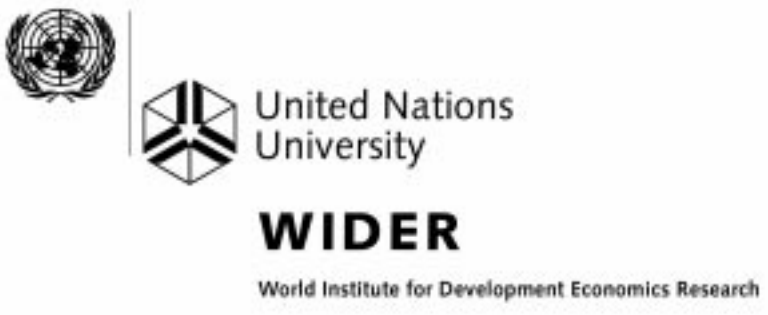


Discussion Paper No. 2002/40

Aid, Public Sector Fiscal Behaviour and Developing Country Debt

Simon Feeny[1] and Mark McGillivray[2]

April 2002

Abstract

This paper looks at public sector debt in developing countries, being concerned specifically with the relationship between aid inflows and the public sector borrowing requirement net of aid loans. After examining the public sector budget constraint and various conditions under which aid might lead to an increase in this borrowing, the paper surveys the empirical results of literature on aid and public sector fiscal behaviour. It finds that the results of a number of studies are consistent with aid leading to increases in this borrowing. Further investigation, in the form of econometric analysis of panel data, also points to this outcome. The paper then looks at a number of theoretical scenarios in which aid leads to increases in borrowing net of aid loans.

Keywords: aid, borrowing, debt, fiscal behaviour

JEL classification: O23, H10

[1] Research Fellow, International Development Program of the School of Social Science and Planning at RMIT University in Melbourne, Australia; [2] Associate Professor of International Development in the School of Social Science and Planning at RMIT University and an External Fellow of the Centre for Research on Economic Development and International Trade (CREDIT) at the University of Nottingham

This is a revised version of the paper originally prepared for the UNU/WIDER development conference on Debt Relief, Helsinki, 17-18 August 2001.

UNU/WIDER gratefully acknowledges the financial contribution from the governments of Denmark, Finland and Norway to the 2000-2001 Research Programme.

Acknowledgements

This paper builds on McGillivray and Morrissey (2001b). Comments from conference participants at the WIDER Development Conference on Debt Relief in Helsinki during 17-18 August 2001 are gratefully acknowledged. The usual disclaimer applies.

UNU World Institute for Development Economics Research (UNU/WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Camera-ready typescript prepared by Liisa Roponen at UNU/WIDER
Printed at UNU/WIDER, Helsinki

ISSN 1609-5774
ISBN 92-9190-202-0 (printed publication)
ISBN 92-9190-203-9 (internet publication)

1 Introduction

There is a growing literature on public sector fiscal aspects of foreign development aid. Most interest is on the impact of aid on various categories of public sector revenue and expenditure. Some studies are concerned primarily with the question of whether aid is used for expenditure purposes other than those for which donors intended (see for example, Pack and Pack 1990, 1993; World Bank 1998; Feyzioglu *et al.* 1998). Put more succinctly, these studies are concerned with the fungibility problem of aid. Other studies provide a more comprehensive analysis of the public sector fiscal response to aid, by simultaneously analysing interactions between aid, taxation and expenditure decisions. Borrowing, net of aid, as a component of the public sector budget constraint, is incorporated into these analyses but gets relatively little attention. It is often merely treated as a residual variable, and is assumed to be a substitute for aid, especially aid loans: as aid loans increase, recipient governments depend less on this form of finance. The implicit policy prescription resulting from this assumption is clear: give more aid, in particular loans, if we want recipient governments to depend less on this form of (additional) borrowing and to prevent them acquiring more debt.

This paper takes a closer look at the link between aid and additional borrowing. This form of borrowing is often financing of last resort, as it is intended to finance an unanticipated gap between expenditure and revenue and other forms of financing. As such the terms and conditions to which it can be subject are relatively disadvantageous to the recipient. While this paper does not look at the consequences of this form of borrowing, it does question both the assumption that it is a substitute for aid and the resultant policy prescription. It starts by looking at the public sector budget constraint and various conditions under which aid might actually lead to an *increase* in this borrowing. It proceeds by surveying the empirical results of literature on aid and public sector fiscal behaviour. It finds that the results of a number of studies are consistent with aid leading to increases in this borrowing. Further investigation, in the form of econometric analysis of panel data, also points to this outcome. The paper then looks at a number of theoretical scenarios in which aid leads to increases in borrowing net of aid loans. Most of these scenarios depict aid and overspending resulting from misperceptions or illusions relating to either the real or nominal value of the aid inflow.

