THE IMPACT OF FOREIGN AID ON GOVERNMENT SPENDING, REVENUE AND DOMESTIC BORROWING IN ETHIOPIA

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Working Paper

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ABSTRACT

The main aim of this Working Paper is to assess the impact of foreign aid inflows on public expenditure, revenue and domestic borrowing in Ethiopia. The paper provides a literature overview of the fiscal effects of aid, and then applies a fiscal response model to Ethiopian data for the period 1964-2005. Since the empirical literature finds little evidence of common cross-country patterns, this highlights the important role that country-specific circumstances play in determining fiscal outcomes. By studying the particular fiscal dynamics in Ethiopia, the paper finds that foreign aid has had a positive impact on government investment, while its effect on current expenditure has been less pronounced. Moreover, by disaggregating aid inflows into grants and foreign lending, the paper is able to analyse their specific roles and impacts. The results support the conclusion that aid inflows increase public investment, with loans having a stronger impact than grants. Both aid grants and loans have a strong negative effect on domestic borrowing, suggesting that aid and domestic financing are close substitutes. Finally, the results also appear to support the hypothesis that higher aid flows displace domestic revenues. However, this particular finding does not seem to be robust across the sample.

Keywords: Foreign Aid, Aid Effectiveness, Fiscal Response Literature, Ethiopia.

JEL Classification: C51, F35, H30

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1 INTRODUCTION

Foreign aid flows to developing countries have increased in the last few years. This fact can be explained, to some extent, by the commitments undertaken by donor countries to fight poverty in the developing world. The Monterrey Declaration of 2002 and the G8 Summit in Gleneagles of 2005 gave some reasons to believe that this trend would be sustained in the coming years, in particular for sub-Saharan Africa countries, where more effort and resources are needed to achieve the Millennium Development Goals (MDGs).

In practice, however, there is still limited knowledge about the potential macroeconomic implications of such an unprecedented increase in aid inflows. There are strong disagreements about which macroeconomic policies are more appropriate to manage this new scenario, as well as the form and speed that this aid increase should take. The debate is even more relevant in the case of the least developed countries in sub-Saharan Africa due to their chronic dependence on foreign aid flows. In this context, the impact of aid on the government sector emerges as a fundamental issue in the aid effectiveness debate since most of these flows are provided directly to the recipient government.

Thus, it is crucial to assess how these funds are used and the impact that they have on the fiscal accounts. Ethiopia is a particularly interesting case study for two main reasons: 1) the country requires a substantial boost in external resources in order to achieve the MDGs, and 2) its recent economic policies and performance have been often praised by donor countries. It is not surprising then that foreign aid resources to Ethiopia have been increasing at a strong pace.

Hence, the main purpose of this paper is to assess how aid inflows impact on the allocation of public resources, domestic revenues and borrowing needs in Ethiopia. The paper is divided into six main sections. After this introduction, the paper briefly presents the new IMF Analytical Framework, which is designed to address macroeconomic management issues arising from a higher volume of aid flows. The second section focuses on the fiscal side, and argues that the framework could be complemented by a stronger empirical model. Section three provides an overview of the literature on the fiscal effects of aid and puts forward several empirical options to address such issues. Section four provides a brief background of the Ethiopian economy, looking at broad economic performance and specific trends in fiscal variables.

Section five is the core of this paper. It starts by presenting the theoretical underpinnings of a traditional fiscal response model. It then applies the model to four decades of Ethiopian data, 1964-2005. Two versions of the model are estimated, one with total aid flows and the other with foreign aid disaggregated into grants and foreign loans. The empirical model is then complemented by cointegration analysis. Section six concludes.

2 THE IMF FRAMEWORK

The International Monetary Fund (IMF) has recently developed a new analytical framework to address macroeconomic management issues brought about by an increase in foreign aid inflows. The framework, first published by the IMF in 2005, is applied to the experience of five African countries with the objective of evaluating possible policy responses to recent surges in foreign aid inflows. The framework highlights the need to coordinate fiscal policy with exchange rate and monetary policy by focusing on two distinct but interrelated concepts:

(a) absorption, which is defined as the widening of the current account deficit (excluding aid) due to an increment in aid;[1] and (b) spending, which is defined as the widening of the fiscal deficit (excluding aid) accompanying an increment in aid. If we take these two concepts together, there are four potential scenarios to be considered (Table 1):

TABLE 1

Possible Combinations in Response to a Scaling Up of Aid

		Central Bank	
		Aid is Absorbed	**Aid is not Absorbed**
Government	**Aid is Spent**	▪ Government spends the aid ▪ Central Bank sells the foreign exchange ▪ Current account deficit widens	▪ Fiscal deficit widens (expenditures are increased) ▪ Central Bank does not sell foreign exchange ▪ International reserves are built up ▪ Inflation increases
	Aid is not Spent	▪ Government expenditures are not increased ▪ Central Bank sells the foreign exchange ▪ Monetary growth is slowed; nominal exchange rate appreciates; inflation is lowered	▪ Government expenditures are not increased ▪ Taxes are not lowered ▪ International reserves are built up

Source: Gupta et al. (2006).

For the purpose of this paper, the relevant concept is that of 'spending'. In order to evaluate the extent to which recipient countries 'spend' aid resources, the IMF suggests the use of the following equation:

$$\text{Aid Spending} = \Delta(GE{-}T)/\Delta A$$

where GE stands for total government expenditures, T for domestic revenues (excluding grants), and A for total aid flows.[2] This equation clearly indicates that aid 'spending' is an increasing function associated with a widening of the government fiscal deficit (net of aid), since $\Delta A > 0$. "Spending captures the extent to which the government uses aid to finance an increase in expenditures or a reduction in taxation" (Gupta et al, 2006, p.10). Table 2 below replicates the IMF results.

TABLE 2

IMF Results (% of GDP)

Country	Period		ΔGE	ΔT	ΔA	$\Delta(GE{-}T)/\Delta A$
	Pre-Aid Surge	**Aid Surge**				
Ghana	1999-00	2001-03	2.3	1.9	6.0	7
Ethiopia	1999-00	2001-03	0.7	1.5	5.9	0
Mozambique	1999-00	2001-03	6.7	1.3	5.0	100
Tanzania	1998-99	2000-04	4.0	0.4	3.9	91
Uganda	1999-00	2001-03	2.5	0.1	3.2	74

Source: IMF (2005: Table 5). All variables are defined as a percentage of GDP. The results are truncated at 0 and 100. The re-calculated value for Ethiopia is -14 per cent, while for Mozambique it is 108 per cent.

The last column reports the extent to which the incremental aid was spent. While the estimate for Mozambique suggests that all aid was 'spent', meaning that the fiscal balance

(before aid) deteriorates by the full amount of aid, the results for Ethiopia suggest that none of the extra aid was 'spent'. In fact, it seems that there was an improvement of the fiscal deficit (before aid), since revenue collection increased by more than the increase in government expenditures. The implication is that Ethiopia is saving aid resources, possibly to substitute for domestic borrowing, or even to pay off debts.

However, this methodology has some limitations. For example, the results from the spending equation will be very sensitive to the point in time in which they are evaluated. Defining the pre-aid surge period and the surge period will be critical for the value of the estimates and perhaps for the policy conclusions. Also, one needs to use the concept of spending with caution since full 'spending' can be achieved through a total displacement of domestic revenues, in which case aid flows cause a proportional decrease in domestic revenues with no increase in government expenditures. In practice, the concept does not distinguish between a desired outcome (e.g., increased developmental expenditures) and a potentially perverse effect that increases aid dependency and threatens long-term sustainability.[3]

In order to investigate these issues in more detail, this paper employs an econometric model for Ethiopia. The next section will survey the literature on the fiscal response to aid, which has developed a sophisticated methodological approach to assess the impact of aid flows on both expenditure and revenue variables. This approach accounts for a number of effects that matter for fiscal behaviour, and can be useful in complementing the IMF framework, especially by providing better insights into relevant fiscal dynamics.

3 FISCAL RESPONSE LITERATURE

The impact of foreign aid flows on government fiscal accounts is a fundamental question in the aid effectiveness debate. Since most aid inflows are provided directly to the recipient government, it is crucial to assess how these funds are allocated (e.g., investment vs. consumption), the type of incentives they produce (tax effort) and the impact that they have on the fiscal balance (debt sustainability). This is the initial and probably the most important transmission channel through which aid impacts the wider economy.

There are several questions that can be addressed within this framework. One of the main donor concerns relates to the use of aid flows to finance non-developmental expenditures. This phenomenon is often known as 'aid fungibility', and occurs when earmarked aid flows finance expenditures that would otherwise be paid for by taxes. Thus, such a process releases domestic funds for 'unintended' (often unproductive) expenditures. Another similar concern is the potential tax displacement effect of aid. It is often argued that an increase in aid inflows will lower the government's incentives to increase its tax effort, or even that tax revenues can be reduced due to policy reforms linked to aid flows (McGillivray and Morrissey, 2001).[4] In this case, aid is not additional to domestic resources since it substitutes for tax revenue.

Aid can also be used to retire onerous domestic debt. This could be a good strategy in countries with a heavy debt burden, but perhaps not generally. Finally, it is important to assess whether aid induces 'extra' domestic expenditures, as some development projects often do not budget for maintenance and recurrent costs, and this would eventually build up government deficits for such purposes. This is commonly known as 'aid illusion' and relates to the miscalculation of the real value of aid (McGillivray and Morrissey, 2000).

In the following paragraphs this paper reviews some of the relevant discussions and research findings on this topic, with particular reference to two distinct (but related) branches of the literature: (i) categorical fungibility, and (ii) fiscal response (or aggregate fungibility).

McGillivray and Morrissey (2001) provide a good review of the categorical fungibility literature. These studies have in common a focus on the impact of aid flows on the composition of government spending, often with a reasonable disaggregation of expenditure items. However, even within this framework, one can find two main methodological approaches. A number of studies estimate a system of linear expenditure equations derived from a utility maximisation problem. The representative agent's utility function is usually specified in a Stone-Geary form and then maximised subject to a budget constraint. Feyzioglu et al. (1998), Khilji and Zampelli (1991), and Swaroop et al. (2000) are amongst this group.

