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Debt Relief, Additionality, and Aid Allocation in Low-Income Countries

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Abstract

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This paper models the resource implications of debt relief provided to low-income countries (LICs). Obtaining debt relief does not necessarily lead to individual aid-dependent countries receiving more overall resources from the donor community. Preliminary cross-section estimates suggest that debt relief provided to low-income countries in the period 1996-2000 neither crowded out other non-debt relief-related aid flows to the debtors concerned nor created significant extra net resources for those countries. While it is too early to fully assess the resource implications of the enhanced HIPC Initiative, this paper provides a possible approach to such an evaluation.

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I. INTRODUCTION

When Naples terms and other so-called traditional debt-relief mechanisms for poor countries were originally conceived by Paris Club creditors in the early 1990s, there was little suggestion that the debt relief involved should lead to greater budgetary resources being available for the poor countries concerned.[2] Indeed, the prevailing view was quite the opposite. By replacing unrealistic medium-term repayment schedules with more realistic ones, commercially-oriented official creditors hoped to increase the incentives for repayment of the remaining debts. Debt-relief and aid-allocation decisions were kept largely separate and were usually dealt with by different ministries in donor countries.[3] In more recent years, however, the international community has significantly expanded its goals for debt relief for poor, aid-dependent countries. These goals now include providing additional resources for those countries to spend on poverty reduction-related activities. By going beyond the narrow approach to debt sustainability defined in terms of projected ability to pay, and adopting a wider interpretation of debt sustainability which explicitly seeks to link debt relief to the future resource needs and poverty reduction aspirations of the country, debt relief has become intricately linked with other aid-allocation decisions.

Given the wider goals, there is no generally accepted analytical framework which would say that debt relief for poor countries is sufficient to meet its aims, any more than we have a clear framework to use in determining whether the provision of direct grant aid is sufficient. Thus, many observers would argue that all debt in low-income countries (LICs) that are clearly aid dependent should simply be written off.[4] In this new world, therefore, the qualification thresholds of the Heavily Indebted Poor Countries (HIPC) debt initiative may not represent a particularly meaningful concept of debt sustainability. Rather they represent the level of debt relief that the international donor community is currently willing to pay for. In a world of limited donor resources, however, this raises the question of what the appropriate balance is between debt relief and other aid activities in providing support to poor countries which are widely accepted as likely to be aid dependent for the foreseeable future.

If there are any additional real resources being transferred to poor countries as a group as a result of debt-relief operations, and if these resources go into a global pool of all aid resources, then they are potentially available to all developing countries regardless of

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[2] For descriptions of the thinking behind the debt-relief initiatives of the late 1980s and early 1990s, see H.M. Treasury (1991), Lawson (1992), Evans (1999), and Daseking and Powell (2001).

[3] For the purposes of this paper, debt relief is defined as action taken by the creditor that reduces the present value of its financial claim on the debtor. Nonconcessional refinancing or rescheduling—although it may provide cash-flow relief—would therefore not count as debt relief in this context.

[4] See, for example, Sachs (2002).

whether they are seeking debt relief from official creditors. However, if debt relief operations assist only highly indebted countries and systematically lead to more donor resources going to defaulting countries than those that have maintained better relationships with creditors, then the latter countries might reasonably consider themselves penalized for good policy. Any evidence of a systematic bias, therefore, would be an argument for providing more resources through direct aid allocations, even if this required providing less new resources though debt-relief operations.

Creditors providing debt relief to poor countries have always been concerned about additionality. In the context of the debate on debt relief, the three most common definitions of additionality can be characterized as follows.

Definition 1: Debt relief is additional if it does not lead to lower levels of other non-debt relief-related aid flows (that is crowding out) for the debtor concerned. This definition makes no claim, however, about whether debt relief brings additional new resources for the debtor or poor countries generally. It emphasizes the lack of any negative impact on non-debt relief-related aid-disbursement decisions. This is the narrowest definition of additionality.

Definition 2: Debt relief is additional if it leads to greater aggregate resources being made available to the individual debtor receiving the debt relief. This definition makes no claim about whether additional resources are available for poor countries as a group, but seeks to observe real additional resources going to the individual debtor country as a result of debt-relief activities. These resources can be used for additional spending that would not otherwise have taken place.

Definition 3: Debt relief is additional if it leads to greater aggregate resources being available to all poor countries as a group. This definition says nothing about whether additional resources are available for the debtor concerned, but seeks to observe additional resources going to poor countries generally as a result of debt-relief operations. Although additional resources are made available, it is, in principle, more difficult to track them compared with Definition 2, since they may be going to countries other than those directly receiving the debt relief.

