THE POLITICAL ECONOMY OF FOREIGN AID

ALLOCATION, TIMING, AND EFFECTIVENESS

Dissertation

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Vera Z. Eichenauer
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BETREUER DER DISSERTATION

Prof. Dr. Axel Dreher

Chair of International Economics
and Development Politics
Alfred-Weber-Institute for Economics
Heidelberg University

"The master-economist must possess a rare combination of gifts... He must be mathematician, historian, statesman, philosopher – in some degree. He must understand symbols and speak in words. He must contemplate the particular, in terms of the general, and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purpose of the future. No part of a man's nature or his institutions must be entirely outside his regard. He must be purposeful and disinterested in a simultaneous mood, as aloof and incorruptible as an artist, yet sometimes as near to earth as a politician."

— John Maynard Keynes

Acknowledgments

Pursuing PhD studies and finishing a dissertation in economics was not a foreseeable journey for me, but an adventure that ended formidably. After undergraduate studies in qualitative Sociology at the University of Fribourg in Switzerland, and graduate studies in International Economic Relations at Sciences Po Paris in France, I started my PhD studies at the University of Zurich with Bruno S. Frey. In inspiring discussions, he encouraged the application of the analytical tools of (behavioral) economics to any type of event. He also generously supported my first steps in the academic world of economics, not least by enabling me to participate in many seminars and workshops. The journey continued at the Chair of Axel Dreher at Heidelberg University and, for an intense period of PhD courses, at the University of Mannheim. Much credit and thanks goes to my thesis supervisor Axel Dreher. Most importantly, his door was always open and his scholarly advice always available. At Heidelberg University, he created a research environment that allowed me as an aspiring applied economist interested in foreign aid and International Political Economy to thrive – both professionally as well as socially. By co-authoring my first paper (Chapter 4 of this thesis), Axel Dreher taught me a wealth of skills. He continuously insisted on and demonstrated the value of carefully crafted research. I also thank him for supporting and challenging me during all stages of my PhD journey, including those that felt like steering through thick fog. Finally, he never forgot to remind us PhD students that research ideas are often generated at conference dinners and that research findings may find their best interpretation over coffee. This reminded me of what I learned in Sociology of Science as an undergraduate student: The creative part of knowledge production takes place (mostly) in places other than the office or laboratory.

Stimulating research discussion and productive academic exchanges with senior and junior scholars were frequent during my PhD studies. I had the fantastic opportunity to participate in many academic gatherings, small and large, close and far, all of them invaluable in (re-)fueling my passion for research, inspiring me through the breadth of topics studied and the rigor and depth of analysis. The opportunity to join academic debates as a junior scholar cannot be taken for granted and I am grateful to Bernhard

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Vera Z. Eichenauer, Heidelberg, September 2016

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The Politics of Special Purpose Trust Funds

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December Fever in Public Finance

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Poverty and Policy Selectivity of World Bank Trust Funds

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Geopolitics, Aid and Growth

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Acronyms

BETF	Bank-executed trust funds
CIA	Central Intelligence Agency
CPIA	Country Policy and Institutional Assessments
DAC	Development Assistance Committee
EU	European Union
FDI	Foreign Direct Investment
FIFs	Financial Intermediary Funds
FQ	fiscal quarter
FY	fiscal year
GDP	Gross Domestic Product
GFATM	Global Fund to Fight Aids, Tuberculosis and Malaria
GNI	Gross National Income
HIPC	Heavily-Indebted Poor Country
IBRD	International Bank for Reconstruction and Development
ICRG	International Country Risk Guide
IDA	International Development Association
IEG	International Evaluation Group
IFC	International Finance Corporation
IMF	International Monetary Fund
IT	information technology
MDBs	multilateral development banks

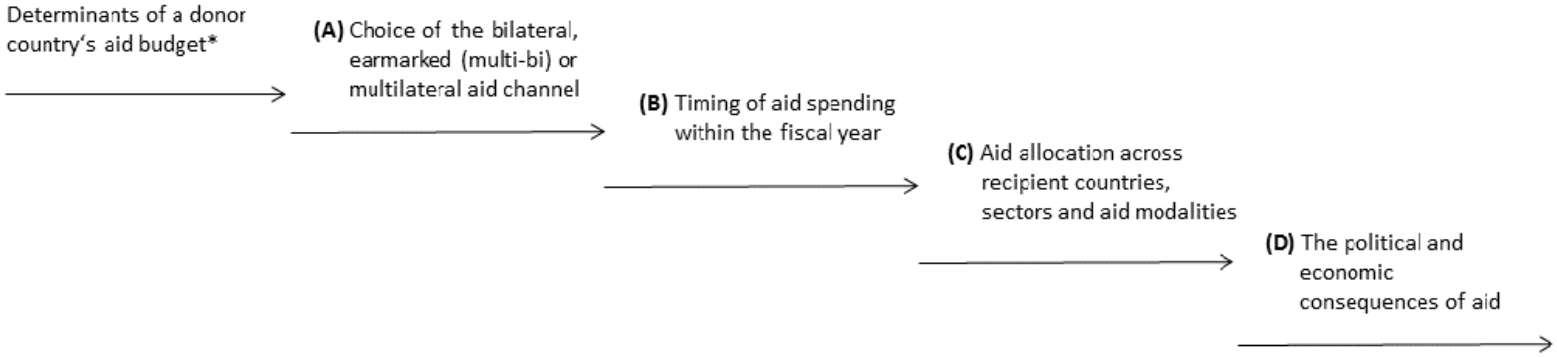
MOPAN	Multilateral Organization Performance Assessment Network
NGOs	non-governmental organizations
ODA	Official Development Aid
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
PRSP	Poverty Reduction Strategy Papers
RETF	recipient-executed trust funds
SPTF	special purpose trust funds
UN	United Nations
UNDP	United Nations Development Programme
UNGA	United Nations General Assembly
UNSC	United Nations Security Council
US	United States of America
WBFY	World Bank fiscal year
WGI	World Governance Indicators
YESS	year-end spending spikes

Introduction

This thesis consists of four essays on the political economy of foreign aid. These essays cover issues related to the allocation, the timing, and the economic consequences of foreign aid for recipient countries (Figure I). Elevating the living standards, capabilities, and dignity of the poorest people of the world and enabling poor countries to increasing the quality of life of their population remain among the most pressing challenges in the world today. Despite the increasing importance of private financial flows to developing countries, (monetary) assistance by governments of, mainly richer, countries remains a popular instrument for supporting financially poor people and countries. The bulk of these aid flows has been and is provided by member states of the Organisation for Economic Cooperation and Development (OECD). The OECD's Development Assistance Committee (DAC) defines what can be counted as Official Development Aid (ODA) and gathers information on these flows. The information collected by the OECD is the main data source used by academics to study aid allocation and performance.

Given the scarcity of public resources and the enormous challenges in developing countries, the effectiveness of development assistance is a topic of great public interest and academic inquiry alike. While much of the public debate takes it for granted that more funds lead to more development, skepticism is widespread among academic economists and political scientists. The debate runs from the macro level – can foreign assistance eliminate extreme poverty and trigger growth – to the micro level – was a specific project effective? The methodological challenges for the identification of causal effects associated with each of the different levels of analysis and their respective ability to create actionable knowledge for policy makers and aid organizations are too numerous to discuss here. It is up to researchers (and practitioners) to overcome these problems and seek to understand how and why development works if aid is to be justifiably used as one means to address poverty globally.

Figure I: The different stages of the aid disbursement cycle and the corresponding chapters in this thesis



(A) **Chapter 1**: *The Politics of Special Purpose Trust Funds* (2015, joint with Simon Hug) proposes a principal-agent model to understand the trade-offs faced by donors when choosing between bilateral, earmarked and multilateral aid.

(B) **Chapter 2**: *December Fever in Public Finance* (2016) analyzes earmarked aid spending at the end of donor countries' fiscal years.

(C) **Chapter 3**: *The Poverty and Policy Selectivity of World Bank Trust Funds* (2016, joint with Stephen Knack) compares the complementarity between the allocation of earmarked funds at the World Bank with the International Development Association's concessional lending.**

(D) **Chapter 4**: *Geopolitics, Aid and Growth* (2016, joint with Axel Dreher and Kai Gehring) shows that politically motivated aid is less effective.

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* *The Use of Multi-bi Aid by France in Comparison with Other Donors Countries* (2015, joint with Bernhard Reinsberg) looks at determinants of aid budgets in donor countries while *The Rise of Multi-bi Aid and the Proliferation of Trust funds* (2015, joint with Bernhard Reinsberg and Katharina Michaelowa) describes the change in the funding mechanisms of international organizations and places the rise of earmarked aid in the context of the aid effectiveness debate.

** The political economy of trust fund allocation is studied in more detail in *'Bilateralizing' multilateral aid? Aid Allocation by World Bank Trust Funds* (2015, joint with Stephen Knack).

Notes: This representation of the foreign aid disbursement cycle is simplified and displays the stages of the cycle relevant for this thesis. Notable omissions are the differences between the allocation of the foreign aid budget across donor countries' ministries and the distinction between the commitment and the disbursement stage. Moreover, the aid disbursement process is nested; some decisions in the aid disbursement cycle are made simultaneously, notably (A), (B) and (C), and thus may influence each other.

Applied economists are often required to strike a balance between relevance and methodological rigor when analyzing development processes and other complex social and economic interactions. Applied economists should neither let methodology determine the research question nor should they use relevance as a justification for not applying the most stringent methods available. Over the last decade, the emphasis on rigor has increased in applied economics and at least since Angrist and Pischke (2010) proclaimed "the credibility revolution in empirical economics," the most credible identification strategies (or 'research designs') have required that variation in the data be as good as randomly assigned. This led to a rise in popularity of natural (e.g., Rosenzweig and Wolpin 2000; Angrist and Krueger 2001), field (e.g., Duflo et al. 2007; Levitt and List 2009) and laboratory (quasi-) experiments (e.g., Kahneman and Smith 2002; Croson and Gächter 2010), which allow for a causal interpretation of relationships between two variables.

The designation of experiments, by some, as superior tool of knowledge creation (i.e.m the 'gold standard') has provoked heated debates in the blogosphere and among academic economists, particularly in the field of development economics. Among the most vociferous critics of the general superiority of experiments are Nobel Prize winner Angus Deaton (e.g., Deaton 2009) and, mostly on randomized controlled trials, Lant Pritchett (e.g., Pritchett 2015). Allegedly, researchers make causal claims about complex socio-economic problems without understanding the mechanisms at work just because the experimental methods suggest causal interpretation is in principle possible. What is more, the search for random or exogenous variation has driven some researchers to (implicitly) let the available estimator determine the parameter of interest, thus limiting research to marginal questions. Even if the research questions they pose are important, some of these (quasi-) experimental methods risk leading to a policy-irrelevant focus on marginal cases for which causal inference is possible. The temporary conclusion that can be drawn from this debate is that most economists welcome the increasing methodological rigor associated with the 'credibility revolution' and acknowledge a role for experiments in economic research, especially for the evaluation of interventions, but fight the claim of their superiority in all circumstances.

The credibility revolution in economics was pioneered in applied microeconomics, a field which is concerned with individuals' (economic) decision-making. Despite this, the causality discourse has also influenced which research is considered the most credible in the field of international political economy, which studies aggregate outcomes and institutions. Satisfying the standards of causality is particularly challenging for scholars interested in comparative research on institutions and events that are few in numbers. What is more, institutions often emerge slowly and institutional changes are policy responses to social and economic problems, making them endogenous to many outcomes of interest. In

my dissertation, I have aimed to combine my desire to improve our understanding of interesting and important macro-economic questions about institutions with the most rigorous analytical methods available to study them.

The four chapters in this thesis take an (international) political economy view on of stages of the foreign aid disbursement cycle as illustrated in Figure I: the motives for using different types of foreign aid (Chapter 1), the timing of spending within a donor country's fiscal year (Chapter 2), the complementarity between aid channels (Chapter 3), and the consequences of political motives for effectiveness of foreign aid (Chapter 4). The political economy lens focuses on the ways in which politics and institutions shape the distribution of resources and influence their efficiency and effectiveness. This thesis contributes to the literatures on foreign aid allocation and aid effectiveness within the field of development economics, to the branch of research evaluating the effects of institutions on fiscal performance within the field of public finance, and to the literature on the role of multilateral organizations in the international political economy.

Chapter 1 – Chapter 3 consider donor countries' motives for the use of different aid channels. Specifically, these chapters investigate questions raised by the changes in the funding mechanisms of multilateral organizations over the last two decades (Figure II). Until recently, academic research has been silent on the rise in earmarked aid provided to multilateral organizations although this is widely discussed in aid agencies. This "academic silence" is in contrast to the academic reflection of policy debates about aid effectiveness triggered by the Millennium Development Goals or the new principles developed around the Paris Declaration. Jointly with Bernhard Reinsberg's (2016b) thesis and Bernhard's and my work with several co-authors, the papers in these chapters are thus the foundation of a new sub-strand in the literature on foreign aid. Earmarked aid is also referred to as 'multi-bi' aid because it is a hybrid between the bilateral and multilateral aid channels. Given the absence of previous research on multi-bi aid, field work and exchanges with staff at international organizations and donors' aid agencies proved essential for better understanding the rise of earmarked aid. In the research project on *The Proliferation of Multilateral Funds*, we conceptualize earmarked aid from the perspective of multilateral organizations (Reinsberg et al. 2015) and with Eichenauer and Reinsberg (2017) we make a new dataset on multi-bi aid available to the research community.

Traditionally, donor countries faced the choice between two channels for ODA-spending, namely the bilateral and the multilateral channel. Donors now increasingly use a hybrid of the two: multi-bi aid, which provides funds to a multilateral development organization for implementation but restricts the use of these funds to specific areas. Given these earmarks by donor countries, the governance body of the multilateral organization receiving the funds has no authority over the allocation of these resources but is merely

the implementing agent. This distinguishes multi-bi aid from traditional 'core' funding to multilateral organizations that is allocated at the discretion of the multilateral organization. An additional difference is that multi-bi contributions are voluntary in nature and thus offer more flexibility to donor governments. Figure III illustrates the differences among the three channels for aid.

When defining multi-bi aid from the perspective of the multilateral implementing organization, Reinsberg et al. (2015) distinguish between 'direct' and 'indirect' multi-bi aid. Direct multi-bi aid (marked by an asterisk in Figure III)is held by the receiving multilateral organization in trust funds, which are based on a contract between the organization and the donor(s). This contract determines the trust fund's purpose and the decision-making rule for the allocation of trust fund aid to projects that the multilateral organization subsequently implements. Individual trust funds may hold small amounts but they are numerous. For example, the World Bank managed more than 900 active trust funds in June 2013 (World Bank 2013). In contrast, indirect multi-bi aid (marked by two asterisks in Figure III) is channeled to multilateral organizations via 'pass-through' multilaterals, which are limited in number to a few dozen. Pass-through multilaterals tend to have narrow thematic or regional mandates and have no implementing capacities of their own. Multilateral organizations implement the projects funded by donors via pass-through multilaterals. In summary, the main distinction between indirect and direct aid is the 'detour' via a pass-through multilateral in indirect aid (for a detailed discussion see Reinsberg et al. 2015). Despite the best efforts of my co-authors and myself, causality cannot be established for some of the results on earmarked aid (Chapter 1 – Chapter 3). However, the academic and policy interest in the data and in the research findings about multi-bi aid at conferences indicate their relevance and stimulating impact on the discussions in the respective communities. Using a political economy perspective on foreign aid and a large literature in economics and political science discussed below, the first three chapters all address the role of politics and institutional rules in shaping the allocation of earmarked aid. Specifically, earmarked aid is related to donor countries' desire to delegate implementation and responsiblity while keeping control over the allocation of their foreign aid. Foreign aid is considered one of the most powerful political and strategic instruments in international relations.

Figure II: Multi-bi aid over time (1990-2012)

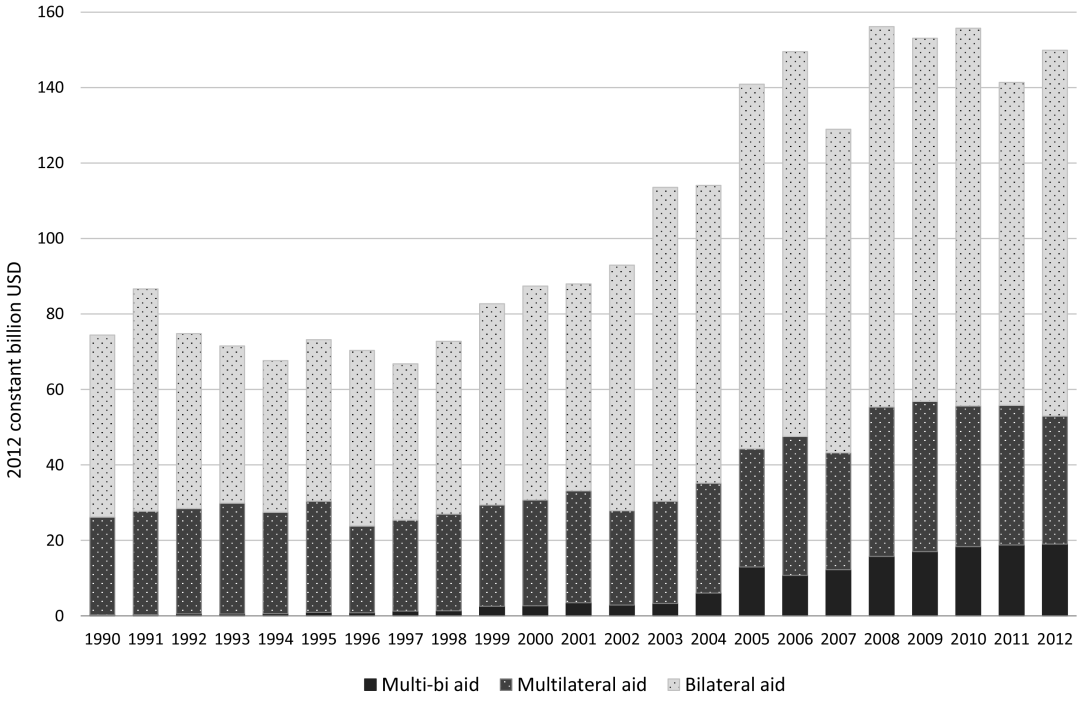
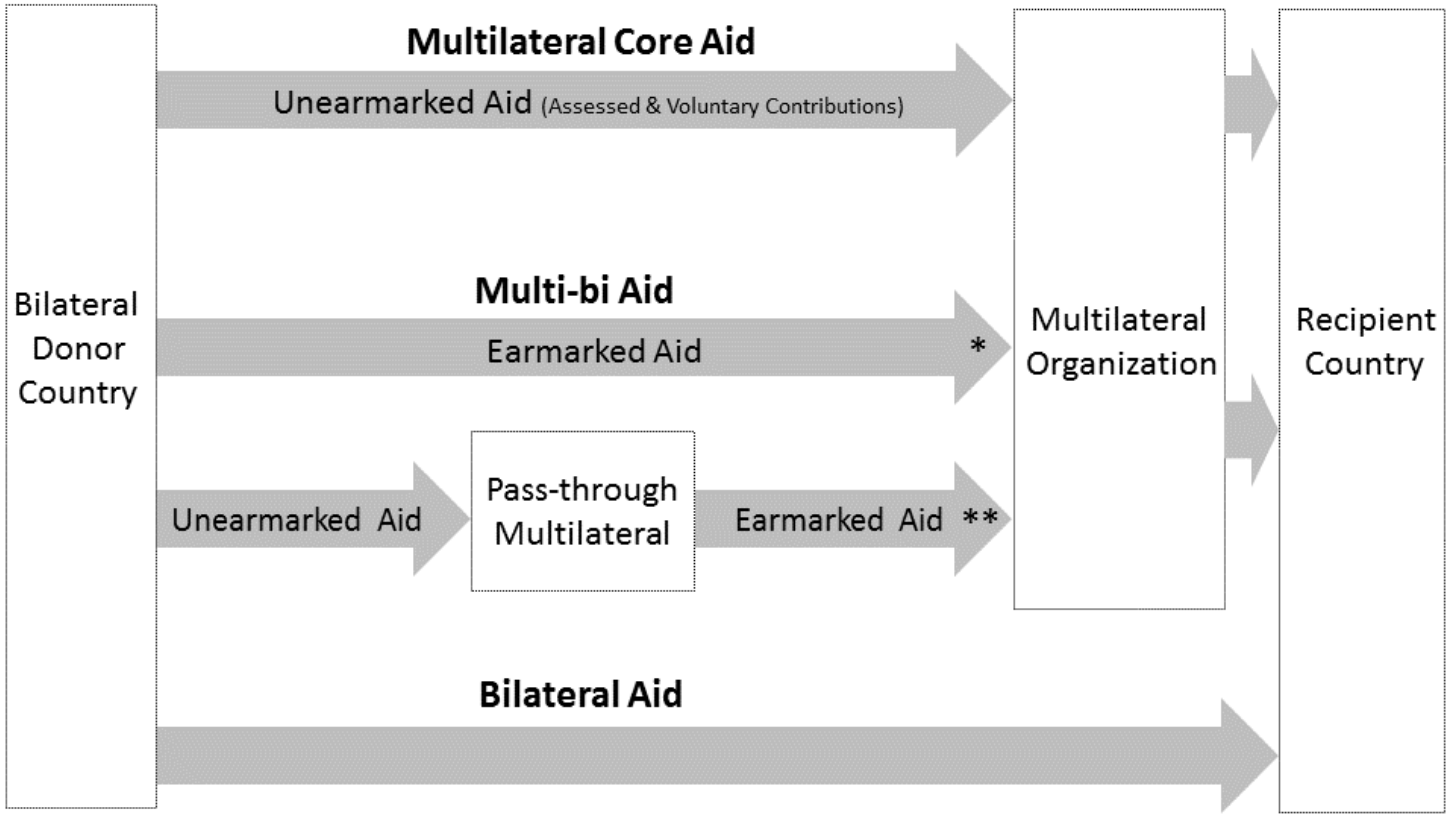


Figure III: Bilateral, multilateral and multi-bi aid



Notes: When multi-bi aid is defined from the perspective of the multilateral organization,
* represents 'direct' multi-bi aid while
** represents 'indirect' multi-bi aid that is channeled via a 'pass-through' multilateral to the multilateral organisation.

The last chapter of this thesis examines whether the political motives underlying (the allocation of) aid has opportunity costs. Acknowledging the crowdedness of the literature on the aid-and-growth relationship, my co-authors and I chose to rely on specifications from the most widely-cited papers in the aid effectiveness literature. We extend their data to provide a rigorous causal analysis of the consequences of (short-term) political motives for aid effectiveness. Aggregated ODA flows are used in this last chapter because of the lack of long time series on multi-bi aid.

Besides the conceptualization and description of (the evolution of) the new phenomenon of earmarked aid, an essential part of 'frontier' research such as on earmarked aid is to identify the most relevant structures, actors, and interactions.

Chapter 1: The Politics of Special Purpose Trust Funds

In *The Politics of Special Purpose Trust Funds* in Chapter 1, Simon Hug and I offer such a framework by proposing a formal principal-agent model that focuses on essential interactions between donor countries and a multilateral organization. This allows us to investigate some of the incentives underlying the recent shift towards country- and issue-specific earmarked funding and the potential consequences thereof. Our game-theoretic model features multiple principals and a multilateral agent. This allows studying how the interaction between donor preferences, voter concerns and special interest groups in the donor country, the voting rules at the multilateral organization, and the presence of special purpose trust funds influence aid allocation. Donor countries pay their (fixed) membership fee to the multilateral organization and then choose how to spend the remainder of their (fixed) aid budget: as bilateral aid, (direct) multi-bi aid, or voluntary multilateral core contributions.[1] An important feature of the model is the assumption that earmarked aid is less effective than multilateral aid because, by definition, earmarking restricts the re-allocation of aid to the most effective project. This inhibits flexible adjustments when new information appears. Donors accept this cost associated with earmaking as they gain the ability to steer the multilateral organization to implement projects in their preferred sector or country.

We show that multilateral organizations with majority rules are more likely to receive discretion and thus voluntary core contributions than those with unanimity requirements. The introduction of earmarking as possibility decreases donors' contributions to the multilateral's discretionary core budget as well as bilateral aid provision. In contrast to much of the literature dealing with issues of delegation in bi- and multilateral aid, our model suggests non-monotonic effects of donors' preference heterogeneity among donor countries on aid allocation decisions. This result is obtained for some parameter combinations

[1]The term special purpose trust funds as understood in this chapter applies both to trust funds (direct multi-bi aid) and large pass-through multilaterals (indirect multi-bi aid).

when SPTFs are an option and are due to the trade-off between effectiveness and control. We provide evidence suggestive of the empirical importance of the theoretically derived implications. Specifically, we find the expected positive relationship between increased preference heterogeneity among donor countries and the level of voluntary core funding. We also find that better-evaluated multilateral agencies attract more multi-bi aid and we find support for the implied positive relationship between bilateral aid and the public's opinion about the merits of bilateral aid.

Chapter 2: December Fever in Public Finance

In *December Fever in Public Finance*, Chapter 2, I study the incidence and reasons for above-average spending at the end of fiscal years. year-end spending spikes (YESS) are prevalent in public and private organizations with annually lapsing budgets. They are generally perceived as being "unhealthy" and wasteful, exemplified by their nicknames such as "December Fever" or "March Madness." Although the potentially lower returns to such expenditures amount to large sums, academic research into the causes and consequences of YESS is scarce. Chapter 2 of this thesis provides the first analysis of YESS across countries. I make use of data for direct and indirect multi-bi aid contributions to the World Bank. Using panel-econometric methods to exploit variation in donors' fiscal years, I find evidence for YESS in contributions to all types of funds at the daily, monthly, and quarterly level for a sample of 27 OECD countries over the 2002–2013 period.[2] I argue that bureaucratic quality affects the size of YESS and test this argument empirically using different measures of bureaucratic quality. I also test the two main alternative explanations proposed in the literature: precautionary savings and procrastination by bureaucrats. The paper proposes a new explanation for the size of spending spikes, bureaucratic quality, and provides the first econometric evidence of this and two further mechanisms proposed in the literature. I find robust support for the mitigating role of bureaucratic quality on the size of year-end spending spikes but not for the other two mechanisms.

Chapter 3: Poverty and Policy Selectivity of World Bank Trust Funds

In the paper *The Policy and Poverty Selectivity of World Bank Trust Funds* in Chapter 3, Stephen Knack and I compare World Bank trust fund aid to other aid flows at the allocation stage of the aid cycle.[3] We focus on donors' multi-bi aid to the World Bank due to the availability of high quality data for this multilateral organization.

Donors' earmarking to their preferred recipient countries and/or issues has raised concerns among the Bank's management and shareholders about the alignment of trust funds

[2]In this chapter, the words trust funds and funds will be used interchangeably.
[3]Chapter 3 analyzes only the allocation of direct multi-bi aid received by the World Bank.

with the performance-based allocation of concessional loans by the International Development Association (IDA), the World Bank's concessional lending arm. More generally, the specific role of this new aid channel in the international aid architecture is yet to be determined. The paper finds that the cross-country allocations of aggregate trust fund aid are poverty- and policy-selective. In this respect, trust fund allocations resemble those of the IDA much more closely than those of bilateral donors. The allocations of trust fund types that are more closely controlled by donor countries – namely, recipient-executed and single-donor trust funds – are more closely related to the strategic interests of donor countries than trust fund aid in general. Trust funds for health and education aid are poverty-selective and positively correlated with the World Bank's assessment of the quality of countries' sector policies while environmental trust funds are neither poverty-selective nor correlated with the assessed quality of countries' environmental policies. Overall, the evidence indicates that multi-bi funds administered by the World Bank do not undermine the IDA's allocation criteria. The paper leaves for future research the question of whether the increase in (indirect and direct) multi-bi aid has affected core contributions to the IDA and other multilateral organizations.

While earmarked aid has sometimes been associated with the "results agenda" developed in the context of the Paris Declaration, in *The Poverty and Policy Selectivity of World Bank Trust Funds*, Chapter 3 of this thesis, and Eichenauer and Knack (2015), Stephen Knack and I provide evidence that donor countries' political and economic interests influence the allocation of trust fund aid across recipient countries. Since Maizels and Nissanke (1984) and Frey and Schneider (1986), evidence has accumulated that the allocation of bilateral (e.g., Burnside and Dollar 2000; Kuziemko and Werker 2006; Faye and Niehaus 2012) and multilateral aid (e.g., Dreher et al. 2009a; Kersting and Kilby 2016) is associated with the various political, strategic and economic interests of donor countries.

This politically- rather than purely poverty- or performance-driven allocation of aid may be deplorable from a normative perspective. However, in a "politics-free" world, no foreign aid might be given or ODA levels are lower. This would be to the detriment of developing countries – if aid is effective. If donors' motives impact on the effectiveness of aid in recipient countries, the normative question of politically motivated selection of aid recipients becomes an economic one.[4] While the importance of politics in the allocation of foreign aid is generally acknowledged in the research community, this is not the case for the effectiveness of aid as we describe in Chapter 4.

[4]There are also opportunity costs associated with the politically motivated allocation of aid if the returns to foreign aid differ across countries.

Chapter 4: Geopolitics, Aid and Growth

With *Geopolitics, Aid and Growth*, Chapter 4, Axel Dreher, Kai Gehring and I contribute to the large literature on the effectiveness of foreign aid by examining whether the short-term political interests of donor countries reduce the effectiveness of aid on growth in recipient countries. Specifically, we test whether the effect of aid on economic growth is reduced by the share of years a recipient country served on the United Nations Security Council (UNSC) in the period the aid is committed. This provides quasi-random variation in aid. For causal inference about the relative effectiveness of politically motivated aid, we make use of the econometric property that the interaction term between an endogenous and an exogenous variable can be estimated consistently under a reasonable set of assumptions. We argue and provide evidence that these assumptions are fulfilled in our case. Our results show that the effect of aid on growth is significantly lower when aid is committed during a country's tenure on the UNSC. This holds when we restrict the sample to Africa, which follows the strictest norm of rotation on the UNSC and thus where UNSC membership can most reliably be regarded as exogenous. We derive two conclusions from this finding. First, short-term political favoritism reduces the effectiveness of aid. Second, political interest variables as instruments for overall aid arguably estimate the effect of politically motivated aid and thus represent a lower bound for the effect of all aid on growth.

CHAPTER 1

The Politics of Special Purpose Trust Funds

Joint with Simon Hug

Largely unnoticed by academia, a new way of funding development cooperation now accounts for twelve percent of all aid committed by the OECD's donor club (OECD 2012: 16). Labeled as earmarked, non-core or multi-bi aid, these contributions are managed by multilateral organizations in special purpose trust funds (SPTF) that operate outside of the multilateral's official governance structure.[1] Since 2003 total contributions to thematic or country-specific SPTFs at the World Bank have exceeded contributions to the International Development Association, the highly concessional lending arm of the World Bank and the world's oldest multilateral development institution (IEG 2011a: vii, 2). In 2012, the Bank managed almost US$ 30 billion in more than a thousand SPTFs (World Bank 2012a). For the United Nations (UN) and its funds and programmes the growth of non-core aid is similarly impressive; non-core resources grew by 450 percent in real terms between 1994 and 2009. In contrast, core resources, which consist of mandatory and voluntary unearmarked contributions, stagnated (United Nations 2011: 2).

Despite the rapid increase in the volume of earmarked aid and the number of trust funds in which the earmarked aid is held, evaluations of the reasons for and consequences of these trends are still largely missing. In this Chapter, we seek to gain an understanding about the factors that lead donor governments to eschew traditional channels of aid giving, namely multilateral and bilateral aid, in favor of earmarked funds. More specifically, we want to understand how preference heterogeneity, decision-making rules, the effectiveness of multilateral institutions and voter concerns affect the decision to choose multi-bi aid. A clearer understanding of the donor motives underlying the trend towards multi-bi aid will allow researchers to address yet unanswered questions related to accountability, aid (in)efficiency and aid (in)effectiveness. To do so we propose a game-theoretical model

[1] The term special purpose trust funds as used in this chapter applies both to trust funds (direct multi-bi aid) and large pass-through multilaterals (indirect multi-bi aid).

that allows us to show how the interaction between donor preferences and the decision rule at the multilateral agency influences donors' aid allocation decisions. Specifically, our model shows that the choice of aid channel is affected by the decision rule in place in the multilateral aid organization, the multilateral's level of expertise, the importance of domestic voter concerns for donor governments, and the preference heterogeneity among donors. Preference heterogeneity, however, contrary to previous work on principal-agent relationships with multiple principals, does not have a monotonic effect on aid allocation decisions. More precisely, if preference heterogeneity among donors in an institution increases there is a non-monotonic transition from core contributions to SPTFs and bilateral aid.

The remainder of the Chapter is structured as follows. In the next section, we document the increasing use of SPTFs by donors and the, so far, largely policy discussions on the topic. Section three presents the literature relevant for our undertaking, namely work on tax earmarking, principal-agent models, and foreign aid. In Section four we present the proposed game-theoretical model that we analyze for its equilibrium characteristics. We derive several propositions from these equilibria. Section five discusses implications and provides the descriptive evidence suggestive of these implications. Section six concludes.

