



Aid Illusion and Public Sector Fiscal Behaviour

by

Mark McGillivray and Oliver Morrissey

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Acknowledgements

Useful comments were received from participants at the *2000 Annual Meeting of the European Public Choice Society*, Siena, Italy, 26-29 April 2000.

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Abstract

Two findings have been common in the literature on the impact of foreign aid on public sector fiscal behaviour in developing countries. The first is that aid ‘sticks’ to higher levels of recipient government expenditure, with aggregate expenditure often rising by more than the value of the aid inflow. The second is that aid is often associated with declines in taxation revenue. This paper, using insights from public choice research on fiscal illusion, provides a number of theoretical scenarios in which the first of these outcomes arises, but which also allow for simultaneous reductions in taxation. In contrast to the arguments regarding fungibility in *Assessing Aid* we present scenarios where, even assuming that donors and recipients are agreed on how aid should be allocated to expenditure headings, apparent fungibility will arise. The paper concludes by suggesting new directions for research on the impact of aid on the public sector in developing countries.

Outline

1. Introduction
2. Simple Analytics of Aid and Public Sector Behaviour
3. Possible Directions for Future Research
4. Conclusions

References

I INTRODUCTION

Foreign aid remains a principal source of public sector revenue in most developing countries. Aid inflows were roughly equal in magnitude to taxation, and constituted approximately half of all public expenditure, in low income countries during the mid- to late-1990s (World Bank, 1996-99). As most of these inflows go to the public sector of recipient countries, any understanding of aid's broader macroeconomic impacts must start with an understanding of its impact on this sector's fiscal behaviour. It is both understandable and appropriate, therefore, that a growing body of empirical research, from the development economics literature, has looked at the relationship between aid inflows and various public sector fiscal aggregates, including taxation, and recurrent and capital expenditure. Although the major focus was on broad government policy affects the effectiveness of aid, *Assessing Aid* (World Bank, 1998) devoted considerable attention to the relationship between aid and recipient public expenditure.

A common research finding is for aid to 'stick' to increases in total public expenditure (see Heller, 1975; Pack and Pack, 1993; Feyzioglu *et al.*, 1998; World Bank, 1998; McGillivray and Ahmed, 1999). Such increases *per se* are not surprising as donors typically intend aid to augment this expenditure. World Bank (1998) refers to this as a 'flypaper effect', adopting the term used in public choice to describe situations where a central government grant has the effect of increasing local (or lower tier) government expenditure by more than the amount of the grant (Barnett, 1993). In the fiscal federalism literature it is quite common to find evidence that lower tier expenditure does increase by more than the value of central grants, and most explanations are couched in terms of fiscal illusion (Dollery and Worthington, 1996). A typical argument invokes the median voter model: local voter-taxpayers do not fully account for the grant (in evaluating the cost of providing local services), therefore underestimate the tax-price of local government-provided goods and vote for, or accept, higher levels of expenditure (Gemmell *et al.*, 1998). In such models the increased expenditure is associated with increased taxes.

Median voter models are not applicable to developing countries receiving aid, and fiscal illusion arguments are not a helpful way to try and explain why total expenditure can increase by more than the value of the aid inflow. Rather, we suggest that there may be forms of aid illusion, in the sense that there are misperceptions regarding how aid should be accommodated in public expenditure. Furthermore, aid is often associated with declines or less than proportional increases in taxation and other recurrent revenue (Khan and Hoshino, 1992; Iqbal, 1997; Pack and Pack, 1993; Ahmed, 1998; McGillivray, 1999; Gang and Khan, 1999).¹ Clearly, this is at variance with the normal flypaper effect. What we seek to explain, then, is why aid can lead to more than proportional increases in expenditure that are *not* financed by increased taxes.

We emphasise at the outset that Feyzioglu *et al.* (1998) and World Bank (1998) are not specifically concerned with explaining why aid is associated with greater increases in expenditure but not with increases in tax revenue. Rather, they are concerned with the broader issue of fungibility – that recipients ‘divert’ aid funds to spending on headings that the donors did not wish to support (and with related cases where aid appears to be associated with less than proportional increases in expenditure). That is, they are concerned with why the ‘wrong’ items of spending increase, or why desired expenditures do not increase, rather than with total spending; McGillivray and Morrissey (2000) provide a critical discussion of these concepts of fungibility. Conventional treatments of fungibility tend to assume, implicitly if not explicitly, that recipient’s intentionally divert aid to uses other than those intended by the donor. Such fungibility is easily explained if donors and recipients simply have different preferences regarding the allocation of public expenditure; ‘malicious’ intent is not required (McGillivray and Morrissey, 2000).

We do not here invoke the assumption that donor and recipient preferences differ; they may do so, but it is not necessary for our arguments. Our aim is to shed light on the finding that aid leads to greater than proportional increases in total public expenditure in recipient countries. To do this we provide five theoretical scenarios under which this

¹. It should be emphasised that this literature is not uncontentious, with many studies and in some instances the literature as a whole coming under sharp criticism (see, for example, Binh and McGillivray, 1993; Gang and Khan, 1993, 1994; Khan, 1994; McGillivray, 1994; White, 1994; McGillivray and Morrissey, 2000).

outcome arises, using relatively simple, yet incisive, static microeconomic analysis. In each scenario tax and other recurrent revenue can fall simultaneously. In most scenarios the above-mentioned finding results from misperceptions or illusions regarding either the real or nominal value of the aid inflow. In all but one scenario an illusion occurs. To this extent the paper builds on research from the public sector economics literature on fiscal illusion and preference revelation (see Barnett, 1993). In this respect the paper attempts to forge links between the public choice and development economics literatures.

