HAS AID MADE THE GOVERNMENT OF INDONESIA LAZY?

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This paper is aimed at assessing the effects of aid on fiscal behaviour in Indonesia. There are four main findings. First, the inflow of aid is driven primarily by the need to fill the fiscal gap; that is, aid is demand driven. Second, although project aid is by definition intended for development expenditures, it results in an increase in routine expenditure as well. This suggests that project aid is fungible: it creates extra resources available to increase non-discretionary spending. Third, programme aid tends to increase routine expenditure but not development expenditure; thus, it mainly serves as budgetary support. Fourth, aid flows make the Government of Indonesia fiscally "lazy". The availability of aid is a disincentive to mobilize domestic revenue through a more efficient and effective taxation system.

I. INTRODUCTION

Foreign economic assistance is believed to have played a crucial role in Indonesia's phenomenal transformation since the early 1970s. Foreign aid to Indonesia rose steadily from about 3 per cent of GDP in 1971 and peaked at about 6.5 per cent of GDP in 1988. Since then, aid dependence has declined; the aid-to-GDP ratio stood at 2 per cent prior to the 1997 Asian financial crisis. Foreign aid financed nearly 70 per cent of total development expenditure in 1971, dropping

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to about 22 per cent of that total in 1974. It fluctuated between 20 and 30 per cent during the period 1975-1985. The contribution of foreign aid to development expenditure rose to about 78 per cent in 1988.

The issue of foreign aid effectiveness has become a concern in the wake of the 1997 crisis, which saw Indonesia's aid dependence rise again as the aid-to-GDP ratio rose to 4.5 per cent in 1999. During the period 1998-2001, over 80 per cent of development expenditure was financed through foreign aid. Thus, Indonesia's present scale of aid-dependence resembles that of late 1969 at the start of the New Order regime.[1]

However, the discussions have remained focused mainly on microeconomic aspects of management, such as coordination, fiduciary standards and absorptive capacity. Broader macroeconomic issues, such as the relationship between aid and national efforts in mobilizing domestic resources, in particular the impact of aid on government revenue and expenditure, has not received much attention from policymakers and academic researchers. Also, the discussion of aid-effectiveness has not been helped by the lack of any serious academic research. In the words of Hill (1996, p. 81),

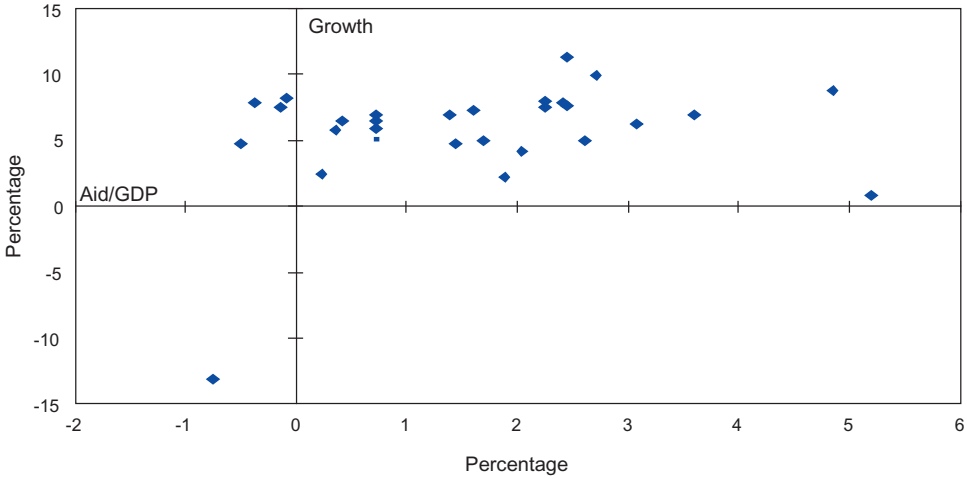
> It is surprising ... that there has been no serious academic study of one of the world's largest and most successful aid programmes over the past quarter-century, examining in detail the impact of the various aid programmes and projects, and assessing the importance of expatriate economic policy advice from the World Bank, the Harvard group, and other organizations.

The discussion of aid effectiveness is further complicated by a lack of consensus in the wider literature. Thus, this paper, seeks to fill the research gap in the Indonesian context and in the process shed light on the debate.

This study focuses on the fiscal response of aid rather than aid-growth relationships for three reasons. First, at least for the Indonesian case, there seems to be no strong correlation between aid and growth (see figure 1). Various regression models have been constructed to establish the relationship, but the results are very unsatisfactory. This raises concern about whether aid has been effective in stimulating growth.

[1] Nearly 80 per cent of the development budget of the 1969/70 fiscal year was financed through foreign aid. See Hill (1996, figure 4.3, p. 46).

