

Maintaining International Reserves Under Three Major Political Regimes in Bangladesh: A Performance Evaluation using the Dummy Variable Approach

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Maintaining an adequate level of foreign exchange reserve is important for any government who wishes to keep her external sector healthy and remain carefree from emergency import situation. This study evaluates the performances of the three major political regimes in Bangladesh in maintaining appropriate level of international reserve on the basis of, firstly absolute amount of reserve in dollar terms (model 1), and secondly its balance of excess of reserves over its three months' import bill (model 2). Dummy variable technique is utilized to measure the performances of these three regimes. Ershad period is considered as the base category for comparison. The other two periods, namely the Awami League (AL) and the Bangladesh Nationalist Party (BNP) periods are assigned the dummy variables D1 and D2 respectively. The coefficient estimates of these two variables are 706.25 and 850.25 respectively, whereas the constant term of both the model is estimated at -1298.7. Based on these estimates, the expected reserve levels for mean values of the control variables, i.e. the trade balance, foreign aid, and remittances, are calculated at 1294 million, 2000 million, and 2144 million US dollars respectively. The paper concludes that instead of relying on foreign aid Bangladesh should concentrate on expanding exports and attract foreign direct investments if it desires to build a respectable level of foreign exchange reserve in the future.

Keywords: International Reserve, Trade Balance, Foreign Aid, Remittances and Bangladesh.

Field of Research: International Finance

1. Introduction

Either from political or economic aspect a very sensitive indicator for any government is to maintain a satisfactory level of international reserve in its coffers. If the amount of international reserve of the central bank falls below the country's three months' import bill, the situation is considered as critical. Historically international reserves of Bangladesh have not been much promising. On many occasions its reserve balance was not able to pay for its import bill (see figure in the appendix B, lower panel).

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A country needs foreign reserves mainly for two reasons: (i) to synchronize its receipts and payments with the rest of the world, and (ii) to withstand occasional speculative raid by the dealers in the foreign exchange market. It somewhat resembles the household's precautionary demand for cash balance. The paycheck comes in at the end of each month, but the family's purchases are spaced out irregularly over the month. Hence it is both handy and prudent to keep some cash balance even though the requirement for cash may dwindle to nothing when the next paycheck arrives.

The reserve position of a country is determined for the most part by the nature of its transaction with the rest of the world and the corresponding flow of fund into or out of the country. On this ground trade balance is an important factor for determining a country's reserve position. For Bangladesh like many other developing countries foreign aid and remittance inflow have been two major factors in creating reserve balance. These three variables have been controlled for when evaluating the performances of the three major political regimes in Bangladesh. In Bangladesh, mainly three political parties dominate the country's political and economic environment. So it is a matter of great interest to know the performance of various governments in Bangladesh regarding maintaining an adequate level of Foreign Exchange Reserve during their regimes and to find out the strength of various factors in influencing international reserve.

The study uses dummy variables to represent the political regimes and on basis of estimated coefficients of these qualitative variables conclusions are arrived at about the performances of the three regimes in maintaining international reserve position. The paper is organized as follows: Objectives of the study are stated in the second section. Rationale of the study is stated in third section. Literature Review is provided in section four where methodology of the study is given in section five. Relevant variables are defined in this section. Sources of data and model specification are also contained in this section. The most important part of this paper is section six which contains estimations and analysis of the results. Section seven concludes the paper with some recommendations.

2. Objective of the Study

The central objective of this study is to measure the performances of various governments in Bangladesh with respect to maintaining an adequate level of foreign exchange reserve during their regimes. The study at the same time tries to find out the strength of various factors in influencing international reserve.

3. Rationale of the Study

Measuring performance of various governments will help us determine the quality of government policies in maintaining sound level of international reserves. Measuring performance in the right way is important because it helps the economic system to move in the right direction (Wang et al 2005). Any incorrect or invalid measurement of performance will bring unwanted consequences and move the economy in the wrong direction.