Alternatively, Pack and Pack (1990, 1993), Cashel-Cordo and Craig (1990), and Gupta (1993) do not use any explicit theoretical framework but also estimate a set of simultaneous equations. In these studies, the government has a 'community indifference curve' and is faced by a budget constraint. They then obtain various equations that represent demand curves derived from optimising decisions. This is a more ad-hoc approach, as it is not supported by an explicit theoretical framework. Table 3 presents the results of a selected number of studies that belong to these approaches.

TABLE 3
Results of Selected 'Categorical Fungibility' Studies

Study	Sample	Extent of Fungib.	Incremental Impact of Aid on:						
			Domestic Revenue	Total Expend.	Develop. Expend.	Non-Develop. Expend.	Health & Education Expend.	Invest. Expend.	Consump. Expend.
Swaroop et al. (2000)	India	-	0.00	0.00	0.00	0.90	0.00	0.00	-
Feyzioglu et al. (1998)	14 LDCs	-0.57	-	0.95	0.23	-	0.13	0.29	0.72
Pack & Pack (1993)	Dominican Republic	0.79	-0.39	-0.27	-0.05	-0.31	0.002	-	0.08
Gupta (1993)	India	0.04	0.01	1.69	0.96	0.73	-	-	-
Khilji & Zampelli (1991)	Pakistan	1.00	-0.01	0.26	-	0.74	-	-	-
Cashel-Cordo & Craig (1990)	46 LDCs	-	10.36 *	12.82 *	-	-	-	-	-
		-	4.25 **	-2.79 **	-	-	-	-	-
Pack & Pack (1990)	Indonesia	0.00	0.29	1.37	1.37	0.00	0.19	-	0.00

Obs: '-' not reported (or cannot be inferred); * African countries; ** non-African countries.
Source: McGillivray and Morrissey (2001, table 2).

As Table 3 demonstrates, the empirical evidence on the fungibility of aid is mixed. The findings of Pack and Pack (1990) for Indonesia and Gupta (1993) for India are encouraging in the sense that aid flows seem to increase development expenditures (in fact, more than proportionally), while there is little evidence of a fall in revenues. However, Pack and Pack (1993) and Khilji and Zampeli (1991) show that aid is highly fungible and has a negative impact on domestic revenues. Moreover, Pack and Pack (1993) for the Dominican Republic and

Swaroop et al. (2000) for India give evidence of a negative or insignificant impact of aid on developmental expenditures. Nevertheless, there are some atypical results, which cast some doubt on the reliability and robustness of this approach: Cashel-Cordo and Craig (1990) show a surprisingly large increase in domestic revenue (as well as total expenditure), while Feyzioglu et al. (1998) present a negative fungibility coefficient.

Although these studies have had an important influence on policy debates,[5] they have some fundamental limitations. Some of these studies (namely Feyzioglu's) rely on cross-section data, not accounting for individual country specificities. This is an important issue since the dynamic responses to a surge of aid are likely to be different even for countries with a similar degree of economic development and political structures. Most importantly, (categorical) fungibility studies are restricted to the observation of the impact of aid on the composition of government spending, diverting attention from the more fundamental issue, which is the broader fiscal impacts of aid over time, especially on tax effort and borrowing (Morrissey et al., 2002). Indeed, these studies assume government revenue to be a residual, not allowing for aid to influence explicitly the tax effort or domestic borrowing. They thus provide few insights into the general fiscal impact of aid.

In view of the limitations detailed above, the fiscal response (aggregate fungibility) literature has emerged as the main approach to influence policy debates. Although fiscal response models look at government accounts in more aggregate terms, they have the advantage of having a broader scope of analysis.[6] Among these studies, we find Heller (1975), Mosley (1987), Franco-Rodriguez et al. (1998), and Mavrotas and Ouattara (2006). These works are also centred on the utility maximisation principle, although the government's utility function differs substantially from that in the fungibility literature. The utility function is defined as the deviations of the observed variables from government targets (budgeted figures), and is often assumed to be quadratic. The function is maximised when all the targets are met. A set of reduced form equations is then derived and estimated simultaneously, often by three-stage least squares (3SLS). Table 4 summarises the main findings.

TABLE 4
Results of Selected 'Fiscal Response' Studies

Main Studies	Country	Impact of Aid on			
		Tax Revenue	Government Investment	Government Consumption	Domestic Borrowing
McGillivray & Ouattara (2005)	Cote d'Ivoire	-0.92	-0.1		0.2
Franco-Rodriguez (2000)	Costa Rica	0.05	-0.02	0.07	-0.08
McGillivray & Ahmed (1999)	Philippines	-0.1	-0.02	0.02	-1.81
Franco-Rodriguez et al. (1998)	Pakistan	-3.6	0.1	-2.4	0.9
Iqbal (1997)	Pakistan	0.0	0.0	1.6	-
Rubino (1997)	Indonesia	-1.4	-0.8	-0.7	-
Khan & Hoshino (1992)	5 Asian countries	1.2	1.2	0.3	-
Gang & Khan (1991)	India	0.0	0.0	0.0	-
Heller (1975)	11 African countries	-0.4	1.1	-0.1	-

Observation: Some authors estimate only structural equations (direct effects), neglecting feedback effects that operate within the entire system of structural equations. This table shows the total effects obtained from reduced-form parameters. See section 5.1 for more details.

Source: McGillivray and Morrissey (2001, table 3) and some of the above mentioned studies.

It is difficult to recognise a consistent pattern of results from Table 4. The impact of aid flows on government investment seems surprisingly low, sometimes even negative, as in the cases of Rubino (1997), Franco-Rodriguez et al. (1998) and McGillivray and Ahmed (1999). The effect of aid on domestic revenues appears to be either negligible or negative, the latter finding supporting the hypothesis of tax displacement. The results for government consumption and borrowing seem inconclusive.

Most of the studies presented above overlook the fact that different aid modalities are likely to affect the government response in different ways.[7] Mavrotas (2005) and Mavrotas and Ouattara (2006) build on the fiscal response tradition by addressing this shortcoming, using disaggregated aid data for Uganda and Côte d'Ivoire, respectively. The four categories that they use are project aid, programme aid, technical assistance and food aid.[8]

TABLE 5
Results with Disaggregated Aid Variables

Study	Aid Variable	Tax Revenue	Public Investment	Public Consumption	Domestic Borrowing
Mavrotas & Ouattara (2006) [Cote d'Ivoire]	Aid (aggregated)	-0.289	-0.196	0.170	-0.761
	Project Aid	-0.413	-0.958	1.477	-1.024
	Programme Aid	-0.163	0.244	-0.067	-0.387
	Technical Assistance	0.129	0.367	-0.531	0.322
	Food Aid	0.129	0.368	-0.531	0.323
Mavrotas (2005) [Uganda]	Aid (aggregated)	n/a	n/a	n/a	n/a
	Project Aid	-0.001	-0.050	-0.029	-0.098
	Programme Aid	-0.019	0.197	0.251	-0.489
	Technical Assistance	-0.015	0.292	0.138	-0.493
	Food Aid	0.002	-0.301	-0.364	-0.513

Sources: Mavrotas (2005) and Mavrotas and Ouattara (2006).

Overall, the results of these studies seem to show that most aid modalities have a positive impact on government investment, but cause a reduction in tax revenue.[9] The results for government consumption seem mixed, while domestic borrowing has a strong negative correlation with aid inflows. Hence, while there is little evidence that aid flows are used to increase government consumption, the impact on government investment is encouraging. However, the variability of the results presented above regarding the magnitude and the sign of impacts seems to suggest that governments respond differently to different types of aid inflows.

Notwithstanding these efforts, the past couple of years have witnessed the use of less rigid theoretical methodologies. Osei et al. (2005), Fagernas and Roberts (2004) and M'Amanja et al. (2005) have used multivariate co-integration (vector autoregression) models and vector error-correction models (VECM) to estimate the impact of aid on fiscal aggregates. Such models arose as a result of the criticisms regarding the strong assumptions inherent in traditional fiscal response models.[10] They depart from the utility maximisation assumption by applying techniques developed in the 'macroeconometrics' literature to estimate the dynamic structural relationship between aid and fiscal aggregates, rather than estimating the underlying structural form. In practice, they use vector autoregressive (VAR) methods to estimate an 'impulse response' function in order to simulate the dynamic effect of aid on fiscal aggregates.

Osei et al. (2005) suggest that aid to Ghana does not have a direct effect on the volume of government spending, but is treated as a substitute for domestic borrowing. Government spending does rise significantly following aid, but this is principally due to an indirect effect arising from higher tax revenue associated with aid inflows. Hence, aid to Ghana has tended to be associated with reduced domestic borrowing and increased tax effort, combining to increase public spending. M'Amanja et al. (2005) finds that grants appear to have a positive effect on long-run growth whilst loans seem to substitute for taxes and finance fiscal deficits, hence having a negative effect on growth. Government spending is found to have a positive long-run influence on growth, while tax revenue has no significant direct effect (but might have an indirect effect through expenditure). The authors conclude that aid to Kenya could be more effective if given in the form of grants, and associated with fiscal discipline. Fagernas and Roberts (2004) analyse the fiscal response to aid for three African countries (Malawi, Uganda and Zambia). Their results are presented below in Table 6.[11]

TABLE 6
Results from Fagernas and Roberts (2004)

Impact of the aid variable on		Development Budget	Recurrent Budget	Domestic Revenue	Domestic Borrowing
Malawi	Grants	++	--	+	--
	Foreign Loans	+	?	+	--
	ODA	++	--	+	--
Uganda	Grants	++	+	+	0
	Foreign Loans	++	++	+	0
	ODA	++		+	0
Zambia	Grants	++	+	--	+
	Foreign Loans	+	+	--	0
	ODA	++	+	--	+

++ strongly positive; + moderately positive; ? ambiguous; 0 insignificant; - moderately negative; -- strongly negative.

Source: Fagernas and Roberts (2004).