1.2 The Trend Toward Special Purpose Trust Funds

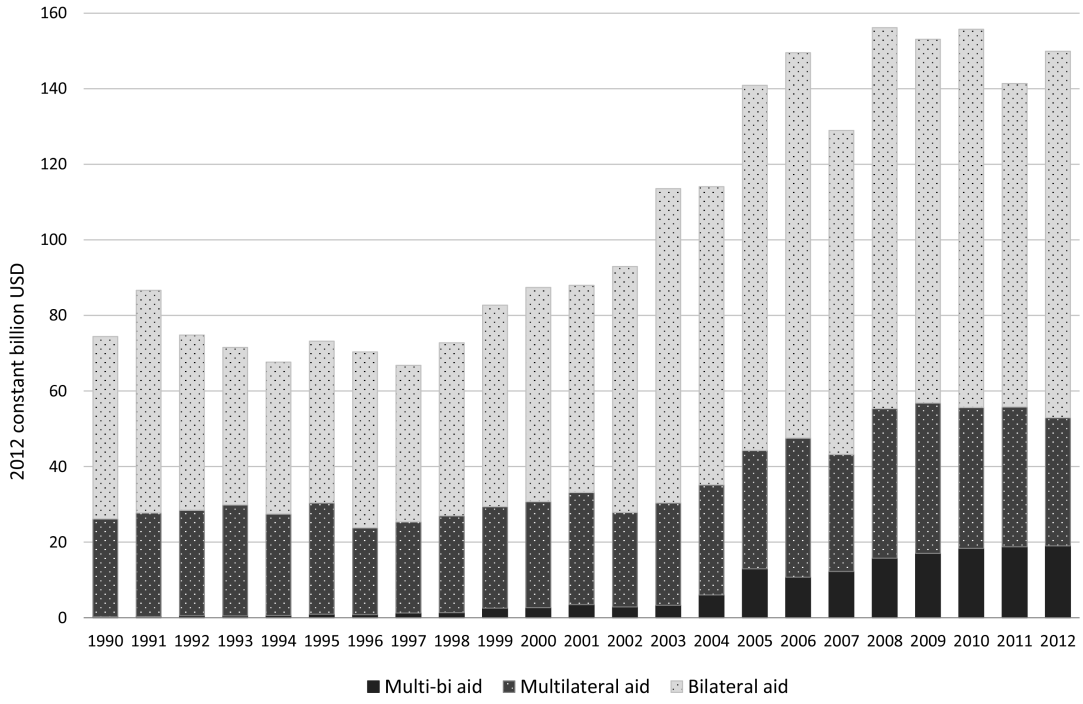
Until recently, donor governments provided foreign aid to developing countries either by giving multilateral core aid to an international organization or by implementing their own projects through their bilateral aid agency.[2] Traditional multilateral aid consists of assessed contributions (typically membership fees) and non-earmarked voluntary (discretionary) contributions to the core account of the multilateral organization (OECD 2012: 23). These multilateral core funds are pooled by the organization and their allocation across developing countries and sectors is determined jointly by the member states according to the organization's decision rule. In contrast, SPTFs allow donor governments to circumvent these often slow and cumbersome decision making processes and have the multilateral organization implement their allocation preferences. It is only within the last two decades that multilateral organizations started to accept earmarked contributions from donor governments (Graham 2017). SPTFs are set up by one or several donors of the multilateral organization in order to support thematic, country- or region-specific

[2]Bilateral policies are not coordinated with third countries and only involve interaction between the donor government and the recipient government or its citizens. Bilateral aid channeled through donor- or recipient-country based **NGO!** is allocated and monitored by the donor country and thus, in a broad understanding, implemented by the bilateral agency.

priorities or any combination thereof (e.g., the Sub-Saharan Africa Transport Program or the Indonesia Multi-Donor Trade and Investment Trust Fund).

Figure 1.1 shows that donors' use of multi-bi aid increased over time. Figure 1.2 shwos that the use of multi-bi aid varies across donors and that some of the larger donors in the 2006-2012 period are donors with small- or medium-sized aid budgets.[3]

Figure 1.1: Evolution of different aid channels over time (1990-2012)

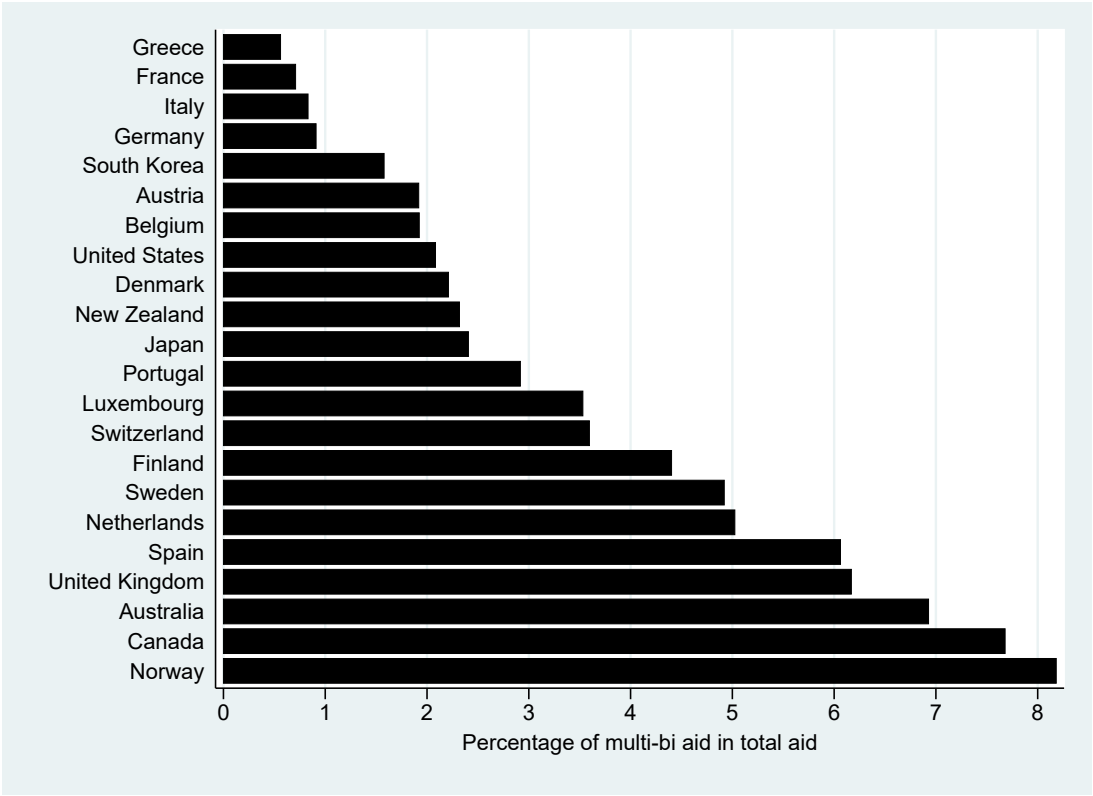


What drives this trend to earmarking?[4] First and foremost, donor governments and multilateral organizations both have interests in the existence of SPTFs. SPTFs allow donors to target their aid strategically according to their preferences including commercial, security and political interests. SPTF aid is similar to bilateral aid in this respect (IEG 2011a: 5). Donors use trust funds to increase the visibility of their multilateral aid to national constituencies and recipient countries (OECD 2010: 39). Moreover, the voluntary character of multi-bi aid, enhances donors' financial flexibility across years. Donors

[3]Multi-bi aid figures are based on the multi-bi aid dataset (Eichenauer and Reinsberg 2017), while other ODA data come from OECD (2015).

[4]In 2010, almost one third of the Official Development Aid channeled through the multilateral system may be counted as multi-bi aid, amounting to almost US$ 17 billion in 2010. This is more than any bilateral donor, except for the United States, provided in that year. For comparison, net bilateral aid disbursements by the United Kingdom in the same year were US$ 13 billion and the European Union (EU) institutions provided US$ 12.9 billion (OECD 2015). Together, core and non-core use of the multilateral system accounted for 40 percent of gross ODA (see OECD 2012: 4).

Figure 1.2: Average share of multi-bi aid in total aid by donor country (2006-2012)



may also use SPTFs to delegate the responsibility for implementing risky development programs and projects to a multilateral organization.

Contributions and contribution volumes to the numerous thematic and country-specific trust funds suggest donor-specific preferences (OECD 2012; Reinsberg et al. 2017). This finding is in line with the observation that donors' use of the multilateral system varies across donors (e.g., Milner 2006; Dietrich 2016).[5] For multilateral organizations, the funds in SPTFs allow growth in staff, size and possibly influence, as predicted by Public Choice theory, which states that bureaucracies, including international ones, strive to increase resources and power (Vaubel 2006; Vaubel et al. 2007).

The proliferation of trust funds provides opportunities for the international development system but also creates risks for development effectiveness and for the reputation and organizational efficiency of multilateral organizations. Through trust funds, donor countries risk gaining undue influence over a multilateral's priorities because its core activities are increasingly co-funded by trust funds (Reinsberg 2016a). Trust funds may create

[5]While our theoretical model developed below does not explicitly address the difference between single- and multi-donor SPTFs, these two types of funds are endogenously determined as a function of our models variables.

reputational risks for the multilateral organization when they incentivize the agency to engage in new countries and types of activities or cooperation(e.g., World Bank 2012a). For example, the World Bank may become active in post-conflict or post-disaster situations, which are in contrast to the Bank's country-based on economic lending to (relatively) stable governments. What is more, multilateral efficiency as a whole might be impaired if multilateral organizations venture into new areas of activity due to the financial incentives created by earmarked aid ("forum shopping"). For example, the UNDP may seek to obtain aid earmarked to climate action, which traditionally has been implemented by the UN Environment Progamme.[6]

In terms of aid effectiveness, the use of SPTFs risks undermining the alleged advantages of multilateral aid implementation through politicizing multi-bi aid and narrowing development objectives (Dreher and Michaelowa 2010; Kilby 2013, 2015; Dreher et al. 2016). For example, donors may use trust funds to jump on trends in aid delivery modes or to mainly fund sectors and one-off aid projects which have easily quantifiable impacts and high visibility (e.g., number of immunized children or schools constructed). This can leave substantial and long-term support efforts like building healthcare systems or maintaining schools to multilateral organizations with decreasing core budgets and creates coordination costs to dovetailing parallel development programs. Multi-bi aid also risks duplicating organizational structures (Reinsberg 2016a) and thus increases the overhead costs of aid (Tortora and Steensen 2014). Co-financing by trust funds tends to draw project managers' attention away from managing and monitoring the project implementation towards reporting on the use of trust fund money.[7]

Despite these and further risks, SPTFs may benefit the international aid system. The smaller groups of donors that control a SPTF allows for quicker decision-making than slow-moving "traditional" multilaterals, giving donors a better chance of responding within the window of opportunity presented by new challenges or catastrophes. By raising funds from multiple sources SPTFs may act as a forum for donor coordination (although the limited evidence suggests otherwise, see IEG 2011a: 43; Barakat et al. 2012: 34f), reducing fragmentation in recipient countries (IEG 2011a). Moreover, trust funds might induce competition among multilateral institutions, leading to more innovation and higher value for aid money and thus more effectiveness.

[6]Donors also use trust funds to fill "gaps in the multilateral system," in particular to provide a rapid response to "emergencies such as natural disasters, disease outbreaks, and the end of armed conflict, where donors want to coordinate their bilateral aid and where the multilateral development banks (MDBs) do not grant resources to engage on a sufficient scale" (IEG 2011a: 5).

[7]World Bank staff reported in interviews that the administrative burden of reporting on the use of trust funds is heavy. For some, transaction costs were prohibitively high and they stopped applying for funds from SPTFs.

1.3 Existing Literature

To study the development of SPTFs we rely on three strands of literature. First, we draw on the public finance literature because earmarking is a longstanding practice in national public accounting. Second, we find inspiration in the literature on principal-agent models, in particular models with multiple principals. Finally, this research relates to the literature on donor motives for foreign aid in general and multilateral aid in particular.

The term earmarking originates from the literature on public finance where it describes the "practice of designating or dedicating specific revenues to the financing of specific public services" (Adugna 2009: i). In domestic politics, earmarking is used by governments to avoid the standard budgeting procedure whereby tax revenue is pooled into a general fund before it is allocated across separate spending programs. Earmarking thus constrains the legislature's (in our case the multilateral agent's and its governing organs') ability to reduce or even eliminate funding for a benefiting program. As critics contend, earmarking may lead to a misallocation of funds. By diminishing the legislature's budgetary flexibility, earmarking impedes its ability to draft an overall budget that is based on funding priorities and accounts for changes in circumstances and assessments over time. Finally, earmarking can increase administrative and compliance costs by incurring the costs of, for example, separate management of cash flows and reporting. For supporters of earmarking, the constraint on the legislature guarantees a steady and reliable funding source of favored programs.[8]

Early models dealing with tax earmarking assumed that the relative shares of resources from the general fund spent on various public goods are exogenously fixed (e.g., Buchanan 1963). Given that these models simultaneously assumed that citizens have control over the level of taxes, it seems rather odd that citizens have no control over allocation decisions (see for this critique Goetz 1968; Goetz and McKnew 1972; Browning 1975; Athanassakos 1990). Implicitly, the same assumption characterizes models dealing with (non-) earmarked contributions to charities/non-governmental organizations (NGOs) (e.g., Bilodeau and Slivinski 1997; Toyasaki and Wakolbinger 2014). In these models, the relative share of funds spent on particular projects is decided by the charities/NGOs themselves (normally) without any influence from donors.

This assumption of an exogenous budget allocation of the general fund is also unrealistic

[8]Recent work on earmarking (e.g., Anesi 2006; Jackson 2013) focuses on legislative decision-making and argues that earmarking ensures funding of particular public goods over several legislative periods, which is not the case for public goods financed through the general fund. Thus, earmarking ties decision-makers' hands. This is less the case when earmarking occurs in aid, as the funds always have a set time for delivery and use (i.e., both earmarked and unearmarked voluntary funds are committed and provided by donor governments, e.g., for certain emergency situations, for a year, for a specific fund).

if these models are adapted to the allocation decisions of multilateral agents. The use of general fund contributions is either set out in the organization's charter specifying its mandate, or involves the member states of the organization in one way or another.[9] Consequently, allocation decisions of a multilateral organization are better conceived as decisions reached collectively by its member states.[10]

Principal-agent models constitute the second relevant strand of literature. While standard principal-agent models rely on one principal and one agent, Bernheim and Whinston (1986) propose a general model of common agency, i.e., a situation where an agent's actions are influenced by multiple principals.[11] The principal-agent literature with multiple (and possibly heterogeneous) principals suggests that preference heterogeneity among principals will result in greater agent discretion, making it more difficult to control them (see Nielson and Tierney 2003; Lyne et al. 2006; Graham 2013).[12] However, Copelovitch (2010) argues that the effect of heterogeneous preferences within a collective principal is theoretically undetermined. For example, heterogeneity among the largest shareholders of the IMF might lead to distributional conflict or "logrolling" in some circumstances while in others it increases the autonomy of the staff (Hernandez 2013; Bresslein and Schmaljohann 2013: for evidence on the World Bank and the Inter-American Development Bank see).

Third, this research relates to the literature on the provision of foreign aid in general and the financing of international organizations in particular. The main explanations for governments' foreign aid provision are a desire to satisfy recipient needs[13] and to advance political and economic interests of the donor country (for an early discussion, see Frey 1984: 86ff). Much of the empirical literature finds that the allocation patterns of both bilateral and multilateral foreign aid is not solely explained by variables of economic need but that donors' strategic and economic interests influence allocation among comparably

[9] For a discussion of these principles, mostly in the context of the UN, see Hüfner (2003) and Graham (2014, 2017).

[10] Lyne et al. (2006) address this issue at the empirical level by determining what characterizes the preferences of various possible coalitions for adopting a particular lending decision.

[11] Surprisingly Lake and McCubbins (2006: 362, footnote 12), argue that "the closest analog to multiple principals is the practice of voluntary contributions to multilateral organizations, as opposed to assessed dues, that allow each member to make their payments contingent on certain activities or conditions." This argument is only correct if we assume that such voluntary contributions are managed in a large pot without individual accounting. Thus, dependent on the exact way in which voluntary contributions are handled, it might, in most cases, be much closer to multiple simple one-principal one-agent relationships, possibly with strategic interactions between principals, which gets interesting when increasing returns of scale or scope are present.

[12] Our model (see below) suggests otherwise: with considerable preference heterogeneity donors have strong incentives to limit the multilateral agent's discretion.

[13] One might argue that even "altruistic" aid is motivated by long-term interests because donors eventually benefit as developing countries become stable and grow, leading to improvements in global health, security and increased demand for goods produced in the donor country and so forth.

poor countries (e.g., Alesina and Dollar 2000; Kuziemko and Werker 2006; Dreher et al. 2009a). Theoretical arguments suggest that multilateral aid might be less politicized than bilateral aid because the multilateral agent enjoys more discretion in her allocation decisions and because she might be pressured by more diverse interest groups than a donor government (e.g., McKeown 2009).[14] Summarizing the empirical evidence, Milner (2006: 109) notes that "a good deal of research suggests [...] that bilateral aid is more tied to donor interest than is multilateral aid, which is often more needs-based in orientation."[15]

Regarding explanations for why donor governments provide multilateral instead of bilateral aid, Milner and Tingley (2013: 314) write that "[t]heories and evidence about why governments choose multilateralism are few." Nevertheless, some arguments have been advanced. First, multilateral agencies are better at providing the collective good "information," for example about the economic and political situation in developing countries, which is important for monitoring recipients (Milner 2006; Schneider and Tobin 2011). Second, governments delegate when there is a need to pool resources and to coordinate the provision or prevention of international public goods and bads respectively (Schneider and Tobin 2011). Third, governments delegate for strategic reasons, for example by shifting responsibility for implementation of risky projects to a multilateral organization to blur accountability for potential ineffectiveness. Fourth, a model by Mavrotas and Villanger (2006) suggests that when giving to a particular recipient, a donor's choice between multilateral or bilateral aid depends on another donor's pressure on that recipient.[16]

Evidence from a survey among donor officials suggests that multilateral aid is motivated by a perception of higher effectiveness and efficiency of multilateral institutions OECD (2012); IEG (2011b). Nevertheless, most aid is still given bilaterally (OECD 2015). Combining these two observations of donor practice suggests that the advantages of multilateral aid matter only under certain conditions.[17] Delegation is likely to depend on the characteristics of the specific multilateral organization.

Schneider and Tobin (2011) propose to move away from a "dichotomous choice" (Schnei-

[14] In contrast, the qualitative analysis of historical key documents containing US decision-makers' assessment of their control of multilateral organizations by Keohane et al. (2009) suggests that the US administration considers multilateral organizations to be instruments of its foreign policy, just like bilateral aid.

[15] Moreover, multilateral institutions may be better able to impose and enforce conditionality because of their lower politicization. For instance Lebovic and Voeten (2009: 109), argue that "a multilateral institution may be seen as an aid giving cartel, designed to maximize donors' influence by presenting a unified front to the recipients."

[16] On a related note, Bayer and Urpelainen (2013) propose a model in which an aid recipient requests funding and two donors have to decide whether to provide this aid bilaterally or multilaterally and in the latter case, how the costs are shared among themselves.

[17] Milner (2006) argues that multilateral aid allows the donor government to credibly signal to its voters about the non-politicized use of foreign aid and thus solves a principal-agent problem in domestic politics.

der and Tobin 2011: 2) framework in which bilateralism is the default way of providing aid. In a more complex framework, a donor may choose from several organizations and provide its multilateral aid to the organizations most closely aligned to its preferences.[18] Most recently, Schneider and Tobin (2011) argue that governments build a portfolio of several multilateral organizations by optimizing the efficiency of implementation and the similarity of allocation policies.

In this Chapter, we study yet another donor strategy in delegation choices to minimize the trade-off between loss of control and gain in effectiveness.[19] In Schneider and Tobin's (2011) parlance, the existence of a large number and variety of SPTF multiplies donor governments' possibilities for strategic aid portfolio building. Earmarking is likely to increase donors' utility beyond what "traditional" aid channels can offer because SPTFs are a cost-effective way to improve the targeting of contributions based on donors' priorities.[20]

1.4 A Model

To get a better understanding of the politics of SPTFs we propose a game-theoretical model. This model builds on well-known models of principal-agent relationships, draws on the literature on tax-earmarking, and adds an explicit decision-making stage, where donors can influence the allocation of aid-funds. Our setup is quite general with a multilateral aid agency and multiple donor as players that choose to allocate aid between two aid projects. Before describing the detailed setup and assumptions of the game, we give a first intuition of the model. Figure 1.3 depicts a simplified extensive form of our game. The game starts with nature (N) choosing the value of k. Without knowing this value, the multilerateral organization m proposes a constraint for her budget allocation ($\underline{s^A}, \overline{s^A}$). The set of donors D then decides whether or not to accept this constraint, followed by them making aid allocation decisions (i.e., choosing their bilateral and SPTF contributions to projects A and B ($b^A_{d_i}, b^B_{d_i}, c^A_{d_i}, c^B_{d_i}$)) while the remainder of the aid budget goes as voluntary

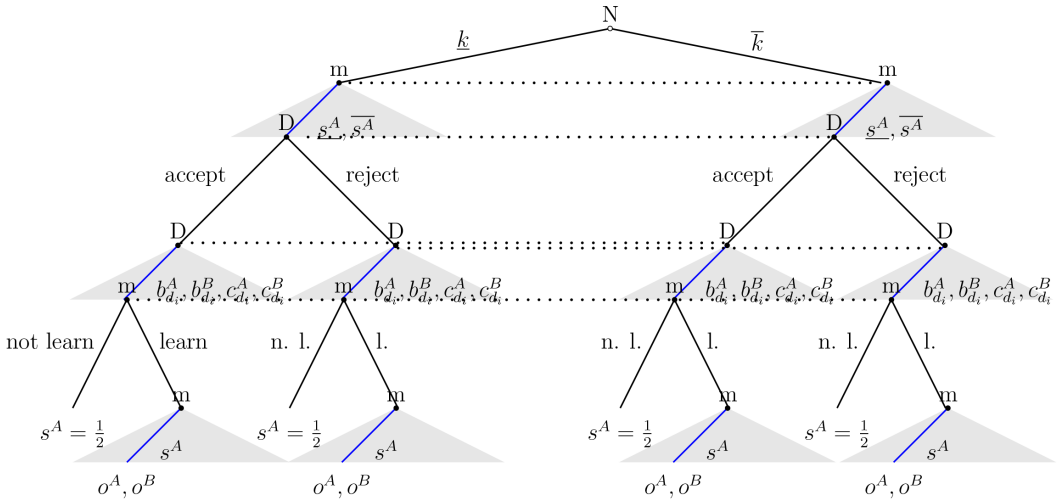
[18] The literature on charitable giving (e.g., Bilodeau and Slivinski 1997) also emphasizes this point.

[19] This Chapter's argument thus has some similarity to Sridhar and Woods (2013)' Trojan Horse argument. In the global health sector, they observe a move away from the governance and funding of traditional multilateral institutions reflecting "a desire by participating governments, and others, to control multilateral agents more tightly." (p. i). According to them, material incentives are used to reward and punish actions and behavior.

[20] Despite the large number of SPTFs, this new type of portfolio building should not entail high search and decision costs for donors: First, donors themselves can set up an SPTF corresponding to its preferences. Second, SPTFs tend to have narrowly defined objectives. Thus, it is relatively easy for donors to check the overlap with their own priorities. Third, SPTFs do not have their own implementing agencies in recipient countries and thus rely mostly on multilateral institutions such as the World Bank and UN agencies for implementation. Therefore donors are already informed about the respective effectiveness of these multilateral organizations, which is one of the allocation criteria for donors. However, SPTFs increase overhead and transaction costs as discussed above.

contributions to the core fund ($c_{d_i}^{C_v}$).[21] After observing these funding decisions, m chooses whether or not to collect information on the value of k and then either based or not based on this information decides on the aid allocation ($s^A \in [\underline{s^A}, \overline{s^A}]$ and $s^B = 1 - s^B$).

Figure 1.3: Game tree



In presenting the game we follow Rasmusen's (1989) list to define its necessary elements before presenting its extensive form. The game models the interaction between two sets of players, namely a multilateral agent m and a set of donor countries, D, with $|D| = n \geq 2$. All donors are members in the multilateral organization m. These two sets of players may take a set of actions in the following sequence of play.

First, m proposes a range or value of discretion s^A, which corresponds to the share of the core fund net of costs c_m (these costs incurred by m will be discussed below) devoted to project A, that m agrees to implement (i.e., a set $(\underline{s^A}, \overline{s^A})$ s.t. $0 \leq \underline{s^A} \leq \overline{s^A} \leq 1$).[22] The share devoted to project B, s^B, has the property $s^A + s^B = 1$.[23] Consequently, if $\overline{s^A} = 1$ and $\underline{s^A} = 0$ m may devote any share of its aid budget to project A (and thus also to project B, while $\overline{s^A} = \frac{1}{2}$ and $\underline{s^A} = \frac{1}{2}$ implies that m has to fund equally the two projects. The set of donors D either accepts or rejects this proposal according to the decision rules

[21] To derive the results for five donors and the more general ones (see below) we use the additional (weak) assumption that indifferent donors will choose the aid channel which gives them most control, i.e., if indifferent between voluntary core and multi-bi aid (or bilateral aid) they will chose multi-bi aid (or bilateral aid), while if they are indifferent between multi-bi and bilateral aid, they willchoose bilateral aid. This is akin to the remark by Mavrotas and Villanger (2006) that, all else equal, governments like to be in the driver's seat.

[22] Consequently, m proposes either a range or a value for s^A that she will choose. This would allow for an extension where D may monitor the value of s^A and punish m in case of non-compliance (the proposal by m might also comprise a schedule of assessed contributions for each $d_i \in D$).

[23] Projects A and B and corresponding donor preferences may represent sectors, countries, or implementation modes (e.g., recipient government vs. NGOs vs. private enterprises).

that prevail in the governing body of the multilateral organization. Individual decisions about the discretion request are denoted by pa_{d_i}, the probability of accepting a proposal. In case of rejection we assume a default level of discretion:

Assumption 1. *If m's proposal for discretion is rejected by D the default level* $\underline{s^A} = \overline{s^A} = \frac{1}{2}$ *is imposed.*

We also assume

Assumption 2. *If a donor is indifferent between the discretion proposed by m and* $\underline{s^A} = \overline{s^A} = \frac{1}{2}$ *(i.e., no discretion), she votes for no discretion.*

After this decision-making stage and taking into account the level of discretion granted to m, each donor $d_i \in D$ $(i = 1, ..., n)$ chooses her aid allocation. Aid allocation is subject to a binding and exhausted budget constraint formed by $y_{d_i} \times t_{d_i} \times a_{d_i}$, where a_{d_i} is the share of the budget devoted to aid,[24] and the budget is generated by a flat tax rate t_{d_i} imposed on national income in each donor country y_{d_i}. Donors first contribute multilateral core aid $c^C_{d_i}$ to the general fund of the multilateral agency through assessed contributions or membership fees $c^{C_a}_{d_i}$, which are exogenously determined. The first option for allocating aid is to make voluntary multilateral contributions $c^{C_v}_{d_i}$. For notational clarity, let $c^C_{d_i}$ be a donor's total multilateral core contributions that consist of assessed and voluntary contributions ($c^C_{d_i} = c^{C_a}_{d_i} + c^{C_v}_{d_i}$). We furthermore assume for every donor that $c^{C_a}_{d_i} > 0$ and $c^{C_v}_{d_i} \geq 0$.[25] While we could allow for donor-specific membership fees $c^{C_a}_{d_i}$, which are common in multilateral organizations, we assume the same level of assessed contributions c^{C_a} for all donors.

Second, donors may also provide aid to any of the two special purpose (non-core) funds for projects A and B through contributions $c^A_{d_i}$ and $c^B_{d_i}$ so that for every donor d_i, $c^A_{d_i} \geq 0$ and $c^B_{d_i} \geq 0$. Third, may also provide bilateral aid b^A_i and b^B_i to projects A and B respectively, so that for every donor $b^A_i \geq 0$ and $b^B_i \geq 0$.

After observing the allocation decisions by all donors $d_i \in D$, the agent m decides whether to obtain information about how aid translates into output. She invests costs c_m

[24] For an identical assumption, see Mavrotas and Villanger (2006), as a_{d_i} might also be considered as the optimal choice by governments given their reelection considerations.

[25] At first glance, voluntary core contributions give the multilateral agency essentially the same discretion as over assessed contributions because the allocation of both voluntary unearmarked and assessed contributions are subject to the decisions by the multilateral agent's governing body where donors are represented. However, this first impression is deceiving: voluntary contributions constitute a mechanism of control because donors have the right to supply their contribution (or not) as they see fit, which, in the model, is a function of the discretion granted. For example, each state can determine for itself what the proper goal of the United Nations Development Programme (UNDP) should be, and if it disagrees with its objectives or is dissatisfied with its performance, it is unconstrained by others in adapting its funding amounts accordingly. Therefore, the level of the core budget is not a formal decision by multilateral governing bodies, but is instead the aggregate outcome of donors' decisions (see Graham 2013).

($c_m = \overline{c_m}$) or not ($c_m = 0$) to learn the value $k \in \{\underline{k}, \overline{k}\}$ which determines the respective "development effectiveness" of the two projects.[26] More specifically, if k is equal to $\underline{k}$ then project A offers better value for the money spent, while projet B is preferable if k is equal to $\overline{k}$. Consequently, the two values of k simply indicate which project is more efficient. Higher (lower) values for $\overline{k}$ ($\underline{k}$) suggest that the differences in terms of efficiency between the two projects become larger, which may come about by m being more efficient in handling aid projects. For these variables we assume the following:

Assumption 3. $\sum_{d_i} c_{d_i}^{C_a} \geq 2\overline{c_m}$

Assumption 4. $-\underline{k} = \overline{k} \in (0, 1)$

Assumption 3 ensures first of all that learning by m is not constrained by the available assessed funds. Second, it ensures that for some values of $\overline{k}$ there exist discretion values $\overline{s^A}$ such that agent m will actually have an incentive to learn about the effectiveness, k. Assumption 4, on the other hand, restricts the difference in the development effectiveness k provided by projects A and B respectively.[27]

If m decides to invest costs $c_m = \overline{c_m}$, she obtains private information about the effectiveness k of projects A and B. The multilateral organization m chooses s^A and s^B constrained by the rule collectively adopted by the donors D (i.e., $s^A \in [\underline{s^A}, \overline{s^A}]$). Jointly with SPTF contributions from donors, this determines multilateral aid allocations $a^A = s^A(\sum_{d_i} c_{d_i}^C - c_m) + \sum_{d_i} c_{d_i}^A$ and $a^B = s^B(\sum_{d_i} c_{d_i}^C - c_m) + \sum_{d_i} c_{d_i}^B$ to projects A and B respectively. With regard to aid effectiveness, we assume that bilateral aid produces aid output but it is less "effective" by having contributions weighted by $(1 - \overline{k})$.[28]

The aid input from multilateral and bilateral sources thus produces "development" output for projects A and B according to the value of the effectiveness parameter k: $o^A = (1 + k)a^A + (1 - \overline{k}) \sum_{d_i} b_{d_i}^A$ and $o^B = (1 - k)a^B + (1 - \overline{k}) \sum_{d_i} b_{d_i}^B$.[29]

We further assume

Assumption 5. *If m is indifferent among all $s^A \in [\underline{s^A}, \overline{s^A}]$ then $s^{A*} = \frac{\underline{s^A} + \overline{s^A}}{2}$.*

[26] This is akin to the assumption that multilateral organizations have fixed costs, see Mavrotas and Villanger (2006).

[27] As a consequence of this assumption one of the two projects always provides "more bang for the buck," and each project provides at least some "bang for the buck."

[28] This imposes an order in terms of aid effectiveness: core contributions, under the assumption of m learning, translate via the factor $(1 + \overline{k})$ into aid output, multi-bi aid by factor 1 and bilateral aid by factor $(1 - \overline{k})$. As we discuss below, however, we assume that bilateral aid generates a "premium" in domestic voter support to donor governments. For a similar assumption, see Mavrotas and Villanger (2006). Tortora and Steensen (2014) provide evidence that donors consider multilateral aid as more effective than bilateral aid. The view that multilateral aid is more effective than multi-bi aid is founded on its flexibility; unlike multilateral aid, multi-bi aid cannot be reallocated to the more effective project from funds in a SPTF, meaning that misallocation can occur.

[29] $\frac{1}{1+k}$ and $\frac{1}{1-k}$ thus correspond to unit prices of aid output for multilateral aid.

The informational structure we assume is that the value of k is unknown to both sets of players, except if m decides to bear the costs for learning its value. Thus the game is one of imperfect information that we transform into one of incomplete information, by letting nature N choose the value of k without informing any of the actors we model.

We assume that m and $d \in D$ have a common prior belief $p(k = \overline{k}) = \frac{1}{2}$ about the value k.

