Japanese Aid to South and Southeast Asia: A Comparative Analysis

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Haider A. Khan received his Ph. D. in economics from Cornell University. His fields of specialization are economic theory and international and development economics. He has published 4 books and monographs as a single author; two books as a co-author; and more than 30 articles in professional journals. He holds a permanent faculty position at the Graduate School of International Studies at the University of Denver, USA, and has held visiting positions in Tokyo University, Hitotsubashi University, Tilburg University, Liaoning University, University of Costa Rica and Cornell University. He was at the Asian Development Bank, Manila and at the Asian Development Bank Institute, Tokyo from 1997 to 1999. He will be a fellow at the Center for International Research on the Japanese Economy at the University of Tokyo in 2002.

1. Introduction:

Japan's role in overseas development assistance is quite significant. Most of the increase in Japanese aid came in late 80's.Between 1975 and 1989, the amount of ODA increased eight-fold in dollar terms. During the 1990s also Japan continued as a major donor in spite of domestic economic slowdown. For example, in 1998, Japan's total ODA was still US$ 10.731 billion approximately .In 1999, according to the OECD statistics the aid flow from Japan increased to 15.32 billion dollars---an increase of 44 percent.. At 1998 constant prices this amounted to 13.45 billion dollars---still an increase of 26.4 per cent in real terms.[1]

Much of Japanese aid has historically been directed to Asia[2]. As Yanagihara and Emig have pointed out:

> This feature reflects not only geographic proximity, but also close historical, cultural, and economic relations, as well as Tokyo's recognition of Asia as its logical sphere of responsibility in global burden-sharing.[3]

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[1] OECD(2001): http://www.oecd.org/dac/htm/agjpn.htm

[2] In 1998, Asia received US$5,372.03 millions or slightly more than 50 per cent of the total aid disbursement by Japan.See Japan's ODA, Annual Report, 1999.http://www.mofa.go.jp/policy/oda/summary/1999/d_g2_01.html

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

Given the importance of Japanese aid overall, but especially in Asia, it is appropriate to ask how effective aid has been so far.The purpose of this paper is to examine the question of Japanese aid effectiveness in a limited geographical context, namely for parts of South and Southeast Asia. Companion papers in the same volume will look at other regions and sub-regions within Asia and elsewhere in the world. In this paper, I will review the available evidence at the macroeconomic level to ascertain to what extent Japanese aid has promoted development-related expenditures and projects in the South and Southeast Asian regions. Sections 2 and 3 will be devoted to these tasks. Some specific policy questions posed for this project in particular, will be addressed in section 4.

Since estimating the effectiveness of aid is a complex econometric exercise when done in a rigorous way, it seems best to motivate the discussion of this paper by using a hypothetical example.[4] 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

[4] For econometric work on some countries in these regions see Gang and Khan(1991,1992) Khan(1994;1995a,b,c;Khan 1997; forthcoming)and Khan and Hoshino(1992). The appendix contains a prototype model that can be used for future work in evaluating the effectiveness of Japanese aid.

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 to development expenditures 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. In this paper, I do not use such a model formally to evaluate aid effectiveness, but the criteria used conform to the discussion above. The appendix to this paper does contain a mathematical model formulated with the above requirements in mind in a bounded rationality setting. This can be used for further econometric assessment of the impact of Japanese aid. I will mention, where appropriate, some results from a limited number of countries on which some work has been done so far.

In the next two sections I will briefly discuss the flow of Japanese aid to South and Southeast Asia respectively. Section 4 will be devoted to the question of aid effectiveness and further policy issues with the summary and conclusions following in section 5. Section 6 is an appendix that outlines a mathematical model for analyzing and estimating the effects of foreign aid.

2. Japanese Aid to South Asia:

According to the Asian Development Bank, the economic region South Asia comprises of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Together these countries received almost 1.5 billion dollars in 1998. This amounted to about 14 percent of the total aid disbursed by Japan for that year.

