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Interplay of aid and fiscal policy: Does budget support induce greater fiscal discipline?

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INTERPLAY OF AID AND FISCAL POLICY: DOES BUDGET SUPPORT INDUCE GREATER FISCAL DISCIPLINE?

The effectiveness of foreign aid has been studied from various perspectives. The current aid system has come under a lot of criticism and the relevance of aid giving in eradicating extreme poverty has been widely questioned.

Even though aid has been found to have a strong, positive impact on growth, there is a concern about other possible effects. Among them is the concern about its impact on aid receiving country government's fiscal discipline. However the research done to date does not properly take into consideration that there exists a variety of aid instruments, which might have different impact.

This thesis addresses the question, whether foreign aid has an impact on fiscal discipline of the aid receiving country's government, and whether different aid instruments differ in this respect. It is first shown theoretically that the traditional forms of aid, which are managed outside the government budget, distort incentives to maintain fiscal discipline, whereas supporting directly government budgets strengthens the budget process and so results in greater fiscal discipline.

The empirical part further tests the hypothesis. Fiscal discipline in terms of debt sustainability under the two aid systems is assessed for 11 Sub-Saharan African countries. Data has been collected from various publicly available sources. The debt sustainability computations indicate greater fiscal discipline in the sample countries since they receive budget support.

Key words: foreign aid, budget support, public finance, debt sustainability

Table of contents

Tables and figures

Introduction

Motivation and background

This thesis examines the fiscal impact of two broad categories of foreign aid: budget support and off-budget aid. During the past 30 years aid effectiveness has been studied from different ideological perspectives and by using various methodologies. There are several issues that complicate the evaluation of aid effectiveness. First of all it is by no means clear what is to be measured: what is it that aid is supposed to do? Taking ending world poverty as the ultimate goal only complicates the question because poverty is such a complex phenomenon that there is no clear, not to mention a single, cure to it. There appears to be no unanimity on aid effectiveness among researchers, donors and aid recipients. This is on the one hand due to different perceptions on effectiveness and efficiency, and because of the (methodological) difficulties of measuring and identifying the impact of foreign aid, on the other.

This apparent mixed evidence on aid effectiveness has eventually been contradicted by Hansen and Tarp (2000). Using an analytical framework to evaluate the existing aid effectiveness literature they conclude that, in the light of research done to date, there is a robust positive aid-growth link. A recent study by Arndt, Jones and Tarp (2009) also shows that foreign aid indeed is effective. They state that "growth is the key objective of aid and must be evaluated as such". They then add new insights to aid-growth debate by moving away from associational to causal inference[1] and conclude that abolishing or significantly cutting back foreign aid would be a mistake. Hence the currently unresolved issue is not whether aid works, but *how* it works and whether there are differences between different aid modalities.

This statement is further confirmed by Easterly[2] in *Reinventing foreign aid* (2009), one of the latest contributions to the critical discussion on development aid. He claims that there is a general discontent with the existing aid system even though international aid is still seen as an important instrument in the fight against poverty. Despite the agreement that the current aid system is not

[1] The authors extend previous research by identifying and evaluating potential outcomes, or counterfactuals. Identifying plausible counterfactuals has been a major empirical evaluation challenge.
[2] Former World Bank economist, currently Professor of Economics at New York University.

working very well there is international consensus that still more aid is needed. Given that controversial evidence on aid ineffectiveness prevails in the media[3] while more and more aid is flowing from rich to poor countries, it is more important than ever to assess how exactly aid works and which aid instruments are most efficient in helping the world's poorest people (Hansen & Tarp 2000, 22).

Fundamentally foreign aid is about rich people giving money to the poor, which means that those who benefit from aid financed services are not the ones who pay for it. In addition, money is not directly handed over to the poor but there is at least one government, nongovernmental organization (NGO) or aid agency in between, and each of them probably having their own interests. Aid agencies are accountable to the rich whose money they are distributing, rather than to the poor who are eventually receiving it. In assessing aid effectiveness this has created incentives for aid agencies to emphasize facts visible to the rich country public rather than real, less observable results.[4]

Consequently a concern has arisen about other possible effects of foreign aid – especially regarding its fiscal impact: the interaction between aid and the recipient country government's fiscal behavior. The fact that most aid goes to the government and hence inevitably through the political decision making process, has not been properly taken into account. The centrality of fiscal effects is further emphasized by suspects and preliminary empirical evidence that there exists a link between foreign aid, increased public spending and reduced tax effort. (McGillivrey & Morrissey 2001; Mayr 2010.) However the link between foreign aid and excess public borrowing has not been thoroughly assessed to date.

Objective of the study and research questions

Aid affects macro economy through several channels. For example, the impact through savings and investment has been studied by Papanek (1972, 1973), aid-policy link by Boone (1996) and Burnside and Dollar (1997). The latest findings confirm that aid has positive impact on economic growth. However, aid effectiveness does not tell us anything about the mechanisms through

[3] Also the Finnish media have recently reported on several negative comments concerning foreign aid giving.
[4] For example Svensson and Reinikka (Easterly 2009) have gained field experience in some practical measures to enhance visibility of results.

which aid has positive or negative effects. Moreover there is not only one kind of aid but various aid modalities, or instruments, and the current trend is to move away from the traditional forms of aid. Since the issue has not yet been addressed, it is interesting to look whether aid modality matters in effective aid delivery.

Besides foreign aid, another topic that has attracted attention is unsustainable fiscal policies in developing countries. Sustained budget deficits and large stocks of public debt are viewed as important contributors to persistent poverty (Afonso & Rault 2010; Mayr 2010). Supported by some empirical evidence, large amounts of aid are also suspected to lead to excess public borrowing (McGillivray & Morrissey 2001; Easterly 2002; Mayr 2010). Insofar the relationship has been brought into light in the fiscal response literature[5] but there are no comprehensive studies on the subject, which makes it another interesting and relevant topic.

With these premises, this thesis will look at both issues - how aid works and whether aid modality matters from the perspective of fiscal discipline.

The research questions are:

1. What are the mechanisms that determine how different aid modalities affect fiscal discipline?
2. Is budget support associated with greater fiscal discipline than off-budget aid?

The objective of the thesis is twofold. To answer the first question, it aims to explore *theoretically* how government behavior alters as a response to foreign aid. As the fiscal discipline research done so far - fungibility and fiscal response studies - looks at the effect of aid on the *structure* of public finances only, the framework is inadequate in determining the underlying mechanisms. Therefore a new theoretical approach will be used.

An *empirical* approach is used to answer the second question, where fiscal discipline is measured in terms of public debt sustainability. More precisely, the empirical section attempts to assess whether a country has a more sustainable debt level when it receives new kind of budget support

[5] An overview of fiscal response studies follows in section 3.

(unconditional aid that is directed to the aid receiving government's budget) than when it receives traditional, off-budget aid (aid that is not disbursed to the government budget). The second research question deviates from the usual approach, as it differentiates between aid modalities. As the evidence on the aid-borrowing-link refers to overseas development assistance (ODA) in general, without separating the impact of various aid modalities, it is important to look whether aid modalities differ in this respect.

The motivation for differentiating aid modalities in terms of on- and off-budget aid lies in the centrality of the topic in the development aid discussion, mostly among practitioners. Foreign aid has been under a lot of criticism and its effectiveness in the traditional, off-budget form has been widely questioned (e.g. Easterly 2009; Koeberle & Stavreski 2006).

Structure and methodology

The first chapter sets a background for the study. A brief literature review introduces to the ongoing discussion on development aid and fiscal behavior, and discusses how the approach to aid effectiveness has changed hand in hand with political changes. Different aid instruments relevant for the thesis are presented. The focus on fiscal behavior will be further motivated in the light of aid dependence, which occurs as long periods of foreign aid inflows alter institutions and incentives in the aid receiving country. The second chapter introduces the special characteristics of foreign aid giving today.

Even though insufficient in explaining how government fiscal behavior changes as a response to foreign aid, the current attempts to theoretically and empirically assess the fiscal impact of aid will be briefly presented in the third chapter. This is to show both the importance of the topic as well as the difficulties encountered in the field of research.

In the fourth chapter a theoretical model on fiscal behavior will be built to show how aid distorts incentives to maintain fiscal discipline, and how putting aid on budget strengthens the political decision making process (budget process), which is a major contributor to fiscal discipline. The theoretical framework draws from political economy and public finance literature that have studied the link between budget process and budget deficits. The purpose of the theoretical

approach is to explain how budget support increases accountability and ownership of the receiving country government, and so helps solve the problems arising from both donor and receiving country behavior. The theoretical model does not include foreign aid in its original form but, as it will be explained, the kind of fiscal behavior predicted by the framework is assumed to result also in the context of development aid due to an analogy between budget processes.

The link between different aid modalities and fiscal discipline is empirically assessed in the fifth chapter, where public sector debt sustainability is taken as a measure of fiscal discipline. Sustainable primary balances are computed for 11 Sub-Saharan African countries before and after they started receiving general budget support (GBS). The results obtained indicate that most sample countries' fiscal discipline has slightly improved after they started to receive GBS. Finally, the sixth chapter concludes and suggests further research topics.

1 From development aid to economic growth

This chapter begins with a presentation of different development aid instruments and defines the core concepts used throughout the thesis. It then continues with a brief historical overview on foreign aid giving. It is essential to consider the changing approach to aid giving because the purpose of foreign aid naturally determines how its effectiveness has been evaluated.

1.1 Foreign aid in a changing political environment

What exactly is foreign aid and what are its different forms? OECD's Development Assistance Committee's (DAC) glossary defines aid activity as "projects and programs, cash transfers, deliveries of goods, training courses, research projects, debt relief operations and contributions to non-governmental organizations". The terms development aid and foreign aid will be used interchangeably throughout the text referring to this kind of aid activity in developing countries.

The term Official Development Assistance (ODA) is "used in measuring the inflow of resources to recipient countries", and includes grants, loans and contributions in cash and in kind. The traditional forms of aid include project and program aid that provide financing for specific projects; technical assistance, whereby the donor supports the receiving country by providing it with staff with certain technical skills, knowledge and knowhow; and food aid, which is mostly delivered as emergency aid.

Aid can be either earmarked or non-earmarked. Earmarking ties the aid to a predetermined expenditure category. There are three disbursement channels of foreign aid (Mokoro 2008, 7). First, earmarked and non-earmarked aid can be disbursed through the channel normally used for government's own-funded expenditures. In this case aid is disbursed to the finance ministry or treasury that further redistributes it to the ministries, departments or agencies (MDAs) responsible for the budget execution. The second channel goes directly to MDAs. Aid is then managed outside of the regular government system and does not follow the normal government procedures. The third option is that expenditure is undertaken either by the donor agency or by non-government agents.

Off-budget aid is either not at all disbursed via government or does not follow regular government channels. Alternatively all different aid modalities, such as project aid, program aid, technical assistance and aid in kind can be on budget, which means that aid is disbursed to the country's government.

The term budget support refers to a lump sum transfer of foreign exchange. Budget support can further be subdivided into general budget support (GBS) and sector budget support, their difference lying in the extent of earmarking and conditionality. General budget support is not earmarked to a sector or expenditure category and comes without conditionality.

Aid is said to be conditional when aid disbursement depends on the fulfillment of some predetermined requirements such as trade policy, structural reforms, democratization etc. Foreign aid is given for various reasons and the rationale for aid giving has changed over time. Also aid modalities have changed several times since the beginning of development assistance circa forty years ago. Foreign aid as an institution began in 1947 with the Marshall plan in Europe. Developing countries have been receiving foreign aid since the 1970s. The connection between development aid, i.e. money inflows to developing countries, and the Marshall plan was the underlying idea that countries suffering from poverty lacked investment needed for economic growth. Therefore industrial countries started to provide funds for investment projects in form of project aid. A strategy based on the successful Marshall plan in Europe did not work for the developing countries that lacked previous economic growth and pre-existing infrastructure. (Castrén 2003.)

A major change has been a shift from financing specific projects or sectors of the society to providing countries budget support. This trend has resulted from changes in international political environment and relationships. During the cold war the presence of the Western Countries in the Third World is mainly explained by political interests of donor countries. Nowadays receiver countries are perceived more as partners, whose own interests are to be respected and taken better into account in allocating funds (Castrén 2003). The purpose is to increase the ownership of the receiver countries' governments by respecting countries' sovereignty.

The failure of the traditional forms of aid (mainly project and program aid) in reducing poverty in the Third World has been widely acknowledged. In the policy research report *Assessing aid*, the World Bank (1998) takes a critical overview on its own history as aid provider and on aid effectiveness. The rationale for the report was the general questioning of the existence of aid in a world of integrated capital markets where finance for investments is available on the markets. The report concludes that financial transfers from rich to poor countries are still needed but their modalities have to change for aid to be effective.

The key findings emerging from the research are that effective aid requires right timing and allocation of funds to promote sound policies and governance. Thereby institutions have been found to play a central role in aid effectiveness. On the one hand, in a country where economic policies are being reformed, assistance is needed to increase benefits of reform as well as to maintain political support. On the other hand finance has little impact before countries reform. Aid was found to be effective in countries with sound management, while distorted environments have to rely on other instruments to support development. (World Bank 1998.)

The focus has thus shifted from the narrow evaluation of projects to allocating resources, both finance and knowledge, to stimulate policy reforms and institutional changes that contribute to sustainable development and poverty reduction. However, also the approach to promote reform changed as making aid conditional on reform failed to deliver desired results. Multilateral donor organizations, the World Bank and the International Monetary Fund (IMF) in particular, had based their assistance on the so-called *Washington consensus*, which consists of a variety of measures aiming at structural reforms such as exchange rate devaluation, cutting inflation and budget deficits, and privatization of state-owned enterprises. The underlying idea is that sustainable macroeconomic development and free trade lead to economic growth, which in turn is the key to poverty reduction.

Critics of aid conditional on structural reform (Bhagwati 2000; Stiglitz 2002; Svensson 2002) point out that the approach failed to recognize countries' differing problems and characteristics. Reforms were imposed before the rest of the society was ready and without consideration of the specific kind of reforms needed in each country – different problems require distinct solutions.