Fundamentally, however, the paper should be seen as an attempt to open new avenues of enquiry for research on aid impact. Specifically, we do not require any conflict of interest between donors and recipients. All we require are possibilities of misperceptions and/or inefficiencies in the flow of information and monitoring in budgetary processes. In developing countries, such possibilities are strong probabilities. World Bank (1998) details the inefficiencies and problems in budgetary management and expenditure monitoring in low-income countries, and how difficult it is to alleviate these capacity constraints.

The paper consists of three further sections. Section 2 outlines the above-mentioned scenarios and points to their outcomes both for expenditure and financing. Section 3 considers possible directions for future research on aid and the public sector in developing countries. Heavy emphasis is given to more research on the link between aid and borrowing. Section 4 concludes.

II SIMPLE ANALYTICS OF AID AND PUBLIC SECTOR BEHAVIOUR

Our concern is with the behaviour of a particular spending unit within the public sector of a given developing country. This might be a ministry, a department or a section within such an organisation. The most important features distinguishing this unit are that: (i) it is responsible for allocating a given amount of aid between 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 officials making decisions on the unit's expenditure. 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 units.² We focus on the decisions of the official with ultimate responsibility for expenditure on specific headings.³ Aid is assumed to be fully fungible; that is, the official treats aid like any other category of revenue and allocates it according to their own preferences, rather than those of the donor, which may be different.

In this context, there may be no fungibility on behalf of the recipient government. That is, the finance or planning ministry may allocate aid to expenditure headings exactly as agreed with donors. Thus, there is no fungibility in the ‘top level’ budget allocations. Our analysis can be interpreted as what happens to expenditure allocations at lower levels, such as in the health or education ministries. Alternatively, our analysis could be viewed as representing allocations to ministries made by the finance ministry, assuming that revenue is exogenous to the officials making these decisions (the may in a different part of the ministry from that that agreed aid allocations with donors). As will become apparent, the outcomes can diverge from intentions. This could be considered as *ex post* fungibility, as distinct from the more common notion of intended *ex ante* fungibility.

We further assume that the official derives utility purely from the quantities of goods purchased with the revenue at their disposal. For convenience, and in a manner similar to Feyzioglu *et al.* (1998), we divide goods into two categories: those which donors intend the official to purchase with a given aid inflow (X) and all other publicly-provided goods

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2. A word of clarification regarding aid inflows is warranted. Recent fiscal response studies assume that the amount of aid allocated by the public sector as a whole in developing countries is endogenous, or a choice variable from the perspective of this sector (Franco-Rodriguez *et al.*, 1998; McGillivray and Ahmed, 1999; France-Rodriguez, 2000). This refers to the amount of aid disbursed by this sector, which is different to the amount of aid committed by donors. The latter amount is treated by these studies as exogenous from the perspective of recipients. The aid variable in our treatment of spending decisions will be the amount of aid disbursed from the finance ministry (or its equivalent) to the spending unit. This will be endogenous from the perspective of the finance ministry, but not necessarily from the perspectives of all spending units.
 3. One could focus on the decisions of a median official of this type in order to generalise the findings of the analysis. Such treatment could be related to public choice approaches based on based on a median voter. As typically democracy is little developed in the countries being considered, links to median voter models seem inappropriate.

(Y). The aid inflow is denoted as A , and comprises grants and loans from official international donor agencies.⁴ The official's utility function can be written as:

