Who Gets Debt Relief?

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Abstract We use preliminary results from an ongoing effort to construct estimates of debt relief to study its allocation across a sample of 62 low-income countries. We find some evidence that debt relief, particularly from multilateral creditors, has been allocated to countries with better policies in recent years. Somewhat surprisingly, conditional on per capita incomes and policy, more indebted countries are not much more likely to receive debt relief. However, countries that are large debtors vis-a-vis especially multilateral creditors are more likely to receive debt relief.   We do not find much evidence that debt relief responds to shocks to GDP growth. Finally, most of the persistence in debt relief is driven by slowly-changing country characteristics, indicating that it may be difficult for countries to "exit" from cycles of repeated debt relief.

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1. Introduction

Debt relief has formed a highly-visible part of aid to low-income developing countries over the past decade. In 1996 the World Bank and International Monetary Fund (IMF) launched the Heavily-Indebted Poor Countries (HIPC) Initiative which has over the past decade provided $59 billion in nominal debt service reductions to a set of 30 eligible countries, mostly in Africa, on public debt owed to bilateral and multilateral creditors. In 2005 the G8 governments agreed to pay off the remaining debts owed to IDA (the International Development Agency, or soft-loan window of the World Bank) by 19 countries that have "graduated" from the HIPC debt relief process, resulting in a further reduction of their total debt outstanding by $37 billion. Prior to these high-profile efforts, the Paris Club group of bilateral official creditors has been providing concessional restructurings to low-income countries since the late 1980s. The accompanying rhetoric has been as expansive as the large sums of money involved. UN economic adviser Jeffrey Sachs has argued that "no civilised nation should try to collect the debts of people who are dying of hunger and disease and poverty".[1] World Bank president Paul Wolfowitz heralded the latest round of debt relief with the statement that "leaders in 38 countries around the world will no longer have to choose between spending to benefit their people and repaying impossible debts".[2]

Despite its prominence, surprisingly little is known about the causes or consequences of debt relief. As we describe in more detail in Section 2 below, a basic problem is that existing data on debt relief from standard data sources do not provide reliable estimates of the value of debt relief. In order to fill this gap, we have in a companion paper (Depetris and Kraay 2005) developed a new set of estimates of debt relief, and we are refining these further in ongoing work. The absence of reliable data has also limited our understanding of the effects of debt relief. In Depetris and Kraay (2005) we used these new estimates of debt relief to perform a systematic analysis of the effects of debt relief in low-income countries, and found little evidence of its purported benefits.[3]

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[1] Financial Times, July 6, 2004.
[2] Speech to 2005 Annual Meetings of World Bank and International Monetary Fund.
[3] See also Easterly (2002) and Arslanalp and Henry (2004, 2005) for discussions of HIPC debt relief.

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We use preliminary estimates of debt relief from this new dataset to study the related question posed in the title of this paper: Who gets debt relief? In Section 3 of the paper we examine the allocation of debt relief across a sample of 62 low-income developing countries to study how the determinants of the incidence and size of debt relief differ from other forms of aid. While foreign aid is significantly higher in poor countries, we find little evidence that debt relief disproportionately benefits poor countries. We find some evidence that debt relief, particularly from multilateral creditors in recent years, has been significantly higher for countries with good policies and institutions. Given the emphasis in recent years on improving the "selectivity" of foreign aid in order to ensure that it goes to countries where it is likely to have the highest impact, the finding that debt relief has also been allocated selectively is encouraging.[4] We find similar patterns of increased selectivity in foreign aid, confirming existing results in the literature. Interestingly, however, we find that conditional on policy and institutional performance, as well as per capita incomes, we find only weak evidence that debt relief goes to countries with higher levels of indebtedness, and no evidence that it goes to countries that have displayed difficulties in servicing their debts through the accumulation of arrears. This suggests that alleviating debt burdens per se may not in fact be the primary motivation for debt relief. Finally, our cross-sectional results provide suggestive, but not conclusive, evidence that large debtor countries (in the sense of accounting for a large share of the portfolio of lenders) are somewhat more likely to receive debt relief.[5]

In the final section of the paper we study the time series properties of debt relief using dynamic panel probit regressions where the dependent variable is an indicator variable measuring the incidence of debt relief. As we document below debt relief exhibits considerable persistence within countries over time: one-third of the 62 low-income countries in our sample account for over 70 percent of the debt relief episodes that we identify. We examine whether this persistence in debt relief is due to serial

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[4] This is also consistent with the stated structure of the HIPC initiative, under which debt relief is granted conditional on good policy performance. Similar requirements were also in place for earlier rounds of debt relief through the Paris Club, recognizing that debt relief differs from other forms of aid in that it constitutes untied budget support and thus is likely to be better used in countries with good policies and institutions. However, we find little empirical evidence of policy conditionality for debt relief in the earlier part of our sample.