Free trade failed to deliver the desired outcome by the same token: trade liberalization in developing countries cannot effectively contribute to economic growth if at the same time access to international markets is denied or trade barriers are maintained.

1.2 The role of fiscal policy

Talking about fiscal policy means focusing on one specific aspect of how aid affects policy, namely its impact on fiscal aggregates. This is a prerequisite for understanding macroeconomic effectiveness, or how aid promotes economic growth (McGillivray & Morrissey 2000.) The big question whether aid is a decisive factor in economic development and under what conditions is still unresolved (Arndt, Jones & Tarp 2009). A variety of approaches have been used to assess aid effectiveness, but the conclusions drawn are heavily dependent on theoretical frameworks, data sets, behavioral assumptions and econometric methods (Easterly 2009; McGillivray & Morrissey 2001).

There are at least two reasons for paying attention to fiscal policy in the context of economic growth and poverty reduction. First of all, fiscal policy is about decisions on public expenditure allocation and its finance. Second, fiscal behavior can be sustainable or not. In other words it can either undermine or promote economic growth and further increase or reduce poverty, respectively.

According to growth theory aid's impact on growth depends on how it affects savings, investment and government behavior in the economy. Most of the aid recipients are low-income countries where aid is still the principal source of revenue, often comparable to tax revenues in size, and therefore aid has a major impact on growth. (McGillivray & Morrissey 2001, 1.) In addition, as most aid goes to the public sector, its impact on growth and poverty-reduction depends essentially on how it influences government behavior. These two facts make government the most important factor contributing to growth in aid receiving low-income countries.

Table 1: Share of ODA of CG expense in selected Sub-Saharan countries 2007/2008

2007	%	2008	%
Niger	108,4	Burkina Faso	98,2
Madagascar	108,4	Uganda	76,3
Burkina Faso	101,3	Togo	75,3
Mali	97,7	Benin	64,3
Uganda	85,9	Cape Verde	53,3
Cape Verde	43,9	Kenya	20,9
Zambia	38,1	Lesotho	17,2
Togo	27,7	Cote d'Ivoire	14,7
Ghana	26,1	Mauritius	6,1
Kenya	24,9	Seychelles	4,4
Lesotho	17,5	South Africa	1,3

Source of data: World Bank Development Indicators Online

Aid covers a significant share of government revenue especially in the poorest aid-dependent countries. Table 1 illustrates the percentage share of Overseas Development Assistance (ODA) of central government (CG) expense[6] in a number of poor sub-Saharan countries. ODA is net aid and equals aid disbursements minus repayments of principal.

Government behavior naturally translates into policy; with emphasis on fiscal policy. Fiscal policy affects poverty through two channels: growth and distribution (McKay 2002). It plays a key role in obtaining sustained economic growth and is a main mechanism to influence distribution through public spending and revenue raising decisions. Together these two aspects of fiscal policy can lead to pro-poor pattern of growth.

A central challenge in assessing fiscal policy's poverty reducing ability is that poverty is multi-dimensional. This means that poverty consists of many aspects that are most likely influenced by several factors. Fiscal policy also includes various types of public expenditure and finance. The way one component of fiscal policy affects one aspect of poverty is rarely straightforward. McKay (2002, 2) points out that not only the nature of public spending (allocation of funds, consumption vs. investment etc.) affects poverty but also the way the expenditure is financed. Consequently considering an increase in the overall level of public spending while ignoring the way it is financed is meaningless because the two may well affect in completely opposite directions. Financing public expenditure through deficit or taxation always involves decisions on who will bear the consequences such as increased tax burden, inflation, interest rates, debt burden. These financing measures will have different poverty impacts.

[6] Expense is cash payments for operating activities of the government in providing goods and services (World Bank Development Indicators online).

Assessing the direct and indirect effects of fiscal policy in quantitative terms is extremely difficult. The major methodological problem lies in identifying the counterfactual: what would have happened without a certain policy measure? Because of this difficulty most analyses focus on determining who receives the benefits of existing public spending, without answering the crucial question why exactly some groups benefit and others do not. Moreover this so-called *benefit-incidence analysis* fails to consider behavioral responses, which means understanding how behavior changes as a result of a determined fiscal policy measure.

The benefit-incidence analysis has been the most often opted technique because of its relatively modest data requirements and relatively easy calculations. There are great differences in the data collected by government ministries and they hardly contain relevant information for poverty impact assessment purposes, such as on the living conditions of the beneficiaries. Incorporating behavioral responses requires a modeling approach and more complex data but is fundamental to consider the counterfactual, or to explore how behavior would have differed if fiscal policy had been different. (McKay 2002.)

Therefore to fully understand the impact of aid on growth and poverty, it is essential to assess government's role as a mediator in the aid delivery and effectiveness process. In this regard there is a deficiency in the aid-growth literature as it does not explicitly recognize that aid is mainly given to the government and consequently its impact in the economy will be mediated by government behavior.

Traditionally aid effectiveness is studied as policy's impact on aid rather than considering how aid itself affects policy. *Aid fungibility literature* addresses the question of allocation by studying the composition of government spending. As it is not informative enough about fiscal behavior, the focus has shifted on *fiscal response studies* that are concerned with modeling how public sector behavior affects the impact of aid. These models cover both the categorical allocation and the effects of aid on total public spending, taxation and borrowing. Although the effects of aid are complex, there is empirical evidence on increased government spending and borrowing as well as reduced tax effort associated with high levels of foreign aid (McGillivray & Morrissey 2001; Mayr 2010).

1.3 Aid dependence: fiscal effects of long term aid

1.3.1. Institutions and governance

Since the very beginning of foreign aid giving there have been concerns about the negative effects of large scale money inflows on recipient countries' government, its behavior and attitudes. Long periods of external aid financing have been found to alter institutions and incentives to maintain fiscal discipline. The term *aid dependence* was first introduced in the 1970s when large money inflows were found to create institutional problems in aid receiving countries such as Bangladesh and Malawi. Bräutigam and Knack (2004, 257) define aid dependence as "a situation in which a government is unable to perform many of the core functions of government (…) without foreign aid funding and expertise".

Poor governance is often stated as the principal reason for many development problems in Africa (World Bank 1998), and includes concepts such as poor quality institutions, weak rule of law, absence of accountability, tight controls over information and corruption. Reasons for the crisis of governance are manifold and vary between countries: colonialism, economic crisis, unsustainable debt, civil wars and political instability. Even though these are probable reasons for poor governance, the fact that a lot of countries that receive large amounts of foreign aid are still characterized by these features has led researches to explore, whether aid itself contributes to poor governance rather than improves it, as intended.

Aid itself as well as the aid delivery process have been claimed to create perverse incentives and informal institutions, not only in the country receiving large amounts of aid but also in the donor organization (Bräutigam & Knack 2004). These incentives and informal institutions such as patterns of behavior, norms and codes of conduct have been identified as worsening already poor governance, and they are noted to be fairly persistent and resistant to change[7].

On the other hand aid can contribute to better governance by providing funds needed to establish strong institutions, improve the quality of civil servants through higher salaries and build legal

[7] Perverse incentives in the process of economic policymaking involve collective action problems like moral hazard and the tragedy of the commons.

systems and accounting offices. Traditionally one of the main purposes of aid has been to build effective institutions; so aid has been addressed to where most needed from this perspective. However, according to the prevailing view, aid is more effective in environments with sound institutions, and critics of large inflows have mostly focused on the absorption capacity of the poor countries, macro-economic impacts like the "Dutch disease"[8] and the way aid volatility complicates budgeting. In contrast to the traditional doctrine, the existence of effective institutions has increasingly become a *prerequisite* for foreign aid. (Moss, Pettersson & van de Walle 2005, 5.)

Moss *et al*. (2005) have studied yet another aspect of aid dependency, namely how aid reduces the willingness and ability of the government to collect state revenues. Since ability to collect revenues is a central task of democratic governance and fundamental to state operations, taxation is considered a key indicator of government capacity. The contemporary literature takes tax effort[9] as determined by the level of development and economic structure. The main measure of tax effort is GDP per capita as higher level of development is associated to a higher taxable surplus in the economy, better tax administration and ability to collect taxes, and finally a higher demand for public goods.

From the fiscal impact point of view, the most interesting outcome of the tax effort literature is that foreign aid seems to reduce tax effort because it provides an alternative, non-earned source of revenue for governments. Once again researches point out the role of incentives; large amounts of free external funding reduce incentives to tax and to improve tax administration.

1.3.2. Aid delivery process

After a decline in foreign aid inflows in the 1990s, a number of studies suggest again a substantial increase in ODA to meet international development targets. These claims for more ODA are supported by several international parties such as the United Nations, the World Bank, many NGOs, recipient countries as well as some European governments. Further increasing aid

[8] Inflows of foreign aid presumably raise the exchange rate, which makes the aid receiving country's manufacturing sector less competitive.
[9] Tax effort is generally measured by GDP per capita, the degree of openness of the economy, the agricultural or industrial share of GDP and population growth.

inflows calls for a greater evaluation of the potential negative impacts of large scale transfers on political and state institutions in low-income countries. (Moss *et al*.2005, 8.)

Table 2: Aid dependence. Net ODA/GNI ratios in selected Sub-Saharan countries

2007	%	2008	%
Liberia	124,7	Liberia	185,8
Burundi	48,6	Burundi	43,9
Sierra Leone	33,5	Guinea-Bissau	31,6
Guinea-Bissau	32,9	Sao Tome and Principe	26,3
Mozambique	24,2	Mozambique	22,0
Sao Tome and Principe	23,8	Malawi	21,2
Rwanda	21,3	Rwanda	19,3
Malawi	20,8	Sierra Leone	19,2
Tanzania	17,5	D.R. of Congo	15,5
Uganda	14,4	Cape Verde	14,2
Burkina Faso	14,1	Central African Republic	13,0
Mali	13,7	Ethiopia	13,0
Ethiopia	13,4	Burkina Faso	12,6
D.R. of Congo	12,9	Gambia	12,3
Niger	12,8	Uganda	11,8
Cape Verde	12,6	Tanzania	11,7
Mauritania	12,4	Togo	11,4
Madagascar	12,3	Mali	11,4
Gambia	12,3	Niger	11,3
Eritrea	11,5	Benin	9,6
Central African Republic	10,4	Guinea	9,1
Zambia	10,0	Madagascar	8,9

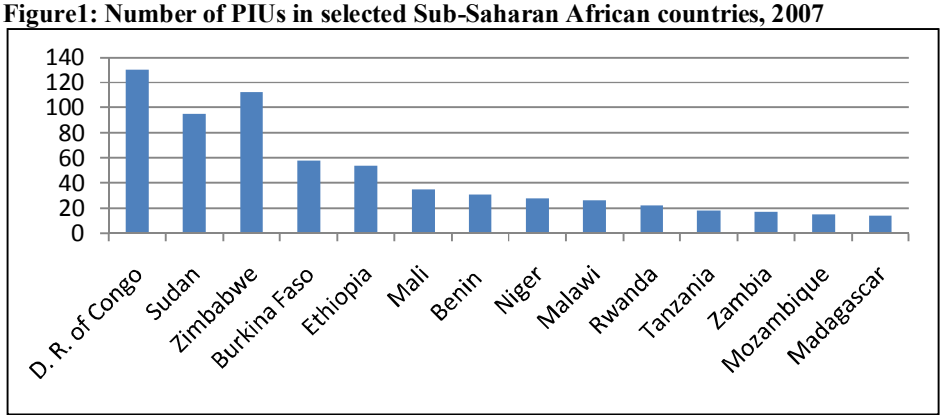
Source of data: World Bank Development Indicators Online

Table 2 reports the share of ODA of government revenues for selected sub-Saharan countries. Net ODA/GNI ratio is often used as a proxy for aid-dependence. Net ODA equals aid disbursements minus repayments of principal. Low-income countries, where more aid is to be addressed already receive historically high amounts of aid. Sub-Saharan Africa, a region that presents the greatest challenges to development and is the most aid-dependent, serves to give a view of the volume of aid flows.

The World Bank Development Indicators Online-database shows that on average Sub-Saharan Africa received ODA equivalent to 13,3 % of the GNI in 2007 and 14,2% in 2008 (excluding Somalia, for which ODA figures were not reported). In 2007 ODA amounted to more than 10 % of GNI in almost half of the regions 45 countries (excluding Somalia). In 7 countries ODA exceeded 20 % of GNI in year 2007. The 10 % threshold has been crossed in approximately three dozen countries in the world for a period of at least two decades. Both the time period and size of flows are historically without precedents (Bräutigam and Knack 2004).

The current international aid system is characterized by a fragmentation of donors' projects and agendas, impediment of learning and the impact on the budget process. High transaction costs result from donor competition for scarce staff in the receiving country. Large amount of donors and projects creates substantial costs for public administration when the number of qualified civil servants is already low. Figure 1 reports the number of parallel implementation units (PIUs) in a number of Sub-Saharan countries in year 2007.

Figure1: Number of PIUs in selected Sub-Saharan African countries, 2007



Source of data: Paris Monitoring Survey 2008

With an increase in the number of separate projects increases also the burden to public administration, since more time is spent on management of donor interest rather than promoting the development of the country. Furthermore, as most aid is received off budget so that it is not integrated into national budgets, aid-financed projects are often implemented through systems outside state structures. In order to do this, the most qualified staff is attracted by donors with extremely high salaries. (Bräutigam & Knack 2004, Moss *et al*. 2005, 7.)

This means that many of the foreign aid's costs to public administration are strictly related to aid delivery and administration from the donor side. These inadequacies of the aid system have been recently recognized among donors and some efforts to address the shortcomings are underway, such as donor pooling[10] and budget support instead of project aid. Institutional attempts to improve the delivery process include the OECD-DAC programs and the *Paris High Level Forum*

[10] Making the amount disbursed to each individual country dependent on its performance relative to competing countries (Svensson 2002, 383).

on Aid Harmonization and Alignment (Moss *et al*. 2005, 9). The existence of these inefficiencies is claimed to be a result of real political and bureaucratic constraints, the improvement of which seems to be very slow. In addition, Bräutigam and Knack (2004, 263) claim that there is a lack of incentives on both donors' and recipients' side to change current practices. They argue for rent seeking and corruption on recipient side; and political, ideological as well as commercial interests on donor side to surpass aid effectiveness as the final goal.

