

MACROECONOMIC EFFECTS OF FOREIGN AID IN BANGLADESH REVISITED

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ABSTRACT

This paper revisits the topic of macroeconomic effects of foreign aid in Bangladesh and finds, in line with the radical anti-aid view, that aid has reduced both GDP growth and domestic savings in Bangladesh. However, the effects of aid on growth were found less damaging than predicted by the radical view. A Keynesian interpretation of the estimated results suggests that by raising consumption expenditures, aid also stimulates the demand-constrained Bangladesh economy, which causes greater utilization of production capacities. In turn, it increases national output through a multiplier-accelerator mechanism. Thus, aid induces indirect positive effects on GDP growth through increased consumption demand, which offset much of the direct adverse effects of aid.

Prelude

Over the years two opposing views have emerged in development economics on the topic of macroeconomic effects of foreign aid. On the one hand, based on early theoretical developments, the traditional pro-aid view advocates aid on the premise that it complements domestic resources, eases foreign exchange constraints, transfers modern know-how and managerial skills, and facilitates easy access to foreign markets, all of which contribute to economic growth (Chenery and Strout 1966, Papanek 1972, 1973, etc.). On the other hand, based on the empirical evidence, the radical anti-aid view criticizes aid on grounds that it supplants domestic savings, worsens income inequality, funds the transfer of inappropriate technology, finances ineffective projects, and in general helps sustain bigger, more corrupt and inefficient governments in the recipient countries (Griffin and Enos 1970, Weisskoff 1972, etc.).¹

Bangladesh, which has received a cumulative influx of almost US \$33 billion in public foreign aid (grants and loans combined), provides an important test case for analyzing the effects of foreign aid on the recipient economy. Several recent studies, e.g. Ahmed (1992), Taslim and Weliwita (1998), etc., have estimated the macroeconomic effects of aid on the Bangladesh economy and generally found results that are in line with the radical anti-aid view. This paper presents results that suggest that the effects of aid on GDP growth in Bangladesh are in fact not very detrimental. Based on the results estimated by this study, a post-hoc Keynesian hypothesis can be put forth that by raising consumption expenditures, foreign aid stimulates the demand-constrained Bangladesh economy, which causes greater

utilization of production capacities. In turn, it

increases national output through a multiplier-accelerator mechanism. Thus, much of the direct adverse effects of aid are offset by the indirect positive effects of increased demand on GDP.

The ensuing sections are organized as follows: section II provides an overview of the aid literature on Bangladesh, section III describes the model and presents the empirical results, and finally, section IV summarizes the results and offers policy implications.

Literature Review

There exists a growing literature on the macroeconomic effects of foreign aid in Bangladesh. Among the very early studies, Islam (1972) analyzed the relationship between foreign capital (foreign public aid and foreign private investment) and gross domestic savings in the erstwhile East Pakistan and concluded that foreign capital had affected domestic savings negatively in the 1950's, but positively in the 1960's. Mostly a descriptive survey paper in nature and lacking in quantitative analysis, this study offers only tentative observations.

A more rigorous approach is taken by Alamgir (1974) who econometrically investigated the effects of foreign capital on gross domestic savings and growth in East Pakistan during 1960-70. The estimated results show that foreign capital affects gross domestic savings positively, but GDP growth negatively. Drawing on these results, the author concluded that since foreign capital finances the imports of foreign investment goods, which are complementary to domestic capital goods in production process, additional foreign capital enhances the utilization of existing production capacity as well as productivity of new investment, which eventually leads to increased domestic savings. No explanation is, however, provided for the

apparently paradoxical results that the effects of foreign capital on savings are positive but on growth are negative.

In an intriguing study of the role of aid in the development dynamics in Bangladesh, Sobhan (1982) concluded that the aid regime has grossly failed in promoting its development agenda. Instead of reducing poverty, aid has led to substantial concentration of wealth among the urban and rural elite, and instead of fostering domestic productive potential, aid has helped nurture a dependent culture on foreign resources, which has been “self-perpetuating ... over the years, and served to reinforce a system which has been inimical to the mobilization of domestic resources and the effective use of production capabilities” (Ibid).