[5] This finding is related to the results of Birdsall, Claessens and Diwan (2003) who show that net transfers are higher in more highly-indebted countries in Sub-Saharan Africa during the 1980s and 1990s.

dependence, persistent adverse shocks, or slowly-changing country characteristics. Our evidence suggests that persistent country characteristics are the most plausible explanation for the persistence of debt relief. This in turn underscores the point made by Easterly (2002) that countries are unlikely to "exit" from repeated cycles of debt relief and debt reaccumulation unless debt relief also alters these country characteristics.

This paper contributes to a small existing literature on determinants of debt relief. Alesina and Weder (2001) study the relationship between various forms of aid and corruption, and document that less corrupt countries are not more likely to get either aid or debt relief. Neumayer (2002) revisits the same question, but looks at a broader set of measures of institutional quality as determinants of debt relief, finding mixed evidence -- some measures of governance are associated with greater debt relief but others are not. The main drawback of both of these studies is that they rely on data on debt forgiveness as reported in the World Bank's Global Development Finance publication. As we discuss further below these data have serious shortcomings that we try to remedy with our new estimates of debt relief. This paper also differs from the two mentioned above in that it focuses on determinants of debt relief in low-income countries alone. Since these countries borrow primarily from official rather than private creditors, it seems plausible a priori that the considerations driving debt relief are different in this set of countries. One previous paper shares our particular focus on low-income countries, but only in passing. Cohen et. al. (2004) report a single OLS cross-sectional regression for HIPC debt relief recipients showing a significant positive partial correlation between debt relief and (a) initial indebtedness, (b) poor policy performance, and (c) worse values on the UN Human Development Index. While they use more reliable estimates of HIPC debt relief as reported by the World Bank, they consider only countries receiving HIPC debt relief since 2000, and thus do not address the question of which countries get debt relief and which do not, nor do they study earlier rounds of debt relief.

2. Measuring Debt Relief

Despite its prominence as a form of aid to developing countries in recent years, reliable and comprehensive data on debt relief do not exist. Here we briefly describe the limitations of published data on debt relief and report on an ongoing project to develop more comprehensive measures of debt relief based on creditor-reported and debtor-

reported data. Details on this exercise can be found in a companion paper, Depetris and Kraay (2005). In that paper we develop estimates of the change in the present value of future external debt service obligations due to debt relief, annually for a sample of 62 low-income countries since 1988.

Data on debt relief that appear in the main publications of the World Bank and the OECD Development Assistance Committee suffer from two major shortcomings. In the case of outright debt forgiveness, published data contain no information on the degree of concessionality of the amount of debt forgiven. This degree of concessionality, and thus the reduction in the present value of future obligations due to debt forgiveness, can vary widely. A standard measure of concessionality is the ratio of the present value of future repayments associated with a stock of debt to its face value. In the sample of low-income countries we will consider, this ratio varies from a highly concessional 47 percent to a virtually non-concessional 95 percent. A further complication is that published data do not distinguish between forgiveness of (i) flows of maturities falling due during a specified period, (ii) stocks of debt outstanding, and (iii) arrears. Rather, the nominal value of the amounts forgiven is typically reported. Thus for example a debt relief operation that forgives $100 million in principal and interest payments falling due in the current year would be indistinguishable from a debt relief operation that forgives a stock of debt outstanding of $100 million, despite the fact that the latter involves the forgiveness of future debt service obligations with a present value that is likely to be substantially less than the $100 million in maturities falling due in the current period. The valuation of a forgiveness of $100 million in arrears is even more complicated, as it requires us to take a stand on whether the debtor country had any intention of paying these arrears in the first place. Yet all three transactions would be recorded identically.

The second difficulty has to do with the reporting of net effects of concessional reschedulings. Typically in such agreements interest and principal payments falling due during a period of a few years are rescheduled on more favorable terms for the debtor, resulting in a new stream of future debt service obligations with a present value that is lower than the original payments that were rescheduled. Standard data sources such as the World Bank's Global Development Finance publication report the gross reduction in

debt service in a given year due to current and past reschedulings, but they do not provide information on the net change in debt service obligations.