A final, important concern about aid dependence is that long periods of aid flows alter the relationship between the government and citizens. External finance could shift government's accountability from citizens to donors especially if they are the major providers of public finance. Even when aid disbursements are conditional on some predetermined requirements, these donor demands may be easier to fulfill than managing domestic revenue collection. (Moss *et al*. 2005, 15.)

That aid dependence creates *moral hazard* is empirically borne out by Bräutigam & Knack (2004) and Knack (2000). Moral hazard is a situation, where an element of insurance induces riskier behavior. Applied to this context, it means that access to external resources induces undevelopmental behavior. The flow of state revenues is not dependent on government efficiency, which undermines incentives to improve government's developmental capacity. When governing elites do not need to raise revenues from the local economy, they do not need the support of their publics or the assent of the legislatures either. Moral hazard operates both in the recipient government as well as within the donor organization.

2 From budget support to poverty reduction

This chapter discusses reasons that have led to an increased emphasis on budget support instead of project aid and other forms of off-budget aid, and how putting aid on budget is thought to correct the problems of perverse incentives, donor fragmentation and the resulting high transaction costs, government's lack of accountability and weakening institutions.

2.1 What is general budget support (GBS)?

Traditionally the most common development aid instruments have been conditional loans and grants to specific projects; justified by the claim that a lack of investment has been the principal constraint to development, and projects were seen as most efficient to capital investment delivery.

Recently, particularly in Europe, bilateral donors have started to shift away from project aid to non-earmarked budget support. Also multilateral agencies like the World Bank, the Asian Development Bank and the Inter-American Development Bank are increasingly moving away from the traditional, conditional, targeted support to more general budget support. This new way of aid delivery is remarkably different from the old arrangements of project-based or *ex-ante* conditionality imposing forms of aid. (Booth & Lawson 2004.)

The main problems with off-budget projects are high transaction costs created by a large number of projects and donors, inefficient spending caused by donors' ability to force their priorities, unpredictable funding levels due to problems in meeting the disbursement conditions, and non-government project management structures that undermine the effectiveness of government systems. Aid projects working outside the government systems thus undermine the credibility and effectiveness of those systems. Also government ownership is reduced because project selection, approval and review processes are determined by the donor instead of the government. (Booth & Lawson 2004.) In addition, developing countries have often lacked resources to maintain the infrastructure put in place with project aid.

Booth and Lawson (2004) divide budget support into three subgroups:

1. Direct budget support is a general definition, which refers to the channeling of donor funds in foreign currency to a partner government using its own allocation, procurement and accounting systems.
2. General budget support (GBS) consists of financial assistance that contributes to the overall budget. Funds may be nominally accounted for a certain sector but there is no formal limitation on their use.
3. Sector budget support covers financial aid that is earmarked to a certain sector or sectors.

The sometimes used name "partnership GBS" (PGBS) reflects the change in the perception of aid delivery in the 1990s. Until then aid delivery was strongly associated with imposing conditionality and structural adjustments. The dissatisfaction with this concept is incorporated in the word "partnership", which emphasizes the ownership of the receiving country so that support is given to its own poverty reduction strategies. Direct disbursements to the government through its own national system are thought to strengthen national planning and implementation capacity and to further increase the effectiveness of public expenditure. (IDD 2006; Koeberle, Stavreski & Walliser 2006.)

The inconsistent use of various terms and concepts is pointed out in one of the first systematic studies on budget aid (Mokoro 2008, 6). Confusion is created because aid is not always straightforwardly incorporated into the budget documents. Budgets also appear in several versions such as draft, final and amended as well as at different levels of administration, especially in decentralized systems.

Because of the various definitions and the number of aid modalities, to avoid confusion, from now on the term *general budget support* (GBS) will be used for non-earmarked (to specific projects or expenditure items), i.e. completely fungible aid funding to government that is disbursed through the government's own financial management system[11]. Perfect fungibility

[11] Also the Ministry for Foreign Affairs of Finland defines *general budget support* as non-earmarked, direct aid to the government budget.

means that the receiving country government uses its own allocation, procurement and accounting systems, even though there are a variety of disbursement channels.

Until the late 1990s budget support was provided in the context of structural adjustment programs. Since year 2000 there has been a major change in thinking about budget support. The "new" GBS since 2000 is based on the idea that an effective government that is accountable to the citizens is a prerequisite for sustained poverty reduction. This is guaranteed by providing untied budgetary resources, relying on national policy processes and putting emphasis on institutional development in order to create accountable, capable governments. Predictable, transparent methods for external budget finance and the use of government systems and processes also minimizes transaction costs. (Booth & Lawson 2004.) In brief, budget support is simply about transferring resources to the recipient country government budget.

Given the financial importance of budget support, it is striking that there has not yet been any formal evaluations of its effectiveness. This can be due to the novelty of the aid instrument, which in its current form has only been provided since year 2000. Most probably another essential reason is the difficulty of assessing causality and attribution as well as the requirement of a joint assessment of the effects by a large number of donors providing budgetary aid in a given country.

2.2 How does GBS work?

Booth and Lawson (2004) provide a model of how budget support contributes to poverty reduction (Figure 2). Their *Evaluation Framework* seeks to answer two questions: whether at the country level GBS is a relevant, efficient and effective aid modality for poverty reduction, and under what circumstances will GBS be more relevant, efficient, effective and sustainable than the same amount of aid in other forms. These criteria are consistent with those of the OECD-DAC in evaluation of development assistance: relevance, efficiency, effectiveness, impacts and sustainability of benefits.

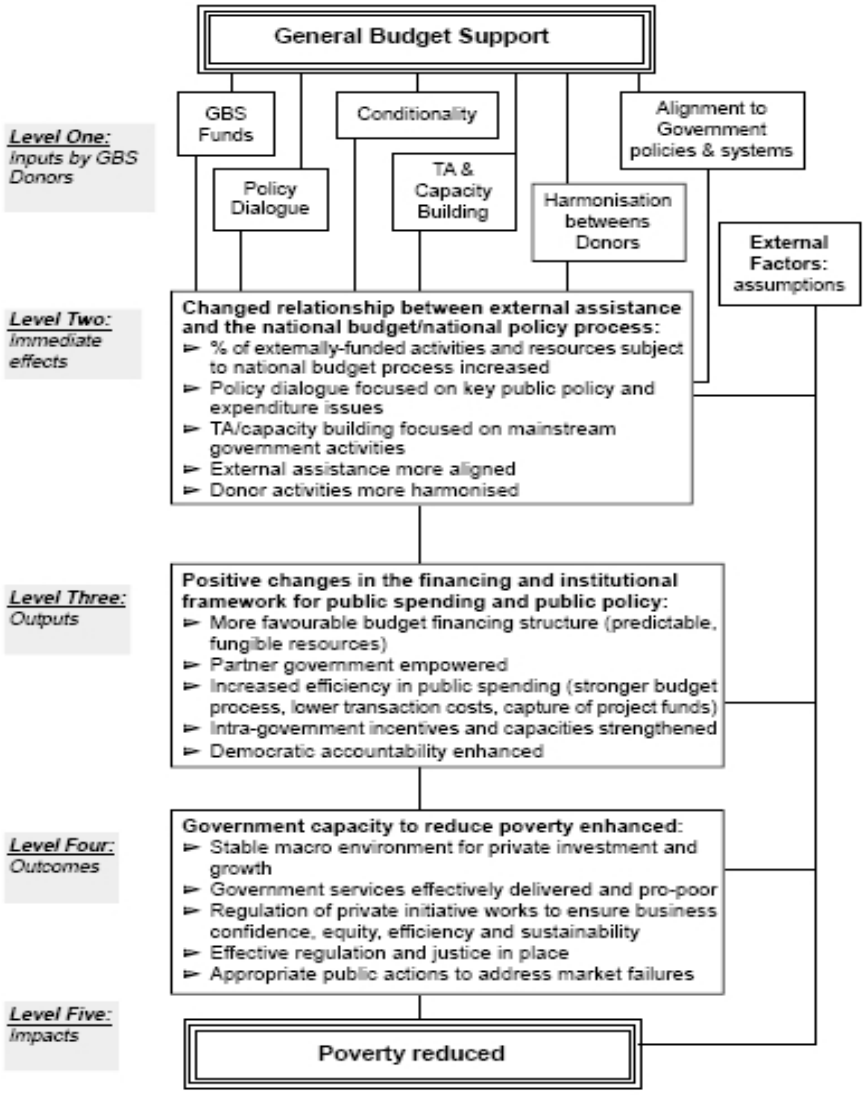
However, as Nilsson (2004, 7) argues, the evaluation of GBS does not have to go all the way to poverty reduction because the ultimate responsibility of poverty reduction measures can be attributed to each single government, while the contribution of GBS in the process is the strengthening of the economic and institutional environment through improved public finance management.

One of the outcomes of GBS identified by Booth and Lawson (2004) is an increased importance of the national budget, which has an impact on incentives such that it results as institutional effects. These effects primarily manifest themselves through empowerment of the partner government and an improved budget financing structure resulting from the predictability of budget funding, as well as increased fungibility of resources coming to the budget. Moreover GBS strengthens democratic accountability because of a greater role given to parliaments in monitoring budget results and spending. These outcomes eventually create stable macroeconomic environment, which is a precondition for private investment and economic growth.

The *Joint Evaluation of General Budget Support 1994-2004* (IDD 2006) is an independent assessment of the effectiveness and efficiency of GBS in achieving sustainable poverty reduction and growth. The study was made in 2004 by a group of 24 aid agencies and 7 partner governments. Significant flows of GBS are delivered in Uganda, Mozambique, Burkina Faso, Rwanda and Vietnam. As main findings of interest, GBS was found to support increases in "pro-poor" expenditures, fiscal discipline was supported by funds subject to the budget process, it helped strengthen the basis for accountability through improved transparency of public finance management, and strengthened government incentives because of its financial empowerment effects.

In conclusion, putting aid on budget is justified on the grounds of public finance management and aid effectiveness. The field of public finance management emphasizes that since aid is an important source of public resources in many developing countries, aid management is a crucial determinant of the overall public finance management. Aid effectiveness literature on the other hand provides support for the claim that country ownership of strategy, and leadership of aid management are essential for aid to be effective (Mokoro 2008, 11).

Figure 2: Booth & Lawson logical framework analysis of GBS



Source: Booth and Lawson (2004)

3 Review of modeling fiscal behavior with aid

The aid effectiveness literature that studies fiscal effects can be subdivided into two categories. *Fungibility studies* aim at assessing the expenditure categories of foreign aid, and whether they are consistent with donor intentions. This branch has mainly emphasized the donor viewpoint on aid effectiveness. As part of the discussion on fiscal impact of aid, the basic idea of the fungibility studies will be briefly presented. Major consideration will be given to the *fiscal response literature*, which is how the fiscal impact of aid is currently explained.

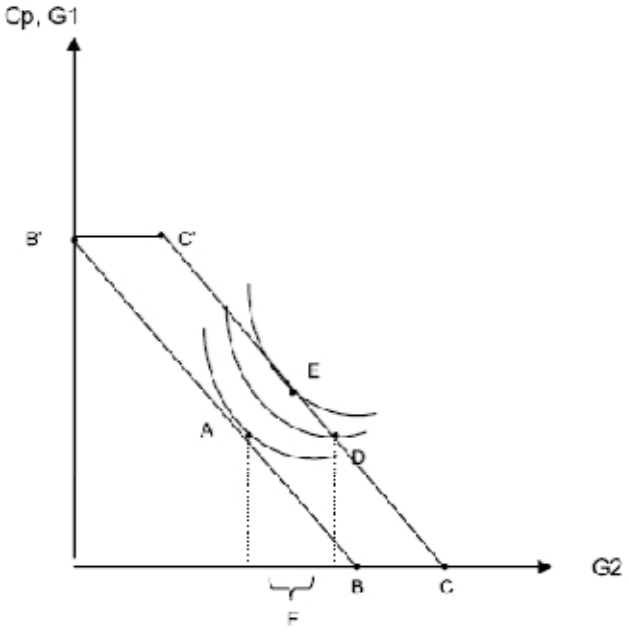
3.1 Aid fungibility

Many researchers such as Cashel-Cordo and Craig (1990), Pack and Pack (1993), Feyzioglu, Swaroop and Zhu (1998), Pettersson (2007) have focused on the issue of aid fungibility, the importance of which arises from the traditional view that aid is provided to stimulate imports and investment. Aid is said to be fungible, if it is not used for the purposes intended by donors (OPM 2003).

Figure 2 below presents the basic framework of aid fungibility as adapted by Nilsson (2004, 13). Consider a country that spends its total resources on a single private good, *Cp*, and two public goods, *G1* and *G2*. It pays all goods with its own money and receives foreign aid earmarked for the purchase of good *G2*.

Without foreign aid, alternative allocation of funds between goods is presented by the line *BB'*. The utility curves represent the preferences of the country, which gives *A* as the optimal choice in the first case. In the second case, the country receives an amount *F* of earmarked foreign aid. Assume differing preferences for the donor and the receiving country. From the donor's point of view the optimal choice is at point *D*, where the recipient spends all the additional funds on good *G2*, while the consumption of goods *Cp* and *G1* has not changed. In this case, aid is *fully non-fungible*.

Figure 3: Aid fungibility



Source: Nilsson (2004)

If, for some reason, the donor cannot monitor the public spending in the aid receiving country, the recipient can take the amount *F* additional to its own resources, which gives the new budget line *B'C'C*. Now aid is *fully fungible* and the resources are allocated at point *E*, where the new budget line meets the optimal utility curve. At point *E*, the additional resources *F* are not entirely spent on good *G2*. Another possible allocation point would occur if aid were *partially fungible.* The recipient's budget line would move out with the fungible part of the funds so that the consumption point would result between points *D* and *E*.