The first two definitions are largely concerned with how a given amount of donor resources is allocated among countries and the impact on the individual debtor. The third definition looks at the overall generosity of the donor community in providing resources to aid-dependent countries and the impact on these countries as a group. This paper focuses on the aid-allocation process among the recipient countries, rather than on the overall level of resource transfer. It attempts to assess the empirical evidence on two related issues. First, what has been the impact, if any, on the non-debt relief-related development assistance received from donors by poor countries, resulting from debt-relief operations undertaken in recent years? This is essentially the question of looking for crowding out of other aid flows to the individual debtor, and hence for additionality under Definition 1. Second, ceteris paribus, are the poor countries which have obtained official debt relief in recent years systematically receiving more official resource transfers than other poor countries which are not seeking or obtaining debt relief? This question looks for a bias in the way aid-dependent countries are

being allocated resources by donor-creditors and can be thought of as looking for additionality under Definition 2. These are essentially empirical questions about the behavior of official donor-creditors that have important implications for all poor countries, including those receiving or considering seeking debt relief from official creditors, as well as those that have chosen not to seek debt relief but which nonetheless continue to depend on donor assistance.

Section II of this paper looks at the resource implications of obtaining debt relief, emphasizing that there is no necessary direct link from debt relief to the availability of additional resources. Section III looks at the aid allocation literature. Section IV presents a model of aid-allocation decisions of donors as a group which incorporates the potential impact of debt relief. Sections V and VI present estimates of the model, Section VII provides preliminary conclusions, and Section VIII some thoughts on further research.

II. THE RESOURCE IMPACT OF DEBT RELIEF

A simple approach to assessing the resource impact of a debt relief agreement on an individual debtor is to focus on the cash debt service payments actually made by the debtor. Bird and Milne (2003) examine two basic accounting identities showing i) the evolution of indebtedness and ii) the fiscal constraint on an individual debtor. Specifically, the external constraint is

$$\Delta D \equiv (S - P) + (L - W)$$

where ΔD is the change in indebtedness, S is the contracted debt service payments, P is actual debt service payments, L is new borrowing, and W is debt relief (which also reduces S). The fiscal constraint is,

$$G \equiv T + L - P + A$$

where G is non-debt related government expenditure, and T is tax receipts, which is augmented by gross new domestic and external borrowing (L) and grant aid (A). P is actual debt service paid, including both principal and interest. Bird and Milne note that the direct impact of debt relief W is to reduce the debt stock, D. The fiscal implications of debt relief arise, if at all, only through its impact on the level of T, P, L and A.

Illustrating this point using an extreme example, if a country has been for many years in complete default and not servicing any of its debts to a particular creditor (i.e. $P = 0$), clearly in such circumstances it would not be possible for any amount of debt relief, no matter how costly in budgetary terms for the creditor, to reduce further the cash payments actually being made by the debtor. Debt relief in this situation would be largely an accounting transaction cleaning up a non-performing loan of the creditor agency. Similarly if a country had received regular comprehensive rescheduling from creditors, then a further comprehensive restructuring of the debt stock involving significant debt reduction, for example, will not necessarily lead to lower cash payments after the deal is completed, especially if

rescheduling is no longer an option (e.g. following a so-called "exit deal" where debtors agree not to seek any further rescheduling in future).

A slightly more sophisticated analysis considers overall net transfers to the debtor, including the impact of debt relief on other grant aid flows and new loans or rescheduling from donors and creditors. Adding a further layer of complication, while one can look solely at the individual bilateral debtor and creditor relationship, it may often be more meaningful to look at larger groups of debtors and creditors and, in particular, at how the actions of one creditor or group of creditors impact on the actions of the other donors or creditors. It is quite possible, for example, for debt relief from an official creditor to be fully additional to *that* creditor government's aid budget for the recipient country, and provide real additional resources (e.g. because the debt was previously being serviced), but not overall because other donors and creditors correspondingly adjust downwards their flows of assistance or debt relief to the debtor concerned. The effect is that no new resources become available for the debtor.

Table 1. Summary of Resource Impact of Debt Relief for Debtor i from Creditor j

Impact on:	Possible Outcomes															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Debtor i's debt service payments paid	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Debtor i's transfers received from donor j	+	+	+	+	-	-	-	-	+	+	+	+	-	-	-	-
Debtor i's net transfers from all official donors and creditors	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-
All LICs net transfers from all official donors and creditors	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-

Notes: + denotes an increase, - denotes a decrease, LICs denotes low-income countries.

Table 1 summarizes the potential impact on debt service payments and net transfers resulting from debt relief being granted to an individual debtor country i by creditor/donor j. Specifically debt relief can lead to either an increase or a decrease in the following indicators (i) debt service paid; (ii) debtor i's net transfers received from creditor/donor j.; (iii) debtor i's net transfers received from all donors and creditors; and (iv) all low income countries' net transfers received from all donors and creditors. The outcome on any one indicator does not necessarily imply the outcome for any of the others. Thus, ignoring (for simplicity) the possibility that outcomes remain completely unchanged, there are 16 possible combinations of outcomes identified in Table 1.