In this paper we use a set of preliminary estimates of debt relief that we developed in Depetris and Kraay (2005), based on creditor-reported data from four main sources: bilateral creditors operating through the Paris Club; multilateral creditors operating through the HIPC initiative; a small donor-funded debt-buyback facility for low-income countries operated by the World Bank; and bilateral debt relief provided by Russia.[6] As detailed in Appendix A of Depetris and Kraay (2005) we combine information on nominal amounts of debt rescheduled or forgiven with rough estimates of the concessionality of the rescheduling and somewhat more sophisticated estimates of the concessionality of the stock of debt itself to arrive at estimates of the present value of debt relief provided, by country and year, for a sample of 62 developing countries since 1988. We are currently also developing more elaborate estimates of the net change in the entire future profile of debt service obligations of a country due to debt relief granted in each year, using the loan-level Debtor Reporting System database maintained by the World Bank.

For most of this paper we will organize our data into three five-year periods, 1989-1993, 1994-1998, and 1999-2003. For each five-year period, we compute the present value of the annual debt relief series for each country, and express it as a share of GDP in the year prior to the beginning of the period. Figure 1 provides a visual overview of the distribution of debt relief and overall indebtedness, for the last of these three periods. We graph the present value of debt relief during the period 1999-2003, expressed as a share of GDP in 1998, against the present value of external debt as a share of exports in 1998. The graph shows a positive simple correlation: initially more-indebted countries received more debt relief during the subsequent five-year period. We shall see however that this simple correlation is substantially weakened once we control for other factors driving debt relief. It is also striking to note that debt relief for some countries has been quite large relative to GDP. According to our estimates countries such as Guyana, Mauritius, Zambia, the Democratic Republic of Congo, and Ethiopia all

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[6] While together these four sources account for the bulk of debt relief to low-income countries during the period we study, they are not comprehensive as they exclude debt relief granted by bilateral non-Russian creditors outside of the Paris Club.

received cumulative debt relief greater than 50 percent of initial GDP over the period 1999-2003.

Table 1 provides some summary statistics on this measure of debt relief for the three periods. The first panel reports the incidence of debt relief across countries. Roughly half of the countries in our sample receive debt relief in each sub-period. The incidence of bilateral debt relief from Paris Club creditors has been fairly constant over time, while the proportion of countries benefiting from multilateral debt relief has increased sharply over time with the introduction and expansion of the HIPC initiative. The amount of debt relief has also increased over time and become quite substantial. For example, in 1999-2003, cumulative (discounted) total debt relief averaged to some 22% of the 1998 GDP of recipient countries, with the bulk coming from multilateral creditors.

While these figures suggest that debt relief has been considerable, it is also important to realize that other forms of aid have been substantially larger. In the last column of Table 1, we also report cumulative discounted aid flows for the same three periods. For the average country, total discounted aid over 1999-2003 was substantially bigger than debt relief, at nearly 40 percent of initial GDP.[7] In earlier periods this distinction is even more marked. In 1994-1998 for example total debt relief averaged only 15 percent of GDP while aid flows were over three times larger at 50% of GDP.

3. Cross-Sectional Results

We now turn to our results on the allocation of debt relief and other forms of aid across countries. Our point of departure is the literature on aid allocation, which has shown that a relatively small number of variables capturing both recipient characteristics as well as donor interests can explain much of the cross-country variation in aid receipts.[8] We then go on to ask how these and other variables predict the cross-country dispersion in debt relief. In the first three columns of Table 2 we report some benchmark aid allocation regressions for the three five-year periods spanned by our data on debt

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[7] The growing prominence of debt relief has complicated the measurement of aid, since published figures rarely clearly distinguish between debt relief and other forms of aid. Roodman (2005) has compiled a careful set of estimates of aid flows net of debt relief that we rely on here.
[8] See for example Alesina and Dollar (2000) and Alesina and Weder (2001).

relief. As we shall see there are interesting differences in our results by subperiod, and for this reason we do not average our data over longer periods. Our sample consists of the set of 62 low-income countries for which we have estimates of debt relief.[9] We regress our discounted total aid variable for each five-year period on log per capita GDP, log population, the quality of domestic policy and institutions as measured by the World Bank's Country Policy and Institutional Assessment (CPIA) ratings, all of which are measured in the year prior to the beginning of each five-year period. Our estimation method is ordinary least squares, and so we interpret the results that follow as capturing partial correlations rather than necessarily causal effects.[10] Not surprisingly, in all periods poor countries receive significantly more aid as a share of GDP, and consistent with the existing literature we also find strong evidence of size effects: small countries are significantly more likely to receive more aid as a share of their GDP. We also find that aid is significantly positively correlated with the quality of domestic policies and institutions in the last period, and marginally so in the middle period, suggesting that the allocation of aid has become increasingly targetted towards countries with good policy over time. Finally we consider a summary statistic of donors' strategic interests, taken from Rajan and Subramanian (2005). Despite its plausibility, however, we do not find this variable to be a very significant predictor of aid in our sample of countries.[11]

The next three columns of Table 2 report the same regressions, but now with debt relief relative to GDP as the dependent variable. Since roughly half of the sample

[9] Our debt relief panel is unbalanced, and moreover some of our RHS variables are not available for all countries, resulting in somewhat smaller samples in each sub-period.

