERMINANTS OF INFLATION IN BANGLADESH

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ABSTRACT

The objective of this study is to examine the determinants of inflation using the data from 1990 to 2010. The Ordinary Least Square (OLS) method has been used to explain the relationships. The empirical results show that money supply, one year lagged value of interest rate positively and significantly affect inflation. Results also indicates that one year lagged value of money supply and one year lagged value of fiscal deficit significantly and negatively influence over inflation rate. There is an insignificant relationship between interest rate, fiscal deficit and nominal exchange rate. The explanatory variables accounted for 87 percent of the variation of inflation during the study period. This study suggests that money supply is to be controlled to reduce inflation. In addition to this reduction of last year interest rate will reduce inflation.





Introduction

Inflation means a rising trend in the general price level of a country. Inflation is sustained increase in the price level at least consecutive three years (Gillis et al, 1996). Inflation is an important issue for a country. One of the important challenges for the government to stabilize price and control it within the limit of the people. Inflation causes various types of economic and political problems. That's why policy makers try to control price within the limit. Inflation rate is measured by the Consumer Price Index (CPI) . The Consumer Price Index (CPI) measures the prices of a fixed market basket of several thousand goods and services purchased by household. The rate of inflation in Bangladesh was moderate during the last decade. The rate of inflation in Bangladesh was 8.80 and food item inflation is 11.34 in FY 2010- FY2011. At present, the rate of inflation in Bangladesh is 9.73 percent (Bangladesh Economic Review, 2011). Existence of excessive aggregate demand of an economy can cause inflation (Demand pull inflation) . On the other hand cost push inflation occurs from pressure of production cost. Although structural inflation arises from constraints such as inefficient production, distribution and marketing system in the production sectors of an economy (CBN, 1996).

It is the major concern for the consumers because it reduces the purchasing power and for the policy makers because it topple down the government of a country . In fact, a continued sustained inflation for economic development of a country is very much harmful.

Moreover, inflation distorts price levels, discourages, investment, erodes saving accelerates capital movement into precious metals or unproductive sectors and is a hazard to economic planning. Although, it breeds inequality in the distribution of income and leads to social and political unrest in the system. Government attempts to control inflation by adopting different fiscal and monetary measures. Research studies on this line are not enough. Very little economic investigations of inflation have been undertaken by the government or private organizations in order to satisfy the policy makers and different stakeholders . This is why, the present study makes an attempt to analyze the impact of money supply, interest rate and exchange rate on inflation in Bangladesh.

Literature Review

B. Fatukasi,(1988) shows the determinant of inflation in Nigeria using the data between 1981 and 2003. This shows that fiscal deficit, money supply, interest rate and exchange rate positively influence over inflation in Bangladesh. The causes of inflation are various and dynamic. It requires high productivity and increased living standard. Cochran. H. John (2000) shows that federal bank enormous debt and deficit substantial inflation could break out in American economy. Shamim and Mortoza (2005) use the data from 1981 to 2005. They use time series analysis such as unit root and error correction mechanism. The result shows that there is a negative long run relationship between inflation and economic growth in Bangladesh. L. H. Cheng and P. Laura, (1997) shows that high inflation is





appeared in the Turkish economy since the 1970s. They found that monetary variables specially money supply and exchange rate play main role to the Turkish inflation process. Public sector deficit and depreciation also contribute to inflation in Turkey. Khanam and Mohammad (1995) use data from 1972-73-1991-92 and show that money wage rate and import price positively influence over price level in Bangladesh. They use econometric tools. This study was 20 years back. So there is a scope to conduct the study using the latest data. Majumder, M. Alamgir, (2006) shows that there is a relationship between inflation and supply side variables such as import cost, oil price hike, exchange rate and production shocks. It indicates that wage inflation is weakly related to the price level in Bangladesh. H. M. Akhter (1989) shows that any disequilibrium in the money market will be adjusted through the changes in the price level. There is lack of study relating to inflation in Bangladesh. The systematic study relating to inflation in Bangladesh is yet to be done. This is, therefore, the present study intends to investigate the relationships between inflation and interest rate, money supply, nominal exchange rate and fiscal deficit in Bangladesh. The finding of the study may help the policy makers in making decisions regarding inflation, money supply. The present study will be helpful to the researchers for further study of similar natures. The results of the study have also great academic importance to the teachers and students of economics business studies, officers of revenue department, bankers and for the financial institutions.