The strategies the two sets of actors may adopt can be characterized as follows. Each donor $d_i \in D$ chooses bilateral aid ($b^A_{d_i}$, $b^B_{d_i}$), contributions to SPTFs ($c^A_{d_i}$, $c^B_{d_i}$) and voluntary core contributions ($c^{C_v}_{d_i}$) as well as a voting rule indicating which of m's proposals for ranges of s^A (and thus also for s^B) are accepted, and which are not. The multilateral agent m, on the other hand, chooses whether to spend $\overline{c_m}$ and, based on the information obtained (or not), selects $s^A \in [\underline{s^A}, \overline{s^A}]$ (and thus also $s^B = 1 - s^A$).

The payoffs for both sets of players are a function of the aid output generated by projects A and B and, for D, a voter-induced benefit due to bilateral aid. We specify for both sets of actors very general utility functions. For the set D, with elements $\{d_1, d_2, ...d_n\}$ and $d_1 = 1$ and $d_n = n$, we assume the following general utility function:

$U_{d_i}(o^A, o^B|d_i) = w_{d_i} o^A + (1 - w_{d_i}) o^B + v_{d_i}(b^A_{d_i} + b^B_{d_i})$

where w_{d_i} is a weighting factor for the two types of aid outputs, while v_{d_i} reflects the fact that bilateral aid may generate benefits to a donor government independent of aid output, namely increased voter support. While we could allow for donor-specific values for v_{d_i}, in what follows we will use the same value of v and make the following assumption

Assumption 6. $v < 1 - \overline{k}$

With this assumption we ensure that the effectiveness of bilateral aid is weakly worse than all possible expected effectiveness from contributions to special purpose trust funds.[30] The view that multilateral aid is more effective than multi-bi aid is founded on its flexibility; unlike multilateral aid, multi-bi aid cannot be reallocated to the more effective project from funds in a SPTF, meaning that misallocation can occur.

For the distribution of the weighting factors we assume a very general form:

Assumption 7. $w_{d_i} = F(g(d_i))$

where g is any real-valued function and F has the general properties of a cumulative density function (i.e., $F(-\infty) = 0$, $F(\infty) = 1$ and $F' \geq 0$). For our main illustration we will assume that F is the uniform distribution and g is assumed to be $\alpha + \beta d_i$ with

[30] This assumption translates on the one hand the common view held in the literature that international aid agencies have more capacities, and on the other hand does not preclude that in equilibrium donors will choose bilateral aid.

$\alpha = \frac{-1}{n-1}$ and $\beta = \frac{1}{n-1}$. Consequently for each d_i, w_i is equal to $\frac{d_i-1}{n-1}$ resulting in the following utility function:

$$U_{d_i}(o^A, o^B|d_i) = \frac{d_i - 1}{n-1}o^A + \frac{n - d_i}{n-1}o^B + v(b^A_{d_i} + b^B_{d_i}) \tag{1.1}$$

The utility function of m is defined as follows:[31]
$U_m(o^A, o^B) = o^A + o^B$

From this it follows that the outcomes of the game are the aid outputs o^A and o^B. Given that the specified game is one of incomplete information, the Bayesian subgame perfect equilibrium concept would be appropriate. As any private information can only be obtained by agent m after D's last decision-node, we can solve the game, however, by backward induction to derive the subgame perfect equilibria.

1.4.1 Analysis: Implications

The game allows us to derive numerous insights into the interplay between donor preferences and decision-making in multilateral organizations. In this section we first present a general result before developing our intuition about the model with an equilibrium analysis of the model restricted to five donors as this is the lowest uneven number for which unanimity and majority rule lead to different outcomes. Based on this intuition we then present a set of general results independent of the number of donors n and their preference distribution, F.

To arrive at these results we solve the game by backward induction and analyze m's last two decision nodes (information collection and aid allocation) jointly. Under the assumption that the range of discretion is centrally located among the preferences of the set D (i.e., $\underline{s^A} = 1 - \overline{s^A}$),[32] we first assess the expected utility for m in the case where she refrains from collecting information ($c_m = 0$): We find that m is indifferent between all allocation combinations between projects A and B (s^A and s^B) and by assumption 5 she chooses $s^A = \frac{1}{2} = s^B$.[33]

If m decides to invest $c_m = \overline{c_m}$ to learn the effectiveness value k, the agent m's expected utility has to be calculated conditional on the information she obtains (using the property

[31] As the information gathering cost born by m (i.e., $\overline{c_m}$) reduces the possible aid output, these costs indirectly reduce m's utility. Also note that m is considered a "benevolent" aid allocator in this model. Future work might consider a more budget-maximizing version, e.g., $U_m(a^A, a^B, c_m) = a^A + a^B - c_m$. The utility function specified for m assumes risk-neutrality, which might be justified by the fact that m only cares about output generated by funds made available by other actors than herself, and she has to exhaust the available funds for aid.

[32] Assumption 7 and the restrictions on d_is' preferences (see above) ensure that this is part of any possible equilibrium.

[33] We present the derivations of this and the following findings in the appendix.

that $s^B = 1 - s^A$).[34] In what follows we replace $s^A|(k = \overline{k}) = s^B|(k = \underline{k})$ with s^* and $s^B|(k = \overline{k}) = s^A|(k = \underline{k})$ with $1 - s^*$ (by symmetry). In addition we will systematically use $\overline{k}$ for situations where the value of k is known (and by assumption 4 we can replace $\underline{k}$ with 1-$\overline{k}$). In the case of indifference, we assume m will collect information. Comparing the expected utilities for the two cases of c_m allows us to determine the conditions under which m will acquire information, namely if

$$\begin{aligned} EU_m(c_m = \overline{c_m}) &\geq EU_m(c_m = 0) \\ \sum_{d_i} c^C_{d_i}(2\overline{k}s^* - \overline{k}) - \overline{c_m}(1 - \overline{k} + 2\overline{k}s^*) &\geq 0 \\ \frac{\sum_{d_i} c^C_{d_i}(2\overline{k}s^* - \overline{k})}{1 - \overline{k} + 2\overline{k}s^*} &\geq \overline{c_m} \end{aligned} \tag{1.2}$$

Assuming fixed $\sum_{d_i} c^C_{d_i}$ we may use equation 1.2 to determine the lowest value of discretion s^* so that m will collect information. This is the case when $s^* = \frac{\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + \overline{c_m}}{2\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m})}$. As by assumption 3 the minimal amount to be found in the core fund through assessed contributions is larger than the costs for collecting information, and the latter costs are strictly positive, this minimal value for s^* is strictly larger than $\frac{1}{2}$.[35] We can state this result in the following proposition as a set of comparative statics results:

Proposition 1. *With increasing core funds ($\sum_{d_i} c^C_{d_i}$), higher values for $\overline{k}$ and $\overline{s^A}$, m is more likely to collect information, provided, in the two former cases, the condition $\overline{s^A} > \frac{1}{2}$ holds.*

The proof of Proposition 1 immediately follows from equation 1.2 and taking derivatives with respect to the three variables.

In a next step, we solve the game for its equilibria under two decision-making rules, namely unanimity and majority rule with five donors. Given our assumptions regarding

[34] Strictly speaking, for the two conditional utilities (depending on the value of k) we also have two sets of conditional share parameters (i.e., $s^A|(k = \overline{k})$ and $s^B|(k = \overline{k})$, resp. $s^A|(k = \underline{k})$ and $s^B|k = \underline{k})$). By symmetry we know that $s^A|(k = \overline{k}) = 1 - s^B|(\underline{k} = \overline{k})$ and the same for $k = \underline{k}$. As the values for k are such that $\underline{k} = -\overline{k}$ we also know that $s^A|(k = \overline{k}) = s^B|(k = \underline{k})$ (i.e., irrespective of which project yields more "bang for the buck," the share devoted to the more effective one will be the same).

[35] Assumption 3 in addition guarantees that some $\overline{k}$ exists such that this lower bound for $\overline{s^A}$ does not exceed 1. This is used as part of the proof of Proposition 6 in the appendix.

the distribution of weighting factors the five donors have the following utility functions:

$$\begin{aligned} EU_{d_1} &= o^B + v(b^A_{d_1}, b^B_{d_1}) \\ EU_{d_2} &= \frac{1}{4}o^A + \frac{3}{4}o^B + v(b^A_{d_2}, b^B_{d_2}) \\ EU_{d_3} &= \frac{1}{2}o^A + \frac{1}{2}o^B + v(b^A_{d_3}, b^B_{d_3}) \\ EU_{d_4} &= \frac{3}{4}o^A + \frac{1}{4}o^B + v(b^A_{d_4}, b^B_{d_4}) \\ EU_{d_5} &= o^A + v(b^A_{d_5}, b^B_{d_5}) \end{aligned}$$

We first derive the optimal allocation rules for five donors, which depend on the discretion $(\underline{s^A}, \overline{s^A})$ given to m, the utility donors obtain from voters and interest groups by giving bilateral aid (v), and the importance of m's knowledge $(\overline{k})$.[36] Figure 1.4 depicts the optimal voluntary aid allocations for possible values of $\overline{k}$.

The figures show that all non-extremist donors, for particular values of the relevant variables, might provide any of the voluntary aid categories. The two extreme donors d_1 and d_5 will never provide voluntary core contributions. Using the "no-discretion" equilibrium value for $\overline{s^A}$, namely $\frac{1}{2}$, that results from a unanimity voting rule and employing the insights depicted in Figure 1.4 we can generate the equilibrium aid allocations for the five donors as a function of $\overline{k}$ and v. Figure 1.5 depicts the aid allocation decisions made by the five donors under unanimity for all possible combinations of these two variables.[37]

Figure 1.5 shows that when the gain through the knowledge of m $(\overline{k})$ is large (or the effectiveness of bilateral aid is small) compared to the utility a donor might get from voters (v), multi-bi aid is the most attractive option for donors.[38] As voter concerns loom larger compared to the gain due to knowledge, bilateral aid, first for "moderate" donors and then increasingly for more extremist donors, becomes more attractive.

Figure 1.6 depicts which discretion levels will be adopted by majority rule and the resulting aid allocation decisions for all possible combinations of $\overline{k}$ and v.[39] The comparison of Figure 1.6 with Figure 1.5 shows how decision-making rules affect aid allocation decisions and the use of multi-bi aid by donors. Under unanimity (Figure 1.5) we noted that for high effectiveness gains for the multilateral relative to the importance of voters, multi-bi aid is attractive to all donors, except the median donor d_3. Donor d_3 makes either voluntary core or bilateral contributions. Under majority rule there is a range for high values of $\overline{k}$ such that a majority of donors gives m maximum discretion and as a

[36] We present the derivation of these allocation rules in the appendix.
[37] These results are formally stated and proven in the appendix.
[38] In the appendix we also derive and illustrate the equilibrium discretion and aid allocation decisions under the assumption that SPTFs are not available.
[39] These results are again stated formally and proven in the appendix.

Figure 1.4: Aid allocation decisions of donors in equilibrium

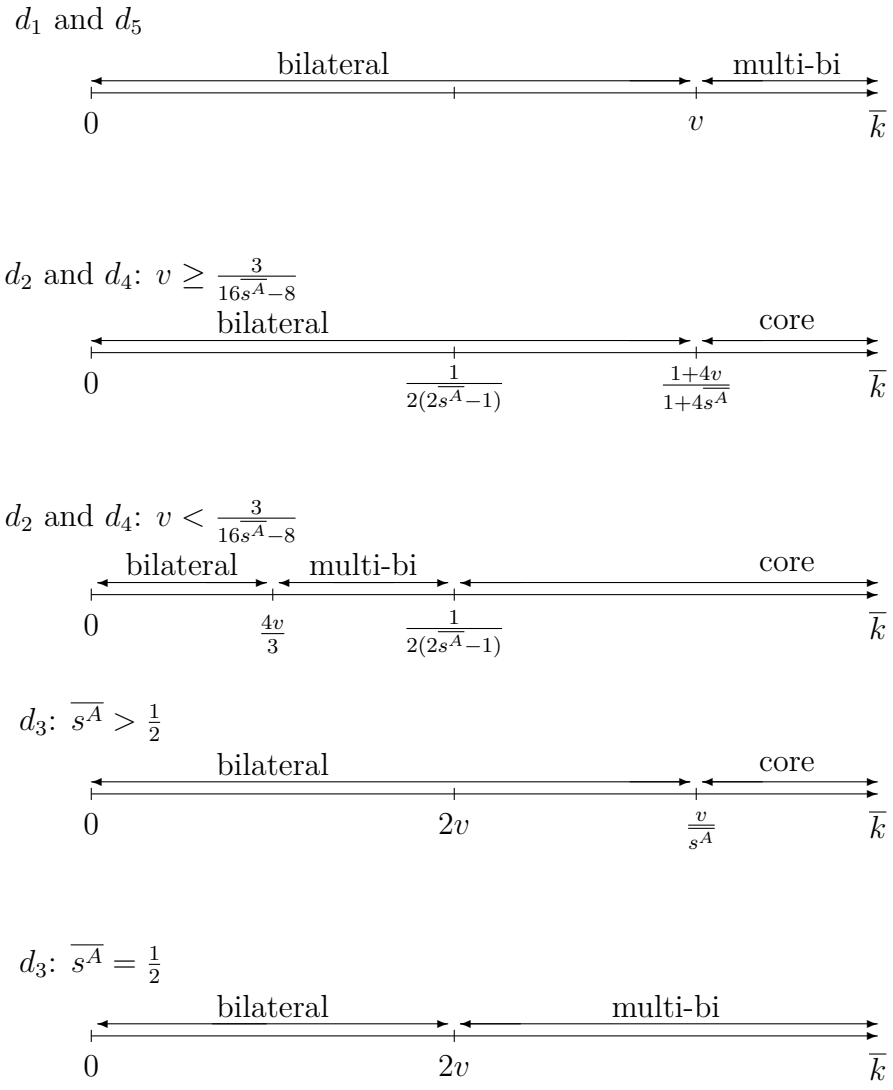
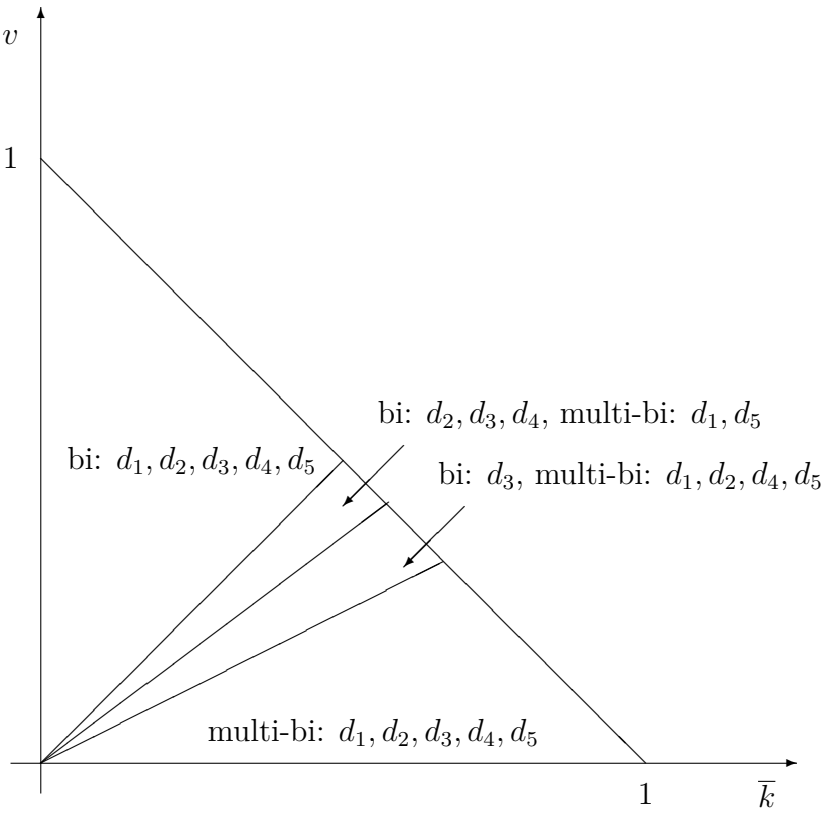


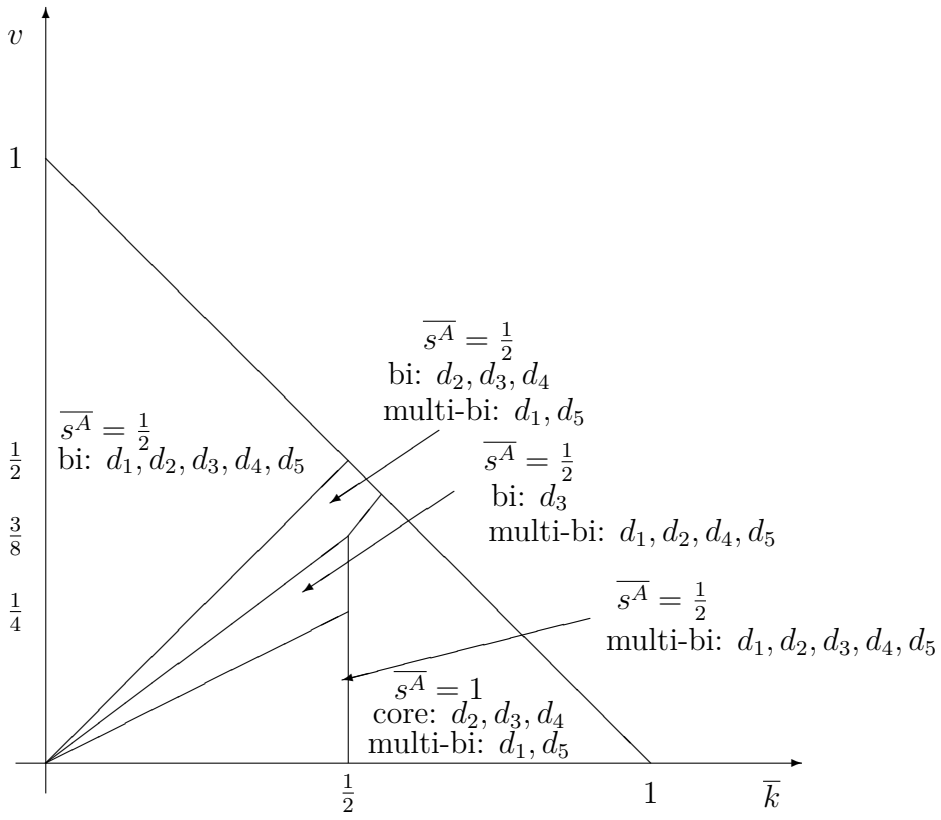
Figure 1.5: Equilibria under unanimity (which implies $\overline{s^A} = \frac{1}{2}$)



consequence the donors make voluntary core contributions (Figure 1.6). As $\overline{k}$ decreases, a majority no longer supports any level of discretion and thus there is no advantage in core contributions. Thus, for low values of v, and just as under unanimity, multi-bi is attractive for all donors except the median one because multi-bi aid is more effective than bilateral aid. As v becomes more important relative to $\overline{k}$, first the median donor switches to bilateral aid before the remaining donors start joining her. Finally, all donors give bilateral aid (for relatively high values of v compared to $\overline{k}$). Under unanimity rule, m is less likely to receive any voluntary core contributions at all than under majority rule and, even if she receives any, she gets less. This occurs because under unanimity only d_3 contributes voluntary core resources and even then she contributes for a smaller range of values of $\overline{k}$ and v than under a majority regime where discretion is granted to m. By exclusivity of a contribution, multi-bi aid is used less in the majority rule situation.[40]

[40] These main results for a model with five donors can easily be extended by dropping the assumption of a uniform distribution of donors' preferences. If we assume that donors d_1 and d_5 have the same preferences as donors d_2 and d_4 respectively it is easy to show that discretion is granted under certain

Figure 1.6: Equilibria under majority rule



1.4.2 General Results

Having developed our intuition for the game we now turn to a set of general results that apply to any number of donors n and any preference distribution F. To generate these general results we note first that in equilibrium only donors who might give voluntary core contributions will vote for any level of discretion for m (i.e., $\underline{s^A} \neq \frac{1}{2} \neq \overline{s^A}$). Consequently, we will first assess the optimal aid allocation rule for a generic donor d_i and, based on this, analyze undhich er what circumstances an unanimous or majority decision might lead to giving m discretion. Based on this we will then assess what the optimal aid allocation

conditions to m even under unanimity rule. The outcomes in terms of discretion and aid allocation become very similar to those depicted in Figure 1.6. Assessing the consequences of majority rule unsurprisingly shows that the same equilibrium outcomes result, as any decision on discretion in practice involves all donors. If we assume that the distribution of preferences is more centered (i.e., $d_1 = \frac{1}{4}$, $d_2 = d_3 = d_4 = \frac{1}{2}$), we again find that under unanimity discretion may be granted to m and the resulting outcomes in equilibria are very similar to those depicted in Figure 1.6. Under majority rule, however, discretion is always granted to m. As a consequence it is much more likely that donors give voluntary core aid, while multi-bi aid becomes much less popular in equilibrium.

rules for all donors D are and derive a set of general propositions.

Proposition 2. *Under unanimity discretion is only granted to m if* $\forall\, d_i$

$$w_{d_i} \in max((\frac{1-\overline{k}-2\overline{k}\overline{s^A}+2v}{2(1-\overline{k})}, \frac{1-\overline{k}}{2}-\overline{k}\overline{s^A}), min(\frac{1-\overline{k}}{2}+\overline{k}\overline{s^A}, \frac{1-\overline{k}+2\overline{k}\overline{s^A}-2v}{2(1-\overline{k})})). \tag{1.3}$$

The proof of Proposition 2 (see Section 1.A) relies on assessing the set of weighting factors w_{d_i} for which voluntary core contributions are optimal. The Proposition also nicely shows why in our example with five donors and a uniform preference distribution discretion was never granted under unanimity. As the expression $\frac{1+\overline{k}}{2}-\overline{k}\overline{s^A}$ is strictly positive (and $\frac{1-\overline{k}}{2}+\overline{k}\overline{s^A}<1$), with a uniform distribution of preferences the most extreme donors will always have a w_{d_i} that falls outside of the interval specified in Proposition 2. A corollary follows immediately from Proposition 2:

Corollary 1. *Under q-majority discretion is only granted to m if the set W, which contains all* d_i *for which* $w_{d_i} \in max((\frac{1-\overline{k}-2\overline{k}\overline{s^A}+2v}{2(1-\overline{k})}, \frac{1-\overline{k}}{2}-\overline{k}\overline{s^A}), min(\frac{1-\overline{k}}{2}+\overline{k}\overline{s^A}, \frac{1-\overline{k}+2\overline{k}\overline{s^A}-2v}{2(1-\overline{k})}))$ *fulfills the condition* $\frac{|W|}{n} \geq q$.

As Corollary 1 covers unanimity as a limiting case (i.e., $q=1$) we derive two general equilibrium propositions under q-majority rule:

Proposition 3. *If the conditions* $\frac{|W|}{n} \geq q$ *and* $\frac{\overline{k}+\overline{k}^2}{2} \geq v$ *hold then the following strategies form the unique subgame perfect equilibrium:*

$$m \;:\; \begin{cases} \{\overline{s^A}=1, c_m=\overline{c_m}, s^A=1\} & \text{if } k=\overline{k} \\ \{\overline{s^A}=1, c_m=\overline{c_m}, s^A=0\} & \text{if } k=\underline{k} \end{cases}$$

$$\forall d_i \in D \;:\; \begin{cases} \{pa_{d_i}(\overline{s^A} \in [\frac{1}{2},1])=1, c_{d_i}^{C_v}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \\ \forall d_i \;\; s.t. \;\; w_{d_i} \in (\frac{1-\overline{k}}{2}, \frac{1+\overline{k}}{2}) & \\ \{pa_{d_i}(\overline{s^A}\neq\frac{1}{2})=0, c_{d_i}^{B}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \forall d_i \;\; s.t. \;\; w_{d_i} \in (\frac{1}{2}-\frac{\overline{k}-v}{1-\overline{k}}, \frac{1-\overline{k}}{2}] \\ \{pa_{d_i}(\overline{s^A}\neq\frac{1}{2})=0, c_{d_i}^{A}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \forall d_i \;\; s.t. \;\; w_{d_i} \in [\frac{1+\overline{k}}{2}, \frac{1}{2}+\frac{\overline{k}-v}{1-\overline{k}}) \\ \{pa_{d_i}(\overline{s^A}\neq\frac{1}{2})=0, b_{d_i}^{B}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \forall d_i \;\; s.t. \;\; w_{d_i} \in [\frac{\overline{k}-v}{\overline{k}}, \frac{1}{2}-\frac{\overline{k}-v}{1-\overline{k}}] \\ \{pa_{d_i}(\overline{s^A}\neq\frac{1}{2})=0, b_{d_i}^{A}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \forall d_i \;\; s.t. \;\; w_{d_i} \in [\frac{1}{2}+\frac{\overline{k}-v}{1-\overline{k}}, \frac{v}{\overline{k}}] \\ \{pa_{d_i}(\overline{s^A}\neq\frac{1}{2})=0, c_{d_i}^{B}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \forall d_i \;\; s.t. \;\; w_{d_i} < \frac{\overline{k}-v}{\overline{k}} \\ \{pa_{d_i}(\overline{s^A}\neq\frac{1}{2})=0, c_{d_i}^{A}=y_{d_i}\times t_{d_i}\times a_{d_i}-c^{C_a}\} & \forall d_i \;\; s.t. \;\; w_{d_i} > \frac{v}{\overline{k}} \end{cases}$$

while if the conditions $\frac{|W|}{n} \geq q$ *and* $\frac{\overline{k}+\overline{\underline{k}}^2}{2} < v$ *hold then the following strategies form the unique subgame perfect equilibrium:*

$$m \;:\; \begin{cases} \{\overline{s^A} = 1, c_m = \overline{c_m}, s^A = 1\} & \text{if } k = \overline{k} \\ \{\overline{s^A} = 1, c_m = \overline{c_m}, s^A = 0\} & \text{if } k = \underline{k} \end{cases}$$

$$\forall d_i \in D \;:\; \begin{cases} \{pa_{d_i}(\overline{s^A} \in [\frac{1}{2}, 1]) = 1, c_{d_i}^{C_v} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}-v}{1-\overline{\underline{k}}}, \frac{1}{2} + \frac{\overline{k}-v}{1-\overline{\underline{k}}}) \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, b_{d_i}^B = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \in [\frac{1-\overline{k}}{2}, \frac{1}{2} - \frac{\overline{k}-v}{1-\overline{\underline{k}}}] \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, b_{d_i}^A = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \in [\frac{1}{2} + \frac{\overline{k}-v}{1-\overline{\underline{k}}}, \frac{1+\overline{k}}{2}] \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, c_{d_i}^B = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} < \frac{1-\overline{k}}{2} \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, c_{d_i}^A = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} > \frac{1+\overline{k}}{2} \end{cases}$$

Proposition 4. *If the conditions* $\frac{|W|}{n} < q$ *and* $\frac{\overline{k}}{2} \geq v$ *hold then the following strategies form the unique subgame perfect equilibrium:*

$$m \;:\; \begin{cases} \{\overline{s^A} = 1, c_m = 0, s^A = \frac{1}{2}\} & \text{if } \overline{s^A} = \frac{1}{2} \\ \{\overline{s^A} = 1, c_m = \overline{c_m}, s^A = 1\} & \text{if } \overline{s^A} > \frac{1}{2} \text{ and } k = \overline{k} \\ \{\overline{s^A} = 1, c_m = \overline{c_m}, s^A = 0\} & \text{if } \overline{s^A} > \frac{1}{2} \text{ and } k = \underline{k} \end{cases}$$

$$\forall d_i \in D \;:\; \begin{cases} \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, c_{d_i}^B = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \in (1 - \frac{v}{\overline{\underline{k}}}, \frac{1}{2}) \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, c_{d_i}^A = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2}, \frac{v}{\overline{\underline{k}}}) \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, b_{d_i}^B = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \leq 1 - \frac{v}{\overline{\underline{k}}} \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, b_{d_i}^A = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \text{ s.t. } w_{d_i} \geq \frac{v}{\overline{\underline{k}}} \end{cases}$$

while if the conditions $\frac{|W|}{n} < q$ *and* $v < \frac{\overline{k}}{2}$ *hold then the following strategies form the unique subgame perfect equilibrium:*

$$m \;:\; \begin{cases} \{\overline{s^A} = 1, c_m = 0, s^A = \frac{1}{2}\} & \text{if } \overline{s^A} = \frac{1}{2} \\ \{\overline{s^A} = 1, c_m = \overline{c_m}, s^A = 1\} & \text{if } \overline{s^A} > \frac{1}{2} \text{ and } k = \overline{k} \\ \{\overline{s^A} = 1, c_m = \overline{c_m}, s^A = 0\} & \text{if } \overline{s^A} > \frac{1}{2} \text{ and } k = \underline{k} \end{cases}$$

$$\forall d_i \in D \quad : \quad \begin{cases} \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, b_{d_i}^B = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \ s.t. \ w_{d_i} < \frac{1}{2} \\ \{pa_{d_i}(\overline{s^A} \neq \frac{1}{2}) = 0, b_{d_i}^A = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}\} & \forall d_i \ s.t. \ w_{d_i} > \frac{1}{2} \end{cases}$$

A series of implications follows from these three Propositions. First of all, Proposition 2 suggests that if not all donors see at least some benefit in both projects A and B no amount of specialized information obtainable by m will allow for a unanimous decision in favor of discretion (it is obvious that less demanding q-majorities will be more easily attainable). Second, when voter-induced benefits from bilateral aid decrease relative to the specialized information obtainable by m, discretion becomes more likely. Third, when voter preferences are more centrally located and less spread out, discretion also becomes more likely.

Regarding fund allocations, discretion obviously matters as well. First, if such discretion is not granted and voter concerns loom large compared to the specialized information obtainable by m (i.e., $v \geq \frac{\overline{k}}{2}$) then donors will only give bilateral aid (see Proposition 4). If voters' interests do not loom as large, and discretion is still not granted, the most moderate donors will contribute to SPTFs, while more extremist donors (preferring either project A or B much more) will only engage in bilateral aid.

Finally, if discretion is granted it will be supported by centrist donors who will also contribute voluntary core contributions as a consequence. Contributions to SPTFs will depend on the interaction of the importance of voters and the donors' preferences. For a given combination of importance of voters and the value of specialized information obtainable by m, donor preferences have non-monotonic effects. More precisely, donors with more extreme preferences will not necessarily engage in bilateral aid. Under some circumstances SPTFs are more attractive to such a donor. More extreme donors, however, will shun voluntary core contributions that are allocated among projects by m. Our analysis of a version of our game without SPTFs (see appendix) nicely demonstrates that the commonly assumed notion that preference heterogeneity among donors reduces multilateral aid only holds if SPTFs are not an option. Consequently, while much of the literature dealing with issues of delegation and bi- and multilateral aid suggests that preference heterogeneity has a monotonic effect on the choice of aid channel, our model suggests its effects are conditional. If the multilateral agent m is completely constrained then we find that increasing preference heterogeneity will lead to more bilateral aid (even exclusively if voters' interest loom large, i.e., if $v \geq \frac{\overline{k}}{2}$).

1.5 Discussion

The results of our game-theoretical model clearly show that decision rules in multilateral organizations and donor preferences interact in more complicated and non-monotonic ways in aid allocation decisions if SPTFs are available to donors.

Our model first shows that the interaction between decision rules and donor preferences offers an explanation for the conditions under which SPTFs are attractive for donors. SPTFs are an appealing alternative, in particular for donors with extreme preferences, when core contributions do not give substantially more output, and when governments generate only little utility from bilateral aid through voters and interest groups. If the latter factor becomes more important, bilateral aid becomes more attractive.

Second, we show that the absence of SPTFs changes the allocation between bilateral and core voluntary contributions. Under both decision rules we consider, the absence of SPTFs increases the tendency to provide voluntary core contributions for all donors and bilateral aid increases relative to a situation with SPTFs. An agent, or a collective principal, with a preference for voluntary core contributions should not be in favor of a multilateral aid organization to allow for multi-bi aid. However, if the multilateral organization and its principals seek to maximize assets managed and implemented by the organization or to minimize aid channeled bilaterally, with, for example the goal to limit fragmentation in recipient countries, it is optimal to offer SPTFs.