In outcome 1, for example, debt service payments to the creditor j actually increase following the debt relief operation, but transfers received from creditor/donor j and the donor community more generally also increase–thus providing the debtor with more resources. In outcome 1, this increase in resources provided to debtor i does not fully crowd out transfers to other countries and so the net transfer to all LICs as a group also increases. This sort of outcome might be, for example, because no or very few cash payments were being made prior to the agreement and the debt reduction agreement requires that a minimal level of debt service be resumed. The debt relief operation is nonetheless associated with a net pick up in donor support for the country concerned. Outcome 2 is similar except that the additional net resource transfers going to debtor i are more than compensated for by lower resource transfers to other LICs. Thus in case 2 the individual debtor has more resources, but LICs as a group do not. At the other extreme, in outcome 16, debt relief does lead to lower cash debt service payments. However, overall the net resources received by the debtor from donor j and the wider donor community fall. This might be because debtor i previously had a very good track record in servicing its debt and so seeking debt relief led to a cut back in new lending or other aid flows from donors. In this case debt relief meant that the individual debtor and LICs as a group ended up with less resources available following the debt relief operation.

It should be clear from the above discussion that for aid dependent countries receiving additional real resource transfers does not necessarily coincide with the provision of official debt relief. In Daseking and Powell (2001) we estimate that after the full implementation of all traditional debt relief mechanisms (i.e. a Naples terms stock of debt agreement and comparable treatment by other bilateral official and commercial creditors) as well as the enhanced HIPC initiative, HIPCs will have received debt relief somewhere in the range of $95-140 billion in 1999 net present value terms in the period since 1988. It would be highly misleading, however, to think of this figure as representing real additional financial resources that poor countries were able to spend during the period since 1988 as a result of debt relief initiatives. Much of the resource transfer associated with these debts took place somewhat earlier when the loans were first disbursed. Obtaining debt relief on bad debts does not allow a debtor to receive the same real resources again.

Similarly, the real resource transfer associated with the still outstanding stock of debt (not yet relieved) has largely taken place, even though the donor governments' budgeting for much of the necessary debt relief has not yet been made (i.e. taxpayers in creditor countries have not yet been asked to pay for the full cost of the earlier resource transfer). Abegro and Ross (2001) note that traditional debt relief already provided to 37 HIPCs over the period 1988-99 may be about $60-65 billion (in 1999 NPV terms), but the costs of additional traditional relief yet to be provided is estimated at about US$36 billion, in addition to the costs of the HIPC Initiative ($39 billion) and any additional bilateral debt forgiveness which has been pledged (estimated at $9 billion).

The remainder of this paper looks at experience with the provision of aggregate aid flows *from a recipient country perspective*, with a view to finding empirical evidence of additional resources being associated with the provision of debt relief or, alternatively, of crowding out of resource flows to individual countries by the costs of debt relief. We are therefore focusing on the first 2 definitions of additionality and on the third row of table 1, and attempting to

distinguish whether countries receiving debt relief have generally been receiving more resources from donors compared to those countries not seeking or obtaining debt relief agreements. The empirical approach taken is to model the allocation of official development assistance (ODA) to low-income, or specifically to so-called "IDA-only" countries,[5] to see if the provision of debt relief has been a significant additional factor in determining overall level of aid flows and net transfers to these countries. This first requires a survey of the aid allocation literature.

III. AID ALLOCATION: A LITERATURE REVIEW

The foreign aid literature can be broadly divided in two parts. The first considers the impact of foreign aid on the receiving countries, especially the link from aid to investment and growth. The second considers the determinants of foreign aid and its allocation. In the absence of sustained growth in income and exports it is difficult both to maintain large resources gaps (i.e. to import debt-financed resources) without debt ratios becoming high, and eventually unsustainable. In a survey of the recent empirical literature on aid effectiveness, however, Tsikata (1998) concludes that "the preponderance of evidence suggests that development aid has not had a significant impact on growth in recipient countries". Several others have argued that a large proportion of foreign aid flowing from wealthy countries to poor countries is wasted and only increases unproductive public consumption. Poor institutional development, corruption, inefficiencies and bureaucratic failures in the developing countries are often cited as reasons for these results.

In many ways this literature provides the most fundamental explanation for the emergence of the LIC debt crisis in the 1980s. Capital, much of it in the form of commercially priced loans and export credits, was provided by wealthy countries with the primary aim of boosting investment and stimulating growth. If commercial loans had been repaid, then this would have been a relatively costless (indeed, profitable) exercise for the wealthy countries. One way or another, the hoped-for growth did not materialize. If capital and investment did not lead to growth, a rise of the debt ratios to unsustainable levels was inevitable. For the purposes of this empirical study, however, I take a closer look at the second part of the aid literature and, in particular, what determines aid allocations?

