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by

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I. INTRODUCTION

In recent years the relative effectiveness of monetary and fiscal policy actions on economic stabilization has been debated by both economists and policymakers. In case of USA, empirical studies using a reduced form 'St. Louis equation' has shown that monetary actions have a greater impact on economic activity than fiscal actions (see, for example Andersen, Leonall and Carlson 1970 ; Carlson 1970 ; Hafer 1982). On the other hand, structural models such as the FRB-MIT model suggest that fiscal, rather than monetary, actions exert the dominant influence on economic activities in USA (see, for example deLeeuw and Kalchbrenner 1969). Batten and Hafer (1983) and Dewald and Marchon (1978) have also discussed the relative effectiveness of the two stabilization policies in other developed countries. However, the results from these studies cannot be generalized for the developing countries since they have significanty different economic and political structures. There has been very few, if any, empirical studies regarding the relative efficacy of the stabilization tools in these countries. The purpose of this note is to test the comparative effectiveness of the two policy variables in case of a developing economy like Bangladesh. Bangladesh represents an open econmy with a large non-monetized sector. Although the monetary management decisions are taken by the Bangladesh Bank yet, unlike many developing countries, the Bank is directly controlled by the Government. The fiscal decisions are also unilaterally taken by the executive branch of the government with little or no input from the legislature.

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The methodology used here is the modified St. Louis equation proposed by Darrat (1984). In the original St. Louis equation, nominal income is regressed on distributed lags of a monetary policy variable and a fiscal policy variable. However, even though this single equation approach has been frequently employed to analyze the macro effects of monetary and fiscal policy actions, the approach has been subjected to much criticism (see, for example deLeeuw and Kalchbrenner 1969; Goldfeld and Blinder 1973; Modigliani and Ando 1976). Following Darrat, three distinct modifications are suggested to the St. Louis equation. First, a growth-rate version of the equation is estimated rather than the original first-difference form. Second, given the dependence of the Bangladesh economy on the foreign sector, a variable measuring foreign trade is included in the equation. Third, the optimal lag length of each variable is determined on the basis of the minimum final prediction error criterion as discussed in Hsiao (1981).

II. THE MODEL AND EMPIRICAL RESULTS

In recent years, many summary measures of monetary and fiscal policy have been developed. The major reason for searching for such a measure is to provide a quick interpretation of current policy stance. In case of Bangladesh, M1 is used as a measure of monetary poicy actions since it reflects more accurately changes in the instruments of policy. Fiscal policy actions are measured by total government expenditures. Total export is used to represent the foreign trade sector.

The modified St. Louis equation to be estimated can be written as

$$\dot{Y}_t = C_0 + \sum_{i=0}^{j_1} m_i \dot{M}_{t-1} + \sum_{i=0}^{j_2} f_i \dot{F}_{t-1} + \sum_{i=0}^{j_3} e_i \dot{E}_{t-1} + U_t \qquad (1)$$

where $\dot{Y}_t$, $\dot{M}_t$, $\dot{F}_t$, and $\dot{E}_t$ represent the growth rate of nominal income, M1, government expenditures and export respectively; C_0, m_i, f_i, and e_i are the coefficients to be estimated and U_t is the error term. The error term is serially uncorrelated with zero mean and constant variance. *A priori*, each of the three summed coefficients are expected to be greater than zero implying that the growth rate in nominal income responds positively to changes in the growth rate of the three explanatory variables. Equation (1) is estimated using annual data for the period 1972–1983. The time series data has been taken from various issues of International Financial Statistics and Statistical Yearbook of Bangladesh published by the International Monetary Fund and Bangladesh Bureau of Statistics respectively.

