

Japanese Foreign Aid, Development Expenditures and Taxation in Malaysia: Econometric Results from a Bounded Rationality Model of Fiscal Behavior

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Abstract:

How does Japanese aid influence the allocation of government expenditures and the raising of government revenues in the recipient country? Using a non-linear model with an asymmetric loss function the case of Japanese aid to Malaysia is examined at the macroeconomic level. It turns out that Japanese aid led to proportionately more development expenditures than did other aid. It also might have been positively related to an increased effort by the Malaysian government to raise taxes. Economic explanations based on a set of bounded rationality models are advanced. Econometric and institutional explanations are also offered. The three sets of explanations can be seen as overlapping and complementary in this case.

Key Words: Japanese aid, Non-linear Models, Development Expenditures, Non-Development Expenditures, Bounded Rationality, Asymmetric Loss, Malaysian Policy Makers.

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Malaysia is included among the eight HPAE's (the high performing Asian economies) by the World Bank (World Bank, 1993).¹ Since 1960 these economies have "grown more than twice as fast as the rest of East Asia, roughly three times as fast as Latin America and twenty five times faster than Sub-Saharan Africa" (World Bank, 1993, p.2). All of them are among the top twenty countries in the world in terms of change in GDP per capita between 1960 and 1985 (Summers and Heston, 1988). In case of Malaysia this remarkable growth has also been accompanied by a modest decline in income inequality as measured by the Gini co-efficient. Although the financial crisis of 1997 affected Malaysia adversely, the basic strategy of economic development did not change dramatically.

Investment in non-human and human capital has been a significant factor in Malaysian growth. Both internal and external sources of finance have been used in promoting investments as well as development expenditures in general. According to the World Bank even as recently as during the period 1986-1991 only 58.8% of the financing of Non-financial corporations was internal. Much of the external finance even in the private sector come from abroad. The government also undertook public investment -- much of it in providing infrastructure. Thus Malaysia was able to maintain an average investment rate of almost 30% of GDP from 1966 until 1996.

The purpose of the present paper is to address a part of the question: what is the relationship between high development expenditures and foreign aid? The total aid received is divided up into two sources: Japanese bilateral and other (bi- and multi-lateral) sources. Since Japan has been so important in providing aid to Southeast Asia its role needs to be understood better. It does not appear that a systematic econometric study has been published on the subject yet. In addition to understanding the effect of these two sources of aid on development expenditures in Malaysia, I also focus on the taxation in Malaysia. How does the presence of foreign aid affect the taxation efforts of the Malaysian government?

The economic model used in order to formulate the above issues rigorously is of a bounded rationality type. Following Simon (1982), I assume that policy-making in the real world (especially in LDC's) inevitably encounters institutional bounds to full rationality. Under such circumstances, the policymakers may know their targets (e.g., development expenditures, tax revenues, etc.) only provisionally. They may wish to minimize deviations from such targets.² However, the targets themselves can not be the ones that are the solutions of an optimizing exercise. Bureaucratic behavior in the presence of uncertainty can be rational only in a bounded sense. In the model described in the next section the policymaker minimizes a loss function incorporating targets that reflect institutional limits to rational prediction.

Existing work on the impact of aid on the recipient countries is not conclusive. Heller (1975) and Khan and Hoshino (1992) did not find much difference between bilateral and multilateral sources of aid. Pack and Pack

(1990, 1993) found conflicting patterns of fungibility in the two cases they studied. One of them, Indonesia, actually seemed from their econometric work to be a country where, overall, aid was going to development. However, they did not look at the effect of Japanese aid *per se*. Since there is no available econometric study on the impact of Japanese foreign aid on Malaysia at all, we are on virgin territory here. Thus, I hope to break some new ground by using a bounded rationality model and deriving econometric estimates from such a model for Malaysia. Although not expected to be definitive, my results can throw some light on the behavior of Malaysian policymakers with respect to both Japanese and other foreign aid.

II. An Example

Since the model below is somewhat complicated it seems best to motivate the discussion by using a hypothetical example. The example is constructed in two stages.

A. Suppose a country receives one million dollars in foreign aid. For the moment we do not question the source of aid. All we are concerned about is how this aid is to be spent by the government which receives it.

It might seem straightforward from the official budgetary documents in many LDC's that aid is spent for what economists call development expenditures -- for roads, education, health and, in some cases, plant and equipment. However, many studies have questioned this assumption. The type of policymaker becomes important. A developmentalist policymaker may allocate most of the \$1 million received, allowance being made for institutional rigidities, uncertainty and some human errors. However, what if the government is merely interested in bureaucratic expenditures? How much of the money will end up in the development budget?

These questions point to the need for distinguishing between developmental and statist policymakers. If we think about aid as a contribution to revenue in the budget there is in this case an increase of \$1 million in revenue. A fiscally conservative policymaker will not necessarily treat this as a windfall. On the other hand, a fiscally liberal (some might say irresponsible) policymaker may see this \$1 million as net gain on the revenue side. In this case domestic revenue raising efforts will be affected negatively.