Over the past three decades there have been a number of attempts to model the aid allocation process. Most work has focused on aid allocation decisions of individual donors. The theoretical background to most of these studies of aid allocation is based on political economy theories of international relations. From a donor point of view aid has been seen as a tool of foreign policy promoting political and diplomatic relations, enhancing stability in countries or regions and expanding export markets, as well as supporting the humanitarian or altruistic goals of governments and their electorates.

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[5] IDA-only countries are low-income countries that the World Bank has designated uncreditworthy and eligible for World Bank Group loans only on highly concessional IDA (International Development Association) terms.

Studies which have tested hypotheses regarding aid allocation have generally related aid flows to observable developing country characteristics, e.g. country political ties or the commercial importance of the recipient to the donor. Empirical investigation of these relationships look for correlations between developing country characteristics and aid allocations from donors, usually using multiple regressions and cross country data. A typical model would be a variant on the following general equation for an individual recipient i, and donor j:

$$A_{ij} = F(D_i, P_{ij}, C_{ij})$$

where A_i is the donor country j's aid to country i, D_i is a vector of variables reflecting country i's developmental requirements (e.g. poverty variables), P_{ij} is a vector of variables representing political interests of the donor j in country i (e.g. a colonial history), and C_{ij} is a vector of variables reflecting commercial interests of the donor j in country i (e.g. exports to debtor). The most comprehensively specified models include variables for each of the three motives.

Wittkopf (1972), for example, looking at four donors (the United States, France, the United Kingdom, and Germany) distinguished four broad groups of factors which could be expected to influence aid decisions: political importance of the recipient to the donor; Cold War considerations; the recipients need and performance; and the availability of alternative sources of assistance. For the United States, for example, he found that Cold War considerations were the most important in explaining per capita aid allocations, while for French, German, and British aid, per capita income and trade balances were the important explanatory variables. For France and the United Kingdom the political importance of recipient countries as reflected in their trade ties was also found to be important. One of the more innovative aspects of this work was its identification of other bilateral aid and multilateral aid as potential determinants of donor j's aid to recipient i, suggesting a degree of coordination between donors.

McKinley and Little in a series of papers (1977, 1978, and 1979), looking at the same four donors, used two alternative models. The "recipient need" model assumed that the aid received by each country is proportional to its economic and welfare needs, while the "donor interest" model assumed that the distribution of aid reflected essentially foreign policy and commercial interests of the donor. They found that the application of the recipient need model on its own produced no statistically significant results, while for all four donors the donor interest model provided relatively good explanations of the aid allocation process.

Maizels and Nissanke (1984) analyzed the determinants of bilateral and multilateral aid separately, again using recipient need and donor interest models similar to those used by McKinley and Little, and they considered the same four donors plus Japan. Using cross country multiple regressions for two periods (1969-1970 and 1978-1980), they concluded that "bilateral aid allocations are made largely (for some donors) and solely (for others) in support of donors perceived foreign economic, political and security interests. By contrast aid

flows from multilateral sources, as would be expected, are allocated essentially on recipient needs criteria."

Mosley (1985) builds a model which integrates the level of "demand" and "supply" of aid in a donor country. The demand for aid is assumed to reflect the perception of the donor country's ability to pay compared with other wealthy countries, as well as developmental, diplomatic and trade creating criteria. The "supply" of aid reflects the behavior of the finance ministry and the state of the domestic economy, the aid giving behavior of the rest of the international community, and an adjustment parameter which reflects the electoral demand for aid-related activities. Electorates are assumed to prefer aid which is in grant (or highly concessional) form and targeted at the poor in agriculture and social infrastructure (higher "quality" aid) rather than tied aid aimed at strategic and political interests. The paper concluded that (using sample data for 1961-80) there are three patterns of adjustment by governments in the market for aid. In the first pattern, governments respond to pressures for more aid by altering the quantity supplied. In the second pattern, governments respond to such pressures by increasing the quality rather than the quantity of aid. In the third pattern, governments do not respond to public demand for more aid and instead try to persuade the electorate that they have better judgment about the right level.

More recently, Alesina and Dollar (2000) focusing on the determinants of bilateral aid, used panel regressions to explain donor allocations using the variables for trade openness, democracy; colonial status; direct foreign investment; income per capita; and population. They found the strongest relationship is with population (small countries get more aid per capita).[6] They also found (surprisingly) a slightly positive correlation between aid and income of the recipient. More open and democratic governments also tended to receive more aid, as well as those with a colonial past. Using data from UN voting patterns as a measure of political strategic interests, they found that friends of Japan receive more aid, but friends of the US do not. Overall the political-strategic variables continued to have more explanatory power than the measures of poverty, democracy and policy.