Foreign aid flows seem to have a strong positive correlation with the development budget of the three countries studied. The other fiscal effects vary according to the country under analysis. In Zambia, aid flows displace tax revenues, have a moderately positive impact on the recurrent budget and are associated with higher levels of domestic borrowing. In Malawi, aid is correlated with a lower recurrent budget and consequently with lower domestic borrowing. Finally, in Uganda, aid raises both development and recurrent spending, but has only a negligible impact on domestic borrowing.

In conclusion, it is difficult to identify a broad consensus (based on generalisations) about the impact of aid on public fiscal accounts. The empirical evidence and theoretical predictions relating to the impact of foreign aid on fiscal variables is mixed. This strengthens the argument that results tend to be country-specific, either because economic circumstances are different or simply because governments behave differently.

4 ECONOMIC BACKGROUND

4.1 ECONOMIC PERFORMANCE

Ethiopia is one of the most populated countries in Africa, with over 70 million inhabitants, and yet it has been chronically understudied by economists. It is also one of the poorest countries in the world, with gross national income (GNI) at about $160 per capita, and is ranked 170 out of 177 countries on the Human Development Index.[12]

The country has been landlocked since the independence of Eritrea in 1993, and the economy is highly dependent on the performance of the agriculture sector, which sustains over 80 per cent of the population and accounts for nearly half of gross domestic product (GDP) and almost all exports (UNECA, 2002, p.84). Coffee remains the main source of export earnings, accounting for over 40 per cent of total exports in 2005 (IMF, 2006). Ethiopia's development efforts have often been hindered by irregular rainfall (droughts), volatility in export commodity prices and costly wars.

In political terms, three main regimes in the recent history of the country can be identified: the Imperial State (until 1974), the Derg Regime (1974-1991) and the Ethiopian People's Revolutionary Democratic Front (EPRDF) Coalition (1991-present). Economic performance under the Imperial State was respectable, with real GDP growing by four per cent a year (on average) during the period from 1960 to 1974, while average growth per capita was about 1.5 per cent (Geda, 2007). Nevertheless, several droughts afflicted the country (e.g., 1958, 1966 and 1973), causing famine and widespread poverty. In the early 1970s, a number of events fuelled the discontent of the population: a growing agrarian crisis (Chole, 2004), the economic consequences of the 1973 oil shock and concerns regarding the inequitable distribution of land.[13]

In 1974, a military coup led by a committee of junior army officers (Derg) deposed the Emperor. The new regime was characterised by a socialist (centrally planned) economic system with a strong military and discrimination against private property and entrepreneurship. Soon after its rise to power, the Derg embarked on large-scale nationalisations, including all land, private property, financial institutions and manufacturing firms, leading to the 'socialisation' of production and distribution (Geda, 2007). The Derg also introduced protectionist measures to control the flow of international trade, with a view to strengthening the state's role in both exports and imports, emphasising strategic export sectors and closely monitoring the price, quantity and distribution of goods (Geda, 2001, p.183).

Economic performance under the Derg regime was poorer than in the past, with GDP growing at about 1.9 per cent per year (1974-1990), while growth was negative in per capita terms (-0.8 per cent). The policy environment, erratic performance of the agriculture sector (e.g., severe drought in 1984-1985) and a lengthy civil war were the main contributors to this sluggish economic record (Chole, 2004).

Another major change in the Ethiopian political and economic context occurred in 1991, when a coalition of rebel forces (EPRDF) succeeded in overthrowing the military regime. The EPRDF reinstated market-economy policies, some of which included the promotion of private-sector development, replacement of trade quantity restrictions with tariffs, restructuring of state-owned trading enterprises and liberalisation of the exchange rate (UNECA, 2002, p.92).[14] During the period 1992-2000, Ethiopia's economic performance improved significantly, albeit with considerable volatility. GDP grew over four per cent per year, and about two per cent in per capita terms.[15]

Nonetheless, the economy remains vulnerable to climate conditions (e.g., bouts of poor rainfall, such as in 1998 and 2003) and other external shocks (such as terms of trade shocks). The export sector is characterised by a lack of diversification, with a large share of export earnings accruing from a small number of commodities. The historical reliance on the export of a few agricultural goods, with often volatile prices (such as coffee), have to some extent contributed to the instability of export earnings.

4.2 GOVERNMENT ACCOUNTS

Figure 1 below plots government sources of revenue and foreign financing for the period 1964-2005. During the Imperial State regime, domestic revenues grew slowly as a percentage of GDP, averaging about 10 per cent during the period 1964-1974. With the Derg regime in power, revenues had a significantly stronger positive trend, rising from about 11-12 per cent to a peak of 25 per cent in 1989. In 1985, there was a fall in revenues (as a percentage of GDP), mainly due to the effects of a severe drought. A sharp decrease in revenues ensued in the period 1990-1992 as a result of the state of war in the country, which led to security and administrative problems regarding tax collection.[16] From 1992, however, government revenues managed to recover beyond their previous nominal levels and are currently stabilised at 16 per cent of GDP. Foreign financing was practically negligible in the 1960s and 1970s, only surpassing the one per cent level of GDP in 1975. This variable has exhibited some volatility, which seems to have increased in recent years.

FIGURE 1
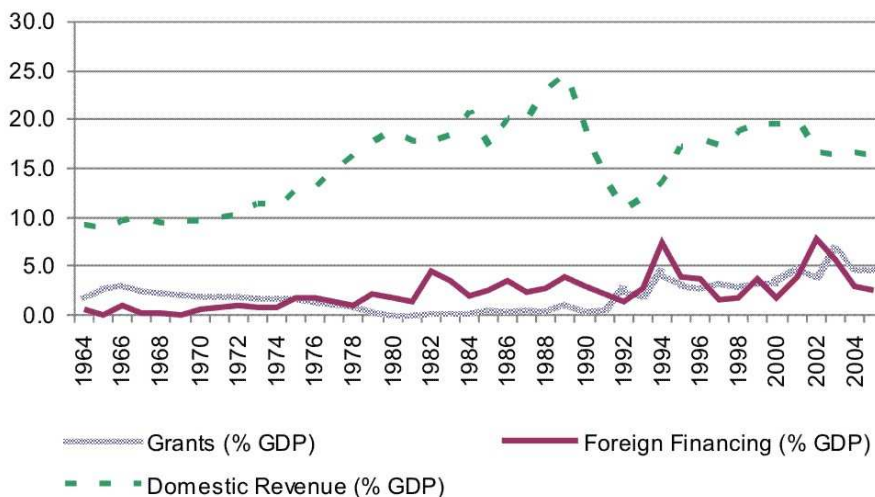
Source: IMF (IFS and Statistical Appendices).

Aid grants declined, relative to GDP, during the Derg regime, but since 1991 have increased at a fast pace, and are currently at around five per cent of GDP. Taking into consideration the recent international efforts to increase foreign aid flows to developing countries in order to support the achievement of the Millennium Development Goals (MDGs), this trend is likely to continue. In terms of their relative importance to the budget, Figure 2 indicates that grants represented a significant share of total revenues during the Imperial State although they had a steadily declining trend in ensuing years. Their relative importance

became almost negligible during the Derg regime, owing to a decline in the volume of grants, but also due to the increase in domestic revenues. As outlined earlier in the paper, since the fall of the Derg regime in 1990, grant flows have again become an important source of revenue, currently accounting for about one quarter of total revenues.
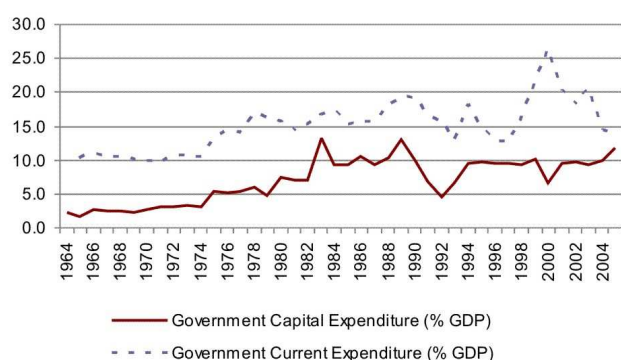
FIGURE 2
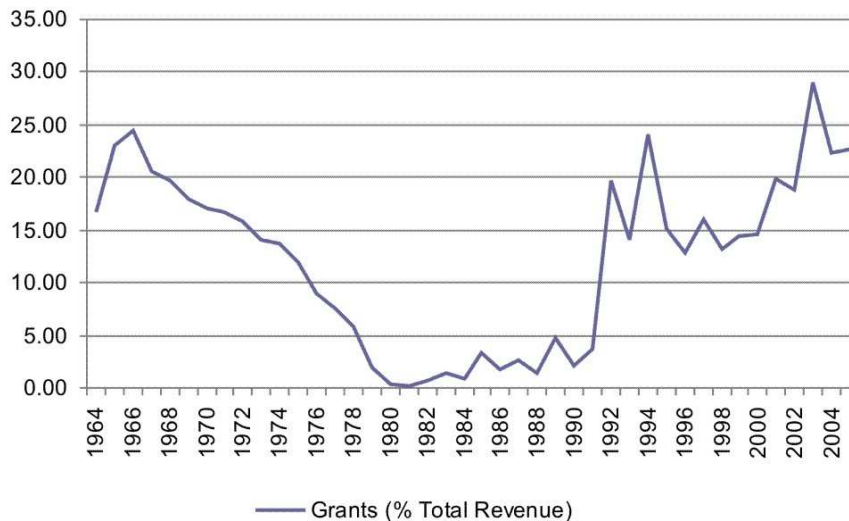
Source: IMF (IFS and Statistical Appendices).

With regard to the composition of domestic revenues, in the 1970s taxes made up about 80 to 90 per cent of the total. However, the relative importance of tax revenues declined throughout the 1980s, reaching a low of 60 per cent in 1989. Recent data suggest that this trend is now being reversed, with tax revenues increasing from 68 to 79 per cent of total revenues during the period 2000-2005.[17] Indirect taxes accounted for most of this recent increase (mainly import duties) while direct taxes seem to have stagnated at around 25 per cent of total revenues. It is also interesting to note that export taxes as a percentage of GDP have become negligible,[18] while import duties have increased substantially, mainly as a consequence of the sharp increase in imports of goods and services in the last few years.