B. We now introduce a further complication. Aid may be given by bilateral or multilateral donors. In the first case, it may be another government, for instance, Japan. In the latter case, international organizations or a consortium of donors may be involved. The question to ask now is: given the type of policymaker, does the source of aid make any difference? How might public expenditures and revenues be affected?

One answer, of course, is that there is no difference. In this example, let us say that \$750,000 went to the development expenditures in A

above. It might turn out that regardless of the source this is what happens in step B also. However, this is not the only possibility. Roughly speaking there are two other broad possibilities. Either bilateral aid leads to more development expenditures then does the multilateral aid or vice versa.

It is apparent now that we need a model that can distinguish both between types of policymakers and types of donors. We also need to do this in an institutional setting which is not too unrealistic. Hence, the assumption of bounded rationality.

III. The Model

The following model is a variation of the model introduced by Gang and Khan (1989, 1994, 1999) and Khan(1997). The model describes how foreign aid influences the recipient's expenditure and revenue-raising behavior in a bounded-rationality setting. In meeting preassigned values of indicator levels of expenditures and receipts the decision-makers respond in a predictable manner to any flows of aid from abroad.

It is important to use an explicitly asymmetric loss function because policymakers may weigh the overshooting and the undershooting of these indicator levels differently. For some policymakers the under-achievement of some indicators may be more significant than overshooting. For others the opposite may be the case.

Following Gang and Khan (1989, 1994,1999) I consider the decision-making process of boundedly rational policymakers who consider *ex ante* in their budgetary planning certain indicators of the "proper" level of (planned) expenditures and revenues. Although these levels are treated as targets *ex ante* the assumption of an asymmetric loss function implies that these are not the utility maximizing values. In fact, the policymakers possess a loss function in which they try to minimize upward and downward deviations which are weighted differently. The indicator levels from which such deviations are measured can be thought of as outcomes of bureaucratic negotiations within the state and between the recipient and the donors.

By this theoretical and modelling strategy it is possible to estimate the marginal impact of aid on budgetary expenditure and revenue categories. Earlier works such as Heller (1975), Mosley, Hudson and Horrell (1989), Gang and Khan (1991), and Khan and Hoshino (1992) employed linear-quadratic or quadratic representations of the objective function. In this paper I follow the recent work by Gang and Khan (1994,1999) by using an objective function with higher degrees of both non-linearity and asymmetry.

The model takes into account the potential effect of aid on development and non-development expenditures. The former type of expenditures include the public sector's contribution to capital formation. Human as well as non-human capital are included. A third component of development expenditures is the government's contribution to **social** and **economic** services, e.g. expenditure on health and general welfare. Non-development expenditures are the expenditures on state administration. These two types of government expenditures are financed by internal and external means. Domestic revenues include taxes, public enterprise surpluses and borrowing. External assistance comes in the form of Japanese bilateral and other aid.

Much of the literature on the macroeconomic effects of foreign assistance focuses on aid's effect on economic growth. Our modeling approach is to analyze the impact of aid on public sector variables. Since aid funds pass

through policymaker's hand prior to reaching their destination, understanding where these funds are allocated by policymakers is a prerequisite to understanding the long-term effects of aid. The distinction made here is between current development and current non-development expenditures. As a rule the former will contribute to the long run health of the economy while the latter will not.³

The policymakers minimize a loss function subject to expenditure constraints. In most general terms, the (quadratic-ratio) loss function, L , is given by

$$\alpha_0 + \sum_i (\alpha_i/2) (i^j/i^k)^\beta,$$

if $j = *$, then $i^k = i$,
if $k = *$, then $i^j = i$,
 $i = R, D, N$,
 $\beta \geq 2$.

(1)

"j" and "k" are related in the following way: if j (respectively k) represents the indicator value (symbolized by *) then i^k (respectively, i^j) equals i. "i" and "j" can be R, D, or N (domestic revenues, development expenditures and nondevelopment expenditures, respectively). The simplest non-linear model which is also asymmetric and economically meaningful, is obtained when $\beta = 2$. Note that for exact fulfillment of chosen indicator levels, $L = \alpha_0 + (\alpha_R/2) + (\alpha_D/2) + (\alpha_N/2)$. The policymaker is making decisions on various categories of public expenditures. Each decision will reflect on her abilities, possibly her status, or even her job. In an uncertain environment, the best she can do is to reach the stated chosen indicator value.