$$U = U(X, Y). \quad (1)$$

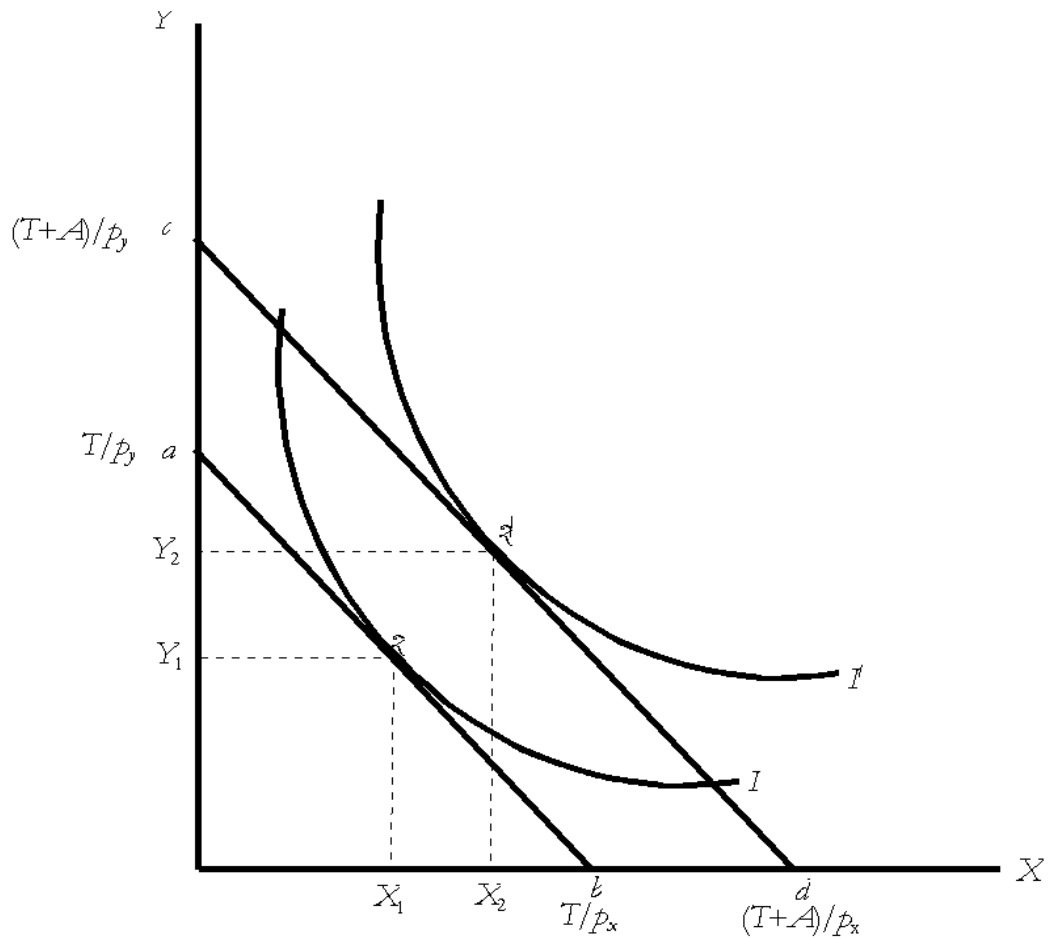
The budget constraint prior to receiving aid is

$$p_x X + p_y Y = T \quad (2)$$

where p_x and p_y are the prices of X and Y , respectively, and T is tax and other recurrent revenue made available to the official for expenditure on X and Y . The optimising problem for the official is to maximise (1) subject to (2). Assuming homothetic preferences, the solution is shown diagrammatically in Figure 1 at point z .

⁴. 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.

Figure 1. Cash Aid and the Budget Constraint



Now assume that a donor provides aid and wants to see the inflow allocated entirely to expenditure on X . Further assume 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:

$$p_x X + p_y Y = T + A \quad (3)$$

and the new optimising solution is z^2 . 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.

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 available to the official in response to the aid, topping-up the aid money with matching funds of its own. That is, the budget constraint would become

$$p_x X + p_y Y = T + A + T^{\&} \quad (4)$$

where $T^{\&}$ is the additional tax revenue. This could be depicted by a further rightward shift in the budget line, with the new optimum yielding an overall increase in expenditure which 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 on fungibility (Feyzioglu *et al.*, 1998; World Bank, 1998).

Let us now consider some other, more feasible and otherwise unexplored scenarios. In most of these scenarios expenditure increases in excess of aid are financed, eventually, by borrowing from domestic or private international sources. 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 modeled as a conscious and deliberate supplement to aid inflows, and thus not as a simple and direct outward shift in the budget line. In effect, we assume that the borrowing implication is realised in the period following this static optimisation and is not taken into account (agents are not forward-looking).

Prior to turning to these scenarios two other points ought to be made. The first is that there is some empirical evidence of aid leading to increased non-aid borrowing (Franco-Rodriguez *et al.*, 1998), although this linkage has not received much attention in the literature. We return to this issue below. Second, in all scenarios expenditure increases in excess of the aid inflows can still occur even with simultaneous reductions in tax and