Figure 1. Scatter plot: Percentage of aid and growth



Second, after more than 30 years of engagement with donors, Indonesia has not been able to reduce its dependence on foreign assistance. It is an irony that Indonesia, with a domestic savings rate of about 27 to 30 per cent of GDP, remained one of the world's most indebted countries. Because the country had to request rescheduling of its debt repayment through the Paris Club three times, a question arises: Has Indonesia fallen into a debt trap?

Third, in almost all difficult circumstances, Indonesia has had to seek foreign assistance. For example, foreign assistance played a significant role in overcoming Indonesia's difficulties in the late 1960s and early 1970s when aid financed nearly 80 per cent of development expenditure. Foreign assistance also helped to ease the difficulties faced in the mid-1980s after the collapse of oil prices. Certainly, it also cushioned against the adverse economic situation during the crisis in the late 1990s. This leads us to a hypothesis that the country has no internal mechanism to deal with adverse economic shocks. If this the case, the question is then: why?

One possible answer to the above questions is that the easy access to foreign assistance made the regime that was in power for decades lazy and it was lax in its revenue efforts. By treating aid as revenue in the government budget, the regime could hide the fiscal deficit and remain profligate. Thus, while the household sector was saving at a fantastic rate, the Government was in fact "dissaving" under the disguise of fictitiously achieved balanced budgets, made possible by high inflows of aid treated as revenue.

In light of the above, it is imperative that this paper examines the impact of aid on government expenditure and revenue. The paper is organized as follows: section II provides a brief review of the literature as a background to this study; section III describes the empirical model and section IV reflects on the close association between budget deficits and aid flows. Section V analyses the effects of aid on public expenditures and non-oil revenues. The final section draws out the implications of the findings for policy purposes.

II. AID EFFECTIVENESS: A BRIEF REVIEW OF THE LITERATURE

Extensive research has been conducted in this area for more than 30 years. Much of this research has been dominated by empirical testing of whether aid contributed to economic growth, using cross-country data.[2] The theoretical foundation for the empirical research originated from the two-gap model of Chenery and Bruno (1962) and Chenery and Strout (1966): developing countries have deficient levels of domestic savings to finance the investment necessary to achieve a desired rate of economic growth, and/or limited foreign exchange reserves needed to acquire imported capital goods. These savings and foreign exchange gaps constraint growth, but foreign aid can fill these gaps.

From the very beginning there has been no solid consensus on aid-growth relationships. The early studies of the relationship between aid and savings produced contradictory conclusions. For example, Rahman (1968), Griffin (1970) and Griffin and Enos (1970) found a negative relationship between aid and domestic savings, whereas Papanek (1972; 1973) and Kennedy and Thirlwall (1971) broadly supported the positive view of the Chenery-Bruno-Strout hypothesis. Among the more recent studies, the influential works by Mosley and others (1987; 1991) and Boone (1994; 1996) found that aid had an insignificant effect on growth.[3] On the other hand, based on a study of 31 sub-Saharan African countries, Hadjimichael and others (1995) suggested that aid significantly affected the economic growth rate of countries, as do a number of policy variables (government investment, human capital, population growth, terms of trade, real effective exchange rate and

[2] See Tarp (ed.) (2000) for a comprehensive survey of aid-effectiveness literature. White (1992) is a useful critical survey of macroeconomic impact of aid. Also see Symposia in Annual World Bank Conference on Development Economics 2003, Economic Journal, vol. 114 (June, 2004), and International Review of Economics & Finance, vol. 13 (2004) for most recent and comprehensive discussions of issues pertaining to aid effectiveness and aid allocations.

[3] Boone's results are described as "surprising" by Tsikata (1998) and his approach is criticised by Hansen and Tarp (2000).

the budget deficit). Similarly, Durbarry and others (1998), drawing on a larger sample of 58 countries from 1970 to 1993, provided robust evidence that greater foreign aid inflows have had a beneficial impact on growth, as again do several policy/economic variables (domestic savings, private net inflows, terms of trade, inflation and the budget deficit).

The much-cited Burnside-Dollar study (1997) concluded that aid works only in countries with "right" policies in place.[4] Right policies are defined as those that produce low inflation, small budget deficits, openness to trade, strong rule of law and a competent bureaucracy. The Burnside-Dollar study generated much interest and influenced policymakers both at the multilateral and bilateral levels. However, critics claim that the methodology of the Burnside-Dollar study is seriously flawed, and Easterly and others (2003) expressed alarm at the influence of the Burnside-Dollar study at the policy level.