There is wide variation in total aid received in absolute terms among the various recipients. In 1998, the range was from a low of 8.47 million dollars for Bhutan to a high of 504.95 million dollars to India. Generally, the size of aid varied consistently and almost proportionately with the size of the recipient country's economy. However, Pakistan, which has an economy much smaller than that of India, received almost an equal amount of aid in 1998--- 491.54 million dollars. Historically, Pakistan and India have been the two largest recipient countries, followed by Sri Lanka and Bangladesh as the countries that shared distant 3rd and 4th places between them. Small economies such as Bhutan or Maldives have historically received smaller amounts, but almost all of the aid has been as grants.

A fraction of Japan's aid to this region has come as technical cooperation grants. However, historically, the amounts have been quite modest. In 1998, for example, the total for the region as a whole was only 110.05 million dollars. This amounted to just over seven per cent of the total Japanese aid received in the region. Even large countries like India and Pakistan consistently received very little in the way of technical cooperation grants. For example, India received only 20.51 million dollars or only four per cent of the total aid received from Japan, as technical cooperation grants in 1998.

Bangladesh was the country that received the largest amount in this category; but even so, the actual amount was only 22.83 million dollars.

Before discussing the effectiveness of various categories of aid for this region, a comparison with Southeast Asia will be useful. It is to this task that I now turn.

3. **Japanese Aid to Southeast Asia:**

Southeast Asia as a region received more aid than did South Asia in 1998. This also confirms a historical trend going back to the 1970s. In 1998, the total Japanese aid for the region was 2,437.66 million dollars--- higher by about one billion dollars than the aid flow to South Asia during the same year.

One Southeast Asian country, Indonesia was listed as the top Japanese aid recipient for 1999 by OECD sources. The total was 1,749 million dollars. Another Southeast Asian country, Thailand ranked third after China, with a received aid flow of 953 million dollars in 1999. For the same year, Philippines and Viet Nam were the 5^{th} and 6^{th} largest aid recipients respectively. Finally, another Southeast Asian country, Malaysia took the 10^{th} place with 235 million dollars received in 1999. Thus, 5 countries in the region were among the top ten recipients of Japanese aid. This region has consistently been the major beneficiary from Japanese aid. Other than the

entry of PRC in the list of major recipients nothing has happened to stem the flow.

Technical cooperation grants have also been higher for this region than those for South Asia. The total amount in 1998 was more than half a billion dollars or over twenty per cent of the total. This compares favorably both absolutely and relatively with the corresponding figures for South Asia mentioned previously. Even small economies such as Laos or Cambodia received technical assistance grants that are comparable to those received by large South Asian recipients such as India or Bangladesh. In 1998 Cambodia received a total aid flow of 81.4 million dollars of which 23.05 million dollars came as technical assistance. For the same year, Laos received 20.9 million dollars in technical assistance grants out of a total amount of 85.57 million dollars of Japanese aid to that country.

Larger recipients like Indonesia and Thailand have routinely received technical assistance from Japan between 100 and 200 million dollars a year during the 1990s. For example, Indonesia received 203.67 million dollars in 1995. Thailand received 147.46 million dollars during the same year. Even wealthy countries such as Brunei and Singapore received technical assistance grants from Japan in the 1990s, albeit for much smaller sums.

Among the developing countries in the region only Myanmar received very small amount of aid and technical assistance relative to its needs.

Thus, Southeast Asia, along with China, is clearly Japan's favorite region for channeling aid flows. Therefore, to a large extent, the overall effectiveness of total aid from Japan depends on whether aid has been effective in Southeast Asia. I now turn to an assessment of the effectiveness of Japanese aid.

4. Effects of Japanese Aid and Some Policy Issues:

In the late 1990s Japan announced a new approach to aid management, based on transparency and efficiency. Given this basic shift in aid philosophy, it is even more important now to assess the impact of the aid carefully. Ideally, a country by country, sector by sector and project by project study should be done, based on a uniform methodology. That ideal is not achievable at present, at least not in this paper. In what follows I report in detail the results from the macroeconomic impacts of Japanese vs. other donors' aid in two country studies I have done independently---Bangladesh from South Asia and Indonesia from Southeast Asia. I also try to answer as many of the following questions related to Japanese aid policy, relying on my formally rigorous academic studies, experience as an economist at the Asian Development Bank, and consultant to various

development organizations and Asian governments. These issues are whether Japanese aid