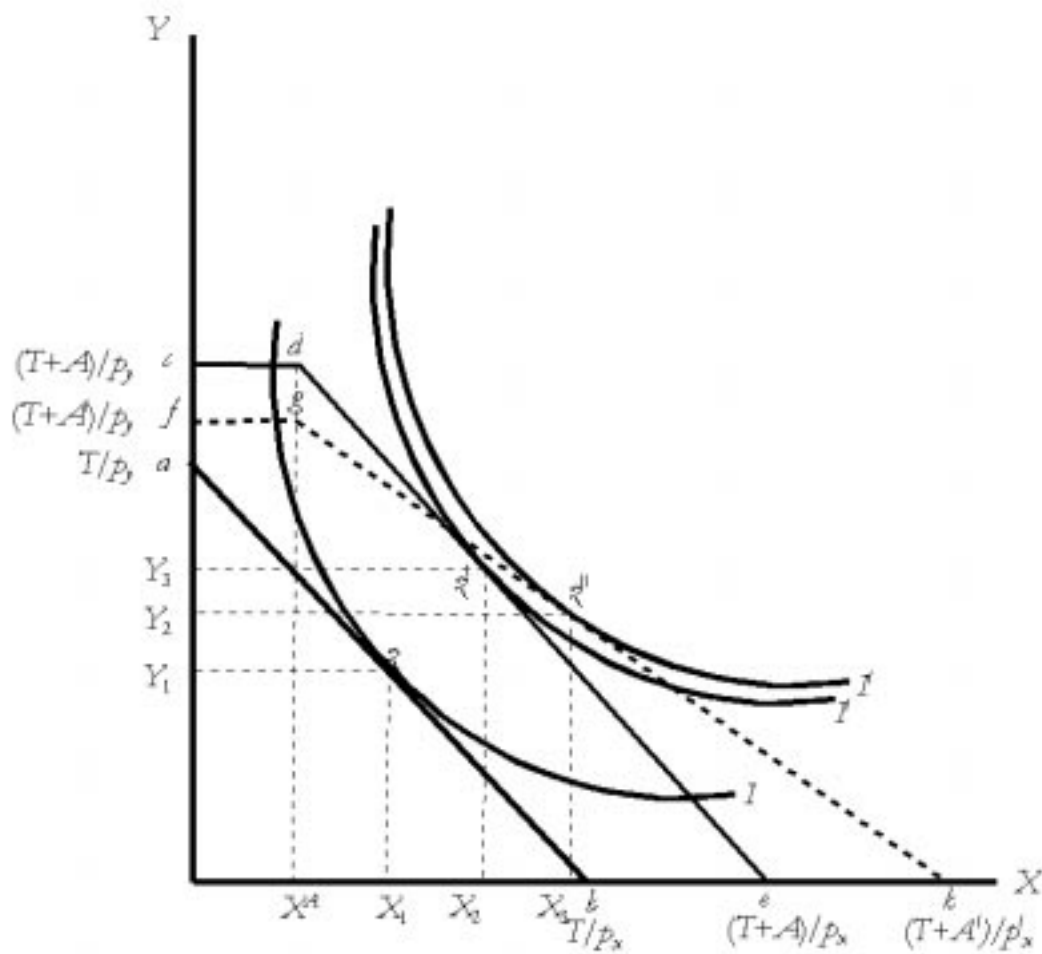
other recurrent revenue. This is not demonstrated explicitly as it should be reasonably clear from the diagrams presented below. We do not seek to explain why tax revenues might fall, but our analysis is not compromised if it does.

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

$$p_x(X + X^A) + p_y Y = T + A \quad (5)$$

where X^A is the aid in-kind and $A = p_x X^A$ 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 in Kind and Misperceptions



Aid may induce a perceived fall in domestic prices. In this context it is useful to think of the prices of the two publicly-provided goods as defined with respect to a numeraire private good's price. 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 the X -good is not exchanged in domestic markets. Even if the aid does not affect domestic prices it is possible that the 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

$$\rho_x (X + X^A) + p_y Y = T + A^{\&} \quad (6)$$

where ρ_x is the perceived price of X , and $A^{\&} = \rho_x X^A$. 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 points z to $z^{\&}$. Had the official's perception of prices been correct, the corresponding move would have been from z to $z^{\&}$. 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.⁵

If borrowing is not permitted, the result may be a termination of the budget line 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 any shortfall would impact on X . Donors could then either accept *ex post* under-spending on X (total spending would increase by the amount of the aid, but with fungibility) or release new aid for X . In practice, borrowing often occurs; cash budgets have had only a limited impact in constraining this (Stasavage and Mayo, 1999).

A second scenario is one in which the recipient is allocated a matching grant, equal to μ , which subsidises the purchase of X up to a threshold quantity X^* . The budget constraint therefore becomes:

$$(1 - \mu)p_x X + p_y Y = T \quad \text{for } X \# X^* \quad (7)$$

The value of the aid inflow in this case equals $\mu p_x X$ and is set at a maximum of $\mu p_x X^*$. The corresponding budget line is acd in Figure 3. The optimum point now coincides with c , the corresponding quantity of X , X_2 , coincides with X^* and expenditure increases by the full amount of the aid allocation (and by the total amount of aid the donor was willing to provide). Yet budgetary processes can in all countries be chaotic to varying degrees, especially in developing countries. One reason for this is information