Debt variables were first explicitly introduced into an aid allocation model by Grilli and Reiss (1992) who provide evidence that European Community (EC) bilateral aid had until the late 1980s, been based on commercial interests while EC multilateral aid had been allocated on the basis of recipient need ever since the early 1970s. They introduce a debt stock variable into their analysis arguing that "...the higher the stock of publicly held or publicly guaranteed external debt, the higher are the non traditional payment needs of the country, and the higher should be the aid it receives". They note that the debt stock variable begins to exhibit statistical significance in their 1980 equation, and is highly significant in their 1988 equation. The paper fails, however, to acknowledge that countries with higher debt stocks are often those which are not servicing their debts in full or are receiving comprehensive reschedulings and so in a cash flow sense are arguably in less of a need than those which have been paying their debts in full. Nonetheless, if we accept their work as evidence that highly indebted

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[6] This is the so called population bias that has been noted by Dowling and Heimenz (1985), among others.

countries have been getting extra aid to compensate for their debt burden, it would be surprising if debt relief did not bring with it some crowding out of such exceptional aid flows.

Most directly relevant to the focus of the current study of the resource impact of debt relief, Birdsall, Claessens, and Diwan (2001) estimate a net transfers equation for 35 sub-Saharan African countries, of the form:

$$Nettransfers_i = \mathcal{G}(debt_i, policy_i, poverty_i, population_i, debtreduction_i).$$

Birdsall et al split the sample to see if results are significantly different for high and low debt countries. Since the impact of debt reduction is already assumed to be reflected in the net transfers data, they predicted a coefficient of unity on debt reduction under the hypothesis of full additionality, and zero indicating no additionality.[7] Their estimated coefficients for high debt countries were close to zero and not significant, which they suggest is *"consistent with the likelihood that in high debt countries, donors have taken advantage of debt reduction to reduce disbursements (including probably reversing previous forced lending) by about a one to one ratio"*. Thus they tentatively suggest that the debt reduction of the 1990s fully crowded out other forms of financing and did not constitute an additional source of funds to poor countries.

IV. THE MODEL

With the exception of Birdsall et al, the above researchers were largely focusing on modeling the allocation of the total ODA budget of an individual donor and illustrating differing behaviors and priorities of those donors. Wall (1995), however, develops a model that combines the decisions of many donors into a model of total ODA allocation for the individual recipient country and which also reflects the impact of one donor on the decisions of the others[8]. Building on and extending Wall's framework, this section develops a theoretical model of aggregate ODA allocation to an individual recipient which also incorporates the potential impact of debt relief operations on the allocation of non-debt relief related aid, and net transfers.

Each of the D donor countries and institutions is assumed to have the objective of maximizing the overall impact of its aid operations to each of R recipient countries. As viewed by each donor the subjectively measured per person impact of aid operations h_i is a function of ODA per capita received a_i, some measure of the recipients well being or poverty level, z_i and the recipient country's population n_i. Impact per head, h_i is also

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[7] The additionality concept they use would be consistent with Definition 2 above.

[8] See also Trumbull and Wall (1994)

assumed here to be affected by the macroeconomic policy environment in place, which we label x_i, and by the extent of any debt relief being provided per capita, d_i so that,

$$h_i = h(a_i, z_i, n_i, x_i, d_i) \quad i = 1, \ldots, R$$

If aid is spent effectively, the impact per head is assumed to increase with per capita ODA, and the less well off a country is the greater is the expected impact of any amount of assistance provided. The impact of debt relief can also be expected to be negative, if donors see debt relief as a substitute for other aid (or zero if debt relief is fully additional to other flows of assistance under the narrow definition of additionality). Finally a stable macroeconomic environment is assumed by most donors to enhance impact per head. So to summarize,

$$\frac{\partial h_i}{\partial a_i} \geq 0, \frac{\partial h_i}{\partial z_i} \leq 0, \frac{\partial h_i}{\partial n_i} \leq 0, \frac{\partial h_i}{\partial x_i} \geq 0, \frac{\partial h_i}{\partial d_i} \leq 0$$

The total impact of aid operations on recipient country i is assumed to be the sum of the impacts on each of its n identical residents. The objective of each donor country, subject to a given total budget for aid, is to maximize the sum of the impacts of its assistance on the R recipients. In this model, because all donors have the same objective function, and because a dollar of aid from one donor is a perfect substitute for a dollar from another donor, the equilibrium when donors act independently is identical to that when they act cooperatively. Thus, following Wall (1995), the model is one that assumes that donors pool their aid budgets to determine the per capita assistance given to the R recipients, but taking into account the debt relief being provided to each country, as well as its population, well being, and macroeconomic policy environment.