This paper now turns to the composition of total government expenditure for the period 1964-2005. Figures 3a and 3b illustrate expenditure trends, the first as a ratio to GDP and the second as a ratio to total expenditures. In Figure 3a, we can observe that public consumption was kept at around 10 per cent of GDP until 1974 while investment expenditure accounted for about 3-4 per cent during the same period. After the rise of the Derg regime to power and as a consequence of its (socialist) policy measures, government current expenditure rose gradually to almost 20 per cent of GDP in 1989, while public spending on capital was about 13 per cent in the same year. In 1983, government capital expenditure had almost doubled in nominal terms due to an increase in economic development expenditures (especially those related to 'agriculture and land settlement' and 'manufacturing'). This was also possibly due to the economic 'zemetcha' (mass mobilisation) campaigns (Abegaz, 2001).

FIGURES 3A

FIGURE 3B

Source: IMF (IFS and Statistical Appendices).
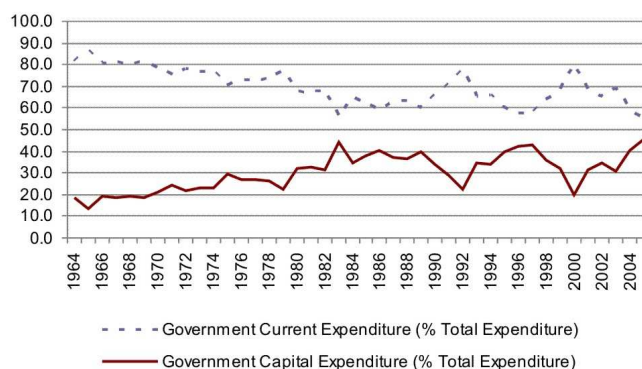
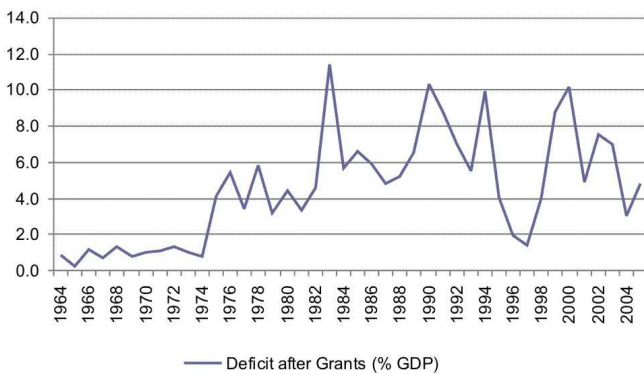Source: IMF (IFS and Statistical Appendices).

Since the beginning of the 1990s there has been some volatility in these variables. The sharp reduction in both items of expenditure in the early 1990s was caused, to some extent, by the drastic fall in domestic revenues and the end of Soviet bloc aid. In 1994, current expenditures increased, mainly due to wages and operating expenses (IMF, 2006) and the doubling of interest payments on internal debt. In 2003, a similar increase was due to a high level of external assistance (which more than doubled). The Eritrean War (1998-2000) was responsible for a sharp increase in military spending, hence the strong increase of current expenditures as a percentage of GDP during this period (Figure 3a). Conversely, the fall in recurrent costs thereafter can be attributed to the scaling down of defence expenditures after the end of the war: they had been cut to less than half of their former level in nominal terms by 2002. This represents a reversal of a long increasing trend, in which military spending went from around four per cent of GDP in the 1960s to an approximate average of eight per cent of GDP in the 1980s, and a high of 15 per cent in 2000 (Geda, 2007).

In 2000, the drop in capital expenditures was due to a reduction in both economic and social investments, likely due to the severe drought that afflicted the country in 1999-2000. During the period 2000-2005, current expenditures declined relative to GDP while capital expenditures more than trebled (IMF, 2006, p. 43). There has been no main driving force behind this increase, but a consistent increase in various items, such as for economic development (mainly agriculture and natural resources) and social development (mainly education and urban development and housing). Current spending on agriculture, natural resources and education was more than doubled. Overall, it is quite clear that capital expenditures gradually increased as a share of total expenditures during the period 1964-2005 (Figure 3b).

The analysis of the government's overall balance (after grants) reveals a high degree of volatility during the period under scrutiny (Figure 4a). Until 1974, the deficit as a percentage of GDP was relatively stable, at about one per cent, but during the protracted civil war, the Derg regime ran higher fiscal deficits.[19] In 1983, the government recorded a very large budget deficit, i.e., almost 12 per cent of GDP, mainly due to a sharp increase in expenditures. The high deficits in 1990-1991 corresponded to the last years of the Derg regime, when the civil war worsened. The problems with revenue collection, which originated in a sharp reduction in domestic revenues, were not compensated by a proportional fall in expenditures (Figure 4b).

In 1994, as well as in 1999-2000, the high fiscal deficits were due to a strong increase in government expenditures (Figure 4b), as mentioned earlier (e.g., a sharp rise in military spending due to the war with Eritrea). Borrowing from domestic sources shows a very strong correlation with the budget deficit before grants, with the exception of 1994, when foreign financing and grants seemed to close this financing gap (Figure 4c). If we analyse the fiscal deficit before grants, the government deficit appears to be widening (on average) (Figure 4d).

FIGURES 4A

Source: IMF (IFS and Statistical Appendices).

FIGURE 4C
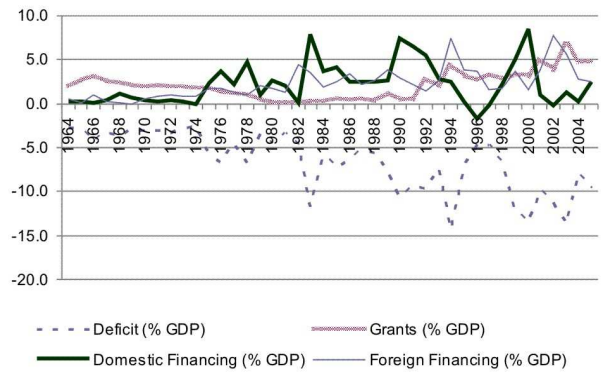
Source: IMF (IFS and Statistical Appendices).

FIGURE 4B
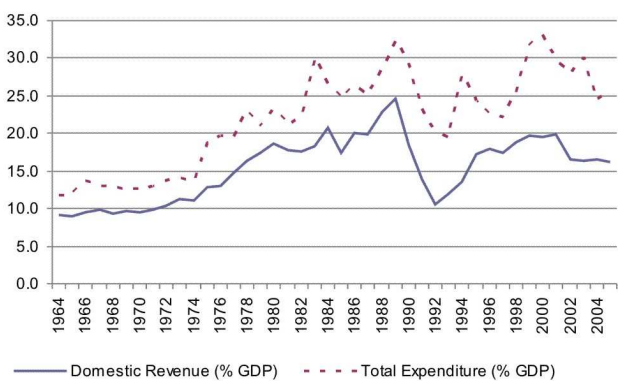
Source: IMF (IFS and Statistical Appendices).

FIGURE 4D
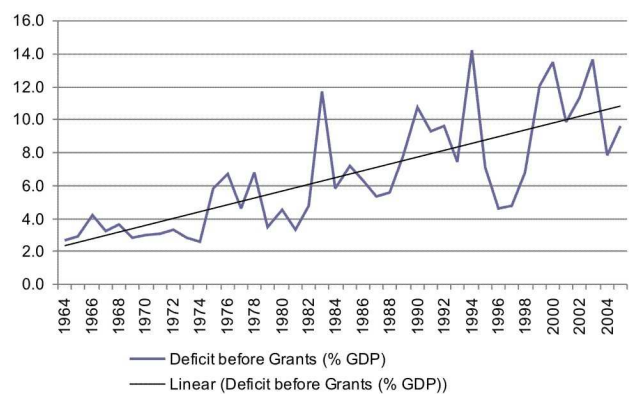
Source: IMF (IFS and Statistical Appendices).

The aim of this section was to present a quick summary of the economic and fiscal developments in Ethiopia during the past 40 years. It provides a good starting point for our empirical analysis, which follows later in Section 5. The reader might find it useful to refer back to some of these graphs and explanations of trends in order to better understand the relevance of the results of the econometric work carried out in Section 5.

5 AN APPLICATION TO ETHIOPIA

5.1 THEORETICAL MODEL

The model used in this section follows closely those presented in Mavrotas and Ouattara (2006) and McGillivray and Ahmed (1999). For the purpose of simplicity, I will illustrate only the case in which the aid variable is aggregated (A) although estimates for a disaggregated model will also be provided and examined.[20] The model assumes that government decision-makers wish to maximise a utility function (U), which takes the following quadratic form:

$$U = -(\alpha_1/2)(Ig-Ig^*)^2 - (\alpha_2/2)(G-G^*)^2 - (\alpha_3/2)(T-T^*)^2 - (\alpha_4/2)(A-A^*)^2 - (\alpha_5/2)(B-B^*)^2 \qquad [1]$$

The policy instruments available to public-sector decision-makers include: government investment (Ig), government consumption (G), domestic revenue (T), foreign aid inflows (A) and domestic borrowing (B). The variables with an asterisk represent annual targets, which are set *a priori* by the government. As is clear from equation [1], utility reaches its unrestricted maximum at 0, when all variables equal their planned levels. The quadratic form ensures symmetry, i.e., both undershooting and overshooting a target confer a certain degree of disutility.[21] The alphas (α) represent the relative weights that government decision-makers place on each of their goals, and are all assumed to be positive.

One implication of equation [1] is that foreign aid (A) is endogenous, based on the assumption that the government has some degree of control over aid disbursements (Franco-Rodriguez et al. 1998). According to the proponents of this formulation, donors and recipient governments engage in negotiations to determine the planned level of aid, with the government having some bargaining power in terms of how these targets are set, as well as with regard to the amount of aid that is actually disbursed. Hence, decision-makers formulate targets for different expenditure items (in this case Ig* and G*) as well as the revenue components (including aid) during their fiscal planning exercises. The utility maximisation framework then suggests that during the fiscal year, they will aim at achieving those same targets.