The main deficiency of the aid-growth studies is that they ignore a simple fact: that aid is primarily channelled through the budget of the recipient countries (McGillivray, 2000; 2002). Thus, the ultimate impact of aid on the economy by and large will depend on how aid affects public expenditures and revenues. If aid is directed mostly towards financing public investment rather than consumption and it does not substitute tax revenues, then aid-growth co-movement may be clearly observed. Some recent works have focused on this strand of reasoning. Following the seminal work of Heller (1975), Mosley and others (1987), Gang and Khan (1991; 1999) and Franco-Rodriguez (2000) modelled the interaction between aid flows and various categories of public expenditures and revenues.[5] Others such as Swaroop and others (2000) and Feyzioglu and others (1998) used the framework of McGuire (1978), and focused on the fungibility issue, that is, whether aid is directed towards its intended purposes. These studies reveal that the impacts of aid on fiscal behaviour vary across countries. In some, aid did not lead to a reduction in revenue-raising efforts and aid was not diverted to unproductive uses. However, studies also found that aid was diverted away from its intended purpose. Some

[4] Both Boone and Burnside-Dollar studies were reviewed in The Economist. Boone's findings were summarised in one short sentence – aid is 'Down the Rathole' (The Economist, December 10, 1994). Findings of Burnside-Dollar were reviewed under the title, "Making Aid Work" (The Economist, November 14, 1998). Aid will only work if it is spent on right countries with low inflation, small budget deficits, openness to trade, strong rule of law and a competent bureaucracy. The Burnside-Dollar (BD) study generated much interests and influenced policymakers both at the multilateral and bilateral levels. However, the critics claim that the methodology of the BD study is seriously flawed, and Easterly et al (2003) expressed alarms at the influence of the BD study at the policy level. Easterly (2003) expressed doubt about the soundness of policy contingent lending.

[5] See also Khan and Hoshino (1992), McGillivray and Morrissey (2000; 2001) and White (1994).

studies found that aid had a positive impact on public investment but a negative impact on tax efforts; others found very small impacts of aid on public-sector fiscal behaviour.

The only academic study of the aid-fiscal behaviour relationship in Indonesia is by Pack and Pack (1990). This study used a McGuire type model of aid fungibility, and found that foreign aid between 1966 and 1986 did not displace development expenditure; instead, aid stimulated total public expenditure. They further found that most categorical aid was spent on the purposes intended by the donors. More importantly, their findings revealed that aid did not lead to a reduction in domestic revenue. Thus, this study provided an overall positive assessment of foreign aid. However, the findings are a bit odd given the continued rise in the aid-to-GDP ratio during this period.

III. EMPIRICAL MODEL

The empirical model of public-sector fiscal response to aid used in the study follows the model advanced by Franco-Rodriguez and others (1998) and McGillivray (2002). The main difference is that the response is established within a vector autoregression framework, enabling us to capture fully the dynamics of aid-fiscal inter-relationships. The model is outlined as follows and technical aspects are provided in the annex.

For the purpose of this study, the vector autoregression consists of a vector of five variables, each of which is a function of its own lags plus a vector of error term. The five variables are: project and programme aid, non-oil tax revenue and development and routine expenditure. Thus, in our case the vector autoregression consists of a system of five equations and each equation corresponds to a particular variable.

Generally speaking, we have five dependent variables in the system, which will be regressed to the lags of all variables. Hence, we have the same explanatory variables for all equations. In doing this, we treat aid and fiscal behaviour as interdependent. An adverse shock on the fiscal side will have follow-up impacts on aid. For example, a fall in domestic revenue may generate the need to increase aid inflows. In exchange, there should be feedback effects from the aid: the availability of the aid may reduce the need to adjust the budget both from the revenue and the expenditure sides. Thus, rather than a uni-directional relationship, aid and fiscal behaviour interact in a dynamic manner.

The above representation is slightly different from the original model of McGillivray (2002). In his model, the variables are separated into target (planned) and actual (realization) where, in a reduced equation format, it turns out that a particular realization is a function of all target variables. This is problematic, especially when target data are not available. McGillivray, in fact, estimates the target as a function of past realization. In effect, current realization is indirectly a function of past realization. This is a relatively perfect case of a vector autoregression model. Thus, rather than going into a cumbersome methodology, it is more convenient to use directly the vector autoregression as an empirical model.

Moreover, with a vector autoregression representation it becomes easy to assess the effect of a particular shock on all variables by using the so-called impulse response analysis. That analysis traces the effect on the system of an exogenous shock to one of the variables in the model. The effect of any unexpected shock to the system can be traced through deviations of the shocked time-paths from the expected time-path given by the model. This technique is quite useful in certain types of policy and sensitivity analyses. The procedure to obtain an impulse response function from a vector autoregression can be outlined as follows.

Technically speaking, an impulse response analysis is a moving average representation of a vector autoregression system; that is, the current value of a variable is a function of the value of all variables in the past, from the beginning of time until the previous period. Thus, one can express a recursive law of motion of all variables once the coefficients and error term are obtained from the regression on the vector autoregression system.

The regression coefficients from the vector autoregression are used as the basis for calculating the impacts of a shock to a variable on all variables in the next periods. For instance, given a one-unit shock to project aid, we can calculate the impacts on all five variables (including project aid) in the period t+0, t+1, t+2 and so forth. Of course, the coefficients will determine the scale and time-path of the impact. One should keep in mind that the impact should be stable, i.e. converge to a certain value.