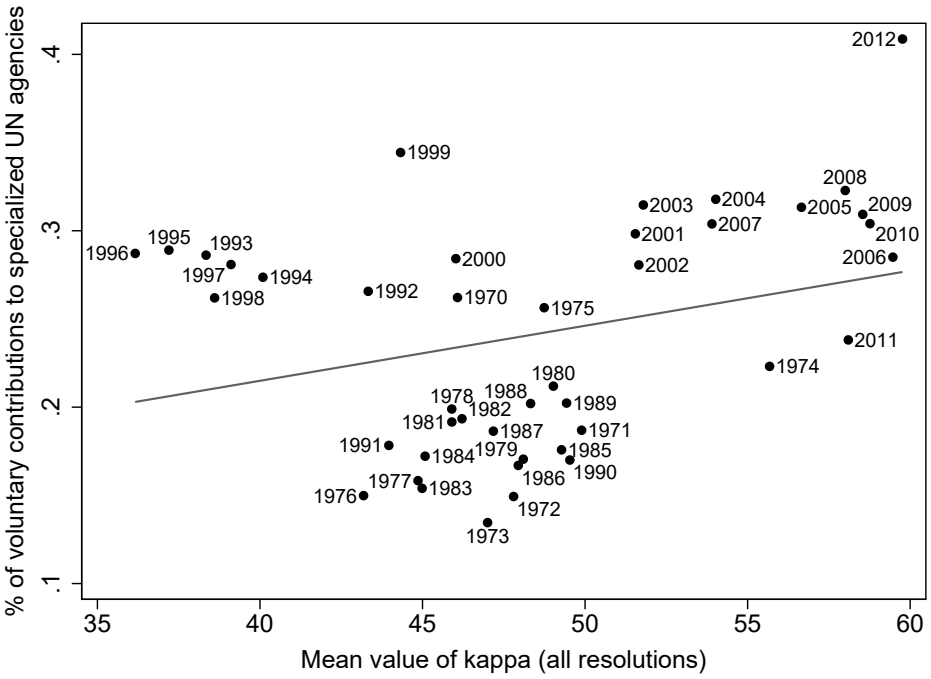
Given that the propositions derived from our model provide for rich insights related to the funding of IOs in general and the emergence of SPTFs in particular, in what follows we offer more precise implications and empirical illustrations related to them.

First, from Propositions 3 and 4 we know that voluntary core-contributions only occur if a required majority (or unanimity) supports giving the agent m discretion. As Proposition 2 and Corollary 1 show, with increasing preference diversity, granting discretion becomes less likely. Consequently, with increasing preference diversity we should see fewer voluntary core contributions and, by implication, larger resistance to increasing assessed core contributions. Figure 1.7 offers some evidence in support of this claim for the specialized agencies of the United Nations. The horizontal axis depicts the yearly mean value of a commonly used preference similarity measure (κ) calculated on the basis of all votes (including consensus actions) on resolutions in the UN General Assembly (Häge and Hug 2016). The vertical axis shows the share of voluntary (earmarked and unearmarked) contributions in the total UN budget.[41] While the relationship is not strong (with several outliers) we still find the expected positive trend. As UN members vote more similarly

[41] *Source:* Total UN System Contributions Data compiled by Klaus Hüfner (Senior Research Fellow, Global Policy Forum): https://www.globalpolicy.org/un-finance/tables-and-charts-on-un-finance/un-system-budget/27505-total-un-system-contributions.html (consulted August 5, 2015).

in the General Assembly (higher value of κ), the share of voluntary core contributions increases.[42]

Figure 1.7: Preference heterogeneity and voluntary contributions to specialized UN agencies as share of total UN contributions



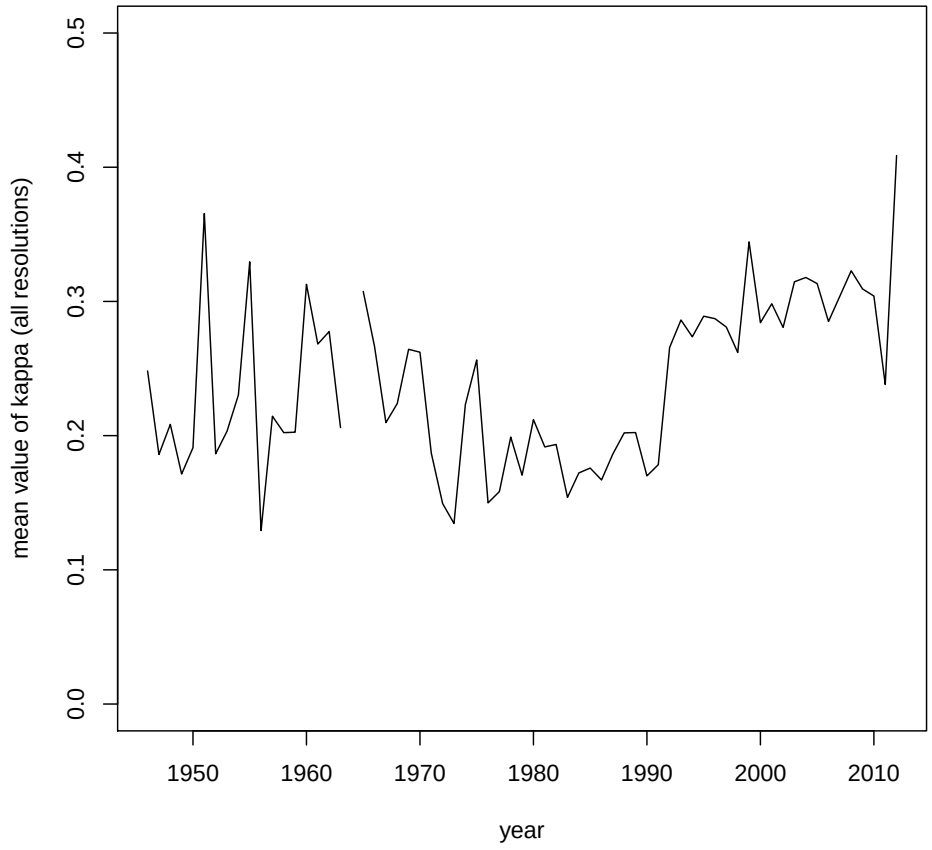
Notes: In a regression of the mean value of kappa on the share of voluntary contributions to UN agencies, the $p - value$ of the coefficient is 0.052. The adjusted R-squared is 0.066.

These changes in relative importance of assessed and voluntary contributions should be related, according to our model, to the funding types allowed by UN agencies. In an insightful study of funding rules, Graham (2015) shows that these have evolved quite considerably since the inception of the UN. For our implications two elements from her study are of crucial importance. First, most specialized UN agencies, especially those founded in recent times, started off without assessed core contributions as financing mechanism. Second, especially in the 1970s and 1990s more and more of the agencies opened up the possibility of allowing voluntary contributions, especially of the earmarked type. If we relate these changes again to our measure for preference heterogeneity as depicted in Figure 1.8, it transpires that in both the 1970s and the 1990s the mean value of κ decreased

[42] While there appears to be a trend towards a higher share of voluntary non-core contributions to the UN budget (Graham 2015: 180ff), Eichenauer and Reinsberg (2017) note that the quality of the OECD data has improved over time. As the time trend for our preference heterogeneity measure (see Figure 1.8) is in addition quite different, we consider Figure 1.7 still a plausible indication of the link between preferences and core contributions.

considerably, implying that preference heterogeneity increased. As Graham (2015) shows, the number of multilateral organizations accepting voluntary funding increased in these two periods.

Figure 1.8: Preference heterogeneity of donors over time based on UN General Assembly votes

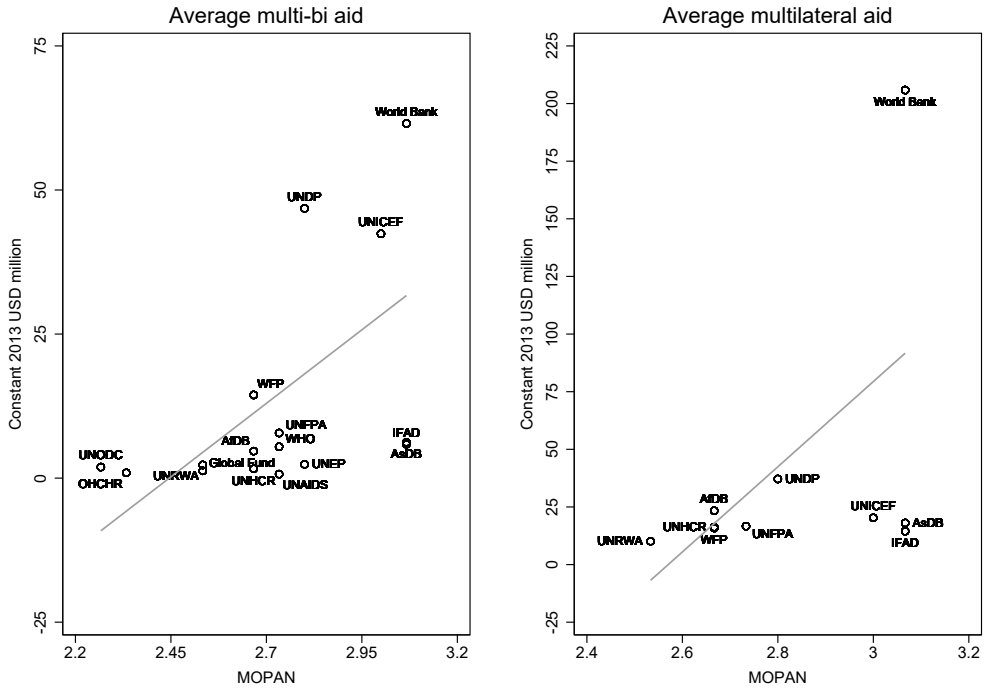


Propositions 3 and 4 also imply that the increasing importance of voter concerns (v) and the decreasing expertise of the agent m ($\overline{k}$) lead to fewer and lower core contributions ($c_{d_i}^{C_v}$). Figure 1.9 offers tentative evidence that better evaluated agencies (i.e., those agencies with a higher $\overline{k}$)[43] attract more funding for special purpose trust funds (multi-bi

[43] The nineteen large Western donor countries organized in the MOPAN jointly assess the organizational effectiveness of major multilateral agencies. Multilateral Organization Performance Assessment Network (MOPAN) scores were coded from Cooperation (2013), which based its scoring on MOPAN data. The quantitative MOPAN assessments are not publicly available otherwise. Higher scores signal increasing organizational effectiveness. When we set the scores from any of the individual donor countries which individually evaluated multilateral organization and made scores publicly available

aid)[44] than others, at least in absolute terms.[45]

Figure 1.9: Evaluation score by donors and average multi-bi aid and multilateral aid across multilateral organizations (2008-2012)



Notes: The y-axis shows the annual amount received by different multilateral organizations from all donors by aid type (in constant 2013 US$ million). The x-Axis shows the performance score given by the Multilateral Organizations Performance Assessment Network MOPAN.

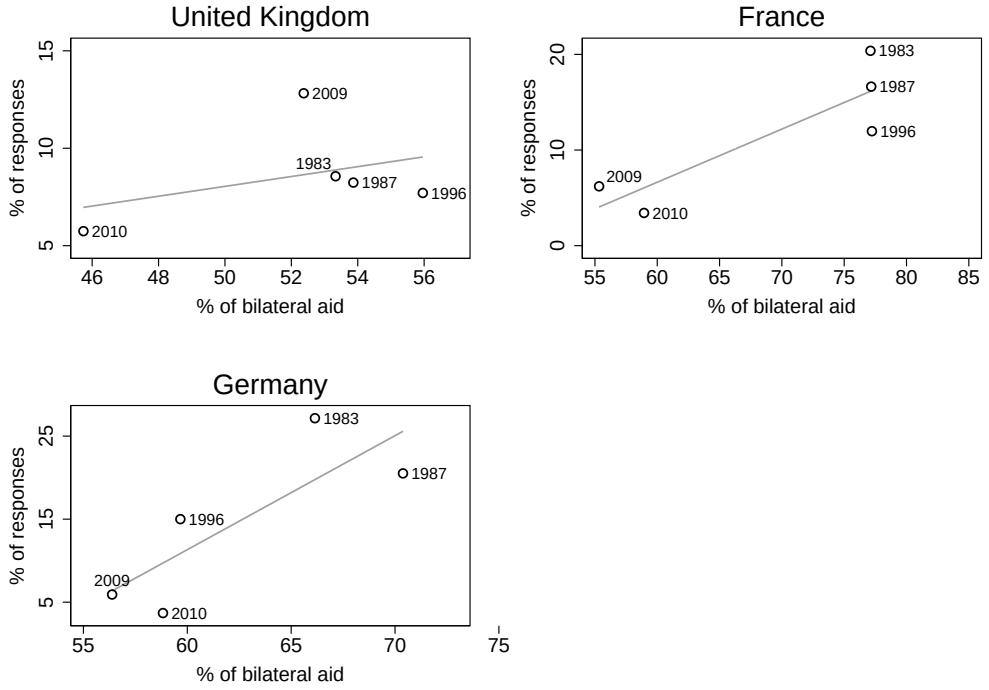
(i.e., the United Kingdom, Australia, Denmark and Canada) against their use of multi-bi aid we obtain similar results. For comparative purposes, we transformed all scores to a 4-point scale.

[44] Multi-bi aid figures are based on the multi-bi aid dataset (Eichenauer and Reinsberg 2017), other ODA data come from OECD (2015).

[45] The figure comes, however, also with several caveats. First, both panels of Figure 1.9 are restricted to those multilateral organizations for which MOPAN evaluation scores are available because there are no alternative measures of the quality of multilateral organizations. Second, the sample of IOs in the right-hand panel is further restricted because multilateral (voluntary and assessed) core aid received by the World Health Organisation (WHO), the UN Environment Programme (UNEP), UNAIDS, the UN Office on Drugs and Crime (UNODC), the Office of the United Nations High Commissioner for Human Rights (OHCHR) and the Global Fund is not available from the OECD so that comparability would not be assured. Furthermore, there might be concerns that the positive relationship between the amount of multi-bi aid and the MOPAN score is driven by outliers. Note, however, that the "outliers", the World Bank, the UN Children's Fund (UNICEF) and the UN Development Programme (UNDP) are multilateral organizations with broad sectoral and geographical mandates. To nevertheless alleviate these concerns we fitted also for both panels of Figure 1.9 a second line excluding these "outliers." Specifically, we fitted the line without the values for the World Bank, UNICEF and UNDP for the left hand panel and without the World Bank for the right-hand panel. The positive relationship is less pronounced without these "outliers" but still present.

Finally, in Figure 1.10 we provide suggestive evidence regarding the role of public opinion. More precisely, we use data from the Eurobarometer over time to depict the share of respondents considering national governments as most useful in providing aid and the share of bilateral aid. The implication from our model is that as voter concerns about the use of foreign aid increase, i.e., opinion shifting towards bilateral implementation of foreign aid, the government will move from voluntary core funding and SPTFs to bilateral aid. The correlational evidence for three major European donor countries in Figure 1.10 support this implication. In the United Kingdom, France and Germany, there is a clear positive relationship between public opinion and the share of bilateral aid.

Figure 1.10: Public opinion and share of bilateral aid in the aid budget of selected European countries



Notes: The y-Axis shows the average percentage share of affirmative answers to a Eurobarometer question of the type: "[...]which one do you think provides the most useful help to the Third World countries?" Response options slightly change between survey waves but always include the national government, international organizations (UN and other international organizations are distinct options in some years), the European Community, and NGOs. The x-Axis shows the percentage share of bilateral aid disbursements of total aid disbursements. *Source:* http://www.gesis.org/eurobarometer-data-service/data-access/

1.6 Conclusion

The increasing importance of special purpose trust funds raises a series of questions concerning their consequences for aid effectiveness, recipient countries, and multilateral organizations. These consequences are, however, hard to ascertain in the absence of a clear understanding of what leads donors to eschew traditional channels of aid-giving, i.e., bilateral or "traditional" multilateral channels.

We propose a simple game-theoretical model as a first stepping stone towards understanding this complex situation. The model allows donors not only to provide voluntary contributions (beyond the compulsory assessed contributions) to a core fund, but also to disburse additional aid to special purpose trust funds or undertake their own bilateral aid activities. For simplicity we assumed that the special purpose trust funds only use the money to finance one specific project, while the multilateral aid agency may divert the core fund (inside approved bounds) to the more effective project. In addition to allowing donors to allocate their non-assessed aid budget to the core fund, to a special purpose trust fund, or to spend it bilaterally, the donors jointly decide the discretion that the multilateral agent has in allocating her budget. We show that the allocation decisions depend upon the decision rule, which interacts in non-intuitive ways with the distribution of preferences among donors. More specifically, contrary to what is normally assumed in principal-agent approaches when dealing with multiple principals, preference heterogeneity does not lead monotonically and uniformly to aid disbursed through channels under increasingly tighter control of the individual principal. While we can show that this effect holds if SPTFs are not allowed, this simple relationship breaks down when multi-bi aid becomes a possibility for donors.

While a complete empirical evaluation of the implications of our model is beyond the scope of this Chapter, we offered a few suggestive pieces of empirical evidence in support of the insights gleaned from our model. we offered a few suggestive pieces of empirical evidence in support of the insights gleaned from our model. Preference heterogeneity appears to influence the share of core funding and also the adoption of the possibility for funding aid through SPTFs. Also, we find evidence that SPTFs are mostly established at multilateral organizations that are evaluated positively, i.e., organizations that are likely to have more expertise.

Finally,despite the fact that we motivated the model by the rise in SPTFs, its generality has implications for the study of multilateral organizations and their funding more broadly. The implications of the model complement those of Hüfner's (2003) and Mazower's (2012) discussion of the changes in the funding of the United Nations system. The finding about the non-monotonic effect of preference heterogeneity on the choice of the aid channel (and

delegation more broadly speaking) also questions conclusions casually drawn by scholars relying on principal-agent approaches.

1.A Appendix: Formal Derivation of the Model in "The Politics of Special Purpose Trust Funds"

In this appendix we first derive the donors' optimal allocation rules for the game with $\|D\| = 5$ before presenting the proofs of the propositions and the lemma that were presented without proofs in the main text.

Derivation of the Agent's Utility

The expected utility of m when she abstains from collecting information:

$$\begin{aligned}
EU_m(c_m = 0) &= \frac{1}{2}[(1+\overline{k})(s^A \sum_{d_i} c^C_{d_i} + (1-\overline{k}) \sum_{d_i} b^A_{d_i} + \sum_{d_i} c^A_{d_i}) + \\
&\quad (1-\overline{k})(s^B \sum_{d_i} c^C_{d_i} + (1-\overline{k}) \sum_{d_i} b^B_{d_i} + \sum_{d_i} c^B_{d_i})] + \\
&\quad \frac{1}{2}[(1+\underline{k})(s^A \sum_{d_i} c^C_{d_i} + (1-\overline{k}) \sum_{d_i} b^A_{d_i} + \sum_{d_i} c^A_{d_i}) + \\
&\quad (1-\underline{k})(s^B \sum_{d_i} c^C_{d_i} + (1-\overline{k}) \sum_{d_i} b^B_{d_i} + \sum_{d_i} c^B_{d_i})] \\
&= s^A \sum_{d_i} c^C_{d_i} + (1-\overline{k}) \sum_{d_i} b^A_{d_i} + (1-\overline{k}) \sum_{d_i} b^B_{d_i} + \sum_{d_i} c^A_{d_i} + \sum_{d_i} c^B_{d_i} + \\
&\quad (1-s^A) \sum_{d_i} c^C_{d_i} \\
&= \sum_{d_i} c^C_{d_i} + (1-\overline{k}) \sum_{d_i} b^A_{d_i} + (1-\overline{k}) \sum_{d_i} b^B_{d_i} + \sum_{d_i} c^A_{d_i} + \sum_{d_i} c^B_{d_i} \qquad (1.4)
\end{aligned}$$

The expected utility of m when she collects information:

$$\begin{aligned}
EU_m(c_m = \overline{c_m}, k = \overline{k}) &= (1+\overline{k})[s^*(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k}) \sum_{d_i} b^A_{d_i} + \sum_{d_i} c^A_{d_i})] + \\
&\quad (1-\overline{k})[(1-s^*)(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k}) \sum_{d_i} b^B_{d_i} + \sum_{d_i} c^B_{d_i}] \qquad (1.5) \\
EU_m(c_m = \overline{c_m}, k = \underline{k}) &= (1-\overline{k})[(1-s^*)(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k}) \sum_{d_i} b^A_{d_i} + \sum_{d_i} c^A_{d_i})] + \\
&\quad (1+\overline{k})[s^*(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k}) \sum_{d_i} b^B_{d_i} + \sum_{d_i} c^B_{d_i}] \qquad (1.6)
\end{aligned}$$

Consequently, this unconditional expected utility reduces to (taking into account the notation introduced above):

$$\begin{aligned}
EU_m(c_m = \overline{c_m}) &= (1+\overline{k})[s^*(\sum_{d_i} c^C_{d_i} - \overline{c_m})] + (1-\overline{k})(1-s^*)(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + \\
&\quad \frac{1}{2}(1+\overline{k})((1-\overline{k})\sum_{d_i} b^A_{d_i} + \sum_{d_i} c^A_{d_i}) + \\
&\quad \frac{1}{2}(1-\overline{k})((1-\overline{k})\sum_{d_i} b^A_{d_i} + \sum_{d_i} c^A_{d_i}) + \\
&\quad \frac{1}{2}(1-\overline{k})((1-\overline{k})\sum_{d_i} b^B_{d_i} + \sum_{d_i} c^B_{d_i}) + \\
&\quad \frac{1}{2}(1-\overline{k})((1-\overline{k})\sum_{d_i} b^B_{d_i} + \sum_{d_i} c^B_{d_i}) \\
&= 2\overline{k}s^*(\sum_{d_i} c^C_{d_i} - c_m) + \sum_{d_i} c^C_{d_i} - \overline{c_m} - \overline{k}(\sum_{d_i} c^C_{d_i} - c_m) + \sum_{d_i} c^A_{d_i} + \\
&\quad (1-\overline{k})\sum_{d_i} b^A_{d_i} + \sum_{d_i} c^B_{d_i} + (1-\overline{k})\sum_{d_i} b^B_{d_i} \\
&= (1-\overline{k})\sum_{d_i} b^A_{d_i} + (1-\overline{k})\sum_{d_i} b^B_{d_i} + \sum_{d_i} c^A_{d_i} + \sum_{d_i} c^B_{d_i} + \sum_{d_i} c^C_{d_i} - \\
&\quad \overline{c_m}(1-\overline{k}+2\overline{k}s^*) + \sum_{d_i} c^C_{d_i}(2\overline{k}s^* - k) \qquad (1.7)
\end{aligned}$$

Derivation of the Donors' Allocation Rules

For d_1, we have expected utility

$$\begin{aligned}
EU_{d_1} &= \frac{0}{4}[\frac{1}{2}(1-\overline{k})[\sum_{d_{i\neq 1}} c^A_{d_i} + c^A_{d_1} + \sum_{d_i} c^C_{d_i} - c_m] + \frac{1}{2}(1+\overline{k})[\sum_{d_{i\neq 1}} c^A_{d_i} + c^A_{d_1} + \sum_{d_i} c^C_{d_i} - c_m] \\
&\quad +(1-\overline{k})b^A_{d_1}] + \frac{4}{4}[\frac{1}{2}(1-\overline{k})[\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_1} + \sum_{d_i} c^C_{d_i} - c_m] \\
&\quad +\frac{1}{2}(1+\overline{k})[\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_1} + \sum_{d_i} c^C_{d_i} - c_m] + (1-\overline{k})b^B_{d_1}] + v(b^A_{d_1} + b^B_{d_1}) \\
&= [\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_1} + (\sum_{d_i} c^C_{d_i} - c_m)(\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}) + (1-\overline{k})b^B_{d_1}] + v(b^A_{d_1} + b^B_{d_1}) \qquad (1.8)
\end{aligned}$$

Partial derivatives of EU_{d_1} with respect to d_1's choice variables are

$$\begin{aligned}
\frac{\delta EU_{d_1}}{\delta c_{d_1}^{C_v}} &= \overline{k s^A} + \frac{1-\overline{k}}{2} \\
\frac{\delta EU_{d_1}}{\delta c_{d_1}^{A}} &= 0 \\
\frac{\delta EU_{d_1}}{\delta c_{d_1}^{B}} &= 1 \\
\frac{\delta EU_{d_1}}{\delta b_{d_1}^{A}} &= v \\
\frac{\delta EU_{d_1}}{\delta b_{d_1}^{B}} &= (1-\overline{k}) + v
\end{aligned} \tag{1.9}$$

For d_2 we have

$$\begin{aligned}
EU_{d_2} = \; & \frac{1}{4}[\sum_{d_{i\neq 1}} c_{d_i}^A + c_{d_2}^A + (\sum_{d_i} c_{d_i}^C - c_m)(\overline{k s^A} + \frac{1-\overline{k}}{2}) + (1-\overline{k}) b_{d_2}^A])] \\
& + \frac{3}{4}[\sum_{d_{i\neq 1}} c_{d_i}^B + c_{d_2}^B + (\sum_{d_i} c_{d_i}^C - c_m)(\overline{k s^A} + \frac{1-\overline{k}}{2}) + (1-\overline{k}) b_{d_2}^B] \\
& + v(b_{d_2}^A + b_{d_2}^B)
\end{aligned} \tag{1.10}$$

Partial derivatives of EU_{d_2} with respect to d_2's choice variables are

$$\begin{aligned}
\frac{\delta EU_{d_2}}{\delta c_{d_2}^{C_v}} &= \overline{k s^A} + \frac{1-\overline{k}}{2} \\
\frac{\delta EU_{d_2}}{\delta c_{d_2}^{A}} &= \frac{1}{4} \\
\frac{\delta EU_{d_2}}{\delta c_{d_2}^{B}} &= \frac{3}{4} \\
\frac{\delta EU_{d_2}}{\delta b_{d_2}^{A}} &= \frac{1}{4}(1-\overline{k}) + v \\
\frac{\delta EU_{d_2}}{\delta b_{d_2}^{B}} &= \frac{3}{4}(1-\overline{k}) + v
\end{aligned} \tag{1.11}$$

For d_3, we have the expected utility

$$\begin{aligned}
EU_{d_3} = \; & \frac{1}{2}[\sum_{d_{i\neq 1}} c_{d_i}^A + c_{d_3}^A + (\sum_{d_i} c_{d_i}^C - c_m)(\overline{k s^A} + \frac{1-\overline{k}}{2}) + (1-\overline{k}) b_{d_3}^A)] \\
& + \frac{1}{2}[\sum_{d_{i\neq 1}} c_{d_i}^B + c_{d_3}^B + (\sum_{d_i} c_{d_i}^C - c_m)(\overline{k s^A} + \frac{1-\overline{k}}{2}) + (1-\overline{k}) b_{d_3}^B] \\
& + v[b_{d_3}^A + b_{d_3}^B]
\end{aligned} \tag{1.12}$$

Partial derivatives of EU_{d_3} with respect to d_3's choice variables are

$$\begin{aligned}
\frac{\delta EU_{d_3}}{\delta c_{d_3}^{C_v}} &= \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \\
\frac{\delta EU_{d_3}}{\delta c_{d_3}^{A}} &= \frac{1}{2} \\
\frac{\delta EU_{d_3}}{\delta c_{d_3}^{B}} &= \frac{1}{2} \\
\frac{\delta EU_{d_3}}{\delta b_{d_3}^{A}} &= \frac{1}{2}(1-\overline{k}) + v \\
\frac{\delta EU_{d_3}}{\delta b_{d_3}^{B}} &= \frac{1}{2}(1-\overline{k}) + v
\end{aligned} \tag{1.13}$$

For d_4 and d_5, the partial derivatives are symmetric to d_2 and d_1 respectively, only that the former preferences lean towards B whereas the later prefer A.

Conditions determining allocation decisions

Now, we look at the determinants of each donor's aid allocation. First, donor d_1 provides voluntary core resources (i.e., $c_{d_1}^{C_v} > 0$) if $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > 1$ and $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > (1-\overline{k}) + v$. The relevant limits for $\overline{k}$ are:

$$\begin{aligned}
\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} &> 1 \\
2\overline{k}\overline{s^A} - \overline{k} &> 1 \\
\overline{k} &> \frac{1}{2\overline{s^A} - 1}
\end{aligned} \tag{1.14}$$

and

$$\begin{aligned}
\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} &> (1-\overline{k}) + v \\
2\overline{k}\overline{s^A} + \overline{k} &> 1 + 2v \\
\overline{k} &> \frac{1+2v}{2\overline{s^A} + 1}
\end{aligned} \tag{1.15}$$

From this, we may determine the value of v that makes one or the other of these $\overline{k}$ binding,

$$\begin{aligned}
\frac{1}{2\overline{s^A} - 1} &> \frac{1+2v}{2\overline{s^A} + 1} \\
2\overline{s^A} + 1 &> 2\overline{s^A} + 4\overline{s^A}v - 1 - 2v \\
\frac{1}{2\overline{s^A} - 1} &> v
\end{aligned} \tag{1.16}$$

Second, the SPTF for project B will receive funds (i.e., $c_{d_2}^B > 0$) if $1 > 1 - \overline{k} + v$ and $1 > \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}$. The first inequality holds for $\overline{k} > v$. For the second inequality we obtain:

$$\begin{aligned} 1 &> \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \\ \frac{1}{2\overline{s^A} - 1} &> \overline{k} \end{aligned} \tag{1.17}$$

Thus, we find that for $\frac{1}{2\overline{s^A}-1} > v$, multi-bi aid is provided if $\frac{1}{2\overline{s^A}-1} > \overline{k} > v$.

Finally, d_1 provides bilateral aid for project B (i.e., $b_{d_1}^B > 0$) if $1 - \overline{k} + v > 1$ and $1 - \overline{k} + v > \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}$. The first inequality holds for $v > \overline{k}$. For the second inequality we obtain:

$$\begin{aligned} 1 - \overline{k} + v &> \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \\ 1 + 2v &> 2\overline{k}\overline{s^A} + \overline{k} \\ \frac{1+2v}{2\overline{s^A} + 1} &> \overline{k} \end{aligned} \tag{1.18}$$

Determining the respective v we find:

$$\begin{aligned} \frac{1+2v}{2\overline{s^A} + 1} &> v \\ 1 + v &> 2v\overline{s^A} \\ \frac{1}{1\overline{s^A} - 1} &> v \end{aligned} \tag{1.19}$$

Donor d_2 provides voluntary core funds (i.e., $c_{d_2}^{C_v} > 0$) if $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > \frac{3}{4}$ and $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > \frac{3}{4}(1-\overline{k}) + v$. We now look for the values of $\overline{k}$ for which d_2 provides voluntary core funds.

$$\begin{aligned} \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} &> \frac{3}{4} \\ 4\overline{k}\overline{s^A} - 2\overline{k} &> 1 \\ \overline{k} &> \frac{1}{4\overline{s^A} - 2} \end{aligned} \tag{1.20}$$

and

$$\begin{aligned} \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} &> \frac{3}{4}(1-\overline{k}) + v \\ 4\overline{k}\overline{s^A} + \overline{k} &> 1 + 4v \\ \overline{k} &> \frac{1+4v}{4\overline{s^A} + 1} \end{aligned} \tag{1.21}$$

From this, we may determine the value of v that determines which one of these $\overline{k}$ is binding,

$$\begin{aligned} \frac{1}{4\overline{s^A}-2} &> \frac{1+4v}{4\overline{s^A}+1} \\ 4\overline{s^A}+1 &> 4\overline{s^A}+16\overline{s^A}v-2-8v \\ \frac{3}{16\overline{s^A}-8} &> v \end{aligned} \tag{1.22}$$

Second, d_2 contributes to the special fund B (i.e., $c^B_{d_2} > 0$) if $\frac{3}{4} > \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}$ and $\frac{3}{4} > \frac{3}{4}(1-\overline{k}) + v$. The relevant constraints for $\overline{k}$ are:

$$\begin{aligned} \frac{3}{4} &> \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \\ 1 &> \overline{k}(4\overline{s^A}-2) \\ \frac{1}{4\overline{s^A}-2} &> \overline{k} \end{aligned} \tag{1.23}$$

and

$$\begin{aligned} \frac{3}{4} &> \frac{3}{4}(1-\overline{k})+v \\ 3 &> 3-3\overline{k}+4v \\ \overline{k} &> \frac{4v}{3} \end{aligned} \tag{1.24}$$

From this, we may again determine the value of v, for which these limits on $\overline{k}$ are binding

$$\begin{aligned} \frac{1}{4\overline{s^A}-2} > \overline{k} &> \frac{4v}{3} \\ 3 &> 4v(4\overline{s^A}-2) \\ \frac{3}{16\overline{s^A}-8} &> v \end{aligned} \tag{1.25}$$

Finally, d_2 provides bilateral aid to project B (i.e., $b^B_{d_2} > 0$) if $\frac{3}{4}(1-\overline{k}) + v > \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}$ and $\frac{3}{4}(1-\overline{k}) + v > \frac{3}{4}$. The relevant values for the limits on $\overline{k}$ are:

$$\begin{aligned} \frac{3}{4}(1-\overline{k})+v &> \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \\ 1+4v &> 4\overline{k}\overline{s^A}+\overline{k} \\ \frac{1+4v}{4\overline{s^A}+1} &> \overline{k} \end{aligned} \tag{1.26}$$

and

$$\begin{aligned} \frac{3}{4}(1-\overline{k})+v &> \frac{3}{4} \\ 3-3\overline{k}+4v &> 3 \\ \frac{4v}{3} &> \overline{k} \end{aligned} \tag{1.27}$$

Next, we determine the values of v that determine which of these limits on $\overline{k}$ is binding:

$$\begin{aligned} \frac{1+4v}{4\overline{s^A}+1} &> \frac{4v}{3} \\ 3+12v &> 16v\overline{s^A}+4v \\ \frac{3}{16\overline{s^A}-8} &> v \end{aligned} \tag{1.28}$$

Donor d_2 may provide voluntary core contributions to the multilateral, give to SPTFs for project B or provide bilateral aid for project B.