This kind of analysis implies that when the donor and the recipient government have the same set of preferences, as in the first case, fungibility is not a problem and the provided funds are used exactly as intended by the donor. For example the previously mentioned Poverty Reduction Strategy Papers (PRSPs) are based on the assumption that values are shared. Cordella and Dell'Arricchia (2007) have studied the question of fungibility in a theoretical model and obtained similar results. Furthermore, the authors show that budget support is preferable to project aid (off-budget aid) when preferences are aligned and when the amount of funds provided is small relative to the recipient's own resources.

McGillivray and Morrissey (2001) have shown in an analytical framework that researchers and donors should not be concerned about fungibility *per se* but instead address the more general question of how aid affects fiscal behavior, and the way spending plans are implemented. They call *aid illusion* a situation in which the implementing officials misperceive the intentions of the policy officials in charge of setting the expenditure plans. Fozzard and Foster (2001) argue that misperceptions can arise from inadequate information and weak public expenditure management systems (a principal-agent problem).

The motivation behind the "aid illusion"- analysis is to enrich the earlier treatments of fungibility, which consider the interaction between donors and recipients without any distinction between officials who set the spending plans and those who implement them. Their principal aim is to illustrate the potential reasons behind the empirical finding that aid leads to a greater than proportional increase in total public spending in the recipient country (McGillivray & Morrissey 2001, 119). Drawing on the public sector economics literature on fiscal illusion and preference revelation, the researchers present four theoretical scenarios that give rise to increased expenditure resulting from misperceptions or illusions regarding the real or nominal value of the aid inflow. The study puts emphasis on further research on the link between aid and borrowing, which arises from misperceptions or inefficiencies related to information inflow and monitoring in budgetary processes.

The conclusion drawn in the paper is that many problems may stem from weak public expenditure management, but also from poor coordination and different aid administration processes by the donors. Fungibility is regarded as a problem related to differing preferences between the donor and the recipient, whereas aid illusion addresses the issue of inefficient allocation and monitoring processes of aid expenditures. (McGillivray & Morrissey 2001, 133.) It is thus argued that the emphasis on fungibility is misplaced and the attention should be shifted to budgetary inefficiencies that may encourage excess spending, which in turn can lead to borrowing and budget deficits.

The increased interest in fungibility studies has been partly due to its prominent role in the 1998 World Bank report *Assessing Aid* and also because of the concern of donors providing budget

support regarding the actual use of funds. However, the *Assessing Aid* report bases its conclusions mainly on the work of Feyzioglu *et al.* (1998), which has been widely questioned for an inadequate methodological approach.

Furthermore, empirical studies on aid fungibility have come to ambiguous conclusions[12] so that any definitive conclusions on aid effectiveness cannot be drawn (Nilsson 2004, 15). Critics of the fungibility studies argue that even though the composition of government spending may be a valid concern to donors interested in how their funds are spent, it cannot be considered as a central issue in the evaluation of how aid affects aggregate fiscal behavior. On the contrary, it is just one aspect among many. Because the policy implications of *Assessing Aid* have received a lot of attention, and general fungibility can in fact play a key role in aid effectiveness, this approach cannot be completely ignored.

The fungibility approach is argued to be too narrowly focused on the composition of government spending, as it considers only one aspect of the impact of aid on the recipient government budget. As such it is not informative enough about fiscal behavior. In order to capture the wider effects of aid on behavior regarding total spending, taxation and borrowing, the attention of researchers has increasingly turned to fiscal response models.

3.2 Fiscal response

The fiscal response literature derives from Heller (1975) and models fiscal behavior to study the potential impact of foreign aid inflows on public finances. In specific, fiscal response models look at how different categories of government expenditure and revenue depend on foreign aid - the impact of aid through relieving the government budget constraint.

Fiscal response models have been recognized to suffer from modeling problems due to weak data found in developing countries (Nilsson 2004, 16) and sensitivity to model specifications (OPM 2003). Nonetheless the interest in fiscal response models persists, particularly for evaluating budget support, because of the common focus on internal account (accountability to parliament

[12] For a critical review of the fungibility literature, especially on its role and insufficiency as an approach in *Assessing Aid* (World Bank 1998), see McGillivray and Morrissey (2000).

and taxpayers). The latest attempts to improve fiscal response modeling e.g. in Mavrotas (2002) and OPM (2003) include aid disaggregation; attempts to trace the specific effects of different types of aid and the effects of budget support through the government accounting system and decision making process in particular (Nilsson 2004, 16).

Heller (1975) assumes revenue allocation among various expenditure categories subject to budget constraints to be the basic task of public sector decision makers. In the simplest model public expenditure is divided into two separate categories: recurrent and capital expenditure, which can be otherwise labeled as government consumption G and public sector investment I_g. The two sources of domestic revenue are taxation T and borrowing B. In the earlier fiscal response models aid A is treated as exogenous and it enters the budget constraint in form of external source of revenue. Public sector decision makers are assumed to be rational utility-maximizers. Then the public sector decision makers' utility function can be represented as:

$$U = U(I_g, G, T, B) \tag{1}$$

Later contributors to the Heller approach have assumed that governments set targets for the various expenditure and revenue categories. Government utility is then maximized when those targets are met. For example, Mosley and Hudson, and Binh and McGillivray (1987; 1993 see McGillivray & Morrissey 2001, 12) represent the utility function (1) as a quadratic loss function:

$$U = \alpha_0 - \frac{\alpha_1}{2}(I_g - I_g^*)^2 - \frac{\alpha_2}{2}(G - G^*)^2 - \frac{\alpha_3}{2}(T - T^*)^2 - \frac{\alpha_4}{2}(B - B^*)^2 \tag{2}$$

where the endogenous variables denoted by an asterisk (*) represent target levels and $\alpha_i > 0$ for $i = 1,\ldots, 4$. It follows from (2) that government maximizes utility if it achieves all set targets and the maximum unconstrained value is α_0. In addition, when $\alpha_i > 0$ marginal utility is diminishing for all levels of I_g, G, T and B. Also, the utility function is symmetric so that overshooting or undershooting the target results in a utility loss of the same proportion.[13]

[13] According to Binh and McGillivray (1993) this claim can be too restrictive, as it seems more plausible that governments regard undershooting revenue targets more worrisome than overshooting. However, McGillivray and Morrissay (2001) add that there are political costs in obtaining revenue, while a revenue shortfall results in political costs related to a budget deficit. Thus, *a priori,* disutility can be taken symmetric for both expenditure and revenues.

The government budget constraint is given by the overall public sector budgetary constraint:

$$I_g + G = T + A + B \quad (3)$$

which simply says that total expenditure cannot exceed total revenues. The above budget constraint (3) can be further decomposed into two separate constraints:

$$I_g = (1-\rho_1)T + (1-\rho_2)A + B \quad (4)$$

and

$$G = \rho_1 T + \rho_2 A \quad (5)$$

where $(1-\rho_1)$ represents savings from the recurrent budget and ρ_2 denotes the proportion of aid allocated to consumption spending.

The government then maximizes U given in (2) subject to the constraints (4) and (5).

The first important problem with this model is the interpretation of ρ_2 as the extent of fungibility of aid (McGillivray & Morrissay 2001, 13). Implicit in the model is the assumption that donors give aid only to finance investments, completely captured in I_g, so that $\rho_2 = 0$ *ex ante*, which makes the proportion ρ_2 of aid allocated to G an *ex post* measure of fungibility. It can be argued that there are expenditures belonging to G, such as social sector expenditures that donors are willing to support, $\rho_2 > 0$ *ex ante* makes the estimated value of ρ_2 a measure of maximum fungibility.

Over-constraint of the model poses another significant problem of this representation. This means that the maximum value α_0 cannot necessarily be reached even when there are enough aid revenues to meet all the targets. Even though total revenue were sufficient for (3), the α s constrain allocation and prevent the specific expenditure targets in (2) to be met. According to McGillivray (2000), using only (3) as a budget constraint resolves the problem but results in

intuitively unrealistic structural equations. The model presented here has been estimated by Gang and Khan (1991, see McGillivray & Morrissay 2001, 16) with time series data for India. However researchers have not reached consensus on the most appropriate way to model public sector behavior with aid inflows.

In later models (Franco-Rodriquez, McGillivray & Morrissey 1998; McGillivray & Ahmed 1999, see McGillivray & Morrissay 2001), aid has been endogenized to capture the fact that disbursed aid actually is a choice variable for the recipient government. Following Franco-Rodriquez *et al* (1998), with endogenous aid the loss function (2) is replaced by:

$$U = \alpha_0 - \frac{\alpha_1}{2}(I_g - I_g{}^*)^2 - \frac{\alpha_2}{2}(G - G^*)^2 - \frac{\alpha_3}{2}(T - T^*)^2 - \frac{\alpha_4}{2}(A - A^*)^2 - \frac{\alpha_5}{2}(B - B^*)^2 \qquad (6)$$

Endogenous aid means that governments have a target also for aid revenue and it is taken into account when deciding on revenue and expenditure allocations. It does not require that recipients control the amount of aid disbursed but they control the amount of aid spent. This reflects the evidence that recipients have choice over the amount disbursed or actually spent, and hence determine how aid is allocated among various expenditure headings.

From the above reasoning it follows that in (6) A represents disbursements and A^* commitments. Further, under-spending an aid commitment can be interpreted as limited absorptive capacity, which can lead to lower aid inflows in subsequent years. Overspending, on the other hand, reflects either previous limited absorptive capacity or emergency aid for that year.

Maximizing (6) subject to (4) and (5) presents the same problem as in the case with exogenous aid. Similarly, maximizing subject to (3) alone implies no constraints on revenue allocation and, once again, results in complete fungibility. This cannot be taken as a realistic presentation of public sector fiscal behavior because of the various pressures facing fiscal decision-making. For example politicians, pressure groups and donors attempt to influence public sector revenue allocation. (McGillivary & Morrissey 2001, 14.) The influence of the pressure groups can be incorporated into the model by assuming the following constraint instead of (4) and (5):

$$G \leq \rho_1 T + \rho_2 A \quad (7)$$

The above constraint captures the pressures on public sector fiscal behavior, which result in a suboptimal outcome with respect to the government's own preferences. The inequality reflects the *external* constraints on public sector decision making in developing countries.

According to Mavrotas (2002, 537), the major problem with the pre-existing empirical studies has been the employment of a single figure for aid, which can lead to inadequate conclusions on aid effectiveness. This leads to two main shortcomings. Firstly, different types of aid operate in different ways in the aid receiving country and can have different macro effects. Secondly, the proportions of different types of aid are changing in different degrees between countries, which will distort the empirical results.

Consequently Mavrotas (2002) has been the first to further develop the fiscal response models to better take into account the heterogeneous character of foreign aid. He first disaggregates aid flows in three different categories: project aid, program aid and technical assistance; and then estimates the model for India and Kenya. He assumes the aid-recipient government utility function similar to (2) and takes aid exogenous.

The problem with this kind of analysis is that the model only depicts accounting relationships. The estimated coefficients reveal the extent of fungibility of foreign aid but causal inferences cannot be made. Also the derivation of the target variables is problematic as the value of the targets cannot be observed. The targets have to be approximated because of lack of data on actual values, and an established theory on target determination. (Mavrotas 2002, 543.) The latest model with disaggregated aid (OPM 2003) includes food aid and endogenous aid. Contrary to many previous studies, the model also allows government to borrow for consumption purposes.

The results obtained in the literature can be relevant for assessing whether public resources are used efficiently in terms of the well-being of the poor, but the existing fiscal response models are still inadequate to assess any causality. Without any assessment of causality, the fiscal response models tell very little about how the government fiscal behavior actually "responds" to foreign

aid. In addition, in the light of the current tendency to move away from sector, program and project aid towards budget support, it can be questioned, whether the way aid is disaggregated in the models actually adds any relevant information for decision makers.

The existing literature on aid effectiveness is mainly criticized for three weaknesses (McGillivray & Morrissey 2001; OPM 2003). First, the models used are inadequate to capture all the channels and mechanisms through which aid affects macroeconomic outcomes. Second, inappropriate econometric methodology has been used so that lag structures and misspecification issues are ignored. Third, the composition of aid together with the varying impact of different forms of aid has been neglected. As McGillivray and Morrissey (2001, 3) point out in their critical review on the theoretical and empirical literature on fiscal effects of aid, different theoretical frameworks, data sets, behavioral assumptions and econometric models have provided a variety of results and, consequently, different policy implications.

Most importantly, the way in which aid affects macroeconomic outcomes depends on the complicated relationship between aid, the policy environment and institutional environment (Nilsson 2004, 17). Jones and Shaw (OPM 2003) have also argued that development assistance leads to development outcomes through three channels: the government budget constraint, policy and institutions. Fiscal response looks at only one of them; the government budget constraint, while the two other channels, policy and institutions, are not included in the analysis.

4 Theoretical explanation to fiscal discipline

After presenting aid fungibility and fiscal response studies that look at the impact of aid on the structure of public finances, this section builds a theoretical model to formally explain the mechanism behind fiscal (in)discipline with different aid modalities. How does government behavior alter as a response to foreign aid?

As discussed in chapter 1, aid is found to affect fiscal behavior and promote fiscal indiscipline in two ways: it creates perverse incentives and weakens institutions. Collective action problems, such as the tragedy of the commons, moral hazard and free rider problems, capture the distorted incentives that hinder the creation of a responsive, capable state and an effective foreign aid system (Bräutigam & Knack 2004). In the literature on political economy and public finance, excess deficits in the industrialized countries have been explained by collective action problems. The literature emphasizes the quality of the budget process, where political decision making takes place.

The same approach is now used here to show formally how and why foreign aid as a means to finance public expenditure may generate incentives and opportunities for increased government spending, and to explain why off-budget aid could lead to greater fiscal indiscipline than direct aid to the government budget.