The loss function stated in equation (1) has the advantage of allowing for asymmetries in loss when the policymaker over- or undershoots the chosen indicator level. It also allows us to examine different assumptions about the "type" of the policymaker. For example, writing the loss function explicitly as

$$\alpha_0 + (\alpha_D/2)(D^*/D)^2 + (\alpha_N/2)(N/N^*)^2 + (\alpha_R/2)(R/R^*)^2,$$

illustrates a policymaker who is "developmentalist" in orientation: undershooting the development expenditure indicator value is worse than overshooting it. At the same time, the above policymaker is a "fiscal liberal" since overshooting the revenue raising indicator value is worse than undershooting. Such policymakers are not very anxious about the emergence of the inflationary gap. These bureaucrats are also "non-statist" in that overshooting nondevelopment expenditures is worse than undershooting. Statist bureaucrats who seek to maximize the resources which the state uses to reproduce itself would have loss functions that are asymmetric in exactly the opposite direction with regard to the composition of public expenditure. All in all, there are eight possible characterizations. These are summarized in Table 1. Part of our problem is to explore which of these characterizations captures the behavior of policymakers "best" in an empirical setting.

Given the type of policymaker, the decision making problem can be described as the minimization of a specific form of equation (1). The economic and institutional constraint to which this minimization problem is subjected is the following:

$$N + D = R + A_B + A_m$$

The above, of course, is the accounting identity that expenditures equal receipts. To capture the flexible distribution of foreign aid and domestic revenues into budgetary categories we instead write,

$$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M, \quad (2)$$

and,

Table 1
Policymakers Alternative Preferences

Type of Policymaker	Development Expenditure	Non Development Expenditure	Domestic Revenue	Specific Loss Function
Type I: Nondevelopmental, non-statist, fiscal liberal	Overshooting worse than undershooting	overshooting worse than undershooting	overshooting worse than undershooting	$\alpha_0 + (\alpha_D/2)(D/D^*)^2$ $+ (\alpha_N/2)(N/N^*)^2 +$ $(\alpha_R/2)(R/R^*)^2$
Type II: Nondevelopmental, non-statist, fiscal conservative	Overshooting worse than undershooting	overshooting worse than undershooting	undershooting worse than overshooting	$\alpha_0 + (\alpha_D/2)(D/D^*)^2$ $+ (\alpha_N/2)(N/N^*)^2 +$ $(\alpha_R/2)(R^*/R)^2$
Type III: Nondevelopmental, statist, fiscal liberal	overshooting worse than undershooting	undershooting worse than overshooting	overshooting worse than undershooting	$\alpha_0 + (\alpha_D/2)(D/D^*)^2$ $+ (\alpha_N/2)(N^*/N)^2 +$ $(\alpha_R/2)(R/R^*)^2$
Type IV: Nondevelopmental, statist, fiscal conservative	overshooting worse than undershooting	undershooting worse than overshooting	undershooting worse than overshooting	$\alpha_0 + (\alpha_D/2)(D/D^*)^2$ $+ (\alpha_N/2)(N/N^*)^2 +$ $(\alpha_R/2)(R^*/R)^2$
Type V: Developmental, non-statist, fiscal liberal	undershooting worse than overshooting	overshooting worse than undershooting	overshooting worse than undershooting	$\alpha_0 + (\alpha_D/2)(D^*/D)^2$ $+ (\alpha_N/2)(N/N^*)^2 +$ $(\alpha_R/2)(R/R^*)^2$
Type VI: Developmental, non-statist, fiscal conservative	undershooting worse than overshooting	overshooting worse than undershooting	undershooting worse than overshooting	$\alpha_0 + (\alpha_D/2)(D^*/D)^2$ $+ (\alpha_N/2)(N/N^*)^2 +$ $(\alpha_R/2)(R^*/R)^2$
Type VII: Developmental, statist, fiscal liberal	undershooting worse than overshooting	undershooting worse than overshooting	overshooting worse than undershooting	$\alpha_0 + (\alpha_D/2)(D^*/D)^2$ $+ (\alpha_N/2)(N^*/N)^2 +$ $(\alpha_R/2)(R/R^*)^2$
Type VIII: Developmental, statist, fiscal conservative	undershooting worse than overshooting	undershooting worse than overshooting	undershooting worse than overshooting	$\alpha_0 + (\alpha_D/2)(D^*/D)^2$ $+ (\alpha_N/2)(N^*/N)^2 +$ $(\alpha_R/2)(R^*/R)^2$

$$N = \rho_R R + \rho_B A_B + \rho_M A_M. \quad (3)$$

$(1 - \rho_R)$, $(1 - \rho_B)$, and $(1 - \rho_M)$ are the fractions of domestically raised revenues, aid, Japanese bilateral aid and other aid, respectively, allocated to government development expenditures. These two constraints reflect alternative uses of government revenues augmented by foreign assistance.⁴ The first constraint allows for the possibility that D can be financed partly by domestic revenues and partly by different sources of foreign aid. The second constraint assumes that domestically raised revenues, and foreign aid not used for development purposes, go towards nondevelopment government expenditure. The model thus involves a trade-off between development and other spending by the government. It is a theoretical model of the implications of recipient preferences that can be used to determine the fiscal behavior of the government in the presence of foreign aid.

