#### 1 Introduction

Programme aid has macroeconomic consequences through both the policy changes supported by the aid and the macro effects of the funds themselves. The first of these has been quite extensively discussed in the debate over conditionality. Hence, whilst policy effects are an important aspect of an evaluation, this paper focuses on the effects of the funds. In addition, the paper focuses in the neglected area of impact, not the better addressed ones of efficiency and effectiveness (see Caputo 1996; Maxwell 1996; and White 1996a). The two issues to be considered are the impact of the forex received within the context of the balance of payments and the fiscal effects of the local currency raised by the sale of that forex. It does not matter if the funds are designated as budget support or import support, the analytical framework for looking at these two aspects is the same in each case (though the systemic effects may differ).

Within both the balance of payments and the government budget there may be aggregate and categorical fungibility. Discussion of aggregate fungibility considers the impact of the funds received on either external account aggregates (imports, exports, commercial borrowing, reserves, etc.) or the overall level of revenue, expenditure and government borrowing. Analysis of categorical fungibility looks inside the item of most interest to the donor (import composition in the case of import support and sectoral expenditure for counterpart funds and budget aid).

This paper examines aggregate and categorical fungibility of untied foreign exchange receipts in Sections 2 and 3 respectively. Section 4 briefly considers these issues for the analysis of budget support and counterpart funds. Section 5 concludes.

## 2 Aggregate Fungibility in the Balance of Payments

In the two gap model aid results in an equivalent increase in imports. Aid and imports are related by the fact that, simply put, imports equal exports plus aid. The reality is not so straightforward for three reasons. First, the external account consists of more than these three items (exports, imports and aid), some of the other items - notably debt

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A Conceptual Framework

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service - being far from insignificant. Second, some aid may well be intended for debt service rather than imports. Finally, a one-for-one response of imports to aid will only be observed if all other items are constant, which of course they are not.

The analysis of aggregate fungibility starts with the accounting framework, which is used to identify the most significant variables in explaining the changes in the level of imports (see White 1994: Ch. 2, for a fuller discussion of the accounting framework). External balance requires that the balance of payments sum to zero. That is:

$$X + AID + PCT + OFP + OKI + \Delta R - M - DS + EO$$
  
= 0 (1)

where X and M are exports and imports of goods and non-factor services respectively, AID is aid (comprising official transfers - that is, grant aid - and concessional loans; all types of aid are included here,  $^1$  though it may be decided to show debt relief separately), PCT is private current transfers, OFP is other net factor payments from abroad, OKI other gross capital inflows, DS debt service (amortization plus interest payments),  $\Delta R$  the change in reserves and EO errors and omissions.  $^2$  (A positive  $\Delta R$  is a reduction in reserves, that is an 'inflow' of capital to the capital account).

Equation (1) is an identity and so **must** hold. Therefore an increase in aid **must** be accompanied ('accommodated') by changes in one or more of the other variables in the identity. Clearly, an aid inflow may be accommodated not only by higher imports, but also by any of: reduced receipts of private transfers or factor income, a lower gross net capital inflow (either flight of domestic capital or the crowding out of private inflows - a change in either OKI or EO'), higher debt service payments, reserve accumulation or reduced exports. A note of caution

#### Methods of analysis

There is an established and well-discussed literature on methodology in the adjustment debate. It is not necessary to review that debate here, only to point to the conclusion: to carry out with versus without analysis requires a modelling approach. The accounting framework given by equation (1) shows the different variables which may adjust to accommodate the aid inflow. From this starting point we need to determine the behaviourial relationships. The theoretical underpinning for analysis is provided by the literature on the macroeconomics of aid. Application of these theories to evaluate the impact of programme aid requires empirical estimation of the behaviourial equations.

For many developing countries formal modelling of these relationships is constrained by either or both a lack of data (short or missing series) and the instability of economic relationships on account of regime changes. A full-blown macro model - incorporating the various forms of programme aid as independent variables - is therefore unlikely to be possible. The alternative is to use a more *ad hoc* approach, in which parameter estimates are drawn from a mixture of econometric work, other studies and guestimates.<sup>4</sup> This approach is now described for the analysis of aggregate fungibility in the balance of payments.