Quite contrary conclusions are drawn by Rahman (1984), which analyzed the effects of aid on domestic resource mobilization in the post-independence Bangladesh. A two-sector model is developed with one sector representing the production of goods intended for import substitution and export promotion, and the other one representing the production of all other goods and services. The estimated results show that, over the 1972-82 period, aid has promoted economic growth, and through higher income, aid has also expanded the tax base and raised domestic savings in Bangladesh. In line with Alamgir's (1974) observations, Rahman also explained these results by noting that by relieving the foreign exchange gap in the import-dependent economy, aid has financed the imports of needed foreign inputs and brought the complementary domestic inputs into production, and thus has played a very important role in domestic resource mobilization.

It should be noted here that the sample period covered in both Alamgir (1974) and Rahman (1984) is only 10 years, and, hence, these studies have essentially captured only the short run stimulus of aid on the macroeconomy, which may diminish in the long run. Several studies that have covered longer sample periods are discussed next.

Ahmad (1990) moved beyond the single equation estimation approach and estimated a simultaneous equation model grounded in the framework of two-gap analysis. The estimated results show that over the 1961-80 period, despite reducing domestic savings, foreign capital inflow has raised GDP growth by increasing output in the primary, manufacturing, and tertiary sectors. The author argues that by relieving

the foreign exchange gap and financing imports of intermediate and capital goods, aid has expanded the economy's productive capacity and thus fostered economic growth.

Islam (1992) estimated several single equation aid-growth models for Bangladesh with 1972-88 data and found that the effects of aid on GDP growth are barely positive, but highly insignificant. When total aid is disaggregated into grants and loans, the effects of grants turn out negative but marginally significant and the effects of loans turn out positive and highly significant. Drawing on these results, the author concluded that foreign loans have stimulated growth in Bangladesh, while grants have not. Based on the other estimated results, the author also concluded that domestic resources have played a much more significant role in promoting economic growth vis-à-vis the foreign resources.

Ahmed (1992) undertook a significant study of the aid-growth debate in Bangladesh. He estimated a 2SLS model that yields structural parameters suggesting that aid has affected both output growth and domestic savings negatively, but the reduced form parameters reveal that the effects of aid on domestic savings are positive, but negative on output growth. The author attempts to reconcile these seemingly conflicting results by arguing that aid funds have possibly been diverted into unproductive channels, including projects that were imposed by the donors but could not be successfully implemented due to institutional constraints.

Taslim and Weliwita (1998) investigated the aid-savings relationship in Bangladesh during 1960-95 and found that the long run relationship between aid and savings has been strongly negative. The estimated coefficients appear fairly robust to different sample periods (pre and post-liberation) as well as to various specifications of the savings function. The coefficient of aid turns out negative and highly significant under all specifications suggesting that aid has had an unambiguously negative effect on gross domestic savings in Bangladesh.

As it can be seen from the preceding discussion, there is no consensus in the aid literature about the macroeconomic effects of aid in Bangladesh. It nevertheless appears that the early studies had found results that mostly accorded with the traditional pro-aid view, while the more recent studies have generally found results that are lined up along the radical anti-aid view, which perhaps explains the growing disenchantment among the academicians

with the aid regime.

This paper adds to the aid-growth literature a Keynesian approach to interpreting the aid-growth relationship. Most aid-growth studies have analyzed this relationship with the classical approach emphasizing the supply side of the economy. This study, in contrast, emphasizes the demand side of the economy. The hypothesis posited here, which in fact is a post-hoc hypothesis based on the estimated results, is that total effects of aid on GDP growth in Bangladesh are less adverse than postulated by the radical anti-aid view. Even though the radical view correctly posits that foreign aid initially depresses GDP growth and reduces domestic savings, the resultant increased consumption expenditures bring about, in accordance with the Keynesian hypothesis, a multiplier-accelerator mechanism that increases national output. Thus, foreign aid increases consumption demand, which induces indirect positive effects on output growth, which in turn can, depending on the strength of the Keynesian multiplier, either partially or more than offset the initial negative effects of aid on GDP growth. Therefore, the radical anti-aid view can be complemented with the Keynesian view to better explain the aid-growth relationship in Bangladesh.