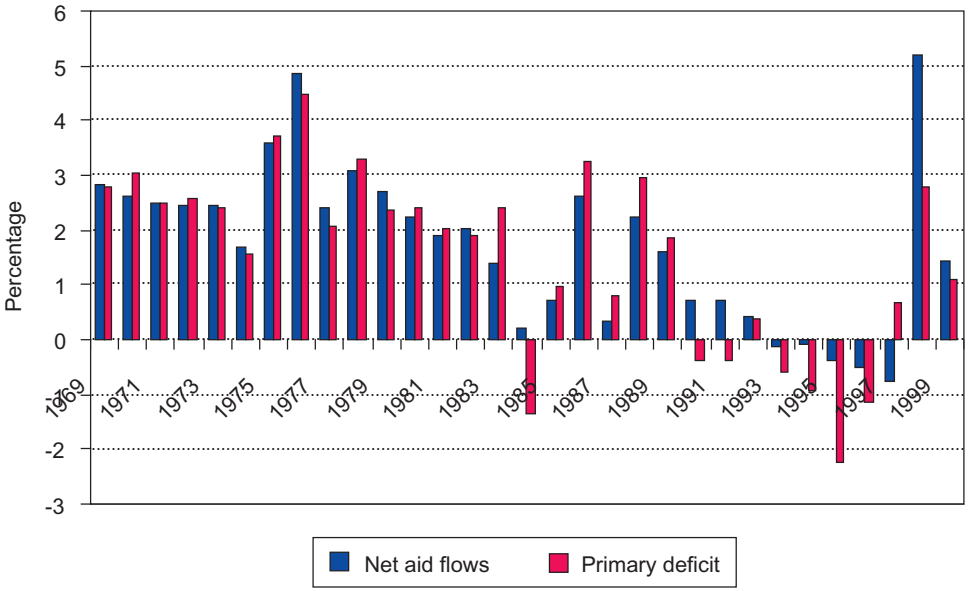
The other aspect is that we need to define the size of the shock. In order to make it comparable across variables, we need to compute their relative contribution to the variation of the system. The overall variation of the system depends on the distribution of the error term in each equation, i.e. the deviation of the observed value from the estimated or predicted value. Such deviation is usually measured in terms of the standard deviation. Thus, the shock is usually set to be equal to one standard deviation. This can be obtained easily from the variance-covariance matrix of the error term.

By applying the above procedures we can assess fiscal effects of aid. Note that, in McGillivray's model, fiscal responses are captured by analysing the coefficients of the aid variables in the fiscal equations. This technique does not allow for intertemporal dynamic effects; in contrast, impulse response analysis stresses the dynamics.

IV. AID AND BUDGET DEFICITS

Perhaps the very reason for obtaining foreign loans is to fill the fiscal gap. As can be seen from figure 2, aid flows almost mirror the size of government budget deficits. The fact that there is a strong correlation between aid flows and budget deficits opens up two possibilities.

Figure 2. Net aid flows and primary budget deficits as a percentage of GDP



Note: Deficit (+); surplus (-).

First, aid may be demand driven; that is, the Government intentionally creates a deficit for various reasons and then seeks to fill the deficit, using aid. Second, aid can be supply driven and therefore induce a deficit. The latter case represents the interests of donors more than those of the debtors.[6]

In order to assess whether net aid inflow to Indonesia was driven by the necessity to fill the fiscal gap, the "Granger causality test" is employed. The test suggests that budget deficits cause net aid flows, which indicates that the size of the deficits determine the size of the net aid inflows (see table 1). In other words, the Government planned the deficit in the first place, and then negotiated with creditors to fill the intended deficit.

Table 1. Results of causality test

Causality		*Test statistics*	*Prob (df = 5, sl = 0.05)*
From	*To*		
Net aid flows	Budget deficit	5.441	0.367
Budget deficit	Net aid flows	11.735	0.047

We also use the causality test to assess whether there was a reverse causality between fiscal deficits and aid flows. The test shows that net aid flows did not cause fiscal deficits, and therefore there was no strong evidence that aid was supply driven. However, this does not mean that creditors has no interest in directing aid to certain activities that meet their objectives in providing loans. Rather, it says that aid is made available upon demand (request) by the Government of Indonesia.

These findings suggest that it is up to the Government of Indonesia to create or close the fiscal gap. Over the period of analysis, the fiscal policy stance of the Government was mainly expansionary and only on a few occasions during the first half of the 1990s did the Government create fiscal surpluses. The creation of deficit was probably motivated by the need to stimulate the economy by means of increasing public expenditure. The increase in public expenditure was very difficult to match with tax revenue in a situation where the domestic taxation regime was very rudimentary. There was no serious attempt to overhaul the complicated

[6] Easterly (2003) has argued that donors are judged by the amount of money spent and hence are driven by the desire to "move money". According to him, Judith Tendler's observation as far back in 1975 that "A donor organization's sense of mission ... relates not necessarily to economic development but to the commitment of resources, the moving of money..." remains valid even today.

tax administrative structures, some inherited from the colonial era, or to ensure tax compliance. The collection process was inefficient and corrupt. Only a significant decline in oil revenue provided the initial stimulus for tax reforms in 1984 and a decade of continuing low oil prices ensured that these reforms were actually implemented seriously.[7] A series of tax reforms, first implemented in the period 1984-1985, attempted to produce a more efficient and buoyant tax system. The results of these reforms were impressive. In 1984, non-oil development revenue contributed to about 30 per cent of total government revenue. In 1996, just before the crisis, the share increased to 68 per cent.