[10] It is not clear however that there is significant reverse causation from aid to our right-hand-side variables, with the possible exception of the CPIA variable. The World Bank is a major provider of aid and also produces the CPIA ratings. It is therefore possible that the Bank generates high CPIA ratings in order to justify a large aid program. To check for this we have re-estimated the regressions in Table 2 using an alternative measure of institutional quality, the Rule of Law index produced by Kaufmann, Kraay, and Mastruzzi (2004), which reflects the views of a very diverse set of respondents, primarily outside of the World Bank. This measure gives broadly similar results, suggesting that this channel of endogeneity is not very important.

[11] In particular we use their instrument for aid, which consists of the fitted values from a bilateral aid regression in which the explanatory variables measure bilateral ties between donors and recipients, such as a colonial ties, common languages, and UN voting patterns. This can be interpreted as the component of aid driven by geopolitical considerations rather than recipient needs. We use the value of their instrument based on such a regression for the period 1999-2000. The weak explanatory power of this variable in our regressions is due to two factors. First, our sample consists mostly of the post-Cold War period where strategic motivations for aid were weaker than in earlier years. Second, it turns out that the Rajan and Subramanian variable is highly correlated with country size (small countries tend to get more politically-motivated aid). Controlling for country size as we do drastically reduces the significance of the Rajan and Subramanian variable.

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in each period does not receive debt relief, we estimate the debt relief equations using Tobit techniques. There are striking differences when these results are compared with those for aid. First, debt relief is much less significantly likely to go to poorer countries, with a modestly significant partial correlation only in the last period. Neither size effects nor geopolitical considerations are consistently significant. The effects of policy performance are most interesting. In the 1989-1993 period debt relief is actually significantly higher for countries with poor CPIA ratings. In the final period however debt relief is positively, although not significantly, correlated with better CPIA scores.

We next augment this basic specification with a set of additional variables intended to capture determinants of debt relief that seem less likely to be important for aid. We first add two measures of the debt burden of the country. We first consider the level of indebtedness itself, measured as the present value of future debt service obligations, expressed as a share of exports. We also add the stock of accumulated arrears, expressed as a share of total debt outstanding, to capture the possibility that debt relief is more likely to go to countries that have accumulated arrears by being unwilling or unable to service their existing debts. Finally we introduce a variable intended to capture creditor interests in providing debt relief. It is possible that creditors provide debt relief defensively in order to prevent arrears on debt outstanding from showing up on their balance sheets. The incentive for such pre-emptive debt relief in order to avoid default is likely to be higher the larger is the debtor country vis-a-vis the creditor. We therefore calculate the share of each debtor country in the total stock of debt outstanding for all debtor countries. This variable is highly skewed due to the presence of a few very large borrowers in our sample (notably China, India, Pakistan, Bangladesh, and Nigeria). To prevent these large values from dominating the results, we express the debtor share variable as a rank, with larger values corresponding to larger debtors.

The results of adding these three variables are reported in columns (7)-(9) of Table 2. Interestingly we find little evidence that more highly-indebted countries are more likely to get debt relief, with the present value of debt entering positively, but marginally significantly in the last period only. We do also find some evidence that greater arrears are associated with more debt relief, although significantly so only in the second period. We do find some modest evidence that debt relief goes to countries that

loom large in the aggregate portfolio of all creditors. We also find that the addition of these variables also alters somewhat the significance of the CPIA variable, which is now positive and significant at the 10 percent level in the final period 1999-2003. The magnitude of the effect is also surprisingly large when compared with the magnitude of the effect of policy and institutional performance on aid. Using the specification in column (3), a move from the 25th percentile of the CPIA to the 75th percentile (from 2.7 to 3.6 on a scale from 1 to 6) would raise cumulative aid over the period as a share of GDP by 13 percentage points, or about one-third of the interquartile range of the aid variable. In contrast, the specification in column (9) of Table 2 implies that a country at the 25th percentile of the CPIA would get no debt relief at all (holding all other variables fixed at their means in the sample), while a country at the 75th percentile of the CPIA would get 12 percentage points of GDP in debt relief. This corresponds to the entire interquartile range of the debt relief variable, so that the effect of policy performance on debt relief is proportionately three times larger than it is for aid. Figure 2 gives a visual impression of the estimated effect of the CPIA on debt relief. The figure reports the partial scatter from an OLS regression of debt relief in the third period on the set of right-hand-side variables in column (9) of Table 2.   While OLS is of course not consistent given the truncation of the dependent variable, it has the advantage of allowing a simple graphical representation of the partial effect. Figure 2 suggests that this positive and quantitatively large effect of policy performance on debt relief is a feature of much of our sample and is not driven by a handful of extreme cases.