2 Aid and public sector debt

Central to the literature on fiscal response and fungibility is the public sector budgetary constraint. This constraint can be written as follows

$$E_i = R_j + A_k + B_l \qquad (1)$$

where E_i is a vector of i government expenditure variables, R_j is a vector of j domestic recurrent revenue variables, A_k is a vector of k aid variables (including grants and loans) and B_l is a vector of l borrowing variables net of aid loans (additional borrowing). Differentiating with respect to A_k yields:

$$\frac{\partial E_i}{\partial A_k} = \frac{\partial R_j}{\partial A_k} + \frac{\partial A_k}{\partial A_k} + \frac{\partial B_l}{\partial A_k} \tag{2}$$

Our interest is in $\partial B_l/\partial A_k$ - incremental aid-induced borrowing. Borrowing occurs when $\partial B_l/\partial A_k$ is positive:

$$\frac{\partial B_l}{\partial A_k} > 0 \tag{3}$$

Aid-induced borrowing emerges in a number of scenarios. We highlight five. The first is where both expenditure and recurrent revenues increase in response to aid, but where the former increases by more than the value of the latter plus aid. The formal conditions under which this specific scenario emerges are as follows:

$$\frac{\partial E_i}{\partial A_k} > \frac{\partial R_j}{\partial A_k} > +1 \tag{4}$$

The second scenario is where expenditure increases by more than the value of the aid inflow and recurrent revenue remains the same; that is:

$$\frac{\partial E_i}{\partial A_k} > 1 \text{ and } \frac{\partial R_j}{\partial A_k} = 0 \tag{5}$$

The third is where expenditures rise and recurrent revenues fall; that is:

$$\frac{\partial E_i}{\partial A_k} > 0 \text{ and } \frac{\partial R_j}{\partial A_k} < 0 \tag{6}$$

The fourth is where expenditures remain unchanged but recurrent revenues fall by more than the value of the aid inflow; that is:

$$\frac{\partial E_i}{\partial A_k} = 0 \text{ and } \frac{\partial R_j}{\partial A_k} < 1 \tag{7}$$

The fifth is where both expenditures and recurrent revenues fall, but with the latter falling by a greater margin; that is:

$$\frac{\partial R_j}{\partial A_k} < \frac{\partial E_i}{\partial A_k} < 0 \tag{8}$$

3 Empirical evidence

3.1 Pre-existing studies

Few studies provide estimates of $\partial B_l/\partial A_k$ as they either do not report or estimate a borrowing equation (it is the omitted equation in the systems estimation in many of the fiscal response studies). It can however be reasonably easily derived from those results which are reported given that

$$\frac{\partial B_l}{\partial A_k} = \frac{\partial E_i}{\partial A_k} - \frac{\partial R_j}{\partial A_k} - 1 \tag{9}$$

and that estimates of $\partial E_i/\partial A_k$ and $\partial B_l/\partial A_k$ are reported in most studies.

Estimates of $\partial B_l/\partial A_k$, derived in this manner, are reported in Table 1.[1] Eight of the 16 borrowing parameters shown in this table are positive. These positive values range between 0.11 and (a perhaps implausibly large) 9.50, in the cases of the Pack and Pack (1993) study of the Dominican Republic and the cross-country study of Cashel-Cordo and Craig (1990). Of the scenarios identified above, three fall into scenario one, four into scenario three and one falls into scenario five.

3.2 Additional evidence

The majority of studies looking at aid and public sector fiscal behaviour, and arguably the most insightful, are those which have been labelled as the 'fiscal response' variety. McGillivray and Morrissey (2001a) provide a review of these and related studies.[2] These studies, following Heller (1975) posit a utility maximizing problem in which public sector fiscal decisionmakers are assumed to minimize a loss function subject to constraints similar to those shown above in equation (1). The losses are minimized (and utility maximized) by ensuring that gaps between target and actual levels of expenditure and revenue are as small as possible. Structural equations and reduced-form equations are derived from this problem and subsequently estimated using observable data.

The fiscal response literature has undergone significant development since the original study of Heller (1975). The current state of the art treats aid flows as endogenous, and as such subject to the loss-minimization process, and assumes *ex ante* that the non-aid borrowing target is zero. The reduced-form borrowing equation consistent with this approach may be written as follows:

$$B = \pi_0 + \pi_1 I_g^* + \pi_2 G^* + \pi_3 R^* + \pi_4 A^* + \mu \tag{10}$$

where I^*_g, G^*, R^* and A^* are targets for public sector investment, expenditure, recurrent expenditure, taxation and other recurrent revenue, and aid (both grants and loans) respectively. π_0 and μ are constant and error terms. I^*_g, G^* and R^* are estimated, following the approach used in the fiscal response literature and A^* is committed aid (disbursed aid is the endogenous variable in the relevant literature).[3] The key parameter, for the purposes of this study, is π_4.

Although aid disbursements are treated as endogenous, aid commitments are treated as exogenous. This is central to our analysis and has been discussed extensively, with support, in the aid allocation and fiscal response literatures (see, for example, Franco-Rodriguez *et al.* 1998). This treatment's justification is that the amount of aid committed is commonly determined in the previous year, or years, and therefore cannot be influenced by borrowing in the current year. Current disbursements might be adjusted on the basis of aid decisionmakers becoming aware of non-aid borrowing, but not commitments, which are predetermined.

