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Empirical Evidence on the New International Aid Architecture

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Empirical evidence on the new international aid architecture

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Abstract

We conduct an empirical study on how 22 donors allocate their bilateral aid among 147 recipient countries over the 1970-2004 period to investigate whether recent changes in the international aid architecture—at the international and country level—have led to changes in donor behavior. We find that after the fall of the Berlin Wall and especially in the late nineties, bilateral aid responds more to economic needs and the quality of a country's policy and institutional environment and less to debt, size and colonial and political linkages. We also find more selectivity by donors when a country uses a PRSP and passes the HIPC decision point. Importantly, PRSPs and HIPCs reduce the perverse effects of large bilateral and multilateral debt shares on aid flows, suggesting less defensive lending. Overall, it appears certain international aid architecture changes have led to more selectivity in aid allocations. The specific factors causing these changes remain unclear, however. And since there remain (large) differences among donors in selectivity that appear to relate to donors' own institutional environments, reforms will have to be multifaceted.

Keywords: development aid, aid allocation, selectivity, debt relief, HIPC, PRSP, aid architecture

JEL Codes: O11, O16, O19

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I. INTRODUCTION

The so-called international financial architecture stands for the rules, institutional framework, and institutions covering both private and official flows. Following the financial crises of the 1990s, there have been many changes in the international financial architecture. These include, among others, new standards to which countries can adhere in their financial and other business dealings (such as the Basle Core Principles for Banking Supervision and the IMF Code of Good Practices on Transparency in Monetary and Financial Policies), the adoption of collective action clauses in sovereign bond issues covering events of liquidity and solvency problems, and changes in international financial institutions' lending policies. In addition, and especially since the fall of the Berlin wall, there have been many changes to the international aid architecture, which can be defined as the subset of international financial architecture rules and institutions affecting aid flows, including the way in which (bilateral and multilateral) aid is being allocated, the mix of official aid and debt flows, the use of official debt reduction and the accompanying policy requirements.

As part of a broader research program, we are interested in both how these changes have come about and how they are affecting actual behavior. In this paper, we study the way in which aid is being provided by donor countries to individual recipient countries and how this varies over time to see whether institutional changes have had some impact on donors and other aid agencies. Specifically, we investigate whether institutional, country-specific and other changes to the international aid architecture have led to significantly different ways in which bilateral aid is being allocated over time. We also explore differences among donors in terms of determinants of aid flows. Aid allocation practice lends itself well to a study of how changes in the international financial architecture affect actual behavior for at least two reasons. First, data on aid are relatively easily available for long periods of time for a large number of donors and a large set of recipient countries. This allows for combining longitude and cross-sectional empirical studies on the allocation of aid. Second, the aid system has been undergoing many changes in the last few years, with policy changes at both the bilateral and multilateral donor levels and actions at the individual recipient country level. As such, we can expect to be able to find and document how changes in the international aid architecture affect actual behavior in the international financial system.

Research on aid can also have significant policy influence, as shown in part by the effects of the academic work on aid effectiveness. Initiated as academic research (Burnside and Dollar, 2000) and rallied by the World Bank study on 'Assessing Aid' (1998), that showed that aid works (better) in good policy and institutional environments, it has become accepted—at least among policy makers—that targeting aid to those countries with an enabling environment maximizes overall aid effectiveness. Although some of this research has been

questioned as to its empirical robustness,¹ it has led to the view that aid ought to be considered only for the ‘needy’ and the ‘deserving’ (as used in Nunnenkamp and Thiele, 2006), notwithstanding what the exact definition of these two concepts is. At the same time, the overall consensus on aid allocation, an already well-studied topic and supported by much recent research, has been that, at least in the past, aid has not been allocated in the most effective way with full concern to the ‘needy’ and the ‘deserving’ objectives, or perhaps to development objectives in general.

These new (research) insights on aid effectiveness and aid allocation have resulted in major changes in the international aid architecture, such that aid scholars have started to refer to these changes as a “paradigm shift” (Renard, 2006). Changes in the international aid architecture have largely aimed to increase the development efficiency and effectiveness of aid allocations. Architectural changes range from specific actions such as more debt relief for a larger number of poor countries to other, far broader ‘institutional’ changes, such as a greater move away from project lending towards programmatic lending, a greater emphasis on coordination among donors, more ownership by the recipient country (including beyond the government), and the so-called ‘alignment’ including greater harmonization of lending terms and policies. It has been accompanied by changes in the development approach more generally, including a greater use of Poverty Reduction Strategy Papers (PRSPs), the explicit introduction of Millennium Development Goals (MDGs), and enumeration of the objective of scaling up aid.

This new environment very much aims to affect the allocation of aid among countries through several channels. Recipient countries that abide by the new paradigm should see themselves rewarded with more aid, also at more concessional terms. It has been accompanied by much bilateral and multilateral debt reduction. This debt reduction was in part motivated to reduce the pattern of “defensive” lending where more indebted countries have been receiving more aid flows to keep up payments to (multilateral) creditors (Birdsall et al., 2003). Institutional and policy changes should lead to fewer coordination problems, resulting in better aid allocation. And the quality of aid, e.g., in terms of the mix between project and program lending, and the accompanying technical assistance, should be higher.

The exact effects of these changes in the design of the multilateral framework on actual aid allocation are not clear a priori, however, and have certainly not yet been studied much. The first and foremost question this paper therefore tries to address is whether there have been any

¹ Easterly, Levine and Roodman (2004), for example, find that the Burnside and Dollar (2000) results do not stand up to a longer time period, when using exactly the same specifications. Many others have also come to question the results (Easterly, 2006 and Radelet, 2006 take a critical look at this research). Rajan and Subramanian (2005) argue that it is hard to find a robust effect of aid on the long-term growth of poor countries, even those with good policies, which they argue arises because aid inflows have systematic adverse effects on a country’s competitiveness, as reflected in a decline in the share of labor intensive and tradable industries in the manufacturing sector, stemming in part from the real exchange rate overvaluation caused by aid inflows.

significant changes in the *actual behavior* of donors in the most recent period compared to earlier periods. The key approach the paper will use to tackle this question is to investigate whether changes have led donors to provide aid money in a more rational manner, that is, do donors allocate aid now to “poorer” and “better” countries. Specifically, we investigate whether donors in recent periods allocate aid with greater sensitivity to the income level and the quality of country policies and institutional environment, i.e., whether there is greater selectivity today compared to in the past. In terms of specific changes, we investigate whether the adoption of the ‘Heavily Indebted Poor Countries’ (HIPC) debt reduction initiative, the introduction of the PRSP and the granting of bilateral and multilateral debt reduction, in general and for specific countries, have led to any improvements in the behavior of bilateral aid flows with regards to income, the quality of country policies and institutional environment, size, debt, and colonial and political linkages. As a corollary, we expect better allocations of aid to achieve a greater impact in terms of meeting the MDGs.

In terms of methodology, we use panel data for the whole matrix of bilateral aid flows and explore the time variation in donor and recipient country behavior. Using this approach provides more power and allows for better estimations compared to cross-section regressions. Policy changes may occur in gradual fashion, for example, and will certainly vary by donor country. Some countries may have done debt reduction early, some late. Furthermore, we can better control for other factors, such as the trade openness of the recipient country which has been found to be important for aid allocation.

Our general finding is one suggestive of significant changes in the international aid architecture as the characteristics that drive the aid to specific countries from bilateral donors respond over time in different and better ways to economic fundamentals and policies. Our results confirm earlier studies that find an increase in selectivity by donors in the nineties, after the fall of the Berlin Wall. We think that the recent changes in the aid architecture, such as the HIPC Initiative and the PRSP process, have led to this greater selectivity in donor flows. From our analysis, actions at the individual country level also seem to have improved aid allocation, with the adoption of PRSP and actual debt relief resulting not only in greater aid flows to the specific country, but also in a reduced importance of debt stocks and the share of official (multilateral) debt in determining aid flows across countries, suggesting the reduction of defensive lending. Although there remain significant differences among donors, we also find evidence of improvements in selectivity across a range of donors. These effects are robust to various econometric specifications, reducing outliers, and alternative data samples.

As such, we can interpret these findings as evidence of an improved international aid architecture. While these are very encouraging signs, we are left unsure as to what specific institutional changes at the international or donor level may have been driving these changes in behavior. Since the (large) differences among donors in selectivity appear to relate to donors’ own institutional environments, we suggest that reforms will have to be multifaceted and include

changes to the political economy and accountability in donor countries. We therefore suggest further research is needed to identify specific institutional and other changes.

The remainder of the paper is structured as follows. Section 2 describes the related literature. Section 3 describes the data and the methodology used. Section 4 provides a discussion of the results and the robustness checks. Section 5 concludes.

I. RELATED LITERATURE

The allocation of aid by (individual) donors among recipient countries has been a much analyzed topic (Radelet, 2006 and Easterly, 2006 provide general reviews on aid that include the aid allocation literature). There have numerous empirical studies on the allocation of aid among countries, starting at least as far back as the 1960s.² The impression, at least until the early 1990s, was that political and strategic interests dominate concerns for growth, poverty reduction or other economic objectives. In other words, the general sense of these investigations was that donors allocated their own money with little concern to development impact. Yet, little impetus for change existed until the fall of the Berlin wall, and the revitalization of the academic literature on the topic.

The removal of the Iron Curtain and the breakdown of communism changed much in global relations, with consequences for international aid. The disappearance of the global power race reduced much of the political motivations for aid. Another development has been the rise in private capital flows and the progress in reform in many countries that in turn have reduced the need for and the nature of official aid. Some countries, even though still poor, have reduced their dependency on aid as they have attracted private external capital flows. Others have made much progress in reducing poverty, reducing the need for aid.

Another force has been academic research. The topic of aid allocation received much renewed attention from academics in recent years starting with the work of Alesina and Dollar (2000). This analysis, and confirmed by a now through a large literature, has provided solid evidence that, while aid is affected by economic considerations pertaining to the countries' growth and poverty situation and prospects, non-economic factors also play a large role, with the role of global political economy factors particularly highlighted. France, Great Britain and Japan, for example, were found by Alesina and Dollar (2000) to favor their former colonies in the dispersion of aid, and they, together with the US and Germany, allocate more aid to recipients that vote in unison with them in the UN. Also factors related to the correctness of the political regime in recipient countries do not seem to matter much: Alesina and Weder (2002) for example find no evidence that less corrupt governments would receive more aid.

² Seminal early studies include Little & Clifford (1965), OECD (1969), Bhagwati (1972) and Dudley and Montmarquette (1976). McKinlay and Little (1977) introduced econometrics; Trumbull and Wall (1994) and Wall (1995) introduced panel data econometric techniques.

In part as a consequence of the changes in geopolitical and global economic circumstances, and with the help of new insights from research, donor countries have since the mid-1990s been adapting their aid programs, altering many policies and possibly the patterns of their bilateral aid allocations. Some of the findings of the newer empirical studies already reveal (indirectly) how changes have altered the way (some) donor countries provide aid to countries. Dollar and Levin (2006), for example, examine the aid allocation by 41 donor agencies, bilateral as well as multilateral, computing poverty- and policy-selectivity indices for these individual donors for different sub-periods in the 1984-2002 period. They conclude that indeed selectivity has increased with respect to economic governance.³ Roodman (2005) also finds that there are improvements over time in donors' behavior. Berthélemy and Tichit (2004) investigate aid flows over 20 years (1980–1999) for 22 donors and 137 recipients. When they compare aid allocation policies in the 1980s with those in the 1990s, they find that the end of the cold war has reduced the bias towards former colonial links and instead led donors to favor trade partners. Moreover, they find that donors seem to reward good economic policy outcomes more since 1990.⁴ Sundberg and Gelb (2006) show that poverty and policy selectivity of aid to Sub-Sahara Africa has improved over time, both for bilateral and multilateral donors. Most other studies also find that the sensitivity of aid flows with respect to income levels of the recipient has increased. A contrarian view comes from Easterly (2006) who does not find consistent evidence of increased selectivity with respect to economic policies, such as trade openness, and only temporarily increased selectivity in the late 1990s with respect to corruption.

As a corollary to the aid allocation analysis, research has considered the (more) optimal allocation of aid from the point of view of reducing poverty and better achieving (some of) the MDGs. Much research has focused on how to allocate aid so as to reduce world poverty, with White and McGillivray (1995) perhaps as the first attempt and the Collier and Dollar (2002) as the best known and most influential recent paper.⁵ These and other papers try to analyze what allocation of aid across countries achieves the highest impact in term of global poverty reduction or other, MDG-related objectives. Relevant for the aid allocation question is that this literature in turn compares the actual allocation with the (more) “optimal” one. This comparison makes clear that the aid allocation of many donors has been “suboptimal,” since, for a given amount of aid, the allocation does not achieve its maximum impact. This in turn suggests that international

³ Dollar and Levin (2006) also investigate sensitivity of aid with respect to democracy which they find has been present consistently.