4.1 The common pool

In a politically decentralized country local officials are chosen locally and are assigned to make decisions on important policy issues (Treisman 2008, 3). There are various ways to model the effects of political decentralization on central government redistribution and fiscal policy. Political economists have started to explain excessive budget deficits as a common pool or common property resource (CPR) problem, where there is overutilization of national wealth as is the case of any common resource (Poterba & von Hagen 1999).

The common-property approach to fiscal politics was first introduced by Weingast, Shepsle, and Johnsen (1981) and later extended by many others such as von Hagen (1998) and Velasco (1998, 2000). In some models the common resource can generate suboptimal outcomes from the point of view of political actors like legislators. In others the outcome is suboptimal for citizens due to fiscal illusion (Weingast, Shepsle, & Johnsen 1981) or due to principal-agent problems in the relation between the people and their representatives (Tommasi & Weinschelbaum 2007).

Von Hagen (1998) has studied fiscal discipline in terms of budget deficit within the common property-framework and argues that the key determinant of the fiscal performance of governments is the quality of the budget process. The budget process is crucial because budgeting requires that all conflicts between competing claims on public finances are resolved during the budgeting process. Four deviations undermine the functioning of the budget process: off-budget funds, non-decisions (expenditures in the budget determined by developments exogenous to the budget process), mandatory spending (laws other than the budget make some government expenditures compulsory) and contingent liabilities (e.g. guarantees for the liabilities of other public or non-public entities).

Also Velasco (2000) develops a political-economic model of fiscal policy with government resources as a common pool that interest groups use to finance expenditures. The interest groups share the same central government budget constraint. The model shows that transfers are higher than socially optimal and lead to fiscal deficits even when there is no incentive for intertemporal smoothing. An essential assumption of the model is a weak government that satisfies the interest groups' bids. The spending bias results from the divergence of benefits and costs: each group benefits fully from its own spending while the costs are spread over all groups. The novelty of the model is that it exhibits a deficit bias in a situation where the government should run a balanced budget (when intertemporal smoothing is not needed). Deficit arises from the strategic interaction among competing groups in a context of decentralized fiscal policymaking, where interest groups share access to government resources. (Velasco 2000, 122.)

The presentation on political decentralization follows Treisman (2008). Local officials view the central budget as a common pool from which to draw as large transfers to their own districts as

possible. The central government is assumed to care only for being in power and not for the policy *per se*. It is thus precommited to implement whichever policy promised. This ensures that the central government can credibly commit to a predetermined expenditure level. Like Velasco, also Treisman assumes that local governments can persuade the central government to satisfy their demands. Local government in Treisman's model can be substituted by spending units such as ministries, departments or agencies (MDAs) responsible for the budget execution, the term previously used in the discussion on development aid.

A country is divided into $n = 1, 2, \ldots, N$ MDAs, each receiving an income y and paying a lump sum tax T. Central government (CG) transfers to an MDA are denoted r_n and are used to finance each MDA's public expenditure g_n. The central transfers in turn are financed with taxes. In other words taxes are collected by the CG and reallocated as transfers to MDAs. Budgeting consists of choosing the expenditure level (i.e. supply of public services) for each MDA given the budget constraint. Consider a budget process where each MDA chooses the expenditure level given the choice of the others and the central government budget.

Each MDA thus maximizes a payoff function:

$$V_n = h(g_n) + y - T \tag{8}$$

where $h' > 0$, $h'' < 0$, $h(0) = 0$, $\lim_{g \to 0} h'(g) = \infty$

subject to the CG budget constraint

$$\sum_n g_n = \sum_n r_n = \text{TN} \tag{9}$$

Equilibrium spending by each MDA is then given by the first order condition:

$$h_g(g_n^*) = \frac{1}{N} \tag{10}$$

The perceived price for an increase in the level of expenditure by an MDA is $\frac{1}{N}$. Since the MDAs are identical, they all choose the same level of expenditure.

Instead, if each MDA had to bear the full cost of its spending and finance it with a lump sum tax, there would be no reallocation of funds and each MDA would then be maximizing (8) subject to the MDA budget constraint

$$g_n = T \tag{11}$$

The equilibrium condition given by the first order condition would be:

$$h_g(g_n^*) = 1 \tag{12}$$

which is more efficient than (10), because spending in (10) is higher than in (12), given N > 1.

In the first case excess spending in an MDA results from *perceived* marginal cost of spending lower than the increase in expenditure: each MDA pays only $\frac{1}{\mathrm{N}}$ of a dollar spent, while in the second case each MDA bears the full cost of its expenditure by paying the true price of an increase in the level of expenditure. Marginal cost of spending is lower in (10) than in (12).

The CPR problem results from a *coordination failure* because the decision makers in the process fail to take into account the full cost of their spending. Von Hagen (1998, 10; von Hagen & Harden 1995) calls this lack of a comprehensive view of the cost implication of spending decisions *fragmentation* of the budget process, whereas in a *centralized* budget process the spending decisions are fully coordinated so that the individual decision makers are forced to take a comprehensive view of the budget. It is important to note that the aim is not to question the assignment of expenditure responsibilities to spending units other than the central government but to focus on the budgeting process, which determines expenditure levels and their finance.

As the CG is assumed weak, it is itself subject to the common pool problem. With external finance, like foreign aid, the spending units bear no part of the expenditure. A logical solution to a CPR problem would be to reduce the vertical fiscal gap (the ratio of central transfers to total revenues in the locality), which means that local expenditure is fully financed by local revenues. This would make the divergence of private (local) and social (national) opportunity costs disappear (Pisauro 2001, 4).

However, the coexistence of a CPR *and* a moral hazard problem leads to a situation where decentralization (reducing the fiscal gap) does not incentivize to operate under the right budget constraint either. The local spending units perceive external finance (central government transfers for MDAs and foreign aid at the CG level) as insurance in case of default. External finance thus disincentivizes to bear the full cost of collecting revenues, affects the budgeting decisions and decreases local accountability.

4.2 The soft budget constraint

Soft budget constraint is a consequence of the problem of moral hazard, where external finance such as foreign aid introduces an insurance element that will affect the budgeting decisions of the spending units. It is another way to illustrate how the divergence of costs and benefits affects accountability as local spending units can pressure the central government to make *unplanned* fiscal transfers. In other words soft budget constraint appears when the access to external resources such as foreign aid convinces decision makers that budgets are flexible, and so encourages fiscal indiscipline.

The simple model of soft budget constraints follows Treisman[14] (2008).

Consider a state divided into three identical local units (spending units, MDAs) $n = 1, 2, 3$ with a fixed population size normalized to one. Each local government levies a local income tax at rate $\tau_{n,}$ while a central government sets a national income tax, T. Assume identical objectives for the

[14] The model developed by Treisman is based on Bordignon, Manasse and Tabellini (2001, see Treisman 2008).

MDAs and central governments that match those of the citizens. An MDA's payoff function is given by:

$$U_n = H(g_n) + (1 - \tau_n - T)y_n \tag{13}$$

where g_n is expenditure on public goods and services in locality n, y_n is total income in locality n, $H' > 0$, $H'' < 0$, $H(0) = 0$, $\lim_{g \to 0} H'(g) = \infty$. The central government's payoff is $U_1 + U_2 + U_3$. The central government can finance spending in local units by transfers, r_n. Taxes induce distortions in economic activity (and nondistortionary taxes are not available) so that income is decreasing in tax rate $y_n = y(\tau_n + T)$, $y' < 0$ and no one works at tax rate 1: $y(1) = 0$.

Consider first the outcome under centralization, where the central government makes policy decisions for the country. The central government sets $\{g_n, \tau_n, r_n, T\}$ for all n to maximize:

$$U_1 + U_2 + U_3 \tag{14}$$

subject to the budget constraint:

$$g_1 + g_2 + g_3 = (T + \tau_1)y_1 + (T + \tau_2)y_1 + (T + \tau_3)y_3 \tag{15}$$

The FOCs give the equilibrium under centralization g_n^c and imply that

$$g_1^c = g_2^c = g_3^c \tag{16}$$

and that

$$H_g(g_n^c) = \frac{y_n - (1 - \tau_n^c - T^c)y_n'}{y_n + (\tau_n^c + T^c)y_n'} \tag{17}$$

for n= 1, 2, 3

Rewriting (17) shows that when the government chooses to raise taxes it trades off the marginal benefit against the marginal cost, while also considering the distortionary effects of the taxes. In (18) the *marginal benefit* from increased public spending is on the left-hand side, while the right-hand side measures the *marginal cost* in terms of loss in decreased private consumption.

$$H_g(g_n^c) \quad \frac{\partial(\tau_n^c + T^c)y_n}{\partial(\tau_n + T)} = -\frac{\partial(1-\tau_n^c - T^c)y_n}{\partial(\tau_n + T)} \tag{18}$$

Rearranging (17):

$$\frac{H_g(g_n^c)[y_n + (\tau_n + T)y_n']}{y_n - (1 - \tau_n - T)y_n'}$$

and assuming[15] $2(y_n')^2 > y_n y_n''$ everywhere for all n there is a unique point $0 < \tau_n + T < 1$ at which tax revenues are maximized. With this additional assumption, since (17) decreases monotonically in $(\tau_n + T)$, there is at most one solution. If there is a solution it must be true that $\tau_1^c = \tau_2^c = \tau_1^c \equiv \tau^c$ and in equilibrium the expenditure level in each locality is:

$$g_n^c = (\tau^c + T^c)y(\tau^c + T^c) \tag{19}$$

Consider now the case under <u>decentralization</u>, where local spending units first commit to a policy variable, say the level of spending g_n. Thus, at time 1 the spending units move simultaneously and play a Cournot game against each other. At time 2, the CG sets the levels of transfers r_n and a central tax rate T, subject to the central budget constraint:

$$r_1 + r_2 + r_3 = T(y_1 + y_n + y_3) \tag{20}$$

whereas the local tax rates are residually solved from the local budget constraints:

[15]This is derived from maximizing $(\tau + T)y(\tau + T)$ and plugging in the FOC $y + (\tau + T)y' = 0$.

$$g_n = \tau_n y_n + r_n, \quad n = 1,2,3 \tag{21}$$

The game is solved by backward induction, where local units have the first move as they commit to an expenditure level.

A time 2 the CG sets $\{r, T\}$ to maximize

$$U_1 + U_2 + U_3 = \sum_{n=1}^{3}(H(g_n) + \big(1 - \tau_n(r_n) - T\big)y\big(\tau_n(r_n + T)\big) \tag{22}$$

subject to

$$g_n = \tau_n y_n + r_n, \qquad n = 1,2,3$$

and

$$r_1 + r_2 + r_3 = T(y_1 + y_2 + y_3)$$

The FOCs under decentralization are:

$$\frac{y_1 - \big(1 - \tau_1^d - T^d\big)y_1'}{y_1 + \big(\tau_1^d + T^d\big)y_1'} = \frac{y_2 - \big(1 - \tau_2^d - T^d\big)y_2'}{y_2 + \big(\tau_2^d + T^d\big)y_2'} =$$

$$\frac{y_3 - (1 - \tau_3^d - T^d){y_3}'}{y_3 + (\tau_3^d + T^d){y_3}'} = \lambda \tag{23}$$

where λ = Lagrange multiplier for the CG's budget constraint under decentralization and which implies same local tax rates across localities in the equilibrium

$$\tau_n^d \equiv \tau^d \tag{24}$$

as well as same output levels

$$y_1 = y_2 = y_3 = y(\tau^d + T^d) \tag{25}$$

The CG first observes the levels of spending and then chooses the allocation of transfers to adjust for the tax-induced distortion. The higher the spending levels set by a local unit, the higher will be the transfer to that locality.

At time 1, the local spending units maximize (13) subject to the central government's reaction function, which is a combination of the central AND local budget constraints, given $\tau_n^d \equiv \tau^d$:

$$g_1 + g_2 + g_3 = 3(\tau^d + T^d)y(\tau^d + T^d) \tag{26}$$

As each local unit takes the others' expenditure levels as given, it sees $(\tau^d + T^d)$ determined by its own choice of g_n which is set in Cournot competition with the others.

Combining the above equations, each locality thus chooses g_n to maximize (13) subject to (26):

$$U_n = H[3(\tau^d + T^d)y(\tau^d + T^d) - \textstyle\sum_{j \neq n} g_j] + (1 - (\tau^d + T^d)y(\tau^d + T^d) \tag{27}$$

The first order conditions are:

$$H_g(g_n^d) = \frac{1}{3}\,\frac{y - (1 - \tau^d - T^d)\,y'}{y + (\tau^d + T^d)\,y'} \tag{28}$$

for n = 1, 2, 3 implying

$$g_1^d = g_2^d = g_3^d = (\tau^d + T^d)y(\tau^d + T^d) \tag{29}$$

Since $\frac{H_g(g_n)[y_n + (\tau_n + T)y_n']}{y_n - (1 - \tau_n - T)y_n'}$ decreases monotonically in the tax rate $(\tau_n + T)$, comparing the outcomes under centralization (17) and decentralization (28), we see that the aggregate tax rate is higher under decentralization,$(\tau^d + T^d) > (\tau^c + T^c)$. This also implies higher public spending under decentralization $g^d > g^c$, because equilibrium public spending is increasing in the aggregate tax rate. Below (28) is rewritten so that the marginal benefit from raising the tax rate is on the left-hand side, and its marginal cost in terms of lower private consumption is on the right-hand side.

$$H_g(g_n^d) \quad \frac{\partial(\tau_n^d + T^d)y_n}{\partial(\tau_n + T)} = -\frac{1}{3}\frac{\partial(1-\tau_n^d - T^d)y_n}{\partial(\tau_n + T)} \tag{30}$$

Equation (30) illustrates that for the local government the cost of increased spending is only one third, while the remaining two thirds are left to the other two localities to bear. Local units commit to inefficiently high levels of spending and ignore the costs to other localities. Localities overspend because otherwise the central government would tax them to finance the overspending of the others. However, localities are identical so they do not receive a net transfer, where $r_n > Ty_n$, but spending and revenues collected in a locality are equal. The important point is that local units have an incentive to bid in excess even though they do not necessarily receive the funds.