Table 1
Constraint equation parameters

Study	$\partial E_i/\partial A_k$	$\partial R_j/\partial A_k$	$\partial B_\kappa/\partial A_\kappa$
Heller (1975) - 11 African countries, 1960-71			
Full sample	0.95	-0.16	0.11
Anglophone countries	0.52	-0.42	-0.06
Pack and Pack (1990) - Indonesia, 1966-86	1.58	0.29	0.29
Cashel-Cordo and Graig (1990), 46 countries, 1975-80	8.66	-1.84	9.50
Gang and Khan (1991) - India, 1961-89			
Aid disaggregated into grants and loans	-0.85	-0.49	-1.36
Aid disaggregated into bilateral and multilateral	-0.51	-0.32	-1.19
Pillai (1982) - Jordan, 1960-78	0.65	-0.5	0.15
Chisti and Hasan (1992) - Pakistan, 1976-88	3.01	0.69	1.32
Khan and Hoshino (1992) - Bangladesh, India, Pakistan, Malaysia and Sri Lanka, 1955-76.	0.96	0.21	-0.25
Pack and Pack (1993) - Dominican Republic, 1968-86	0.72	-0.39	0.11
Gupta (1993) - India, 1969-93	1.97	0.01	0.96
Iqbal (1997) - Pakistan, 1976-95	1.00	0.10	-0.10
Franco-Rodriguez *et al.* (1998) - Pakistan, 1960-95	-2.30	-3.60	0.30
McGillivray and Ahmed (1999) - The Philippines, 1960-92	-1.90	-0.10	-2.80
Swaroop *et al.* (2000) - India, 1970-95	0.54	-0.31	-0.15
Franco-Rodriguez (2000) - Costa Rica	0.50	0.05	-0.55

Data required to estimate (4) were obtained from the OECD's International Development Statistics (2001) and the World Bank's World Development Indicators (2000). A panel dataset is constructed for the period 1980 to 1997. The panel consists of 634 observations for 79 developing countries. Panel datasets allow for empirical analysis which accounts for unobserved country-specific effects. It is possible to treat the country-specific effects as either fixed or random. The fixed effects approach involves splitting the constant into a different part for each individual country in the sample, and estimating the model using Ordinary Least Squares (OLS). Essentially, this involves estimating the model with a dummy variable for each developing country. Estimates of (4) obtained using the fixed effects approach are as follows.[4]

$$B = -6.88e+11^{\#} - 2.20^{\#} I_g^* + 0.21^{\#} G^* + 0.09^{\#} T^* + 1.65^{\#} A^* + \mu$$

$$(-2.23) \quad (-1.70) \quad (1.66) \quad (131.29) \quad (16.06)$$

$$R^2 = 0.99$$

where # denotes significantly different from zero at the 95 per cent level or greater. Pertinently, the estimate of π_4 is positive and significant, indicating that a one unit change in aid commitments results in a 1.65 unit change in non-aid borrowing. The resultant conclusion, that aid is positively associated with non-aid borrowing, is robust with respect to alternative estimates of the targets for investment, expenditure, recurrent revenue, and measures of the aid variable (specifically, in which aid disbursements are used instead of commitments). In each case π_4 remained positive and significantly different from zero, with its values ranging from 1.99 to 0.85.

4 Towards an explanation[5]

How might the above results, pointing to aid-induced additional borrowing, be explained? In this section we offer a tentative explanation, tentative in the sense that we provide a number of theoretical scenarios which require subsequent investigation. Our concern is with the behaviour of a particular spending unit within the public sector of a given developing country, what we have termed implementing officials. We focus on the actions of the implementing official with ultimate responsibility for specific expenditure categories. The most important features distinguishing this unit are that: (i) it is responsible for allocating a given amount of aid across various spending categories; and (ii) that the total revenue pool it has at its disposal for allocation, including aid, is exogenous to the preferences of the implementing officials. The second of these assumptions is consistent with a situation in which a finance ministry controls revenue flows, allocating given amounts of revenue, including aid, to spending or implementing units. Thus, the finance ministry, or policy officials, draw up the budget and set expenditure plans. Aid is assumed to be fully fungible to the policy official; that is, the policy official treats aid like any other category of revenue and can allocate it according to their own preferences, rather than those of the donor, which may be different.

We assume that the implementing unit derives utility purely from the quantities of goods purchased with the revenue at its disposal. For convenience, and in a manner similar to Feyzioglu *et al*. (1998), we divide goods into two categories: those that donors intend the official to purchase with a given aid inflow (X) and all other publicly-provided goods (Y). The aid inflow is again denoted as A, and comprises grants and loans from official international donor agencies.[6] The implementing official's utility function can be written as:

$$U = U(X, Y). \tag{11}$$

The budget constraint faced by this official prior to receiving aid (via the policy official) is

$$p_x X + p_y Y = R \tag{12}$$

where p_x and p_y are the prices of X and Y, respectively, and R is tax and other recurrent revenue made available to the official for expenditure on X and Y. The optimizing problem for the official is to maximize (11) subject to (12). Assuming homothetic preferences, the solution is shown diagrammatically in Figure 1 at point Z^I (I denoting initial). We assume that this solution is what the policy official wants. This would be