The utility function [1] is then maximised subject to the following constraints:

$$Ig + G = B + T + A \qquad [2]$$

$$G \leq \rho_1 T + \rho_2 A + \rho_3 B \qquad [3]$$

Equation [2] is the traditional government budget constraint, which indicates that government expenditures must equal total receipts (revenues and borrowing). This equation must always hold. However, by simply constraining the utility function to equation [2], we are allowing for total fungibility since there is no restriction on how each revenue source is allocated amongst the various expenditure items (Franco-Rodriguez, 2000).

For this reason, equation [3] is added to the traditional budget constraint, where the rhos (ρ) represent the maximum proportion of domestic revenue, aid flows and domestic borrowing allocated to consumption, with these coefficients assumed to lie between 0 and 1. Conversely, $1-\rho$ stands for the proportion allocated to investment. However, the interpretation of ρ_2 should not be taken as the extension of fungibility, as in categorical fungibility studies. The reason is that some aid flows intended for development purposes might be recorded as consumption expenditures, and the inequality does not need to hold in every period (Franco-Rodriguez, 2000).

Equation [3] suggests that there are external constraints that influence how governments allocate their resources amongst expenditure items. The expression can be best understood as actions undertaken by donors or domestic interest groups, which impose the values of the rhos (ρ) on decision-makers, with no guarantee that the targets can be met, even if revenues satisfy the standard budget constraint. If equation [3] is not binding, the utility function [1] is maximised subject to equation [2]. In this case, it is possible to reach the unconstrained maximum (i.e., 0) if revenues are sufficient. However, if equation [3] is binding, external and domestic pressures prevent the attainment of this maximum, even when revenues are sufficient, because at least one expenditure target cannot be met (Franco Rodriguez et al., 1998).

Most of the fiscal response studies depend on this assumption. Other specifications of the constraints have been used in the literature, but since the rhos (ρ) should be the outcome of the maximisation problem, and not be imposed *a priori*, this seems to be a better formulation.[22]

Maximising the utility function [1] subject to the constraints [2] and [3] and solving the first-order conditions of the Lagrangian will give the following system of structural equations:[23]

$$Ig = (1-\rho_1)\beta_1 Ig^* + (1-\rho_1)\beta_2 G^* + (1-\rho_1)[1-(1-\rho_1)\beta_1-\rho_1\beta_2]T^* +$$
$$[(1-\rho_2)-(1-\rho_1)(1-\rho_2)\beta_1-(1-\rho_1)\rho_2\beta_2]A + [(1-\rho_3)-(1-\rho_1)(1-\rho_3)\beta_1-(1-\rho_1)\rho_3\beta_2]B \qquad [4]$$

$$G = \rho_1\beta_1 Ig^* + \rho_1\beta_2 G^* + \rho_1[1-(1-\rho_1)\beta_1-\rho_1\beta_2]T^* + [\rho_2-\rho_1(1-\rho_2)\beta_1-\rho_1\rho_2\beta_2]A +$$
$$[\rho_3-\rho_1(1-\rho_3)\beta_1-\rho_1\rho_3\beta_2]B \qquad [5]$$

$$T = \beta_1 Ig^* + \beta_2 G^* + [1-(1-\rho_1)\beta_1-\rho_1\beta_2]T^* - [(1-\rho_2)\beta_1+\rho_2\beta_2]A - [(1-\rho_3)\beta_1+\rho_3\beta_2]B \qquad [6]$$

$$A = \beta_3 Ig^* + \beta_4 G^* - [(1-\rho_1)\beta_3+\rho_1\beta_4]T + [1-(1-\rho_2)\beta_3-\rho_2\beta_4]A^* - [(1-\rho_3)\beta_3+\rho_3\beta_4]B \qquad [7]$$

$$B = \beta_5 Ig^* + \beta_6 G^* - [(1-\rho_1)\beta_5+\rho_1\beta_6]T - [(1-\rho_2)\beta_5+\rho_2\beta_6]A \qquad [8]$$

where,

$\beta_1 = \alpha_1(1-\rho_1)/\Phi_1$	$\beta_2 = \alpha_2\rho_1/\Phi_1$	$\beta_3 = \alpha_1(1-\rho_2)/\Phi_2$
$\beta_4 = \alpha_2\rho_2/\Phi_2$	$\beta_5 = \alpha_1(1-\rho_3)/\Phi_3$	$\beta_6 = \alpha_2\rho_3/\Phi_3$

and,

$$\Phi_1 = \alpha_1(1-\rho_1)^2 + \alpha_2\rho_1^2 + \alpha_3 \qquad \Phi_2 = \alpha_1(1-\rho_2)^2 + \alpha_2\rho_2^2 + \alpha_4 \qquad \Phi_3 = \alpha_1(1-\rho_3)^2 + \alpha_2\rho_3^2 + \alpha_5$$

Since the alphas (α) are expected to be positive and the rhos (ρ) to lie between 0 and 1, it can be concluded that the betas (β) are also expected to be positive. These structural equations capture the direct impact of aid flows on the remaining fiscal variables although it is argued that the estimation of these equations ignores indirect feedback effects, which operate through the simultaneous-equation system. To capture the total impacts (direct and indirect), the reduced-form equations need to be derived. When the previous structural equations are

solved simultaneously (ensuring that only exogenous variables remain on the right-hand-side), the system of reduced-form equations can be represented as follows:

$$Ig = \delta_1 Ig^* + \delta_2 G^* + \delta_3 T^* + \delta_4 A^* \tag{9}$$

$$G = \delta_5 Ig^* + \delta_6 G^* + \delta_7 T^* + \delta_8 A^* \tag{10}$$

$$T = \delta_9 Ig^* + \delta_{10} G^* + \delta_{11} T^* + \delta_{12} A^* \tag{11}$$

$$A = \delta_{13} Ig^* + \delta_{14} G^* + \delta_{15} T^* + \delta_{16} A^* \tag{12}$$

$$B = \delta_{17} Ig^* + \delta_{18} G^* + \delta_{19} T^* + \delta_{20} A^* \tag{13}$$

The deltas (δ) are specific combinations of rhos (ρ) and betas (β), and ultimately alphas (α). What is clear from the equations above is that the reduced-form specification will be able to give information about the impact of aid targets (often commitments), and not aid disbursements. By looking at the structural equations [4]-[8], it becomes clear that the impact of A* on A will be decisive in assessing the impact of aid flows on the remaining fiscal variables.[24]

However, there is a practical problem. Since the system represented by the reduced-form equations [9]-[13] is over-identified, it is not possible to estimate it simultaneously (McGillivray, 2000, p.162). Hence, it is necessary to estimate the system of structural equations [4]-[8],[25] and then substitute the estimated coefficients back into the equations before solving the system simultaneously.

5.2 ESTIMATION

The data were collected from the International Financial Statistics (IFS) database of the International Monetary Fund (IMF), and was complemented by several issues of the IMF Statistical Appendices for Ethiopia. The data cover the period 1964-2005. The variables collected include: government revenues excluding grants (T), grants (A1), government total expenditure (GE), government capital expenditure (Ig),[26] financing from abroad (A2), domestic financing (B), imports (M), exports (X) and GDP (Y). All the variables are expressed in million Birr, and are deflated by the GDP deflator.

The consistency of the data was checked by applying the standard budget constraint, where total government expenditures must equal the sum of domestic revenues (T), grants (A1), foreign finance (A2) and domestic borrowing (B). There were only minor differences (decimal points), but for the sake of consistency the domestic borrowing variable was derived as a residual by using the traditional fiscal constraint. For the remainder of this paper, the terms 'capital expenditure' and 'investment', as well as 'current expenditure' and 'consumption', will be used interchangeably.

While most of the studies in this literature obtain their foreign aid variables from the OECD-DAC statistics, this paper argues that this is not adequate for Ethiopia. Figure 5 compares IMF data with the DAC statistics for grants.
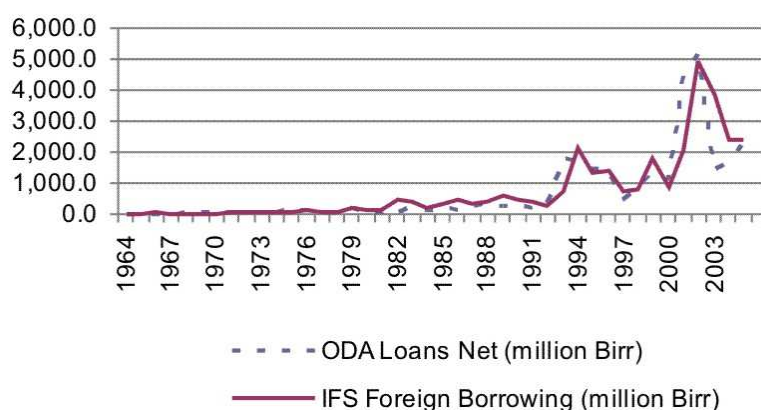
FIGURE 5
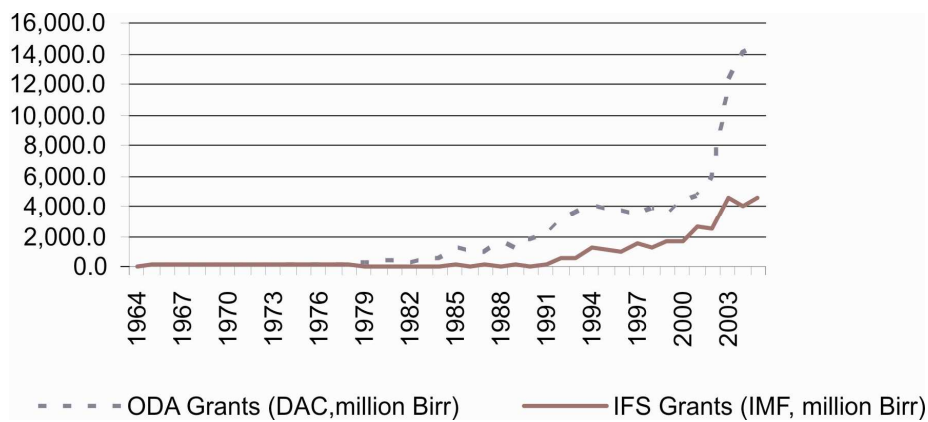
The DAC reported values for ODA grants exceed those reported by the IMF by a considerable margin. This discrepancy often arises from the fact that some aid flows are not reported in the government budget; they are often regarded as 'off-budget' items (see MacKinnon, 2003:9). These tend to be grant-funded projects that are implemented without the knowledge of the government planning office, either due to the lack of reporting of aid-funded activities by donor agencies or lack of communication among sectoral ministries, regional offices and the central government. For this reason, the use of IMF data will be more appropriate for the analysis of the fiscal response since it is compiled from government sources and reports the amount of grants of which government decision-makers are actually aware.[28]

These are the values that will be taken into consideration when formulating the budget, hence influencing the fiscal decisions undertaken by the government. The DAC data would be best suited for other macroeconomic questions, such as the impact on the exchange rate, where total aid flows are more pertinent. Another problem arising from the use of DAC statistics is the interpretation of the domestic borrowing variable (B). Since this is constructed as a residual from equation [2], so as to ensure that the fiscal data are consistent, borrowing from domestic sources could be substantially underestimated, potentially biasing the results of our model.