Decentralized decision making thus entails overspending. Centralization increases ownership and accountability of the spending decisions (hardens the budget constraint), which has been the problem of the traditional forms of aid. Since foreign aid is fundamentally about rich people giving money to the poor, it means that those who benefit from aid financed services are not the ones who pay for it. Even though aid does not explicitly feature in the models, due to this analogy of the divergence of costs and benefits and the resulting coordination failure of the decision makers, off-budget aid can be thought of as a fragmented budget process, whereas budget support corresponds to a centralized budget process as it improves coordination of spending decisions.

Within this framework, the four deviations that undermine a centralized budget process and lead to an inefficient spending outcome could be interpreted as off-budget aid such as project aid that is directly disbursed to the MDA, and financial consequences of off-budget financing (e.g. construction of a school or a hospital financed with foreign aid with subsequent running costs falling on the central government). Koeberle and Stavreski (2006, 13) argue likewise for budget support:

> "Budget support provides more discipline in the budget process by reducing fragmentation and limiting the access of line ministries and other government agencies to extra-budgetary financing. It also can be expected to strengthen the government's capacity to design and implement programs and poverty reduction strategies."

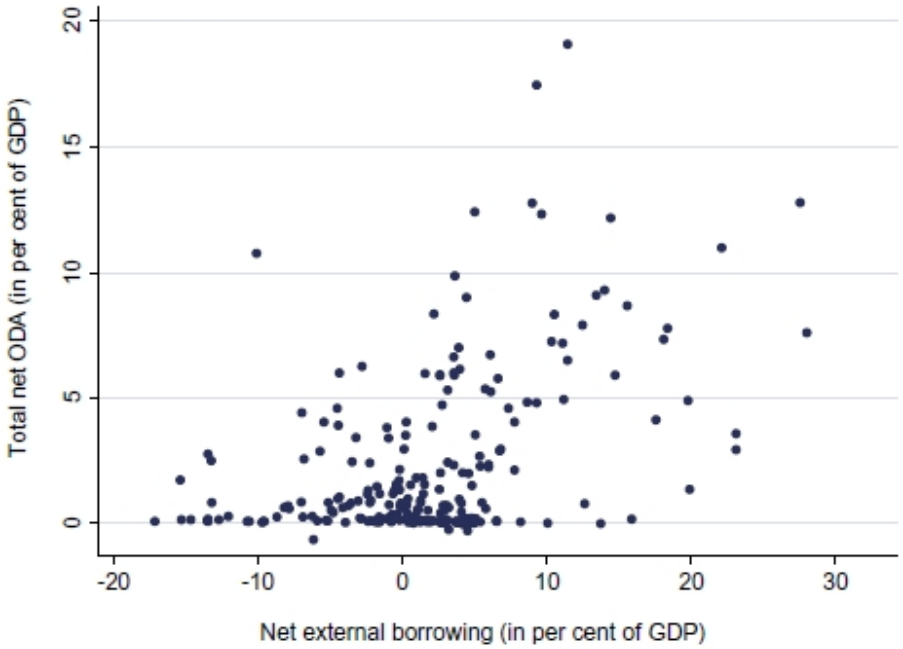
5 Empirical approach to aid modality and fiscal discipline

5.1 Debt sustainability as a measure of fiscal discipline

Good macroeconomic policy is characterized by debt sustainability: government's ability to fully service its debt (Wyplosz 2007). Research on developing countries also shows that low budget deficits and low levels of public debt are key determinants of economic growth (Adam & Bevan 2005; Gupta, Clements & Inchauste 2004; Gupta, Clements & Baldacci 2005). ODA is expected to help the receiving countries achieve greater fiscal sustainability but evidence indicates to the opposite direction (Mayr 2010, 21).

Mayr (2010) among others shows that despite substantial inflows of foreign aid, debt burdens in developing countries are still high, which can adversely affect fiscal sustainability. Figure 4 shows a positive correlation between ODA and net external borrowing.

Figure 4: ODA and borrowing, 1991-2005



Source: Mayr 2010. Data obtained from the OECD Development aid database (2008) and the United Nations Common Database online (2008).

This section analyzes empirically the relationship between fiscal policy, aggregate public sector debt sustainability and general budget support. Public sector debt sustainability is taken as a measure of fiscal discipline to study whether government budget deficits are more sustainable in the presence of general budget support than when a country receives off-budget aid. The second research question is, in fact, a hypothesis formulated from the theoretical part in section 4.

Instead of determining sustainable debt levels, the focus will be on determining the primary balances required for the accumulated stock of debt to be on a sustainable level. This approach will be indicative about the fiscal effort needed to fully service the debt, given predicted macroeconomic conditions.

5.2 Methodology

The sustainability model was developed by Edwards (2003) to evaluate fiscal policy sustainability of the countries graduating from the HIPC (Highly Indebted Poor Countries) program of the IMF and World Bank. Here the model is used to compute the fiscal policy path that is compatible with aggregate public sector debt sustainability in selected Sub-Saharan African countries that receive general budget support. Fiscal sustainability is achieved when "the ratio of public sector debt to GDP is stationary, and consistent with the overall demand for government securities", both domestic and foreign (Edwards 2003, 3).

The framework has been chosen because it escapes certain caveats that are common to debt sustainability computations (Wyplosz 2007). First, it considers *aggregate* public sector debt, while most calculations (IMF among others) only concentrate on external debt. Second, when both domestic and external (foreign) stocks of debt are included, GDP is a more appropriate benchmark for the debt ratio than exports because it reflects the ability of the entire economy to generate income. Third, instead of looking at the level of debt, the analysis focuses on primary fiscal positions consistent with debt sustainability. The reason is that *primary balance*, defined as the nominal balance[16] excluding total interest payments, is a policy instrument used to reach debt

[16] Nominal balance is defined as revenue, including nondebt-creating grants, less expenditure.

sustainability. Finally, the model is dynamic and takes into account the transition from the initial point to the steady state.

5.2.1. Model

The model considers two kinds of public debt[17].

1) External or foreign debt denoted DF[18]. This is concessional/subsidized debt granted by the multilaterals and other international donors.
2) Domestic debt denoted DD. This is debt issued on commercial terms and assumed to be held by local residents only.

Both types of debt are assumed to be denominated in US dollars. Total public sector, US dollar denominated debt (D) equals DF+DD and, at any time t , the net increase in total debt equals the sum of the increase in the two types of debt: $\Delta\, \mathrm{D_t} = \Delta \mathrm{DF_t} + \Delta \mathrm{DD_t}$. On the other side, net debt increases equal *nominal* interest payments (r_t^f, r_t^d)[19] on foreign and domestic debt plus the primary balance (*pb*) minus seignorage ($\Delta \mathrm{B_t}$):

$$\Delta\, \mathrm{D_t} = (r_t^f\, \mathrm{DF_{t-1}} + r_t^d \mathrm{DD_{t-1}}) + \mathrm{pb_t} - \Delta \mathrm{B_t}. \qquad (31)$$

In (31) a *positive* pb means a primary *deficit* and $\Delta \mathrm{B_t}$ denotes the change in the monetary base, or the stock of monetary liabilities, which reflects seignorage. Equation (31) thus says that changes in fiscal balance are financed by changes in debt and/or monetary base. In developing countries seignorage revenue is viewed as a source of fiscal financing (Cuddington 1997) and its magnitude depends on the rate of domestic inflation (π), the ratio of the monetary base (B) (or base money, or degree of monetization in the economy,) to nominal GDP (Y) and the income elasticity of demand for money[20]. More specifically, the monetary base evolves according to the rule:

[17] For alternative definitions of domestic and external/foreign debt, see Panizza (2008)
[18] Denoted DC in Edwards (2003)
[19] Interest rate on foreign/concessional debt is denoted r_t^c in Edwards (2003).
[20] Money demand is assumed to have unitary income elasticity.

$$B_t = (g + \pi)B_{t-1}. \quad (32)$$

The scope is to compute the sustainable primary balance to GDP ratios, in other words, the value of $\left(\frac{pb_t}{Y_t}\right)$ that is "consistent with changes in aggregate public sector debt that are on a sustainable path" (Edwards 2002, 5). Debt is on a sustainable path when each type of debt increases at the same rate as national and international creditors desire to accumulate government-issued securities. This is an important assumption as it allows the government stock of debt to evolve according to the creditors' behavior. In the basic framework it is assumed that international creditors are willing to accumulate debt at a rate θ and holders of domestic debt at a rate β. Neither of the debt to GDP ratios can grow without limit so they are bounded in the long run:

$$\theta \leq (g + \pi^*);\ \beta \leq (g + \pi). \quad (33)$$

The above constraint assures convergence of $\left(\frac{pb}{Y}\right)$, the primary debt to GDP, through time.

Putting equations (31), (32) and (33) together yields a general expression for the dynamic behavior of the sustainable primary balance to GDP ratio:

$$\left(\frac{pb_t}{Y_t}\right) = \frac{(\theta - r_t^f)\left(\frac{DF_0}{Y_0}\right)e^{(\theta - g - \pi^*)(t-1)} + (\beta - r_t^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g + \pi)\left(\frac{B_0}{Y_0}\right) \quad (34)$$

Where $\left(\frac{DD_0}{Y_0}\right)$ and $\left(\frac{DF_0}{Y_0}\right)$ are the initial ratios of the face value of domestic and foreign debt, respectively, $\left(\frac{B_0}{Y_0}\right)$ denotes the initial ratio of base money to GDP and π is the rate of domestic inflation, while π^* denotes the rate US inflation and e the Euler's number. The model focuses on the face value rather than on the present value of debt, as the approach is more transparent in describing the flows involved. Since π and g refer to *target* rates of domestic inflation and growth, the results obtained are conditional on the assumption that the targets are met.

According to the equation (33), the dynamic path for the sustainable primary balance depends on the following key variables: nominal interest rates on domestic and foreign debt, rate of growth of *real* GDP, rates of domestic and foreign inflation and the sustainable growth rates of domestic and foreign debt $\{r_t^f, r_t^d, g, \pi, \pi^* \theta, \beta\}$.

5.2.2. Design

Domestic debt (DD) is assumed to grow at the rate of nominal GDP: $\beta = (g + \pi^*)$. While the domestic debt to GDP ratio is assumed to remain at the level of period t=0, four possible scenarios for the evolution of concessional loans (θ) will be considered.

- Case A: $\theta = 0$. This is the most conservative scenario. It is assumed that no net funds are provided so that the nominal *value* of concessional debt stays constant. In other words concessional loans are fully rolled over.
- Case B: $\theta = \pi^*$. Donors are willing to maintain *the real dollar value* of the concessional debt. Foreign debt thus grows at the rate of international inflation.
- Case C: $\theta = (\phi g + \pi^*)$, where $0 \leq \phi < 1$. It is assumed that concessional funds increase in *real* terms.
- Case D: $\theta = (g + \pi^*)$. This is the most optimistic scenario and corresponds to the case C, where $\phi = 1$. Concessional funds are provided sufficiently to maintain the external debt to GDP ratio at the same level as in period t=0.

By focusing on the availability of concessional loans, while assuming domestic debt to GDP ratio constant, the approach provides insight on how efforts to achieve debt sustainability depend on donor behavior. See Appendix C for the sustainable and steady state primary balances and debt to GDP ratios for the cases A-D used in computations.

The scope of the analysis is to examine, whether the sample countries' fiscal discipline has improved since they started receiving (non-earmarked) general budget support. When sustainable public debt levels are taken as an indication of fiscal discipline, the research hypothesis can be formulated as follows: *fiscal positions are on a more sustainable level when a country receives general budget support than when it receives traditional forms of aid*.

With this purpose, sustainable debt paths are simulated for two separate periods. As budget support has been provided in its non-earmarked, direct budget support form since year 2000, it becomes natural to set this year as a benchmark and compare fiscal sustainability in pre- and post-2000 eras. Based on the preceding discussion on GBS and its impact on fiscal behavior, setting year 2000 as a benchmark will allow assessing fiscal discipline in pre- and post-GBS eras. Hence a pre-2000 and a post-2000 debt sustainability simulation is conducted for 11 Sub-Saharan African countries, which have received GBS in years 2005 and 2007 according to the OECD's *Survey on Monitoring the Paris Declaration* 2006 and 2008. Table 3 shows the amount (in millions of US dollars) of budget support each country has received. Other countries that have received budget support in both years (Burundi, Rwanda and Sierra Leone) have been excluded from the sample because of difficulties encountered in finding data.

Table 3: Budget support in the sample countries

	U$D m		% of GNI	
	2005	2007	2005	2007
Benin	13,03	15,90	0,31	0,29
Burkina Faso	44,31	65,48	0,82	0,97
Cape Verde	1,86	10,27	0,19	0,78
Ghana	98,44	172,71	0,93	1,18
Malawi	60,53	45,43	2,15	1,28
Mali	33,60	39,22	0,66	0,53
Mozambique	153,34	247,33	2,47	3,37
Niger	9,94	11,64	0,29	0,27
Tanzania	262,22	458,88	1,87	2,85
Uganda	54,74	132,40	0,62	1,10
Zambia	36,24	112,87	0,54	1,13

Source of data: OECD Paris Monitoring Survey 2006 & 2008; author's calculations

1999 is set as a base year (t=0) for the first, pre-2000 era simulation. Based on the macroeconomic variables of the base year, the sustainable fiscal policy path for 10 years is computed. As enough time needs to elapse before GBS can be expected to have an impact on fiscal behavior, year 2008 has been selected as a base year (t=0) for the second, post-2000 era simulation. It is also realistic to assume fiscal policy to have macroeconomic effects in the medium term. In the short term macroeconomic effects might not yet be observable, whereas in the long term there could be other changes in the economy obscuring the effects of budget support.

The resulting primary balances are informative about the fiscal adjustment required for the base year (t=0) stock of public debt to be sustainable, given the assumptions on its evolution made in the four scenarios. It is thus possible to compare the fiscal effort needed to sustain the existing debt levels before and after the countries start receiving budget support.