The maximization problem is thus,

$$\text{Max } H_i = \sum_{i=1}^{R} h(a_i, z_i, n_i, x_i, d_i) n_i \quad \text{s.t.} \quad \sum_{i=1}^{R} a_i n_i = \sum_{j=1}^{D} A_j$$
$$a_i$$

Assume a per person impact function specified as

$$h_i = \frac{a_i^\alpha d_i^\beta x_i^\varepsilon}{z_i^\eta n_i^\gamma}$$

Denoting λ as the Lagrangian multiplier, the R+1 first order conditions are

$$\frac{\alpha a_i^{\alpha-1} d_i^\beta x_i^\varepsilon}{z_i^\eta n_i^\gamma} = \lambda, \quad i = 1, \ldots, R. \quad \sum_{i=1}^{R} a_i n_i = \sum_{j=1}^{D} A_j$$

If we rearrange these equations we obtain an expression for the aid allocation as a function of the recipients population, well being or recipient need, macroeconomic performance, and debt relief received.

$$a_i = \left[\frac{\lambda z_i^{\eta} n_i^{\gamma}}{\alpha d_i^{\beta} x_i^{\varepsilon}} \right]^{\frac{1}{\alpha - 1}} \quad i = 1,....,R \qquad\qquad \sum_{i=1}^{R} a_i n_i = \sum_{j=1}^{D} A_j$$

Finally, by taking logs of the first R equations in the above expression and also adding an error term yields the general equation to be estimated, which reflects how a given amount of donor resources would be allocated among each of the potential recipients:

$$\log a_i = \beta_0 + \beta_1 \log z_i + \beta_2 \log n_i + \beta_3 \log d_i + \beta_4 \log x_i + \mu_i \qquad i = 1,....,R$$

where $\quad \beta_0 = \frac{1}{\alpha - 1} \log \frac{\lambda}{\alpha}, \beta_1 = \frac{\eta}{\alpha - 1}, \beta_2 = \frac{\gamma}{\alpha - 1}, \beta_3 = \frac{-\beta}{\alpha - 1}, \beta_4 = \frac{-\varepsilon}{\alpha - 1}$

V. ESTIMATION AND DATA

Recognizing that aid allocation decisions by donors for poor and uncreditworthy countries are qualitatively different from those for other countries (where e.g. politics and other donor interest variables are likely to play a greater role), the potential sample is restricted to the 63 IDA-only countries as determined by the World Bank in 2002. This group, therefore, excludes low income countries like China, India and Pakistan that have access to capital markets. The IDA-only group is also the group of countries potentially eligible for concessional debt relief, such as Naples terms, under the auspices of the Paris Club, and hence those also eligible to be considered for assistance under the HIPC initiative. It is therefore the natural sample for this study.

Of the 63 IDA-only countries a full data set was collected for 60 countries (excluded countries were Liberia, Myanmar, and Somalia). The main **dependent variable** is the (log of) disbursed Official Development Assistance (ODA) per capita of the recipient countries for the five year period 1996-2000 (LODAEXCAP) but excluding ODA that is described by donors as "action relating to debt," based on data from OECD/DAC. Highest aid per capita recipients under this definition have been Cape Verde, Nicaragua, Tonga and Vanuatu. Lowest recipients per capita have been Bangladesh, Congo DR, Ethiopia and Sudan. In the second set of regressions the dependent variable is (log of) the official net transfers per capita as identified by the World Bank's *Global Development Finance*, 2002. Cape Verde, Nicaragua, Sao Tome, and Georgia top the list, while lowest per capita net transfers recipients were to Cote D'Ivoire, Cameroon, Congo DR, Kenya and Sudan. This variable reflects the impact of all official resources flows including debt relief on both ODA and non-ODA debt, as well as new official loans and grants. In the sample, the correlation between these two alternative dependent variables considered is 0.91.

I test for the statistical significance of recipient needs by considering two variables which reflect donors judgment about well being and the likely impact of aid, and which might be expected to influence donor decisions: (log) **per capita income** (LGNICAP) and (log) **human rights** (LFRH). The first variable uses data from the World Bank's *World Development Indicators,* while the second is an index based on the assessment of political and economic freedom in developing countries by *Freedom House* (a low measure signifies greater economic and political freedom). The (log) **population** variable (LPOP) is from World Bank data. The variable for **macroeconomic performance** (LFUND) is based on the observation that in making aid allocation decisions, donors often insist that an IMF program be in place and on track before they will disburse concessional program assistance (as opposed to project finance, which is not typically explicitly linked to an IMF program). The variable used is the (log of) the absolute number of disbursements made under ESAF or PRGF programs to a country during the period 1996-2000 plus one. This variable can be expected to be closely related to the number of quarters during the period that the country had an IMF program broadly on track during that period.