Solving the constrained loss minimization problem leads to a set of nonlinear simultaneous equations. The direction and extent of the impact of Japanese bilateral and other foreign aid on N and D can be estimated. The eight sets of estimating simultaneous systems equations appear in the table in the appendix.

IV. Data and Estimation Problems

The information for Japanese bilateral and other aid comes from OECD statistics. The budgetary allocation data for Malaysia comes from Europa World Yearbooks and from Malaysian government budgetary statistics. It should be noted that Malaysia is a multiracial society where traditionally the Chinese and the Indians were to be found in the rubber and tin industries and commerce. As Anand (1983:3) has pointed out the main reasons for the Malay community's lack of involvement in the modern industrial sector were : British colonial policy; employer discrimination; poor working conditions; and the "alleged lack of economic motivation and preference for traditional lifestyles on the part of the Malays."

With independence the New Economic Policy (NEP) sought to 'correct the economic imbalance between the races' and to 'eradicate poverty among all races.' Expansion of the modern sector and the involvement of the Malays in it were policy objectives pursued vigorously by the government. The development expenditures in budget reflect these objectives. Development expenditures on the average have exceeded 20 % of the total over the period under review. The government has run a deficit hovering near 15% during this period. The three worst years were 1981, 82 and 83. The adverse Malaysian export commodity price movements in the world market were largely responsible for these huge deficits. In the late 80's and early 90's the deficits have declined as a percentage of the total budget.

It should also be noted that Malaysia followed an expansionary fiscal policy in the late 1970's and the early 80's. There was a prominent surge in public investment during this period. As an OECD study points out (Demery and Demery, 1992: 55):

Investment in physical infrastructure was prominent during the years of expansion, taking around 60 percent of the total development budget... Expenditure on energy, communication and transportation accounted for just 35 percent of total public investment in 1979, but rose markedly to 55 percent by 1984. Investment in productive capacity accounted for around 15 percent of public investment.

With the establishment of the Heavy Industries Corporation, the government began to participate in the financing of directly productive activities through public investment. A housing boom as well as a general construction boom resulted from this ambitious public investment program.

At around this time the social sector components of public investment and education remained over MR 1.1 billion over 1981-87. By 1984 social service share in the budget, however, fell to 23 percent of the total from 28

percent in 1979. All the data have been converted to constant Malaysian dollars (Ringits) at constant 1980 purchasing power parity prices.

For the purpose of estimating and interpreting the model correctly, it is important to remember that the policymakers work with actual budgetary data and not with theoretical entities we have in the model. A translation between the two modes is necessary. Unfortunately, the Malaysian budgetary categories do not always correspond to Development and Non-development expenditures automatically. At the same time, many of the published categories such as Agriculture and Irrigation, Industry, Mining and Energy, Transportation, and Communications, Public Works and Education, Health and Family Planning can be used either directly or with slight modifications. However, there is a large "other" or residual category. After discussion with the Malaysian scholars and officials, it was decided that part of this "catch-all" category, in fact, caught some "non-development expenditures." It was estimated to be between 15% and 30%. After further discussions and checking (a very time-consuming process) with the Ministry of Finance and Central Bank of Malaysia officials an estimate of linkage to non-development expenditures was arrived at for each year between 1960 and 1993.

On the revenue side Development Funds including Project Aid can be marked off from the other items. The flow from personal and corporate income tax, excise and import tax receipts constitute the major sources of government tax revenues. The revenue collection figure has remained constant at about 30% of GDP over the last two decades (Demery and Demery, 1992; World Bank).

The econometric estimation procedure for the models in Table 2 follows a system-wide approach. The simultaneous non-linear 3 stage SURE (seemingly unrelated regression estimation procedure) method is used. The econometric package used is SHAZAM. The estimation procedure also includes correction for autocorrelation in simultaneous equations framework.

Table 2

**The Impact of Japanese and Non-Japanese Aid
to Malaysia 1960-1993
Non-linear SURE Parameter Estimates
(Standard errors in parentheses)**

MODEL	ρ_M	ρ_B	ρ_R	α_D/α_R	α_N/α_R	AIC
Type I	.7832 (.0712)	.7435 (.0011)	.7853 (.0023)	-.5131 (.0210)	-.6311 (.0312)	62.03
Type II	.8618 (.0021)	.7281 (.0891)	.8125 (.1236)	.1792 (.0235)	.6911 (.0213)	62.38
Type III	.6802 (.0851)	.6814 (.0633)	.8516 (.0491)	.5698 (.0883)	.5251 (.1101)	63.55
Type IV	.8126 (.0205)	.6932 (.0904)	.8352 (.1921)	.2173 (.1305)	.1838 (.0211)	62.01
Type V	.6062 (.0078)	.4316 (.0513)	.4123 (.0511)	-.1231 (.1502)	-.0521 (.2215)	61.82
Type VI	.5827 (.0021)	.4895 (.0281)	.4632 (.0016)	-.0391 (.0753)	-.0385 (.0982)	59.08
Type VII	.5618 (.0498)	.3392 (.0025)	.5623 (.0205)	.0615 (.0531)	.1619 (.0215)	58.08
Type VIII	.6015 (.0215)	.3892 (.0582)	.5122 (.0252)	.0881 (.2152)	.0916 (.0283)	60.91