With regard to loans, the IMF reports foreign financing, which includes all government borrowing from abroad. In theory, this item should incorporate both concessional lending (e.g., IDA 'soft' loans) and borrowing at competitive (or commercial) rates. Although it is not possible to directly assess the proportion of concessional lending, it is feasible to compare the IMF data with the DAC values for ODA loans. Since all foreign loans will be, in principle, reported in the budget (as opposed to grants), these two series are likely to be identical if most borrowing is, as should be expected for a country such as Ethiopia, from bilateral and multilateral concessional sources.[29]

FIGURE 6

Source: IMF (IFS and Statistical Appendices) and IDS-DAC.

Figure 6 above shows a strong correlation between the two variables: ODA (concessional) loans and foreign (commercial) borrowing. This suggests that most foreign loans to the government were provided on concessional terms, which is not particularly surprising due to the difficulty that some African countries face when borrowing from international markets. The higher IMF estimates during the 1980s might be explained by the existence of loans from the Soviet bloc, which are not included in the total ODA figures.[30] Hence, the grants variable (A1) can be aggregated with foreign financing (A2), and it can be argued with some confidence that these are, in fact, total aggregate aid flows (A).

Since it is difficult to obtain data for the target variables, the standard procedure followed in the literature is to construct proxy variables. These approximations are, in fact, the fitted values of long-run cointegrating relationships between each of the fiscal variables and a set of exogenous regressors (i.e., exogenous to the model). The rationale is that, since government targets are based on expectations about the future values of revenues and expenditures, the fitted values of a cointegrating relationship will represent the values that could be obtained in equilibrium (Franco-Rodriguez, 2000).

For this purpose, these targets will be approximated by estimating an unrestricted error-correction model (UECM) and testing for cointegration. This methodology combines the long-run information and the error-correction mechanism in the same equation. One of the main advantages is that the variables of the cointegrating relationship can be either stationary or non-stationary (i.e., they have a unit root). In this particular case, this is important since preliminary tests could not reject the hypothesis that some of the relevant variables are stationary.[31] The generic specification is given below:

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \Delta y_{t-i} + \sum_{i=1}^{p} \delta_i \Delta x_{t-i} + \sum_{i=1}^{p} \varepsilon_i \Delta z_{t-i} + \lambda_1 y_{t-1} + \lambda_2 x_{t-1} + \lambda_3 z_{t-1} + u_t$$

The cointegration test is obtained from the application of coefficient restrictions on the long-run coefficients (the Wald test). If these coefficients are (jointly) statistically different from zero, then it is suggested that there is cointegration, hence a long-run relationship amongst

the variables. The 'critical values' used to assess cointegration were those from Pesaran et al. (2001). The target for government revenues (T*) was obtained by regressing T on exports (X) and imports (M). Export taxes were until recently an important source of revenue while import duties have accounted for a substantial share of tax revenue. The target for government investment (Ig*) was obtained from the fitted values of the long-run relationship among GDP, loan commitments and Ig.[32]

Since it was not possible to find a cointegrating relationship for government consumption expenditure, the procedure in Franco-Rodriguez (2000) was followed: a regression with its lagged values and a time trend was used. With regard to the aid variables, the OECD-DAC data on ODA commitments were used as a proxy for aid targets, a procedure used in most of the fiscal response studies. The implicit assumption is that governments have a certain degree of bargaining power in setting the amount of these commitments, and so these values can be taken as aid targets. Although this procedure seems to be sensible for the loan target, it might not be adequate for the target for aid grants since these will be overestimated. Hence the Creditor Reporting System (CRS) database of the DAC was used to proxy for this variable.[33]

Once the target variables are obtained, it is possible to proceed to the estimation of the system of structural equations. It is standard practice to use the non-linear three-stage least squares (N3SLS) estimation method since the system of equations [4]-[8] is not linear in the coefficients, and contains cross-equation restrictions. Table 7 presents the results.

TABLE 7
Estimation Results

Model	Parameter	Estimate	Std. Error	T-Statistic	P-value
Aggregated Aid	ρ_1	0.5470	0.0308	17.7546	0.000
	ρ_2	0.8332	0.0673	12.3716	0.000
	ρ_3	0.8919	0.0918	9.7161	0.000
	β_1	0.2014	0.1911	1.0538	0.294
	β_2	1.6051	0.1611	9.9642	0.000
	β_3	0.1554	0.1086	1.4311	0.154
	β_4	1.1647	0.1050	11.0939	0.000
	β_5	0.1412	0.1117	1.2649	0.208
	β_6	1.1013	0.0979	11.2456	0.000
Disaggregated Aid	ρ_1	0.6259	0.0450	13.8975	0.000
	ρ_2	0.7044	0.2032	3.4668	0.001
	ρ_3	0.5543	0.2362	2.3461	0.020
	ρ_4	0.9017	0.1221	7.3859	0.000
	β_1	0.1717	0.2108	0.8147	0.416
	β_2	1.4782	0.1753	8.4325	0.000
	β_3	0.1646	0.0854	1.9263	0.056
	β_4	0.6763	0.1584	4.2704	0.000
	β_5	0.2355	0.1006	2.3413	0.020
	β_6	-0.6364	0.4484	-1.4191	0.158
	β_7	0.1375	0.1276	1.0772	0.283
	β_8	1.0827	0.1283	8.4378	0.000

Observation: ρ_4, β_7 and β_8 in the disaggregated model correspond to ρ_3, β_5 and β_6 in the aggregate model (i.e., parameters associated with domestic borrowing).

The first step is to analyse the results of the aggregated model. As mentioned earlier in the paper, the rhos (ρ) represent the proportion of revenues, aid flows and domestic borrowing allocated to consumption. The estimated coefficients suggest that 55 per cent of domestic revenues are allocated to consumption, with the remaining 45 per cent going to public investment. This result seems very plausible, as most developing countries will want to ensure that an important share of government recurrent costs is covered by domestic revenue sources.

The second coefficient suggests that 83 per cent of foreign aid is allocated to pay for recurrent costs, which may seem slightly high. Finally, almost 90 per cent of domestic borrowing is allocated to consumption expenditure, which might represent a major concern since loans should ideally be used for investment purposes. However, this might suggest that the government often turns to the domestic borrowing market to close the financing gap (the deficit).

However, the betas (β) do not have an intrinsic meaning or interpretation. They are all positive, as expected. The p-values in the last column indicate that β_1, β_3 and β_5 are not statistically significant even at the 10 per cent level of confidence, while the remaining coefficients are strongly significant. Some authors would choose to restrict insignificant coefficients to zero, as well as limit the rhos (ρ) to lie within the interval [0,1] and the betas (β) to be only positive numbers. However, this procedure might have the implication of biasing the results.[34]

Turning now to the disaggregated model, we can see the impact of disentangling the effects of grants and foreign borrowing. All the rhos (ρ) are statistically significant, and lie within the expected interval [0,1]. Corroborating the previous results, a large share of domestic revenues seems to be devoted to recurrent expenditure (roughly two-thirds) while 70 per cent of grants seem to be allocated to consumption. Although this would seem to support the argument that aid (in this case grants) is fungible, it is important to bear in mind that a portion of current expenditures will be developmental (e.g., for salaries of school teachers). Moreover, total grants to the country are not likely to be so 'pro-consumption' due to the existence of off-budget investment grants.

The coefficient for loans, by contrast, looks more 'pro-investment', with 45 per cent of loans allocated to capital expenditures. Finally, the figure for borrowing reinforces the previous finding that most domestic borrowing is used to pay for recurrent costs. There are three betas (β) that do not seem to be statistically significant (at the 10 per cent confidence level), but since most of these estimated values are relatively low, they are not expected to bias the results significantly. Nevertheless, the models have also been solved for the case where β_1, β_6 and β_7 take the value of zero, but this does not change the final results and conclusions significantly.

5.2.1   Direct Impact of Aid Flows

Now that we have estimated the system of equations, we can substitute the estimated coefficients into the structural equations in order to obtain the direct impacts of aid flows. Table 8 summarises the relevant impacts.