Finally, I consider two **debt relief variables**. The first (LARTDCAP) is based on data reported by donors to the OECD's Development Assistance Committee (DAC) as the cost of "action related to debt" during the period 1996-2000 per head of population of the recipient country. The second (LDFOGDFCAP) is the amount of debt forgiveness or reduction per capita reported by the World Bank in *Global Development Finance* (GDF) using data from the Debtor Reporting System (DRS). Neither debt relief variable is ideal. The main difference between them is that the OECD/DAC data do not include debt reduction information from Russia, which is significant in many cases. Moreover different creditors have in the past used differing conventions when reporting the costs of debt relief to the OECD/DAC. Some have reported all debt stock reduction in the year of the agreement, for example, while other creditors spread the budgetary costs reported to DAC over the remaining lifetime of the loan. The GDF data includes debt relief on Ruble debts valued at the official exchange rate of 0.6R=$1, which many would consider to overstate the value (in dollar terms) of the debts forgiven. Hence in the GDF data, the countries that have received the most debt relief per capita are those with a significant exposure to Russia, such as Angola, Cote D'Ivoire, Guinea-Bissau, Nicaragua, and Vietnam. From the point of view of the analysis, both measures suffer from the problem that about a third of the sample have not reported receiving any debt relief during the period 1996-2000 and so the observation is zero. As an alternative to measuring debt relief, therefore, I also investigated a dummy variable (either zero or one) for a country having received debt relief during 1996-2000 or not (DRDUMMY), and another PCDUMMY for those countries (a smaller group) that have received a Paris Club deal during the period. Ordinary Least Squares (OLS) is used to estimate the equation.

VI. RESULTS

The results of estimating the non-debt relief aid equation for IDA-only countries is shown in Table 2. The strongest effect comes from the population variable, suggesting that population bias remains a significant factor in donor decisions, with donors systematically giving more

aid per capita to countries with smaller populations. Having a Fund program on track also clearly has a positive and significant impact on non-debt relief aid receipts.

The per capita income and political freedom variables are both significant. As one would expect, the greater political and economic freedom the higher is aid per capita, as western donors presumably consider that aid will be more effective in such circumstances. The positive association of income per capita and aid per capita is consistent with the results of Alesina and Dollar (1998). While initially this may seem counter intuitive, it could be explained by donors perceptions that among the group of IDA-only countries, aid should be allocated to countries that are showing themselves able and willing to take policy measures that stimulate income growth. The costs of "action related to debt" using the OECD/DAC data is not significant, and neither is the debt reduction and forgiveness variable based on the World Bank's GDF database and the Debtor Reporting System. When the debt relief variables were separately replaced with a dummy for debt relief or no debt relief (DRDUMMY), and the Paris Club deal dummy (PCDUMMY), again these was not significant, and the coefficients on the other variables remained stable.

Using the same model to estimate net official transfers per capita as the dependent variable, brings us closer to estimating the overall resource impact of debt relief operations. Table 3 shows the results. The income per capita variable becomes insignificant as well as the debt relief variables. The significance of economic freedom and human rights is somewhat weaker in these equations, but having a Fund program on track remains very significant for IDA-only countries. Once again, replacing the debt relief variables with the dummy variables DRDUMMY and PCDUMMY produced insignificant results, with the coefficients on the other variables remaining stable.

VII. PRELIMINARY CONCLUSIONS

This paper represents work in progress, and its conclusions are highly tentative. However, the above results seem to provide plausible and reasonably robust equations for explaining non-debt-relief official development assistance (ODA) per capita allocations to International Development Association (IDA)-only countries in terms of population, the consistency of performance under IMF programs, economic freedom, and per capita income. There is no evidence, however, of any significant link during 1996-2000 from debt-relief actions to either the level of other non-debt relief-related ODA flows being provided or the overall level of net official transfers to the debtor countries concerned. The lack of significance of the debt-relief variables in both sets of equations sends both good news and bad.

The good news is that there is no evidence of significant crowding out of other aid flows from debt-relief activities during 1996-2000. In this very general sense, at least, financing of debt relief provided during 1996-2000 might be characterized as having been additional to other aid flows for the recipient countries, consistent with Definition 1 of additionality. The bad news is that this apparent additionality of the financing of debt relief does not imply that significant additional real resources have been made available to the debtors concerned, as would be sought under Definition 2 of additionality. The results do not suggest that the provision of debt relief in 1996-2000 has been associated with a significantly increased

transfer of official resources to the individual debtors concerned, when compared with those countries not seeking and receiving debt relief. Thus the results are also consistent with those of Birdsall and others (2001), who found no significant impact of debt relief on net transfers in the period prior to the enhanced HIPC Initiative.

The total amount of the transfer of resources seems to be associated with variables other than debt relief. It is too early to assess the full impact of the enhanced HIPC Initiative, and it is certainly possible that the increased debt relief provided as a result of adopting more ambitious goals and lowering the qualification thresholds in 1999 will result in more real resources for the debtors concerned in the years ahead. In the absence of an additional overall transfer of resources to all poor countries, however, this would potentially divert resources from other IDA-only countries and LICs, effectively introducing a bias in favor of the heavily indebted poor countries. This paper provides a framework that can be used to look for any developing bias as more post-2000 data observations are obtained.