As mentioned in the previous section the "boundedly rational" nature of the policymakers means that the chosen indicator levels of budgetary targets are not exact but are only roughly accurate. Since there is very little empirical evidence of Malaysian policymakers' actual chosen indicator levels for these targets it becomes an important problem to estimate these. The planning documents are not adequate since they are drawn up at infrequent intervals and represent longer term targets. The categorizations are also different from those required by the approach adopted here. Therefore I try to approximate the chosen indicator levels by regressing the actual (*ex post*) values on a series of instrumental variables and then forecasting the indicator values. As Sargent has recently pointed out in the context of rational expectations, the economist or the econometrician actually works in a bounded rationality sense when predicting values such as these from models such as the ones I have used.⁵

Each indicator level is estimated by specifying an equation relating the actual variable to some instruments. I then regress the actual variable on the chosen instruments (with correction for auto-correlation). Planned D is obtained by estimating an equation where D is a linear function of GDP and total gross domestic investment in the private sector together with proxies for investment in human capital. The fitted values of the dependent variable serve as indicator levels. Planned R is found in a similar manner, by regressing R on GDP and lagged imports and then using the fitted values of the dependent variable as the indicator value. Planned N is obtained by regressing N on the lagged value of itself.

V. Results and Interpretation

How has Japanese aid influenced the fiscal behavior of the Malaysian policymakers? In order to answer this question, it is important to understand how the allocation between budgetary categories can be influenced by the injection of foreign aid.

According to the theoretical approach adopted here the policymakers respond to the availability of foreign aid by reallocating money to the various budgetary categories. Although the model assumes bounded rationality, the reallocation itself is in response to additional amounts of foreign aid and is therefore in keeping with allocation at the margin. Thus comparative statics exercises can be performed legitimately. My major concern here is to examine the allocation of finance to development and non-development expenditures. An additional area of interest is the impact of aid on domestic revenue raising.

The results of the empirical exercise for Malaysian data are given in Table 2. The structural equations in the table in the appendix contain parameters ρ_R , ρ_B and ρ_M by way of constraints (2) and (3). These three parameters show the nondevelopment expenditure responses to an increase in domestic revenues, bilateral Japanese aid, and multilateral and non-Japanese bilateral aid respectively. In the table estimates for these three parameters together with some others are shown for the eight different models describing eight different policymaker types as described in Table 1. For the structural equations I refer the reader to the table in the appendix. After some general observations, I have chosen to discuss two cases in detail for illustrative purposes. Others can be interpreted following a similar approach.

Looking across the rows in Table 2, it is striking that for both developmentalist and non-developmental types of policymakers Japanese bilateral aid seems to have had a greater impact than other aid in almost every case of development expenditures. It may be recalled from Table 1 that Types I-IV are the non-developmental policymakers and Types V-VIII are the developmental ones. It is also interesting to see the difference between the two types. The co-efficient (with varying degrees of significance) ρ_B varies between .6814 and .7435 for models I-IV. That means that in the presence of Japanese aid approximately 25 to 31 percent of this aid goes to development expenditure on the margin if the policymaker is non-developmental. On the other hand, from models V-VIII, the corresponding percentage of aid going to development expenditures is between 51 and 64 percent. For models I to IV, ρ_M varies between .6802 and .8126. For models V to VIII, the range for ρ_M is between .5618 and .6062. Thus, it would be appropriate to conclude that in terms of influencing development expenditures in Malaysia for Japanese bilateral aid has been more successful than the non-Japanese aid. In addition to revealing the influence of Japanese aid, the above co-efficients also indicate that the type of the policymaker really can make a difference. The type of the policymaker also

makes a difference in terms of financing development expenditures out of domestic revenue. For a non-developmental policymaker p_R varies between .7853 and .8516. Rather dismally, this implies that between 78 and 85 percent of domestic revenues may go to non-development expenditures in the presence of aid when the policymakers are non-developmentalists. Thus, a major hypothesis of this study is verified: the more developmental the orientation of the policymaker the more foreign aid influences spending in the direction of development. It also corroborates the earlier finding that bilateral Japanese aid has performed well in general for development purposes.