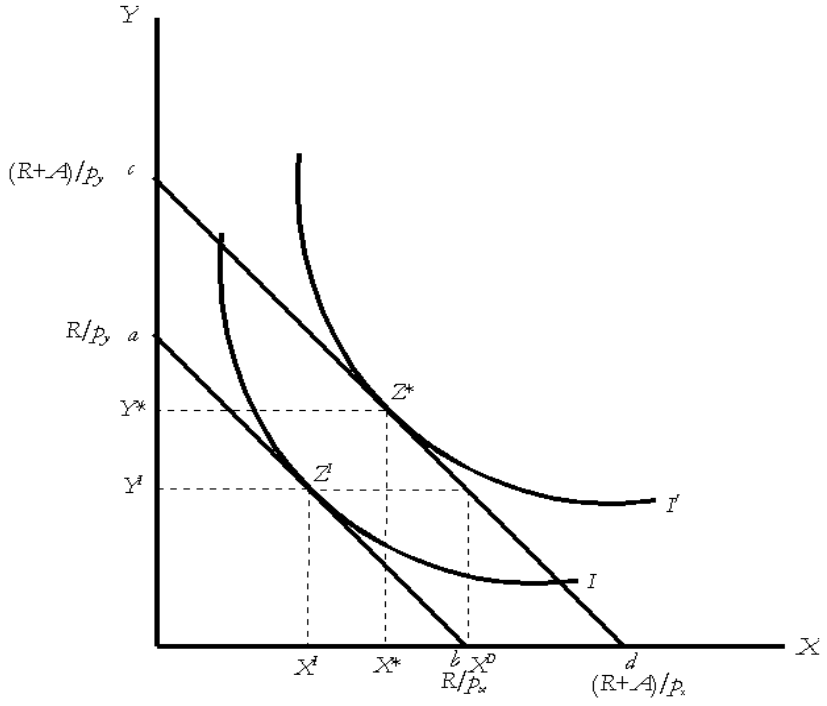
consistent with both sets of officials sharing the same preference map for X and Y, or that the policy official is able to dictate the implementing official's marginal rate of substitution between these two goods.

Assume that a donor provides aid and wants to see the inflow allocated entirely to expenditure on X. Using p_xX^D as notation for the donor's desired spending on X we have $p_xX^D = p_xX + A$. It follows that X^D is the quantity of X that the donor wants purchased. Assume also that prices remain constant and the aid is a cash block grant (it could alternatively be aid in kind, a matching grant, a tied grant or even a loan). The new budget constraint becomes:

$$p_xX + p_yY = R + A \tag{13}$$

The new optimizing solution is Z^* , which is used throughout to also represent the target of policy officials. As will become clearer later, this would be the optimum of the implementing official in the absence of illusion or misperception. Contrary to donor intentions, expenditure on X does not increase by the value of the aid inflow (i.e. there is fungibility). In this simple case, total expenditure on X and Y increases by the value of the inflow.

Figure 1



Under what circumstances might total expenditure increase by an amount greater than the value of the aid inflow? A possible and quite straightforward means is that the finance ministry increases total tax and other recurrent revenue and makes this increment to the (implementing) official responsible for spending, topping-up the aid money with matching funds of its own. That is, the budget constraint would become

$$p_xX + p_yY = R + A + R' \tag{14}$$

where $R^{/}$ is the additional recurrent revenue. This could be depicted by a further rightward shift in the budget line, with the new optimum yielding an overall increase in expenditure that is greater than the value of the aid inflow. But recall that available evidence often indicates that aid results in *decreases* in aggregate recurrent revenue. While this does not necessary imply that reductions in such revenue are spread across all public sector spending units, it would seem quite unlikely that, against this background, the unit in question receives a net increase in revenue. Thus it would be unreasonable to expect that the budget line would lie to the right of *dc* in Figure 1. Another possibility is that tax revenue is diverted from another spending area, but this too is inconsistent with the findings of the literature as it would imply a reduction in expenditure elsewhere.

Let us now consider some other, more feasible and otherwise unexplored scenarios. In each of these scenarios, expenditure increases in excess of aid are financed, eventually, by additional borrowing. As asserted above, this borrowing is typically considered financing of the last resort, as it is intended to finance an unanticipated gap between expenditure and revenue. Such borrowing should not be modelled as a conscious and deliberate supplement to aid inflows, and thus not as a simple and direct outward shift in the budget line. Moreover, we assume that the borrowing implication is realized in the period following this static optimiation and is not taken into account (agents are not forward-looking).