- attaches central importance to promoting the self-help efforts of developing countries;
- focuses on building economic infrastructure;
- emphasizes technology transfer in technical cooperation;
- request-based aid procedure ensures non-intervention in domestic political matters;
- ODA schemes and formulas are diverse enough;
- the decision-making system is overly centralized in Tokyo;
- the decision-making process is drawn out in order to build consensus among stakeholders;

I will also try to ascertain

- the desirability of having Japanese government ministries select technical experts for overseas aid assignments;
- the effectiveness of emphasizing on-the-job-training (OJT) in technology transfer strategies;
- the degree to which project-based technical assistance is donor driven in the following respects: identification; design; implementation and monitoring; and substantive areas of assistance;
- the merits and actual policy emphasis on various types of technical cooperation such as project vs. program formulas;
- the merits and actual policy emphasis on such efforts as the promotion of technology substitution, technology transfer, and institution building;
- the quality and appropriateness of technical experts;
- the quality and appropriateness of training techniques;

The Macroeconomic Impact: development vs. non-development expenditures---results from an econometric model:

The model is formally set out in the appendix. Roughly, it describes the behavior of policymakers given their own type(e.g., whether they are developmentalist or not) and determines how much of the aid from various sources goes to either development or non-development expenditures**.** 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.

4a: Results from Bangladesh:

For the period, 1980 t0 1999, Bangladesh received aid from both Japanese and other bilateral and multilateral sources. The model results show that on the whole Japanese bilateral aid was somewhat more effective in generating developmental expenditures than other aid.

Indeed, it is striking that for both developmentalist and non-developmentalist types of policymakers Japanese bilateral aid seems to have had a greater impact than other aid in almost every case of development expenditures. It is also interesting 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, the corresponding percentage of aid going to development expenditures, if the policymaker is developmentalist, is between 51 and 64 percent. Thus, it would be appropriate to conclude that in terms of influencing development expenditures in Bangladesh, success for Japanese bilateral aid depends on the type of the policymakers in Bangladesh; however, regardless of which type made policy in the last two decades, Japanese aid fared better than the non-Japanese aid. In addition to revealing the influence of Japanese aid, the results 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, rather dismally, the model implies that between 78 and 85 percent of domestic revenues may go to non-development expenditures in the presence of aid in Bangladesh development purposes.

What kind of policymakers did make the decisions in Bangladesh 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.On the whole, however, a picture of at least partial(but far from total) commitment to genuine development objectives emerges.[5]

It is also possible to offer some econometric evidence to corroborate the above characterization. Akaike information criterion or 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 (2LogL)/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, during the period of observation statist concerns dominated the real fiscal agenda in Bangladesh. This too, seems to be consistent with the institutional studies and my own informal observations.

If the **presence** of aid pulls some money out of the domestic revenue to non-development purposes we have to be cautious about its overall effects. Only if the substitution effect is not too high (i.e. aid does

[5] This is also consistent with my own visits to Bangladesh and extensive conversations with the Bangladeshi and other academics and development practitioners on the subject. Since I speak and read Bengali, it was easy for me to meet and talk with people from many different backgrounds.

not replace completely development expenditures that would have been financed out of domestic revenues) will there be an incremental effect of aid on development expenditures. Under this scenario also, Japanese bilateral aid turned out to be more effective.

4b: Results from Indonesia---development vs. non-development expenditures:

Just like in Bangladesh, it is striking that for both developmentalist and non-developmentalist types of policymakers, Japanese bilateral aid seems to have had a greater impact than the rest of the world aid in on development expenditures types.In the presence of Japanese aid, approximately 26 to 39 percent of this aid goes to development expenditure on the margin if the policymaker is non-developmental. On the other hand, the corresponding percentage of aid going to development expenditures is between 67 and 53 percent if the policymaker is developmentalist.

What kind of policymakers did make the decisions in Indonesia regarding development? This is a particularly fascinating question, but is hard to answer in a definitive fashion. The "best guess" one can make must use a great deal of reliable institutional history. In case of Indonesia this is largely unavailable. The books and articles written on this subject deal at best with particular episodes. On the whole, however, again, like

Bangladesh, a picture of at least partial commitment to genuine development objective emerges. This is also consistent with my own visits to Indonesia and extensive investigations with the Indonesian and non-Indonesian academics and development practitioners on the subject.