⁴ See also Nunnenkamp and Thiele (2006) for a more recent analysis along the same lines.

⁵ Note that we do not try to review the very large literature on the impact of aid: see rather Easterly (2003), McGillivray et alii (2006), or Rajan and Subramanian (2005); an earlier review is Mark McGillivray (2004). See also Anderson and Waddington (2006), Radelet (2006) and Easterly (2006) for recent reviews of the literature, focusing on changes in the new aid architecture and the MDGs.

economic and geopolitical factors (or other, unknown factors) remain important in bilateral aid allocations.

The studies nevertheless support the view that there has been some revisiting, as the more recent behavior of some of the donors comes closer to being “optimal”. This may be in part because some donors now explicitly use these models to determine their aid allocations. Benefiting from the lessons of policy research, bilateral agencies like the UK DFID and the Netherlands development ministry have been using these models since the mid-1990s; and for longer time, multilateral institutions have used such models to drive their aid programs (see Easterly, 2003 and Wood, 2006). This may have improved the patterns of aid allocations. Obviously, results very much depend on the criteria used for optimal behavior—e.g., growth, poverty, the flow of foreign direct investment received, gross primary school enrolment, infant mortality rate—and on the specific estimation methods on the impact of aid.⁶ As such, there is still considerable debate (see further McGillivray 2004; and Wood, 2006). Also, the literature has since expanded and now considers country factors such as sound institutions and human rights record among those potentially driving optimal aid (these factors may in part be motivated by their indirect impacts on the MDGs, especially those other than poverty). Recent papers along these lines include Gates and Hoeffler (2006), and Amprou, Guillaumont and Guillaumont Jeanneney (2007).⁷

While the existing research has highlighted the role of changing circumstances and the fall of the Berlin wall, changes have not just been triggered by global economy and geopolitical changes. There have also been many changes in the forms in and rules under which official aid is being provided, that is, the international aid architecture more narrowly defined. Common adaptations are that individual donors have been introducing more openness in the allocation of their aid, aiming at more selectivity, and introducing greater implicit and explicit use of benchmarks and results-based allocations (such as in the US Millennium Challenge Account). Many donors have moved to substitute debt-type flows by concessional aid (grants instead of loans); in some cases, donors have altered their mix of balance-of-payments/budget support and project financing; and (almost) all donors have engaged in bilateral (official) debt reduction, in the latest round through the (enhanced) HIPC initiative with 100% write-offs. Furthermore, additional multilateral debt reduction has been set in progress through the MDRI (Multilateral Debt Reduction Initiative).

⁶ For example, one optimization can be with respect to aid impact on current poverty, given policy choices in the country. Another optimization might be with respect to aid impact on policy, given policies’ impact on future poverty in the country. The first, say, may lead donors to give more aid to countries where there is more poverty and where the impact of aid on poverty is larger (because the policy environment is better). The second may lead donors to take a longer-term view, and try to through their aid-policies induce better policies, such as better governance and greater accountability, that leads to lower poverty in the longer term.

⁷ Gates and Hoeffler (2006) analyze, for example, whether Nordic aid agencies allocated aid over the period 1980-1999 different from how other countries did. They find that the Nordic countries differ significantly from other donors as they gave more to democracies and do not give to political allies.

Since earlier work has shown that aid flows used to be a function of the levels and structure of a country's obligations, including its debt stock outstanding to the multilateral financial institutions (Birdsall et al. 2003), these debt reductions may have affected the amounts and relative destinations of bilateral aid flows. Some studies have further investigated aspect of defensive lending, i.e., the role of debt in triggering certain aid and debt disbursements. Marchesi and Missale (2004), for example, examine both grants and net loans made to a panel of 55 both HIPC-and non-HIPC low-income countries during the last two decades to understand the main reasons that motivated the behavior of both donors and creditors. They find that the total amount of net transfers to HIPCs, as compared to non-HIPCs, have been increasing with their debt level. Greater net transfers have taken the form of net loans from multilateral organizations and grants in exchange for loans from bilateral institutions.

With the model changing from additional aid flows to official debt reduction in the 1990s, some recent studies have investigated the motivations for debt relief. Chauvin and Kraay (2006) find that while 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 especially vis-à-vis multilateral creditors are more likely to receive debt relief. Finally, they find that most of the persistence in debt relief is driven by slowly-changing country characteristics, indicating that it may difficult for countries to "exit" from cycles of repeated debt relief.⁸

This evidence thus suggests that HIPCs have kept receiving large amounts of resources just because of their high indebtedness or large size, thereby supporting both the hypothesis of defensive lending and defensive granting. This result may potentially have important policy consequences as it provides an argument in favor of debt relief, and the HIPC and MDRI Initiative in particular, in that it helps 'restore policy selectivity'. As such, now that (HIPC and MDRI) debt relief is being implemented in a growing number of countries, it is interesting to check to what extent debt relief has indeed been successful so far in eliminating defensive lending. More generally, the changes of aid composition and the growing importance of debt relief as an alternative aid instrument, or 'aid modality' (Collier, 2006), call for more attention to doing disaggregated analyses of aid allocation. Few though have studied the explicit changes that

⁸ Although we focus only on the determinants of aid, not on its impact, it is worth mentioning the work by Chauvin and Kraay (2005). They study the effect of debt reduction and debt relief on recipient government resources for development spending. Using a newly-constructed database measuring the present value of debt relief for 62 low-income countries, they find little evidence that debt relief has affected the level and composition of public spending. They do not find evidence either that debt relief has raised growth, investment rates or the quality of policies and institutions among recipient countries. Although they cannot rule out a variety of data and statistical problems, their evidence does suggest that some skepticism is in order regarding the likely benefits of further large-scale debt relief.

taken place as a consequence of the aid paradigm shift in general, and the debt reduction initiatives and PRSP mechanism in particular.⁹

Finally, a significant share of aid is allocated multilaterally, as in the case of the International Development Agency (IDA), managed by the World Bank, the Poverty Reduction and Growth Facility (PRGF) of the IMF, and programs of other multilateral financial institutions.¹⁰ While we do not study multilateral aid allocations, the multilateral aspect does introduce some other dimensions. For example, much of bilateral official debt reschedulings and debt reductions occurs through multilateral forums (the Paris Club). This introduces some potential conflict of interests, such as IDA disbursements that can get influenced by the World Bank/IBRD financial positions. Or the heavy World Bank and IMF inputs into the Paris Club process, in turn often reflecting G7 and geopolitical inputs, may bias final outcomes. There is also strategic behavior among donors themselves that can be affected by the actions of multilateral financial institutions, such as aid disbursements (see Mavrotas and Villanger (2006) for a theoretical model with this property). As such, the framework for multilateral aid affects not only multilateral flows directly, but also bilateral flows. This is again important since there have been some changes in terms of the multilateral framework over the last few years. These have included changes in institutional arrangements, e.g., more openness regarding finances and decisions, increased degrees of concessionality of multilateral flows and procedures, and more coordination in lending and disbursement policies.

More generally, the international development architecture has been undergoing many changes in the last few years. This includes specific actions such as the Paris Declaration on Harmonization and Alignment of aid flows. Other, broader but related new ‘institutional’ mechanisms include the greater use of PRSPs, the explicit introduction of MDGs and the broader objective of scaling up aid, and other, institutional environment changes. All of these institutional and policy changes and the actual bilateral and multilateral debt reduction can be expected to affect the allocation among countries and the mix between aid and official capital flows for individual countries.

The exact effects of these and other changes in the design of the multilateral framework for allocating aid on actual allocation are not clear a priori, however, and have certainly not been studied much. Do these changes really lead donors to provide aid money in a more rational manner? Is there less influence of (geo-) political factors today, is there more selectivity today, does this differ by groups of donors and is there a relationship with institutional changes? Does

⁹ Aid disaggregation approaches have become more popular, especially in fiscal response studies (of aid). See Mavrotas (2005) for a recent review of this literature. See also Cassimon and Van Campenhout (2006) who analyze the long-term fiscal response of HIPC debt relief compared to that of donor grants or loans.

¹⁰ Altogether there are some 20 multilateral financial agencies, providing around 32% of total net aid transfers (using Roodman’s definition) in 2003.

the substitution of grants for loans by specific donors lead to better allocation as there are fewer conflicts between the collection on past loans and the extension of new support? Or does the provision of grants lead to a moral hazard on the part of the specific donors as they are less concerned about the long-term prospects and viability of countries? These are some of the questions we will investigate.

II. DATA AND METHODOLOGY

We want to investigate whether institutional and other changes at the bilateral and multilateral levels have led to significantly different ways in which (bilateral) aid is being allocated. We specifically want to study whether there have been changes in the process of allocation of aid over time, whether the granting of debt reduction (HIPC) and the adoption of PRSP for specific countries affects aid flows, whether the aid allocation is less affected by defensive lending over time, and whether there are differences among donors in the aid allocation process. In this section, we describe the data sources, data, and the methodology we use to investigate these questions.

A. Data sources and data

Table 1 provides a detailed list of variables used, their description and their sources. Data on official development assistance (ODA, including debt reduction) for each of the reporting donors to each recipient country in a specific year come from the OECD/DAC (Development Assistance Committee) database. While the OECD/DAC database does not include all bilateral donors (China is not a reporting member, for example), it does cover the bulk of international aid flows over the period. In terms of recipient countries, we restrict our analysis to developing countries, i.e., those countries on what was known until recently as the Part I list of countries of the DAC (as of January 1st 2001). Countries included on the Part II list of the DAC, receiving what is traditionally called Official Aid (OA), are either transition countries or more advanced countries (such as Israel or South Korea) and are excluded from our analysis. Data are obtained from the On-line CRS system of OECD/DAC, with bilateral donor-recipient transactions captured through the so-called DAC Table 2a data, which also allow for some disaggregation by type of aid flow (grants, loans and debt relief). Altogether the aid data are a three-dimensional panel of ODA flows to 147 recipient countries from 22 bilateral donors for the period 1970-2004.

The DAC statistics generally focus on the concept of *net aid*, which is total resources provided by donors in the form of grants, loans and debt relief, net of any loan principal repayments the country makes to the donor. In our analysis, we will use actual disbursements rather than commitments. Contrary to many earlier studies, we do not use the net ODA data, but transform the net aid figures into *net aid transfers*, by taking into account interest payments on the loans, to account for total net resource transfers. The total net aid transfer concept we use is thus defined in the following way:

Net aid transfer = total (bilateral) ODA grants + total (bilateral) ODA loans extended to recipients – ODA loan amortization by recipients – interest paid by recipient

In the econometric analysis, we focus on net aid transfer, scaled by recipient population, as the basic dependent variable. We relate this bilateral aid flow to a number of independent variables. We obtain macroeconomic variables mainly from the World Bank’s World Development Indicators (WDI). Data on policy and institutional environment as well as on specific linkages between donors and recipients come from a variety of sources. And we use the DAC aid data itself to create aid measures that are independent of the bilateral aid flows that we study. The independent control variables we include are commonly used by others in this literature: bilateral trade flows (to explore the role of non-aid economic relations between both countries), net aid provided by other donors (to explore the role of aid coordination), and total aid provided by the specific donor to all countries (to control for the overall level of aid generosity of the donor country).

In terms of our main variables of interest, the “need” or ‘poverty selectivity’ element of aid is proxied by using the recipient country’s per capita income (in constant US dollars) lagged one period to limit endogeneity—of aid flows driving GDP, with poorer countries expected to receive more aid. The ‘policy’ selectivity dimension of aid is explored by using the World Bank Country Policy and Institutional Assessment (CPIA) index of the recipient country. This index is available for a large number of developing countries and for a long period of time.¹¹ We also want to explore changes in the small country effect found in the aid literature, where we proxy size using recipient country population. To check for defensive lending practices, we use data on the countries’ debt stocks (relative to exports) and debt composition. For debt stocks, since nominal debt stocks can be quite misleading as a measure of debt burden given the highly concessional interest rates, we use the present value of debt using a new, comprehensive time series of present value of debt calculated at the World Bank for a large number of countries, and also used in Chauvin and Kraay (2005, 2006).¹² For debt composition, we use the share of bilateral and multilateral claims in total claims at each point in time, to investigate whether large shares of bilateral and multilateral debt affect new aid flows, as has been found in the past (Birdsall et al., 2003; Marchesi and Missale, 2004).¹³ These data come from the World Bank’s Global Development Finance database.