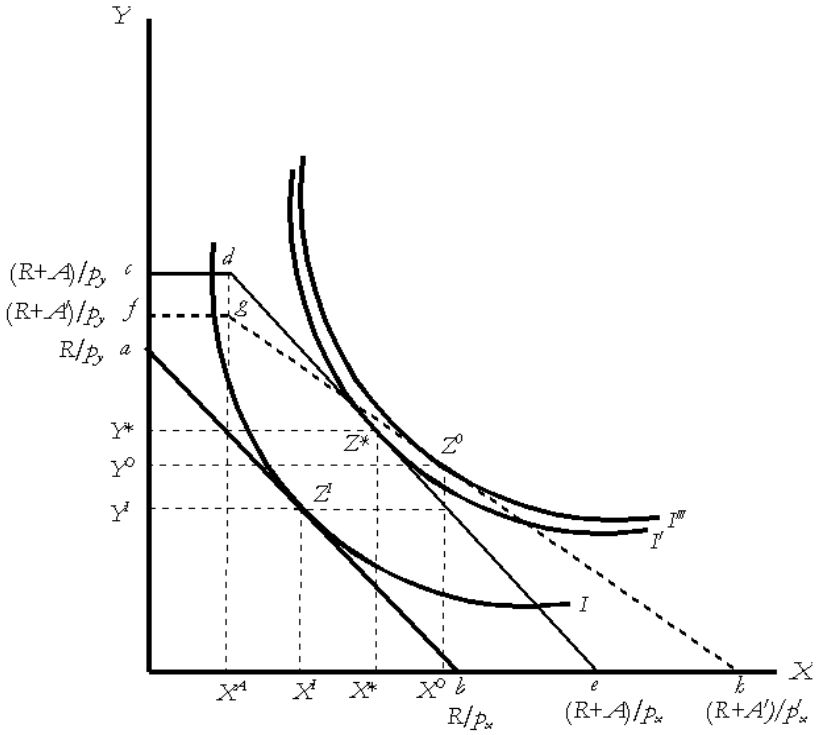
Prior to turning to these scenarios it should be emphasized that in all scenarios expenditure increases in excess of the aid inflows can still occur even with simultaneous reductions in tax and other recurrent revenue (as in a number of the scenarios identified above in section 2). This is not demonstrated explicitly as it should be reasonably clear from the diagrams presented below. We do not seek to explain why tax revenues might fall, but our analysis is not compromised if they do.

The first scenario is one in which the donor provides aid in kind, rather than as a cash grant, as is sometimes the case in practice. Specifically, the donor seeks to increase the physical amount of some good entering the official's budget. The constraint equation then becomes

$$p_x(X + X^A) + p_yY = R + A \qquad (15)$$

where X^A is the aid in kind and $A = p_xX^A$ and thus represents the recipient's financial valuation of the aid. Note that $X + X^A$ must be equal to or greater than X^A, and thus the budget line now contains a horizontal segment. This is illustrated in Figure 2, with the corresponding budget line being *cde*.

Figure 2



Aid may induce a perceived fall in domestic prices. The provision of aid in kind may reduce the relative price of *X*. This could occur when recipient governments or their agencies sell aid-financed commodities or services, or those provided in kind by donors, at less than market prices. Alternatively, if there is a domestic private market that is quantity constrained, there is an incentive for officials to divert aid goods to that market (e.g. medicines). More generally, it could occur when aid results in an increase in domestic supply, forcing down market prices. This does not apply to aid provided in kind if *X* is not exchanged in domestic markets. Even if the aid does not affect domestic prices, it is possible that the implementing official wrongly perceives that the domestic price of *X* falls as a result of the aid receipt. In this situation the perceived budget constraint becomes

$$p_x'(X + X^A) + p_y Y = R + A' \qquad (16)$$

where p_x' is the perceived price of *X*, and $A' = p_c X^A$. The corresponding budget line, in Figure 2, is *fgh*. With homothetic preferences this results in an increase in expenditure on *X* and *Y*, which exceeds the actual value of the aid inflow. In Figure 2 this is shown by the move from point Z^I to Z^O (denoting outcome). Had the implementing official's perception of prices been correct, the corresponding move would have been from *Z* to *Z** (the policy official's target). Note that *Z** is the result of fungibility; the policy officials had not planned to increase expenditure on *X* to the level desired by donors (X^D) but rather to the lower level *X** and releasing fungible funds to increase expenditure on *Y* to *Y**. However, as a result of misperceptions by the implementing officials, the outcome Z^O results in the donor's target X^D being met (although this may not necessarily be the outcome). In this scenario, aid illusion results in aggregate spending increasing by more than aid, and by more than policy officials planned, and

spending on X may increase by the value of aid. Thus, the actions of implementing officials can have the effect of countering the fungibility-driven intentions of policy officials.

Given that the misperception results in a level of expenditure which cannot be supported from the current budget, this would require an appeal for additional finance, most probably by going back to the finance ministry which would then in turn need to borrow from domestic or other sources.[7] If borrowing is not permitted, the result may be a termination of the budget such that some end-of-period expenditure is not met. Whether this has the effect of meeting intended donor allocation *ex post* depends on the timing of expenditure on X and Y. If, for example, all Y had been provided then any shortfall would impact on X. While these outcomes are not consistent with the empirical evidence mentioned in the preceding section, donors could then either accept *ex post* under-spending on X, or release new aid for X. In practice, borrowing often occurs; cash budgets have had only a limited impact in constraining this (Stasavage and Moyo 2000).