As in the case of Bangladesh, here too,I am also able to offer some econometric evidence to corroborate the above characterization. It would seem that by the previously mentioned Akaike information criterion at least, in Indonesia 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.

4c: Some Institutional and Policy Issues:

Turning now to the questions raised at the beginning of this section, it is clear in light of the above, that rigorous answers would require further data gathering and econometric estimation. For example, TAs could be distinguished from other forms of Japanese aid for model formulation and estimation. In fact, this looms as a major future task. For the moment, one has to rely on institutional knowledge and expert opinion to address the questions raised earlier.

As far as promoting self-reliance is concerned, the results, as perceived by the policymakers in these two regions, seems to have been mixed.On the one hand, some technical projects, such as the capability for Input-Output matrix data generating for the BPS(Biro Pusat Statistik), Indonesian central statistical Bureau that was aided by IDE has been a success. On the other hand Indonesian experts express some misgivings about large scale, especially, infrastructural projects where technological learning may not be taking place rapidly enough.

Thus, while emphasis on infrastructural projects may be correct at the present stage of development in South and Southeast Asia, the transfer of technology and skills could be speeded up. Training of local personnel and use of local businesses and professionals whenever available will be an appropriate policy move.

As far as intervention in domestic policy formulation of the recipients and their domestic politics are concerned the Asian policymakers generally compare Japan favorably to the US. In their view, the US has a history of using aid for political purposes, whereas Japan uses it for economic and, increasingly in recent years, for humanitarian purposes. At the same time, smaller European countries such as the Netherlands and the Scandinavian countries are perceived as being the most fair donors.

In terms of diversity of aid schemes and formulas, the recipients express a perception of lack of transparency on the part of Japanese government. In Bangladesh, several NGO representatives expressed a desire to see greater allocation and involvement of Japanese aid to health, education and gender-related projects. Health-oriented efforts such as the *Shapla Neer* are greatly valued and appreciated. Environment is another area where there is a perceived need for greater funding than is currently the case.

The remarks heard about the lack of transparency also are echoed when the centralization of Japanese aid decision making procedure in Tokyo is mentioned. However, many South and Southeast Asian policymakers think that the other donors are also centralized and hamstrung by an aid bureaucracy that is largely unaware of recipient needs and unwilling to listen.

I will now also try to ascertain

- the desirability of having Japanese government ministries select technical experts for overseas aid assignments;
- the effectiveness of emphasizing on-the-job-training (OJT) in technology transfer strategies;
- the degree to which project-based technical assistance is donor driven in the following respects: identification; design; implementation and monitoring; and substantive areas of assistance;
- the merits and actual policy emphasis on various types of technical cooperation such as project vs. program formulas;
- the merits and actual policy emphasis on such efforts as the promotion of technology substitution, technology transfer, and institution building;
- the quality and appropriateness of technical experts;
- the quality and appropriateness of training techniques

On all of the above issues there is a surprising amount of unanimity among the Bangladeshi and Indonesian policymakers and other aid constituencies. In particular, they all agree that much of Japanese aid is donor driven , beginning with identification of projects and programs. In their view, the design, implementation and monitoring are also one-sided.

In terms of the quality and appropriateness of technical experts, these show wide variations. Over time, the quality has improved. Also, as Japanese universities and training institutes pay more attention to the training of development professionals and devise improved curricula, the sought-after quality-improvement seems to be taking place. Young Japanese who learn Asian languages and culture seem to be better appreciated and are probably more effective actually, than are those with simply advanced academic training from western institutions without the cultural assets. While it is desirable to have these Japanese experts who have the requisite technical skills and cultural sensitivities, a sense of partnership with the local experts seems to be missing. The ideal should, therefore, be a mix of rigorous technical training and cross-cultural sensitivity geared towards building a permanent partnership in development.