What kind of policymakers did make the decisions in Malaysia regarding development? This is a particularly fascinating question, but is hard to answer in a definitive fashion. Within the context of the model, the "best guess" one can make must use a great deal of reliable institutional history. In the case of Malaysia, this is largely unavailable in English. On the whole, however, a picture of at least partial commitment to genuine development objectives emerges.⁶

It is also possible to offer some econometric evidence to corroborate the above characterization. In Table 2, the last column presents the value of the Akaike Information Criterion (AIC) for each of the eight models. AIC is a model selection criterion that can be applied to any model that can be estimated by the maximum likelihood method. One simply minimizes $(2\text{Log}L)/n + 2k/n$ where k =the number of parameters in the likelihood function L and n is the number of observations. Particularly for a non-linear model the AIC is a convenient econometric discriminator among different model specifications. It would seem that by this criterion at least type VII policymaker model may be the most appropriate one for Malaysia during the period of observation. This means that both developmental and statist concerns dominated the real fiscal agenda during this period. This too, seems to be consistent with the institutional studies and my own informal observations.

Let us consider then the type VII policymaker first. According to the typology in table 1 this is further a fiscally liberal policymaker. All the p 's are positive and significant at .05 level.⁷ In the presence of foreign aid almost 43% of the additional revenue goes to non-development expenditures. For bilateral Japanese foreign aid the percentage going to development expenditures is 66% whereas almost 44% of aid from all other sources is spent for developmental purposes. Thus, a straightforward interpretation would have been to claim the superiority of Japanese aid over other aid in this case. However, some caution is required. We do not know if the **presence** of aid pulls some money out of the domestic revenue to non-development purposes. It is reasonable to suspect that for some categories of aid (for both generally Japanese and other aid) this may be partially the case. Under these circumstances if the substitution effect is not too high (i.e. aid does not replace completely development expenditures that would have been financed out of domestic revenues) only then there is an incremental effect of aid on development expenditures. Under this scenario, Japanese bilateral aid would seem to be more effective. I show next that in case of Malaysia this may be a reasonable conclusion.

In order to do this, we need to look at the connection between aid and the revenues by looking at the ratios of the parameters from the loss function. The ratios of the parameters from the loss function (the α 's) can be readily interpreted by referring to the structural equations. In the simultaneous equations framework, given the specific objective function and constraints, the ratios of α 's (e.g. α_D/α_R or α_N/α_R) indicate how to explain the changes in domestic revenue in the presence of foreign aid. For the type VII policymaker both α_D/α_R and α_N/α_R are significantly different from zero. The interpretation of the first of these coefficients is as follows: in the presence of foreign aid any increase in development expenditures ceteris paribus reduces the domestic revenue raising effort. The quantitative magnitude is given in a non-linear fashion by the product of this coefficient and $(1-p_R)$. However, raising the target for development expenditures even with aid coming in will lead to an increase in R . The coefficient α_N/α_R also gives an estimate of (partial) impact of non-development expenditures on R . In this case an increase in non-development expenditures also leads to an increase in R . Also this magnitude is further increased by the magnitude of R^* . Thus, bureaucratic or political decision to increase R^* will lead to an increase in revenues as well. We may call the above description the aid-dependent revenue effect.

If aid-dependent revenue effect is positive, then the presence of aid actually increases domestic revenue. In the case of Malaysia for model VII type of policymaker this will be true. Let us now turn to the model which has the least AIC value among the rest; this is model VI. As can be seen from table 1 this is the developmental, non-statist and fiscally conservative type.

Looking across the row under the headings for the various parameters the contrast is indeed quite reassuring empirically as far as a comparison between the effects of Japanese bilateral and other aid is concerned. More than 53% of the domestic revenue goes towards development expenditures even in the presence of foreign aid. The coefficient is significant both statistically and economically. Out of bilateral Japanese aid, again in a statistically significant sense, more than 60% goes to development expenditures. Of the other aid receipts about 37% goes to development expenditures.

Turning now to the other coefficients α_D/α_R and α_N/α_R have absolute values of .0391 and .0385 and both are statistically significant. Looking at the revenue equation for this type of policymaker in the table in the appendix we can see that the negativity of α_D/α_R (estimated) implies that revenue increases as indicator levels of development expenditures increase although the rate of increase is quite slow. This is consistent with a developmentalist but fiscally conservative preference. Aid finances development expenditures more than domestic revenue raising efforts. In the absence of aid such expenditures may drop dramatically. Non-development expenditures also lead to an increase in revenue raising. This is consistent with a balancing the budget fiscal conservatism. It also suggests that foreign aid is only marginally diverted to non-

development expenditures when finance is needed. It is more likely that domestic revenues are increased more than proportionately to cover these non-development expenditures.

From the discussion of the two cases, it would seem that developmental, statist Malaysian policymaking environment contributed to the observed effects of Japanese aid. Whether the policymakers were fiscally conservative or liberal may not have made that much difference. What is important to note is that regardless of which one of the two models (VI or VII) we accept Japanese aid is qualitatively strongly linked with an increase in development expenditures. It also performs better in this sense than other aid quantitatively in both the models.