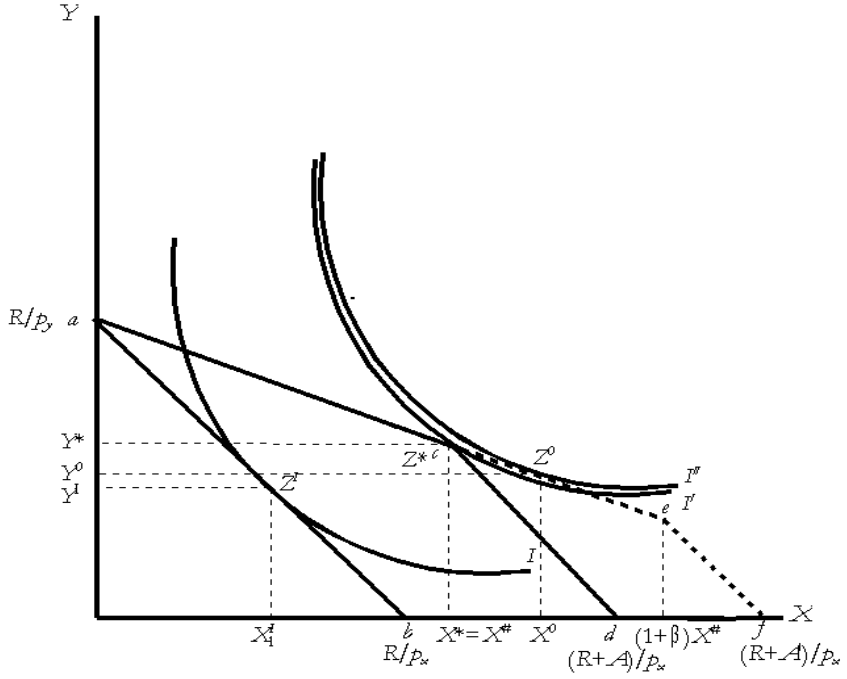
A second scenario is one in which the recipient is allocated a matching grant, equal to m, which subsidizes the purchase of X up to a threshold quantity $X^{\#}$. The budget constraint therefore becomes:

$$(1- m)p_xX + p_yY = R \quad \text{for} \quad X \leq X^{\#} \tag{17}$$

The value of the aid inflow in this case equals mp_xX and

is set at a maximum of $mp_xX^{\#}$. The corresponding budget line is *acd* in Figure 3. The optimum point is now Z^* which coincides with c, the corresponding quantity X^* coincides with $X^{\#}$ and expenditure increases by the full amount of the aid allocation

Figure 3



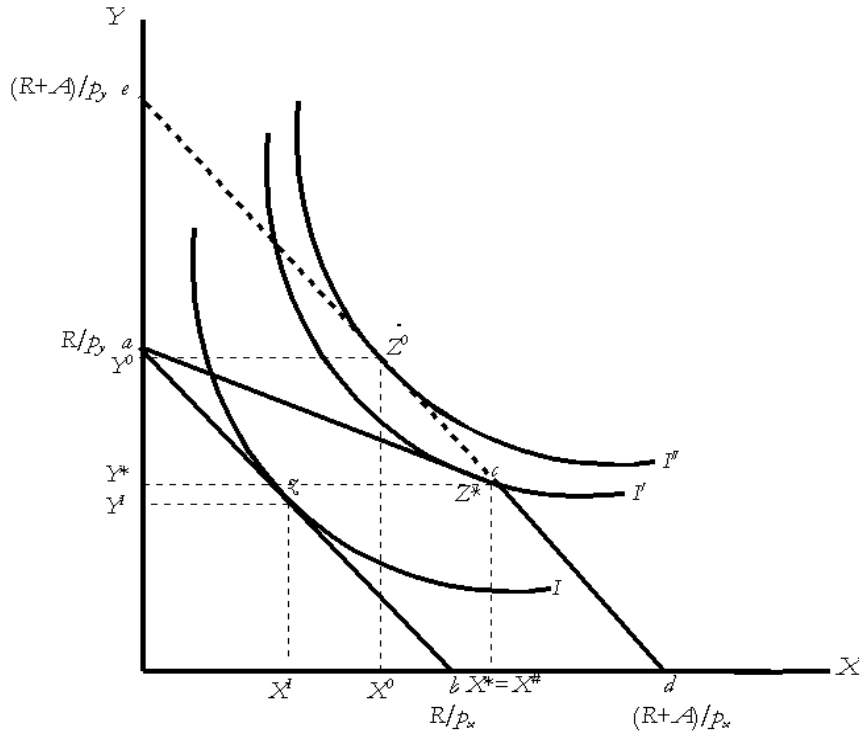
(and by the total amount of aid the donor was willing to provide). In this case, the matching grant has the intended effect of 'forcing' policy officials to plan for Z^* and X^* where there is no fungibility. Expenditure on Y does increase, to Y^*; this is not due to fungibility but instead an income effect resulting from the subsidy, with part of the increase in real income (or saving resulting from the subsidy) being allocated to Y.

Budgetary processes can in all countries be chaotic to varying degrees, especially in developing countries. One reason for this is information deficiency. It is quite possible that the threshold is not adequately communicated to, or perceived by, the implementing official. The budget constraint can thus be written as:

$$(1- m)p_xX + p_yY = R \quad \text{for} \quad X \leq (1+b)\, X^{\#} \tag{18}$$

where b is an error parameter which for the purpose of our analysis is assumed to be greater then zero. Under this scenario the implementing official behaves as if the amount of aid available is $A^{\alpha} = mp_x(1+ b)\, X^{\#}$. The corresponding budget line, with the dotted segment in Figure 3, is *aef*. The outcome, as drawn, is Z^O, with expenditure increasing by more than both the value of the aid inflow and the maximum amount the donor is willing to provide. But at this point the official is overspending, in that Z^O lies to the right of the actual budget line *acd*, and will have to obtain additional finance. Thus, aid illusion here results in aggregate expenditure increasing by more than the value of the aid and expenditure on X increases by more than even donors intended. Additional financing will be required to fund the resulting deficit, and again empirical findings suggest that this is not in the form of aid.