4. Literature Review

“Maintaining International Reserves under Three Major Political Regimes in Bangladesh” is relatively a fresh thinking in Bangladesh perspective. A very few studies have been found in this regard which are as follows:

Aizenman and Marion (2003), Edison (2003), and Lane and Burke (2001) studied in this area and found that real *per capita* GDP and population are included to capture the size effect on international reserve holding.

Most recently, Aizenman *et al.* (2004) also identify structural changes in the Korean international reserve holding after the Asian financial crisis.

Dooley, *et al.* (2005) offers an alternative view on the link between capital flows and international reserves. These authors argue that in the current international financial framework (the “Bretton Woods II system”), emerging market economies accumulate international reserves to secure FDI inflows from the center country, i.e., the United States. In other words, the economies in the “periphery” hold international reserves to ensure importation of financial intermediaries from abroad. According to this view, capital inflows are positively correlated with holdings of international reserves.

5. Methodology of the Study

The study uses dummy variables to represent the political regimes and on basis of estimated coefficients of these qualitative variables conclusions are arrived at about the performances of the three regimes in maintaining international reserve position.

Definition of Variables:

International reserve (R): The amount of liquid asset hold by the central Bank in terms foreign currency in order to synchronize receipt and payment with foreign country and to withstand occasional speculative activities raid by the dealers of foreign exchange.

Performance Measurement (DRM): performance in each year is measured as excess of international reserve over the period’s average three months import bill. Obviously, positive and higher values of the variable will indicate better performance.

Foreign aid (AID): Foreign Aid is defined as the sum of food aid, commodity aid and project aid that was disbursed in each year. Aid in physical term for example commodity or project aid indirectly contributes toward foreign exchange reserve buildup as it reduces the need for importing these material by spending foreign currency.

Remittances (REM): It is defined as the amount of foreign currency sent by the Bangladeshi nationals working abroad. The role of remittances got prominence in 1974 when Wage Earners Scheme (WES) was introduced. The WES provided incentives for sending money through official channels. Expatriate workers could now send their money at rates corresponding approximately to the open market rate.

International remittance has played a significant role in reducing dependence of the government on Foreign Aid. In the appendix B it is clearly seen that declining role of foreign aid has well been taken over by the heroic role of the earnings of expatriate workers. Since liberation foreign exchange earnings were composed of mainly foreign aid, export earnings, and remittances. Foreign aid was the major component of reserve during the early seventies. But subsequently Bangladesh has been able to diversify its export and as a result export earnings increased significantly. Of late wage earners' remittances are playing a dominant role in the foreign exchange reserve. This reserve leaks out in the form of paying import bill, paying for factor earnings of foreign nationals, paying bill for obtaining health service and education abroad. So it is apparent that net balance of foreign exchange reserve should depend on net export or trade balance, foreign aid and factors that affect these two variables. We have chosen political regimes as an indicator of policy environment that can affect reserve. Since this is a qualitative variable it is introduced in the model as dummy variables.

Sources of Data:

All data are collected from secondary sources and they are converted in dollar terms for the purpose of comparison across regimes. All the figures that were used in this study was collected from the following publications -

1. Bangladesh Economic Survey, Various Issues, published by the ministry of finance.
2. Economic Trends (Monthly) published by Bangladesh Bank.
3. Bangladesh Bank Annual Report, Published by Bangladesh Bank.
4. Statistical Year Book, Published by the Bangladesh Bureau of Statistics.