These results are very much at variance with the received wisdom on the effect of foreign aid on public expenditures. Japanese aid may be more effective because of the links with infrastructure investment. It may also be the case that the microlevel projects are more successfully managed through technical cooperation. Finally, it may be the case that some aid flows require matching funds (Cashel-Cordo and Craig, 1986).

V. Conclusions

Contrary to much of the aid literature, Japanese aid to Malaysia seems to have had considerable effect on development expenditures in the public sector in that country. Japanese aid also seems to have performed better than other aid regardless of the type of policymakers in Malaysia. It may also have been accompanied by some increase in revenue raising efforts on the part of the Malaysian government.

That Japanese aid is more effective than other aid is surprising but not completely counter-intuitive in the Asian context. Japan's field experience, technical cooperation and mainly infrastructure-oriented aid can go a long distance toward an adequate explanation (Khan, 1995 b; Browne, 1990). Of course, as Japanese aid becomes more diversified, this situation may change.

However, in case of Malaysia the increase in public investment can be linked directly with government policy. Mahathir's 'Look East' policy in the '80s coincided with both an increase in Japanese aid and direct investment. It should be noted that some scholars have been critical of the precise content of the new Japan-Malaysia relationship (Jomo K.S., 1994). At the same time the increased Japanese presence neatly coincided with the Malaysian government's own policies in the 1980's.

Further work disaggregating both the types of Japanese aid and the categories of expenditures will throw more light on the aid-public sector expenditures relationship. Also results from one or two countries can not be generalized readily without falling a ready prey to the fallacy of induction. Careful empirical work covering more countries will reveal in the future just how effective Japanese aid is in each case. Finally, for Malaysia itself as well as for

other countries, the welfare effects of aid need to be estimated by looking at its impact on different socio-economic groups.

APPENDIX

Table
Structural Equations

Langrangian	Estimating equations
Type I: min. $V = \alpha_0 + (\alpha_D/2)(D/D^*)^2 + (\alpha_N/2)(N/N^*)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = [-(\alpha_D/\alpha_R)(1 - \rho_R)(D/D^*)^2 - (\alpha_N/\alpha_R)\rho_R(N/N^*)^2]R^{*2}$
Type II: min. $V = \alpha_0 + (\alpha_D/2)(D/D^*)^2 + (\alpha_N/2)(N/N^*)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_3)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = \{[(\alpha_D/\alpha_R)(1 - \rho_R)(D/D^*)^2 + (\alpha_N/\alpha_R)\rho_R(N/N^*)^2][1/R^{*2}]\}^{(-1/3)}$
Type III: min. $V = \alpha_0 + (\alpha_D/2)(D/D^*)^2 + (\alpha_N/2)(N^*/N)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = [-(\alpha_D/\alpha_R)(1 - \rho_R)(D/D^*)^2 + (\alpha_N/\alpha_R)\rho_R(N^{*2}/N^{*3})]R^{*2}$
Type IV: min. $V = \alpha_0 + (\alpha_D/2)(D/D^*)^2 + (\alpha_N/2)(N^*/N)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_2 A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = \{[(\alpha_D/\alpha_R)(1 - \rho_R)(D/D^*)^2 - (\alpha_N/\alpha_R)\rho_R(N^{*2}/N^{*3})][1/R^{*2}]\}^{(-1/3)}$
Type V: min. $V = \alpha_0 + (\alpha_D/2)(D^*/D)^2 + (\alpha_N/2)(N/N^*)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = [(\alpha_D/\alpha_R)(1 - \rho_R)(D^{*2}/D^3) - (\alpha_N/\alpha_R)\rho_R(N/N^{*2})]R^{*2}$
Type VI: min. $V = \alpha_0 + (\alpha_D/2)(D^*/D)^2 + (\alpha_N/2)(N/N^*)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = \{[-(\alpha_D/\alpha_R)(1 - \rho_R)(D^{*2}/D^3) + (\alpha_N/\alpha_R)\rho_R(N/N^{*2})][1/R^{*2}]\}^{(-1/3)}$
Type VII: min. $V = \alpha_0 + (\alpha_D/2)(D^*/D)^2 + (\alpha_N/2)(N^*/N)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = [(\alpha_D/\alpha_R)(1 - \rho_R)(D^{*2}/D^3) + (\alpha_N/\alpha_R)\rho_R(N^{*2}/N^3)]R^{*2}$
Type VIII: min. $V = \alpha_0 + (\alpha_D/2)(D^*/D)^2 + (\alpha_N/2)(N^*/N)^2 + (\alpha_R/2)(R/R^*)^2 - \rho_D(D - (1 - \rho_R)R - (1 - \rho_B)A_B - (1 - \rho_M)A_M) - \rho_N(N - \rho_R R - \rho_B A_B - \rho_M A_M)$	$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M$ $N = \rho_R R + \rho_2 A_B + \rho_M A_M$ $R = \{[-(\alpha_D/\alpha_R)(1 - \rho_R)(D^{*2}/D^3) - (\alpha_N/\alpha_R)\rho_R(N^{*2}/N^{*3})][1/R^{*2}]\}^{(-1/3)}$

Bibliography

Anand, S. 1983, Inequality and Poverty in Malaysia: Measurement and Decomposition. Washington, D.C. Oxford University Press for the World Bank.