¹¹ We also used other institutional environment indexes, such as the governance and corruption indexes produced by Kaufmann, et al. (2004, 2005) and the law and order indexes of Freedom House. We did not use alternative proxies for aid effectiveness brought forward in the recent aid literature, such as compliance with MDG targets, reduced vulnerability to external shocks, better governance and greater accountability, or greater democracy (see for example, Amprou et al., 2007).

¹² See also Dikhanov (2004) for the technical background document.

¹³ This analysis can easily be expanded to consider whether the intra-bilateral debt composition affects the bilateral flows, such as the question whether bilaterals engage in defensive lending to a country when they have relatively larger claims outstanding.

We also want to explore the role of colonial and geopolitical links since these have been found to affect aid flows. For example, colonizers tend to give more aid to their former colonies, and political motivations have been found to drive aid flows, e.g., aid is being given to induce favorable votes in the UN. We therefore include in all regressions dummies for former colonial linkages (e.g., UK with Nigeria), and an index of the degree to which a recipient countries can be considered geopolitical friends of major donors.¹⁴ Since we include in our regressions already pair-wise donor-recipient dummies (see next section), we already account for any potentially specific, strategic donor-recipient links, such as the well-known cases of US-Egypt and US-Pakistan bilateral relations.

To check whether structural changes in the nineties have affected aid allocations and their relationship to our need and selectivity measures, we split the sample into three sub-samples, 1970-89, 1990-1998 and 1999-2004, and use period dummies for each. This first period is similar to earlier studies and coincides with the period before the fall of the Berlin wall. The second and third periods reflect the post-Berlin wall era; this period is split into two sub-periods to check whether indeed a new aid architecture has emerged in recent years, as a consequence of the new literature on aid effectiveness and the changes in the institutional aid set-up, all starting in the late nineties (for example, the World Bank Aid study in 1998; the launch of the HIPC/PRSP framework). We interact these three period dummies with the relevant aid effectiveness variables — poverty (per capita income), policy (CPIA), small country effect (population) and defensive aiding (debt) — to check for structural breaks. Additionally, we interact these four variables with dummies for every year to provide the year-by-year evolution over time of the sensitivities, as done by Sundberg and Gelb (2006) for the poverty and policy dimensions. We also do these year-by-year interactions for the colonial and geopolitical linkages variables.

To investigate recipient-country specific recent institutional aid architecture changes, we use HIPC-dummies at the individual country level (using the enhanced HIPC decision point as the year) and PRSP-dummies at the date of full PRSP by the recipient country (using the dates as published by the IMF/World Bank). We also interact these HIPC and PRSP dummies with the poverty, policy, size and debt burden variables, to see whether there have been changes in selectivity and effectiveness following these actions. Furthermore, to investigate whether there are differences in aid allocation processes among donors and whether the aid architecture has involved changes at the donor level over time, we also explore the variation among donors in

¹⁴ The degree of ‘friends of the donor’ is defined dependent on the number of times the recipient has voted in the same manner in the UN. The data on friends cover the following donors: Australia, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Portugal, UK, and USA. Data are those used by Alesina and Weder (2002), with thanks to Beatrice Weder for providing us with the data.

their sensitivities with respect to the most important dimensions—poverty, policy, size and debt burden. We do so within the panel regression, where in addition we also allow for time variation.

B. Methodology

We have panel data with donor, recipient and time dimensions. One issue facing all aid studies is that for many donor-recipient country combinations aid flows are zero. This may introduce a selection bias which can arise for two reasons: on the donor side, for example, as little is known about the country and therefore it gets no aid; or on the recipient side, for example, as there is no interest in engaging with that particular donor country. In either case, no aid is being extended. Treating this observation as “zero aid” can bias our regression results, but a Tobit analysis can account for this fact. Two other methods are a probit in the first regression followed by a regression results with the Heckman inverse Mill’s ratio obtained from the first step; or just using only non-zero observations in a simple OLS regression framework. Another econometric challenge is that there can be changes in aid budgets from year to year. To account for this, we can allow for time-varying effects for each pair of donor and year, which means we would end up using random effects panel estimations to avoid possible bias when using fixed effects (see Berthélemy and Tichit (2004) for details on this estimation technique).

We face thus a number of econometric choices. However, as Berthélemy and Tichit (2004) and Berthélemy (2006) have shown, the differences between fixed effects using non-zero observations only, Heckman, Heckman two stage using all observations, random effects or OLS are small. To avoid presenting multiple results, we therefore choose to conduct fixed effects panel regression results using the non-zero observations only. This means that besides our recipient country control variables and bilateral relationship dummies to account for political and economic factors, we should include fixed effects at the bilateral donor-recipient level to account for any donor-recipient specific time invariant effect. We also include time (year) dummies to capture any large variation across time.

When using fixed effects, however, another important problem is introduced. It relates to the nature of aid allocation, which is focused on bilateral pairwise relations and as such is similar to explaining trade in gravity-type models. The possibility then arises of fixed effects driving the regression results. A natural candidate for an empirical model would be one that explains bilateral aid flows at time t by matrix of explanatory variables, a fixed donor effect, a fixed recipient effect and time dummies:

$$a_{ijt} = \alpha + \beta x_{ijt} + \phi_i + \gamma_j + \theta_t + \varepsilon_{ijt} \quad (1)$$

This is essentially the three way model proposed by Matyas (1997) in the context of gravity models as an alternative to the pooled OLS model that does not allow for unobserved heterogeneity. Egger and Pfaffermayr (2003) show that when (1) is extended to include bilateral interaction effects such as:

$$a_{ijt} = \alpha + \beta x_{ijt} + \phi_i + \gamma_j + \mu_{ij} + \theta_t + \varepsilon_{ijt} \quad (2)$$

this generalization of the three way model is in fact identical to a two way model with only time and bilateral effects:

$$a_{ijt} = \alpha + \beta x_{ijt} + \mu_{ij} + \theta_t + \varepsilon_{ijt} \quad (3)$$

They argue that the original Matyas model of (1) is likely to be mis-specified, since “it does not span the whole vector space of possible treatments of explaining variations in bilateral trade (or aid) and ignoring such bilateral trade (or aid) interactions may lead to biased estimation” (see also Baltagi, Egger & Pfaffermayr, 2003). In general, fixed effects accounts for any time invariant historical, geographical, political, cultural or other influence which will lead to deviations from the ‘normal’ aid (or trade) flows. However, specification (1) only takes into account such effects for the receiver (e.g., Tanzania receives more aid than other similar countries) and the donor (e.g., Denmark gives more aid than similar countries). It does not take into account the specific effect that Denmark gives more aid to Tanzania than similar country pairs. To do so, we need to estimate equation (3).

Equation (3) can best be estimated as a panel, with the individual specific effects either regarded as fixed effects or as random effects. Both methods have their problems: estimating (3) using random effects assumes that all explanatory variables are uncorrelated with the individual specific effects. This may be unrealistic in the empirical problem at hand. This is not an issue in the fixed effects model since it eliminates any individual specific effects. However, a fixed effects regression eliminates everything that is time invariant from the model. This is a pity, because in the context of this study, we are interested in the marginal effects of some time invariant factors. For instance, it may be instructive to check whether country pairs with colonial ties—a time invariant bilateral fixed factor—receive more or less aid.

Hausman and Taylor (1981) derive an instrumental variables estimator that can be considered to be in between a fixed and a random effects approach since it allows some variables to be correlated with the individual specific effects but still allows for the estimation of time invariant effects. In their model, exogenous variables (both time varying and time invariant) serve as their own instruments, time-varying endogenous effects (in the sense that they are correlated with individual specific effects) are instrumented by their deviation from individual means (as in the fixed effects approach) and time invariant endogenous effects are instrumented by individual averages of time varying exogenous variables. As such, the Hausman-Taylor model allows the estimation of time invariant effects, without imposing the strong assumption that all variables should be uncorrelated with the individual specific effects. Moreover, fixed effects would be inefficient if some of the variables are uncorrelated with the individual specific effects, since they are instrumented needlessly. A nice additional feature of the Hausman-Taylor model is that instruments can be derived within the model.

As such, we argue that the Hausman-Taylor model is our preferred model. The main challenge in this model is deciding which of the variables are correlated with the individual specific effects and which are not. For this, Hausman and Taylor (1981) suggest using economic intuition. It is useful to realize that the individual specific effects are the proportions of the errors that contain country pair specific elements not included in the model. In other words, if a variable is possibly correlated with other political, social, historical, cultural or economic aspects not included in the model, it is probably endogenous. In our specification, lagged GDP per capita, net aid per capita provided by other donors, lagged trade as a share of GDP and the CPIA are considered endogenous. Furthermore, our ‘friends of the donor’ indicator is considered a time invariant endogenous variable, while the colonial ties indicator is a time invariant exogenous one.

As already outlined, to check for structural breaks due to the changes in the institutional environment in the nineties, we use three sub-period dummies as well as year-specific dummies, and interact both set of dummies with the effectiveness proxies (poverty, policy, defensive lending and population). At the individual recipient country level, as noted, we consider simple pre- and post-HIPC dummies and pre- and post-PRSP dummies as proxies for recent changes in the aid architecture. Additionally, we interact again these dummies with the four effectiveness variables. Finally, we are interested whether there are differences among donors and whether the aid architecture has involved changes at the individual donor level. We therefore allow for donor-specific sensitivities in terms of the most important variables within the panel regression setup and allow these coefficients to change over time within our panel regression.

Besides the Hausman-Taylor model, we conducted other robustness tests (not reported). First, we ran the fixed effects panel regressions most others have. We also run the regressions with all observations, including zeros. We do not report the results as they are qualitatively similar, but econometrically less well motivated. Second, our panel regression results are also dependent—in terms of their statistical advantage over other regression techniques—on the degree of homogeneity in the data: with much heterogeneity, the panel approach offers little gains and possibly some costs. We thus need to consider whether we have homogeneity in our three dimensions: over time, and across donors and recipients. The possibilities are many, though: in the behavior of aid flows to different recipients, variation across donors and over time, etc. and we can not check for all of them.

In terms of recipient countries, we run the aid allocation regressions by groups of similar-like recipients, grouping them by income level, score on the CPIA index, and size of country. It is somewhat easier to check whether we have homogeneity in the donor dimension, since we have fewer donors than recipients. We do this in several ways: we check the heterogeneity of the sensitivity of the bilateral aids flows in terms of the most important variables—poverty, policy, size and debt burden—by running individual aid allocation regressions for each donor separately; and by running the aid allocation regressions by groups of similar-like donors. Most of these results confirmed the general panel regression results (which we report next), although with generally reduced statistical significance. The most important exception is of course that the

respective variables by which we group countries are not as statistically significant (e.g., when we group recipients by level of income, income is no longer as significant). For space reasons, we do not report these robustness results.

III. EMPIRICAL RESULTS

This section discusses the empirical results of our aid allocation analysis. We first provide some descriptive statistics and stylized facts, followed by a detailed discussion of the results for the main specifications used. As noted, we derive the results using the non-zero observations-only and using the Hausman-Taylor model.

A. Descriptive statistics

Figure 1 shows the development of the bilateral net ODA transfers over time, measured in US dollars in year 2000 constant prices, including the total as well as the disaggregation into its grant, loan and debt relief components¹⁵. Figure 2 presents the same data, but now on a recipient country per capita basis. Both figures show the aggregate evolution of our dependent variable. Figure 1 shows the increase of aid in the eighties, followed by a drop in aid volume in constant prices from the mid nineties on, and a recovery from around 1998 on, with total aid volume reaching close to the early nineties peak in 2004. When disaggregating the total aid volume, it is clear that over time, grants have replaced loans, with net loan transfers becoming negative in recent years. Debt relief largely accounts for the short-lived peak in aid volume in 1991, as well as for most of the increase in volume in the most recent years. Figure 2 shows that in per capita terms, net aid transfer remains within a fairly limited bound for the whole period, ranging between 6 and 8 (constant) dollar per person over the full period, with again an outlier in the mid-1990s. It thus shows that changes in the absolute volume of aid over time largely match the increases of recipient population over time, although in most recent years, aid per capita has not recovered to its mid-1990s level. Also, as a larger share consist of debt relief granted, net transfers may be even lower.