Model Specification:

The reserve performances of various political regimes have been estimated based on two types of models. The first one relates the amount of international reserves to the trade balance, foreign aid, and remittance along with the two political dummies. The second one regresses the same dependent variables on the difference between reserve and three months' average import bill of the same year. Maintaining an amount of reserve above a country's three months import bill is considered important for the developing countries. Because of low credit rating these countries do not have adequate access to international liquidity, especially commercial credit when need arises. If they obtain fund from official sources they are laden with conditionality's. So maintaining reserves in excess of three months import bill is important. The two specified models used here are:

$$R = \beta_0 + \beta_1 BOT + \beta_2 AID + \beta_3 REM + \beta_4 D1 + \beta_5 D2 \text{ ----- (1)}$$

$$DRM = \beta_0 + \beta_1 BOT + \beta_2 AID + \beta_3 REM + \beta_4 D1 + \beta_5 D2 \text{ ----- (2)}$$

where R is the amount of reserve in millions of US dollars, DRM is the difference between reserve and three months import bill, BOT is the balance of trade defined as the difference between export and import, AID is the amount of disbursed foreign aid, also expressed in millions of US dollar. D1 and D2 are political dummies. D1 is assigned the value 1 in each year during the AL period i.e. for the period 1972-75

and 1996-2001 and is assigned zero for the rest of the period. Similarly for D2, which represents the dummy variable for the BNP period, value 1 is assigned for years during the BNP regimes and zero for the other years. The third regime Ershad period does not need any dummy in the presence of constant term in the regression equations. Two dummies are sufficient here¹. The effect of the Ershad regime on reserve performance is automatically reflected in the estimated intercept term. Since the variables DRM and BOT contain negative terms for some years and logarithm of negative numbers are not permitted, the models were run based on the actual values instead of their logarithmic values.

6. Findings and Analysis (Estimated Results and Explanations)

The estimated models are summarized in table 1

Table 1: Coefficient estimates from model (1) and model (2)

Dependent Variables:

Model (1): R

Model(2):DRM

Independent Variables	Model (1)		Model (2)	
	Coefficients	t-ratios	Coefficients	t-ratios
BOT	0.1686	1.0067	0.4977	3.1194
AID	1.2457	3.5442	1.3151	3.6792
REM	0.5702	4.0706	0.1239	0.8916
D1	706.25	3.5957	605.73	3.0427
D2	850.25	3.8370	733.27	3.3984
Constant	-1298.7	-3.6332	-1250	-3.4300
R ²	0.8147	--	0.5090	--
DW	0.8283	--	0.8558	--

Source: Summarized from SHAZAM output

In both the estimated models the Durbin-Watson (DW) values indicate that the residual terms are likely to be auto correlated. To avoid the probable inconsistency errors relevant coefficients were estimated after adjusting the models for autocorrelation using SHAZAM procedures. These corrected coefficient estimates are reported in Table 1. Some important and theoretically expected results emerge from the empirical estimates of these two models. All the coefficients are found to be of right sign and are statistically significant except for the REM variable in model 2. This later variable, in spite of its insignificance, possesses the right sign.

From the positive coefficient estimates in model 1 we can conclude that improvement in balance of trade, or increases in the amount of foreign aid, or surges in remittance inflow increase the amount of international reserve level in the government coffer. The same sign for the coefficients in model 2 indicate that positive improvements in these variables improves the performances of the governments in terms of maintaining reserves in excess of its three months import bills. Of these three variables, inflow of foreign aid seems to be a strong determinant of international reserve. For every 1 million dollar increase in foreign aid,

international reserve increases by about 1.2 million dollars. On the other hand trade balance appears to be the least powerful in influencing international reserve balance. Improvement in trade balance by one million dollars raises the reserve level by about .19 million dollar. The influence of remittance is somewhat moderate. Reserve level increases by about .58 million dollar for a one million dollar increase in remittance flow. During the sample period both foreign aid and trade balances have showed tendencies for deterioration while remittance inflow has increased sharply. Remittance has played an important role in keeping the international reserves from falling.