In the remaining columns of Table 2 we disaggregate debt relief by the identity of the creditor, distinguishing between debt relief provided by (a) bilateral creditors operating through the Paris Club, (b) multilateral organizations, primarily the IMF, World Bank and African Development Bank operating through the HIPC initiative, and (c) the Russian Federation.[12] We do this only for the final 1999-2003 period as multilateral debt relief was inconsequentially small in earlier periods. We use the same set of explanatory variables, with the exception that we recalculate the debtor size variable separately for bilateral, multilateral, and Russian debt in order to more closely capture the interests of these three groups of creditors. The results reveal interesting differences among the

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[12] As discussed in more detail in Depetris and Kraay (2005) we develop separate estimates for debt relief provided by Russia as it is a major bilateral lender that has for most of our sample period not participated in the Paris Club group of creditors.

three types of creditors. Multilateral creditors stand out as having a cross-country allocation of debt relief that most closely resembles cross-country allocations of aid. Debt relief from multilaterals is significantly higher in poor countries, small countries, and countries with better CPIA scores, as was the case for aid. In contrast, there is relatively little evidence that these three core variables predict debt relief from other creditors. We find weakly significant evidence that debt relief from bilateral and multilateral creditors, but not Russia, goes to countries that are more highly indebted.

Finally, multilateral debt relief stands out as being the only form of relief where the size of the debtor appears to matter significantly, consistent with the hypothesis of defensive granting of debt relief. The estimated magnitude of this effect is non-trivial. Holding all other variables constant at the mean, predicted debt relief increases from 0 to 7 percentage points of GDP as we move from the 25th percentile of creditor size to the 75th percentile. This is about one-half of the mean value of multilateral debt relief among recipients.

Overall our results reveal some interesting similarities and differences between the cross-country allocation of aid and debt relief. Both aid and debt relief have over time become more responsive to cross-country differences in policy and institutional quality. This is particularly the case for debt relief from multilateral creditors. Interestingly aid flows are much more sensitive to cross-country differences in per capita incomes than is debt relief, with only marginally significantly more debt relief going to poorer countries in our sample. It is also somewhat surprising that debt relief is only modestly significantly associated with higher levels of indebtedness. Finally, we find some suggestive, but not conclusive evidence, that countries that are large debtors vis-a-vis multilateral lenders are more likely to receive debt relief.

4. Dynamic Panel Results

In this section of the paper we explore the dynamic behaviour of debt relief over time. A striking feature of debt relief is that it is highly persistent over time, with many countries benefiting from repeated rounds of debt relief while other countries never receive it. In our sample of 62 low-income countries, 23 never receive debt relief over the period 1989-2003, while another 20 countries have six or more rounds of debt relief

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during the same 15-year period. Mali, Senegal and Tanzania stand out with 8 episodes of debt relief each, and Nicaragua has had 10 episodes of relief. Together, these 20 frequent recipients of debt relief account for 71 percent of the country-years in which we observe positive debt relief. Another way to see this strong persistence is to divide our sample of 62 countries into the 25 that did receive debt relief in the first five-year period, 1989-1993, and the 37 countries that did not. Of these 25 initial recipients of debt relief, fully 23 received debt relief at least once during the second 5-year period, and 22 in the third period. In contrast, of the 37 countries initially with no debt relief, 28 continued not to receive debt relief if the second period, and 26 in the third.

This observed persistence in debt relief raises several policy-relevant questions. Are frequent recipients of debt relief countries that have been serially unlucky in the sense of receiving repeated adverse shocks to which donors have responded with debt relief? Does the initial granting of debt relief trigger a sequence of subsequent rounds of debt relief? Alternatively, is the persistence of debt relief due to the fact that there are persistent country characteristics that drive debt accumulation and force subsequent debt relief? We explore these questions with the help of a series of dynamic panel probit regressions, where the dependent variable is an indicator taking on the value of one if a country receives debt relief in that year and zero otherwise.[13] In particular we estimate variants on the following probit specification:

(1) $\quad \mathrm{Prob}[y_{it} = 1] = \Phi(\rho(L) \cdot y_{it-1} + \beta' X_{it} + \mu_i)$

where y_{it} the indicator variable for debt relief in country i at time t, X_{it} is a vector of explanatory variables, μ_i is an unobserved country effect, and $\Phi(.)$ is the cumulative normal distribution function. The coefficients of the polynomial in the lag operator, $\rho(L)$, capture the dependence of current debt relief on past debt relief, while the parameter β captures the effects of the other explanatory variables.