### The balance of payments and sources and uses of forex

The starting point is to obtain a consistent set of balance of payments figures, where the categories used should by-and-large correspond to those

is necessary: the accounting framework is useful for identifying key areas for analysis but does not necessarily establish causal links - the quantification of these links should be the ultimate objective of the evaluation

<sup>&</sup>lt;sup>1</sup> Technical assistance should only be included if the import of services is captured in the factor service account.

<sup>&</sup>lt;sup>2</sup> This identity may be presented in a number of ways through various aggregations and/or disaggregations, and to show the current account on one side of the equation and the capital account on the other. It is usual to present capital inflows net of amortization so that only interest payments appear on the left hand (current transaction) side of the equation.

<sup>&</sup>lt;sup>3</sup> One method of measuring capital flight is through errors and omissions, so that the aid may be accommodated through changes in EO.

<sup>&</sup>lt;sup>†</sup> This approach to parameter estimation is established practice in much CGE modelling.

	1989-93 (\$US millions)				
	1989	1990	1991	1992	1993
Uses of forex					
Imports	1020	1084	952	1302	950
Debt service	354	759	767	679	544
Payment of arrears	0	255	171	216	153
Total	1374	2098	1890	2197	1647
Sources of forex					
Exports	1410	1263	1085	1111	949
Aid	236	422	798	1070	820
Debt relief	0	725	293	551	359
Change in reserves <sup>1</sup>	-130	11	30	-95	-71
Other items <sup>2</sup>	-142	-323	-316	-440	
Total	1374	2098	1890	2197	1647
Memo item:					
Net inflow <sup>3</sup>	-118	133	153	726	482

Notes: (1) - indicates increase in reserves; (2) comprising net non-interest service

payments; net short-term flows; valuation adjustment and errors and omissions;

(3) aid plus debt relief minus debt service and payment of arrears.

Source: Mwanawina and White (1995).

identified in equation (1). These data may be reclassified to show 'sources and uses of forex', giving a descriptive overview of the balance of payments (e.g. the relative importance of exports and aid as sources of forex). For example, in the case of Tanzania exports accounted for over 70 per cent of all forex receipts in the early 1970s but less than one third by the late 1980s: meanwhile the share of aid had risen from under one fifth to nearly half (White and Wuyts 1993: 24). Table 1 shows the sources and uses of forex table (derived from the balance of payments) for Zambia for the period 1989 to 1994. The usual balance of payments convention is to show scheduled debt service payments (rather than actual) as an outflow and to record arrears accumulation as a mode of financing.

However, since 1990 Zambia has been repaying arrears, so that these are shown as a use of forex and the debt service shown is actual debt service.<sup>5</sup>

The balance of payments data show real imports to have declined dramatically from 1989 to 1991, but have recovered somewhat thereafter. The change in real imports can be broken down into a price effect and changes in nominal imports. Looking for the moment at nominal changes, there was a decline in imports from 1989 to 1991 despite a ten-fold rise in net transfers from \$US 44 million to \$US 481 million and an increase in loan disbursements from \$US 192 million to \$US 317 million. Assuming, for simplicity, that both these sources are entirely constituted by aid (which is not entirely true, but not

<sup>&</sup>lt;sup>5</sup> There has been some accumulation of arrears in this period, though these are small compared with the magnitudes shown here and are presumably netted out from the data.

so unrealistic when looking at broad orders of magnitude) - then a \$US 660 million increase in aid inflows was matched by a \$US 68 million **decline** in imports. Clearly other things have not been constant whilst aid has been increasing.