Table 2 provides the raw statistics for the dependent and independent variables used in the analysis. We find that the average net aid transfer provided by a donor to each recipient was \$2.4 per capita per year, but with a large variation (the minimum being -\$138 and the maximum being

¹⁵ The disaggregation is made using the following decomposition. The grant component of net aid transfers is defined as total bilateral grants, netted of debt forgiveness grants. The loan component equals net loan transfers (corrected for offsetting entries on debt relief), including interest payments, but netted of interest payments forgiven. The debt relief components sums debt forgiveness grants (netted of the offsetting entries on debt relief) and interest payments forgiven. The component ‘offsetting entries on debt relief’ refers to the amortization part of debt forgiveness, that has to be deducted, congruent with the net aid logic of DAC ODA statistics, in order to avoid double counting of amortization forgiveness in ODA statistics in future years. See e.g. Global Monitoring Report 2007 (table 4.1, p.153) for details on DAC debt relief accounting.

\$9052 per capita per year, a small country that received large aid from a single donor in a single year. If we exclude the zero observations, average aid per capita per donor stands at \$3.8 (\$4 excluding also the negative entries). Of the total net aid transfer, grants was the largest component, on average per donor some \$2.2 per capita per year including zeros, while net loans per donor were some \$0.16 per capita per year, and debt relief being granted per donor was \$0.04 per capita per year (not reported).

In terms of the other, explanatory variables, the raw statistics are as expected and indicate the large variations among countries. Recipients' GDP per capita (in 2000 prices) averages some \$3900, but varies from less than \$500 to \$23266, with the latter being very high and surely not a country in need of aid. The average population size is some 2.8 million, but the standard deviation is high, 11.8 million, and the smallest is 20,000 people and the largest is some 1.3 billion (China), with no countries in the middle segment between 300 million and 1 billion people. For this reason, population is added in log terms in the regressions.

Total aid provided by donors other than the specific donor for the specific recipient country was on average some \$32 per capita per year, with a high of some \$9,567 per capita in a single year, again the small country. Since donors on average provided some \$309 in net aid transfer per capita (using the population of the recipient country) to all other countries in the same year, it means that the average country received about 9% of an individual donor's total aid budget ($\$32/(\$309+\$32)$). It shows that donors are still relatively fragmented in their aid allocation across countries.

Bilateral donor-recipient country trade as a percentage was on average 2.2% of recipient country GDP, but again with large variation. The average CPIA index was 3.46, but shows significant variation as the index goes from a low of 0.72 to the CPIA maximum of 6, with a standard deviation of 0.88. The debt burden, measured in present value terms, was on average 181% of exports, but varied from less than 1% to a high of 6500% of exports. The bilateral share of total debt was on average 38% and the multilateral share some 33%, showing the importance of these two forms of official financing in total external financing. About 2% of countries had a PSRP and a similar 2% of countries had passed the HIPC decision point by end 2004.

B. Regression results

In discussing the various analyses, we proceed as follows. In Table 3, we present the basic aid allocation model, allowing not only for the conventional 'poverty' and 'policy' selectivity-related explanatory variables and other conventional control variables (including the small country effect), but also adding explanatory variables related to the defensive lending (and granting) hypothesis. Also in this Table, we use period dummies that split the sample in three sub-periods to check for structural breaks, and interact these period dummies with the four effectiveness proxies. We also use annual interaction dummies and graphically present these as trends. In Table 4, we report the effects of recent changes in the aid architecture at the country

level (HIPC and PRSP dummies), including interactions between the country changes (HIPC and PRSP dummies) and the policy and lending variables. We use every time the total net aid transfer per capita provided by each donor to each recipient as the dependent variable, where the net aid measure captures the net amount of resources provided to a country, i.e., the flows of grants, net loans, debt relief (including items such as technical assistance, emergency and food aid), incorporating also, where appropriate, interest payments paid by the recipient to the donor. All regression results presented in Tables 3-4 also use only observations with non-zero dependent variables and for which we also have all independent variables, leaving us with some 45,000 observations.

The basic aid allocation model

We start with reporting the results for the standard regressions for the allocation of bilateral aid, largely following the specification used by many others (Table 3). From the first regression results (Table 3, column 1), we confirm the standard finding that the income level and the size of the recipient country matters, with wealthier and larger countries receiving less aid. We also find that the more aid a donor gives in general, the less it gives to any specific country. And we see that aid by one donor is positively affected by the aid behavior of other donors, hinting at complementarity among donors, possibly due to signaling or better coordination. We confirm the results of others that the openness of the country to (bilateral) trade matters with countries with whom the donor trades more intensively receiving more aid. We also confirm that colonial and geopolitical linkages can drive bilateral aid flows. All these variables are statistically significant.

Importantly, we find that on aggregate and over the whole period donors are providing aid taking into account the quality of the policy and institutional environment in the recipient country, as measured by the CPIA, albeit only at a 10% level of statistical significance. Again, this confirms studies by others that donors consider the policy and institutional environment of the recipient in their aid allocations, with the stronger effects found for the more recent period.

We next discuss whether debt stocks and debt compositions affect the bilateral aid flows to countries. First, from the base regression results (Table 3, column 1), we find that the present value of the debt owed by the country to all creditors combined relative to a country's exports does not significantly affect the flow of net aid transfers to the country, nor does the share of bilateral debt in total debt. Multilateral debt share exerts some negative effects on debt flows. Contrary to earlier findings, these results do not seem to indicate the importance of a phenomenon of defensive lending driving aid flows over the whole period.¹⁶

¹⁶ Earlier results using a log variant for positive aid observations did hint at defensive lending practices, so this issue seems to depend on specifications, also in our analysis.

These results so far could be affected by the changes over time in the relationships. The basic set up therefore also includes an analysis of any structural breaks in the key relationships. As explained, we do this by using dummies for three subperiods, before 1990, 1990-1998, and 1999-2004, and interacting these with the key variables—GDP per capita, policy (CPIA), defensive lending (debt stock), and population—to see what extent the relations of aid with key determinants changes over the periods. Table 3, column 2 to 5 provide the results for the changes in sensitivities.

In terms of income, the results (Table 3, column 2) show that over time the responsiveness of aid to recipient country income has increased (in absolute terms): the coefficient evolves from -0.400 to -0.595. This suggests that donors have become more focused on providing aid to the poorest countries, rather than say to their political allies or to countries with which they trade much. Other recent research (Easterly, 2006, Sundberg and Gelb, 2006, Amprou, 2007) confirms this finding.

Next we find that the small country bias becomes smaller over time as the coefficient for population becomes less negative, becoming half in size from -1.279 to -0.635. This decline may be because donors with the end of the cold war became less interested to support small countries to say, buy votes in the UN. Another trend that could potentially have been offsetting this reduced importance of the country effects is that some of the very largest countries have been able to tap into private external financial markets or otherwise were restricted in their aid flows (e.g., as they hit portfolio limits), which means large countries would have been receiving even less aid funds over time, thus making the coefficient more negative. The fact that there is no offset, but rather a decline in the coefficient suggests an even sharper decline in the small country effect among donors.

Very importantly, aid becomes much more responsive to policy (Table 3, column 4): from being insignificant in the first period, the coefficient becomes 0.244 in the second period, and then increases further to 0.897 in the most recent years. This empirical finding confirms Berthélemy and Tichit (2004), Dollar and Levin (2006), Roodman (2005), Sundberg and Gelb (2006), and others who find that there are (large) improvements over time in donors' selectivity. Dollar and Levin (2006), for example, find that, while "in the second half of the 1980s, aid was allocated indiscriminately to well governed and poorly governed countries alike, at the same level of per capita income, today there is a clear tendency to allocate more assistance to poor countries that have reasonably good economic governance."¹⁷ It confirms the growing consensus in the aid community that donors take the policy and institutional environment of countries more into

¹⁷ Dollar and Levin (2006) find this relationship between aid and governance when they use the World Bank's CPIA measure; the same relationship is found if alternatively an independent assessment of institutions is used. Roodman (2005) finds that donors' selectivity standings by the 2005 CDI methodology have been relatively stable since 1995, but that refers more to the ranking of countries and not to their absolute degree of selectivity.

account in their aid allocation in recent years.¹⁸ It also explains why over the whole period we find that the coefficient for CPIA is only statistically significant at the 10% level.

Regarding the defensive lending hypothesis, the coefficients on debt for the subperiods provide additional information. They suggest that if anything, the concerns about countries' debt burdens have declined over the periods. While in the early period, high debt was a reason behind lower levels of aid, as the coefficient was statistically significant negative, in the later periods aid flows were no longer significantly affected by the level of debt of the countries. This change does not, however, suggest defensive lending per se, for which we need to consider as well the composition of debt.

We complemented the three sub-period analysis by running the basic set up including yearly time dummies interacted with our four key determinants, thus allowing for annual evolutions. Figures 3 to 6 provide the graphical representation of these trends. The figures include the significance band of the various parameters. The figures show very clearly the increase over time in responsiveness of aid regarding poverty and policy, and the decline in the role of country size and debt in determining aid flows. Specifically, the coefficient for income decreases from -.4 to -.7, with the biggest drop in the early 1990s (note that the income sensitivity is always statistically significant different from zero). The coefficient for population moves up as well, with a sharper increase over the period from -1.5 to -0.5 (note that the population sensitivity is always statistically significant different from zero). This means there is less of a small country bias during the latter part of the period. The coefficient for CPIA increases from 0 to 1.2, with the sharpest rise starting in the mid 1990 (note that the policy sensitivity was not statistically significant different from zero until the mid-1990s). And the coefficient for debt increases from a low of -0.4 to about zero (and statistically insignificant from zero) in the late 1980s/early 1990s, after which it remains stable. This confirms that debt is no longer a detriment to aid flows, maybe in part due to the bilateral and multilateral debt reductions over this period.

We can also consider the effects of changes in the role of colonial and the geopolitical linkages in aid flows (Figure 7 and 8). Here we find that there is a sharp decline in these factors as well over time, suggesting that aid is being allocated more according to economic criteria. Specifically, the coefficient for colonial linkages declines to a third, while the coefficient for the friends variable falls by about half. Altogether, these results suggest that there have been large changes in the international aid architecture that have led to a more rational allocation of aid among countries depending on needs and selectivity.

¹⁸ A notable exception to this view is Easterly (2006) who argues that in his review of the evidence there is little or no sign of increased selectivity with respect to policy and institutions.

Specific international aid architecture changes

We next analyze how (recipient) country specific policy actions related to changes in the international aid architecture affect the aid flow behavior. We use two dummies: when a country adopted a PRSP and when it became eligible for the HIPC-initiative (as proxied by a HIPC II decision point agreement). We interact these dummies again with our standard country and policy variables. Table 4 summarizes the results, where the first regression repeats the results of Table 3.

We find that there are positive effects on net aid flows of a country adopting a PRSP (Table 4, column 2) and when it becomes eligible for the HIPC (Table 4, column 8), since both dummy coefficients are statistically significant positive. This confirms that donors consider a PRSP a sign of a good development program and “reward” a country when it adopts a PRSP. It also shows that the reduction of debt through the HIPC-initiative is a positive one for aid flows.¹⁹

So far these results are as expected. More interesting are the effects of these actions on the willingness and ability of donors to be selective with respect to our four key determinants of effectiveness, poverty, policy, defensive lending and population. We investigate this by interacting the PRSP or HIPC dummies with these four variables, while including the other determinants as well as the PRSP or HIPC dummies independently in the regressions.

With respect to PRSP, the results show an increased responsiveness to GDP when the country has a PRSP. It shows that donors are willing to give more aid to the poorer countries when they have a PRSP; the same goes for the HIPC dummy (although the HIPC dummy itself is now negative, but insignificant). For the rest, once the country has a PRSP, aid does not seem extra responsive to policy, defensive lending or population. This goes also for the HIPC dummy, with the exception of policy responsiveness: the statistically significant sign for the HIPC dummy interacted with CPIA, together with the HIPC dummy itself becoming negative, suggests that CPIA matters very much for aid once countries have received HIPC debt reduction. As such, the debt reduction re-introduces or enhances selectivity in donors’ behavior.. It suggests that donors see the HIPC as an important signal on which basis they are willing to reward good policy more.