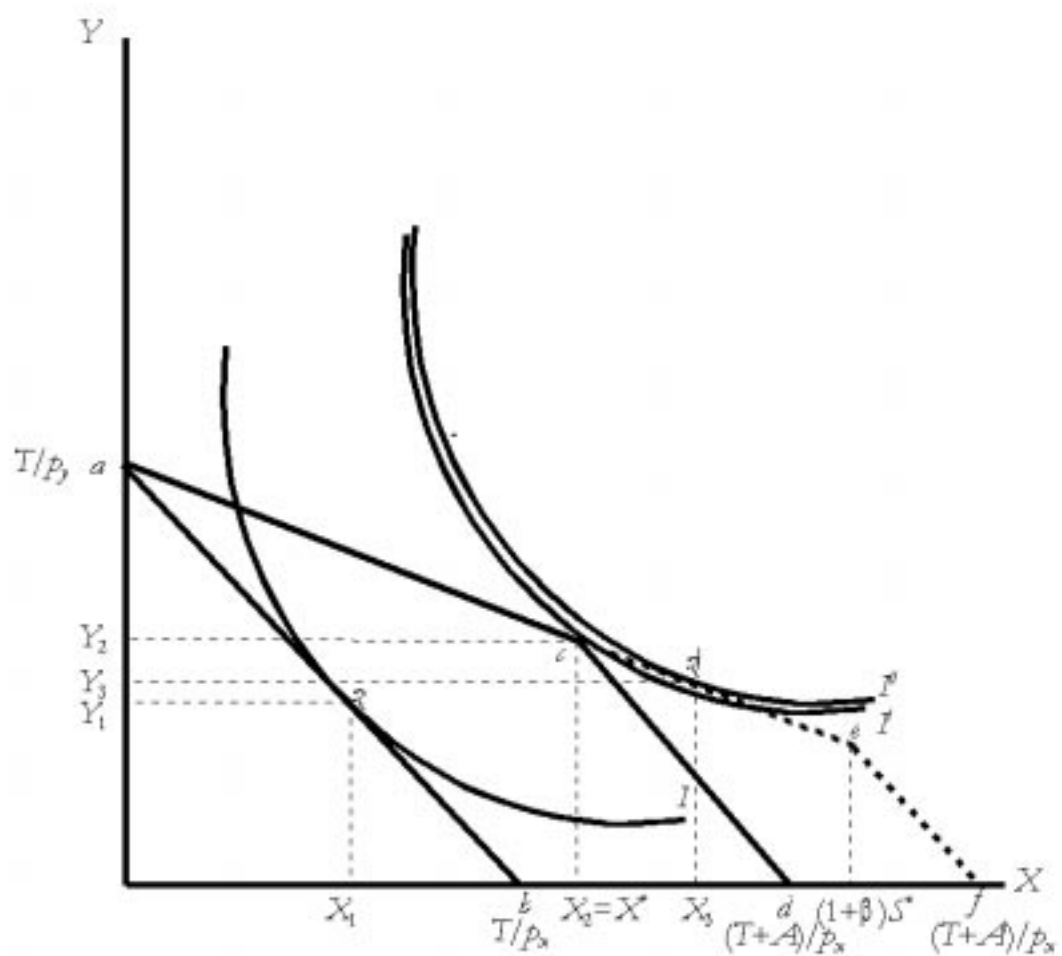
5. Further to the above discussion of actual price changes, it is possible that the price of X could actually rise as a result of the aid in kind, owing to an increase in demand shown in Figure 2. If not perceived this would exacerbate the outcome just illustrated.

deficiency. It is quite possible that the threshold is not adequately communicated to, or perceived by, the official. The budget constraint can thus be written as:

$$(1-\mu)p_x X + p_y Y = T \quad \text{for } X \neq (1+\beta)X^* \quad (8)$$

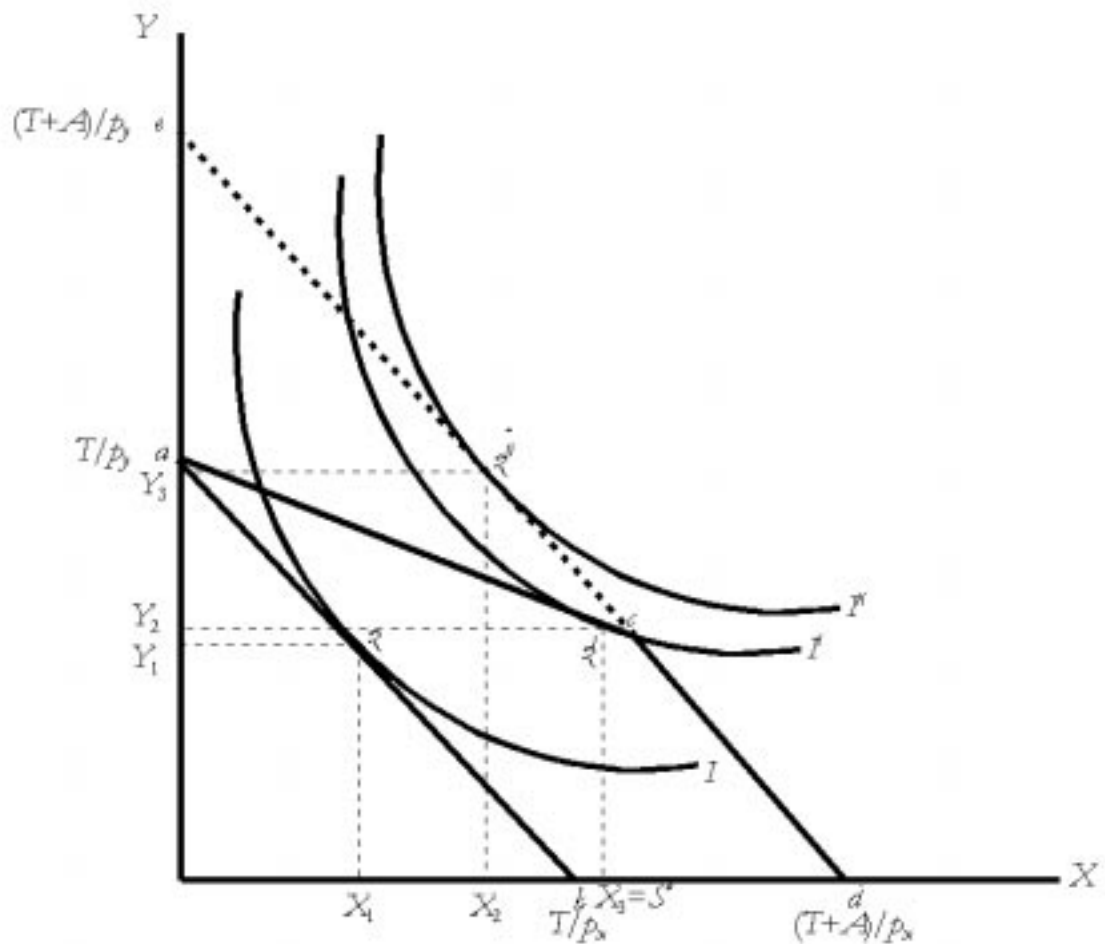
where β is an error parameter which for the purpose of our analysis is assumed to be greater than zero. Under this scenario the official behaves as if the amount of aid available is $A^{\&} = \mu p_x (1+\beta)X^*$. The corresponding budget line, shown in Figure 3, is aef . The perceived optimal outcome, with homothetic preferences, is $z^{\&}$, 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 $z^{\&}$ lies to the right of the actual budget line acd , and will have to obtain additional finance (thus, the aid combined with misperceptions leads to increased borrowing to fund the resulting deficit).