Finally, I want to discuss the merits and actual policy emphasis on such efforts as the promotion of technology substitution, technology transfer, and

institution building. Here, neither Japan nor any other donor gets high marks. At the same time, my own views, based on discussions in Asia, are that Japan, in spite of, a history of aggression, in Southeast Asia, is perceived as potentially more capable of accomplishing these goals. In South Asia, particularly, India and Bangladesh, there is much goodwill among the policy elite and at the popular level for Japan. Although the political history is complex, Subhash Bose and the Indian National Army were supported by Japan in their sincere and self-sacrificing revolutionary war for independence against British imperialism. Culturally also, the links through Buddhism and other elements still find a warm echo in the hearts of the people even after so many centuries. If Japan shows sincere commitment to transfer technology, help build institutions of popular participation, and a genuine interest in transferring skills in a credible way, it can easily establish itself as the most helpful donor in South and Southeast Asia.

5. Conclusions:

In this paper I have tried to survey the current state of Japanese aid giving and its impact on South and Southeast Asia. Clearly, Japan comes out ahead of many western donors, particularly, large ones such as the US and UK. However, other smaller western donors are

also looked at favorably by the recipients. But in all cases, there seems to be a perception that local voices are not being heard and that the manner of giving aid is more of a bureaucracy to bureaucracy than people to people. Better training of technical personnel, more knowledge of the history, geography and cultures of the recipients will be helpful. Language training should also be an integral part of this. There is a widespread perception that in its bid to catch up with the west Japan lost its interest in the rest of Asia and its own deep cultural bonds. A refocusing on Asia in a deeper way may help Japan regain its own cultural balance as well.

Another problem for Japan to avoid is to look too insistently on its own economic history to find policies for other Asian countries. As my Japanese colleagues, K. Ohno and K. Sakurai have pointed out:

> The conditions of Japan in those days and those facing the developing countries and the transitional economies today are different. If the conditions are different, the policies and directions that need to be pursued are not necessarily equivalent. These conditions not only include economic aspects, such as the international setting, developmental stage, levels of capital and labour force, human capacity and population, administrative capacity of the government, but also historical, cultural, social, and geographical conditions.[6]

[6] Higashi Ajia no Kaihatsu Keizaigaku, translation by OECD, OECD(1999) p.23. See also the book by Ohno and Ohno and the contributions therein.

It is to be hoped that by listening to such sage advice from within and outside Japan, and using its own historical experience as a partial guideline Japanese aid policy in the future will be guided more fully by both impartial economic analysis and a political and cultural dialogue between Japan on the one hand and, South and Southeast Asia on the other.

6. Appendix: A Bounded Rationality Model for Econometric Estimation of the Impact of Japanese and other Aid:

The Asymmetric Loss function Model for Allocation of Foreign Aid :

The policy-makers 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 expenditure, 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 policy-maker 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 policy-maker over- or undershoots the chosen indicator level. It also allows us to examine different assumptions about the "type" of the policy-maker. For example, writing the loss function explicitly as

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

illustrates a policy-maker who is "developmentalist" in orientation: undershooting the development expenditure indicator value is worse than overshooting it. At the same time,

the above policy-maker is a "fiscal liberal" since overshooting the revenue raising indicator value is worse then undershooting. Such policy-makers 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. Part of our problem is to explore which of these characterizations captures the behavior of policy-makers "best" in an empirical setting.

Given the type of policy-maker, 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 distribution of foreign aid and domestic revenues into budgetary categories we instead write,

$$D = (1 - \rho_R)R + (1 - \rho_B)A_B + (1 - \rho_M)A_M \qquad (3)$$

and,

$$N = \rho_R R + \rho_B A_B + \rho_M A_M \qquad (4)$$

$(1 - \rho_R)$, $(1 - \rho_B)$, and $(1 - \rho_M)$ are the fractions of domestically raised revenues, bilateral aid and multilateral aid, respectively, allocated to government development expenditures. These two constraints reflect alternative uses of government revenues augmented by foreign assistance.[7] The first constraint allows for the possibility that D can be financed

[7] One would like the allocation of aid among budgetary categories to be the outcome of a utility maximizing problem. Incorporating fungibility into a decision-making problem as a subproblem is extremely difficult. Use of a single budgetary constraint *a priori* assumes that aid is 100 percent fungible. While not directly addressing the fungibility issue, our approach does not *a priori* assume 100 percent fungibility; it does look at the allocation of aid among budgetary categories.

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 bilateral and multilateral foreign aid on N and D can be estimated econometrically with the help of these equations.

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