Because of perfect symmetry, d_4 and d_5 face exactly the same constraints as d_1 and d_2. First, donor d_3 will provide core contributions (i.e., $c_{d_3}^{C_v} > 0$) if $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > \frac{1}{2}$ and $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > \frac{1-\overline{k}}{2} + v$. The relevant $\overline{k}$ are:

$$\begin{aligned} \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} &> \frac{1}{2} \\ 2\overline{k}\overline{s^A} - \overline{k} &> 0 \end{aligned} \tag{1.29}$$

This inequality always holds for $\overline{k} > 0$ as long as $\overline{s^A} > \frac{1}{2}$. Therefore, d_3 will always prefer to give core funding to contributing through any of the SPTF, except if $\overline{s^A} = \frac{1}{2}$ in which case she is indifferent and will choose one of the SPTFs (by assumption she's indifferent between the two SPTFs). We now look at the inequality determining the threshold for which d_3 prefers core over bilateral contributions.

$$\begin{aligned} \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} &> \frac{1-\overline{k}}{2} + v \\ \overline{k} &> \frac{v}{\overline{s^A}} \end{aligned} \tag{1.30}$$

Second, d_3 provides funds to the special fund B (i.e., $c_{d_3}^B > 0$) if $\frac{1}{2} > \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}$ and $\frac{1}{2} > \frac{1}{2}(1-\overline{k}) + v$. Because the first inequality never holds when $\overline{s^A} > \frac{1}{2}$ (see above), d_3 never contributes to SPTF B (nor A) under these circumstances.

Finally, donor d_3 supports project B bilaterally (i.e., $b_{d_3}^B > 0$) if $\frac{1-\overline{k}}{2} + v > \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2}$

and $\frac{1}{2}(1-\overline{k})+v>\frac{1}{2}$. For the first inequality to hold, we need $\overline{k}$ such that

$$\begin{aligned}\frac{1-\overline{k}}{2}+v &> \overline{k}\overline{s^A}+\frac{1-\overline{k}}{2}\\ \frac{v}{\overline{s^A}} &> \overline{k}\end{aligned} \tag{1.31}$$

As for the later inequality, d_3 will provide bilateral aid whenever $2v>\overline{k}$. Looking at the values of v for the $\overline{k}$, we get

$$\begin{aligned}\frac{v}{\overline{s^A}} &> 2v\\ \frac{1}{2} &> \overline{s^A}\end{aligned} \tag{1.32}$$

By assumption, this will never happen. Thus, d_3 never gives multi-bi aid for any value of v if $\overline{s^A}>\frac{1}{2}$. Donors d_1 and d_5 will never make core contributions independent of the values of $\overline{s^A}$ (and all other variables).

This leads directly to our proposition regarding the equilibrium under unanimity rule:

Proposition 5. *With five donors with preferences distributed uniformely under unanimity rule no discretion is granted to m ($\overline{s^A}=\frac{1}{2}$), who will refrain from learning the value of k.*

This proposition follows immediately from the observation that d_1 and d_5 will make no voluntary core contributions. As it is only through the latter that donors' utility is affected by $\overline{s^A}$, by assumption 2 d_1 and d_5 will reject any level of discretion leading to $\overline{s^A}=\frac{1}{2}$. *Q.E.D.*

Proposition 5 suggests that only under majority rule can a subset of the five donors adopt sufficient discretion for m to engage in learning. As m's utility is strictly increasing in $\overline{s^A}$ and in $\sum_{d_i} c_{d_i}^C$ we first derive the conditions under which the donors will contribute core funds under the assumption of $\overline{s^A}=1$. Under this assumption the following proposition follows rather simply:

Proposition 6. *With five donors with preferences distributed uniformely under majority rule $\overline{s^A}=1$ is accepted by donors d_2, d_3 and d_4 who will give core contributions if and only if either of the following two sets of conditions is fulfilled:*

i) if $v<min(1-\overline{k},\frac{3}{8})$ and $\overline{k}>\frac{1}{2}$

ii) $v<1-\overline{k}$ and $\frac{3}{8}<v<\frac{5\overline{k}-1}{4}$

Proof of proposition 6: We know (from above) that if m obtains information on the value of k her utility is strictly increasing in $\overline{s^A}$ and $\sum_{d_i} c_{d_i}^C$. Thus, it is in m's interest to set (if possible) $\overline{s^A}=1$ and have all donors to contribute to $\sum_{d_i} c_{d_i}^C$. Consequently, in

what follows we determine the conditions under which all donors, only two or only one contribute(s) to the core fund.

From above we know that d_1 contributes to the core fund under two conditions, namely if either $1-\overline{k} > v > \frac{1}{2\overline{s^A}-1}$ and $\overline{k} > \frac{1+2v}{1+2\overline{s^A}}$ or $v < \frac{1}{2\overline{s^A}-1}$ (and $v < 1-\overline{k}$) and $\overline{k} > \frac{1}{2\overline{s^A}-1}$. The first condition implies that $1-\overline{k} > \frac{1}{2\overline{s^A}-1}$ or after rearranging that $\overline{k}(1-2\overline{s^A}) > 1-2\overline{s^A}$. This condition can never hold, as the expression in parenthesis is strictly smaller than 0 for all $\overline{s^A} > \frac{1}{2}$ while the right hand side of the expression is strictly positive for all values for $\overline{s^A}$. Regarding the second set of conditions the constraint that $\overline{k} > \frac{1}{2\overline{s^A}-1}$ is never fulfilled as both $\overline{k}$ and $\overline{s^A}$ can never exceed 1. This proves that d_1 (and by symmetry d_5) will never contribute core funds. It also implies that under unanimity rule m will never get any discretion, as d_1 and d_5 will vote against any $\overline{s^A} \neq \frac{1}{2}$.

As any discretion under unanimity is rejected it follows that all donors will make their aid allocation decision based on $\overline{s^A} = \frac{1}{2}$. Figure 1.5 in the main text depicts, based on the optimal allocation rules presented above the outcomes as a function of $\overline{k}$ and v.

For d_2 (and by symmetry d_4) we know that she will contribute to the core fund under two sets of conditions:

$1-\overline{k} > v > \frac{3}{16\overline{s^A}-8}$ and $\overline{k} > \frac{1+4v}{1+4\overline{s^A}}$

and

$v < \frac{3}{16\overline{s^A}-8}$ (and $v < 1-\overline{k}$) and $\overline{k} > \frac{1}{4\overline{s^A}-2}$

For d_3 we know that she will contribute to the core fund under the following condition:

$v < 1-\overline{k}$ and $\overline{k} > \frac{v}{\overline{s^A}}$

An additional lemma allows us to generate the full equilibrium aid allocation decisions:

Lemma 1. *With five donors with preferences distributed uniformely under majority rule m cannot offer less than full discretion ($\overline{s^A} < 1$) and induce donors d_2, d_3 and d_4 to make core contributions under other conditions than those specified in proposition 6.*

From this lemma it follows that for all other combinations of values for $\overline{k}$ and v no majority will support a discretion proposal different from $\overline{s^A} = \frac{1}{2}$.

Conditions under which donor d_3 contributes to the core fund

For donor d_3 only two conditions are relevant, namely that $v < 1-\overline{k}$ and $\overline{k} > \frac{v}{\overline{s^A}}$.

Combining the two (under the assumption of maximum discretion, i.e., $\overline{s^A} = 1$) results in the constraint that $v < \overline{k}$ and $\overline{k} < 1-v$. Consequently, in a space defined by $\overline{k}$ horizontally and v vertically, the set of values below both diagonals form the set of values for $\overline{k}$ and v that leads d_3 to contribute core funds.

Conditions under which donors d_3, d_2 and d_4 contribute to the core fund

To assess whether these three donors contribute to the core fund requires combining the conditions for d_3 with either of the two sets for donor d_2.

1. The first possible combination (i.e., $v < 1 - \overline{k}$ and $\overline{k} > \frac{v}{\overline{s^A}}$ and $1 - \overline{k} > v > \frac{3}{16\overline{s^A} - 8}$ and $\overline{k} > \frac{1+4v}{1+4\overline{s^A}}$) implies that
   $1 - \overline{k} > v > \frac{3}{16\overline{s^A} - 8}$
   Solving for $\overline{k}$ results in the constraint $\overline{k} < \frac{16\overline{s^A} - 11}{16\overline{s^A} - 8}$ which equals $\frac{5}{8}$ under the assumption of $\overline{s^A} = 1$. Consequently if $\overline{k} < \frac{5}{8}$ and $v > \frac{3}{8}$ then d_2 will give core funds if $v < \frac{5\overline{k} - 1}{4}$ from $\overline{k} > \frac{1+4v}{1+4\overline{s^A}}$ with $\overline{s^A} = 1$. This last constraint holds simultaneously with $v > \frac{3}{8}$ only if $\overline{k} > \frac{1}{2}$. This is the small upper-most spike of the triangle on the right side with $\overline{s^A} = 1$.

2. The second possible combination (i.e., $v < 1 - \overline{k}$ and $\overline{k} > \frac{v}{\overline{s^A}}$ and $v < \frac{3}{16\overline{s^A} - 8}$ and $\overline{k} > \frac{1}{4\overline{s^A} - 2}$) implies (combining the first and the last constraint) that
   $1 - v > \overline{k} > \frac{1}{4\overline{s^A} - 2}$ (i.e. $\overline{k} > \frac{1}{2}$) or after rearranging
   $\frac{4\overline{s^A} - 3}{4\overline{s^A} - 2} > v$
   As v has to be positive, this implies that $\overline{s^A} > \frac{3}{4}$. As at the same time $v < \frac{3}{16\overline{s^A} - 8}$ under the assumption that $\overline{s^A} = 1$ this second constraint is binding (it can be shown that this latter constraint is binding if $\overline{s^A} > \frac{15}{16}$, while the former becomes binding if v is smaller). This is the rhomboid of the triangle on the right side, from $v = 0$ up to $v = \frac{3}{8}$.
   Consequently, in the second combination and for $\overline{s^A} = 1$, d_2 will give core aid if $\overline{k} > \frac{1}{2}$, and $v < min(\frac{3}{8}, 1 - \overline{k})$.

Conditions under which all donors contribute to the core fund

In order to have donor d_1 (and d_5) contribute core funds, we need $\overline{k} > \frac{1}{2\overline{s^A} - 1}$. For all values of $\overline{s^A} \in [\frac{1}{2}, 1]$ this lower limit for $\overline{k}$ exceeds 1, implying that the two extreme donors will never make contributions to the core fund.

From this it follows that the following conditions lead to voluntary core contributions with $\overline{s^A} = 1$:

i) if $v < min(1 - \overline{k}, \frac{3}{8})$ and $\overline{k} > \frac{1}{2}$ (Combination 2 before) or $v < 1 - \overline{k}$ and $\frac{3}{8} < v < \frac{5\overline{k} - 1}{4}$ and $k < \frac{5}{8}$ (Combination 1 before) then donors d_2, d_3, d_4 will make core contributions.

ii) if $\overline{k} < min(v, \frac{1}{2})$ or $\frac{1}{2} < \overline{k}$ and $\frac{5\overline{k} - 1}{4} < v < 1 - \overline{k}$ then only donor d_3 will make core contributions.

Conditions under which donors prefer agent learning

As the previous derivations were predicated on the assumption that $\overline{s^A} = 1$ and that m learned the value of k we next determine the conditions under which each donor prefers m to spend $\overline{c_m}$ and learn the value of k. We start with d_2 whose expected utilities for full discretion and agent-learning and for no discretion without learning are the following:

$$\begin{aligned} E(U_{d_2}|\overline{s^A} = 1, \underline{s^A} = 0) &= \frac{1}{4}[\sum_{d_i \neq 1} c^A_{d_i} + c^A_{d_2} + \frac{1}{2}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k})b^A_{d_2}] \\ &\quad + \frac{3}{4}[\sum_{d_i \neq 1} c^B_{d_i} + c^B_{d_2} + \frac{1}{2}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k})b^B_{d_2}] \\ &\quad + v(b^A_{d_2} + b^B_{d_2}) \\ &= \frac{1}{4}[\sum_{d_i \neq 1} c^A_{d_i} + c^A_{d_2}] + \frac{1}{2}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + \frac{1}{4}(1-\overline{k})b^A_{d_2} \\ &\quad + \frac{3}{4}[\sum_{d_i \neq 1} c^B_{d_i} + c^B_{d_2}] + \frac{3}{4}(1-\overline{k})b^B_{d_2} + v(b^A_{d_2} + b^B_{d_2}) \end{aligned} \tag{1.33}$$

$$\begin{aligned} E(U_{d_2}|\overline{s^A} = \frac{1}{2}, \underline{s^A} = \frac{1}{2}) &= \frac{1}{4}[\sum_{d_i \neq 1} c^A_{d_i} + c^A_{d_2} + \frac{1}{2}\frac{1}{2}(1+\overline{k})\sum_{d_i} c^C_{d_i} + \frac{1}{2}\frac{1}{2}(1-\overline{k})\sum_{d_i} c^C_{d_i} \\ &\quad + (1-\overline{k})b^A_{d_2}] + \frac{3}{4}[\sum_{d_i \neq 1} c^B_{d_i} + c^B_{d_2} + \frac{1}{4}(1+\overline{k})\sum_{d_i} c^C_{d_i} \\ &\quad + \frac{1}{4}(1-\overline{k})\sum_{d_i} c^C_{d_i} + (1-\overline{k})b^B_{d_2}] + v(b^A_{d_2} + b^B_{d_2}) \\ &= \frac{1}{4}[\sum_{d_i \neq 1} c^A_{d_i} + c^A_{d_2}] + \frac{1}{2}\sum_{d_i} c^C_{d_i} + \frac{1}{4}(1-\overline{k})b^A_{d_2} \\ &\quad + \frac{3}{4}[\sum_{d_i \neq 1} c^B_{d_i} + c^B_{d_2}] + \frac{3}{4}(1-\overline{k})b^B_{d_2} + v(b^A_{d_2} + b^B_{d_2}) \end{aligned} \tag{1.34}$$

Find $\overline{k}$ such that $E(U_{d_2}|\overline{s^A} = 1, \underline{s^A} = 0) > E(U_{d_2}|\overline{s^A} = \frac{1}{2}, \underline{s^A} = \frac{1}{2})$

$$\begin{aligned} \frac{1}{2}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) &> \frac{1}{2}\sum_{d_i} c^C_{d_i} \\ \overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) &> \overline{c_m} \\ \overline{k} &> \frac{\overline{c_m}}{\sum_{d_i} c^C_{d_i} - \overline{c_m}} \end{aligned} \tag{1.35}$$

Same procedure for d_3:

$$\begin{aligned} E(U_{d_3}|\overline{s^A}=1,\underline{s^A}=0) &= \frac{1}{2}[\sum_{d_{i\neq 1}} c^A_{d_i} + c^A_{d_3} + \frac{1}{4}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k})b^A_{d_3})] \\ &\quad + \frac{1}{2}[\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_3} + \frac{1}{4}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k})b^B_{d_3}] \\ &\quad + v[b^A_{d_3} + b^B_{d_3}] \\ &= \frac{1}{2}[\sum_{d_{i\neq 1}} c^A_{d_i} + c^A_{d_3}] + \frac{1}{2}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + \frac{1}{4}(1-\overline{k})b^A_{d_3} \\ &\quad + \frac{1}{2}[\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_3}] + \frac{1}{2}(1-\overline{k})b^B_{d_3} + v(b^A_{d_3} + b^B_{d_3}) \end{aligned} \tag{1.36}$$

$$\begin{aligned} E(U_{d_3}|\overline{s^A}=\frac{1}{2},\underline{s^A}=\frac{1}{2}) &= \frac{1}{2}[\sum_{d_{i\neq 1}} c^A_{d_i} + c^A_{d_3} + \frac{1}{4}(1+\overline{k})\sum_{d_i} c^C_{d_i} + \frac{1}{4}(1-\overline{k})\sum_{d_i} c^C_{d_i} \\ &\quad + (1-\overline{k})b^A_{d_3})] + \frac{1}{2}[\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_3} + \frac{1}{4}(1+\overline{k})\sum_{d_i} c^C_{d_i} + \\ &\quad + \frac{1}{4}(1-\overline{k})\sum_{d_i} c^C_{d_i} + (1-\overline{k})b^B_{d_3}] + v[b^A_{d_3} + b^B_{d_3}] \\ &= \frac{1}{2}[\sum_{d_{i\neq 1}} c^A_{d_i} + c^A_{d_3}] + \frac{1}{2}\sum_{d_i} c^C_{d_i} + \frac{1}{2}(1-\overline{k})b^A_{d_3} \\ &\quad + \frac{1}{2}[\sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_3}] + \frac{1}{2}(1-\overline{k})b^B_{d_3} + v(b^A_{d_3} + b^B_{d_3}) \end{aligned} \tag{1.37}$$

Find $\overline{k}$ such that $E(U_{d_3}|\overline{s^A}=1,\underline{s^A}=0) > E(U_{d_3}|\overline{s^A}=\frac{1}{2},\underline{s^A}=\frac{1}{2})$

$$\begin{aligned} \frac{1}{2}(1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) &> \frac{1}{2}\sum_{d_i} c^C_{d_i} \\ \overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) &> \overline{c_m} \\ \overline{k} &> \frac{\overline{c_m}}{\sum_{d_i} c^C_{d_i} - \overline{c_m}} \end{aligned} \tag{1.38}$$

Finally, the same procedure for d_1:

$$\begin{aligned} E(U_{d_1}|\overline{s^A}=1,\underline{s^A}=0) &= \sum_{d_{i\neq 1}} c^B_{d_i} + c^B_{d_1} + (1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + (1-\overline{k})b^B_{d_1} \\ &\quad + v[b^A_{d_1} + b^B_{d_1}] \end{aligned} \tag{1.39}$$

$$E(U_{d_1}|\overline{s^A} = \frac{1}{2}, \underline{s^A} = \frac{1}{2}) = \sum_{d_i \neq 1} c^B_{d_i} + c^B_{d_1} + \frac{1}{2}(1+\overline{k})\sum_{d_i} c^C_{d_i} + \\ + \frac{1}{2}(1-\overline{k})\sum_{d_i} c^C_{d_i} + (1-\overline{k})b^B_{d_1} + v[b^A_{d_1} + b^B_{d_1}] \quad (1.40)$$

Find $\overline{k}$ such that $E(U_{d_1}|\overline{s^A} = 1, \underline{s^A} = 0) > E(U_{d_1}|\overline{s^A} = \frac{1}{2}, \underline{s^A} = \frac{1}{2})$

$$\begin{aligned} (1+\overline{k})(\sum_{d_i} c^C_{d_i} - \overline{c_m}) &> \sum_{d_i} c^C_{d_i} \\ \overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) &> \overline{c_m} \\ \overline{k} &> \frac{\overline{c_m}}{\sum_{d_i} c^C_{d_i} - \overline{c_m}} \end{aligned} \quad (1.41)$$

Conditions under which all actors prefer agent learning

Thus, all donors prefer that m learns whenever $\overline{k} > \frac{\overline{c_m}}{\sum_{d_i} c^C_{d_i} - \overline{c_m}}$. By assumption 3 we know that the lower bound for $\overline{k}$ is at most $\frac{1}{2}$. Thus for all conditions under which a majority of donors, namely d_2, d_3 and d_4 might give core contributions under the assumption of agent learning (see above), this lower bound is not binding.

Thus we only need to focus on the conditions under which m will acquire information, namely if $\frac{\sum_{d_i} c^C_{d_i}(2\overline{k}s^* - \overline{k})}{1-\overline{k}+2\overline{k}s^*} \geq \overline{c_m}$. In the main text we have shown that the following value for s^* is the lowest which ensures that m will engage in learning:

$s^* = \frac{\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + \overline{c_m}}{2\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m})}$

To be part of an equilibrium with full discretion, this value has to be smaller than 1:

$$\begin{aligned} \frac{\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) + \overline{c_m}}{2\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m})} &< 1 \\ \overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m})\overline{c_m} &< 2\overline{k}(\sum_{d_i} c^C_{d_i} - \overline{c_m}) \\ \frac{\overline{c_m}}{\sum_{d_i} c^C_{d_i} - \overline{c_m}} &< \overline{k} \end{aligned} \quad (1.42)$$

As this is the same condition as the one for the donors, which is fulfilled for all conditions under which under majority rule core contributions are made by a majority of donors (under the assumption of agent learning), the conditions specified above characterize the subgame perfect equilibria. *Q.E.D.*

Proof of Lemma 1

In the proof of proposition 6 there is only one set of conditions allowing for core aid given by d_2, d_3 and d_4 which includes an upper bound for $\overline{s^A}$ and thus might induce m to offer less than full discretion, namely that $v < \frac{3}{16\overline{s^A}-8}$ and $\frac{1}{4\overline{s^A}-2} < \overline{k}$. Together these two conditions generate an upper and a lower bound for $\overline{s^A}$ of the following form:

$\frac{1+2\overline{k}}{4\overline{k}} < \overline{s^A} < \frac{3+8v}{16v}$

Solving for v generates the condition $v < \frac{3\overline{k}}{4}$. For the upper bound for $\overline{s^A}$ to be smaller than 1 requires that $\frac{3}{8} < v$ and for the lower bound to be smaller than 1 $\frac{1}{2} < \overline{k}$ has to hold. These three conditions, however, generate a subset of the values of $\overline{k}$ and v contained in proposition 6. Thus, there are no values of $\overline{k}$ and v under which m might by offering less than full discretion induce d_2 and d_4 to contribute core contributions, when full discretion would fail. *Q.E.D.*

Results for Majority and Unanimity Rules Without SPTFs

The partial derivatives with respect to each donor's choice variables (except that $c_{d_1}^A$ and $c_{d_1}^B$ are no choice variables anymore).

- Donor d_3 contributes voluntary core funds iff $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > \frac{1}{2}(1-\overline{k}) + v$. Rearranging gives that d_3 contributes core funds if $\overline{k} > \frac{v}{\overline{s^A}}$
- Donors d_2 and d_4 contribute core funds iff $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > \frac{3}{4}(1-\overline{k}) + v$. Rearranging gives that d_2 contributes core funds if $\overline{k} > \frac{1+4v}{1+4\overline{s^A}}$.
- Donors d_1 and d_5 contribute core funds iff $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > (1-\overline{k}) + v$. Rearranging gives that d_1 contributes core funds if $\overline{k} > \frac{1+2v}{1+2\overline{s^A}}$

Conditions under which d_3 contributes to the core fund

For $\overline{s^A} = 1$, d_3 contributes if $v < \overline{k}$. For $\overline{s^A} = \frac{1}{2}$, d_3 contributes if $v < \frac{\overline{k}}{2}$.

Conditions under which d_3, d_2 and d_4 contribute to the core fund

For $\overline{s^A} = 1$, d_3, d_2 and d_4 contribute if $\overline{k} > \frac{1+4v}{5}$. Here, we have a majority in favor of full discretion. The function $v = \frac{5\overline{k}-1}{4}$ cuts $v = 1-\overline{k}$ at $\overline{k} = \frac{5}{9}$.

For $\overline{s^A} = \frac{1}{2}$, d_3, d_2 and d_4 contribute if $\overline{k} > \frac{1+4v}{3}$. Here, we do not have a unanimous decision in favor of full discretion. The function $v = \frac{3\overline{k}-1}{4}$ cuts $v = 1-\overline{k}$ at $\overline{k} = \frac{5}{7}$.

Conditions under which all donors contribute to the core fund

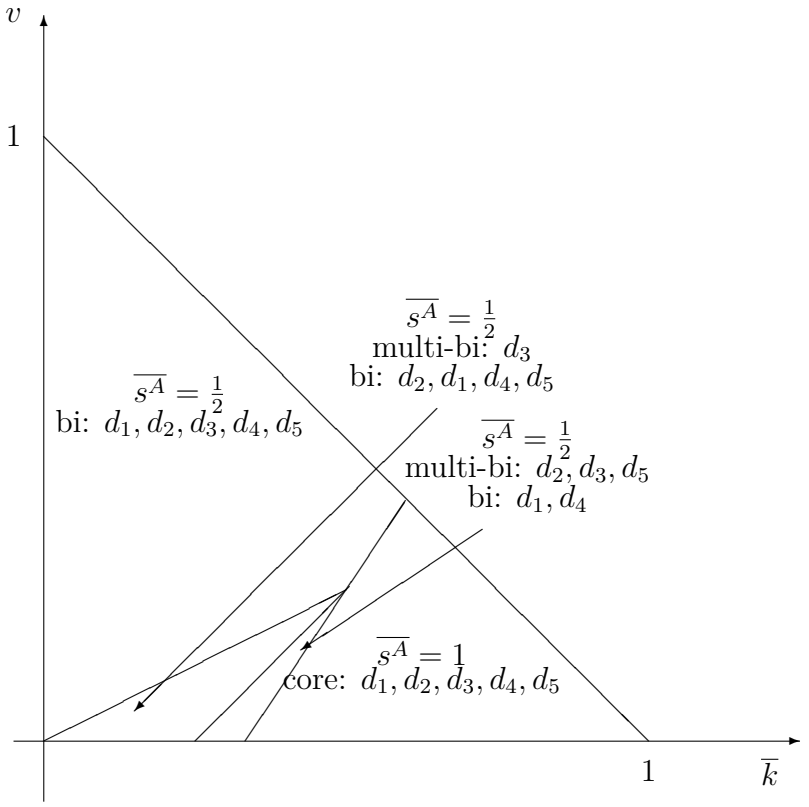
For $\overline{s^A} = 1$, all donors contribute if $\overline{k} > \frac{1+2v}{3}$. Here, we have unanimity in favor of full discretion. The function $v = \frac{3\overline{k}-1}{2}$ cuts $v = 1-\overline{k}$ at $\overline{k} = \frac{3}{5}$.

Graphical Illustration

Figures A.1 and A.2 show the allocation decisions for a situation without multi-bi aid. Comparing these figures with each other, we see that under majority rule, voluntary core contributions are more likely because a majority of donors still contributes to m when the extreme donors already switched to bilateral aid. For both decision rules, the absence of SPTFs changes donors' allocations. Specifically, extreme donors contribute voluntary core aid for high values of $\overline{k}$ when no SPTFs exist whereas they never contributed to the core fund when multi-bi aid is allowed for.

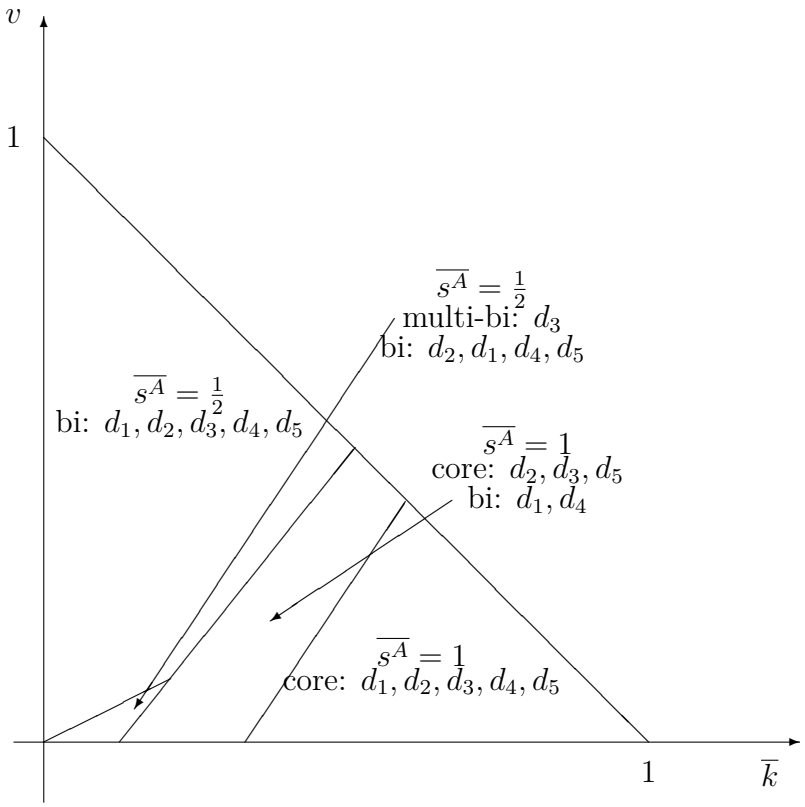
Comparing the situation without SPTFs, figures A.1 and A.2, to the situation with trust funds, 1.5 and 1.6, shows that the absence of SPTFs has divergent consequences.

Figure A.1: Equilibria under unanimity rule without special purpose trust funds



Under unanimity the absence of SPTFs leads to more situations where voluntary core contributions are given and in addition this involves almost always more donors. At the same time, bilateral aid also experiences an increase. Thus if the agent has a strict preference for voluntary core contributions not accepting multi-bi aid is optimal under unanimity. If, however, the agent wants to minimize aid spent bilaterally and maximize overall assets under management, then she should accept SPTFs under unanimity. Under majority rule these same findings hold, but as discussed above core contributions are more prevalent.

Figure A.2: Equilibria under majority rule without special purpose trust funds



Proof of Proposition 2

The general utility function for d_i is $U_{d_i}(o^A, o^B|d_i) = w_{d_i}o^A + (1 - w_{d_i})o^B + v_{d_i}(b^A_{d_i} + b^B_{d_i})$. Given d_i's uncertainty concerning aid effectiveness its expected utility function is the following:

$$\begin{aligned} EU_{d_i} &= w_{d_i}[\frac{1}{2}((1-\overline{k})(\sum_{d_j \neq i} c^A_{d_j} + c^A_{d_i} + (1-\overline{s^A})(c^C_{d_i} - \overline{c_m})) + \\ &+(1+\overline{k})(\sum_{d_j \neq i} c^A_{d_j} + c^A_{d_i} + \overline{s^A}(c^C_{d_i} - \overline{c_m})) + (1-\overline{k})b^A_{d_i}] + \\ &+(1-w_{d_i})[\frac{1}{2}((1-\overline{k})(\sum_{d_j \neq i} c^B_{d_j} + c^B_{d_i} + (1-\overline{s^A})(c^C_{d_i} - \overline{c_m})) + \\ &+(1+\overline{k})(\sum_{d_j \neq i} c^B_{d_j} + c^B_{d_i} + \overline{s^A}(c^C_{d_i} - \overline{c_m})) + (1-\overline{k})b^B_{d_i}] + \\ &+v(b^A_{d_i} + b^B_{d_i}) \end{aligned} \tag{1.43}$$

Taking, as above, partial derivatives of EU_{d_i} with respect to d_i's choice variables yields the following expressions:

$$\begin{aligned} \frac{\delta EU_{d_i}}{\delta c^{C_v}_{d_i}} &= \overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \\ \frac{\delta EU_{d_i}}{\delta c^A_{d_i}} &= w_{d_i} \\ \frac{\delta EU_{d_i}}{\delta c^B_{d_i}} &= (1 - w_{d_i}) \\ \frac{\delta EU_{d_i}}{\delta b^A_{d_i}} &= w_{d_i}(1-\overline{k}) + v \\ \frac{\delta EU_{d_i}}{\delta b^B_{d_i}} &= (1 - w_{d_i})(1-\overline{k}) + v \end{aligned} \tag{1.44}$$

As only donors who will give voluntary core contribution will vote for any amount of discretion, we need to establish for what values of w_{d_i} this is the case. The first case to look at is when $w_{d_i} \leq (1 - w_{d_i})$ (which implies that $w_{d_i} \leq \frac{1}{2}$). For such donors d_i to contribute voluntary core contributions the following conditions have to hold: $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \geq (1 - w_{d_i})$ (which implies for this case that it is also larger than w_{d_i}) and $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \geq (1 - w_{d_i})(1 - \overline{k}) + v$ (which implies that it is also larger than $w_{d_i}(1-\overline{k}) + v$). From the first expression it follows that $w_{d_i} \geq \frac{1+\overline{k}}{2} - \overline{k}\overline{s^A}$ while the second implies that $w_{d_i} \geq \frac{1}{2} - \frac{\overline{k}\overline{s^A} - v}{1-\overline{k}}$. It is easy to show, given our assumptions, that both expressions are smaller than $\frac{1}{2}$. In the second case we have $(1 - w_{d_i}) \leq w_{d_i}$ (which implies that $\frac{1}{2} \leq w_{d_i}$). For such donors d_i, to contribute

voluntary core funds, the following two conditions have to hold: $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \geq w_{d_i}$ (which implies for this case that it is also larger than $(1 - w_{d_i})$) and $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} \geq w_{d_i}(1 - \overline{k}) + v$ (which implies that it is also larger than $(1 - w_{d_i})(1 - \overline{k}) + v$). From the first expression it follows that $w_{d_i} \leq \frac{1-\overline{k}}{2} + \overline{k}\overline{s^A}$ while the second implies that $w_{d_i} \leq \frac{1-\overline{k}-2v+2\overline{k}\overline{s^A}}{2(1-\overline{k})}$. Again, it can be shown that these upper bounds for w_{d_i} are never smaller than $\frac{1}{2}$. Consequently, if w_{d_i} fulfills both sets of conditions, d_i will contribute voluntary core funds and thus vote in favor of discretion. From this, proposition 2 follows immediately. *Q.E.D.*

Proof of Corollary 1

Given the proof of proposition 2 and the definition of W this corollary follows immediately. *Q.E.D.*

Proof of Proposition 3

Next we consider fund allocations in equilibrium. If the conditions of Proposition 2 applies to all donors D it follows immediately that all donors will exhaust their budget by provoding voluntary core contributions (i.e., $\forall\ d_i c^C_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}$. If the condition of Proposition 2 applies only to a q-majority of donors and q is the required majority to adopt discretion levels, then all donors d_i for which the condition of Proposition 2 applies will contribute voluntary core contributions (i.e., $\forall\ d_i$ for which $w_{d_i} \in W\ c^C_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a}$). For all other donors, for which this condition does not hold, either bilateral aid (i.e., $b^A_{d_i}$, resp. $b^B_{d_i}$) or contributions to a SPTF (i.e., $c^A_{d_i}$, resp. $c^B_{d_i}$) is optimal.