As argued by some, the buildup of (multilateral) official debt in the earlier period made donors lose (part of) their selectivity, which seems to have been regained—and actually strengthened to a significant some degree—at the individual country level when the decision to get debts reduced is taken. The interactive dummies for the debt shares (Table 4, column 7 and 13) show clearly

¹⁹ Some caveats are in order here as to the beneficial impact on the country. Specifically, the increase in aid flows may come in different types, debt relief, debt flows, or grants. To the extent that aid flows are overestimated because debt relief is measured as net transfers, the HIPC debt reduction may led to a measured, but not real increase in aid flows. Furthermore, an increase in aid in the form of debt flows following debt reduction may be less beneficial since, as some have argued, the reduction in debt is just creating free headroom for others. See the discussion around the latest debt sustainability analysis, e.g. IDA&IMF (2006).

that the adoption of a PRSP and the eligibility for HIPC reduce the importance of debt composition in aid flows, with the effects of a large multilateral debt share statistically significant for both PRSP and HIPC and the bilateral debt share statistically significant for the HIPC dummy. It suggests that these specific actions lead to less defensive lending.

Changes over time among donors

From the regression results so far, we have found that there is a clear pattern of increased selectivity of donors over time and reduced influence of colonial and political factors. We also found some evidence that there are changes in the effects of debt on aid flows as they relate to the countries' adoption of PRSP and eligibility for HIPC. This is good news for the international aid architecture in that more selectivity can enhance the development impact of aid. In general, as already noted, other research also supports the view that donors have improved their selectivity and quality of aid. In a very comprehensive assessment of donors' attitude towards aid, the Center for Global Development's *Commitment to Development Index* (see Roodman, 2005)—covering not only aid flows, but also investment, security and migration—shows for 21 major donor countries—the same countries as in our sample except Luxembourg—an average improvement in the index (which runs from 10 between 2003 and 2006 (from 5.0 to 5.2).

The question is whether we can identify, besides the general changes, particular changes at individual donors that may have contributed to the increased selectivity. Existing research (e.g., Berthélemy, 2006; Dollar and Levin, 2006) has already highlighted the differences among donors in their interests in development, with some donors having more altruistic objectives while others have more geo-political interests. Dollar and Levin (2006) show that there were improvements among specific donors with respect to policy selectivity. And the Center for Global Development's *Commitment to Development Index* suggests some convergence in general approaches, with the standard deviation in the index among donors going from 1.00 to 0.82 between 2003 and 2006. The question is whether within our framework we also find evidence that these differences exist, whether they have also changed over time and for which donors specifically. Analyzing these (changing) differences among donors within our empirical framework may help identify what institutional changes for which donor(s) have helped bringing about the overall changes.

We conduct such an exercise by deriving the elasticities of individual donors with respect to our four key measures, poverty, policy, defensive lending and population. We do this within our panel approach, thus keeping all other control variables the same for all donors, but allowing the coefficients for each donor to differ and to vary over the three time periods. Table 5 reports the average of the coefficients for the three periods by donor, where the donors are sorted by the degree of sensitivity with respect to the CPIA variable.

Table 5 shows the large differences among donors, with the sensitivity with respect to CPIA to vary between -0.59 for the United States to 0.91 for the United Kingdom, making the UK much

more policy sensitive than the US. In terms of GDP per capita, the average sensitivity varies from -3.34 for the United States to 0.65 for Japan, suggesting that the US aid is much more geared towards the poorest countries than Japan's aid is. In terms of population, the average sensitivity varies from -3.38 for the United Kingdom to -1.37 for Luxemburg, suggesting that the United Kingdom is more geared towards smaller countries. Finally, the average sensitivity with debt varies from -0.29 for France to 0.21 for the United States, suggesting that for France debt is more a detriment to aid flows than it is for the United States. Not all these coefficients are statistically significant, however, so the results just provide a rough comparisons of the differences among donors.

The detailed results for the individual donors also confirm the general improvement in selectivity over time. The average sensitivities across the 22 donors for the three periods, reported in Table 6, show an increase in sensitivity with respect to income, a sharp increase in sensitivity with respect to CPIA, a lowering of the bias towards smaller countries and a reduced concern over debt burdens. The results thus suggest that, across the board, there has been an improvement in the selectivity of donors. We also find that there is less variability among donors over time in the CPIA and the GDP per capita dimensions (as measured by a decline in the coefficient of variation, especially for the CPIA), suggesting that donors have become more homogeneous in their aid allocations and generally more focused on recipient countries' progress and prospects with development.

Figure 9 shows this improvement and sense of convergence for the four dimensions by plotting for each donor the coefficients for the three periods. The clearest is the general improvement in the CPIA dimension (top chart), followed by the GDP per capita dimension (second chart), where for many donors both sensitivities (in absolute values) were much higher in the late 1990s than before. The progress is less obvious for the population (third chart) and debt (bottom chart) dimensions where the decline in coefficients is less consistent across the donors, and significant differences remain among donors in the degree of bias towards small countries and concerns over debt burdens. Nevertheless, they suggest some improvements and convergence in these last two dimensions as well.

IV. CONCLUSIONS

We study how the behavior of bilateral aid flows to individual countries has changed over time and in responses to institutional changes. We observe behavioral changes over time in actual aid flows towards what appears to be more optimal allocations of resources across countries. Specifically, over time the role of poverty and the countries' policy and institutional environment increases, and the small country effect slightly reduces. We like to conclude that these changes are related to changes in the overall institutional environment, the international aid architecture. The specific institutional environment and policy changes we can identify at the country level that led to more selectivity in donor flows are the adoptions of the HIPC and PRSP. These occur already after the fall of the Berlin Wall, but are intensified more recently, suggesting that

changes in the aid architecture have led to (even) more selectivity in donor flows. While the role of debt burden in deterring aid flows has declined, we find little evidence of defensive lending driving overall flows. Debt relief, however, through the HIPC Initiative, combined with the adoption of PRSP program seem to have reduced the importance of the share of official (bilateral and multilateral) debt in determining aid flows.

While these are very encouraging signs, we are left unsure as to what specific institutional changes, if any, at the international or donor level may have been driving these changes in behavior. We know there have been a number of changes in long-standing multilateral financial institutions—such as the Paris Club, IMF, World Bank, consultative group meetings etc.—and we can suspect these changes have affected the behavior of bilateral aid flows as well. We also know that there has been more attention paid to aid allocation in the later 1990s, in part due to research started in the mid-1990s. But which of these changes specifically has had the beneficial impacts we find remains to be analyzed. This is important though since further precision in the institutional factors driving changes in behavior would greatly help make the international financial system work better for developing countries.

We do know, however, (and have confirmed again) that the behavior of individual donors differs as to their degree of altruism and selectivity relative to their geopolitical and own interests. This suggests that part of the reasons for the changes in behavior observed lie in the institutional environment in the donor country. We can get some more insights into this relationship when we correlate the donors' score on the Commitment to Development Index with the various indexes of Kaufmann, Kraay, and Mastruzzi (KKM, 2004) of the donors' institutional environments. The KKM indexes cover Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. We do this for the year 2004 and for the 21 countries for which we have data for both set of indexes. We find that there are strong positive correlations, i.e., those countries with more transparent and less corrupt environments tend to be more committed to development and provide aid in a more selective manner. Interestingly, the strongest correlation is with the voice and accountability index (0.86), followed by a strong correlation as well with the control of corruption index (0.76). The lowest correlation is with political stability (0.54). The correlation is somewhat less strong for the specific CDI quality of aid variable (correlation is 0.64; see Figure 10), perhaps suggesting that aid is somewhat less related to the overall institutional environment of the donor country and more related to the behavior of the specialized agencies involved in aid budgets and allocation.

These findings nevertheless suggest that the way preferences of citizens in the donor country are taking into account matters for how aid get allocated; and a greater presence of corruption in the donor country seems to make selectively less likely. While this is admittedly a very crude analysis, it nevertheless suggests that the quality of aid and its allocation is not independent of the institutional environment in the donor country. As such, analysis and research of the international aid architecture needs to take into account not just the policy and institutional environment in the recipient countries, but also that in the donor countries.

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Table 1. List of Variables, Description and Sources

| | | |
|---------------------|---|------------|
| net_aid_pc = | net aid transfer per capita | DAC |
| gdplagged = | GDP per capita at PPP rates and in 2000 prices, lagged 1 year | WDI |
| cpia = | Country Policy and Institutional Assessment score | World Bank |
| logpop = | the log of population | WDI |
| aidotherdonorsexo = | net aid per capita provided by all other donor | DAC |
| sumnetaidexo = | the sum of net aid provided by the specific donor | DAC |
| pvdod = | the present value of debt as a ratio to exports of goods and services | World Bank |
| lagtrade_gdp = | the sum of bilateral donor–recipient country exports and imports scaled by recipient country GDP, lagged 1 year | WDI |
| multi_dod_ltdod = | the share of multilateral debt in total debt | GDF/WDI |
| bilat_dod_ltdod = | the share of bilateral debt in total debt | GDF/WDI |
| hipc = | a dummy if the country passed the HIPC decision point | Own |
| prsp = | a dummy if the country adopted a PRSP | Own |
| col = | a dummy taking the value of 1 if the donor country pair has colonial history | |
| friends = | a dummy taking the value of 1 if recipient country voted in agreement with donor in the UN | |

Table 2. Descriptive Statistics of Variables Used (USD, unless indicated otherwise)

| <i>Dependent variable</i> | | Number | Mean | Standard Deviation | Minimum | Maximum |
|-------------------------------------|-----------|--------|---------|--------------------|---------|---------|
| Net aid transfer per capita | All | 90516 | 2.39 | 42.89 | -137.56 | 9052 |
| | Non-zeros | 56264 | 3.84 | 54.35 | -137.56 | 9052 |
| | Positive | 53649 | 4.08 | 55.64 | 0.00 | 9052 |
| <i>Independent variables</i> | | | | | | |
| Gdplagged | | 67980 | 3900.02 | 3363.25 | 466.20 | 23266 |
| Population | | 103972 | 2.8mn | 11.8mn | 19700 | 1.3 bn |
| Pvdod, % goods and services exports | | 75592 | 181.02 | 328.95 | 0.00 | 6510 |
| Aidotherdonors | | 90516 | 32.49 | 108.02 | -129.23 | 9567 |
| Sumnetaidexo | | 90516 | 308.57 | 648.59 | -18.57 | 10399 |
| Laggedtrade, % of gdp | | 70621 | 2.20 | 12.22 | 0.00 | 1543 |
| CPIA | | 65252 | 3.46 | 0.88 | 0.72 | 6.00 |
| Multilateral debt share (%) | | 81114 | 32.63 | 23.62 | 0.00 | 100 |
| Bilateral debt share (%) | | 81114 | 38.30 | 23.12 | 0.00 | 100 |

Table 3. Basic Regression Results

| | base | Int gdp | Int pop | Int cpia | Int debt |
|--------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| gdplagged | -0.562** (0.043) | | -0.520** (0.043) | -0.693** (0.046) | -0.548** (0.044) |
| logpop | -0.892** (0.098) | -1.004** (0.12) | | -0.917** (0.1) | -0.891** (0.098) |
| cpia | 0.0856+ (0.045) | 0.0928* (0.044) | 0.121** (0.045) | | 0.0654 (0.045) |
| pvdod | -0.0019 (0.011) | -0.0072 (0.011) | 0.0156 (0.011) | 0.00492 (0.011) | |
| aidotherdonorsexo | 7.244** (1.14) | 6.052** (1.15) | 1.5 (1.19) | 5.609** (1.16) | 6.967** (1.15) |
| sumnetaidexo | -0.224** (0.047) | -0.226** (0.047) | -0.224** (0.047) | -0.224** (0.047) | -0.223** (0.047) |
| lagtrade_gdp | 12.27** (1.13) | 12.25** (1.13) | 11.56** (1.13) | 12.13** (1.13) | 12.21** (1.13) |
| multi_dod_ltdod | -0.576+ (0.34) | -0.967** (0.34) | 0.0147 (0.34) | -0.395 (0.34) | -0.554+ (0.34) |
| bilat_dod_ltdod | 0.0428 (0.27) | 0.244 (0.27) | 0.161 (0.27) | 0.0856 (0.27) | 0.108 (0.27) |
| friends | 0.105** (0.016) | 0.102** (0.02) | 0.105** (0.018) | 0.109** (0.017) | 0.104** (0.016) |
| coldum | 7.868** (0.9) | 7.865** (1.14) | 7.826** (0.97) | 7.840** (0.91) | 7.840** (0.9) |
| int1 | | -0.400** (0.051) | -1.279** (0.11) | -0.0655 (0.051) | -0.0685** (0.021) |
| int2 | | -0.542** (0.048) | 0.917** (0.11) | 0.244** (0.067) | 0.01 (0.012) |
| int3 | | -0.595** (0.044) | -0.635** (0.11) | 0.897** (0.11) | -0.00884 (0.03) |
| Constant | 12.35** (1.80) | 14.59** (2.24) | 17.91** (1.93) | 10.88** (1.93) | 12.43** (1.81) |
| Observations | 45731 | 45731 | 45731 | 45731 | 45731 |
| Number of donrecID | 2271 | 2271 | 2271 | 2271 | 2271 |