Objectives

The specific objectives of this study are as follows:

1. To explain the relationship between inflation and interest rate.
2. To examine the relationships between inflation and money supply.
3. To discuss the relationship between inflation and nominal exchange rate
4. To analyze the relationship between inflation and fiscal deficit

Methodology of the Study

The study is based on secondary data. Secondary data were collected from different published and unpublished documents. Data were analyzed using Econometric Views. Data were collected mainly from World Development Indicators, World Bank, Monthly Economic Trends

Applied econometric research is concerned with the measurement of the parameters of relationships and with the prediction of the value of economic variables.

The relationships of economic theory which can be measured with one or another econometric technique are casual, that is, they are relationships in which some variables are





postulated as causes of the variation of the another variable.

Specification of the Model

The first and the most important steps we have to take in attempting the study of any relationship between variables, is to express this relationship in mathematical form that is to specify the model, with which the economic phenomenon will be explored empirically. This is called specification of the model or formation of the maintained hypothesis

Various functional models can be used in multiple regression analysis. Functional analysis was used to reveal the quantitative relations between variables and set of explanatory variables. To determine the effects of the various factors such as interest rate, exchange rate, Domestic Credit , Fiscal deficit on the price level .

Variables of the model

This study tries to assess the determinant that influence over price level. On the basis of this information we may write the model as follows:

$$INF = f (M2, IR , NER , FD)$$

INF = Represented by Consumer Price Index (CPI)

M2 = Money Supply

IR = Interest Rate

NER = Nominal Exchange Rate

FD = Fiscal Deficit

This model can be specified as follows:

$$INF = \beta_0 + \beta_1 IR + \beta_2 M2 + \beta_3 NER + \beta_4 FD + u_i$$

The parameter $\beta_0, \beta_1, \beta_2, \beta_4$ is expected to have a positive sign which postulates an positive relationship interest rate, money supply, fiscal deficit. In addition to this β_3 to have a negative sign which postulate an negative relationship with nominal exchange rate.

Estimation of the Model

The estimation of the model is a purely technical stage which requires knowledge of the various econometric methods, their assumptions and economic implications for the estimates of the parameters. Time series data give information about the numerical values of variables from period to period.

Results and Interpretation

Table:1: Consumer Price Index, Fiscal Deficit , Interest rate , Nominal Exchange Rate , Fiscal Deficit , Money Supply (1990-2010)

Year	CPI	MFD(million Tk)	IR	NER (Tk	FD (million Tk)	WPI	M2 (million Tk)





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1990	136.4	5718.81	16.0	32.92	5718.81	1225.0	22297.6
1991	147.7	6631.2	15.9	35.67	6631.2	1276.0	25004.0
1992	154.4	5618.38	15.0	38.14	5618.38	1322.0	28525.9
1993	158.7	4764.06	15.0	39.13	4764.06	1345.0	31535.6
1994	163.9	7853.78	14.5	40	7853.78	1412.0	36403.0
1995	178.4	7015.92	14.0	40.2	7015.92	1478.0	42212.3
1996	100.0	7817.04	14.0	40.83	7817.04	1558.0	45690.0
1997	103.96	6688.49	14.0	42.7	6688.49	1568.0	50627.0
1998	112.96	6806.12	14.0	45.45	6806.12	1648.0	55869.0
1999	120.94	10106.2	14.1	48.06	10106.2	1760.0	63027.0
2000	124.31	14462.49	15.5	50.31	14462.49	1753.0	74762.0
2001	126.72	12931.05	15.8	53.95	12931.05	1726.0	87174.0
2002	130.26	12840.4	16.0	57.43	12840.4	1730.0	98616.0
2003	135.97	12624.36	16.0	57.9	12624.36	1822.0	113994.0
2004	143.9	13984.74	14.8	58.94	13984.74	1889.0	129721.0
2005	153.24	16311.24	14.0	61.39	16311.24	1954.0	151446.5
2006	164.21	13719.09	14.0	67.08	13719.09	2021.0	180674.2
2007	176.04	14960	16.0	69.03	14960	2080.0	211504.0
2008	193.54	33840.84	16.4	68.6	33840.84	2150.0	248794.0
2009	206.43	25206.39	14.6	68.8	25206.39	2210.0	296499.0