Consider first the case of donors for which $w_{d_i} \leq 1 - w_{d_i}$ holds, who will choose between bilateral aid for project B or SPTF B. Two subcases have to be considered. First we note that the two possible lower bounds and the two possible upper bounds for w_{d_i} in Proposition 2 relate as follows $\frac{1+\overline{k}}{2} - \overline{k}\overline{s^A} \leq \frac{1-\overline{k}-2\overline{k}\overline{s^A}+2v}{2(1-\overline{k})}$ if $\frac{\overline{k}^2+\overline{k}}{2} \leq v$ (which implies also that $\frac{1-\overline{k}+2\overline{k}\overline{s^A}-2v}{2(1-\overline{k})} \leq \frac{1-\overline{k}}{2} + \overline{k}\overline{s^A}$).

Consequently assume first that $\frac{\overline{k}^2+\overline{k}}{2} \leq v$; then following Proposition 2 only d_is with $w_{d_i} \in [\frac{1-\overline{k}-2\overline{k}\overline{s^A}+2v}{2(1-\overline{k})}, \frac{1-\overline{k}+2\overline{k}\overline{s^A}-2v}{2(1-\overline{k})}]$ will vote for discretion. Given this, the following allocation rule follows:

$$(c^C_{d_i}, c^A_{d_i}, c^B_{d_i}, b^A_{d_i}, b^B_{d_i}) = \begin{cases} c^C_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1-\overline{k}}{2}, \frac{1+\overline{k}}{2}) \\ c^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}-v}{1-\overline{k}}, \frac{1-\overline{k}}{2}] \\ c^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in [\frac{1+\overline{k}}{2}, \frac{1}{2} + \frac{\overline{k}-v}{1-\overline{k}}) \\ b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{\overline{k}-v}{\overline{k}}, \frac{1}{2} - \frac{\overline{k}-v}{1-\overline{k}}) \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2} + \frac{\overline{k}-v}{1-\overline{k}}, \frac{v}{\overline{k}}) \\ c^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} < \frac{\overline{k}-v}{\overline{k}} \\ c^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} > \frac{v}{\overline{k}} \end{cases}$$

Next assume that $v \leq \frac{\overline{k}^2+\overline{k}}{2}$ then we know that only d_is with $w_{d_i} \in (\frac{1+\overline{k}}{2} - \overline{k}\overline{s^A}, \frac{1-\overline{k}}{2} + \overline{k}\overline{s^A})$ will vote for discretion. Under $\overline{s^A} = 1$ this condition reduces to $w_{d_i} \in (\frac{1-\overline{k}}{2}, \frac{1+\overline{k}}{2})$, which induces the following allocation rule:

$$(c^C_{d_i}, c^A_{d_i}, c^B_{d_i}, b^A_{d_i}, b^B_{d_i}) = \begin{cases} c^C_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}-v}{1-\overline{k}}, \frac{1}{2} + \frac{\overline{k}-v}{1-\overline{k}}) \\ b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in [\frac{1-\overline{k}}{2}, \frac{1}{2} - \frac{\overline{k}-v}{1-\overline{k}}] \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in [\frac{1}{2} + \frac{\overline{k}-v}{1-\overline{k}}, \frac{1+\overline{k}}{2}] \\ c^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} < \frac{1-\overline{k}}{2} \\ c^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} > \frac{1+\overline{k}}{2} \end{cases}$$

Q.E.D.

Proof of Proposition 4

When the conditions under propositon 2 or Corollary 1 do not hold, no discretion is granted to m, i.e., $\overline{s^A} = \underline{s^A} = \frac{1}{2}$. We derive the optimal allocation rules first for all d_i for which $w_{d_i} \leq 1 - w_{d_i}$ (which implies that $w_{d_i} \leq \frac{1}{2}$). Fur such donors to provide voluntary core funding it has to be the case that $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > 1 - w_{d_i}$ and $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > (1 - w_{d_i})(1 - \overline{k}) + v$. As with $\overline{s^A} = \frac{1}{2}$ the first expression implies that $w_{d_i} \geq \frac{1}{2}$ which is in contradiction of the assumption of this case, no voluntary core contributions are given by donors in this case. By symmetry for all d_i for which $1 - w_{d_i} \geq w_{d_i}$ a similar contradiction appears, implying that voluntary core funds are never given in the absence of discretion.[46]

Consequently only bilateral or multi-bi aid will be given voluntarily in equilibrium. Starting again with the case where $w_{d_i} \leq 1 - w_{d_i}$ (which implies that $w_{d_i} \leq \frac{1}{2}$), multi-bi

[46] Strictly speaking assuming that $w_{d_i} = \frac{1}{2}$ means that $d_i$is indifferent between making voluntary core contributions or multi-bi. For simplicity's sake we do not consider this case here.

aid will be given if $1 - w_{d_i} \geq (1 - w_{d_i})(1 - \overline{k}) + v$ which implies that $\frac{\overline{k}-v}{\overline{k}}$. In the second case where $1 - w_{d_i} \leq w_{d_i}$ (which implies that $\frac{1}{2} \leq w_{d_i}$) for multi-bi aid to be given it has to hold that $w_{d_i} < w_{d_i}(1 - \overline{k}) + v$. This implies that $\frac{v}{\overline{k}} > w_{d_i}$. Consequently two subcases have to be considered, namely whether $\frac{\overline{k}}{2} \leq v$ or not. First, under $\frac{\overline{k}}{2} \geq v$ the following optimal allocation rule in equilibrium follows:[47]

$$(c^C_{d_i}, c^A_{d_i}, c^B_{d_i}, b^A_{d_i}, b^B_{d_i}) = \begin{cases} c^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (1 - \frac{v}{\overline{k}}, \frac{1}{2}) \\ c^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2}, \frac{v}{\overline{k}}) \\ b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \leq 1 - \frac{v}{\overline{k}} \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \geq \frac{v}{\overline{k}} \end{cases}$$

Second, if $v \geq \frac{\overline{k}}{2}$ the following optimal allocation rule in equilibrium follows:

$$(c^C_{d_i}, c^A_{d_i}, c^B_{d_i}, b^A_{d_i}, b^B_{d_i}) = \begin{cases} b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \leq \frac{1}{2} \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \geq \frac{1}{2} \end{cases}$$

Q.E.D.

Proof of Proposition with no SPTFs

To prove this Proposition we assess for all $w_{d_i} \leq 1 - w_{d_i}$ (which implies that $w_{d_i} \leq \frac{1}{2}$). For such d_i to contribute voluntary core contributions it has to hold that $\overline{k}\overline{s^A} + \frac{1-\overline{k}}{2} > (1 - w_{d_i})(1 - \overline{k}) + v$. This implies that $w_{d_i} > \frac{1}{2} - \frac{\overline{k}\overline{s^A}-v}{1-\overline{k}}$. This lower limit is smaller than $\frac{1}{2}$ if $v < \overline{k}$ (as by symmetry a symmetric upper bound exists for $1 - w_{d_i} \leq w_{d_i}$ (which implies that $w_{d_i} \geq \frac{1}{2}$, this holds also for these donors). Consequently if $v \geq \overline{k}$ no discretion will be granted and all donors will only give bilateral aid. If $v \leq \overline{k}$ holds all d_i for which $w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}\overline{s^A}-v}{1-\overline{k}}, \frac{1}{2} + \frac{\overline{k}\overline{s^A}-v}{1-\overline{k}})$ holds will vote for discretion. If the resulting W is such that $\frac{W}{n} \geq q$, then all these donors will contribute voluntary core contributions, while the remaining donors will contribute bilateral aid. If $\frac{W}{n} < q$ no discretion will be granted. Consequently, all donors for which d_i for which $w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}-2v}{2(1-\overline{k})}, \frac{1}{2} + \frac{\overline{k}-2v}{2(1-\overline{k})})$ holds would contribute voluntary core funds. For this set not to be the empty set, $v \leq \frac{\overline{k}}{2}$. All other donors will provide bilateral aid. All donors will provide voluntary core aid if $v \leq \frac{(2\overline{k}-1)}{2}$.

If $v \geq \overline{k}$ the following optimal allocation rule in equilibrium follows:

[47] For simplicity's sake we leave aside a decision rule for the donor indifferent between the two aid projects. We could easily assume that she splits aid contributions equally among the two projects.

$$(c^C_{d_i}, c^A_{d_i}, c^B_{d_i}, b^A_{d_i}, b^B_{d_i}) \quad = \quad \begin{cases} b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} < \frac{1}{2} \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} > \frac{1}{2} \end{cases}$$

If $v \leq \overline{k}$ the following optimal allocation rule in equilibrium follows:

$$(c^C_{d_i}, c^A_{d_i}, c^B_{d_i}, b^A_{d_i}, b^B_{d_i}) \quad = \quad \begin{cases} c^C_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}-v}{1-\overline{k}}, \frac{1}{2} + \frac{\overline{k}-v}{1-\overline{k}}) \\ & \text{and } \frac{W}{n} \geq q \\ b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \leq \frac{1}{2} - \frac{\overline{k}-v}{1-\overline{k}} \text{ and } \frac{W}{n} \geq q \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \geq \frac{1}{2} + \frac{\overline{k}-v}{1-\overline{k}} \text{ and } \frac{W}{n} \geq q \\ c^C_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \in (\frac{1}{2} - \frac{\overline{k}-2v}{2(1-\overline{k})}, \frac{1}{2} + \frac{\overline{k}-2v}{2(1-\overline{k})}) \\ & \text{and } \frac{W}{n} < q \\ b^B_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \leq \frac{1}{2} - \frac{\overline{k}-2v}{2(1-\overline{k})} \text{ and } \frac{W}{n} < q \\ b^A_{d_i} = y_{d_i} \times t_{d_i} \times a_{d_i} - c^{C_a} & \forall d_i \text{ s.t. } w_{d_i} \geq \frac{1}{2} + \frac{\overline{k}-2v}{2(1-\overline{k})} \text{ and } \frac{W}{n} < q \end{cases}$$

Q.E.D.

CHAPTER 2

December Fever in Public Finance

The heightened spending by government offices in the quarter, months, and weeks before the end of the fiscal year is widely acknowledged, nicknamed, and has repeatedly been discussed as a problem in government reports (e.g., GAO 1985, 1998, 2004; Crawford et al. 2009).[1] Such year-end spending spikes are observed in most organizations with annually lapsing budgets, including public and private organizations (e.g., Fichtner and Greene 2014; Baumann 2015; Merchant 1985). The common explanation is that in most countries and organizations, agencies need to return unobligated funds to the Treasury general fund at the end of the fiscal year. For the agency, this not only implies a loss of appropriated resources and the associated utility but is also associated with the fear of lower appropriations in future years. However, "use it or lose it" rules explain why budgets are spent *within* the fiscal year but not why heightened spending occurs *at the end* of the fiscal year (FY). Despite the omnipresence of the phenomenon and the widespread perception and plethora of anecdotal evidence that YESS are (partially) inefficient, theoretical and quantitative empirical research on the causes and consequences of rushed end-of-year spending is scarce. Although some literature on policy reforms to curb year-end spending spikes exists, hard evidence on their effects is lacking.[2] The underlying causes of YESS also seem to be poorly understood in practice. For example, the introduction of carry-forward rules, that allow government units to transfer unspent funds to the next fiscal year, has not lead to sizeable reductions in year-end spikes in the United Kingdom (Crawford et al. 2009; Baumann 2015).

This lack of research is in striking contrast to the potential consequences of rushed spending. Economic theory predicts that agents faced with lapsing funds may spend inefficiently as their opportunity costs are close to zero Liebman and Mahoney (2017) are the first to provide rigorous quantitative evidence that funds spent at the end of the fiscal year provide less value for money. Their finding confirms qualitative and anecdotal

[1] Fichtner and Greene (2014) provide a review.
[2] Fichtner and Greene (2014) review these proposals and discuss reform experiences.

evidence that lapsing budget balances are usually spent on low-priority projects in a rushed and unplanned manner (e.g., Douglas and Franklin 2006; McPherson 2007; Fichtner and Greene 2014). Because of rushed decision-making, end-of-year projects and in particular contracts are particularly prone to cronyism. This might be an additional reason for lowered efficiency, which is not yet explored in the literature.

The U.S. Senate Subcommittee (1980) notes that although the share of year-end spending might be small relative to total government budgets, hurry-up spending amounts to large sums of money and even small efficiency losses lead to major (opportunity) costs. Research on YESS thus contributes to understanding and ultimately improving fiscal performance. In public finance, there is a large literature on institutions improving fiscal outcomes.[3] One strand of this literature is concerned with budgetary institutions at the implementation stage of the budgetary processes. Thereof, two papers using sub-annual data are most relevant to this study. Liebman and Mahoney (2017) interpret YESS as precautionary savings by a government agency confronted with uncertain spending demands while Baumann (2015) explains YESS with the procrastinating behavior of bureaucrats. Using calibration, both studies find support for their respective theoretical mechanism. I propose a new explanation for YESS: they result from inadequate planning in ineffective bureaucracies. I argue that achieving the intended budget balance of zero at the year-end requires qualified staff, expedient software, and adequate reporting and controlling systems. Higher administrative capacity is thus associated with smaller YESS. Identifying the causal mechanism(s) underlying YESS is important because alternative explanations imply the need for different types of policies to curb heightened year-end spending.

Using detailed accounting data on a specific item in the foreign aid budget for 27 OECD countries over the 2002-2013 period, I econometrically test the existence of YESS across countries. As comprehensive data on sub-annual spending across countries is not available, I analyze sub-annual accounting data on a discretionary budget item within countries' aid budget. Increasingly, OECD countries channel part of their foreign aid via large multilateral funds and sector- or country-specific trust funds at the World Bank to developing countries. Using financial accounting data from the World Bank on contributions to these funds, this Chapter is first to empirically show that YESS exist across countries. According to the definition of multi-bi aid in the introduction of this thesis, this analysis looks at donors' earmarked contributions to multilateral organizations (direct multi-bi aid) and donors' unearmarked contributions to pass-through multilaterals (indirect multi-bi aid). The finding on YESS is highly robust to the definition of 'last period of the fiscal year' as the last weeks, month or quarter in the donor-specific fiscal year. This Chapter furthermore shows that bulk expenditures at the end of the fiscal year are sub-

[3]For a recent review see Eslava (2011).

stantially reduced by bureaucratic quality. The robustness of this finding is assessed using alternative indicators of governance and by controlling for potential omitted variables. In contrast, I find no clear evidence in favor of or against the two alternative explanations for YESS, which posit opposing relationships between YESS and uncertainty. Reducing the dynamic inefficiences associated with lapsing budgets is the ultimate question of interests. The data does not allow for a rigorous analysis of the effects of YESS on performance. I offer descriptive evidence that end-of-year spending is qualitatively different from the remainder of the fiscal year.

In response to government transparency initiatives and technological progress, access to sub-annual government data is likely to improve in the coming years. This Chapter aims to be a starting point for empirical research on the reasons for uneven government expenditures within the fiscal year. The Chapter makes four contributions to the public finance literature. First, this Chapter is the first to analyze YESS with cross-country panel data while the two previous quantitative studies on YESS in public finance, Liebman and Mahoney (2017) and Baumann (2015), look at variation within individual countries. The World Bank data allows to study both cross-country and within-country variation. Second, I am the first to apply econometric analysis rather than calibration to study YESS.[4] The two previous studies on YESS calibrate their respective principal-agent models to the data. Third, I suggest and test an additional explanation for year-end expenditure surges: poor planning capacities of government bureaucracies. Fourth, the study contributes to the public finance literature by systematically testing proposed explanations for the existence of year-end spikes. As my data cover a discretionary spending item within the foreign aid budget, I also contribute to the foreign aid literature by proposing a new and additional reason for the popularity of trust funds and large multilateral funds with donor countries (for a discussion see Reinsberg et al. 2015).

The remainder of the Chapter is organized as follows. Section 2.2 reviews the related literature. In Section 2.3, I provide arguments as to why bureaucratic quality should be related to the size of YESS. Section 2.4 describes the data and the identification strategy. Section 2.5 uses panel-econometric methods to establish the size and variation in year-end spending spikes by analyzing the data at the quarterly, monthly, and daily level. Specifically, Section 2.5.3 analyzes the relationship between YESS and effective bureaucracies and Section 2.5.4 tests the implications of the two main alternative theories for YESS. Section 2.6 discusses the findings and concludes.

[4]Oyer (1998) uses econometrics to analyze variation in revenue and price within firms' fiscal years.

2.2 Related Literature

Anecdotal and suggestive evidence for heightened year-end spending in government departments and company divisions across the world abounds (e.g., Merchant 1985; Comptroller General of the United States 1980; Douglas and Franklin 2006; McPherson 2007; Baumann 2015; Liebman and Mahoney 2017). The two arguments often proposed to explain end-of-year spending sprees however lack timing specificity: These two arguments explain why the entire budget is spent *within* a fiscal year but cannot account for heightened expenditures *at the end* of the fiscal year. [5]

In the economic literature, year-end spending spikes have so far been explained either by the bureaucracy's uncertainty about spending demands (Liebman and Mahoney 2017) or by bureaucrats' procrastination (Baumann 2015).[6]

Given the scarceness of analyses of sub-annual fiscal behavior, I draw on the political economy literature in public finance more generally to construct a motivating framework for the empirical analysis of YESS and potential mechanisms. There is a large literature on institutional features affecting fiscal performance. Previous research highlights the conflicts of interests and preference heterogeneity of the actors in the budgetary process and proposes and evaluates budget institutions that aim to improve fiscal discipline by constraining policymakers (see Eslava 2011). Empirical findings suggest the effectiveness of institutions is often conditional on political systems and environments (see Eslava 2011). Budgetary institutions discussed in the literature are either numerical targets or procedural rules (Von Hagen and Harden 1995). The latter may govern the drafting, approval or implementation stage of the budgetary process. Curbing YESS requires budgetary institutions at the implementation stage, the period of budget execution.

Eslava (2011) specifies two budgetary institutions at the implementation stage: First, limits to the parliament's ability to impose ex-post amendments to the size of the budget and, second, the possibility of the government to cut (but not to expand) the budget

[5] The first is that budget authorities in most countries need to return unspent funds to the general treasury at the end of the fiscal year. As this would affect the agency's utility negatively, these lapsing funds are spent. Second, the agency fears to obtain lower appropriations in subsequent years if the principal interprets the returning of funds as a signal of a lack of need. It is important to note that (planning for) overspending is no alternative as the consequences of overspending are more severe, including personal liability of the budget holder (Hyndman et al. 2005). Although there is no evidence supporting this argument, the fear of lowered appropriations is widespread among bureaucrats (Douglas and Franklin 2006; Fichtner and Greene 2014).

[6] See Baumann (2015) for a brief discussion of alternative explanations, that do not withstand close scrutiny. He does not cover the recent argument by Hurley et al. (2014), who propose a model in which an agency faces uncertainty about the costs of high-priority projects but must nevertheless choose additional projects of lower quality to assure exploiting the budget until the end of the fiscal year. The model's implication that year-end spending is inefficient is however generated by the assumption, namely that this over-planning leads to high-priority projects (rather than the low-quality ones) being abandoned in the end of the year.

after parliamentary approval. She also highlights the importance of budget transparency for these institutions to be effective. Dietrichson and Ellegård (2015) investigate two additional budgetary institutions at the implementation stage: Carry-forward rules and the threat of dismissal following non-compliance to the budget. Carry-forward or roll-over rules allow sub-units of the central government to transfer surpluses or force them to carry deficits to the next fiscal year. They find that fiscal surpluses are higher in Swedish municipalities with carry-forward rules. Surpluses are also higher when local manageres face a higher risk of dismissal as a consequence of budget deficits. Dietrichson and Ellegård (2015) term these institutions "incentive-aligning" as they reduce the conflict between the principal and the agent, in their case of the size of the fiscal deficit.[7]

In the two papers on YESS, Liebman and Mahoney (2017) and Baumann (2015), the conflict between the principal and the agent is about the timing of expenditures within the fiscal year. Before looking into the details of these models, it is worthwhile considering the importance of the exact timing of disbursements to politicians. There is ample evidence at the annual level that the timing of expenditures matters during election times (e.g., Klomp and De Haan 2013; Sjahrir et al. 2013; Curto-Grau 2014). In other times however, politicians may care little about the exact disbursement date. Neither Liebman and Mahoney (2017) nor Baumann (2015) discuss the empirical importance of the conflict between the parliament (the principal) and the government agency (the agent).

The first paper in the nascent literature on YESS is Liebman and Mahoney (2017), who propose a stochastic principal-agent model inspired by models of life-cycle consumption. The game features two sub-annual periods and two players, a representative government agency and parliament. To model short-run rigidities in the production function, decreasing returns to spending within each period of the budget year are assumed.[8] This basic set-up is also adopted in Baumann (2015).[9] Liebman and Mahoney (2017) then introduce stochastic shocks which complicates the agency's optimization problem of timing expenditures. With no option to overspend, the agency insures itself against future expenditure demands through the build-up of a rainy day fund in the first period of the year. A year-end spending spike is thus observed whether demands materialize or not.

[7] In the case of Swedish municipalities, the principal is formed jointly by the council and the executive committee while the agents are the operating branches.

[8] For example, departments often have a (quasi-) fixed expert staff that, in periods of abnormally high spending, has less time to devote to each project or for supervising external consultants. Project preparation time available to staff has been shown to affect the quality of World Bank projects (Kilby 2015). Although the assumption of decreasing returns to spending is theoretically sound and realistic, there is little empirical evidence that rushed spending is of lower quality. Baumann (2015) discusses the robustness of his model's implications to alternative assumptions about returns.

[9] Neither of the models exhibits a ratchet effect phenomenon (Freixas et al. 1985), in which the pattern of spending over the year provides an informative signal to the principal on the social value of spending at the agency.

In the latter case, the agency needs to rush to spend the precautionary savings at the year-end. Thus, the model predicts a positive relationship between the size of spikes and uncertainty. Liebman and Mahoney (2017) also offer the first and so far only quantitative assessment of the quality of end-of-year spending.[10] They show that the average quality of information technology (IT) projects contracted in the last week of the fiscal year is substantially lower. This finding confirms common perceptions and anecdotal evidence that end-of-year spending is "uneconomic, inefficient, ineffective or of inappropriate quality (usually inappropriately high quality)" (Hyndman et al. 2005: 6). Liebman and Mahoney (2017) propose to curb YESS by extending the budget period through the introduction of roll-over rules.

While the precautionary saving mechanism is convincing and generally supported by accounts of budget holders, Liebman and Mahoney's (2017) paper has some weaknesses. First, Baumann (2015) criticizes that the level of uncertainty assumed in the calibration of Liebman and Mahoney's (2017) model is unrealistically high, being more than ten times that of professional forecasters in predicting standard macroeconomic variables such as unemployment.[11] One possible explanation is the difficulty of determining the optimal size of precautionary savings.[12] If savings are above the optimal level, YESS would be excessively high given the level of uncertainty. Second, the unpredictability of spending demands is likely to vary across government agencies and hence the size of YESS could differ.

The second paper in the nascent economics literature on YESS is Baumann (2015). He observes that neither the introduction nor the reform of roll-over rules in the United Kingdom has reduced year-end surges as it should have according to Liebman and Mahoney's (2017) theory.[13] Moreover, he finds a positive relationship between certainty and spending spikes rather than the negative one predicted by the precautionary savings hypothesis (Baumann 2015: Figure 4). Against the backdrop of these doubts about uncertainty about future spending demands being the (sole) explanation for YESS, Baumann (2015) proposes a deterministic principal-agent model in which time-discounting effort-averse bureaucrats postpone spending to later periods within the fiscal year. He argues that the

[10] Fitzenberger et al. (2014: 3) use differences between projected and actual spending on training programs at the end of fiscal years as an instrumental variable "to come closer towards estimating the causal effect of further training" on employment outcomes in West Germany. The paper lacks a discussion about the external validity of effects based on additional training programs that are budget-driven and thus "independent of whether there were suitable participants available and whether the offered program made sense for the individual unemployed." Fichtner and Greene (2014) review the qualitative evidence on the efficiency of year-end spending.

[11] Liebman and Mahoney (2017) assume a root mean square error of 19.6. By assuming risk-averse agents, a lower level of uncertainty might suffice to obtain the calibration results.

[12] I thank Andreas Fuchs for raising this point.

[13] Fichtner and Greene (2014) review the prevalence of carry-over authority and heightened budget transparency across countries and their effects on year-end spending.

time-inconsistency between the continuous effort expended by public servants to identify and disburse to projects of good quality and the discontinuous end-of-year performance evaluation by the parliament (the principal) leads to procrastination.[14] Using monthly data on spending by Northern Irish departments, he finds the data to be more consistent with his procrastination theory than with Liebman and Mahoney's (2017) hypothesis. To curb YESS, he suggests budgetary 'taxes' that increase towards the end of the fiscal year.

As the analyzed expenditures originate from the foreign aid budget, this Chapter also relates to the literature on foreign aid. Specifically, the analysis contributes to the literature on donors' choice of aid channels by suggesting a new argument for the popularity of World Bank funds with donors' aid agencies: Trust funds are an attractive instrument to spend lapsing funds.[15] The capacity of these funds to de-annualize part of the aid budget thus provides an additional justification for the efficiency advantage of trust fund aid over bilateral aid assumed in the model by Eichenauer and Hug (2016) in Chapter 1 of this thesis. As the present Chapter studies spending patterns within fiscal years, it only indirectly relates to arguments about the choice of aid channels made by Milner (2006), Milner and Tingley (2013), and Schneider and Tobin (2013). In the aid literature, the two most closely related papers are Reinsberg et al. (2015), who use the same data as this to examine donors' choice between different types of trust funds, and Eichenauer and Knack (2016) in Chapter 3 of this thesis, who study whether trust fund disbursements to recipient countries complement or compensate the performance-based allocation of the IDA, the World Bank's concessional arm. To the best of my knowledge, there is only one paper in the foreign aid literature that considers sub-annual variation.

Michaelowa (2003) uncovers a spike in the number of interim Poverty Reduction Strategy Papers (PRSP) endorsed in the last month of the calendar year 2000. PRSP are a requirement for participation in the Enhanced Heavily-Indebted Poor Country (HIPC) initiative. The likely reason for this spike is mounting public pressure through the "Jubilee 2000 Coalition Initiative," a large debt-relief campaign by non-governmental and religious organizations. The example of the HIPC initiative shows that the timing of decisions matters for public perception. Many donors have self-committed to spending a certain share of their Gross National Income (GNI) on foreign aid, and, according to several aid officials, year-end spending such as that made via trust funds is necessary to achieve spending targets.[16] Although this argument does not illuminate the reasons

[14] The mechanism is similar to the argument about effort and nonlinear performance contracts in Oyer (1998).

[15] Information on the sub-annual timing of donor countries' contributions to multilateral organizations, non-governmental organizations, and on bilateral aid disbursements is lacking. It is thus impossible to test the relative attractiveness of these aid channels at different moments within the fiscal year.

[16] Most donors have self-commitments that are below the 0.7 percent of GNI target propagated by the United Nations and advocated for by non-governmental organizations.

behind the uneven disbursement pattern within the fiscal year, it explains the persistence of YESS in the foreign aid budget even in countries without lapsing budgets.

2.3 Bureaucratic Quality and End-of-Year Spending

The achievement of a satisfactory fiscal performance is a persistent challenge. This has become all the more evident in the aftermath of the 2008 financial crisis, which put a strain on the finances of many countries, regions, and municipalities. One common response is the strengthening of budget institutions.

Recent microeconomic research finds that management and organizational practices explain a large share of productivity differences between firms (Bloom et al. 2016). Nicholas et al. (2014) suggest that about one quarter of cross-country and within-country differences in total factor productivity can be explained by management practice. It is textbook knowledge that the productivity of public services is difficult to assess because public institutions are often monopolists and produce outputs that are difficult to measure. At the macroeconomic level, the administrative capacity of government bureaucracies for fiscal and other outcomes is well established (e.g., Knack and Keefer 1995; Keefer and Knack 2007; Knack and Rahman 2007; Van de Walle 2006). The analysis of sub-annual spending patterns contributes to this research agenda.

How could bureaucratic quality affect the size of YESS? There are seven channels that could plausibly affect the size of YESS in substantial ways. These channels can be associated with three aspects of institutional and administrative capacity: policy and structures, systems, and human resources (World Bank 2006). YESS may result from inadequacies in one or several of these clusters.

Two channels are related to the policies and structure in the public administration. First, the re-allocation of funds by bureaucrats might be constrained by rules, which often earmark funds to closely defined spending categories (Douglas and Franklin 2006). Second, reshuffling resources between issue areas or transferring funds to the next fiscal year is often associated with additional administrative burden. This may prevent bureaucrats from making use of such possibilities instead of spending resources within the budget area. What is more, these rules might create new costs.[17] More generally, a reasonable degree of discretion and flexibility allows bureaucrats to adjust expenditures swiftly and on a case-by-case basis.

The two most relevant systemic factors are adequate technological infrastructure, allowing for optimal resource and process management. First, modern accounting software gives decision makers access to up-to-date information about the remaining budget and

[17] Douglas and Franklin (2006) report for Oklahoma that the carry-over law increased paperwork.

improves the precision of cost estimates for planned projects. This allows the forecasting expenditure demands based on previous years' experiences and helps in determining the optimal size of precautionary savings. Second, inadequate forecasts or planning of expenditures as well as excessive precautionary savings can result in a YESS that is due to accidental 'left-over' funds.[18] Third, constant re-optimization of expenditures is required to achieve the intended budget balance of zero at the year-end (Douglas and Franklin 2006).

Human resources are the first dimension of bureaucratic quality. A first factor is the availability of qualified staff while a second is the efficient management of these people. Suitable career, pay and other incentive schemes may increase worker productivity as may adequate monitoring.[19] In particular, managerial accountability for budget balances seems to be effective in improving fiscal performance (Dietrichson and Ellegård 2015). A weak human resource management may increase procrastination by bureaucrats, which blends my argument with Baumann's (2015).[20]

In sum, the interaction between bureaucratic quality and YESS may occur via multiple channels. These channels interact in non-linear ways, making their disentanglement difficult.[21] As a first stepping stone, this Chapter aims to make a strong case that bureaucratic quality matters. It is beyond this analysis to identify the set of institutions influencing YESS within bureaucracies.

Also note that this Chapter cannot establish an indisputable causal relationship between bureaucratic quality and YESS. Assessments of the effectiveness of budget institutions are plagued by the endogeneity of budget institutions to previous fiscal outcomes (e.g., De Haan et al. 1999). Another source of endogeneity are findings that some budget institutions are feasible or effective only under certain political environments (e.g., Hallerberg et al. 2009). Finally, a third force might simultaneously influence fiscal outcomes and budgetary institutions. Eslava (2011) mentions culture, voters' preferences and the political environment as common third factors. To mitigate such endogeneity concerns, a handful of studies (e.g., De Haan and Sturm 1994) analyzes the effect of (budget) institutions

[18] In contrast, Hurley et al. (2014) argue that agencies overprogram and then disrupt some projects at the end of the fiscal year because of insufficient funds.

[19] In case of effort-averse and time-discounting bureaucrats as assumed in Baumann (2015), monitoring should be continuous rather than occurring at the end of the fiscal year only

[20] Note that the bureaucratic quality argument is different because I (in contrast to Baumann (2015)) make no prediction about the relationship with uncertainty.

[21] Arguably, disbursements to public projects take place only at the end of the fiscal year because of lengthy planning and disbursement phases. This might be due to the project planning phase occupying at least the first half of the fiscal year while getting the approval necessary for disbursements takes several more weeks or even months, e.g., because it involves multiple decision makers. As this problem repeats itself each year, bureaucracies with higher administrative capacities are likely to have adapted their planning (e.g., to using multi-annual plans and medium-term budgeting) and optimized approval processes to minimize year-end bottlenecks.

conditional on potential third forces. In line with these previous efforts, I examine below whether the effect of bureaucratic quality persists once I account for fundamental third factors such as per capita income or transparency in the political process. In other words, I attempt to rule out these alternative explanations and stories as much as possible.