5.2.3. Calibration and data

This sub-section briefly presents the parameter values used to compute the sustainable fiscal paths before and after countries start receiving budget support (See Table 4 for details). The data used in computations has been collected from various sources, such as the IMF Financial Statistics Database, IMF Country Reports (Article IV documents) and Working Papers, World Bank's World Development Indicators (WDI) Online and the United Nations Common Database (See Appendices A and B for a summary on variables and sources).

In the first simulation, where sustainable primary balances are computed for the pre-2000 era, base year t(0)=1999, whereas the second simulation is post-2000 and t(0)=2008. Due to data availability, Burkina Faso's base year in the second simulation is set at 2007.

Initial external/concessionary debt to GDP ratios $\left(\frac{DF_0}{Y_0}\right)$ and *initial domestic debt to GDP ratios* $\left(\frac{DD_0}{Y_0}\right)$ and *base money* $\left(\frac{B_0}{Y_0}\right)$ are actual, realized values in the base year[21]. External debt ratios have been created by using data from the World Bank and the United Nations databases, while domestic debt ratios have been derived from various sources. *Rate of accumulation of debt,* θ and β get different values as of cases A-D. By construction, domestic debt remains at its base line level. In case C it is assumed that $\phi = ½$. In the first simulation, *rate of growth of nominal GDP in US$, interest rates* and *domestic rate of inflation* are historical averages for the simulation period 1999-2009. The annual US inflation rate is assumed 2,50%, which is the historical average for the period 1999-2009.

Also in the second simulation, where countries have started receiving budget support, t(0) = 2008, primary balances are computed for a 10-year period. *Nominal GDP growth in US$*,

[21] Because of lack of data, for some countries domestic debt ratios for year 2000 are used.

interest rates and *domestic rate of inflation* are again period averages[22]. Actual data is used where available[23], the rest are IMF staff estimates. The results are conditional on the assumption that these target rates are achieved.

[22] In specific, averages for 2008-2015 are used.
[23] 2008 and 2009

Table 4: Main assumptions for assessing public sector debt sustainability.

Base year 1999

	Real GDP growth	Inflation	Nominal domestic interest rate	Nominal foreign interest rate	Reserve money/ GDP	Nominal GDP growth	External debt/ GDP	Domestic debt/ GDP
Benin	4,17	3,25	18	0,98	12,2	7,75	61,70	15
Burkina Faso	5,56	2,09	18	1,01	10,1	7,42	45,08	15
Cape Verde	5,46	2,44	8	1,84	18,94	7,63	52,45	26,00
Ghana	5,04	21,21	37	1,13	20,55	28,35	66,72	29,00
Malawi	3,09	28,08	35	0,88	7,64	31,32	145,64	11
Mali	4,89	3,17	18	1,10	11,2	9,10	109,46	15
Mozambique	7,75	8,80	17	0,78	6,29	17,97	119,19	12,08
Niger	4,46	2,58	18	0,98	3,5	7,27	73,87	15
Tanzania	6,70	9,21	17	0,85	7,9	16,18	75,81	12
Uganda	7,19	4,49	10	0,80	5,5	12,64	49,91	2
Zambia	4,83	20,75	36,19	1,02	12,43	26,46	143,88	5,00
Average	5,37	9,64	21,11	1,03	10,55	15,64	85,79	14,28

Base year 2008

	Real GDP growth	Inflation	Nominal domestic interest rate	Nominal foreign interest rate	Reserve money/ GDP	Nominal GDP growth	External debt/ GDP	Domestic debt/ GDP
Benin	5,07	3,47	2,70	1,39	10,00	8,54	13,87	4,3
Burkina Faso	4,77	2,94	4,57	1,13	22,60	7,71	18,66	1,4
Cape Verde	5,93	2,46	4,89	1,44	20,00	8,39	35,31	15,8
Ghana	7,16	10,15	11,79	4,85	12,60	17,31	21,16	29,8
Malawi	7,17	8,06	16,86	0,96	6,00	15,23	19,64	19,00
Mali	4,97	3,34	9,28	1,09	12,60	8,31	24,59	2,5
Mozambique	7,26	6,13	12,50	1,79	8,00	13,39	28,64	4,1
Niger	6,33	3,21	6,03	1,67	1,66	9,54	16,49	5,7
Tanzania	6,95	7,19	9,89	1,24	9,87	14,14	18,11	14,3
Uganda	7,09	7,24	11,61	1,29	6,50	14,33	12,26	10,70
Zambia	5,91	9,44	11,99	1,94	5,83	15,36	8,15	15,5
Average	6,24	5,78	9,28	1,71	10,52	12,02	19,72	11,19

Source: IMF, WB, AfDB; author's calculations

5.3 Simulation results

The debt sustainability exercise consists of two simulations both with four cases (A-D) for 11 Sub-Saharan countries that have received the "new" budget support in years 2005 and 2007. Results are reported in Table 6 so that a minus sign (-) indicates a primary deficit, whereas a plus sign (+) stands for a primary surplus. The higher the primary surplus, the larger the fiscal effort needed to achieve debt sustainability, which implies fiscal indiscipline in and/or before the base year. High primary surpluses are a case of concern also because, in the light of historical budget balances, they are not very realistic in developing countries (e.g. Mayr 2010, 21). Table 5 shows that net borrowing has been positive in the least developed and low income countries throughout the period 2001-2005.

The following conclusions can be drawn from Table 6:

- Depending on the scenario, the sustainable balance can be either a deficit (a negative number) or a surplus (a positive number).
- The speed at which the steady state is reached depends on the value of θ. The stock of external debt declines faster, when θ is small, i.e. debt accumulates slowly.
- In case D both domestic and external debt ratios are kept constant so the steady state is achieved instantly in year 1.
- In case A of the first simulation (base year 1999) most countries (all except for Cape Verde, Uganda and Zambia) start with positive figures. This means that fiscal sustainability before year 2000 requires primary *surpluses*.
- In the second simulation (base year 2008) all but one country (Malawi) can allow *deficits* to arise in cases A and B. In cases C and D all countries can afford deficits.
- In case A the fiscal effort is higher in the first simulation in all but one country (Zambia). Most countries' fiscal effort is clearly greater in the first than in the second simulation in cases A and B.
- In the first simulation, all figures turn into negative in cases C and D. Especially in case D large deficits are allowed. Contrary to the cases A and B, in cases C and D larger deficits arise in the first than in the second simulation. This is most obviously due to the fact that

cases A-D move gradually from the most conservative to the most optimistic scenario in terms of new debt accumulation.

In the first simulation, the initial levels of external debt are significantly higher than in the second simulation. As cases C and D assume that debt levels increase in real terms, or remain constant relative to GDP, very high deficits arise. At the same time domestic debt ratios are assumed to remain at their initial, remarkably lower levels. It is unlikely that international donors would be willing to maintain such high debt levels at concessional interest rates. Extremely high deficits arise because the creditors' behavior is assumed unrealistically optimistic. Hence, cases A and B can be viewed as most realistic.

Comparing each country's sustainable balances before and after year 2000 under cases A and B, the exercise indicates greater fiscal discipline in the second simulation, i.e. after countries started receiving budget support. Even though the assumptions on foreign creditors' willingness to provide additional funds at the same rates is unlikely, the simulation exercise is still informative about the impact of projected and realized fiscal policies on debt sustainability.

Table 5: Total external stock of debt and net borrowing (% of GDP) by country income group, 2000-2005

	2001	2002	2003	2004	2005
Stock of debt					
Least developed countries[a]	110.37	113.90	114.67	107.39	90.66
Low income countries[a]	71.59	70.09	67.00	60.23	51.74
Lower middle income countries[a]	63.91	64.24	63.31	56.12	45.80
Upper middle income countries[a]	47.69	55.67	56.60	53.51	49.34
	2000	2001	2002	2003	2004
Net borrowing					
Least developed countries	5.17	2.72	3.25	4.53	n.a.
Low income countries	7.02	7.43	3.58	4.88	6.92
Lower middle income countries	0.46	0.74	−0.67	−2.26	1.04
Upper middle income countries	−0.63	2.14	0.01	−0.01	−0.61

Source: Mayr (2010). Data extracted from UN Common Database (2008), OECD Geographical Distribution of Financial Flows to Developing Countries (2009).
Note: Outliers with net borrowing smaller than -100% or larger than 100% of GDP are excluded.
[a] According to the DAC list of ODA recipients available at www.oecd.org/dataoecd as of April 2008.

5.4 Critical evaluation

Main weaknesses of the framework used are its focus on the availability of external debt, and results that rely on exogenous assumptions on growth, inflation, and interest rates. However, endogenizing the assumptions requires a general equilibrium exercise, which is beyond the scope of this study.

Furthermore, the analysis was designed to study the debt sustainability of the sample countries, which have received budget support without any comparison to countries that have not received aid in such form. The analysis could thus be extended to two groups of countries; those that have received budget support after year 2000 and those who have not. This would allow identifying whether there is a tendency of improved fiscal discipline also in countries that have *not* received budget support. Comparing country groups would remove those factors that affect debt accumulation and debt sustainability but are not explained by the model.

Another useful exercise would be to analyze the results with respect to the relative amount of budget support each country received. Finally, the availability and conformity of data, especially estimates for years ahead, significantly restrict the choice set of sample countries.

Table 6: Sustainable fiscal primary balances. Simulation results.
Base year t(0)=1999

Case A (θ = 0)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozam-bique	Niger	Tanzania	Uganda	Zambia
1	1,26	1,03	-0,59	3,25	1,90	1,71	0,54	1,98	0,19	-0,27	-0,47
2	1,22	1,00	-0,66	3,20	1,83	1,63	0,46	1,93	0,14	-0,30	-0,56
3	1,19	0,97	-0,72	3,15	1,77	1,55	0,38	1,89	0,09	-0,33	-0,65
4	1,15	0,94	-0,78	3,11	1,71	1,49	0,32	1,85	0,05	-0,36	-0,74
5	1,12	0,92	-0,84	3,07	1,65	1,42	0,26	1,82	0,01	-0,39	-0,82
6	1,10	0,89	-0,89	3,03	1,60	1,36	0,20	1,78	-0,03	-0,41	-0,89
7	1,07	0,87	-0,93	2,99	1,55	1,31	0,15	1,75	-0,06	-0,43	-0,95
8	1,04	0,85	-0,97	2,96	1,50	1,25	0,11	1,72	-0,09	-0,45	-1,02
9	1,02	0,83	-1,01	2,93	1,46	1,21	0,07	1,69	-0,12	-0,47	-1,07
10	1,00	0,81	-1,05	2,90	1,42	1,16	0,03	1,67	-0,14	-0,48	-1,13
Ss	0,69	-0,76	-1,50	-5,31	-2,35	0,58	-1,03	1,31	-1,25	-0,64	-3,17

Case B (θ = π*)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-0,19	-0,01	-1,81	1,70	-1,55	-0,84	-2,16	0,25	-1,55	-1,41	-3,82
2	-0,15	0,02	-1,79	1,74	-1,48	-0,77	-2,02	0,30	-1,47	-1,35	-3,73
3	-0,12	0,05	-1,77	1,78	-1,42	-0,71	-1,90	0,34	-1,40	-1,30	-3,64
4	-0,09	0,08	-1,76	1,82	-1,36	-0,64	-1,78	0,38	-1,34	-1,26	-3,55
5	-0,05	0,11	-1,74	1,85	-1,29	-0,59	-1,67	0,42	-1,28	-1,21	-3,47
6	-0,02	0,14	-1,73	1,89	-1,23	-0,53	-1,57	0,46	-1,22	-1,17	-3,39
7	0,00	0,17	-1,72	1,92	-1,17	-0,48	-1,47	0,50	-1,17	-1,14	-3,32
8	0,03	0,19	-1,71	1,95	-1,12	-0,43	-1,38	0,53	-1,12	-1,10	-3,25
9	0,06	0,21	-1,69	1,98	-1,06	-0,38	-1,30	0,57	-1,07	-1,07	-3,18
10	0,09	0,23	-1,68	2,01	-1,01	-0,33	-1,23	0,60	-1,03	-1,04	-3,12
Ss	0,69	-0,76	-1,50	-5,31	-2,35	0,58	-1,03	1,31	-1,25	-0,64	-3,17

Case C ($\theta = \phi g + \pi^*$)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-1,40	-1,17	-3,13	4,62	-3,68	-3,33	-6,35	-1,29	-3,87	-3,30	-7,06
2	-1,35	-1,12	-3,09	4,68	-3,59	-3,23	-6,12	-1,23	-3,76	-3,22	-6,93
3	-1,31	-1,07	-3,05	4,74	-3,50	-3,14	-5,90	-1,17	-3,65	-3,14	-6,81
4	-1,27	-1,03	-3,00	4,80	-3,42	-3,05	-5,69	-1,12	-3,54	-3,06	-6,69
5	-1,23	-0,98	-2,96	4,85	-3,33	-2,96	-5,48	-1,07	-3,44	-2,98	-6,57
6	-1,19	-0,94	-2,92	4,91	-3,25	-2,88	-5,29	-1,01	-3,34	-2,91	-6,46
7	-1,15	-0,90	-2,88	4,96	-3,17	-2,80	-5,10	-0,96	-3,24	-2,84	-6,34
8	-1,11	-0,86	-2,85	5,01	-3,09	-2,71	-4,91	-0,91	-3,15	-2,77	-6,24
9	-1,08	-0,82	-2,81	5,06	-3,01	-2,63	-4,74	-0,86	-3,06	-2,70	-6,13
10	-1,04	-0,78	-2,77	5,11	-2,93	-2,56	-4,57	-0,82	-2,97	-2,64	-6,03
Ss	0,69	-0,76	-1,50	-5,31	-2,35	0,58	-1,03	1,31	-1,25	-0,64	-3,17

Case D ($\theta = g + \pi^*$)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
2	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
3	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
4	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
5	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
6	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
7	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
8	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
9	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
10	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29
Ss	-2,60	-2,33	-4,46	-1,43	-5,81	-5,82	-10,54	-2,83	-6,20	-4,68	-10,29