Imports are clearly not the only important use of forex - in 1990 and 1991 roughly half of all forex was used for debt service and payment of arrears, this figure remaining above 40 per cent in 1992 and 1993. The debt relief provided to Zambia has not been sufficient to cover these payments - so that debt servicing has eaten into aid flows. However, aid plus debt relief have exceeded the value of debt service and payment of arrears - shown as a positive net inflow in the bottom row of Table 1 (but shortterm flows are excluded here - the intention is to show if there has been 'new money' from aid-related flows, which there has). That this new money has not facilitated an increase in imports appears to be the result of deteriorating export earnings. The relative importance of these different factors may be further analysed by decomposing the sources of changes in imports.

Decomposition analyses have been extensively applied to the external account (e.g. Balassa 1986) and were used in an aid accounting framework in the SASDA-financed studies collected in White (1994). They have also been applied in the BOP support evaluation of Zambia for SIDA (Mwanawina and White 1995, where the technical details for this analysis are supplied - see also White 1996b). This technique is descriptive and the results are not reported here at length (see Mwanwina and White 1995, and White 1996b) the main finding is that the increase in inflows has been largely matched by increased debt service (so the net inflow is relatively small in most years) and, in most years, a deterioration in export earnings. Only in one year (1992) did a combination of higher flows and improved earnings reach sufficient levels to facilitate a marked rise in imports, and this fact was presumably due to the provision of drought-related assistance. We can thus conclude that whilst the traditional view is that aid is intended to increase imports that is no longer the case as some - in Zambia's case, most - aid is actually intended to contribute to debt servicing. But what if Zambia had not received aid? - if it would have paid some of the debt anyhow, then that aid which is being accounted against debt payments is actually free forex. To examine this issue it is necessary to analyse behavioral relationships.

#### A counterfactual balance of payments

As discussed above, the best approach would be an economy wide model incorporating different forms of aid. But there are no such models and, if there were, data for their estimation would be hard to come by. Hence a more *ad hoc* approach must be adopted, involving a series of judgements about the impact of aid on the other items in the balance of payments in order to construct a counterfactual balance of payments. This counterfactual will show, *inter alia*, the level of imports in the absence of aid.

Table 2 summarizes the expected impact, and the channels for that impact, of aid on the various items in the balance of payments. The theories and evidence have been reviewed elsewhere (see White 1992; White and Luttik 1994; and White 1994: Ch. 2). An important exception is the absence of any empirical analysis of the additionality of debt relief. That is - does debt relief pay debt that would have been paid anyway (so it is equivalent to free forex) or debt that would not have been paid (so no additional forex is directly available to the recipient as a result of the relief)? Regression analysis reported in White (1996b) shows that debt forgiveness has a significant impact on debt payment - i.e. at least some of the debt would have not been paid in the absence of the relief. Loan finance also increases debt payment in all regions but Asia, though exports have no significant effect. A perverse, though robust, finding was that grants reduced debt payments.

The *ad hoc* approach advocated above to analyse behaviourial relationships was adopted in Mwanawina and White (1995), but that analysis failed to make explicit the model closure being assumed. Closure may be either through quantity adjustment (i.e. forex rationing, with imports determined as a residual) or through the market (i.e. exchange rate adjustment). A procedure for constructing the counterfactual under each of these assumptions is summarized in Table 3.

Using the quantity-constrained approach, Mwanawina and White (1995) found the impact of aid on total imports to be as shown in Figure 1. To

Variable	Impact of aid	
Exports	Possible reduction through Dutch disease effects (real exchange rate appreciation). This possibility supported by empirical analyses of effects of aid funds, but effect ambiguous if also allow for impact of aid-supported policies.	
Arrears accumulation	Aid may (intentionally for debt relief or through fungibility) be used for arrears reduction.	
Private current transfers and other factor payments	No effect anticipated in the literature.	
Other capital inflows	Either aid may act as a catalyst for commercial borrowing (World Bank position on adjustment lending though admitted in <b>RAL III</b> (World Bank 1992) to operate with a considerable lag) or to crowd out commercial flows (Bauer's view).	
Imports	Aid can directly finance imports and may further increase import demand through multiplier effects.	
Debt service of	Aid may (intentionally for debt relief or through fungibility) be used for debt payment. Empirical evidence (reported in White 1996b) suggests that 50c each additional dollar of loan finance is used for debt payment, and that one dollar of debt relief results in repayment in excess of one dollar. Grants, however, appear to reduce debt payments.	
Change in reserves	Some part of the aid inflow may be added to reserves. Analysis of Tanzanian data (White and Wuyts 1993) showed that this had been the case in some periods.	
Errors and omissions	Aid may finance capital flight, which may be proxied by errors and omissions. There has been no empirical analysis of this issue.	