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[13] We are acutely aware of the fact that there is likely considerable measurement error in our estimates of debt relief. By taking five-year averages we could smooth out some of this measurement error in the previous section. Rather than try to explain the likely noisier annual variation in the quantity of debt relief, we try only to explain its incidence which is probably better measured.

We allow for the possibility that the persistence in debt relief is driven by time-invariant country characteristics through the country effect μ_i. The presence of country effects in a dynamic probit regression raises a familiar initial conditions problem. Roughly speaking, since both the contemporaneous and lagged values of the dependent variable are functions of the same country effect, the error term in the regression is correlated with the explanatory variables by construction. Moreover, there might be other economic reasons why the country effect is correlated with the other explanatory variables in X_{it}. We therefore do not want to impose the standard random-effects assumption the country effect is independent of the right-hand-side variables. Instead, we make the weaker assumption that the country effect is a linear function of the initial value of the dependent variable as well as period-averages of the explanatory variables in X_{it}. Under this assumption, Wooldridge (2005) shows that we can obtain consistent estimates of the slope coefficients in Equation (1) using a random effects probit estimator, provided that we augment the set of explanatory variables with the initial value of the dependent variable and time averages of the other variables in X_{it}.

The results of this dynamic probit specification are in Table 3. In the first two columns we estimate the simplest benchmark specification without any other control variables, and including four lags of the dependent variable. We estimate this equation separately for the period 1989-1995 and 1996-2003, and we include a full set of year dummies whose coefficients are not reported to save space.[14] We do note however that the period dummies are jointly highly significant in the second period, and the dummies for 2000, 2001 and 2002 in particular are individually significant capturing the flurry of debt relief associated with the expansion of the HIPC initiative around this time. In these simple specifications with no other control variables, we find little evidence that the likelihood of receiving debt relief is significantly altered by a country's history of debt relief in the previous four years. In both periods the coefficients on lagged values of debt relief are not jointly significantly different from zero.

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[14] We divide our sample in two rather than three subperiods because we are including four lags of the debt relief indicator variable on the right-hand-side. Since we also need to control for the initial value of the debt relief indicator to correct for the initial conditions problem, we cannot perform the estimation with only five years of data since the initial value would be perfectly collinear with the fourth lag.

In the next two columns we add several control variables. We first ask whether debt relief responds to shocks to output growth, as would be the case if debt relief is provided as insurance against shocks. To capture this possibility we enter the lagged value of real total GDP growth. We also add the same measures of policy performance and arrears as we used in the previous section. Since these probit regressions allow for country effects, we are now in effect asking whether within-country improvements in policy performance, or deteriorations in the ability to service debt as shown by arrears accumulation, make it more likely that a country receives debt relief, conditional on lagged debt relief. Somewhat surprisingly we find that growth enters positively in both periods, although not significantly so. We have experimented with further lags of growth but have not found evidence that the likelihood of debt relief increases in response to prior drops in output. More intuitively, we find a positive, but again not significant, correlation between arrears accumulation and the incidence of debt relief. Finally, the within-country variation in policy and institutional performance as captured by the CPIA are not significantly correlated with subsequent debt relief. The remaining regressors, consisting of the initial value of the dependent variable and period-averages of the other right-hand-side variables, control for cross-country differences in the country effect. Consistent with our results in the previous section, we find some evidence that debt relief is positively and somewhat significantly correlated with cross-country differences in average policy performance.

Taken together, the lack of significant evidence of serial dependence in debt relief, combined with the observation that the within-country variation in growth, policies and institutions, and arrears does not explain much of the variation in the incidence of debt relief, suggests to us that debt relief is mostly driven by fairly persistent country characteristics. This in turn has important consequences for policy, as discussed at length in Easterly (2002). In short, unless debt relief changes these underlying characteristics, it is likely that debt relief will be followed by debt reaccumulation, in turn necessitating further debt relief.

5. Conclusions

In this short paper we have presented new results on the cross-country and over-time allocation of debt relief in low-income countries. Although debt relief has become a

highly-visible form of assistance to low-income countries over the past 10 years, we as yet know little about its impact. This is in part due to weaknesses with existing published data on debt relief, which we are trying to remedy in an ongoing project to develop better estimates of debt relief. Using preliminary results from this project we document that debt relief is much less responsive to cross-country differences in per capita income, and somewhat more responsive to cross-country differences in policy and institutional performance than are other forms of aid. We also find, somewhat surprisingly, that debt relief is in most cases not significantly associated with higher debt burdens, suggesting that reducing debt overhang is not a major motivation for debt relief. We also find some evidence that large debtor countries are more likely to receive debt relief, particularly from multilateral creditors. Finally, we have seen that the strong observed persistence in debt relief is primarily due to relatively persistent country characteristics. This in turn suggests that, unless debt relief changes these characteristics, it may be difficult for debtor countries -- as well as creditors -- to escape from repeated cycles of debt relief.