The Model and Empirical Results

Theoretical Design of the Model

A simultaneous growth model is developed here to capture the effects of aid on GDP growth and domestic savings in Bangladesh². By accounting for the simultaneous relationship between growth and savings, this model eliminates the specification bias that has been routinely overlooked in similar studies. A notable feature of the model is the inclusion of a dummy variable that captures the effects of natural and political shocks on GDP growth and gross domestic savings.

The system of equations of the structural model is as follows:

$$GR_t = \alpha_1 + \beta_1 Aid_t + \beta_2 S_t + \beta_3 CLF_t + \beta_4 MX_t + \beta_5 Dummy_t + u_t \quad (1)$$

$$S_t = \alpha_2 + \beta_6 Aid_t + \beta_7 GR_t + \beta_8 CX_t + \beta_9 Dummy_t + v_t \quad (2)$$

where, GR = GDP growth rate; Aid = foreign aid as a percentage of GDP; S = gross domestic savings as a percentage of GDP; MX = imports plus exports (net volume of trade) as a percentage of GDP; CLF =

increments in labor force; CX = increments in export earnings as a percentage of GDP; Dummy = a dummy variable for periods of natural calamities and/or political disturbances; and t = time. All variables except CLF and Dummy are measured in real terms.

Rationale of the Model

Equation (1) is an augmented Harrod-Domar type growth model. In addition to the usual factors of growth, i.e. labor (CLF), domestic savings (S), and foreign capital (Aid), two other variables, net volume of international trade (MX) and the dummy, are included as additional explanatory variables. Many aid-growth studies, e.g. Papanek (1973), Gupta and Islam (1983), Lee et al (1986), Mosley et al (1987), etc., have adopted the first three variables in one form or another in their model specifications.

The fourth variable, MX, is included following Dowling and Hiemenz (1982) as a proxy for economic openness. Since the 1980's the erstwhile closed Bangladesh economy has opened up significantly to international trade. As a result, the volume of trade (imports plus exports) has steadily increased from about 22% of GDP in early 1980's to almost 32% in 1995. Much of the expansion in the volume of trade is due to the spectacular growth in the exports sector, which has caused the export-import ratio to rise from about 30% in early 1980's to almost 60% in 1995 (GOB 1996). It can be hypothesized, consistent with international trade theories, that the rising level of international trade (as well as the fast growing export sector) has played a positive role in the growth dynamics in Bangladesh.

Finally, the dummy variable for natural and political disturbances is included in line of the arguments put forth by Papanek (1972) that these non-economic factors are no less crucial than the usual economic factors in determining growth. Indeed, the floods in 1987 and 1988, and severe political turmoil in 1990 and 1995 have had very adverse effects on the level of economic activities and consequently economic growth in Bangladesh. Therefore, unless the effects of these shocks are accounted for, the model would be misspecified and the macroeconomic effects of aid and the other explanatory variables would be inaccurately estimated.

A few other variables, such as foreign direct investment (FDI), literacy rate, export earnings, terms of trade, government expenditures, tax efforts, etc. have been included as additional explanatory

variables in similar aid-growth studies for other countries (White 1992). FDI is excluded from the present model as foreign direct investment is a relatively new phenomenon in Bangladesh and still very negligible. Nonetheless, since the FDI inflow presently continues to increase at a steady pace, future studies should consider incorporating it. Literacy rate is excluded as no continuous data could be found for the 1970's and the early 1980's. Since the volume of exports is already included in the variable MX (volume of international trade), export earnings are not separately included in the model. The other three variables were tried in alternative model specifications, but were subsequently dropped as the regression results did not appear satisfactory.