(Table 4 continues)
Base year t(0)=2008

Case A (θ = 0)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-0,87	-1,58	-1,72	-0,67	0,50	-0,76	-0,50	-0,05	-1,13	-0,59	-0,24
2	-0,88	-1,60	-1,76	-0,75	0,49	-0,77	-0,55	-0,07	-1,15	-0,60	-0,25
3	-0,90	-1,61	-1,80	-0,83	0,47	-0,79	-0,59	-0,09	-1,17	-0,61	-0,26
4	-0,91	-1,62	-1,83	-0,90	0,46	-0,81	-0,62	-0,11	-1,18	-0,63	-0,27
5	-0,92	-1,63	-1,86	-0,97	0,45	-0,82	-0,65	-0,13	-1,20	-0,64	-0,28
6	-0,93	-1,64	-1,89	-1,03	0,44	-0,83	-0,68	-0,14	-1,21	-0,64	-0,29
7	-0,94	-1,65	-1,91	-1,08	0,43	-0,85	-0,71	-0,16	-1,22	-0,65	-0,30
8	-0,94	-1,66	-1,93	-1,13	0,42	-0,86	-0,73	-0,17	-1,23	-0,66	-0,30
9	-0,95	-1,67	-1,95	-1,17	0,41	-0,87	-0,76	-0,18	-1,24	-0,67	-0,31
10	-0,96	-1,68	-1,97	-1,21	0,40	-0,88	-0,78	-0,19	-1,25	-0,67	-0,32
Ss	-1,05	-1,74	-1,68	-2,18	-0,90	-1,01	-1,07	-0,31	-1,40	-0,93	-0,89

Case B (θ = π*)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-1,19	-2,02	-2,54	-1,15	0,05	-1,33	-1,15	-0,43	-1,55	-0,87	-0,43
2	-1,19	-2,01	-2,52	-1,18	0,07	-1,31	-1,14	-0,42	-1,53	-0,86	-0,42
3	-1,18	-2,00	-2,50	-1,21	0,09	-1,30	-1,13	-0,42	-1,52	-0,85	-0,42
4	-1,17	-1,99	-2,48	-1,24	0,11	-1,28	-1,12	-0,41	-1,51	-0,84	-0,42
5	-1,17	-1,98	-2,46	-1,26	0,12	-1,27	-1,11	-0,40	-1,50	-0,84	-0,42
Ss	-1,16	-1,97	-2,45	-1,29	0,14	-1,26	-1,10	-0,40	-1,49	-0,83	-0,42
7	-1,15	-1,96	-2,43	-1,31	0,15	-1,25	-1,09	-0,39	-1,48	-0,82	-0,41
8	-1,15	-1,95	-2,42	-1,33	0,16	-1,23	-1,08	-0,39	-1,47	-0,82	-0,41
9	-1,14	-1,94	-2,41	-1,35	0,18	-1,22	-1,07	-0,38	-1,46	-0,81	-0,41
10	-1,14	-1,93	-2,40	-1,37	0,19	-1,21	-1,07	-0,38	-1,45	-0,81	-0,41
Ss	-1,05	-1,74	-1,68	-2,18	-0,90	-1,01	-1,07	-0,31	-1,40	-0,93	-0,89

Case C ($\theta = \phi g + \pi^*$)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-1,52	-2,43	-3,50	-0,51	-0,59	-1,90	-2,10	-0,91	-2,12	-1,38	-0,65
2	-1,51	-2,42	-3,46	-0,51	-0,56	-1,88	-2,06	-0,89	-2,10	-1,36	-0,64
3	-1,50	-2,40	-3,43	-0,50	-0,54	-1,85	-2,02	-0,87	-2,07	-1,35	-0,64
4	-1,49	-2,39	-3,39	-0,49	-0,52	-1,83	-1,99	-0,86	-2,05	-1,33	-0,63
5	-1,47	-2,37	-3,36	-0,48	-0,50	-1,81	-1,95	-0,84	-2,02	-1,31	-0,62
6	-1,46	-2,36	-3,32	-0,48	-0,48	-1,79	-1,91	-0,82	-2,00	-1,30	-0,62
7	-1,45	-2,35	-3,29	-0,47	-0,46	-1,77	-1,88	-0,81	-1,98	-1,28	-0,61
8	-1,44	-2,33	-3,26	-0,46	-0,44	-1,76	-1,85	-0,79	-1,95	-1,27	-0,61
9	-1,43	-2,32	-3,23	-0,46	-0,42	-1,74	-1,82	-0,78	-1,93	-1,25	-0,60
10	-1,42	-2,31	-3,20	-0,45	-0,40	-1,72	-1,79	-0,76	-1,91	-1,24	-0,60
Ss	-1,05	-1,74	-1,68	-2,18	-0,90	-1,01	-1,07	-0,31	-1,40	-0,93	-0,89

Case D ($\theta = g + \pi^*$)

Year	Benin	Burkina Faso	Cape Verde	Ghana	Malawi	Mali	Mozambique	Niger	Tanzania	Uganda	Zambia
1	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
2	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
3	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
4	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
5	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
6	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
7	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
8	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
9	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
10	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87
Ss	-1,85	-2,85	-4,47	-2,53	-1,23	-2,47	-3,05	-1,39	-2,70	-1,66	-0,87

Source: Author's calculations

6 Conclusions

Aid affects growth through several channels. Since most aid goes to the government and through the political decision making process, government behavior plays an important role in aid effectiveness. Currently the fiscal impact of aid is studied in the aid fungibility and fiscal response literature. They study how fiscal behavior of the receiving country government affects aid effectiveness. The contradictory results obtained are viewed as modeling, or econometric issues that have been tried to resolve accordingly, by improving the models.

However studying mere accounting relationships does not tell us why aid sometimes results in excess public borrowing and deficits. It is important to acknowledge that aid itself also affects fiscal behavior and a deeper understanding of how government behavior alters when public expenditure is financed with foreign aid is needed. Financing public spending with external funds, which are managed outside the budget are found to undermine accountability, weaken institutions and distort incentives to maintain fiscal discipline.

Research on the fiscal impact of aid done to date, including the recent paper by Mayr (2010), who finds a policy of running budget deficits to be optimal in the presence of foreign aid, ignores the existence of various aid instruments. Yet the criticism against the current aid system mainly arises from factors such as distorted incentives, weak institutions, problems caused by a great number of uncoordinated donors and the lack of accountability of the receiving country government. These factors are claimed to be related to the traditional aid instruments, which are disbursed outside the government budget. The assessment of aid effectiveness should better take into consideration the changes in aid giving, especially the shift away from the traditional forms of aid, such as project and program aid, towards directly supporting government budgets.

Thereby the first aim of the thesis was to explain theoretically the mechanisms that determine fiscal discipline in the presence of foreign aid. The *common pool resource* -approach shows that external funds, such as foreign aid, may lead to fiscal indiscipline because the budget constraint is not internalized, i.e. the cost burden of spending is not borne solely by the spending unit, which incentivizes higher spending. The *soft budget constraint* goes a step further and illustrates that external finance makes the spending units perceive the budget as flexible. In other words, aid

introduces an element of insurance in case of default and so induces moral hazard behavior. The soft budget constraint is elsewhere described as a fragmented budget process, whereby spending decisions are not coordinated. External funds that are managed outside the government budget lead to a fragmentation of the budget process. This is the case of the traditional forms of aid that are managed outside the budget, whereas centralized budget process hardens the budget constraint, improving fiscal discipline. This is why putting aid on budget is expected to result in greater fiscal discipline.

This statement, that was first shown theoretically, was further formulated as a hypothesis for the second research question, and then tested empirically. Sustainable primary balances under four scenarios were calculated for 11 Sub-Saharan African countries that have received the new kind of budget support. According to two of the most realistic scenarios, in most of the sample countries running primary deficits slightly larger than before was in line with public debt sustainability. This is taken as an indication of improved fiscal discipline since the countries started to receive general budget support (GBS). So the empirical results support the earlier findings that foreign aid in its traditional form induces excess public borrowing.

At the same time it should be noted that the empirical model suffers from some limitations. First, it relies on exogenous assumptions, or target rates of growth, inflation and interest rates. However, endogenizing the assumptions requires a general equilibrium exercise, which is beyond the scope of this study. The second limitation concerns the behavioral assumptions of the creditors. Even though the assumptions on foreign creditors' willingness to provide additional funds at constant rates is unlikely, the simulation exercise is still informative about the impact of projected and realized fiscal policies on debt sustainability.

It is evident that research should not anymore treat all foreign aid as if there was only one modality, but various aid instruments should be incorporated in the analysis. The next step within this debt sustainability framework would be to endogenize the variables used in calculations. Further research should focus on a more appropriate framework for debt sustainability assessment and put effort in finding appropriate data and reliable forecasts. The empirical testing could also be designed to study the debt sustainability of two groups of countries: those that have

received budget support after year 2000 and those who have not. This would allow identifying whether fiscal discipline has improved only in those countries that have received budget support. The debt sustainability exercise should also take into account the relative amount of GBS (for example, GBS to government revenues ratio and the amount of GBS relative to other forms of aid) that the countries have received. Finally, a more thorough research in many respects is needed to move away from associational to causal inference concerning budget support and fiscal discipline.

Appendix A Data description and sources. Base year 1999

Variable and symbol	Description	Source
Initial external debt to GDP ratio $\left(\frac{DF_0}{Y_0}\right)$	Public and publicly guaranteed external debt stocks to total GDP (current US$) in the base year.	Created from the World Bank Global Development Finance Database and United Nations Common Database (2008)
Initial domestic debt to GDP ratio $\left(\frac{DD_0}{Y_0}\right)$	Treasury bills, bonds, government stocks. For some countries data for year 2000 or average for 27 non-CFA SSA countries is used.	IMF WP/04/46.
Rate of accumulation of external debt going forward θ	Different assumptions, depending on the scenario being considered.	
Rate of accumulation of domestic debt β	$(g + \pi^*)$ in the baseline scenario.	
Rate of real GDP growth g	Annual %, period average	IMF Financial Statistics database and Article IV documents
Rate of US inflation π^*	2,5% per year, period average	
Monetary base to GDP ratio $\left(\frac{B_0}{Y_0}\right)$	Reserve money to nominal GDP, actual base year	World Development Indicators online (WDI) 2010
Domestic rate of inflation π	GDP deflator (annual %), period average	
Nominal interest rate on foreign funds r^f	Interest rate on new external debt commitments, official %, period average	WDI 2010
Nominal interest rate on domestic funds r^d	Nominal Treasury bill rate 1995-2000	IMF WP/04/46

Appendix B Data description and sources. Base year 2008.

Variable and symbol	Description	Source
Initial external debt to GDP ratio $\left(\frac{DF_0}{Y_0}\right)$	Public and publicly guaranteed external debt stocks to total GDP (current US$) in the base year	Created from World Bank Global Development Finance Database and United Nations Common Database (2008)
Initial domestic debt to GDP ratio $\left(\frac{DD_0}{Y_0}\right)$	Actual figures, IMF estimates	IMF Article IV documents
Rate of accumulation of external debt going forward θ	Different assumptions, depending on the scenario being considered.	
Rate of accumulation of domestic debt β	$(g + \pi^*)$	
Rate of real GDP growth g	IMF staff estimates, period average	IMF Financial Statistics Online Database and IMF Article IV documents
Rate of US inflation π^*	Assumption 2,5% per year	
Monetary base to GDP ratio $\left(\frac{B_0}{Y_0}\right)$	Reserve money to nominal GDP, actual base year	IMF Article IV documents
Domestic rate of inflation π	GDP deflator (annual %), IMF staff estimates, period average	IMF Article IV documents
Nominal interest rate on foreign funds r^f	IMF staff estimates, period average	IMF Article IV documents
Nominal interest rate on domestic funds r^d	IMF staff estimates, period average	IMF Article IV documents

Appendix C: Sustainable and steady state primary balances and debt/GDP ratios under alternative scenarios

CASE	Dynamic path of sustainable primary balance to GDP ratio	Steady state sustainable primary balance to GDP ratio
A: $\theta = 0$ $\beta = (g + \pi^*)$	$\left(\frac{pb_t}{Y_t}\right) = \frac{(-r_t^f)\left(\frac{DF_0}{Y_0}\right)e^{-(g+\pi^*)(t-1)} + (g+\pi^*-r_t^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$	$\left(\frac{pb_t}{Y_t}\right) = \frac{(g+\pi^*-r^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$
B: $\theta = \pi^*$ $\beta = (g + \pi^*)$	$\left(\frac{pb_t}{Y_t}\right) = \frac{(\pi^*-r_t^f)\left(\frac{DF_0}{Y_0}\right)e^{(-g)(t-1)} + (g+\pi^*-r_t^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$	$\left(\frac{pb_t}{Y_t}\right) = \frac{(g+\pi^*-r^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$
C: $\theta = (\phi g + \pi^*)$ $\beta = (g + \pi^*)$	$\left(\frac{pb_t}{Y_t}\right) = \frac{(\phi g+\pi^*-r_t^f)\left(\frac{DF_0}{Y_0}\right)e^{(-g)(t-1)} + (g+\pi^*-r_t^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$	$\left(\frac{pb_t}{Y_t}\right) = \frac{(g+\pi^*-r^d)\left(\frac{DD_0}{Y_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$
D: $\theta = (g + \pi^*)$ $\beta = (g + \pi^*)$	$\left(\frac{pb_t}{Y_t}\right) = \left(\frac{D_0}{Y_0}\right)\frac{(g+\pi^*) - r_t^f\left(\frac{DC_0}{D_0}\right) - r_t^d\left(\frac{DD_0}{D_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$	$\left(\frac{pb_t}{Y_t}\right) = \left(\frac{D_0}{Y_0}\right)\frac{(g+\pi^*) - r_t^f\left(\frac{DC_0}{D_0}\right) - r_t^d\left(\frac{DD_0}{D_0}\right)}{(1+g+\pi^*)} - (g+\pi)\left(\frac{B_0}{Y_0}\right)$

Note: In these equations a positive pb/Y means a primary deficit, whereas a negative pb/Y indicates a primary surplus.

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