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Figure 1: Debt Relief and Total Indebtedness

Figure 2: Partial Effect of Policy on Debt Relief
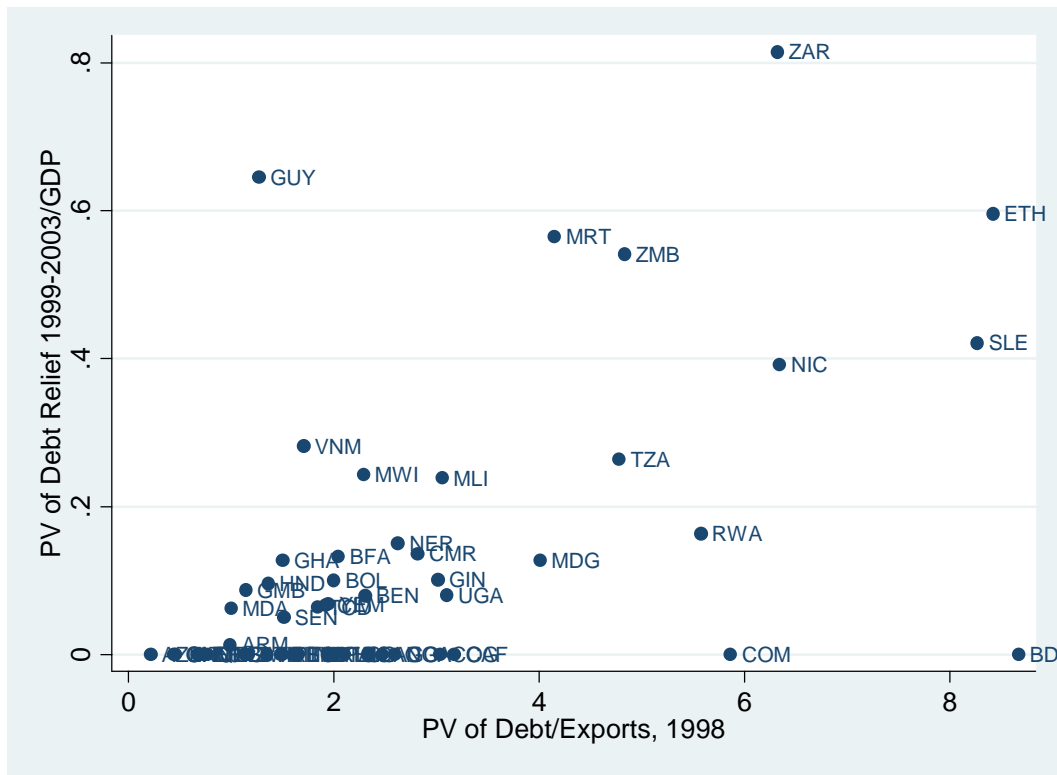
Table 1: Summary Statistics on Debt Relief and Aid

| | Debt Relief/GDP | | | | |
	Total	Bilateral	Multilateral	Russia	Aid/GDP
Proportion of Countries with Debt Relief>0					
1989-1993	48.9%	48.9%	8.5%	6.4%	-
1994-1998	52.8%	50.9%	17.0%	11.3%	-
1999-2003	53.6%	44.6%	42.9%	25.0%	-
Average Conditional on Debt Relief>0					
1989-1993	4.7%	3.7%	0.9%	0.1%	62.3%
1994-1998	15.2%	9.7%	2.0%	3.4%	54.8%
1999-2003	22.3%	6.5%	11.6%	3.4%	39.2%
Standard Deviation Conditional on Debt Relief>0					
1989-1993	5.5%	4.0%	2.7%	0.2%	54.5%
1994-1998	19.8%	16.5%	5.2%	12.2%	39.9%
1999-2003	21.4%	11.2%	11.6%	10.0%	29.0%

Note: The three sub-periods cover different samples of 47, 53, and 56 countries respectively.