Figure 4



A third scenario also relates to a misperception, with the official thinking and acting as if the aid inflow is not a matching grant but a block grant (perhaps the nature of the grant was not fully communicated to the official). This is depicted in Figure 4. The actual budget constraint after the provision of aid is (13), but the perceived constraint is (9). The corresponding budget lines are *acd* and *ed*, respectively. The policy officials plan Z^*, corresponding to *c* and with no intended fungibility, but misperceptions by implementing officials yield an outcome of Z^O. Total expenditure increases by an amount greater than the aid inflow but the excess is allocated to *Y* rather than *X*, and the government must obtain additional funds to finance this spending. In this case, although policy officials did not take advantage of fungibility, aid illusion on the part of implementing officials resulted in an outcome with the appearance of fungibility.

Aid often subsidizes the provision of public goods. Donors, from time to time, require the recipient to recover provision costs by introducing or increasing charges for the good under consideration (this is often the case for education or health care). Rationales for this include the ability this affords to provide more goods or use the recovered funds to improve public sector saving. Let us assume that the donor requires some cost recovery and that the aid allocation under consideration is a block grant and that the recovered costs are used to supply more of the good under consideration. This leads to our fourth scenario. The budget constraint with cost recovery becomes

$$(p_x - c_x)X + p_y Y = R + A \tag{19}$$

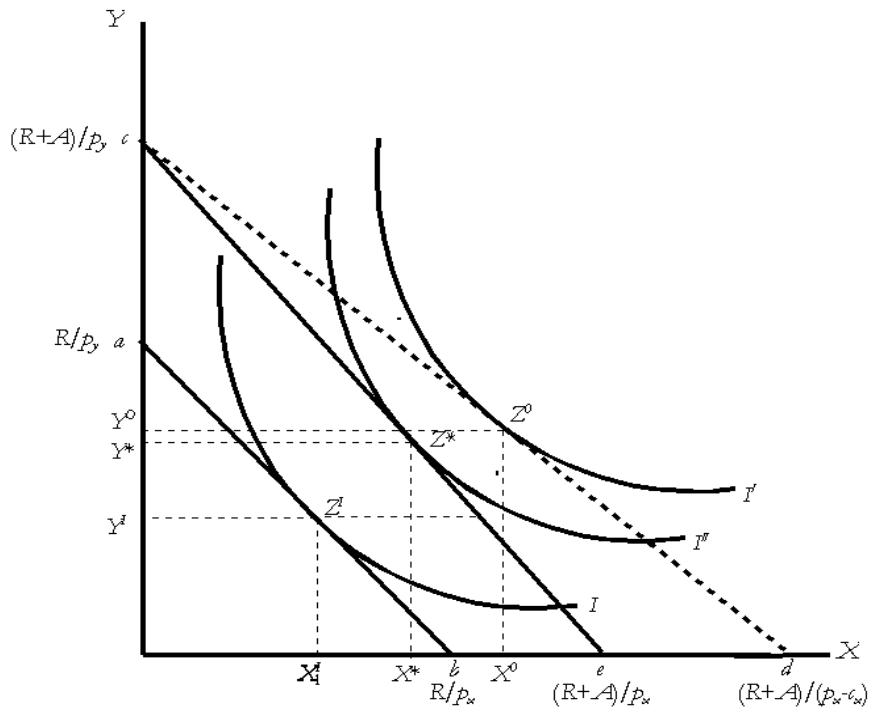
where c_x is the extent of cost recovery required by the donor, per unit of *X* sold to the public. But it is quite common for recipient countries to fail in achieving the extent of cost recovery required by donors. The budget constraint in this situation can be written as

$$(p_x - [1-d]c_x)X + p_y Y = T + A^{\alpha} \text{ and } \quad 0 \leq d < 1 \tag{20}$$

where *d* represents the extent of cost recovery failure. Let us assume in this instance that the policy official correctly perceives the extent of failure, which in this case is the extreme with $d=1$; that is, there is no recovery at all. In this case the budget constraint reduces to (9) and the budget line shifts to *ce* and the target becomes Z^*. However, the implementing official perceives incorrectly that there is full cost recovery and therefore no failure ($d=0$) and spends according to *cd*. The outcome is therefore Z^O, with expenditure increasing by more than the value of the aid inflow and with additional financing being required. More generally, this represents the problems inherent in raising tax revenue (or achieving a specified revenue target) in developing countries. This is a common cause of budget deficits, hence of borrowing.