Much will depend on how aid agencies' policies react and the overall size of aid budgets, as well as the absorptive capacities and policies of individual countries receiving debt relief and implementing the strategies detailed in their poverty reduction strategy papers (PRSPs). These preliminary empirical results, however, confirm the importance of continuing to see the primary benefits from debt relief in the wider context of a full program of financial support from the international community and suggest that much of the impact from debt-relief initiatives comes through linking relief to simultaneously redirecting already available public resources toward poverty-reducing activities such as improving health and education. Although the extent of additionality and additional resources created specifically through debt relief will clearly vary considerably among countries, as a general proposition the additional resources directly freed up as a result of the debt-relief activities prior to the enhanced HIPC initiative would not appear to have been significant.

VIII. RESEARCH AGENDA

The next stage in this empirical research should include expanding the dataset from a cross-section to a panel data analysis; updating the estimates using more recently published GDF data; considering different model specifications (e.g., linear, semi-log); testing some further recipient-need variables, such as child-mortality rates, for which a reasonably full dataset exists; and controlling for the possibility that some recipients are systematically preferred by the donor group (fixed effects) in the allocation of aid for such reasons as their former colonial status or location in particular regions. A panel dataset will also allow lags to be introduced into the model structure.

As the additional data for 2001, 2002, and 2003 become available, it will be possible to split the sample into two or more periods and compare the post-1999 and pre-1999 periods, to see if changing the goals of debt relief under the enhanced HIPC Initiative and the higher levels of assistance granted have introduced a bias in the delivery of total assistance. On this basis, we would be able to assess whether aid allocation to all poor countries is keeping pace with the debt-relief initiatives focused on HIPCs or, alternatively, whether the process has become unbalanced.

Table 2: Ordinary-Least-Squares Results for
Dependent Variable LODAEXCAP

	(1)		(2)		(3)		(4)		(5)	
Constant	13.87	(1.77)	13.87	(1.79)	13.84	(1.80)	13.95	(1.78)	13.89	(1.77)
LFRH	-0.30 **	(0.13)	-0.32 **	(0.13)	-0.32 **	(0.13)	-0.32 **	(0.13)	-0.32 **	(0.15)
LFUND	0.24 ***	(0.06)	0.25 ***	(0.07)	0.25 ***	(0.07)	0.23 **	(0.07)	0.26 ***	(0.06)
LGNICAP	0.31 ***	(0.08)	0.32 ***	(0.09)	0.32 ***	(0.09)	0.31 ***	(0.09)	0.32 ***	(0.08)
LPOP	-0.39 ***	(0.04)	-0.39 ***	(0.04)	-0.43 ***	(0.04)	-0.39 ***	(0.04)	-0.39 ***	(0.04)
LARDCAP	0.01	(0.02)								
LDFOGDFCAP			0.00	(0.01)						
DRDUMMY					-0.02	(0.12)				
PCDUMMY							0.07	(0.11)		
R-squared	0.836		0.833		0.833		0.834		0.833	
SSR	6.58		6.68		6.68		6.64		6.69	
Normality (Jarque-Bera) 1/	1.56		1.21		1.70		1.45		1.22	
White Hetroskedasticity F-test 2/	1.79 *		2.13 *		1.69		1.80		1.8	
Observations	59		59		59		59		59	

Numbers in parentheses are standard errors

* is significant at 10% level, ** is significant at 5 percent level, *** is significant at 1 percent level

1/ Null hypothosis residuals normally distributed

2/ Null hypothosis no hetroskedasticity

Table 3: Ordinary-Least-Squares Results for Dependent Variable LOTNGDFCAP

	(1)		(2)		(3)		(4)		(5)	
Constant	18.25	(2.63)	17.98	(2.56)	18.25	(2.59)	18.46	(3.03)	18.24	(2.60)
LFRH	-0.35 *	(0.20)	-0.26	(0.19)	-0.35 *	(0.18)	-0.37 *	(0.19)	-0.32	(0.19)
LFUND	0.28 ***	(0.10)	0.25 ***	(0.11)	0.28 ***	(0.28)	0.308 ***	(0.10)	0.235 **	(0.10)
LGNICAP	0.07	(0.12)	0.08	(0.12)	0.07	(0.12)	0.07	(0.12)	0.07	(0.12)
LPOP	-0.40 ***	(0.05)	-0.40 ***	(0.05)	-0.40 ***	(0.05)	-0.39 ***	(0.05)	-0.4 ***	(0.05)
LARDCAP			0.03	(0.02)						
LDFOGDFCAP	0.00	(0.01)								
DRDUMMY							-0.09	(0.18)		
PCDUMMY									0.16	(0.16)
R-squared	0.672		0.690		0.672		0.674		0.677	
SSR	13.66		13.03		13.66		13.58		13.44	
Normality (Jarque-Bera) 1/	2.61		2.06		2.61		1.94		2.84	
White Hetroskedasticity F-test 2/	1.155		1.027		1.155		1.08		1.08	
Observations	58		58		58		58		58	

Numbers in parentheses are standard errors

* is significant at 10 percent level, ** is significant at 5% level. *** is significant at 1 percent level.

1/ Null hypothosis residuals normally distributed.

2/ Null hypothosis no hetroskedasticity

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