Table 2: Regression Results

Variable	Coefficient	Standard Error	T-Value	Collinearity Statistics (VIF)	P-Value
Constant	156.5996	94.05274	1.665019		0.1167
Interest Rate (IR)	4.315794	6.033302	0.715329	1.201	0.4854
Money Supply (M2)	0.000640	0.000217	2.953351	12.655	0.0099
Fiscal Deficit (FD)	-0.000743	0.001631	-0.455475	5.728	0.6553
Nominal Exchange Rate (NER)	-2.549202	1.108477	-2.299733	7.603	0.0362

Dependent variable CPI

$R^2 = 0.56$

SE = 21.25

DW = 1.14

F = 4.92 Prob (F-Statistics) =

0.0097

The results of the estimated equation are shown in the table above. The results show that explanatory variables can explain about 56 percent changes in the dependent variable as adjudged with the coefficient of multiple determinants. The explanatory variables money

supply and nominal exchange rate are statistically significant at the conventional level of 5 percent of the explanatory variables. The nominal exchange rate has negative sign. Since the VIF value is less than 10, the variables are free from multicollinearity problem. Since the DW statistic is 1.14, there is a positive serial correlation. To correct the autocorrelation problem autoregressive error specification (AR₁) and lagged model is used .

Table 3: Regression Results with autoregressive Error Specification

Variable	Coefficient	Standard Error	T-Value	P-Value
IR	2.725363	7.649130	0.356297	0.7273
M2	0.000529	0.000288	1.833421	0.0897
MFD	-0.000225	0.001353	-0.166225	0.8705
NER	-2.168023	1.993591	-1.087496	0.2966
AR(1)	0.455701	0.262231	1.737787	0.1059

Dependent variable CPI

$R^2 = 0.65$

SE = 20.24

DW = 1.76 F = 5.001 Prob (F-Statistics) = 0.0089

Table 3: Regression Results with Lagged Variable

Variable	Coefficient	Standard Error	T-Value	P-Value
IR	-4.101759	5.819339	-0.704850	0.4987
M2	0.009471	0.002704	3.503263	0.0067
MFD	-0.002206	0.001296	-1.701195	0.1231
NER	-3.565478	3.215082	-1.108985	0.2962
CPI(-1)	0.199369	0.217811	0.915333	0.3839
IR(-1)	16.55675	6.243539	2.651821	0.0264
M2(-1)	-0.010613	0.003216	-3.300259	0.0092
MFD(-1)	-0.004103	0.001502	-2.731386	0.0232
NER(-1)	3.862709	3.669824	1.052560	0.3200

Dependent variable CPI

R² = 0. 87 SE = 14.59

DW = 2.82 F = 7.82 Prob (F-Statistics) = 0.0036

Autoregressive Error Specification (AR₁) regression model shows that the DW value is 1.76. For 19 observations and 4 explanatory variables $d_L = 0.650$ and $d_U = 1.584$. This indicates that This model is free from autocorrelation problem. After adjustment using AR₁ no variable is significant. Using the lagged model DW statistics is 2.82. Akaike Information Criterion (AIC) is 9.10 and AIC is 8.50 in the autoregressive error specification and lagged model respectively. Since AIC value in lagged model is low, lagged model is more acceptable. After adjusting DW value using lagged model money supply and one year lag fiscal deficit, one year lag interest rate and one year lag money supply significantly affect inflation rate.

Conclusion and Policy Recommendation

Inflation is one of the major macroeconomic problems in Bangladesh economy. In this research, it is tried to determine the determinant of inflation in Bangladesh. This study shows that there is a positive relationships between money supply and inflation in Banglades. But interest rate, fiscal deficit and nominal exchange rate do not significantly affect inflation. The one year lagged value of interest rate positively and significantly affect inflation. An increase of one year lagged interest rate increase inflation because an increase of interest reduce investment and output which push the price level up. So, one year lagged interest rate have to be reduced to reduce inflation. The explanatory variables can explain 87 percent variation of the dependent variable. While the stochastic error term capture 23 percent. At 5 percent level of significance, all these variables has influence over inflation rate. So, government can take various policies to



control inflation such as increase of production of goods and services. Government can control wage and import goods and services from abroad. Along with this government have to control population growth rate, activities of middlemen to control inflation.

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