Table 2: Cross-Sectional Regressions for Aid and Debt Relief

Dependent Variable Time Period	(1) Aid/ GDP 1989-93	(2) Aid/ GDP 1994-1998	(3) Aid/ GDP 1999-2003	(4) Debt Relief/GDP 1989-93	(5) Debt Relief/GDP 1994-1998	(6) Debt Relief/GDP 1999-2003	(7) Debt Relief/GDP 1989-93	(8) Debt Relief/GDP 1994-1998	(9) Debt Relief/GDP 1999-2003	(10) Bilateral/ GDP 1999-2003	(11) Multilateral/ GDP 1999-2003	(12) Russian/ GDP 1999-2003
ln(GDP Per Capita)	-0.401 (0.121)***	-0.362 (0.120)***	-0.283 (0.069)***	0.013 (0.026)	-0.116 (0.113)	-0.174 (0.103)*	0.02 (0.042)	0.009 (0.105)	-0.089 (0.094)	-0.033 (0.043)	-0.159 (0.072)**	-0.044 (0.048)
ln(Population)	-0.133 (0.044)***	-0.135 (0.028)***	-0.094 (0.025)***	-0.028 (0.017)*	-0.182 (0.061)***	-0.044 (0.053)	-0.037 (0.021)*	-0.268 (0.126)**	-0.145 (0.088)*	-0.061 (0.037)*	-0.192 (0.070)***	-0.015 (0.052)
CPIA Rating	0.086 (0.053)	0.115 (0.060)*	0.155 (0.047)***	-0.034 (0.012)***	-0.064 (0.038)*	0.131 (0.134)	-0.027 (0.014)*	-0.013 (0.043)	0.186 (0.096)*	0.052 (0.080)	0.158 (0.080)**	0.104 (0.062)*
RS Instrument	0.887 (0.526)	-0.07 (0.145)	0.056 (0.152)	-0.068 (0.090)	-0.789 (0.806)	-0.189 (0.446)	-0.11 (0.116)	-0.683 (0.663)	-0.246 (0.440)	-0.22 (0.377)	-0.176 (0.278)	-0.069 (0.552)
PV of Debt/Exports							0.009 (0.011)	0.04 (0.034)	0.053 (0.028)*	0.029 (0.017)*	0.033 (0.017)*	-0.001 (0.020)
Arrears/Debt							0.144 (0.132)	0.721 (0.350)**	0.564 (0.366)	0.138 (0.278)	-0.049 (0.252)	0.462 (0.299)
Rank of Debtor (1)							0.001 (0.002)	0.007 (0.004)*	0.009 (0.005)*	0.003 (0.002)	0.01 (0.004)**	0.005 (0.005)
Constant	5.163 (1.279)***	4.939 (0.886)***	3.458 (0.694)***	0.471 (0.372)	4.032 (1.515)***	1.599 (1.256)	0.488 (0.514)	3.929 (2.268)*	2.003 (1.853)	0.853 (0.779)	3.34 (1.456)**	-0.067 (0.909)
Observations	42	51	55	42	51	55	40	49	54	54	54	54
R-squared	0.71	0.36	0.46									

(1) Rank of debtor is calculated using total debt outstanding in columns (7)-(9), and using bilateral, multilateral, and Russian debt only in columns (10)-(12).
Robust standard errors in parentheses. For the OLS regressions in columns 1-3 these are calculated using White's correction. For the remaining Tobit regressions they are calculated using 200 bootstrap replications.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Dynamic Panel Probit Regressions for Incidence of Debt Relief

	(1) 1989-1995	(2) 1996-2003	(3) 1989-1995	(4) 1996-2003
First Lag Dependent Variable	-0.403 (0.243)*	-0.105 (0.210)	-0.536 (1.33)	-0.018 (0.26)
Second Lag Dependent Variable	0.214 (0.253)	0.137 (0.207)	0.058 (0.39)	0.236 (0.24)
Third Lag Dependent Variable	0.102 (0.272)	0.356 (0.207)*	-0.034 (0.38)	0.404 (0.222)*
Fourth Lag Dependent Variable	-0.082 (0.302)	0.139 (0.199)	-0.175 (0.37)	0.197 (0.21)
Lagged Real GDP growth			1.33 (2.184)	2.219 (2.267)
Lagged CPIA Rating			0.212 (0.169)	-0.05 (0.279)
Lagged Arrears/Debt			1.409 (1.59)	1.282 (1.145)
Initial Debt Relief	1.23 (0.448)***	1.29 (0.317)***	1.244 (0.587)**	0.965 (0.341)***
Average (Real GDP growth)			1.727 (6.33)	-4.871 (4.98)
Average (CPIA Rating)			-0.359 (0.35)	0.718 (0.371)*
Average (Arrears/Debt)			-0.322 (2.18)	0.24 (1.53)
Constant	-1.946 (0.323)***	-1.841 (0.286)***	-1.696 (1.16)	-3.914 (0.995)***
Observations	496	496	409	468
Number of Countries	62	62	58	60
P-Values for test of Joint Significance of:				
(a) Period Effects	0.226	0.001	0.326	0.003
(b) Lags of dependent variable	0.314	0.414	0.324	0.337

Standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%