construct this figure it was assumed that Zambia did not receive the large increase in aid flows from 1990 onwards. Rather net transfers and other disbursements grew at a nominal rate of 10 per cent per annum. Some of the reduction in imports is assumed to be absorbed by net non-interest services, which are fixed at their 1989 level. Since debt payment is a function of aid receipts Zambia will accumulate arrears (rather than reduce them as in the factual case) - this increases finance, but is offset by the assumption that no debt relief is obtained. Moreover, scheduled amortization and interest payments are higher than in the actual case

given the higher interest as arrears accumulate and the capitalization of interest arrears. Changes in reserves and the valuation adjustment, both of which are quantitatively of minor importance, are set at zero. It is assumed that exports are unchanged (Mwanawina and White argue that the net effect of aid policies and aid funds on the real exchange rate may have been toward depreciation, so aid's impact on imports may be understated). The level of imports is then calculated as a residual item.

In Figure 1, real imports continue to decline to ever lower levels without aid, compared to the recovery

Table 3 Procedure for constructing counterfactual balance of payments under different closure rules

Step	Quantity adjustment	Market clearing
1	Set future trajectory of aid and debt relief for counterfactual.	Set future trajectory of aid and debt relief for counterfactual.
2	Using econometric estimates, judge future debt service payments.	Using econometric estimates, judge future debt service payments.
3	Calculate arrears accumulation.	Calculate arrears accumulation.
4	Project PCT, OFP, EO and DR. (The first two are best left unchanged and the latter two - which are usually quite small - set to zero).	Project PCT, OFP, EO and DR. (The first two are best left unchanged and the latter two - which are usually quite small - set to zero).
5	Project real exchange rate impact of lower aid inflows and consequent impact on exports; offsetting these against policy effects and possible adverse consequences for production bottlenecks.	Calculate required exchange rate required to equilibrate demand and supply of forex and calculate corresponding levels of exports and imports.
6	Calculate imports as a residual.	

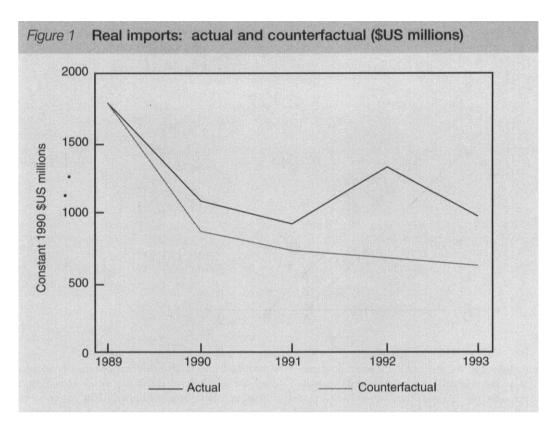
they have in fact experienced since 1991. In 1992 actual imports were double the amount predicted by the counterfactual for the reduced aid scenario. From the counterfactual balance of payments, Mwanawina and White calculate how much aid has gone to higher imports. In 1990 and 1991, periods in which there was large settlement of arrears, over 70 per cent of the aid resulted in higher debt payments and only a quarter in raising imports above what they would have been in the absence of that aid. The picture changed in 1992 and 1993. There was a higher net inflow in these years, as the requirement from debt obligations diminished, and more of the inflow was available for import finance - just under half in each year. A further 40 per cent contributed to increased debt service payments and a large share was absorbed by adjustment of other items.