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| gdplagged | -0.562** (0.043) | -0.560** (0.043) | -0.562** (0.043) | -0.558** (0.043) | -0.557** (0.043) | -0.560** (0.043) | -0.558** (0.043) | -0.550** (0.043) | -0.548** (0.043) | -0.553** (0.043) | -0.553** (0.044) | -0.551** (0.044) | -0.548** (0.044) |
| logpop | -0.892** (0.098) | -0.919** (0.100) | -0.910** (0.098) | -0.917** (0.100) | -0.918** (0.100) | -0.912** (0.100) | -0.921** (0.10) | -0.924** (0.10) | -0.909** (0.100) | -0.931** (0.10) | -0.927** (0.10) | -0.930** (0.10) | -0.926** (0.10) |
| cpia | 0.0856+ (0.045) | 0.0813+ (0.045) | 0.0812+ (0.045) | 0.0799+ (0.045) | 0.0807+ (0.045) | 0.0813+ (0.045) | 0.0825+ (0.045) | 0.0778+ (0.045) | 0.0772+ (0.045) | 0.0735+ (0.045) | 0.0785+ (0.045) | 0.0774+ (0.045) | 0.0802+ (0.045) |
| pvdod | -0.00186 (0.011) | -0.00039 (0.011) | -0.00030 (0.011) | -0.00029 (0.011) | -0.00026 (0.011) | -0.00055 (0.011) | 0.00129 (0.011) | 0.00155 (0.011) | 0.00228 (0.011) | -0.00003 (0.011) | 0.000706 (0.011) | 0.00133 (0.011) | 0.00447 (0.011) |
| aidotherdonorsexo | 7.244** (1.14) | 6.948** (1.15) | 6.920** (1.15) | 6.993** (1.15) | 6.966** (1.15) | 6.963** (1.15) | 6.845** (1.15) | 7.006** (1.15) | 6.831** (1.15) | 6.923** (1.15) | 6.974** (1.15) | 6.962** (1.15) | 6.861** (1.15) |
| sumnetaidexo | -0.224** (0.047) | -0.224** (0.047) | -0.224** (0.047) | -0.224** (0.047) | -0.224** (0.047) | -0.224** (0.047) | -0.224** (0.047) | -0.225** (0.047) | -0.224** (0.047) | -0.225** (0.047) | -0.225** (0.047) | -0.225** (0.047) | -0.225** (0.047) |
| lagtrade_gdp | 12.27** (1.13) | 12.24** (1.13) | 12.22** (1.13) | 12.24** (1.13) | 12.25** (1.13) | 12.23** (1.13) | 12.25** (1.13) | 12.25** (1.13) | 12.21** (1.13) | 12.22** (1.13) | 12.23** (1.13) | 12.26** (1.13) | 12.24** (1.13) |
| multi_dod_ltdod | -0.576+ (0.34) | -0.871* (0.35) | -0.870* (0.35) | -0.857* (0.35) | -0.856* (0.35) | -0.870* (0.35) | -0.862* (0.35) | -0.782* (0.34) | -0.771* (0.34) | -0.808* (0.34) | -0.810* (0.34) | -0.779* (0.34) | -0.786* (0.35) |
| bilat_dod_ltdod | 0.0428 (0.27) | 0.0882 (0.27) | 0.0612 (0.27) | 0.0867 (0.27) | 0.0934 (0.27) | 0.0838 (0.27) | 0.148 (0.27) | 0.0802 (0.27) | 0.0629 (0.27) | 0.106 (0.27) | 0.0828 (0.27) | 0.0902 (0.27) | 0.174 (0.27) |
| friends | 0.105** (0.016) | 0.105** (0.017) | 0.107** (0.017) | 0.105** (0.017) | 0.104** (0.017) | 0.106** (0.017) | 0.105** (0.017) | 0.106** (0.017) | 0.106** (0.017) | 0.105** (0.017) | 0.106** (0.017) | 0.104** (0.017) | 0.106** (0.017) |
| coldum | 7.868** (0.90) | 7.865** (0.92) | 7.856** (0.90) | 7.863** (0.92) | 7.882** (0.92) | 7.869** (0.92) | 7.861** (0.92) | 7.838** (0.95) | 7.840** (0.92) | 7.844** (0.95) | 7.843** (0.95) | 7.852** (0.96) | 7.833** (0.94) |
| prsp | | 0.605** (0.16) | 0.151 (0.27) | -1.187 (1.71) | 0.515+ (0.26) | 1.843 (2.25) | 3.149* (1.46) | | | | | | |
| hipc | | | | | | | | 0.503** (0.15) | -0.0621 (0.25) | -2.549+ (1.44) | 0.799** (0.28) | -0.912 (2.26) | 4.414** (1.54) |
| *gdp | | | 0.261* (0.12) | | | | | | 0.412** (0.14) | | | | |
| *cpia | | | | 0.513 (0.49) | | | | | | 0.900* (0.42) | | | |
| *pvdod | | | | | 0.0437 (0.10) | | | | | | -0.106 (0.085) | | |
| *log(pop- | | | | | | -0.0761 (0.14) | | | | | | 0.0873 (0.14) | |
| *multi debt | | | | | | | -2.366 (1.53) | | | | | | -3.820* (1.61) |
| *bilat debt | | | | | | | -3.446* (1.73) | | | | | | -4.686** (1.74) |
| Constant | 12.35** (1.80) | 12.80** (1.83) | 12.27** (1.80) | 12.42** (1.83) | 12.83** (1.84) | 12.34** (1.83) | 12.80** (1.84) | 12.49** (1.87) | 12.24** (1.83) | 12.63** (1.88) | 12.56** (1.87) | 12.98** (1.90) | 12.47** (1.87) |
| Observations | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 | 45731 |
| Number of donrecID | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 | 2271 |

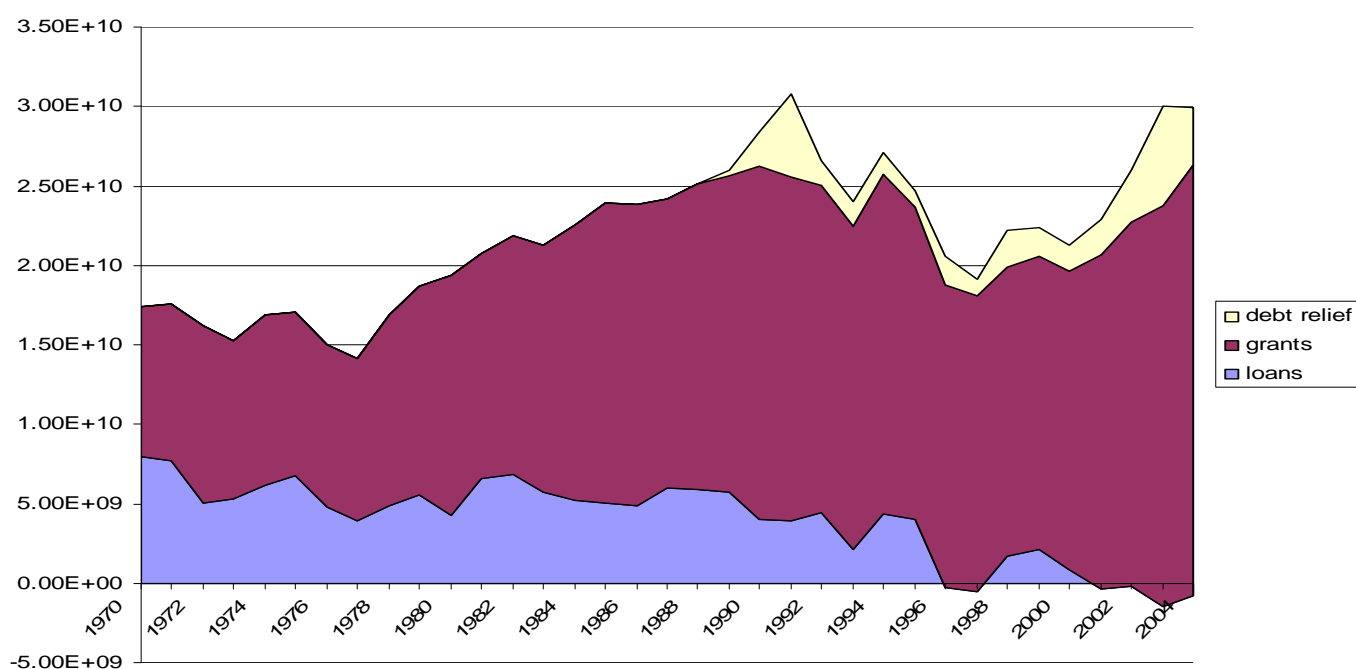
Table 5. Donor Specific Sensitivities With Respect to Country Variables
(Average three periods; data are sort by the sensitivity w.r.t. CPIA)

| | GDP | GPIA | POP | PVDOD |
|----------------|-------|-------|-------|-------|
| United States | -3.34 | -0.59 | -1.7 | 0.21 |
| Italy | 0.29 | -0.21 | -2.4 | 0.1 |
| Luxembourg | -0.46 | -0.04 | -1.37 | -0.02 |
| New Zealand | 0.06 | 0.22 | -1.49 | -0.02 |
| Norway | -0.51 | 0.24 | -1.56 | 0.03 |
| Finland | -0.06 | 0.25 | -1.52 | 0.02 |
| Austria | -0.13 | 0.25 | -3.03 | -0.05 |
| Netherlands | -0.02 | 0.27 | -2.75 | -0.04 |
| Sweden | -0.44 | 0.31 | -1.7 | 0.06 |
| Canada | -0.74 | 0.33 | -2.71 | -0.08 |
| France | -1.32 | 0.34 | -3.01 | -0.29 |
| Ireland | 0.02 | 0.34 | -1.52 | -0.03 |
| Switzerland | -0.09 | 0.35 | -1.53 | 0 |
| Greece | 0.2 | 0.43 | -1.55 | -0.07 |
| Denmark | -0.15 | 0.47 | -1.53 | -0.01 |
| Japan | 0.65 | 0.51 | -2.79 | 0.05 |
| Portugal | 0.12 | 0.51 | -2.7 | -0.04 |
| Belgium | -0.47 | 0.65 | -2.66 | -0.24 |
| Australia | -0.31 | 0.66 | -3.13 | -0.03 |
| Germany | -0.76 | 0.72 | -2.93 | -0.17 |
| Spain | -0.28 | 0.82 | -1.61 | 0.05 |
| United Kingdom | -2.19 | 0.91 | -3.38 | -0.16 |

Table 6. Average Sensitivity

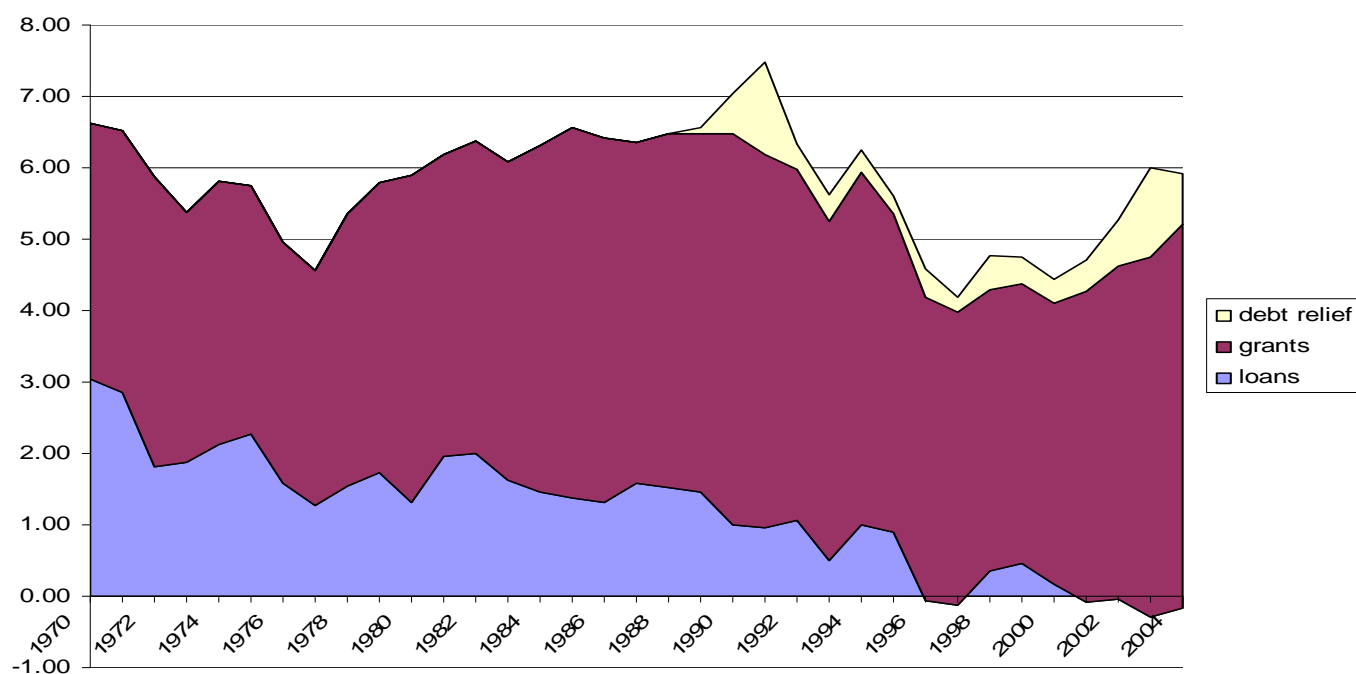
| Period | GDP | CPIA | POP | DOD |
|---------|--------|--------|--------|--------|
| pre 90 | -0.348 | -0.076 | -2.554 | -0.077 |
| 90-99 | -0.474 | 0.220 | -2.191 | -0.006 |
| post 99 | -0.518 | 0.876 | -1.929 | -0.013 |

Figure 1. Bilateral Net ODA Transfers (1970-2004; USD at constant prices).