TABLE 8

Direct Impacts of Aid

Model	Impact		Estimate
Aggregated Aid	A on Ig	$(1-\rho_2) - (1-\rho_1)(1-\rho_2)\beta_1 - (1-\rho_1)\rho_2\beta_2$	-0.454
	A on G	$\rho_2 - \rho_1(1-\rho_2)\beta_1 - \rho_1\rho_2\beta_2$	0.083
	A on T	$-(1-\rho_2)\beta_1 + \rho_2\beta_2$	-1.371
	A on B	$-(1-\rho_2)\beta_5 + \rho_2\beta_6$	-0.941
Disaggregated Aid	A1 on Ig	$(1-\rho_2) - (1-\rho_1)(1-\rho_2)\beta_1 - (1-\rho_1)\rho_2\beta_2$	-0.113
	A1 on G	$\rho_2 - \rho_1(1-\rho_2)\beta_1 - \rho_1\rho_2\beta_2$	0.021
	A1 on T	$-(1-\rho_2)\beta_1 + \rho_2\beta_2$	-1.092
	A1 on B	$-(1-\rho_2)\beta_7 + \rho_2\beta_8$	-0.803
	A2 on Ig	$(1-\rho_3) - (1-\rho_1)(1-\rho_3)\beta_1 - (1-\rho_1)\rho_3\beta_2$	0.111
	A2 on G	$\rho_3 - \rho_1(1-\rho_3)\beta_1 - \rho_1\rho_3\beta_2$	-0.006
	A2 on T	$-(1-\rho_3)\beta_1 + \rho_3\beta_2$	-0.896
	A2 on B	$-(1-\rho_3)\beta_7 + \rho_3\beta_8$	-0.661

As mentioned earlier, it is important to bear in mind that these results represent only partial effects. The impact of aggregate aid flows on capital expenditure seems to be negative, as is the effect on domestic tax revenue collection. Government current expenditures are positively correlated with aid flows, while the last coefficient suggests that foreign aid is a substitute for domestic borrowing. Nonetheless, if specific types of aid have different fiscal impacts, these results will be biased due to the aggregation of aid.

The disaggregated model seems to support this proposition, as the direct impacts of aid grants and loans on expenditure are significantly different. Grants appear to have a negative impact on public investment and a weak positive effect on public current expenditure while loans have a positive effect on public investment and an almost negligible impact on government current expenditure.[35] Moreover, both grants and loans seem to have a negative effect on revenue collection, with the negative impact of grants being stronger than that for loans. Similarly, both forms of aid have a negative relationship with domestic borrowing. These results suggest that aid flows are a substitute for both taxes and domestic borrowing.

5.2.2 Direct and Indirect Effects of Aid Flows

Although the results so far have given us interesting insights into the fiscal response to aid flows, these are only partial (direct) effects. To obtain the total (direct and indirect) effects that run through the simultaneous system, one has to analyse the estimates for the reduced-form equations. This is done by simultaneously solving the system of structural equations (with the estimated coefficients).

TABLE 9

Total Impacts of Aid

Impact	Ig	G	T	B
A*	0.016	-0.001	-0.059	-0.524
A1*	0.064	-0.004	-0.474	-0.435
A2*	0.295	0.033	-0.154	-0.457

The results reported in Table 9 above suggest that an increase in the aid commitment (which in turn will be followed by an aid disbursement) has a weak positive impact on public investment, while it reduces domestic revenues. The impact on recurrent expenditure is almost negligible. Finally, the impact on borrowing is strongly negative, suggesting that aid and domestic borrowing are close substitutes. However, as was stated before, these coefficients are likely to be biased due to the aggregation impact.

The disaggregated model provides further insights into the impact of aid inflows on the fiscal aggregates. Both grants and foreign loans have a positive impact on public investment, with loans having a stronger impact, as expected. This happens because loans tend to be associated with capital projects while grants captured in the budget figures tend to be biased towards consumption due to the existence of grant-funded projects not recorded in the budget (i.e., off-budget items). The impact on current expenditure is positive but weak while the negative results for domestic revenue seem to corroborate the conclusions of the aggregated aid model, although the coefficient on grants is significantly greater than for loans.

This effect suggests that grants produce a stronger tax disincentive effect than loans, perhaps because they will not have to be paid back. However, it could also be the case that the model is capturing some 'exogenous' or indirect effects rather than a disincentive caused by higher aid flows, e.g., droughts or aid conditionality.[36] Finally, the impact of both forms of aid on domestic borrowing is strongly negative, suggesting that they both act as substitutes for domestic borrowing, with a roughly equal magnitude.

The results presented above suggest that foreign aid directly finances new public expenditure. But one might argue that by substituting for domestic borrowing and revenue, foreign aid also does so indirectly. In fact, similar conclusions are reached in a recent study for Ghana (Osei et al., 2005), which finds that aid does not have a strong direct effect on the volume of government spending but is treated as a substitute for domestic borrowing.

Although some donors would be concerned with the lack of additionally of aid resources, to the extent that a birr of aid does not generate an equivalent increase on the expenditure side, substituting aid for domestic borrowing or even using aid flows to retire onerous debt might be a desirable strategy in cases where the debt burden is high.

Taking into consideration that domestic borrowing is often seen as an expensive last resort to balance the budget, this strong negative correlation with aid might suggest that a significant share of aid flows is not being incorporated into the budget planning process (notwithstanding being recorded). This might arise in cases where aid unpredictability and volatility undermine long-term fiscal planning, prompting large fluctuations in the levels of domestic borrowing. This might explain why foreign aid does not have a stronger (direct) impact on the other fiscal variables, especially on the spending items.

Although the use of a fiscal response model has improved our capacity to analyse specific fiscal dynamics in Ethiopia, one needs to be aware of its limitations. One of them concerns the underlying assumptions about government behaviour that are embedded in the model (e.g., utility maximisation and symmetric functions). If these assumptions are incorrect, the results and conclusions from this framework could be biased. Another weakness relates to the use of proxies for the target variables since data on budgeted (i.e., planned) figures are not readily accessible. It is often acknowledged by researchers that these models might be sensitive to the way targets are approximated. Finally, even though the results and conclusions seem plausible, not all of the results appear to be robust to changes in the time period. This might arise from the existence of outliers in the data or perhaps structural breaks in the time series.

5.3 COINTEGRATION ANALYSIS

In order to complement the previous analysis, and test the robustness of the results obtained, this paper also estimates cointegrating relationships for each of the main fiscal variables. This approach is more straightforward than the fiscal response framework, and addresses some of the shortcomings of the previous methodology: there is no need to make strong assumptions about government behaviour or to estimate proxies for the target variables. It also allows testing for structural breaks and outliers in the data.

Nevertheless, the single equation approach presented in this section might ignore potential interactions among fiscal variables, which can be important if fiscal decisions are taken simultaneously. This is also referred to as the 'endogeneity problem', which occurs when, say, the level of expenditures influences revenue collection, which in turn influences spending decisions. This is one of the main reasons why the single-equation approach is not popular in the fiscal response literature. However, the purpose of this exercise is merely to strengthen our understanding of the fiscal dynamics. If the results corroborate the conclusions of the previous fiscal response analysis, they could suggest that the relationships in the data are fairly strong, and that the model specification is not 'driving' the results.

The relationships between fiscal aggregates and other relevant macroeconomic variables are studied in an unrestricted error-correction model (UECM). This methodology has some advantages over other cointegration approaches: the variables can be either stationary or integrated of order one; only one equation is estimated, combining both short- and long-run information; and cointegration testing is fairly straightforward. To assess the existence of a long-run relationship amongst the variables (cointegration), one needs to test the joint significance of the long-run coefficients in each equation (the Wald test). Standard diagnostic tests were also applied to the estimated equations: the Jarque-Bera test (normality), Ramsey RESET test (specification), Breusch-Godfrey LM test (serial correlation) and Breusch-Pagan-Godfrey test (heteroscedasticity). All the specifications passed these tests at the five per cent confidence level, unless otherwise specified.

TABLE 10

Long-Run Impact of Aid on Expenditures and Revenue

Variables	Gov. Capital Expenditures (Ig)			Gov. Current Expenditures (G)				Revenue (T)	
	(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(2.3)	(2.4)	(3.1)	(3.1b)
Constant	-4.21***	-2.43***	-2.30***	0.83	1.21**	1.27	0.76	1.19	-6.45*
Revenue (T)	1.27***	1.05***	1.02***	0.91***	0.71***	0.77***	0.87***	-	-
Imports (M)	-	-	-	-	-	-	-	0.44*	1.35***
Exports (X)	-	-	-	-	-	-	-	0.43	0.39
Aggregate Aid (A)	0.14	-	-	-	0.18**	-	-	-	-
Grants (A1)	-	0.00	-	-	-	0.07**	0.06**	-0.09	0.13
Loans (A2)	-	0.19***	0.20***	-	-	0.05	-	0.15*	0.05
Dummy (D83)	1.11***	-	-	-	-	-	-	-	-
Dummy (D94)	-	-	-	0.86***	-	-	-	-	-
R-Squared	0.70	0.71	0.69	0.46	0.45	0.42	0.40	0.71	0.86
Wald Test (F-Stat)	4.91**	5.35**	7.19***	7.47**	5.92**	4.15*	5.49**	3.48	6.16***

Note: All variables are in logarithmic form, except the constant and dummy variables. The asterisks represent significance at the 10 per cent (*), five per cent (**), and one per cent (***) confidence levels, according to the critical values in Pesaran et al. (2001).

The results in the first three columns of Table 10 correspond to the impact on government capital expenditures. Since the first specification (1.1) failed the normality test on the residuals, a dummy variable had to be added to solve an outlier in 1983.[37] All three specifications have strong R-squares, while the Wald tests indicate that these are valid long-run relationships. The coefficients suggest that both domestic revenues and aid loans have a positive impact on the level of capital expenditures. However, aid grants are not statistically significant.

These results seem robust across time and support the previous findings, namely, that aid loans have a stronger positive impact on investment than grants. The coefficients can be read as long-run elasticities (i.e., percentage changes), since the equations were estimated in log-log form. Therefore, a one per cent increase in aid loans will cause an increase of about 0.2 per cent in capital expenditure.

The results in the following four columns also seem to suggest that domestic revenue and aid flows have a positive impact on current expenditures. However, it appears that in this case grants have a stronger impact than loans. As before, the first specification failed the normality test, and a dummy variable for 1994 had to be included.[38] In this case the R-squares are weaker, possibly due to the recurrent behaviour of this type of expenditure, which makes it less responsive to changes in revenue and aid flows. Nonetheless, the Wald tests suggest cointegration amongst the variables.