Figure 3. Matching Grants and Misperceptions



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 (7), but the perceived constraint is (3). The corresponding budget lines are acd and ed , respectively. Without the misperception the official would shift to $z^{\&}$, but instead spends according to $z^{\&\&}$. Total expenditure increases by an amount greater than the aid inflow (and the excess is allocated to Y rather than X), and the official must obtain additional funds to finance this spending.

Figure 4. Matching Grant Perceived as Block Grant



Aid often subsidises 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 is our fourth scenario. The budget constraint therefore becomes

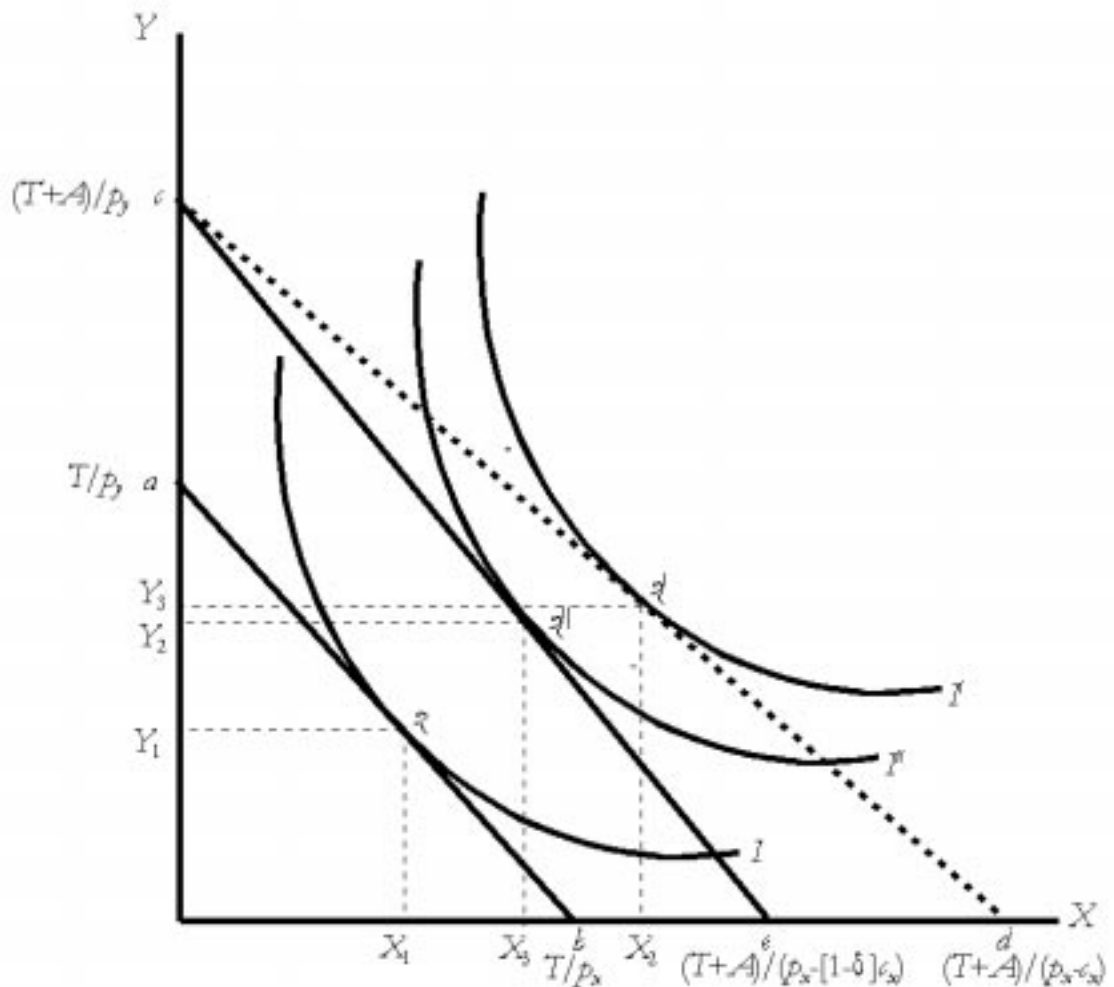
$$(p_x - c_x)X + p_y Y = T + A \quad (9)$$