Binh, Tran-Nam and Mark McGillivray, 1993, "Foreign Aid, Taxes and Public Investment: A Comment," Journal of Development Economics 41, 173-176.

Browne, Stephen, 1990, Foreign Aid in Practice, New York: New York University Press, pp.193-95.

Cashel-Cordo, Peter and Steven G. Craig, 1992, "Donor Preferences and Recipient Fiscal Behavior: A Simultaneous Analysis of Foreign Aid Fungibility and the Flypaper Effect," Manuscript, Canisius College, Buffalo, NY 14208.

Demery, D. and L. Demery, 1992, Adjustment and Equity in Malaysia. OECD, Paris.

Europa World Yearbook (London: Europa Publications Ltd.), various years.

Gan, Wee Beng, 1988, Macroeconomic Policy, Real Exchange Rate and International Competitiveness - The Malaysian Experience during the 1980's. University of Malaya, Kuala Lumpur (photocopy)

Frey, Bruno and Friedrich Schneider, 1986, "Competing Models of International Lending Activity," Journal of Development Economics 20, 224-245.

Gang, Ira N. and Haider Ali Khan, 1989, "Modelling Foreign Aid and Development Expenditures," paper presented at AEA conference, Atlanta.

-----, 1990, "Some Determinants of Foreign Aid to India, 1960-1986," World Development 18, 431-442.

-----, 1991, "Foreign Aid, Taxes and Public Investment," Journal of Development Economics, 34, 355-369.

-----, 1993, "Reply to Tran-Nam Binh and Mark McGilliray, "Foreign Aid, Taxes and Public Investment: A Comment," Journal of Development Economics 41, 177-178.

-----, 1994, "Foreign Aid and Development Expenditures: Does the Policymaker Make Any Difference?" unpublished paper.

Geographic Distribution of Financial Flows to Developing Countries (Paris: OECD, various years).

The Government of Japan: Ministry of Foreign Affairs, 1990, Waga Kuni No Seifu Kaihatsu Enjo, Tokyo.

Heller, Peter S., 1975, "A Model of Public Fiscal Behavior in Developing Countries: Aid, Investment and Taxation," American Economic Review 65, 429-445.

Holt, C. C., 1962, "Linear Decision Rules for Economic Stabilization and Growth," Quarterly Journal of Economics 56, 20-45.

Islam, Shafiqul(ed.), 1991, Yen for Development, New York, Council on Foreign Relations Press.

Jomo, K.S. ed., 1994, Japan and Malaysian Development. Routledge, London.

Khan, Haider Ali, 1994, "Does Bilateral Foreign Aid Affect Fiscal Behavior of a Recipient?" Journal of Asian Economies.

-----, 1995a, "Does the Policy-Maker Make a Difference?" paper presented at AEA/ASSA meetings, Washington D.C., January 1995.

-----, 1995b, "Does Japan's Aid Work?" unpublished paper, University of Denver.

Khan, Haider Ali and Eiichi Hoshino, 1992, "Impact of Foreign Aid on the Fiscal Behavior of LDC Governments," World Development 20, 1481-1488.

Maizels, Alfred and Machiko K. Nissanke, 1984, "Motivations for Aid to Developing Countries," World Development 12, 879-900.

Government of Malaysia, Ministry of Finance, Annual Budget. Various years.

-----, Economic Report. Various years.

Mosley, P., J. Hudson and Sara Horrell, 1987, "Aid, the Public Sector and the Market in Less Developed Countries," Economic Journal 97, 616-41.

National Development Information Office (Indonesia), 1991, Indonesia Source Book, 1990/91 (Jakarta).

Pack, Howard and Janet Rothenberg Pack, 1990, "Is Foreign Aid Fungible: The Case of Indonesia," Economic Journal 100, 188-94.

Pack, Howard and Janet Rothenberg Pack, 1993, "Foreign Aid and the Question of Fungibility," Review of Economics and Statistics 258-265.

Sargent, T.J., 1976, "A Classical Macroeconomic Model for the United States," Journal of Political Economy 84, 207-238.

-----, 1993, Bounded Rationality in Macroeconomics (Oxford: Clarendon Press).

Schlosstein, Steven, 1991, Asia's New Little Dragons: The Dynamic Emergence of Indonesia, Thailand and Malaysia, Illinois: Contemporary Books Inc..

Sengupta, G.K., 1970, "Optimal Stabilization Policy with a Quadratic Criterion Function," Review of Economic Studies 36, 127-146.

SHAZAM User's Reference Manual Version 7.0, 1993, McGraw Hill.