#### 3 Microeconomic Analysis of Import Composition (Categorical Fungibility)

The impact of programme aid depends upon how it affects not only the level of imports but also their

composition. One approach to this question is microeconomic - adding up what the import support funds have been used for. For example, analysis of the use of Swedish OGL in Zambia shows that only eight per cent has been used to finance consumer imports. But fungibility renders this analysis irrelevant in the eyes of many aid analysts. Turning instead to the overall import composition we find that the share of consumer imports in 1991-93 doubled compared with their share in 1988-90. This rise has been at the expense of intermediate imports; capital imports having remained relatively unchanged.

The average for the later period is based on 1991 and 1993 only, data for 1992 are unavailable. Perhaps this omission is no bad thing as the data for that year would be distorted by drought-related maize imports. There is a substantial difference in the share of consumer imports between the two years - falling from 38.4 per cent in 1991 to 24.5 in 1993. So it might be argued that increased consumer imports were initially partly explained by a post-liberalization 'import splurge' and that consumer imports have now settled down to lower



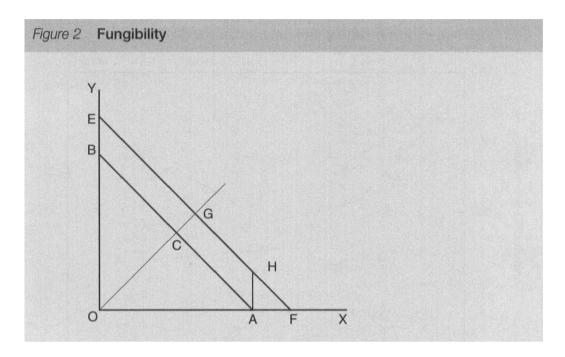
levels. But two observations don't make a trend. What we are concerned to analyse here is how much of the increase in consumer imports may be said to have been paid for by the BOP support - i.e. to return to the question of fungibility.

Fungibility may be explained by reference to Figure 2. There are two activities to be financed, X and Y. The recipient has resources M to allocate between these two uses which may be represented by the downward sloping straight line (the budget constraint). At one extreme, shown by point A (so distance OA equals M°), all resources are devoted to X, and at the other, point B, they are devoted to use Y. In reality, the recipient will probably choose some combination of X and Y, such as point C. Now suppose that a donor provides additional funds, T, which the recipient may use for whatever purpose they care. The budget

line will shift out to EF (where OF=OE=M+T). Assuming for simplicity that the recipient allocates the resources in the same proportion as before the allocation of funds is now given by point G (an assumption economists describe as a homothetic utility function).

Suppose instead that the donor provides funds of T but specifies that they should be used for activity Y. The budget line is no longer given by EF but EHA, where the vertical section HA is equal to T - the amount of donor resources that must be used for activity Y. But, in the case shown here, this tying of aid to activity Y makes no difference at all to the allocation of resources by the recipient - the allocation is still point G. Although the donor has given funds T to be used specifically for activity Y, the amount of resources allocated to Y has not increased by this amount but a rather smaller

<sup>&</sup>lt;sup>6</sup> It is being assumed that both activities have a price of unity. This assumption is for the sake of simplicity alone, the message of the argument is not altered by dropping the assumption.



amount. It is not that funds are being diverted - a total of greater than T is being allocated to activity Y but some of this expenditure would have occurred even in the absence of the aid and the donor funds are being budgeted against this activity.

This fungibility may be limited if donor funds are large relative to the countries' own resources, in which case the increased expenditure on items desired by the donor can exceed the amount indicated by the recipient's marginal propensity to consumer those items. Mwanawina and White (1995) carry out such an analysis using the Zambian data for a variety of scenarios (e.g. no debt service payments are made in the absence of aid and the project aid is successfully tied). These scenarios give a feel for the order of magnitude of BOP support being used to finance consumer imports. This figure is estimated to be between 10 to 20 per cent. That is greater than the amount suggested by the microeconomic analysis of Swedish OGL funds, at the upper limit two and half times as much. But even this upper limit of 20 per cent does not seem high enough to constitute an argument for moving away from balance of payments support toward more tied forms of aid.