Source: author's calculations based on DAC on-line CRS data.

Figure 2. Recipient Country Per Capita Bilateral Net ODA Transfers to Developing Countries (1970-2004; USD at constant prices).



Source: author's calculations based on DAC on-line CRS data and World Bank WDI population figures.

Figure 3. Evolution of Responsiveness of Aid to Countries' Income

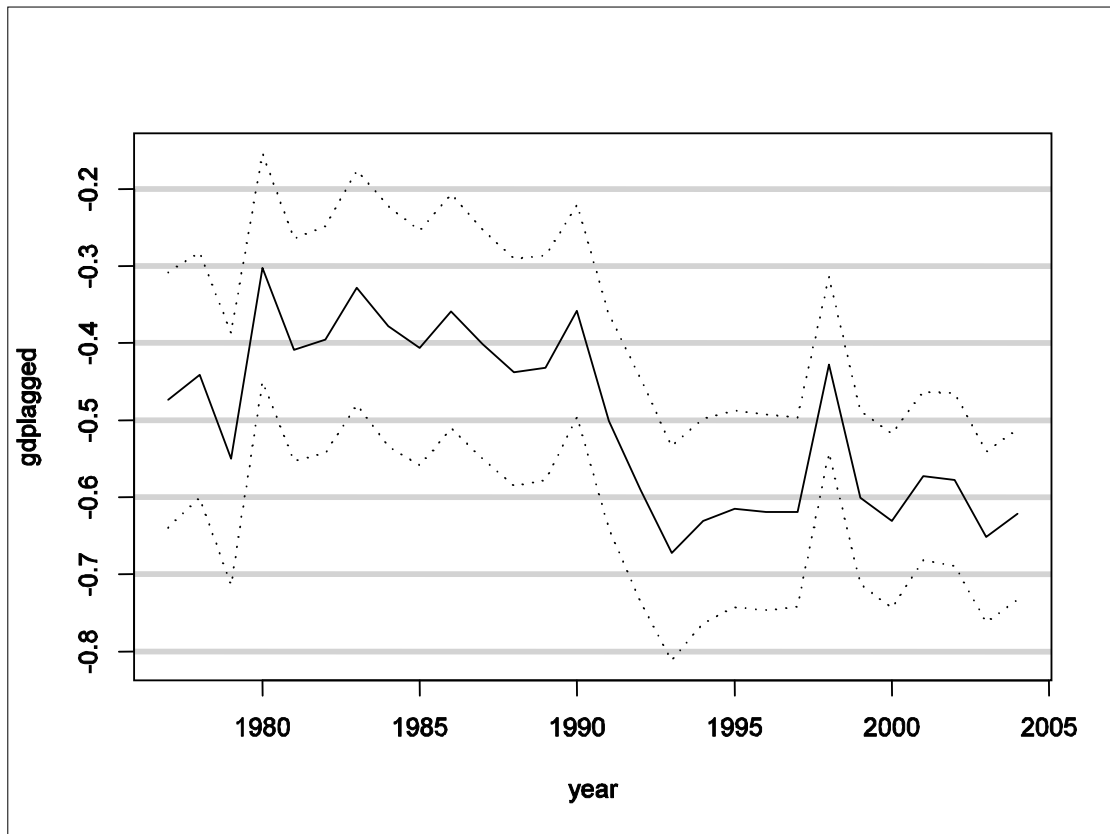


Figure 4. Evolution of Responsiveness of Aid to Countries' Population

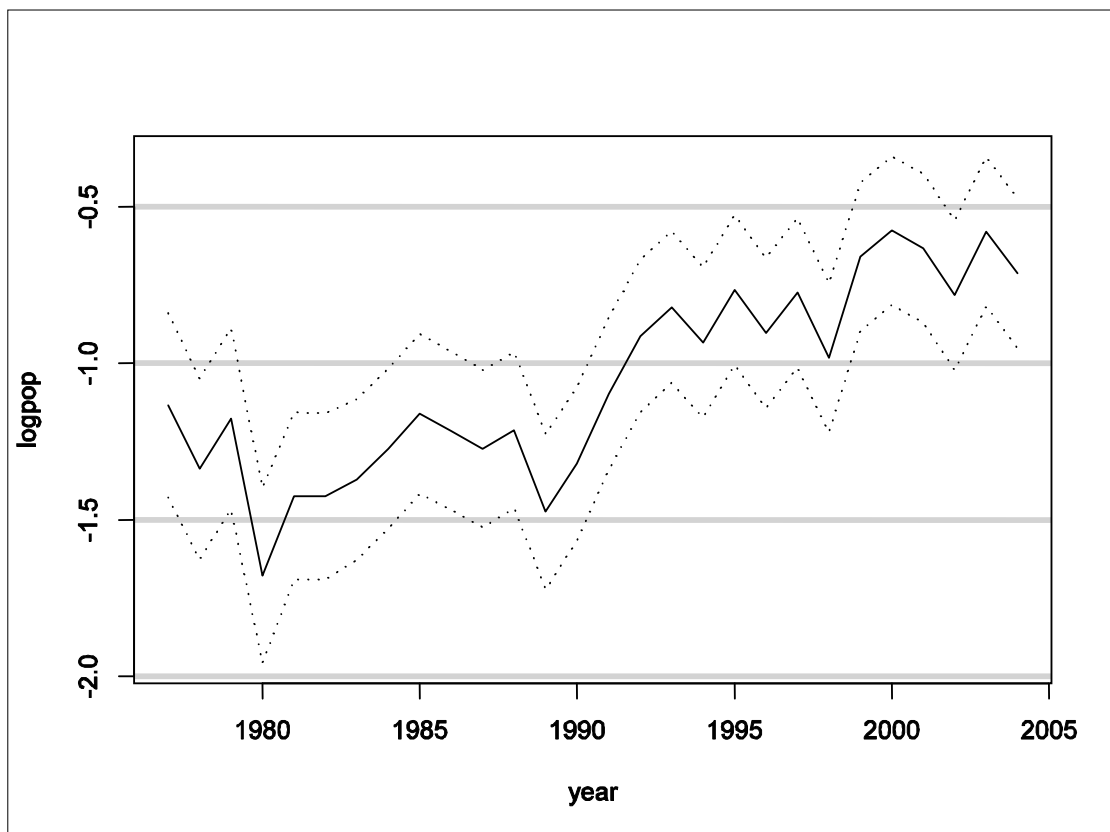


Figure 5. Evolution of Responsiveness of Aid to Countries' Policy



Figure 6. Evolution of Responsiveness of Aid to Countries' Debt

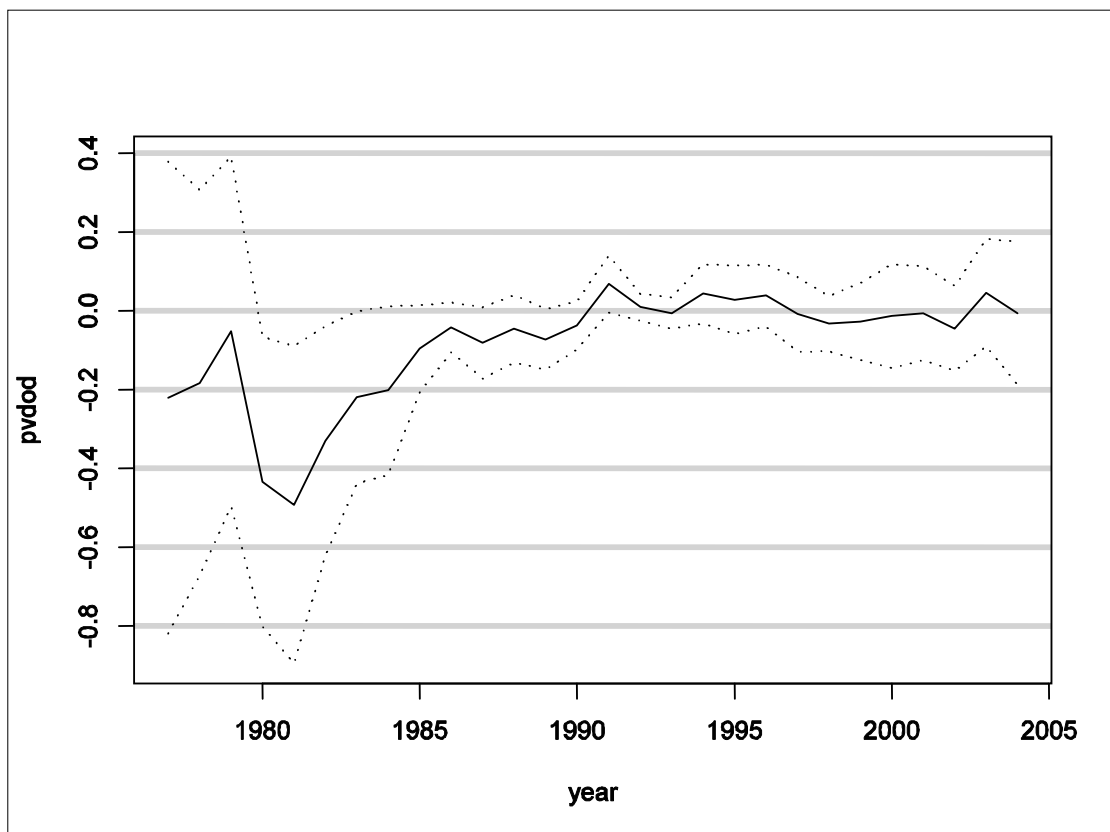


Figure 7. Evolution of Responsiveness of Aid to Colonial Linkages.