2.4 Data and Identification

Due to falling technology costs and (government) transparency movements, more and more detailed data are available to researchers on the web (Fung et al. 2007; The Economist 2010). Nevertheless, there are not yet publicly accessible data on sub-annual government activities that are comparable across countries. I therefore use financial accounting data on a specific aid type available from the World Bank.[22] Over the last two decades, donor countries have started to provide earmarked aid to multilateral organizations (Eichenauer and Reinsberg 2017). Traditional multilateral funding is allocated by the organization's governance body. In the case of earmarked aid, individual donors target the aid to their preferred recipient countries, institutions, or topics. In contrast to bilateral aid, the implementation of this earmarked aid is delegated to multilateral organizations. One multilateral organization receiving earmarked aid from donors is the World Bank, which made available disaggregated data on this new aid type.

2.4.1 Institutional Background and Data

The World Bank Group manages the earmarked aid in designated trust funds until suitable projects are identified and ready to receive disbursements. These funds might thus accumulate and hold cash over several years before disbursing the aid to beneficiaries. A trust fund is typically set up at the request of one or several donor countries by an individually negotiated contract between the funder(s) and the Bank. Among other things, this contract details the beneficiary country or issue, the decision-making powers of funders, the services provided by the Bank and the Bank's management fee. Donor support for trust funds mostly comes from foreign aid budgets but also from foreign affairs and finance departments (OECD 2012; Eichenauer and Reinsberg 2017).[23]

[22] The data are publicly available at: https://finances.worldbank.org/trust-funds (accessed on September 15, 2016) but do not provide some of the details required for this analysis (e.g., the contribution date).

[23] One type of trust fund (International Bank for Reconstruction and Development (IBRD)/ IDA trust funds) is funded almost entirely by donors' foreign aid units. Sensitivity analyses using IBRD/ IDA trust funds only are shown in Tables A.11 –A.12 in the Appendix. The coefficient size increases substantially while signs and significance levels are unchanged or increase. The fiscal year at the World Bank runs from July 1 to June 30. All amounts are in constant 2013 US$.

Figure 2.1: Contributions to World Bank funds and disbursements by the International Development Association

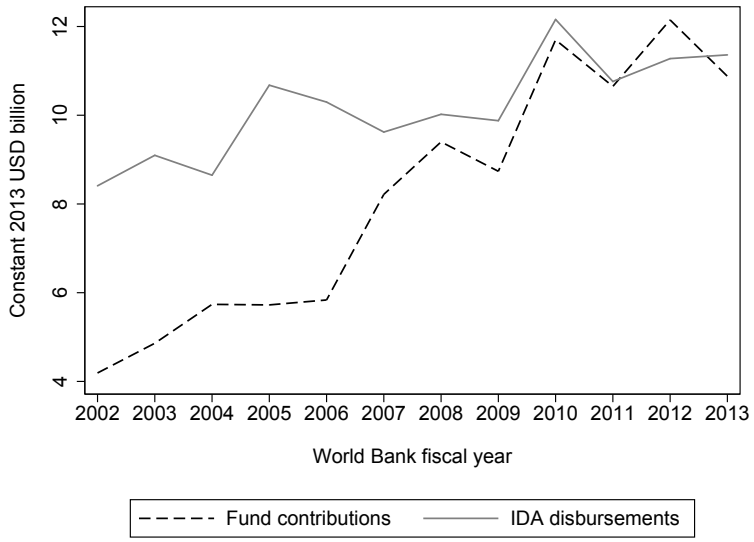


Figure 2.1 shows that earmarked funds have gained in attractiveness over the sample period, receiving more than US$ 12.1 billion in the World Bank's fiscal year 2012 and almost US$ 98.1 billion over the Bank's 2002-2013 fiscal years, of which 30 and 29 percent were made in donor-specific last fiscal quarters, respectively.[24] Balanced spending over all fiscal quarters would imply that in average 25 percent of funds are spent in every quarter. Figure 2.1 puts these numbers into perspective: gross disbursements by the IDA, amounted to US$ 10.9 billion in the 2012 fiscal year. Over the sample period, the World Bank has managed 1669 funds over the sample period whereof more than 900 were active in June 2013 (World Bank 2013). The data include information on the day of the contribution, the donor government and the receiving fund.[25] In the sample period, 13,209 individual contributions were made by DAC donors to any type of fund, and 7,919 were made to IBRD/ IDA trust funds. To create monthly and quarterly indicators, I use the variable *PostingDate*, which corresponds to the date of the financial transaction.[26] Table 2.1 shows descriptive statistics.

[24]The fiscal year at the World Bank runs from July 1 to June 30. All amounts are in constant 2013 US$.

[25]I use the same data as Reinsberg et al. (2015), obtained from the World Bank's Trust Funds and Partnership Department.

[26]I consider the variable as trustworthy because whenever a transfer was reimbursed to a donor government, probably because funds were wired by mistake, in almost all cases funds were returned on the same day in all but eleven cases. I drop observations when the reimbursement was not completed on the same date. Any remaining negative flows at the aggregate level are set to one before logarithms are taken. Results are robust to these decisions.

Table 2.1: Descriptive statistics

Variable	Obs.	Mean	St. Dev.	Min.	Max.
Quarterly contributions*	1294	60.541	124.998	0.000	1479.981
First fund contributions	1296	1.288	2.620	0.000	36.000
Mean contributions in last quarter*	323	86.513	150.151	0.000	1163.747
Bureaucratic quality, ICRG	1215	3.657	0.503	2.500	4.000
Yearly bureaucratic quality, ICRG	1248	3.660	0.501	2.500	4.000
Corruption, ICRG	1215	4.166	1.121	2.000	6.000
Transparency, IMF	1134	53.126	23.224	0.000	100.00
Control of corruption, WGI	1242	1.497	0.751	-0.255	2.553
Government effectiveness, WGI	1242	1.502	0.499	0.214	2.357
Regulatory quality, WGI	1242	1.393	0.351	0.484	1.971
Average governance, WGI	1242	1.338	0.423	0.232	1.985
Total disaster-affected people, million	1296	224	141	97	659
Asylum seekers	1296	14294	17052	35	109580
Battle-related deaths	1296	25293	12143	12207	71981
Total aid disbursements*	1296	4313	5837	14	32398
Election quarter	1296	0.069	0.253	0.000	1.000
Election year	1296	0.346	0.476	0.000	1.000
Government change	1296	0.017	0.130	0.000	1.000
Year of government change	1296	0.118	0.323	0.000	1.000
Aid minister change	1296	0.018	0.132	0.00	1.000
Year of aid minister change	1296	0.067	0.250	0.000	1.000
Late budget	1296	0.486	1.730	0.000	14.00
Accounting type	924	0.418	0.493	0.000	1.000
Primary balance (% of GDP)	1234	-1.266	3.198	-13.197	5.999
GDP per capita, constant 2005 US$	1044	36434	11208	17847	90889
Economic crisis	1150	0.063	0.242	0.000	1.000

Note: *in constant 2013 US$ million.

Figure 2.2: Different types of funds

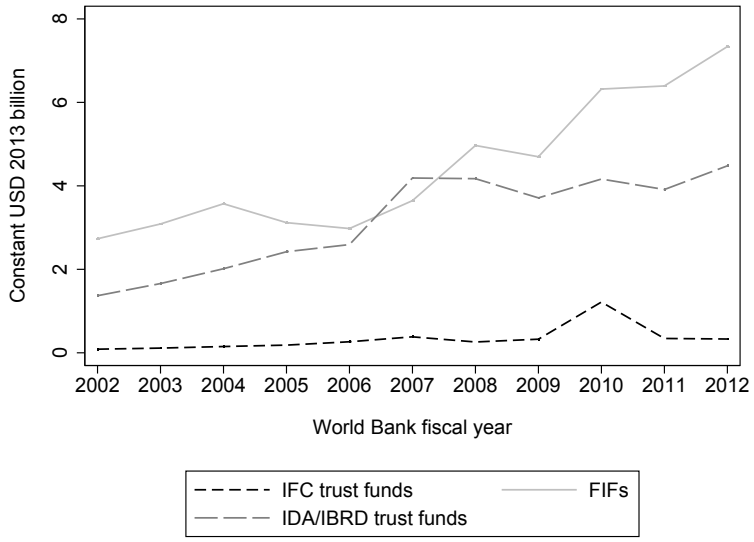


Figure 2.2 shows the importance of the different types of funds over the sample period.[27] Because contributions to one or the other type are likely to be substitutes when donor agencies spend 'left-over' funds at the end of the FY, all fund types are included in the analysis.[28] The analysis is limited to the 27 donor countries organized in the OECD's DAC during the sample period for a number of reasons: First, all OECD countries are democracies, making their budgetary processes relatively comparable. Second, some of the covariates are available only for this group of countries. Third, the vast majority of the aid allocation literature analyzes aid by this donor group. While non-DAC countries, private companies, multilateral organizations, and NGOs also contribute to these funds, figure 3 shows that donor countries organized in the DAC are by far the most important donor type in terms of volume (Figure 2.3, see also Eichenauer and Reinsberg 2017).[29]

Figure 2.4 – Figure 2.7 provide a first impression of the data. As can be seen from

[27]The World Bank categorizes funds according to their topic and the services it provides to these funds. These funds may support the projects of or be implemented by the IBRD and the IDA, or by the International Finance Corporation (IFC). Alternatively, contributions are made to Financial Intermediary Funds (FIFs), which may also use organizations other than the World Bank for implementation. FIFs are pass-through multilaterals as described in the introduction of this thesis. They are institutionally less dependent from the World Bank than trust funds, relying mainly on its financial management service.

[28]Clearly, there are other spending categories within the foreign aid budgets that are substitutes for trust fund contributions. However, no sub-annual data on these spending categories are available.

[29]OECD/DAC countries in our sample (in alphabetic order) are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Slovakia, Sweden, Switzerland, the United Kingdom, and the United States.

Figure 2.3: Different types of donors

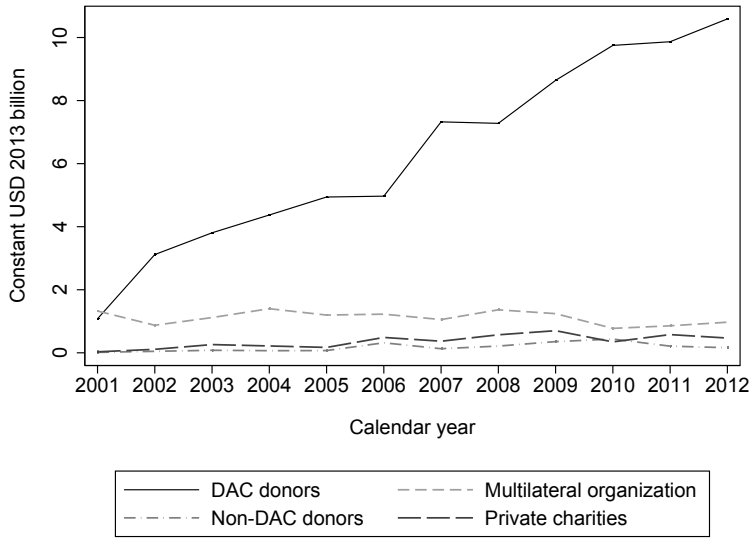
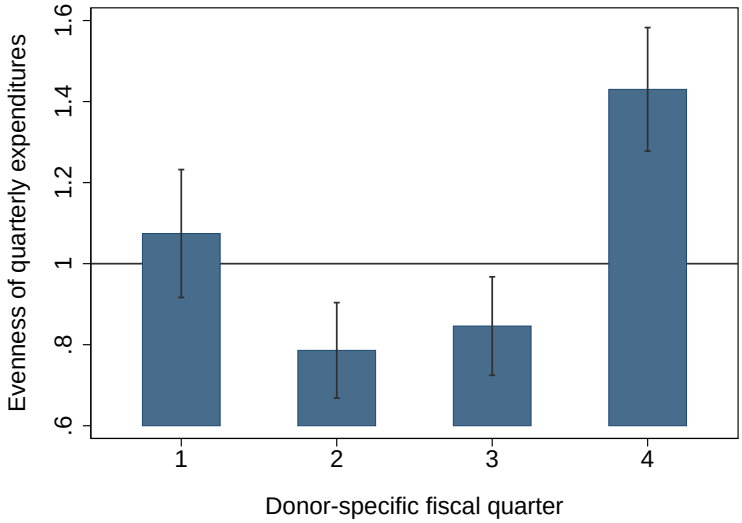


Table 2.2, donors rely on different fiscal years for budgeting. I define donor-specific fiscal quarter (FQ) by assigning donors' contributions in a calendar quarter to the FQ according to the fiscal year used by the donor. Figure 2.4 shows the ratio of actual average quarterly contributions as a share of average quarterly contributions if these were disbursed evenly over the donor-specific fiscal year. Again, the horizontal line at one marks balanced spending over the fiscal year. Contributions in the last quarter are significantly above the line of balanced spending while contributions in the second and third quarter are significantly below it. Figure A.1 in the Appendix shows the same ratio at the monthly level. Contributions in the first and last month are significantly above the line of balanced spending. Figure 2.5 shows the evenness of weekly expenditures in the eight weeks before and after the end of the fiscal year. While the confidence interval is large and includes the line of balanced spending, the end of the fiscal year clearly marks a break. Figure 2.6 shows contributions to funds by donor-specific FQ. The grey-shaded area mark the last fiscal quarters of donor-specific fiscal years. Visual inspection suggests that spending is higher in the last FQ.

Table 2.2: Budget years of DAC donors

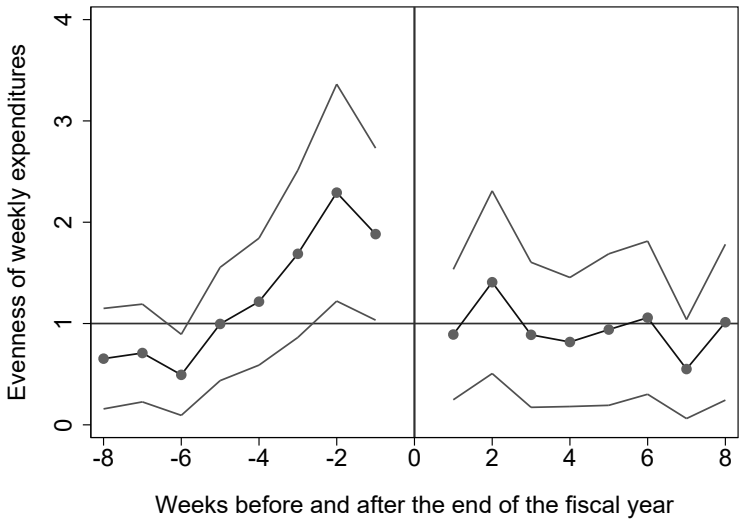
Fiscal year	1.4. - 31.3.	1.7. - 31.6.	1.10. - 30.9.	1.1. - 31.12.
Calendar quarter corresponding to the last fiscal quarter	1	2	3	4
Donor countries	Canada, Japan, United Kingdom	Australia, New Zealand	United States	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, South Korea, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland
Number of countries	3	2	1	21

Figure 2.4: Fund contributions by donor-specific fiscal quarter



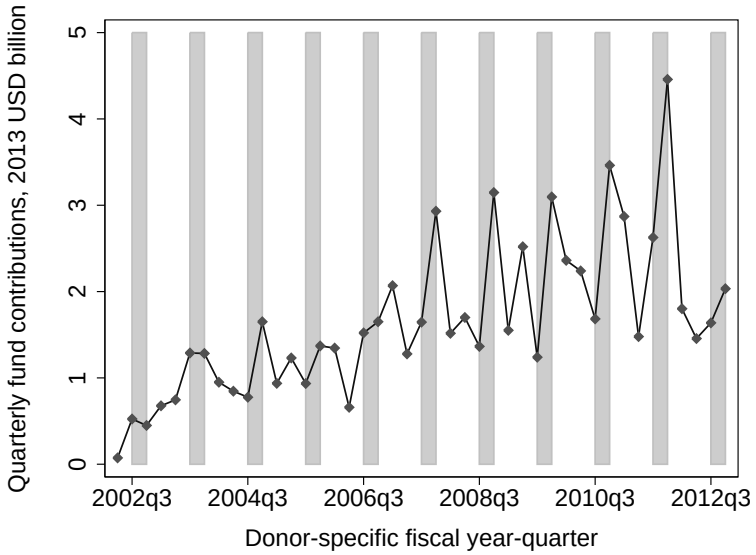
Notes: The y-scale shows the evenness of spending within the fiscal year and is defined as the actual quarter trust fund contributions divided by the average quarterly contributions (i.e., annual trust fund contributions divided by 4). The vertical line at one represents even spending in the last fiscal quarter (i.e., one quarter of annual spending).

Figure 2.5: Weekly contributions to funds around the end of the donor-specific fiscal year



Notes: The y-scale shows the evenness of spending which is defined as the actual weekly fund contributions divided by the average weekly contributions (i.e., annual fund contributions divided by 52). The x-scale depicts the number of weeks before and after the end of the donor-specific fiscal year. The vertical line at one represents even spending in the last fiscal quarter (i.e., one quarter of annual spending). The lines without dots represent the 95% confidence bands.

Figure 2.6: Aggregate quarterly fund contributions by donor-specific fiscal quarter



Notes: The grey-shared area highlight changes in contributions between the third and the last fiscal quarter of donor-specific fiscal quarters.

2.4.2 Identification Strategy

In contrast to existing research on year-end spending in the public sector, I use panel-econometric analysis with various fixed effects rather than calibration to test my and the alternative explanations for spending spikes. I exploit variation in donors' fiscal years to control for seasonal effects (Table 2.2). My main dependent variable is (logged) quarterly amounts contributed to trust funds by donor-specific FQ. I analyze the data at different levels of temporal aggregation to test the robustness of the main results. For the main analysis, I prefer quarterly data over temporally more disaggregated data for two reasons. First, trust fund contributions are not observed every day and are of substantial size. Temporal aggregation helps to reduce the effect of outliers. Second, quarterly data are more adequate for testing the explanations for YESS. In particular, the variables I use to approximate the uncertainty present in the planning and budgeting phase typically do not occur at a precise date while they can reasonably be assumed to occur within a given quarter.

I start with testing the raw YESS effect. (Logged) *quarterly amounts* in constant US$ are regressed on a dummy for the last FQ and on various fixed effects. My preferred regression equation takes the following form:

$$Log\ (Quarterly\ amount)_{iq_if_i} = \alpha + \beta\ Last\ fiscal\ quarter_{iq_i} + \delta_{if_i} + \epsilon_{iq_if_i} \quad (2.1)$$

The index i refers to the donor country, q_i to the donor-specific fiscal quarter, and f_i to the donor-specific fiscal year. Table 2.2 shows that a majority of countries uses the calendar year as their budget year but that six major donors start their fiscal years in April, July, or October. The dummy $Last\,fiscal\,quarter_{iq_i}$ is one in the fourth donor-specific fiscal quarter. The baseline categories are thus the contributions made in the first, second, and third fiscal quarters (i.e., the remainder of the fiscal year). A positive coefficient β would provide evidence for a YESS.

My preferred specification relies on donor-fiscal year fixed effects (δ_{if_i}) that account for time-invariant donor characteristics and donor-specific time-variant shocks. As many of the co-variates of interest described below do not vary within the donors' fiscal year, I will have to rely on donor- and fiscal-year fixed effects instead of their interaction in the regressions. Errors are robust to heteroscedasticity and clustered at the donor country level. Potential reverse causality is discussed in Section 2.5.3.

2.5 Empirical Analysis

The phenomenon of heightened year-end spending is widely recognized and has attracted many nicknames. In particular, YESS is often referred to by the season associated with the end of a country's financial year. Nicknames such as 'March Madness', 'Spring Sale', 'Christmas Season,' 'December Fever,' or as 'Grand Piano Syndrome' suggest that end-of-year spending tends to be of the 'unhealthy' and wasteful type.[30] In stark contrast to public awareness about end-of-year spending spikes, the academic literature on its causes and consequences is scarce. In particular, there is no systematic empirical evidence for sub-annual fiscal budget cycles across countries. The next section establishes that sub-annual budget cycles in fund contributions across donor countries exist. Subsequent sections will assess the explanatory power of the different explanations for (the size of) heightened year-end contributions to trust funds.

2.5.1 Cross-country Evidence for End-of-Year Spending Spikes

This section establishes the existence of heightened year-end contributions to trust funds at the quarterly, monthly and weekly level. Table 2.3 shows that contributions to trust funds are significantly higher in the last FQ. The coefficient β is statistically and economically significant across columns and robust to the introduction of increasingly stringent fixed effects. Column 1 shows the relationship between the logged contributions by donor-quarter and the dummy for the last FQ without any fixed effects. Contributions are estimated to almost double in the last quarter relative to the other quarters of the fiscal year.[31] Due to donors' heterogeneous use of trust funds, the estimated adjusted R-squared is small. The smallest trust fund donor in the sample, Slovak Republic, contributed less than (2013 constant) US$ 60,000 over the sample period whereas the largest donor, the United States, provided US$ 15.7 billion. Column 2 accounts for fiscal-year-specific shocks, absorbing factors such as the general popularity of trust funds in a given fiscal year. The adjusted R-squared slightly decreases relative to column 1. The introduction of donor-fixed effects alone barely affects the estimated coefficient because the last FQ dummy is essentially uncorrelated with unobserved donor characteristics as it mechanically occurs every fourth quarter.

[30] The British Council coined the term 'Grand Piano Syndrome' to suggest that British Council offices around the world purchased grand pianos, an extravagant and largely unnecessary expense, in March, the final month of the British fiscal year. While it is possible that bureaucrats strategically spend less during the year to make such luxury shopping possible, this is rather unlikely because such misappropriation might lead to dismissal. Due to the re-election constraint, politicians would not approve of such spending unless it benefits them directly.

[31] Percentage: $100 * \left(e^{1.039} - 1\right) = 183$.

Table 2.3: Last fiscal quarter effect

	(1)	(2)	(3)	(4)	(5)	(6)
Last fiscal quarter	1.039***	0.998***	1.040***	1.238***	1.214***	1.679**
	(0.306)	(0.301)	(0.350)	(0.402)	(0.418)	(0.649)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	Yes	Yes	Yes	Yes
Calendar year FE	No	No	No	Yes	Yes	Yes
Donor-calendar year FE	No	No	No	No	Yes	Yes
Calendar quarter FE	No	No	No	No	No	Yes
Adjusted R-squared	0.00428	0.00406	0.711	0.710	0.697	0.702
N° of observations	1296	1296	1296	1296	1296	1296
N° of donors	27	27	27	27	27	27

Column 3 thus directly adds donor-fiscal year fixed effects to control for the level of trust fund contributions by a given donor in a given fiscal year. Identification thus comes from the within-country-within-fiscal year variation in contributions. This is my preferred specification because it accounts for the most important sources of omitted variables. The estimated coefficient is of similar size as in column 1, suggesting a doubling of contributions in the last FQ. To rule out that omitted variables drive the result, columns 4-6 include increasingly stringent fixed effects. Column 4 adds calendar-year fixed effects to control for time-variant changes that affect all donors equally and are not captured by the fiscal year effects. For example, they would account for the introduction of a new regulation on trust fund contributions by the World Bank, or a joint trust fund initiative by several donors. As the adjusted R-squared is lower in column 4, any bias from potential omitted variables must be minor relative to the high number of additional dummies.

Seasonal effects such as lower staff productivity in the Christmas season are further potentially important sources of unobserved heterogeneity. I exploit the fact that some countries' fiscal years deviate from the calendar year, which allows for the inclusion of calendar-quarter fixed effects (column 6). The identification mainly originates from the five donor countries with fiscal years departing from the calendar year. It is thus less precisely estimated while its increase suggests that YESS in these five donor countries is more pronounced than in donor countries with a calendar-based fiscal year. Although the deviation from the calendar year is unlikely to be the main explanation for higher year-end contributions in these countries, it should be noted that in all sample countries government staff tend to work a lower number of days in the last month of the calendar year due to holiday days taken for Christmas and New Year festivities. This implies that there are fewer working days in December to spend funds. Because the fiscal year coincides with the calendar year in the majority of the sample countries, the coefficient of interest, β, would be downward biased.

To examine whether the length of the month has any effect, Table 2.4 analyzes the data at the monthly level. The results show that, irrespective of fixed effects, contribution amounts in the last month of the fiscal year are statistically and economically significantly higher: On average about eighteen times as high as in the other eleven months of the year.[32] Moving from column 1 to 6, the same set of increasingly stringent fixed effects used previously are introduced. Column 7 adds month-fixed effects to account for fine-grained seasonality effects and for differences in the number of days per month. The coefficient is remarkably stable across columns.

[32]Percentage: $100 * \left(e^{2.985} - 1\right) = 1,878.$

Table 2.4: Last fiscal month effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Last fiscal month	2.985***	2.994***	3.042***	3.041***	2.974***	2.736***	3.212***
	(0.534)	(0.539)	(0.555)	(0.554)	(0.549)	(0.561)	(0.731)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	Yes	Yes	Yes	Yes	Yes
Calendar year FE	No	No	No	Yes	Yes	Yes	Yes
Donor-calendar year FE	No	No	No	No	Yes	Yes	Yes
Calendar quarter FE	No	No	No	No	No	Yes	Yes
Month FE	No	No	No	No	No	No	Yes
Adjusted R-squared	0.0120	0.0186	0.525	0.524	0.523	0.524	0.544
N° of observations	3879	3879	3879	3879	3879	3879	3879
N° of donors	27	27	27	27	27	27	27

Notes: The dependent variable is (logged) monthly contributions to funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To explore in more detail what drives the effect at the quarterly and monthly levels, Table 2.5 analyzes the contribution data at the daily level. As mentioned above, the lack of aggregation increases the noise in the data so that more imprecise estimates must be expected. Coefficients are consistently positive in the eight weeks prior to the end of the fiscal year and increase as the fiscal year draws to a close. The coefficients turn significant at the latest five weeks before the end of the fiscal year irrespective of the included fixed effects. In some weeks in the new fiscal year, the weekly dummies are still positive and statistically significant although with substantially smaller coefficients. There are several reasons that may explain this pattern: Transfers made by donor countries at the end of the fiscal year need several working days to be wired to the World Bank account; World Bank staff post the date of receipt with delay due to the holiday season, in particular around the end of the calendar year, when the fiscal year of a majority of donors ends, and Christmas and New Year festivities take place; or donors made transfers later than intended due to delays in their bureaucracies. Finally, it is common practice that disbursements ordered prior to the fiscal year but undertaken up to sixty days (i.e., up to 7 weeks) after its end may be counted as disbursements of the elapsed fiscal year (OECD 2003: 109). Indeed, the estimated coefficients and significance levels decrease as the elapsed fiscal year moves further away. Note that heightened spending in the first weeks of the new fiscal year is not a threat to the identification as it would bias the estimated coefficient downward.

The variable of interest is not a 'true panel variable' because it does not vary over fiscal years within a donor country but only across countries within the fiscal year. In these cases, Angrist and Pischke (2009) suggest checking whether results hold in the cross-sectional setting. Table 2.6 shows that they do. The coefficient shrinks substantially, suggesting that last quarter expenditures are about three-quarters higher than in the other FQs rather than doubling as in the panel analysis shown in Table 2.3. Typically, cross-sectional estimates are larger than coefficients in fixed effect estimations because panel results are more sensitive to bias from measurement error and to selection effects (Angrist and Pischke 2009: 167). These concerns do not seem to apply to the analyis in this Chapter.

Table 2.5: Daily contributions to trust funds at the end of the fiscal year

	(1)	(2)	(3)	(4)	(5)
Before: week 8	0.0976*	0.0706	0.0828	0.101**	0.101**
	(0.0561)	(0.0597)	(0.0556)	(0.0485)	(0.0485)
Before: week 7	0.0455	0.0186	0.0308	0.0485	0.0485
	(0.0498)	(0.0642)	(0.0551)	(0.0534)	(0.0534)
Before: week 6	0.159*	0.133	0.145*	0.162	0.162
	(0.0839)	(0.0836)	(0.0846)	(0.0986)	(0.0986)
Before: week 5	0.135***	0.108***	0.120***	0.174***	0.174***
	(0.0416)	(0.0362)	(0.0362)	(0.0581)	(0.0581)
Before: week 4	0.186***	0.159**	0.171***	0.273***	0.273***
	(0.0600)	(0.0634)	(0.0603)	(0.0952)	(0.0952)
Before: week 3	0.353***	0.326***	0.338***	0.440***	0.440***
	(0.113)	(0.105)	(0.108)	(0.154)	(0.154)
Before: week 2	0.369***	0.342***	0.355***	0.457***	0.457***
	(0.105)	(0.0997)	(0.101)	(0.137)	(0.137)
Before: week 1	0.458**	0.431**	0.443**	0.545**	0.545**
	(0.177)	(0.163)	(0.170)	(0.207)	(0.207)
After: week 1	0.0964	0.112	0.0998	0.223	0.223
	(0.0951)	(0.103)	(0.0981)	(0.137)	(0.137)
After: week 2	0.185**	0.201**	0.189**	0.312**	0.312**
	(0.0853)	(0.0870)	(0.0879)	(0.129)	(0.129)
After: week 3	0.128*	0.143*	0.131*	0.254*	0.254*
	(0.0701)	(0.0797)	(0.0748)	(0.131)	(0.131)
After: week 4	0.117**	0.133**	0.120**	0.243**	0.243**
	(0.0537)	(0.0618)	(0.0569)	(0.108)	(0.108)
After: week 5	0.0935*	0.109**	0.0969*	0.198**	0.198**
	(0.0508)	(0.0518)	(0.0523)	(0.0856)	(0.0856)
After: week 6	0.112**	0.128**	0.116**	0.199**	0.199**
	(0.0452)	(0.0486)	(0.0471)	(0.0731)	(0.0731)

Table 2.5: (continues on next page)

Table 2.5: (continued)

	(1)	(2)	(3)	(4)	(5)
After: week 7	0.0921	0.108	0.0955	0.179*	0.179*
	(0.0645)	(0.0735)	(0.0674)	(0.104)	(0.104)
After: week 8	0.112*	0.127*	0.115*	0.198**	0.198**
	(0.0591)	(0.0669)	(0.0606)	(0.0816)	(0.0816)
Aggregation level	Daily	Daily	Daily	Daily	Daily
Calendar year FE	No	Yes	Yes	Yes	Yes
Fiscal year FE	No	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	Yes	Yes	Yes
Calendar quarter FE	No	No	No	No	Yes
Calendar month FE	No	No	No	Yes	Yes
Adjusted R-squared	0.00214	0.00313	0.0299	0.0303	0.0303
N° of observations	118341	118341	118341	118341	118341
N° of donors	27	27	27	27	27

Notes: The dependent variables are (logged) daily contributions to all funds and cover the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

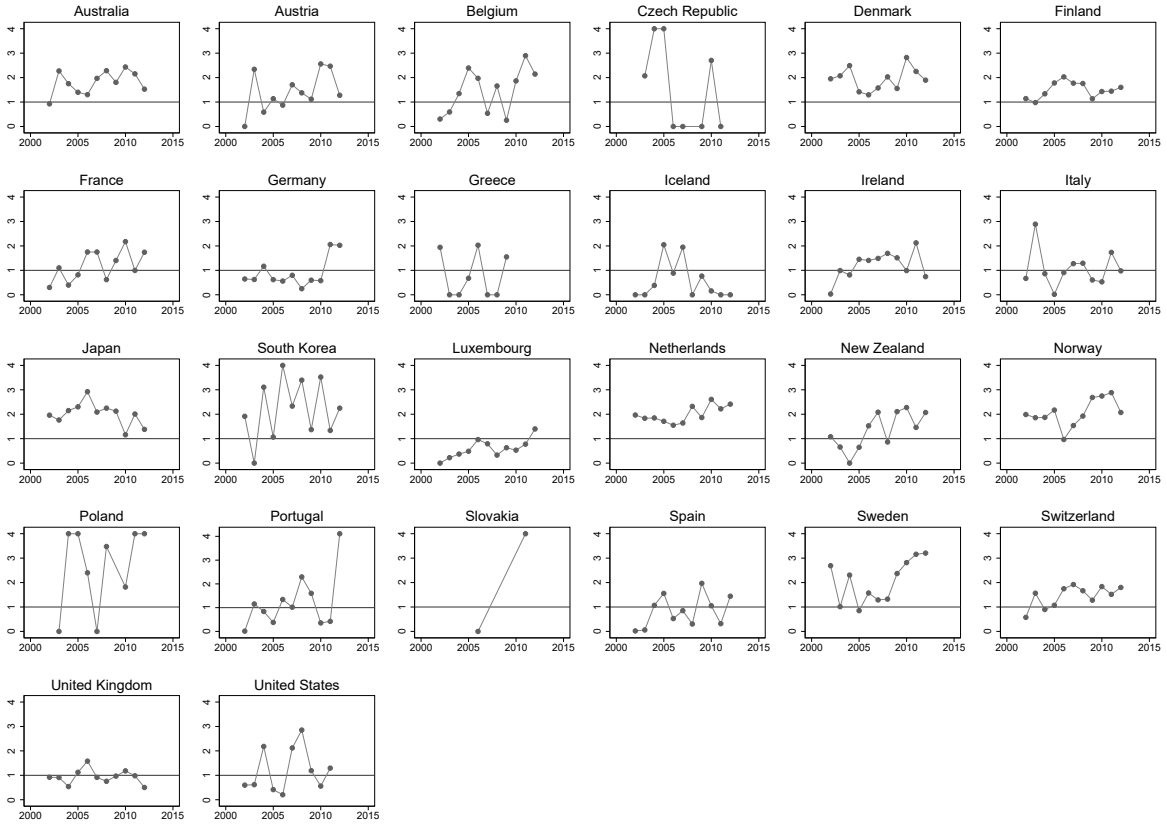
Table 2.6: Cross-section analysis

	(1)	(2)
Last fiscal quarter	0.551**	0.551***
	(0.220)	(0.126)
Collapse dimension	FY-FQ	FY-FQ
Calendar year FE	No	Yes
Donor FE	No	No
R-squared	0.0866	0.848
Adjusted R-squared	0.0683	0.795
N° of observations	52	52

Notes: The dependent variable is (logged) quarterly contributions to all funds. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 2.7: Evenness of spending within the fiscal year by donor country



Notes: The y-axis shows the evenness of spending within the fiscal year and is defined as the actual quarterly trust fund contributions divided by the average quarterly contributions (i.e., annual trust fund contributions divided by 4). The vertical line at one represents even spending in the last fiscal quarter (i.e., one quarter of annual spending).