Although the share of BOP support used to finance consumer imports has been small, the relative

magnitudes mean that BOP support has financed a substantial share of the higher level of consumer imports. Indeed, approximately half of consumer imports have been financed by BOP support: that is, in fact, that **the whole** of the increase in consumer goods imports has been financed by BOP support.

# 4 Fungibility in the Government Budget

For a sustainable development path the government must be able to finance its activities from its own revenue base. Donors are therefore concerned when their aid seems to be used to displace tax collection. There are three ways in which this issue may be analysed:

• there is an academic literature, which may be called fiscal response models, addressing precisely this issue. One part of this literature uses a model first proposed by Heller (1975) to consider how aid affects taxes, domestic borrowing and aggregate government expenditure on consumption and investment (an oft-cited recent example is the paper by Gang and Khan 1990). The other part of the literature consider how aid impacts on different sectoral categories of government expenditure (see the published work of Pack and Pack 1990 and 1993, but there are several unpublished applications of this

approach). Both strands of the literature are reviewed in White and Luttik (1994: Ch. 2).

- a counterfactual government budget may be constructed. Such a counterfactual may be derived from the fiscal response models just mentioned (though the results have never been presented in this manner) or derived in a more *ad hoc* manner.
- the fungibility framework just used to look at import composition may be applied, with different categories of expenditure (ideally developmental and non-developmental) on the axes and the sum of financing used to draw the budget constraint.

A combination of the first two approaches seems the most desirable - but for many countries data constraints will prevent full econometric modelling. Most importantly, aid does not pass through the budget in many countries - so although we may get a sectoral composition of aid flows and a sectoral composition of government expenditure, we do not know the extent of overlap and so cannot know the total sectoral expenditure. In many countries this problem is now being tackled, but this will not help the econometrician who has a need for long time series. Secondly, a division into developmental and non-developmental expenditures is difficult - often investment and consumption are used to correspond to these two categories respectively - but this is clearly unsatisfactory (investment in a prestige project may be non-developmental but current expenditure on primary school teachers' salaries is developmental). A sectoral classification is preferable, but still presents some ambiguities.

The short-comings in the data may lead us to the third graphical approach, but there is a problem here also. The budget constraint is set by the sum of financing (roughly taxes plus domestic borrowing plus aid). The with versus without aid case may be drawn by shifting the budget constraint by the amount of the aid - but this method assumes no dis-

placement of taxes or domestic borrowing by aid, which is at odds with the literature. Hence, a counterfactual budget in aggregate terms must be the starting point as it was for the analysis of the external account in Section 3 of this paper.

#### 5 Summary

The macroeconomic evaluation of programme aid requires analysis of both aggregate fungibility and categorical fungibility. That is, how the aid affects the different aggregates in the external account and the government budget (aggregate fungibility) and the composition of imports and government expenditure (categorical fungibility). These questions are best answered by macroeconometric modelling, but the data are rarely available for this route to be followed. Hence a more ad hoc approach must be Aggregate fungibility may be analysed through the construction of a counterfactual balance of payments and government budget, where behaviourial reactions are judged by the evaluator on the basis of own analysis, existing studies and guestimates. Categorical fungibility may then be analysed from this knowledge of the shift in the budget constraint.

These techniques are illustrated here with reference to the case of Zambia (drawing on Mwanawina and White 1995). It is shown that aid has contributed to higher imports. In the last two years covered by the analysis, half of aid has been used for this purpose and one half for debt service; during the earlier period the share was 25 and 75 per cent respectively. Between 10 and 20 per cent of BOP support is estimated to have been used to finance consumer imports.

The methods used to derive these estimates are crude. Nonetheless, they are an attempt to answer the relevant questions and will hopefully provide a basis for further work in this area.

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