Government policies and how the scarce reserve is being spent are also important in determining the level of foreign reserve or performance of various governments in maintaining foreign reserves. Ershad period is taken as the base period for comparisonⁱⁱ. The performances of the other two regimes are made with this benchmark period. The mean level of reserve during these three periods can be expressed as (Gujarati, 1988, p.441):

$$\hat{\beta}_0 + \hat{\beta}_1 \text{BOT} + \hat{\beta}_2 \text{AID} + \hat{\beta}_3 \text{REM} : \text{Ershad period}$$

$$(\hat{\beta}_0 + \hat{\beta}_4) + \hat{\beta}_1 \text{BOT} + \hat{\beta}_2 \text{AID} + \hat{\beta}_3 \text{REM} : \text{AL period}$$

$$(\hat{\beta}_0 + \hat{\beta}_5) + \hat{\beta}_1 \text{BOT} + \hat{\beta}_2 \text{AID} + \hat{\beta}_3 \text{REM} : \text{BNP period}$$

Using the coefficient estimates obtained in table 1 and using the mean value of BOT, AID, and REM average reserve positions of these three governments are calculated in table 2.

Table 2: Expected reserve positions of the three governments calculated at the mean level the three control variables.

Regimes	Expected Reserve Levels
Ershad	1,293.7375 million US dollars
AL	1,999.9875 million US dollars
BNP	2,143.9875 million US dollars

Source: Author's calculation based on table 1.

Of the three regimes, the expected reserve level during the Ershad regime was the lowest, only at about 1.3 thousand million US dollars. The corresponding figure for the AL and the BNP periods were about 2 thousands and 2.14 thousands million dollars respectively. Reserve formation is closely linked to the policies adopted and performances attained in the external sector of the economy by the respective governments. Starting in the 1980s almost every government in Bangladesh is emphasizing on pro-market reforms and putting priority on development based on private sectors. Foreign direct investment and remittances have grown at a faster rate in the past few years which in turn have contributed to higher reserve levels during the BNP periods.

One of the major obstacles to external sector performance and reserve growth lies in the political misunderstanding and bitter feuds between any government and its opposition. The opposition often resort to nationwide strike to force the government to their demand. According to an estimate some \$100 million a day is lost in the manufacturing and export sectors during national strikes (Priyangika, 2000).

Considering the adverse impacts of politics on the economy business community of this country is putting pressure on the political leaders to de-link business from politics. As long as the major political parties are able to work out some common ground to work together it will be difficult for any government to move forward without hindrances.

7. Concluding Remarks

A sound level of foreign exchange is an indication of a country's healthy foreign sector. Especially when a government is keen to keep its currency stable and avoid fluctuating exchange rates there is no alternative to maintain an adequate amount of foreign exchange reserve. In the presence of huge amount foreign exchange reserve speculators feel shy to attack a currency and devalue it forcefully.

Compared to the neighboring countries Bangladesh does not possess an attractive amount of foreign exchange reserve. For example, India's balance of foreign exchange reserve in June 1996 was 165.542 billion US dollars whereas the corresponding figure for Bangladesh was only 3.650 billion US dollars at that time. Export earnings, foreign investments, and remittances play important role in building foreign exchange reserve.

The study finds foreign aid to be the strongest determinant of foreign exchange reserve for the sample data. But Bangladesh should not rely on this source for building its reserve. After the breakdown of the Soviet Union and other communist countries, developed countries are increasingly diverting their aid funds toward these countries thus inevitably reducing the fund flow to the other developing countries. In these changing circumstances it is in the developing countries' interest to turn their attention to finding ways of increasing their export earnings through diversification or other export promotion measures. At the same time since Bangladesh has potential for exporting its huge unskilled manpower, government can take initiative through diplomatic means to persuade countries like Malaysia and Middle East where there is shortages of unskilled manpower to import more manpower from Bangladesh. If Bangladesh can sustain her increasing trend of remittance earnings, export earnings and foreign direct investment flows, we can expect a further boost in its reserve level in the near future.