With this improvement, why did the Government continuously rely on aid? More puzzling, with relatively high domestic savings, why was foreign financing found to be more attractive than domestic borrowing?

There were five reasons for this situation. First, financing the deficit through the commercial domestic market may be difficult when the market is underdeveloped. Before the crisis, the size of the market was only about 6 trillion rupiahs.[8] Second, obtaining concessionary loans from bilateral and multilateral donors could reduce financial costs. Government projects are typically less commercially oriented than those of the private sector, and therefore it is more reasonable to seek funds with the actual cost below the market rate. Besides, the financial terms from non-commercial sources is generally favourable, with lower interest rates and longer repayment periods. For instance, in 1999, the average interest rate of official creditors was only about 3.8 per cent per annum, with the average maturity being about 16.7 years and a grace period of about 5.2 years, and the grant element of the total aid was about 38.1 per cent (see table 2).[9]

Third, even if the domestic bond market is relatively sizeable, aid financing is still more attractive when the Government wants to avoid the crowding out effects of budget deficits. Deficits can directly reduce private investment through increases in domestic interest rates. However, the adverse impact of aid financing

[7] Hill (1996) and Gillis (1985)

[8] After the crisis, although the Government has issued bonds amounted to IDR 660 trillion as a result of bank bailout, only IDR 35 trillion is actively traded in the market. Hence, it would be difficult for the Government to "recycle" the bonds. Thus, developing domestic bond market remains the biggest challenge in the near future in order to warrant fiscal sustainability.

[9] However, these favourable financial terms has to be compensated by non-financial conditionality such as donor determined procurement, earmarking, and policy reform. Thus, effectively the Government may lose its policy independence.

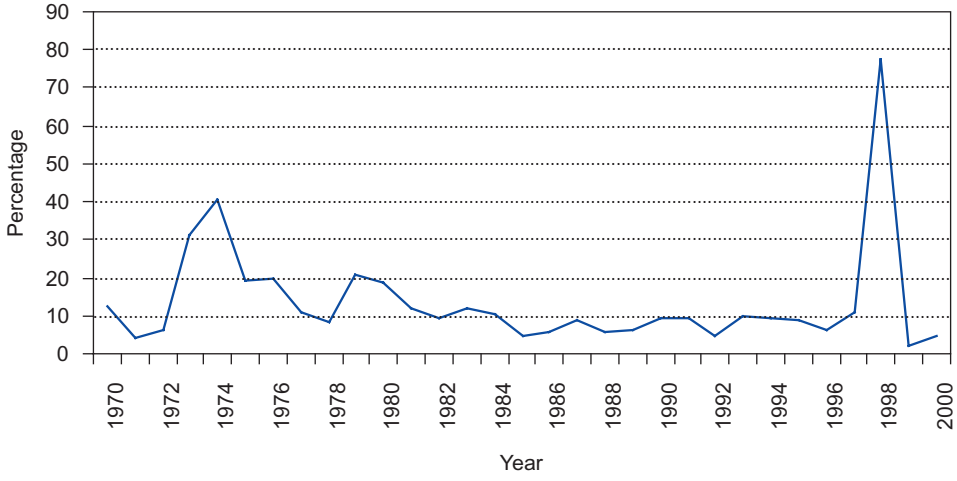
Table 2. Average terms of aid

	1970	*1980*	*1990*	*1995*	*1997*	*1999*
Interest (%)	2.4	5.4	5.6	5.1	6.3	3.8
Maturity (years)	35.9	25.5	23.1	21.3	19.5	16.7
Grace period (years)	9.5	7.3	6.6	5.8	4.9	5.1
Grant element (%)	62.9	36.2	32.8	33.3	22.7	38.1

on the private sector may not be fully contained when it leads to a real exchange rate appreciation.[10]

Fourth, aid can also avoid the inflationary financing of budget deficits by means of "printing money". This was indeed the main success story of aid and technical assistance to Indonesia in the late 1960s and 1970s. The runaway inflation during the period 1973-1974 and again after the crisis started in the late 1990s was successfully scraped in just a few years (see figure 3).[11]

Figure 3. Inflation in Indonesia



[10] Gray and Woo (2000).

[11] The same was the case with the hyperinflation of the mid-1960s.