TABLE I

REGRESSIONS RESULTS FROM THE MODIFIED ST. LOUIS EQUATION FOR BANGLADESH

Lag (i)	Constant	$\dot{M}$	$\dot{F}$	$\dot{E}$
	—.126 (1.20)			
0		.112 (1.04)	.178 (3.04)	.244 (1.68)
1		.110 (0.82)	.109 (2.96)	.088 (2.41)
2		.092 (0.96)	.262 (2.82)	.031 (2.77)
3		.048 (1.88)	.138 (3.05)	
4			.096 (3.43)	
Σm_i=.362 (1.08)		$\bar{R}^2$= .91		
Σf_i =.783 (4.43)	D.W. Statistic = 1.78			
Σe_i =.363 (2.86)				

The regression results are given in Table I. Using the minimum final prediction error criterion, the optimal lag length for the variables M, F and E are calculated to be 3, 4 and 2 respectively. Coefficients of all three explanatory variables have the expected positive sign. The cumulative impact of the growth in government expenditures is positive and significant at 1 per cent level, while the cumulative impact of the growth in Ml is positive but not significant even at the 10 per cent level. This suggests that in Bangladesh government expenditures have a greater impact on nominal income than Ml.

Moreover, the t-statistic for the fiscal summed coefficient is significantly larger than the corresponding value for the monetary summed coefficient. This further indicates that fiscal impacts on nominal income are more predictable than the monetary impacts (see, for instance Keran 1970). These findings are similar to the general conclusion of Darrat (1984) regarding the Latin American countries but contrary to the findings of the St. Louis equation in case of USA.

The relative strength of the impact of government expenditures and Ml can be compared by calculating their beta summed coefficient. For either policy variable, this coefficient represents the product of the estimated summed coefficient and the ratio of the standard deviation of that policy variable and nominal income. The summed coefficients are estimated to

[1]The numbers in parentheses in Table I are the absolute values of t-statistics.

be .681 (significant at 1 per cent level) for government expenditures and .240 (significant at 10 per cent level) for M1. This further indicates that the fiscal policy variable has a greater impact on nominal income than the monetary policy variable.

Finally, the dynamic characteristics of the model are explained by computing the impulse response functions (IRFs). Fischer (1981) has described the IRFs as a type of dynamic multipliers which give the current and subsequent effects on each variable of a shock to one of the other variables in the model. These functions are of interest to policy makers because they describe the effects and timing of policy variables of ultimate concern. In calculating these functions, a one standard deviation shock is given in period one to the impulse variable (M and F respectively) and its effect on current and subsequent values of income is studied. The results are presented in Table II. The figures in each column represent the responses of income at the indicated period (in the column headed by period) to a one per cent shock to the variable in the heading of the column. The responses are expressed in per cent of changes. Responses are calculated for lags up to four years.

TABLE II

IMPULSE RESPONSE FUNCTIONS

Period	Response Function of Y Due to a Shock to	
	M	F
1	.26	.80
2	.41	.51
3	.28	.33
4	.07	.31

A shock to M1 initially raises income. The peak effect occurs in the second year when a one per cent change in M1 leads to a 0.4 per cent change in income. However, the effect gradually declines and in the long run becomes very small. On the other hand, a shock to government expenditures has a significant impact on income for the entire four year period reported. The peak effect occurs in the first year when a one per cent change in government expenditures lead to a 0.8 per cent change in income. The effect then declines in the second year. During the last two years, the effect

seems to stabilize at a slightly lower level. Table II shows that the magnitude of the effect is much higher in case of an unanticipated shock to government expenditures than to M1. The long-run effects are also higher in case of the government expenditures variable.

III. CONCLUDING REMARKS

The purpose of this note has been to discuss the relative impact of monetary and fiscal policy actions on economic activities in Bangladesh. A modified St. Louis-type reduced from equation is estimated for the sample period 1972-83. The regression results suggest that growth in government expenditures has a greater impact on changes in nominal income than growth in M1. Computation of beta summed coefficient further supports the regression results. The dynamic analysis of the model suggests that the long-run effects of an unanticipated shock to the monetary and fiscal policy variables are also different. The effects of a shock to government expenditures on nominal income last for a relatively longer period of this compared to a shock to the M1 variable. Moreover, the magnitude of the effect is also greater in case of the fiscal variable.

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