Our final theoretical scenario is relatively straightforward: a cash block grant which leads to an un- or not fully-anticipated increase in prices. This scenario relates to the 'Dutch Disease' effects of foreign aid. An increasing number of empirical studies have found that large foreign aid inflows lead to a real exchange rate appreciation. The real exchange rate is commonly defined as the relative price of traded goods (imports and exports) to non-traded goods. Governments are usually the recipients of foreign aid and the output of a public sector is primarily non-tradable in nature. Large inflows of foreign

Figure 5



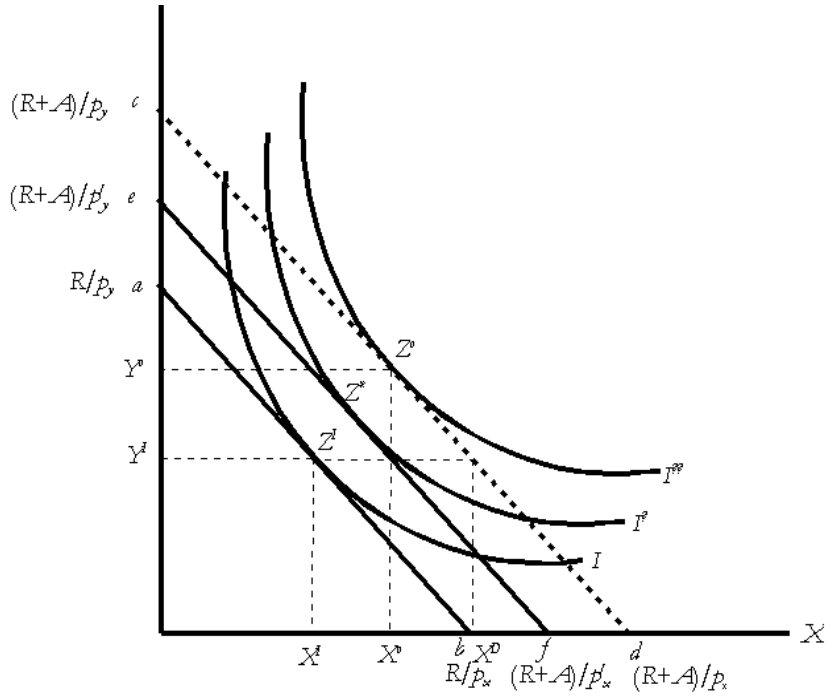
aid commonly lead to greater expenditures on non-tradeable goods. This increases the demand for these goods and therefore leads to an increase in their price. Here we assume, for simplicity, that the prices of both *X* and *Y* increase (although the price of just one good increasing leads to the same outcome) and that this is fully un-anticipated. The new budget constraint becomes:

$$p_x'X + p_y'Y = R + A \qquad (21)$$

The new optimizing solution is *Z**. However the perceived budget constraint is (13) and thus there is overspending which must be financed. This scenario is depicted in Figure 6.

The various scenarios outlined here all indicate how aid can induce overspending by recipients (albeit not necessarily on the goods donors may wish to see increased spending), which results in borrowing in addition to aid loans already received. The problem arises because the spending official may not correctly perceive the budget constraint, what we refer to in general as aid illusion. Such misperceptions may arise because the nature of restrictions on the aid grant are not communicated properly, or because the aid is linked to ambitious cost recovery (or revenue raising) targets. Donors adopt various means to reduce fungibility, such as matching grants or aid in kind, but we have shown that these may not be effective. Such measures may neither ensure the aid is allocated to the intended items nor that aid does not induce overspending. The implication is not to reduce aid, nor even to attach more conditions to aid. Rather, donors need to ensure that aid is granted in a transparent simple way, and technical assistance is provided for budgetary planning in recipient countries.

Figure 6



5 Conclusion

This paper challenged the assumption that aid and borrowing (net of aid loans) are substitutes. Instead, it showed that based on some previous studies and new panel data estimates that aid can actually be positively associated with this form of borrowing and therefore lead to increases in debt. The paper then considered a number of theoretical scenarios in which most of the spending decisions of recipient governments are subject to illusions or misperceptions regarding either the nominal or real value of aid. In each case the overspending is the result, which in turn leads to additional, non-aid borrowing. Finally, it ought to be emphasized that this paper is far from a definitive treatment of aid and public sector borrowing. Its main objective was to give attention to a largely overlooked issue in the literature of foreign aid, in the hope that is receives far more attention. Possible directions for future research are to look into the composition of this form of borrowing more comprehensive econometric investigation of its determinants.

Notes

1 All estimates shown in Table 1, with the exception of those of Pillai (1982) are point. Very similar conclusions are drawn from non-point estimates (that is, where statistically insignificant values are set

to zero). The estimates of a number of studies listed in Table 1, which do report results for additional borrowing, do not satisfy equation (2). In this event $\partial B_I/\partial A_K$ was re-estimated using equation (9).

2 Note that McGillivray and Morrissey (2001a) are rather critical of the approaches used in the literature, including those of studies for which results are reported in Table 1. The usual degree of caution should be attached to interpretations drawn from this table, therefore.

3 Further details of target estimation are available from the authors.

4 The model was also estimated using the random effects approach. However, the approach implied that individual country effects were unimportant and the results reduced to those of OLS estimation. The fixed effects approach found that country-specific effects are important, which is very likely to be the actual case.

5 This section draw heavily on McGillivray and Morrissey (2001b).

6 Loans for the purpose of our analysis would be measured in net terms; that is, the amount of the loan disbursed, less repayments, in the current period.

7 Further to the above discussion of actual price changes, it is possible that the price of X could actually rise as a result of the aid in kind, owing to an increase in demand shown in Figure 2. If not perceived this would exacerbate the outcome just illustrated. Aid-induced price rises are discussed below.

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