Fifth, in a crisis situation, aid could play a more significant role in preserving fiscal sustainability and sustaining growth. With the economy entering a downturn, tax revenue falls. In such circumstances, the need to stimulate growth can be facilitated by creating an aid-financed fiscal deficit. By doing so, cuts in public expenditure, which tend to propagate the crisis, can be avoided.

Because the aid was by and large found to be demand driven, there is a need to assess whether it was used effectively, or whether it was directed towards productive activities that could stimulate growth and increase the capacity to repay the debt at the same time. The following section discusses the fiscal response to aid.

V. FISCAL RESPONSE

Effects on government spending

In order to assess the impacts of net aid flows on government spending, an impulse response function analysis is employed. Aid is classified into two categories, project and programme aid, and each category should have different impacts on different types of government expenditure. Project aid is usually directed towards financing development expenditure; therefore, it can be expected that an increase in the disbursement of project aid will tend to induce a higher level of development expenditure. The impact of project aid on routine expenditure will depend on whether it is fungible or not. If it is not fungible, routine expenditure should not increase. On the other hand, it is natural to expect that programme aid is fungible. Programme aid is typically used in hard times, mainly to maintain essential social and routine expenditure. In other words, programme aid comes as budget supports.

The results of impulse response analysis are displayed in figures 4 and 5. Two shocks are exercised: one standard deviation shock each on project and programme aid. The figures display the response of fiscal variables to the shocks. The responses are measured in terms of deviations from the expected time paths. A positive value indicates that the variable in question will increase due to a given shock. The effect can be either transitory or permanent. The effect will be transitory if the response, which can be initially either positive or negative, stabilizes at zero in the latter periods. The effect is said to be permanent if it stabilizes at a value below or above zero.

Figure 4 indicates that a one standard deviation shock on project aid will lead to increases in both development and routine expenditure, permanently. However, it has a stronger effect on routine expenditure compared with development expenditure. This means that the availability of project aid provides free resources to increase routine spending. In other words, project aid is fungible. This finding is contrary to that of Pack and Pack (1990).

Figure 4. Effects of one standard deviation shock of project aid on development and expenditures and non-oil revenue

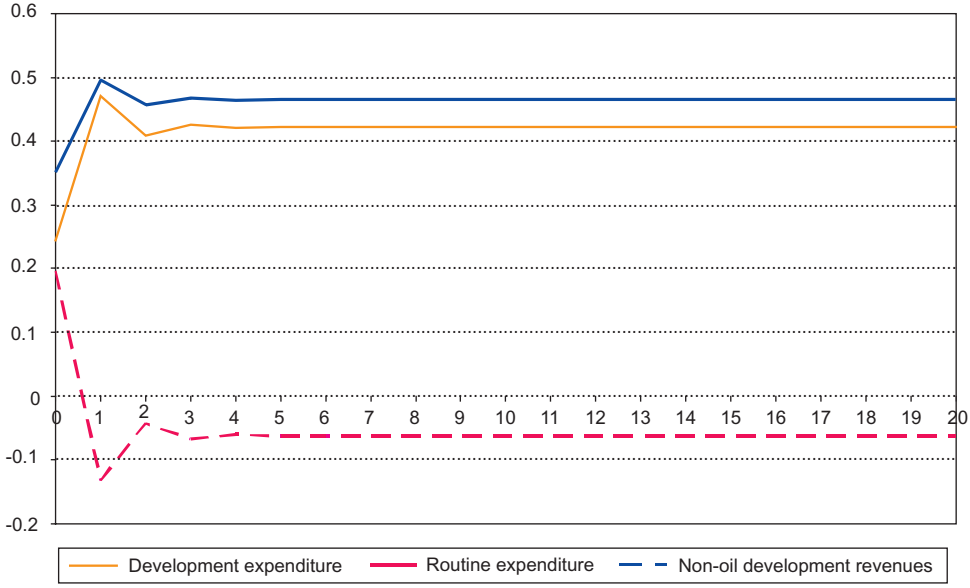
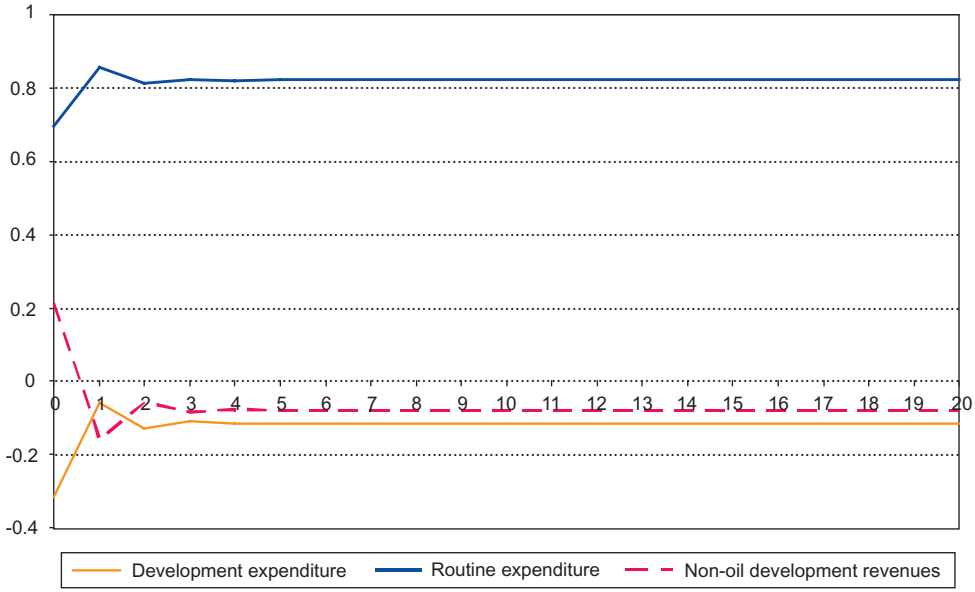