Figure 8. Evolution of Responsiveness of Aid to Geopolitical Linkages

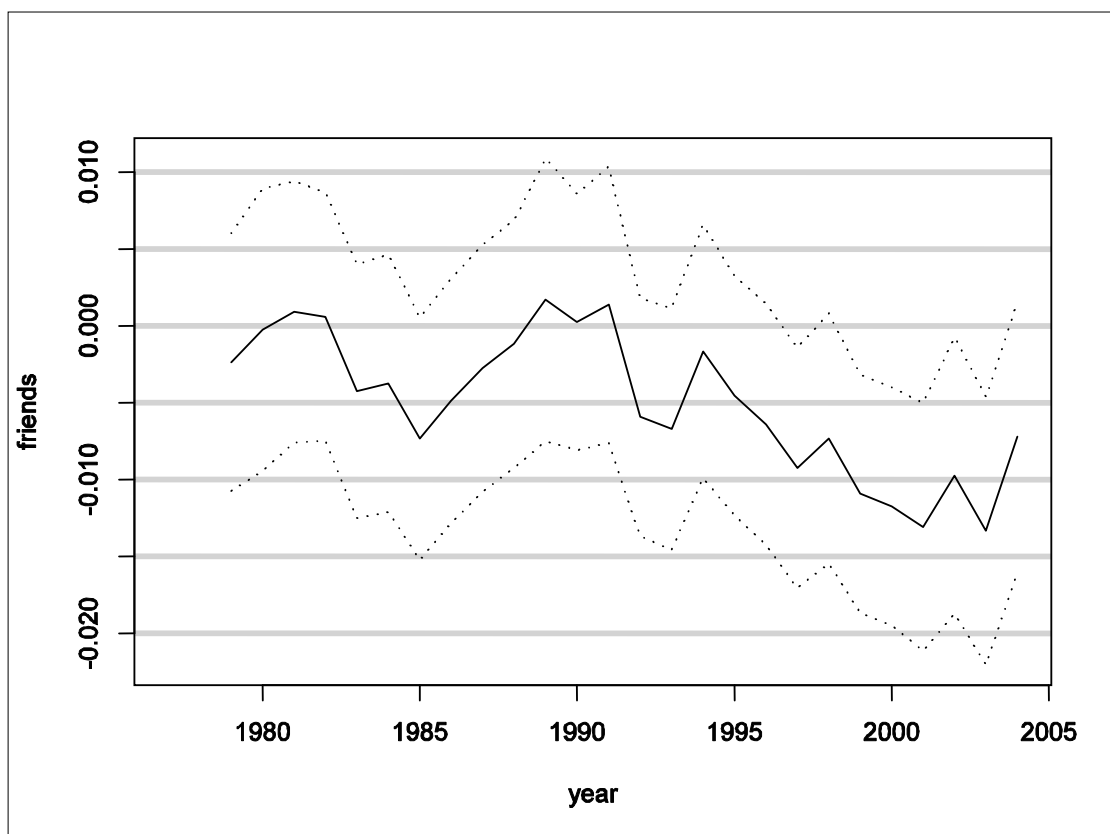


Figure 9a. Time-Varying, Donor-Specific Sensitivities for CPIA

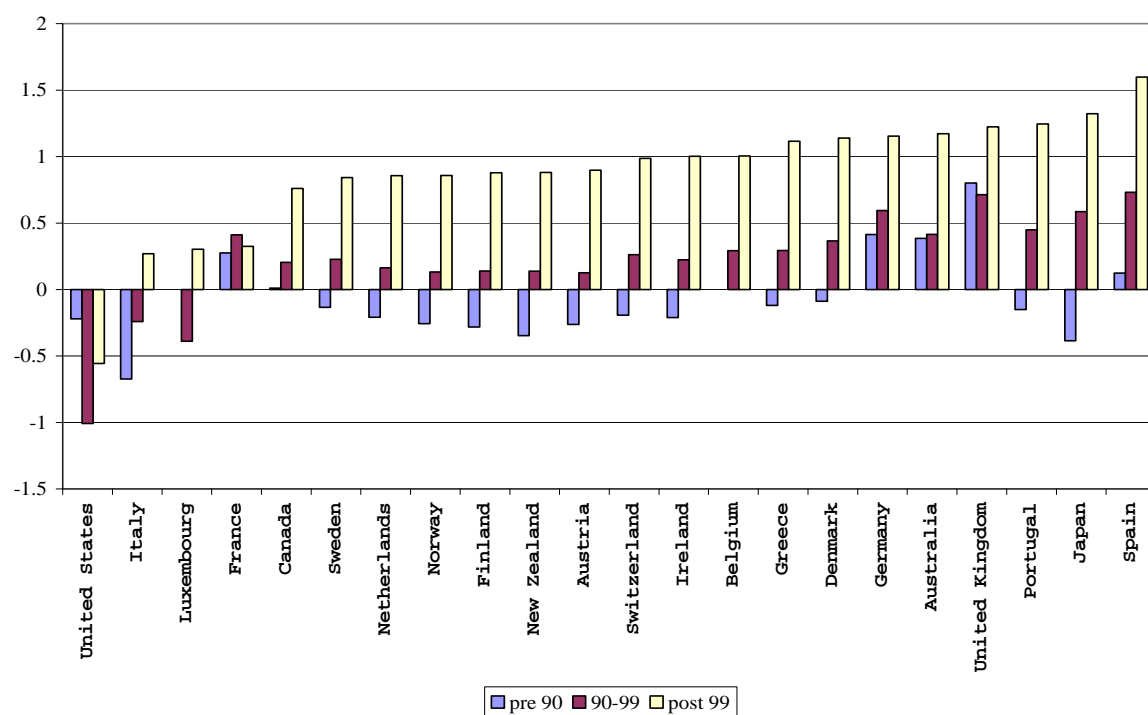


Figure 9b. Time-Varying, Donor-Specific Sensitivities for GDP

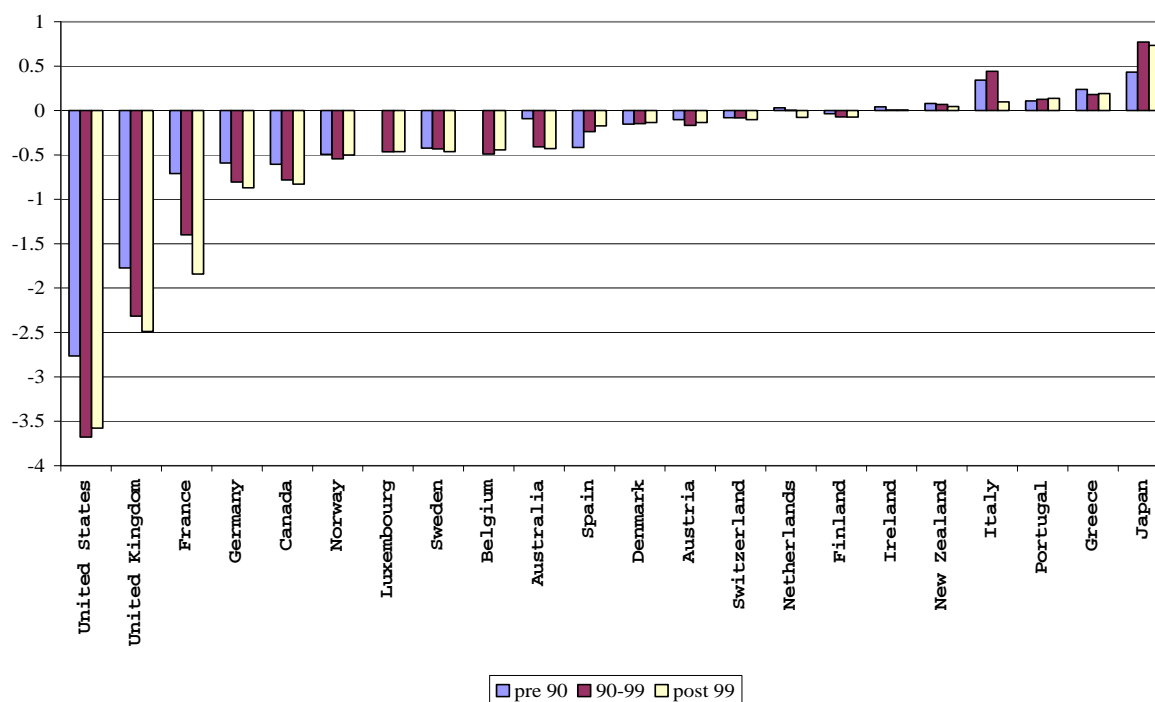


Figure 9c. Time-Varying, Donor-Specific Sensitivities for POP

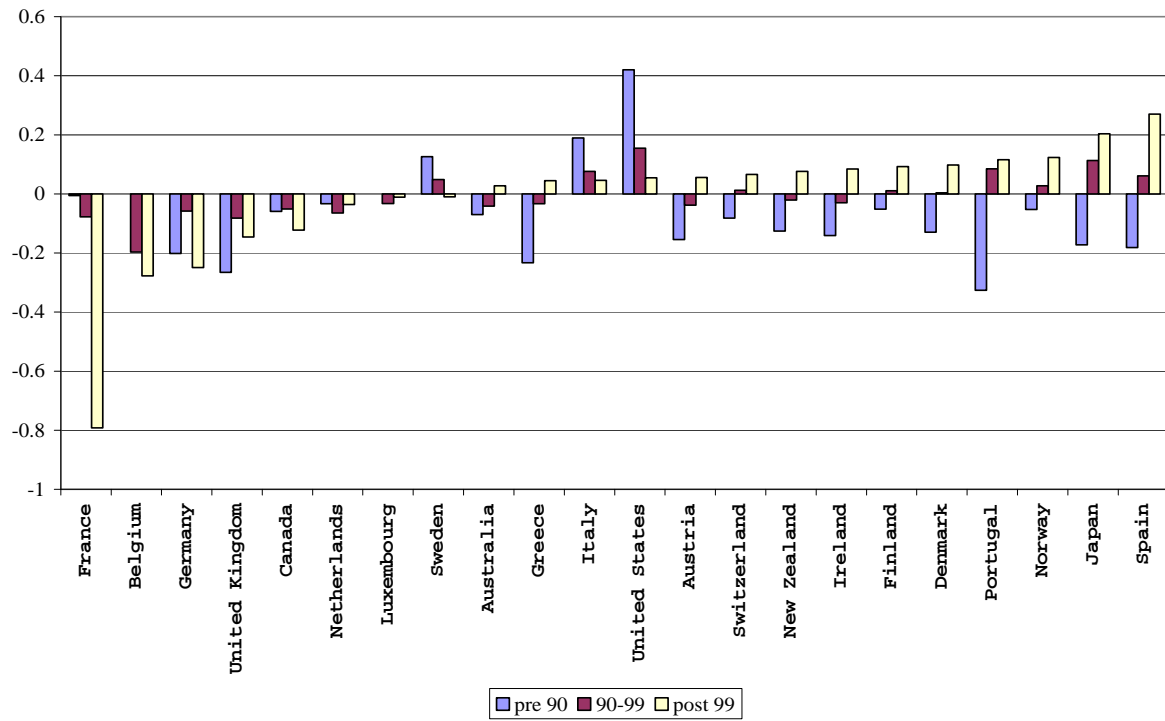


Figure 9d. Time-Varying, Donor-Specific Sensitivities for DOD

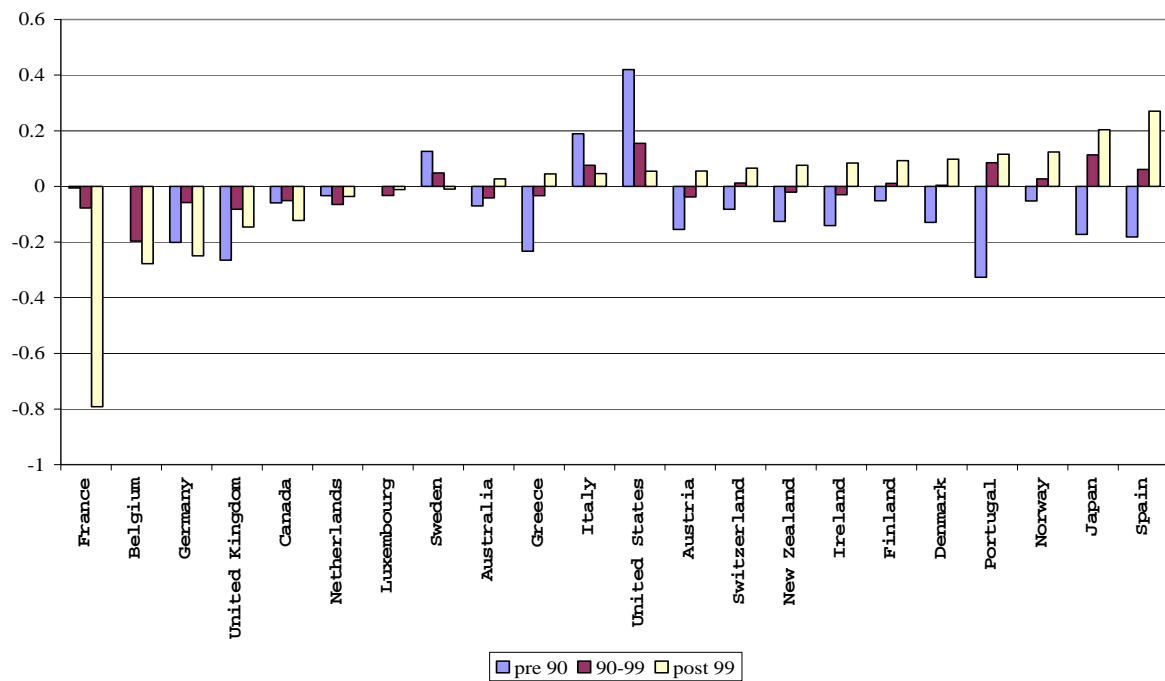


Figure 10. Relationship between KKM Voice and Accountability and the CGD CDI Aid Index