The savings equation in (2) is essentially grounded in the Keynesian type saving functions. The GDP growth rate has been added following Mikesell and Zinzer (1973) and White (1992), who contended that higher economic growth raises transitory income more than permanent income, which induces increased savings. Incremental export earnings has been added following Papanek (1972) and Rahman (1984) on grounds that exports of primary products usually generate highly concentrated income, which is more likely to be saved, and also export taxes are a significant source of government revenues and, hence, public savings. Finally, the level of private savings is determined to a large extent by how confident the investors feel about future returns from their domestic investment, but frequent occurrences of natural disasters and political turmoil are likely to seriously erode investors' confidence in the local economy. The dummy variable for natural and political shocks has been accordingly added in the savings equation to capture the deleterious effects these exogenous economic shocks have on the investors' willingness to accumulate additional savings.

It should be noted here that the theoretical validity of the present model rests crucially upon the presumed uni-directional causality running from aid to growth, and not vice versa. Several studies, e.g. Griffin and Enos (1970), Maizels and Nissanke (1984), Gulhati and Nillari (1988), etc., have concurred that the economic need of the recipient country generally takes a back-seat to the donors' geo-political and commercial motives in devising aid strategies. However, following Papanek (1972) it can be argued that it is the slow or negative growth rate of the recipient economy that necessitates foreign assistance, and hence the causality also runs from economic need to aid. Although the inflow of food

aid in Bangladesh has generally been responsive to the occurrence of natural disasters, the majority of project and commodity aid packages have not responded noticeably to economic performance. Therefore, *ex ante* it appears quite legitimate to regard aid as an exogenous variable in modeling the aid-growth relationship. Furthermore, when the well known Granger causality test is applied to test for the direction of causality between aid and growth, the results clearly indicate that the causality runs only from aid to growth, not vice versa. Therefore, the proposed model formulation stands valid.³

Data, Methodology, and Estimation

Annual time-series data from 1973 to 1996 are used in estimating the model. It should be noted here that since computation of GDP growth and increments in export earnings and labor force requires data from the preceding period as well as the current period, these values could not be computed for 1973. Accordingly, the actual sample period spans from 1974 to 1996. Data are collected from several sources: the *Bangladesh Economic Survey* (GOB 1996), *Statistical Yearbook of Bangladesh* (BBS 1997), and *World Tables* (World Bank 1998). The dummy variable assumes the value of 1 in 1975, 1982, 1988, 1989, 1991, and 1996 --years following the occurrence of catastrophic natural calamities and/or intense political unrest and uncertainty in the preceding year.

The simultaneous system is estimated using the two-stage least squares (2SLS) procedure. The system comprises two endogenous variables --GR and S, and five exogenous variables --AID, MX, CX, CLF, and Dummy. The *a priori* expected signs of the coefficients are as follows: $\beta_3 > 0$, $\beta_4 > 0$, $\beta_7 > 0$, $\beta_8 > 0$, $\beta_5 < 0$, and $\beta_9 < 0$. According to the classical view, higher savings lead to higher level of investment, which in turn leads to higher output growth, and, hence, β_2 is positive. On the other hand, according to the Keynesian view, higher savings lead to reduced consumption demand, which restricts output growth, and, hence, β_2 is negative. The traditional pro-aid view predicts that β_1 and β_6 are positive, while the radical anti-aid view predicts the contrary. The estimated structural parameters, asymptotic *t*-statistics, adjusted R^2 , and the *Durbin-Watson statistics* are reported next, none of which indicates the presence of any statistical shortcomings of the estimated equations.⁴

Structural Equations

GDP Growth Equation:

$$\begin{aligned} \text{GR} = & 9.74 - 1.19 \text{Aid}^{**} - 1.40 \text{S}^{**} + 0.08 \text{MX} \\ & (-2.40) \quad (-3.30) \quad (0.50) \\ & + 0.90 \text{CLF}^{**} - 4.62 \text{Dummy}^{**} \\ & (2.40) \quad (-4.28) \end{aligned}$$

*Adjusted R*² = 0.28; *D-W Statistic* = 1.66.