Figure 5 suggests that a one standard deviation shock on programme aid will lead to increases in routine expenditure and decreases in development expenditure. In a difficult time, it is understandable that the objective of obtaining programme aid is to preserve routine expenditure, the bulk of which is unavoidable (salaries and wages). However, the interpretation of the responses of development expenditure requires caution. The decline in development expenditure may not be due to the availability of programme aid; rather it is a necessary adjustment in a crisis situation when the programme aid begins to flow. Hence, there is a negative correlation between programme aid and development expenditure.

Figure 5. Effect of one standard deviation shock of programme aid on development and expenditures and non-oil revenue



In sum, it is found that aid is used mainly to preserve an intended level of routine expenditure, rather than development expenditure. In addition, aid is fungible: aid provides additional resources to be used for consumptive purpose. Thus, it is not so surprising that there is no strong correlation between aid flows and growth. To the extent that aid is not directed to increase spending on productive purposes or to support productive activities, on which government revenue largely depends, debt repayment may become a serious problem. The increase in the debt burden needs to be matched with increasing tax efforts. Thus, we investigate the impact of aid on the Government's revenue-raising efforts.

Effects of aid on non-oil domestic revenue

In this section, we assess the impact of the availability of project and programme loans on the Government's tax efforts. The analysis is facilitated by impulse response functions presented in figures 4 and 5. Note that the capacity of the Government to raise funds domestically is represented by non-oil development revenues. Oil revenue is excluded because the production level of oil is determined through OPEC quotas. Hence, the revenue from oil production-sharing is not related to the government, "effort" to raise tax.

As can be seen from figures 4 and 5, both programme and project aid have a small adverse impact on non-oil development revenues over the long run. Thus, it can be said that aid acquisition is not followed by improvement in the government revenue. This is a relatively surprising result, given that programme aid generally imposes structural reforms, including improvement in the taxation system. One possible explanation for this unexpected result is that tax reform has never been part of the conditionality of any structural adjustment loans from the World Bank and the IMF. In fact, the World Bank's adjustment loan of 1987 was approved entirely on the basis of reforms already implemented.[12] This favourable treatment might have had an adverse impact on fiscal behaviour; that is, the Government did not have any incentive to further reform the taxation system. From 1990 to 1996, indeed, the tax-to-non-oil GDP ratio remained stagnant at about 10.4 per cent, indicating that there was no substantial attempt to improve tax efforts. Hill (1996, p. 47) noted: "... notwithstanding the gradual decline in the importance of aid after 1988, Indonesia has not yet achieved one of its major fiscal objectives, that of reduced dependence on foreign aid". Hill (1996) concluded that oil revenues and steady flows of aid had made the Indonesian Government lazy to collect tax from non-oil sectors. Every time the Government ran into a budget deficit, the donors filled the financing gap. Thus, the Government had little incentive to increase its capacity to raise funds from domestic sources.[13]

VI. CONCLUSION AND POLICY IMPLICATIONS

This paper was aimed at assessing the effects of aid on fiscal behaviour. There are four main findings worth highlighting. First, the aid flow is generally demand driven in the sense that it is a result of a continuous lax fiscal regime. It is created by the desire to fill the fiscal gap. However, this does not suggest that aid agencies play a passive role. The fact that the Government can always obtain aid, in amounts almost equal to the deficit, suggests that the supply of aid is always made available upon request. Moreover, government agencies can also have an interest in directing aid allocated for specific purposes that meet the donors' interests.

Second, although project aid is by definition intended to finance development expenditures, it results in an increase in routine expenditure as well. This suggests that project aid is fungible: it creates extra resources available to

[12] Mosley *et al* (1991)

[13] It took a crisis to change this. After a slight fall in 1998-2000, the tax ratio increased to 12.6 per cent in 2001. By the end of 2004, the ratio is expected to become just about 15 per cent.

increase non-discretionary spending. Thus, the effectiveness of project aid in stimulating growth through an increase in public investment is jeopardized.