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Appendix A

Data Table

Year	R	AID	REM	X	M	D1	D2
1972-73	173	551	20.32	260.33	682.71	1	0
1973-74	110	461	11.3	357.73	986.39	1	0
1974-75	257	901	54.09	347.91	1078.42	1	0
1975-76	213	801	16.33	327.24	1321.25	1	0
1976-77	294	535	47.28	400.77	952.15	0	1
1977-78	269	834	101.98	475.69	1163.12	0	1
1978-79	393	1030	124.04	548.47	1512.6	0	1
1979-80	275	1223	248.84	658.68	1908.36	0	1
1980-81	250	1146	378.74	758.51	2598.96	0	1
1981-82	121	1240	412.38	790.63	2699.08	0	0
1982-83	358	1177	317.28	769.44	2463.87	0	0
1983-84	540	1268	596.4	724.5	2164.77	0	0
1984-85	395	1269	439.1	931.43	2825.23	0	0
1985-86	476	1306	555.1	998.78	2542.35	0	0
1986-87	715	1595	696.4	879.92	2546.1	0	0
1987-88	856	1640	737	1067.09	2715.08	0	0
1988-89	913	1668	771	1290.98	3041.42	0	0
1989-90	520	1810	760	1304.87	3650.36	0	0
1990-91	880	1732	764	1671.34	3618.1	0	0
1991-92	1608	1611	848	1688.84	3411.91	0	1
1992-93	2121	1675	944	2097.84	3731.54	0	1
1993-94	2765	1559	1088.8	2277.94	3994.16	0	1
1994-95	3070	1739	1197.63	2660.74	4602.47	0	1
1995-96	2039	1443	1217.06	3173.11	6501.54	0	1
1996-97	1719	1481	1475.4	3297.23	6621.11	1	0
1997-98	1739	1251	1525.42	3778.4	6898.41	1	0
1998-99	1523	1536	1705.74	3831.27	6973.77	1	0
1999-00	1602	1588	1949.32	3921.92	7694.39	1	0
2000-01	1302	1369	1882	4690.68	8359.92	1	0
2001-02	1583	1442	2501	6467	8540	0	1
2002-03	2470	1585	3062	5986	9658	0	1
2003-04	2705	1033	3372	6548	10903	0	1
2004-05	2930	1491	3849	7603	13147	0	1
2005-06	3484	1567.64	4802	6984	14746	0	1
2006-07	5077	1630.57	5979	9627	17157	0	0
2007-08	6149	2061.51	7915	9708	21629	0	0
2008-09	7471	1847.31	9689	10720	22507	1	0
2009-10	10750	2216.95	10987	11233	23738	1	0

Source: Economic Trends, Various Issues.

Where,

R = International reserve (in millions of US dollars)

AID = Amount of Foreign Aid (in millions of US dollars)

REM= Remittances (in millions of US dollars).