Gross Domestic Savings Equation:

$$\begin{aligned} \text{S} = & 8.26 - 0.78 \text{Aid}^{**} + 0.03 \text{GR} \\ & (-3.07) \quad (0.12) \\ & + 1.54 \text{CX}^{**} - 0.66 \text{Dummy} \\ & (3.08) \quad (-0.59) \end{aligned}$$

*Adjusted R*² = 0.53; *D-W Statistic* = 1.13.

[** coefficients significant at 1% level of significance]

The estimated growth equation shows that except MX (volume of trade) all explanatory variables turn out significant at the 1 percent level of significance, while in the savings equation, aid and incremental export earnings turn out significant at 1 percent. Notwithstanding the presence of three insignificant coefficients, these results present considerable improvement over the results obtained by Lee et al (1986) and Ahmed (1992). Results reported by the former had yielded six insignificant coefficients, while those by the latter had also yielded six insignificant coefficients --three of which turned out with wrong signs.

The estimated results show that foreign aid has reduced both GDP growth and gross domestic savings in Bangladesh. The former result reconfirms Ahmed's (1992) findings that aid has adversely affected GDP growth in Bangladesh, while the latter accords with Ahmad's (1990) and Taslim and Weliwita's (1998) results that aid has significantly reduced gross domestic savings in Bangladesh. These results firmly accord with the radical view that instead of benefiting the recipient economies, foreign aid in fact hurts them.⁵

Furthermore, the coefficient of domestic savings on GDP growth turns out significantly negative, which accords with the Keynesian hypothesis that increased savings reduce consumption demand and, thus, constrain growth. It is also found, in line with the *a priori* expectations, that increments in the labor force has significantly raised growth, incremental export earnings has strongly increased savings, and finally

natural and political shocks have exacted a heavy toll on GDP growth. The recent trend in opening up the economy to international trade has, however, had only a very feeble effect on growth, which is possibly due to the small time frame captured by the small sample size. GDP growth and occurrences of natural and political shocks appear to have insignificant effects on domestic savings. One very plausible explanation of these insignificant effects is that since natural and political shocks are significant determinants of GDP growth, there exists strong multicollinearity between these two variables, and, hence, it is difficult to separate out their individual effects on savings. It is also very probable that increased income in the private sector is not re-invested in the economy due to the pervasiveness of several non-economic factors, such as a highly corrupt bureaucracy, acute lack of law and order, and frequent political unrest. As Bangladesh generally lacks a "business-friendly" environment, increased income in the private sector is possibly siphoned out of the country to be invested in safer havens abroad, which partly explains why the level of domestic savings is not highly responsive to the GDP growth rate.

It should be noted here that the structural coefficients in a simultaneous system of equations measure only the direct or partial effects of the explanatory variables, while the reduced form coefficients measure the sum-total of direct and indirect effects. Therefore, in order to gauge the total effects of the explanatory variables, it is essential to estimate the reduced form coefficients, which may turn out considerably different from the structural coefficients. The reduced form coefficients of aid on GDP growth and savings are presented next.

Reduced Form Coefficients

	Total Effects of Aid
GDP Growth Rate	-0.09
Domestic Savings/GDP	-0.78

The reduced form coefficients show that the total effects of aid on both GDP growth and gross domestic savings still remain negative; the negative effects on growth, however, turn out much smaller than the structural coefficient, while the effects on domestic savings remain virtually unchanged (after rounding-off).⁶ The reason why the total effects of aid on growth turn out less adverse than the direct effects can be explained by a combination of the radical anti-aid view and the Keynesian interpretation.

The radical view posits that easy access to foreign aid puts additional resources at the government's disposal and since aid is generally fungible between public investment and consumption⁷, aid frequently increases public consumption expenditures. Private consumption expenditures are also raised by increased income in the private sector that accrues from the aid-financed projects. By raising consumption expenditures, the Keynesian view postulates, foreign aid stimulates the demand-constrained Bangladesh economy, which causes greater utilization of production capacities, which, in turn, increases national output through a multiplier-accelerator mechanism. These indirect effects of increased demand on GDP offset much of the direct adverse effects of aid. Thus, a 1 unit increased aid/GDP ratio in Bangladesh causes the GDP to decline by only 0.09 percent, which is significantly lower than the structural estimate of -1.19 percent.⁸ Total effects of aid on GDP growth can even be positive if the multiplier-accelerator mechanism produces sufficiently strong demand to offset all the direct effects of aid.