Third, programme aid tends to increase routine expenditure but not development expenditure. Thus, this type of aid serves only as a buffer to maintain a certain level of routine expenditure. In times of economic hardship, fiscal revenue usually declines and thus the dependence on aid revenue increases. This also suggests that the economy has no internal mechanism on the fiscal side to deal with economic downturns. Persistent budget deficits over a long period before a crisis makes no fiscal resources available to exercise a "fine tune" policy mix.

Fourth, aid flows make the Government fiscally "lazy". The availability of aid is a disincentive to expand domestic revenue through a more efficient and effective taxation system. In five years leading to the Asian financial crisis of 1997, the tax ratio remained constant at about 10.4 per cent despite the fact that that period was characterized by an economic boom, which is favourable for increasing tax efforts.

Our findings suggest that the Government of Indonesia has to reduce its dependence on aid. In the longer term, the objective of the Government should not be just filling the fiscal gap, but actually to create fiscal discipline. Closing the fiscal gap can be attained by increasing government revenues and improving expenditure management. However, the dilemma is that the arithmetic of closing the fiscal gap, that is, increasing tax and lowering expenditures, is not very simple. Public investment may be very crucial for sustaining growth, and increasing taxes may not be an easy task. Thus, where public expenditure cannot be cut, taxation cannot be simply increased, as doing so requires an overhaul of the taxation system. Such an overhaul may take time to be fully effective. At the same time, both the widening of the tax base and the cutting of public expenditure face strong political resistance. Therefore, over the short run, the Government may still have to rely on aid inflows to finance public investment and on rescheduling debts and debt forgiveness in order to lower the debt burden. Hence, the donors and the Government will have to cooperate in a constructive manner in the foreseeable future.

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ANNEX

TECHNICAL NOTES

In a vector autoregression representation, the interrelationships between aid and fiscal behaviour can be specified as follows:

$$\mathbf{Z}_t = \sum_{i=1}^{p} \Pi_i \mathbf{Z}_{t-i} + \varepsilon_t \qquad (1)$$

where $\mathbf{Z}_t$ is a vector of aid and fiscal variables and ε_t is a Gaussian error term. Aid is disaggregated into two components: project and programme aid. Fiscal variables include non-oil tax revenue, development and routine expenditures. Thus $\mathbf{Z}_t$ is a vector of five variables.

Assuming that Π is not a full-rank matrix, the solution of (1) involves common stochastic trends, and is given by the following formula:

$$Z_t = Z_0 + C(1)S_t + C^*(L)(h_t - h_0) \qquad (2)$$

where $h_t = \Psi W_t + u_t$

$$S_t = \sum_{i=1}^{t} u_i, \quad t = 1, 2, 3, ...$$

$$C(L) = C(1) + (1 - L)\, C^*(L)$$

$$C^*(L) = \sum_{i=0}^{\infty} C_i^* L^i$$

Note that L is the one period lag operator and C_i^* matrices are obtained recursively from the following formula:

$$C_i^* = C_{i-1}^* \Phi_1 + ... + C_{i-p}^* \Phi_p \qquad (3)$$

for i = 1, 2,...., with $C_0^* = I - C(1)$, and $C_i^* = 0$ for $i<0$. Matrix C(1) can be obtained directly such that:

$$C(1)\Pi = 0 = \Pi C(1) \qquad (4)$$

The matrices, Φ_i can be obtained from coefficient matrices such that:

$$\Phi_1 = I - \Pi + \Gamma_1$$

$$\Phi_i = \Gamma_i - \Gamma_{i-1}, \quad i = 1, 2, ..., p-1$$

$$\Phi_p = \Gamma_{p-1}$$

Let $A_i = C(1) + C_i^*$, and A_i can be obtained recursively as:

$$A_i = A_{i-1}\Phi_i + \ldots\ldots + A_{i-p}\Phi_p, \quad \text{for } i = 1, 2,\ldots. \qquad (5)$$

where $A_0 = \mathrm{I}$, $\lim_{i\to\infty} A_i = C(1)$, and $A_i = 0$ for $i<0$.

Let Σ be the covariance matrix of the innovation, ε_t, and σ_{ij} be the component of the matrix. For a shock in variable i, it is necessary to define the size of the shock and an 1Xm matrix, $e_i = (0,\ldots,1\ldots,0)$ where the i-th component of the matrix is set to 1, while other components are set to zero. The size of the shock is usually set such that $\delta_i = \sqrt{\sigma_{ii}}$. The corresponding generalized impulse responses at time T+N are given by the following formula:

$$GI_i\,(\beta_j^{'} Z_t, N) = \frac{\beta_j^{'} A_N \Sigma e_i}{\sqrt{\sigma_{ii}}} \qquad (6)$$

where $i = 1, 2,\ldots. m$; $j = 1, 2,\ldots., r$ and N = 1, 2,....

The above impulse-response function may be used to assess the fiscal effects of aid. The pattern and size of the impulse will tell us about the direction and significance of the impacts.