where c_x is the extent of cost recovery required by the donor, per unit of X sold to the public. In this situation the budget line, shown in Figure 5, shifts in principle from ab to cd and the new optimum point is $z^{\&}$ and expenditure increases by more than the value of the aid inflow without additional financing being required. But it is not uncommon for recipient countries to fail in achieving the extent of cost recovery required by donors. The budget constraint in this situation, our fifth scenario, can be written as

$$(p_x - [1 - \delta]c_x)X + p_y Y = T + A^{\&} \quad \text{and} \quad 0 \neq \delta < 1 \quad (10)$$

where δ represents the unanticipated extent of cost recovery failure. The actual budget line is therefore ce and the corresponding optimum is $z^{\&\&}$. But the official has spent according to cd , expenditure has risen by more than the value of the aid inflow and additional financing is required. It is worth noting that this scenario does not require misperceptions. Rather, it captures the possibility of implementation failures for cost recovery in developing countries. 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

Figure 5. Cost Recovery



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). The problem arises because the spending official may not correctly perceive the budget constraint. 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.

III. POSSIBLE DIRECTIONS FOR FUTURE RESEARCH

The most obvious direction for future research is that more attention be paid to the link between aid and other borrowing. In much of the empirical literature on aid and the public sector, cited above, this variable is ignored. Those studies which do take into account borrowing estimate a system of simultaneous equations, but do not estimate the borrowing equation or do not provide sufficient information to infer values of its parameters. The relevance of scenarios one to three and five above (and related scenarios) is obviously enhanced if aid can be shown to lead consistently to increases in borrowing.

But simply reporting estimates of a borrowing equation within the context of existing models of aid and public sector fiscal behaviour alone would not be sufficient. Existing empirical studies focus on fiscal aggregates and not the behaviour of individual spending agencies within the public sector of developing countries. But the approach of this paper is essentially microeconomic, looking at the behaviour and conditions under which specific spending agencies operate. Such behaviour is unlikely to be uniform across agencies, and this approach is therefore justifiable. In particular, the provision of aid in kind, in block or matching grant form, or with specific conditions attached will clearly not apply to the public sector as a whole. Moreover, the traditional approach of treating taxes as endogenous, and recent advances which treat aid as endogenous are quite appropriate at the aggregate level. But they might not be appropriate at the level of spending agencies within the public sector. Modifications to the empirical modeling approach used in the relevant literature need to be considered.

Finally, there is a strong case for more theoretical work prior to the conduct of further empirical research. As it currently stands the empirical research on aid and the public sector is to varying degrees *ad hoc*, so theoretical exploration is justified *per se*. Such work could well benefit from the derivation of lessons and directions from the literature

on public choice. Indeed, it is ironic that development economics research on aid and the public sector in developing countries has in general, and in recent years especially, ignored the public choice literature.

IV. CONCLUSION

This paper attempted to shed light on the finding, common in empirical research on the impact of aid on public sector fiscal behaviour, that these inflows lead to greater than proportional increases in total public expenditure in recipient countries. It provided five theoretical scenarios under which this outcome arises, using a relatively simple static microeconomic analysis. In each scenario tax and other recurrent revenue can fall simultaneously. To this extent the scenarios are consistent with another common finding of the above-mentioned research, that aid can be associated with reductions in tax and other recurrent revenue. In most scenarios the above-mentioned finding resulted from misperceptions or illusions regarding either the real or nominal value of the aid inflow. To this extent the paper built on research from the public choice approaches to fiscal illusion and preference revelation, and attempted to forge links between the public choice and development economics literatures. Fundamentally, however, the paper attempted to open new avenues of enquiry for research on aid impact. Such avenues include greater consideration of the determinants of borrowing in developing countries, as well as consideration of the different forms in which aid is provided, and in general the conditions under which individual spending agencies, rather than the public sector as a whole, operate.

In one sense our analysis can be interpreted as implying that targeting aid on specific uses or expenditure headings may be even more difficult to achieve than suggested in conventional fungibility literature. In a naïve sense, most writers on fungibility argue that recipients do not want to spend aid in the way that donors want it spent. Furthermore, there is a limit to what donors can do about it, as attempts to attach conditions to the use of aid tend not to be effective. This does not mean there is nothing that donors can do; as McGillivray and Morrissey (2000) argue, there are various ways in which donors can limit, albeit not eliminate, fungibility and influence recipient allocations of aid to expenditure headings. The point made here is that these measures must be transparent, the intentions must be communicated to the relevant spending

officials, and recipients must have effective means of monitoring expenditures and budgetary processes. As argued in World Bank (1998), many problems stem from weak public expenditure management in recipient countries. Measures to address this are essential if aid is to be used more effectively. However, many problems stem from the actions of donors also. Donors rarely coordinate amongst themselves and employ different aid administration processes. At the most trivial level, timing of financial years and classifications of expenditures often differ among donors and between donors and recipients. This is a source of misperception and misinformation that exacerbates budgetary inefficiencies in recipient countries, may encourage excess spending and thus leads to deficits and borrowing. Our principle contribution is to suggest a distinction be drawn between *ex ante* fungibility, where donor and recipient spending preferences differ, and *ex post* fungibility, where both donors and recipients have less than efficient processes for allocating and monitoring aid expenditures. The implications for aid policy and practice are very different in each case.