Conclusion and Policy Implications

This paper finds that foreign aid has reduced both GDP growth and gross domestic savings in Bangladesh. These results accord with the radical anti-aid view that instead of promoting the recipient country's welfare, aid actually depresses them. However, this paper also finds that the effects of aid on growth are less damaging than predicted by the radical view. These results are consistent with the Keynesian hypothesis that by raising consumption expenditures, aid also stimulates the demand-constrained Bangladesh economy, which increases output through a multiplier-accelerator mechanism. Thus, aid induces indirect positive effects on GDP growth through increased consumption demand, which offset much of the direct adverse effects of aid.

Furthermore, this paper finds that increased domestic savings significantly reduce GDP growth, which is consistent with the Keynesian hypothesis that the Bangladesh economy is demand-constrained. It is also found that increments in the labor force significantly raise GDP growth and incremental export earnings significantly boost domestic savings, but GDP growth has had very weak effects on savings and the recent openness in international trade has had very feeble stimulus on growth. Finally, the effects of natural and political shocks appear to be very adverse on GDP growth, but weak on savings.

This study finds that occurrences of natural and political shocks have exacted a heavy toll on GDP growth in Bangladesh. Even though political stability is not a policy instrument, it is perhaps the most significant prerequisite for fostering an economic environment conducive to economic growth. Therefore, the government should seek ways together with the opposition political parties to bring about a congenial political atmosphere in Bangladesh. Unfortunately, the government and the opposition parties are currently at loggerheads over various issues, which seems eerily similar to the series of events whose build-up led to a fierce political battle during 1995-96 that wrecked havoc to the economy. A report by the World Bank and ADB on the deleterious effects of this political turmoil on the economy observed that: "... [by 1995/96] an uncertain political climate began to take its toll. ... The impact of the disruption carried through in 1996/97 when the industrial sector registered a growth rate only 3.6 percent in 1996/97, [down from an average of 8 percent per annum between 1991/92 and 1994/95], one of the lowest in recent years" (The Daily Star 1998). The present cycle of political instability has not only hurt the industrial sector, but also caused significant capital flight⁹, repelled foreign investors, and created an overall economic environment that is least conducive to economic growth. One can only hope that the current political culture of confrontation will give way to a political culture of tolerance and harmony, and democracy will take a firmly institutionalized shape in Bangladesh, otherwise the hope of achieving the country's economic potential will remain a dream as distant as ever.

The principal finding of this study is that foreign aid has reduced both GDP growth and domestic savings in Bangladesh. Much of the failure of the aid regime in raising economic growth can be explained by a number of factors such as diversion of aid funds away from public investment projects into non-productive public expenditures, preference for undertaking prestigious but ineffective mega-projects, transfer of inappropriate technology, price distortions in the trade sector, worsening income inequality, etc. This study also finds, in line with the Keynesian view, that the Bangladesh economy is demand-constrained and hence if aid financed programs and projects can generate sufficient consumption demand through the multiplier-accelerator mechanism, the direct negative effects of aid would be offset by the indirect positive effects and, thus, the net effects of aid on growth could theoretically even turn out positive. In addition

to the indirect positive effects of aid-induced consumption on output growth, it should be also noted that aid money spent on certain human capital augmenting consumption items, such as nutrition, education, and healthcare increases labor productivity and eventually leads to higher economic growth. In a study of a number of developing economies, Maddison (1970) found that improvements in education and healthcare account for nearly 20 percent of the increases of the effective labor force, which in turn accounts for almost 35 percent of output growth. Therefore, it appears that aid-induced consumption can substantially contribute to economic growth, or at least abate the detrimental direct effects of aid on growth. This aid-consumption linkage should be further explored and embedded in the aid-planning framework.