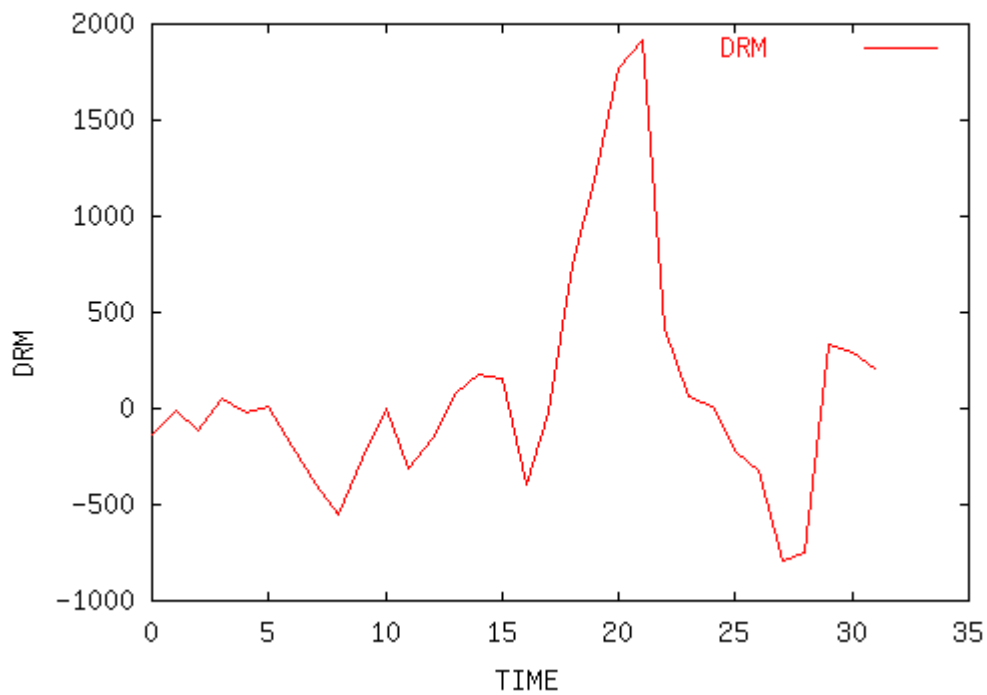
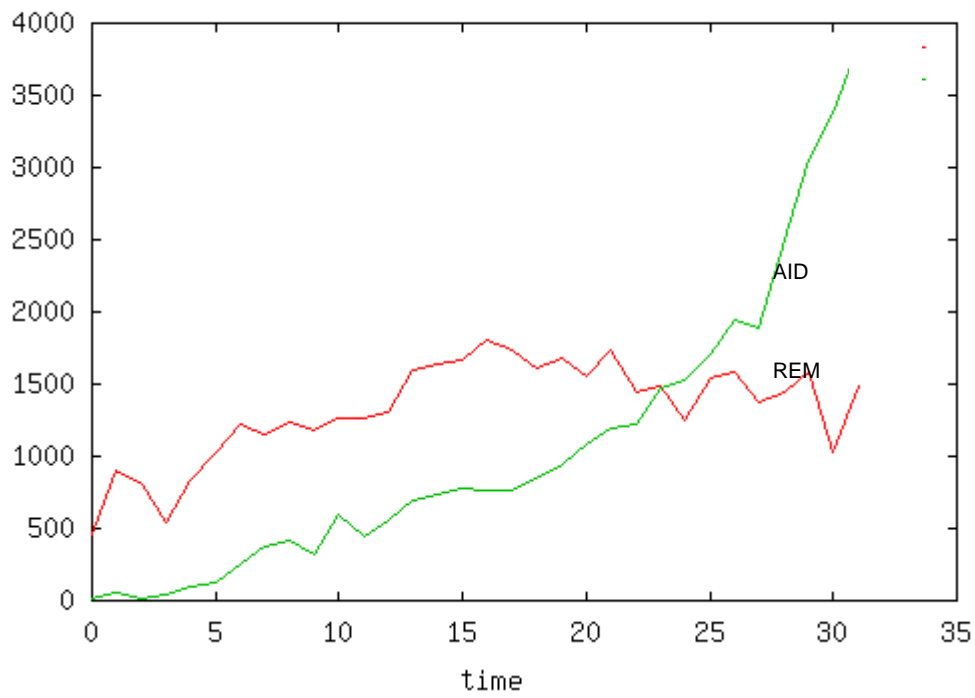
X = Amount of Export (in millions of US dollars)

M = Amounts of Imports (in millions of US dollars)

D1 = Dummy variable representing the AL period

D2 = Dummy variable representing the BNP period

Appendix B



Figures: Foreign aid and remittances (upper panel), excess of reserve over three months' import bill (lower panel)

Endnotes

ⁱ Inclusions of one more dummy for the Ershad period will render the data matrix orthogonal thus collapsing the least square procedure. See Judge et al (1988), p.423

ⁱⁱ Of course the choice of the base period is arbitrary. Any regime could be used as the base period and serve the same purpose.