REFERENCES

- Ahmed, A. (1998), 'Aid and Fiscal Behaviour in Developing Asia', in M. Alauddin and S. Hossan (eds). *Development, Governance and Environment in South Asia: Special Focus on Bangladesh*, London: Macmillan, 1998.
- Barnett, R (1993), 'Preference Revelation and Public Goods', in P.M. Jackson (ed), *Current Issues in Public Sector Economics*, Macmillan, London, pp. 94-131.
- Binh, T. and M. McGillivray (1993), 'Foreign Aid, Taxes and Public Investment: A Comment', *Journal of Development Economics*, 41, 173-176.
- Dollery, B. and A. Worthington (1996), 'The Empirical Analysis of Fiscal Illusion', *Journal of Economic Surveys*, **10**, 261-297.
- Feyzioglu, T., V. Swaroop and M. Zhu (1998), 'A Panel Data Analysis of the Fungibility of Foreign Aid', *World Bank Economic Review*, **12**, 29-58.
- Franco-Rodriguez, S. (2000), 'Recent Advances in Fiscal Response Models with an Application to Costa Rica', *Journal of International Development*, 12:3, 429-442.
- Franco-Rodriguez, S., M. McGillivray, M. and O. Morrissey (1998), 'Aid and the Public Sector in Pakistan: Evidence with Endogenous Aid', *World Development*. 26, 1241-1250.
- Gang, I.N. and H.A. Khan (1991), 'Foreign Aid, Taxes and Public Investment', *Journal of Development Economics*, 24, 355-369.
- Gang, I.N. and H.A. Khan (1993), 'Reply to Tran-Nam Binh and Mark McGillivray: Aid, Taxes and Public Investment: A Comment', *Journal of Development Economics*, 41, 177-178.
- Gang, I.N. and H.A. Khan (1994), 'Reply to Howard White: Foreign Aid, Taxes and Public Investment: A Further Comment', *Journal of Development Economics*, 45, 165-167.
- Gang, I.N. and H.A. Khan (1999), 'Foreign Aid and Fiscal Behaviour in a Bounded Rationality Model: Different Policy Regimes', *Empirical Economics*, 24, 121-134.
- Gemmell, N., O. Morrissey and A. Pinar (1998), 'Fiscal Illusion and the Demand for Local Government Expenditures in England and Wales', University of Nottingham: *Discussion Papers in Economics No. 98/19*.
- Heller, P.S. (1975), 'A Model of Public Fiscal Behaviour in Developing Countries: Aid, Investment and Taxation', *American Economic Review*, 65, 429-445.
- Iqbal, Z. (1997), 'Foreign Aid and the Public Sector: A Model of Fiscal Behaviour in Pakistan', *Pakistan Development Review*, 36, 115-129.

- Khan, H.A. and E. Hoshino (1992), 'Impact of Foreign Aid on the Fiscal Behaviour of LDC Governments', *World Development*, Vol. 20, 1481-1488.
- Khan, H.A. (1994), 'The Impact of Foreign Aid on the Fiscal Behaviour of Asian LDC Governments: Reply to Mark McGillivray', *World Development*, 22, 2019-2020.
- McGillivray, M. (1994), 'The Impact of Foreign Aid on the Fiscal Behaviour of Asian LDC Governments: A Comment on Khan and Hoshino (1992)', *World Development*, 22, 2015-2017.
- McGillivray, M. (1999), 'Aid and Public Sector Fiscal Behaviour in Developing Countries', *Review of Development Economics*, forthcoming.
- McGillivray, M. and A. Ahmed (1999), 'Aid, Adjustment and Public Sector Fiscal Behaviour in the Philippines', *Journal of the Asia-Pacific Economy*, 4, 381-391.
- McGillivray, M. and O. Morrissey (2000), 'Aid Fungibility in *Assessing Aid: Red Herring or True Concern?*', *Journal of International Development*, 12:3, 413-428..
- Pack, H. and J.R. Pack (1990), 'Is Foreign Aid Fungible? The Case of Indonesia', *Economic Journal*, 100, 188-194.
- Pack, H. and J.R. Pack (1993), 'Foreign Aid and the Question of Fungibility', *Review of Economics and Statistics*, 75, 258-265.
- Stasavage, D. and D. Mayo (1999), 'Are cash budgets a cure for excess fiscal deficits (and at what cost)?', Oxford, Centre for the Study of African Economies, WPS/99-11.
- White, H (1994), 'Foreign Aid, Taxes and Public Investment: A Further Comment', *Journal of Development Economics*, 45, 155-163.
- World Bank (1996-99), *World Development Report*, (various years) Oxford University Press, New York.
- World Bank (1998), *Assessing Aid. What Works, What Doesn't and Why*, Oxford University Press, New York.

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