In light of the results that foreign aid exert overall unfavorable effects on GDP growth in Bangladesh, it may be wise to reflect on the view taken by Bauer (1972) that aid is neither a necessary nor a sufficient condition for economic development. If it were a necessary condition then the presently developed countries could not have achieved economic development without the assistance of any foreign aid. Moreover, there is no historical evidence that capital imports performed any significant role in the development of the currently prosperous nations. Although aid increases domestic resources available for consumption and investment, it does not necessarily follow that aid leads to economic growth. To achieve that goal, aid would have to positively affect the primary determinants of growth -- native economic aptitudes, political arrangements, social institutions, etc., and there is no evidence that the aid regime has been able to accomplish that in any recipient country to any significant extent. Therefore, instead of relying on external resources, the policymakers should perhaps ponder turning to their domestic resources. If the domestically generated resources are deployed in the process of economic development, then the factors required for their effective utilization, such as personal skills and aptitudes, socio-economic institutions, etc., would also be encouraged to flourish simultaneously.

Although the observations in the preceding paragraph may appear somewhat of a digression, yet they are necessary in order to get a better insight into the long term development prospects of Bangladesh. If the aid regime has failed in its mission to promote economic development in the recipient economies, and there exists a great many number of empirical studies that support the contention, it is high time that the

policymakers chart alternative development strategies based on their domestic resources, a course that holds much at stake not only for Bangladesh but also for the LDCs in general.

Endnotes

¹ Detailed discussions of both the traditional and the radical views can be found in Quazi (1999).

² Lee et al (1986) developed a similar model to estimate the macroeconomic effects of aid for a group of 10 Asian countries, while Ahmed (1992) employed a similar model for Bangladesh. There are, however, several differences between these and the present model. First, foreign private investment (FPI) is excluded from the present model as the FPI inflow is still very negligible in Bangladesh. Second, in order to deal with the identification problem in estimation, the ratio of incremental export earnings to GDP in the growth equation is replaced by a new variable -- volume of international trade (MX) as a percentage of GDP. Finally, since per capita income is highly correlated with natural and political shocks, the former has been dropped from the savings equation.

³ Details are available from the author.

⁴ The adjusted R^2 values are not very high, which nevertheless should not be taken as symptoms of poor goodness-of-fit for either equation. The reason is that since the 2SLS procedure replaces the actual values of the endogenous explanatory variables by their fitted values, the adjusted R^2 statistic becomes a questionable measure of goodness-of-fit for the estimated equation and may even turn out negative (Maddala 1988). Among the two other similar studies to have used the 2SLS estimation procedure, Ahmed (1992) reports even lower adjusted R^2 values of 0.24 and 0.30 for the growth and savings equations, respectively, while Ahmad (1990) does not even bother to report them. The estimated *D-W statistics* show that the null hypothesis of no autocorrelation can not be rejected for either equation at the usual levels of significance.

⁵ There exists a substantial literature comprising the radical anti-aid view, which contends that instead of benefiting the recipient economy, foreign aid in fact harms it. For detailed discussions of the adverse effects of aid on the recipient economy, see Griffin (1970), Griffin and Enos (1970), Bauer (1972), Weisskoff (1972), Lappé et. al. (1980), Krauss

(1983), and Hayter and Watson (1985), among others.

⁶ Since equations (1)-(2) constitute a simultaneous system, estimation of the model with the ordinary least squares (OLS) method is inappropriate. The system was nonetheless estimated by the OLS method in order to compare between the structural coefficients from the simultaneous system and the OLS coefficients. The estimated OLS coefficient of aid on GDP growth is -0.75 and on domestic savings is -0.79, which again are consistent with the radical anti-aid view. Compared to the 2SLS reduced form coefficient, the OLS coefficient however overestimates the negative effects of aid on GDP growth.

⁷ See Griffin (1970) for a detailed discussion of the fungibility issue of aid.

⁸ Ahmed (1992) estimates that a 1 percent increase in the aid/GDP ratio in Bangladesh causes GDP to decline by 0.93 percent.

⁹ Details of the effects of political instability on capital flight from Bangladesh can be found in Quazi and Alam (2000).

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