The final two columns contain the results from trying to assess the impact of aid flows on domestic revenues. The first specification (3.1) is not a cointegration relationship, and it fails the structural form test (RESET). Alternative specifications were tested but did not improve the results (e.g., including GDP as a proxy for the level of activity in the economy as well as private consumption). Further analysis through CUSUM and Chow Breakpoint tests suggests that there is a breakpoint around 1992. This is not particularly surprising, as the relationship between domestic revenues and trade variables (imports and exports) is likely to have changed after the economic reforms were introduced during this period.

Equation (3.1b) uses a sub-sample (1964-1992), and suggests that imports accounted for a substantial share of domestic revenues during this period. Neither exports nor aid flows seem to be significant. Although most of the coefficients on aid are not statistically significant in the various specifications utilised, there were very few cases in which the coefficients were negative. This might suggest, as highlighted before, that the impact of aid on domestic revenue is not a direct effect per se since the negative coefficient might hide specific tax and non-tax dynamics.

With regard to domestic borrowing, regressing its value (B) on the fiscal deficit before grants and aid flows would be the same as estimating the budget equation.[39] However, it is clear from Figure 4c that domestic borrowing is strongly driven by the size of the budget deficit (excluding grants), while both types of aid flows seem to be strong substitutes for domestic financing.

To conclude, the results clearly suggest that domestic revenues are the most important source for funding government expenditures, while foreign aid flows also have a significant positive impact on spending. It is important to note, however, that while aid loans tend to be associated with capital expenditures, grants have a stronger relationship with current expenditures. This result does not suggest that loans are more effective than grants, since some recurrent expenditure is essentially developmental, such as the salaries of school teachers and nurses and the purchase of medicines. Moreover, off-budget grants tend to be directed to investment purposes.

Overall, these results corroborate the conclusions of the fiscal response model. Aid flows have a positive impact on government spending, while the results for domestic revenue do not seem to be robust across time. More research would thus be required into specific tax and non-tax dynamics (e.g., disaggregating by type of revenue or adding omitted explanatory variables) in order to more clearly understand whether aid flows have an impact on domestic revenues.

6 CONCLUSION

The main aim of this Working Paper has been to assess the fiscal effects of aid flows in Ethiopia. It started by analysing some of the most important economic developments of the past 40 years, focusing its attention on the government sector. It then provided a brief overview of the recent debates surrounding the fiscal response literature, and applied a fiscal response model to the Ethiopian data (1964-2005).

Two versions of the model were estimated. The first specification included a variable representing total aid inflows, while the other disaggregated this variable into aid grants and foreign loans. The main objective of the model was to examine how an increase in foreign aid inflows affects the recipient country's expenditure decisions, namely, the allocation of public resources and borrowing for such purposes, and the extent to which foreign aid produces negative incentives in relation to revenue collection. The model was then complemented by cointegration analysis.

Overall, the results presented in this study seem encouraging. Foreign aid has a clear positive impact on public spending, with a slight bias towards investment expenditures. The impact on domestic borrowing seems to be robust to different specifications, leading to the conclusion that both aid grants and loans act as substitutes for domestic borrowing.

There are two possible interpretations for this relationship. Since domestic borrowing is often an expensive last resort to balance the budget, an increase in aid flows could be used to reduce such an onerous burden. In this case, the incremental aid is indirectly paying for expenditures that would otherwise be financed through expensive domestic borrowing. Conversely, it might also be the case that, facing a shortfall in aid flows, the government resorts to domestic finance in order to keep expenditure levels stable. This could be one of the negative consequences of aid volatility and unpredictability, which should be addressed by donor countries in the spirit of the Paris Declaration.

Finally, there is some evidence that an increase in aid will have a negative impact on revenue collection. This might fuel concerns about external dependency and the lack of the long-term sustainability of such dynamics. However, this result does not seem to be robust across the sample, suggesting that the model does not fully capture the dynamic behaviour of domestic revenues.[40]

These results are not totally surprising. Aid flows (especially loans) are often earmarked to specific investment projects, while governments are likely to use tax revenues to pay for most recurrent costs. According to UNECA (2002, p.89), roughly half of the Ethiopian government's capital spending was financed through external sources, while most of the recurrent budget was paid for by domestic revenues. It is therefore predictable that an increase in aid inflows would have a stronger positive impact on the capital budget than on current expenditure.

Nevertheless, the results of the IMF (2005) study suggest that aid flows to Ethiopia have not been 'spent'. After the thorough analysis undertaken in this Working Paper, it is possible to say that over the 40-year period here considered, the fiscal deficit before grants has clearly widened (see Figure 4d in section 4), while aid flows have gradually increased, especially post-1992. Moreover, the empirical model presented here indicates that aid flows have not only induced an increase in government expenditures but also (subject to some caveats) a reduction in domestic revenues.

In conclusion, the results suggest that donors and recipients of aid should focus on ensuring greater 'aid additionality.' The priority should be on financing new capital spending, which can contribute not only to enhancing human development but also to expanding the economy's productive capacity. While using foreign aid to pay off onerous domestic debt can serve a useful purpose at least in the short run, the medium-term purpose of aid should clearly be to expand MDG-related government spending. Moreover, donors should channel more aid into building up national capacities to mobilise domestic revenue. Otherwise, developing countries such as Ethiopia will have difficulty in graduating from reliance on external aid.

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NOTES

1. "It measures the extent to which aid engenders a real resource transfer through higher imports or through a reduction in the domestic resources devoted to producing exports" (IMF, 2005, p.3).

2. The equation can be re-written as $(\Delta GE - \Delta T)/\Delta A$.

3. However, some researchers suggest that lowering the tax burden can have a positive effect on the economy, mainly through higher private savings.

4. Some examples are trade liberalisation and the introduction of a value-added tax (VAT) at the cost of other taxes.

5. Especially through the World Bank (1998) publication.

6. These models were developed as a branch of the savings debate (see Griffin, 1970).

7. However, Khan and Hosino (1992) do disaggregate aid flows into bilateral and multilateral sources, and into grants and loans.

8. They argue that neglecting aid disaggregation would lead to aggregation bias in the results and conclusions, in cases in which the preferences of the aid-recipient government are higher for some of these types of aid.

9. The authors suggest that a reduction in taxation effort could benefit the private sector and individual households, so they do not see it as a necessarily bad outcome.

10. Some contentious issues in this literature include the specification of the utility function (linear-quadratic vs. quadratic - asymmetry), the use and estimation of targets (sensitivity of results) and the issue of endogenous aid.

11. This methodology does not provide numerical results such as those produced by a standard Fiscal Response model.

12. The sources are WDI (2007) and UNDP (2006), respectively.

13. Political power was to a great extent related to the size and quality of the land owned (Geda, 2007).

14. However, the initial steps of the reform process had been taken by the Derg regime in its last years. "In the case of Ethiopia, the willingness to engage in meaningful reform seems to have prevailed since 1988. The Derg approached Western donors with hat in hand once it became clear that Soviet bloc aid was about to end and that the socialist experiment had failed" (Abegaz, 2001).

15. Calculated from WDI (2007).

16. Source: National Bank of Ethiopia, Quarterly Bulletin, volume 6(4), 1990/91.

17. IMF (2006, p.41).

18. Export taxes were once an important item on the revenue side although in the past few years these rates have been almost abolished (Abegaz, 2001).

19. Which were financed, to some extent, by monetisation (i.e., printing money) (Bevan, 2001, p.4).

20. For more details on the analytical model with disaggregated aid, see McGillivray and Ahmed (1999). These authors disaggregate aid flows by source (bilateral and multilateral).

21. Although some authors have argued against this specification, their proposed alternatives (e.g., linear-quadratic) are not without problems. In fact, this has been the most widely used specification in peer-reviewed publications.

22. See Franco-Rodriguez (2000).

23. Equation [3] is transformed into an equality (corner solution), and B* is set to zero.

24. There is a vast literature on aid uncertainty, which suggests that aid commitments are poor predictors of disbursements. This might, to some extent, compromise the impact of A* on aid flows A, and hence the results of the model.

25. Due to the budget constraint, one of these equations will be redundant, so in practise we have to drop one of them. Equation [5] is the main candidate since all of its coefficients are present in the other equations.

26. This was initially derived as the difference between total expenditure (GE) and government consumption from the national accounts. However, since the latter, by definition, does not include interest payments and government transfers, the series was corrected to the extent possible by the IMF Statistical Appendices for the period 1992-2005. A thorough comparison with other sources (e.g., NBE Quarterly Reports) suggests that this new series is accurate.

27. The IFS (IMF) exchange rate was used to convert the DAC USD values into Birr.

28. It is important to note, however, that being reported in the budget does not necessarily indicate that the funds are channelled through the treasury or that the government is directly in charge of the implementation of the project or programme.

29. See MacKinnon (2003, p.11).

30. From 2000 onwards, there might have been discrepancies regarding the recording date.

31. The remaining variables are integrated of order one, i.e., I(1).

32. The explanatory variables for these target approximations have to be exogenous to the model. This means that in this case domestic revenue and aid flows cannot be used on the right-hand side of the equation.

33. This was done by subtracting sector allocable and emergency aid commitments from the grant total.

34. See Ouattara (2006).

35. The negative effect of grants might arise from the fact that one of the grant components is positively correlated with natural disasters (e.g., drought relief), while investment expenditures are likely to decrease in such events.

36. The volume of grants may increase during natural disasters while tax collection is likely to be reduced. Another possibility is that the model is capturing some degree of aid conditionality. The fiscal data show that aid flows to Ethiopia (especially grants) increased substantially from the early 1990s, roughly when economic reforms started to be implemented.

37. Already identified in section 4.2.

38. Also explained in section 4.2.

39. The coefficient for the deficit (expenditure minus domestic revenue) would be 1, and -1 for foreign aid flows. In the levels form it would be: $B = a + b*(G + Ig - T) + c*A$, with $a=0$, $b=1$, $c=-1$.

40. Section 4.2 provides some insights into the composition of domestic revenues through the years. Its volatility (structural breaks) and the omission of important factors that may explain its behaviour could explain the lack of robustness.