Next, I explore the heterogeneity across donors and years. Figure 2.7 shows that yearly spending moments vary substantially across years for some donors but not for others. The horizontal line represents balanced spending within the fiscal year. Dots above the horizontal line indicate a YESS. I also explore donor heterogeneity statistically.[33] I obtain the donor-specific coefficients for the YESS effect from interactions of each donor dummy with the last quarter dummy. The regressions include fiscal year- and donor- fixed effects. The Slovak Republic is the smallest provider of trust fund aid in the sample and I thus use the last quarter effect in the Slovak Republic as the baseline category. As these coefficients are based on variation in twelve observations, it is not surprising that they lack precision. Almost all point estimates are positive and in the four cases where they are not, the coefficients are close to zero (except for Luxembourg, a small donor) and

[33]Results are available from the author upon request.

even their 90% confidence intervals include zero. One of the two top trust fund donors, the United Kingdom, does not experience any YESS on average. This might be due to the possibility of (partial) roll-overs to the next financial year. In contrast, large donors like Denmark, Japan, the Netherlands, Norway and Sweden have significant year-end budget spikes. Not only the estimated size of the coefficient but also the width of the confidence intervals vary widely across donor countries. Small confidence intervals are observed for some large trust fund donors. This implies that they make regular use of trust funds to spend lapsing budgets (Switzerland, Denmark, Japan, Norway, New Zealand and Sweden). This can also be seen from Figure 2.7. In sum, there is substantial heterogeneity in donors' use of trust funds to spend lapsing budgets in both regularity and extent. In sum, there is substantial evidence for the existence of YESS in trust fund contributions at three different levels of temporal aggregation. The use of trust funds to spend lapsing budgets is also acknowledged by staff at bilateral aid agencies. As a French aid official put it: "[The fiscal year] is of course only one element of explanation for trust funds. But a powerful one."[34]

2.5.2 Cross-country Evidence for End-of-Year Creation of Trust Funds

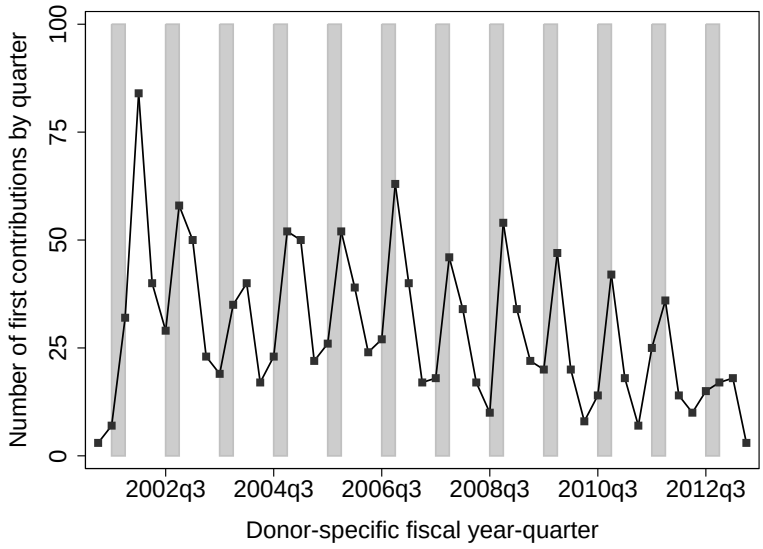
Trust funds allow donors to store funds programmed for a specific bilateral project but where circumstances do not allow full disbursement within their fiscal year. For example, signatures on the project contract may be missing or preconditions required for disbursements may not be met. Under such circumstances, donor countries might resort to setting up a trust fund with a narrow mandate. According to World Bank staff, the creation of a single-donor trust fund can be done within a few months under some circumstances.[35] While I hypothesize that trust fund creation timed to the end of the donor's fiscal year is higher, the data do not provide information about the creation of trust funds. I thus test for a last quarter effect in trust fund creation by constructing the variable *quarterly number of first contributions*. In the disaggregated data, I define first contribution as the first transfer ever received by a given trust fund. Aggregating to the donor-specific FQ in a given year, I obtain a cardinal variable ranging from zero to thirty-six and interpret this variable as the number of new trust funds created in a given quarter. Figure 2.8 shows that most trust funds are created in the early years of the sample and that within fiscal years, most trust funds receive their first contribution in the last quarter of the fiscal year

[34] Statement in an e-mail exchange in October 2014, translated by the author.

[35] The creation of a trust fund is easier if the donor knows his goal, if the issue is not sensitive, if there is interest within the Bank and staff on both sides are prompt in carrying out the administrative tasks. The process of setting up a fund takes longer if multiple or 'complicated' donors are involved.

as highlighted by the grey-shaded areas. The process of trust fund creation is described below.

Figure 2.8: Number of first contributions by donor-specific fiscal quarter



Notes: The grey-shaded area highlights the change in the number of funds receiving first-time contributions between the third and the last fiscal quarter.

Donors create significantly more trust funds in the last quarter. According to column 1 in table **??**, more than 0.8 additional first-time contributions are made in the last quarter. Given the standard deviation of 2.6 for the dependent variable, this corresponds to about 30 percent of a standard deviation change. Because the dependent variable is zero in most donor-quarters, column 2 re-estimates the main effect using a zero-inflated negative binomial regression, which is most adequate for over-dispersed cardinal dependent variables.[36] I model the logit part of the model with donors' quarterly participation in G8 summits and the count part with the dummy variable of interest and fiscal-year fixed effects.[37] The coefficient of interest in column 2 is slightly smaller but similar to the point estimate obtained using Ordinary Least Squares (OLS). This suggests that the use of OLS is relatively unproblematic and column 3 thus adds donor-fiscal year fixed

[36]The Vuong test indicates that the zero-inflated model is preferable to an ordinary negative binomial regression model and according to the likelihood test the zero-inflated negative binomial model is more adequate than the zero-inflated Poisson model.

[37]The G8 variable is inspired by an observation of the World Bank's evaluation unit (IEG 2011a: vii): "For large multi-donor funds, the decision [about trust fund contributions] generally comes at the initiative of senior government officials or international groups of officials such as the G-7." Russia joined the G7 in 1997 and was expelled from the G8 following its annexation of Crimea in March 2014. We thus only observe G8 meetings in our sample period.

effects to the model of column 1. The coefficient is similar to previous columns. In informal conversations, World Bank staff suggested that institutional restrictions in their organization might affect the creation of trust funds. In particular, the World Bank has discontinued solicitations of trust funds during recent replenishment negotiations for the next three-year funding period of IDA.[38] The IDA replenishment period might thus be an omitted variable. Column 4 includes the variable *End of IDA cycle*, which is one in the last quarter of an IDA replenishment period. The last quarter effect is robust to the inclusion of the variable. For the IDA variable, I find a negative coefficient, implying that the intended purpose of the restriction was achieved.

Table 2.7: First contributions to funds and bureaucratic quality

	(1)	(2)	(3)
Last fiscal quarter	-2.314	-2.406	-1.954
	(1.890)	(1.931)	(1.943)
Last fiscal quarter	0.908	0.882	0.758
* bureaucratic quality	(0.592)	(0.602)	(0.620)
Bureaucratic quality	1.103***	1.043***	
	(0.339)	(0.330)	
Model	OLS	OLS	OLS
Fiscal year FE	No	Yes	Yes
Donor-fiscal year FE	No	No	Yes
Adjusted R-squared	0.0976	0.174	0.598
N° of observations	1296	1296	1296
N° of donors	27	27	27

Notes: The dependent variable is the quarterly number of first contributions and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

[38] As the Bank's fiscal year runs from July 1 to June 30 and the IDA budget is replenished for a three-year period, the end period of IDA12-IDA16 fall in our sample period, which, respectively, ended on June 30 of the years 2002, 2005, 2008, and 2011.

2.5.3 Empirical Evidence for the Bureaucracy Hypothesis

As suggested above, the simplest explanation for spending surges at the end of the budget year is probably a failure to plan. This section tests this argument formally by using bureaucratic quality as a measure of planning capacity and interact it with the dummy for the last FQ. I expect better bureaucracies to reduce YESS and therefore a negative interaction term.

Several measures of governance and, more specifically, government capacity exist. As the quality of governance in general and of subcomponents of governance in particular are notoriously hard to measure (Langbein and Knack 2010), I provide extensive sensitivity analysis. For the main regressions, I use the variable *Bureaucratic Quality* from the International Country Risk Guide (ICRG) (Howell 2011), a commercial service providing information on political risks to investors and lenders. ICRG provides the only governance measures available at monthly frequency. Moreover, the variable corresponds most closely to the theoretical mechanisms underlying the argument. Values range from zero to four with higher scores indicating the presence of regular, meritocratic recruitment and advancement processes, insulation from political pressure, and the ability to continue service provision during government changes (Howell 2011). Because no more details about the definition are given and the scores are based on expert ratings, further research was conducted to validate the measure against alternative ones, although only for developing countries.[39] Given that the bureaucratic quality score is based on expert surveys, there is also small risk of reverse causality with YESS. Surveyed experts might observe inefficient projects that are due to YESS and attribute lower scores to the bureaucracy as a consequence. In robustness checks, I lag the bureaucratic quality variable by one year to mitigate these concerns. A further concern is the ordinal nature of the ICRG and most governance variables. Nevertheless, the literature uses the ICRG variables as interval data (e.g., Knack and Rahman 2007). I dichotomize bureaucratic quality at the sample mean and replicate the results with the binary measure as robustness check. As there is relatively little variation in bureaucratic quality over the time-frame and across the sample countries, I test the robustness of the results by using alternative measures of governance and government effectiveness. These proxy variables aim to measure concepts similar but distinct from bureaucratic quality. For adequate comparison with these yearly variables, I also run regressions with the annual average of the ICRG bureaucratic quality variable and do not include fiscal year-donor dummies in regressions with annual

[39] Knack and Rahman (2007) find bureaucratic quality to be highly correlated with Evans and Rauch's (1999) more detailed "Weberian scale" of bureaucratic development. Hendrix (2010) assesses the construct validity of operationalization of state capacity in the civil conflict literature and concludes by suggesting that survey-based variables of bureaucratic quality are among the two most theoretically and empirically justified measures.

variables. Table 2.1 shows descriptive statistics for the different governance measures and Table 2.9 their correlation matrix.

Table 2.8 shows that the interaction effect of bureaucratic quality and last FQ has the hypothersized negative effect and is economically and statistically significant. This result is independent of the included fixed effects (columns 1-4). In terms of magnitude, a one-point (one standard deviation) increase in bureaucratic quality increases reduces YESS by 81 (40) percent.[40] For the average donor, this would translate into a reduction of last quarter funding by, respectively, 70 and 35 million US$.[41] Put differently, the results predicts that YESS is 160 percent lower for a donor with the maximum level of bureaucracy in the sample (e.g., New Zealand in 2010) compared to a country with the lowest level in the sample (e.g., Italy in 2010).[42] Figure 2.9 shows the marginal effect of the last quarter for the different levels of bureaucratic quality observed in the analyzed sample of OECD countries. Although there is a year-end effect for all levels of bureaucratic quality, YESS is smaller for better bureaucracies.

Given the strong increase in contributions over time, I want to test the robustness of the main result to changes in the time period. Column 5 includes contributions during the second half of the World Bank's fiscal years 2008-2013 while column 6 focuses on the start of the sample period (2002-2007). The results are robust to these modifications. I also analyze the sensitivity of the results to the exclusion of individual donor countries controlling for donor-fiscal year effects. The main result is not sensitive to excluding any of the donors. In particular, the result is robust to the exclusion of the United States, a special case because its budgets are often delayed and USAID, the US aid agency, is more micro-managed by the legislature than aid agencies in other donor countries (Tables A.2–A.4). Column 7 excludes the five smallest donors.[43] Column 8 excludes the two donors, which share the budget year of the World Bank (i.e., Australia and New Zealand). The result is robust to their exclusion.

Results are also robust to using the one-year lag (Table A.5), the yearly average of bureaucratic quality (Table A.7) and for the monthly analysis. In sum, there is robust evidence that smaller end-of-year spending spikes are observed in countries with better bureaucracies. In the following, the robustness of this finding to alternative measures of bureaucratic quality is tested.

[40] Percentage: $100 * \left(e^{-1.674} - 1\right) = -81.25; 100 * \left(e^{-1.674} - 1\right) * 0.50 = -41.63$.

[41] Average contributions in the last quarter are US$ 86.51 million. Thus, $-0.8125 * 86.51 = -70.29$ and $-0.82 * 86.51 * 0.503 = -35.35$.

[42] $\frac{4}{2.5} = 1.6$.

[43] The Slovak Republic, Poland, Iceland, the Czech Republic and Greece each provide less than US$ 40 million to funds over the sample period. The next largest donor, Portugal, provides almost three times as much as Greece, the largest donor among the excluded donors.

Table 2.8: The effect of bureaucratic quality on contributions in the last quarter

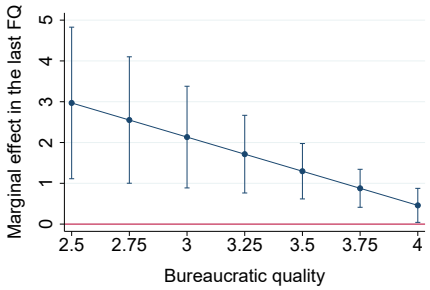
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Last fiscal quarter	7.154***	7.197***	7.238***	6.707**	6.303**	7.871**	5.072*	7.061***
	(2.433)	(2.460)	(2.490)	(2.856)	(2.991)	(3.626)	(2.559)	(1.631)
Last fiscal quarter	-1.674**	-1.683**	-1.688**	-1.549**	-1.530*	-1.733*	-1.126*	-1.636***
* bureaucratic quality	(0.617)	(0.623)	(0.631)	(0.723)	(0.762)	(0.920)	(0.641)	(0.445)
Bureaucratic quality	6.254**	6.284**	-0.337	1.864***	-0.479	2.325***	-0.382	-0.500
	(2.404)	(2.412)	(0.390)	(0.238)	(0.352)	(0.233)	(0.335)	(1.202)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	No	No	No	No
Adjusted R-squared	0.222	0.225	0.710	0.714	0.712	0.722	0.391	0.722
N° of observations	1296	1296	1296	1296	712	584	1056	1200
N° of donors	27	27	27	27	27	27	22	25
Notes					≤ 2007	> 2007	5 minor	WB year

Notes: The dependent variable is (logged) quarterly contributions to funds and covers the World Bank's fiscal years 2002-2013. Column 5 excludes observations after the World Bank's fiscal year 2007 while column 6 excludes contributions prior to the year 2007. Column 7 drops the five smallest trust funds donors (The Slovak Republic, Poland, Iceland, the Czech Republic and Greece) and column 8 the two donors that have the same fiscal year as the World Bank (Australia and New Zealand). Robust standard errors in parentheses clustered at the donor country level.

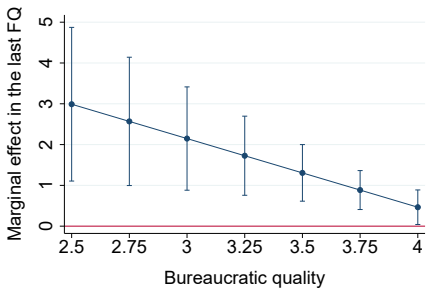
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 2.9: Marginal effects for regressions with different sets of fixed effects

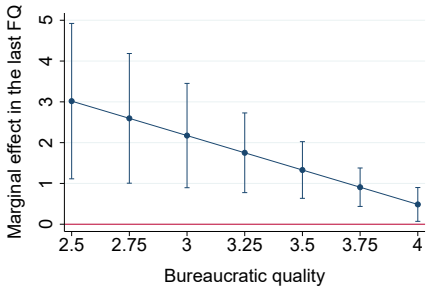
(a) Without fixed effects



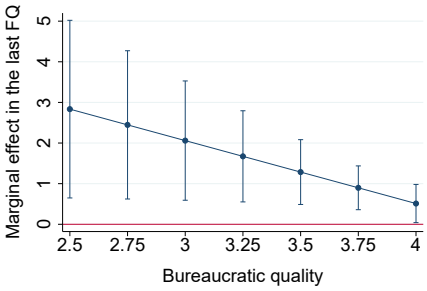
(b) With fiscal year-fixed effects



(c) With donor- and fiscal year- fixed effects



(d) With donor-fiscal year-fixed effects



Notes: Marginal effect of bureaucratic quality on (logged) fund contributions in the last fiscal quarter. Figures a, b, c and d correspond to columns 1, 2, 3 and 4 in Table 2.8 respectively.

It is possible that it is good governance more generally that drives the result for the bureaucratic quality variable. I use six governance variables that claim to measure concepts similar but distinct from bureaucratic quality (see column 1 of Table 2.9 for their correlation with ICRG bureaucratic quality). First, I use three different governance measures from the World Governance Indicators (WGI) are used (Kaufmann et al. 2011). The WGI consist of six annual indicators that aim to capture different dimensions of governance.[44] Langbein and Knack (2010) examine the dimensionality of the WGI indexes and conclude that the individual WGI indicators do not generally capture distinct aspects of governance. Their result supports averaging the six indices in a broader index (e.g., Bjørnskov 2006). I use the *average WGI* value as one sensitivity check but as the goal is not to test a specific hypothesis about one or the other dimension, I also use the relevant indicators individually.

First, the *WGI government effectiveness* indicator aims to capture "the capacity of the governments to effectively formulate and implement sound policies" (Kaufmann et al. 2011). It includes the ICRG bureaucratic quality variable as one source of information. Government effectiveness is defined more broadly than bureaucratic quality while clearly encompassing it. This is less clear for the *WGI regulatory quality* variable that measures "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development" (Kaufmann et al. 2011). Third, I use the *WGI control of corruption* indicator that should capture "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests" (Kaufmann et al. 2011). One channel for the negative relationship between bureaucratic quality and YESS is the absence of political interference that disturbs the implementation of the disbursement plan. One relatively indirect measure for such political interference is the level of government corruption. As alternative measure of corruption, I use the monthly available *ICRG corruption* score, which is mostly "concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for favors', secret party funding, and suspiciously close ties between politics and business." The lower the value, the more widespread corruption is.

The transparency of government finances reduces the opportunities for corrupt activities, indicates statistical capacity, and increases the accountability of the government to taxpayers for the efficient use of taxes. Alt and Lassen (2006) find that political business cycles in 19 OECD countries in the 1990s are reduced by fiscal transparency. Ficht-

[44] The indicators are constructed using an Unobserved Components Model which weights the information contained in more than thirty existing data sources. Each governance measure is distributed between -2.5 and 2.5 with a mean of zero and a standard deviation of one. Higher values correspond to better governance.

ner and Greene (2014) note that YESS may also be curbed through heightened budget transparency such as via a midyear budget execution review as introduced in Taiwan in 2002. However, as information about sub-annual government spending is generally not available, there are no public discussions about YESS and the channels through which transparency decreases political business cycles are not (readily) applicable to sub-annual spending cycles. Nevertheless, one could expect that the more transparent donors are, the more likely it is that they will be held accountable for rushed end-of-year spending, especially if it is of the wasteful kind. Due to a lack of alternative measures, I use a new measure of fiscal *transparency* that is based on the comprehensiveness of governments' reporting to the International Monetary Fund (IMF) (Wang et al. 2015).[45]

Table 2.9 shows the correlation of the six governance measures with ICRG bureaucratic quality and oneanother. The interaction of the alternative governance measures with the last quarter is negative and significant for different sets of fixed effects (Table A.9 and Table A.10). The interaction with the IMF fiscal transparency measure is negative but far from being statistically or economically significant.

Omitted variable bias arises due to failure to account for a factor that affects both bureaucratic quality and the size of YESS. To reduce such concerns, I conduct two types of sensitivity analysis. First, I examine the potentially most important common determinant of bureaucratic quality and YESS: the level of development as measured by income per capita. As noted in previous research (e.g., Knack and Rahman 2007; Acemoglu et al. 2001), the correlation of income per capita and bureaucratic quality is also high in my sample ($r = 0.64$) Column 1 of Table 2.10 shows that the finding about bureaucratic quality is robust to the inclusion of Gross Domestic Product (GDP) per capita (OECD 2016a). The interaction of GDP per capita with the last quarter dummy is also statistically significant.

A second source of omitted variable bias are specific institutions or procedures that vary across countries and over time. In this Chapter, I will consider whether these institutions or procedures have additional explanatory power for YESS.

[45]Using the Aid Transparency Index which assesses the state of aid transparency among major donor organizations, would be most appropriate here but it is only available since 2011. Measuring budget transparency more generally, the Open Budget Index (OBI), a biannual survey measure of budget transparency, participation, and oversight, is available from 2006 for some donor countries. However, fourteen donors are not included in any year. Independent of using the raw or interpolated values of the OBI, the interaction with the last FQ dummy is insignificant. Further alternative indicators of fiscal transparency are not available for the sample period (e.g., the indicator of Alt and Lassen 2006) or limited to EU countries (Hallerberg et al. 2009).

Table 2.9: Correlation matrix for governance measures

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	Bureaucratic quality, ICRG	1.000								
(2)	Yearly bureaucratic quality, ICRG	0.998	1.000							
(3)	Binary bureaucratic quality, ICRG	0.984	0.982	1.000						
(4)	Government effectiveness, WGI	0.851	0.852	0.834	1.000					
(5)	Regulatory quality, WGI	0.785	0.786	0.790	0.831	1.000				
(6)	Average governance, WGI	0.866	0.867	0.862	0.948	0.897	1.000			
(7)	Corruption, ICRG	0.760	0.762	0.758	0.857	0.765	0.903	1.000		
(8)	Control of corruption, WGI	0.854	0.855	0.852	0.928	0.860	0.974	0.929	1.000	
(9)	IMF transparency index	0.200	0.200	0.196	0.162	0.192	0.213	0.221	0.224	1.000

First, the accounting system might affect the size and existence of spending spikes. During the sample period, many OECD governments transitioned from cash to accrual accounting. Cash accounting records a transaction when the monetary transfer occurs while accrual accounting registers the activity when the product or service is consumed or produced. Experts suggested that rushing expenditures at the end of the budget year might be more difficult under accrual accounting. However, time-series information on countries' transition between accounting systems. Table 2.10 shows the effect of accrual accounting on YESS. The binary indicator is one in country-years accrual accounting is used (Table A.1). Column 2 shows that the interaction with accounting type is statistically insignificant while the bureaucratic quality effect remains. Second, roll-over rules might affect the size of YESS despite the lack of evidence from the mentioned reforms in the UK. However, there is currently not enough internationally comparable information to code the introduction, presence and type of roll-over rules,

Third, bureaucratic quality and YESS are both related to fiscal discipline (e.g., Vlaicu et al. 2014), making it a potential omitted variable. Expenditures may be more generous when the budgetary situation of the country is relatively good and tight in periods of fiscal austerity. Moreover, expenditures might be more closely monitored by the parliament in the latter case, making YESS less likely. I proxy the fiscal space available to the government with the primary balance (as a share of GDP) (IMF 2015). According to column 3 of Table 2.10, the interaction with bureaucratic quality stays negative and significant while the interaction with the primary balance is insignificant.

While the theoretical effect of bureaucratic quality on YESS is unambigious, theory suggests two opposing effects on the creation of new trust funds. These may or may not be of the same size and may compensate each other partly in a reduced form estimation. First consider that it takes several months to negotiate a trust fund's founding contract and to complete the administrative paper-work. This implies that staff in bilateral aid agencies need to plan ahead if they want to have a trust fund ready at the end of the fiscal year. Consequently, first-time contributions at the end of the fiscal year should be higher in higher quality bureaucracies. However, these donors are less likely to have 'left-over' funds in the first place due to higher planning capacity. These two effects may (partly) counter oneanother. Table 2.11 shows that, controlling for the level of bureaucratic quality, there no longer is a last quarter effect.

In sum, there is robust evidence that a lack of planning capacity as measured by the general quality of bureaucracy, and, more generally, the quality of governance reduces YESS substantially. However, bureaucratic quality reduces YESS only by around 86 percent in average. The following sections explore whether other explanations for YESS, namely the uncertainty about spending demands, add explanatory power.

Table 2.10: Income per capita, accounting type, and fiscal space

	(1)	(2)	(3)
Last fiscal quarter	26.56**	7.507***	5.889**
	(11.23)	(2.588)	(2.292)
Last fiscal quarter	-0.910*	-1.831**	-1.374**
* bureaucratic quality	(0.472)	(0.706)	(0.585)
Bureaucratic quality	-0.812*	-0.336	-0.146
	(0.426)	(0.463)	(0.352)
Last fiscal quarter	-2.104*		
* GDP p.c. (ln)	(1.086)		
GDP p.c. (ln)	6.920*		
	(3.786)		
Last fiscal quarter*		0.504	
accounting system		(0.615)	
Accounting system		0.112	
		(0.606)	
Last fiscal quarter			-0.0337
* primary balance			(0.0679)
Primary balance			-0.147**
(% of GDP)			(0.0556)
Fiscal year FE	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes
Adjusted R-squared	0.710	0.706	0.746
N° of observations	1268	1264	1234
N° of donors	27	27	26

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2.11: First contributions to funds and bureaucratic quality

	(1)	(2)	(3)
Last fiscal quarter	-2.314	-2.406	-1.954
	(1.890)	(1.931)	(1.943)
Last fiscal quarter	0.908	0.882	0.758
* bureaucratic quality	(0.592)	(0.602)	(0.620)
Bureaucratic quality	1.103***	1.043***	
	(0.339)	(0.330)	
Model	OLS	OLS	OLS
Fiscal year FE	No	Yes	Yes
Donor-fiscal year FE	No	No	Yes
Adjusted R-squared	0.0976	0.174	0.598
N° of observations	1296	1296	1296
N° of donors	27	27	27

Notes: The dependent variable is the quarterly number of first contributions and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2.5.4 Empirical Evidence for the Precautionary Savings and the Procrastination Hypotheses

This Section seeks to assess the explanatory power of the other alternative theories for end-of-year spending spikes, which accord a large role to uncertainty. The first step is to establish that importance of uncertain but, within a confidence inverval, forecastable events on YESS. In a second step, I condier the direction of the relationship between YESS and uncertainty. Both theories predict that positive spending shocks lower year-end spending, which implies a negative relationship between unexpected spending demands and YESS.

Unexpected demand shocks arise from the beneficiaries of the public service in question. They are exogenous to the bureaucracy and to the time of the fiscal year. I consider three demands shocks to which OECD governments are likely to respond via their aid agency.

The first and arguably most exogenous international demand shock is the occurence of natural disasters in developing countries after which OECD governments rush to disburse disaster aid (Fuchs and Klann 2013). I find that the (logged) total number of people affected by natural disasters decreases YESS (Column 1 in Table 2.12).

The two other international demand shocks considered, violent conflicts and refugees,

are less exogenous to the donor country, more slow-onset and thus more predictable.[46] Column 2 and 3 of Table 2.12 find that these events are not statistically related to YESS. In sum, demand shocks reduce YESS as predicted by both theories.

The two theories make opposing prediction regarding the relationship between the degree of uncertainty and the size of YESS. Liebman and Mahoney's (2017) model predicts a positive association between the size of spending spikes and uncertainty. Heightened year-end spending is driven by uncertainty about demands in the later months of the fiscal year, leading to the build-up of reserves to meet unexpected demands and expenditures. If no shock occurs, these reserves are nevertheless spent before the end of the budget year as the funds would otherwise lapse.

In contrast, Baumann's (2015) model suggests a negative relationship between YESS and uncertainty. Bureaucrats procrastinate over strenuous tasks until their appraisal at the end of the year but will take advantage of beneficial shocks during the fiscal year to disburse the budget earlier.

As Baumann (2015) notes, it is variation in unpredictability of future demands that explains precautionary savings in Liebman and Mahoney (2017). This interpretation makes it possible to empirically test their hypothesis against real world measures of uncertainty. Neither Liebman and Mahoney (2017) nor Baumann (2015) propose variables to measure uncertainty. Uncertainty does not have a universally accepted definition. In the emerging literature on YESS, this Chapter provides the first attempt to identify and measure major sources of uncertainty affecting the size of YESS. Controlling for bureaucratic quality, the following sections propose and tst plausible indicators of uncertainty related to budget policy, domestic politics, and the macroeconomic situation. These variables are interacted with the last FQ dummy to test their effect on YESS.

Uncertainty and Budget Policy

The ability of a government agency to deal with uncertainty may depend on the agency's budget and in particular on the discretionary part of the budget. Agencies with large

[46] While the persistence of conflicts in developing countries is slightly more predictable than the occurrence of natural disasters, their onset and intensity represent a source of uncertainty in the programming process.

Conflicts, natural disasters, and economic crises in developing countries have been associated with increased migration to OECD countries (e.g., Neumayer 2005).

Not least because of a lack of legal migration possibilities, such migrants often seek asylum status in Western countries. The OECD / DAC's definition of ODA allows donor countries to count some of the expenses associated with asylum seekers in donor countries as foreign aid (see the OECD Methodological Note on refugees:
http://www.oecd.org/dac/stats/RefugeeCostsMethodologicalNote.pdf (accessed on September 15, 2016)). Unexpected surges in the (logged) annual number of asylum seekers could lead to lower YESS.

Table 2.12: International demand shocks

	(1)	(2)	(3)	(4)
Last fiscal quarter	39.235***	-3.270	7.259**	34.678*
	(11.338)	(7.728)	(2.614)	(17.257)
Last fiscal quarter	-1.673**	-1.710**	-1.688**	-1.686**
* bureaucratic quality	(0.631)	(0.629)	(0.644)	(0.640)
Bureaucratic quality	-0.353	-0.352	-0.383	-0.403
	(0.387)	(0.390)	(0.396)	(0.394)
Last fiscal quarter*	-1.678***			-1.612**
disaster affected (ln)	(0.542)			(0.605)
Last fiscal quarter*		1.056		0.326
battle deaths (ln)		(0.680)		(0.762)
Last fiscal quarter*			-0.002	0.009
asylum seekers (ln)			(0.149)	(0.153)
Asylum seekers (ln)			0.238	0.239
			(0.222)	(0.221)
Fiscal year FE	Yes	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.713	0.710	0.710	0.712
N° of observations	1296	1296	1296	1296
N° of donors	27	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

budgets may absorb spending shocks better by dispersing the unexpected demand shock across their programmed expenditures, leading to minor cuts (increases) for all projects. Large agencies would thus require lower levels of precautionary savings and be able to avoid large YESS. This absorption advantage of large agencies should be especially pronounced for shocks that are not proportional to the size of the agency.

Table 2.13 considers whether agencies with large (logged) ODA disbursements (column 1) (OECD 2016a) or higher (logged) annual fund contributions (column 2), a lower bound the discretionary part of the budget available, experience lower YESS. Both variables are lagged by one fiscal year. While the interaction is insignificant in column 1, column 2 suggests that YESS increase in the size of total contributions. The interaction between bureaucratic quality and the last quarter dummy remains significantly negative in both columns.

Another major source of uncertainty for a government department is the lack of information about the size of the budget. The main reason for an unknown budget size is late budget approval by parliament. Liebman and Mahoney (2017) find for the U.S., where budgets are agreed on notoriously late, delayed appropriations heighten spending at the end of the fiscal year. In the majority of OECD countries, appropriations were never delayed in the analyzed time period.

Column 3 of Table 2.13 tests whether the number of months by which the budget is delayed affects last quarter contributions (own coding, see Table A.1). The interaction with late budget is insignificant, suggesting that delayed approval of the budget does not systematically increase YESS across countries.[47] As it is possible that all three variables affect YESS conditionally on one another, column 4 includes them in tandem. While significance levels sometimes change, the overall picture does not. The effect of interest regarding bureaucratic quality is preserved. Given the high correlation between total aid and yearly contributions ($r = 0.76$), these variables will not jointly be included in subsequent regressions due to multicollinearity concerns. In sum, there is no evidence that the fiscal variables affect YESS.

[47] Austria is a special case. Although biannual budgeting has been constitutionally allowed in exceptional cases only since 2009, budgets have been appropriated for two-year-periods since the beginning of the 2000s (Austrian Parliament 2016). Setting the late approval dummy for Austria to zero halves the interaction coefficient to -0.097. Although statistically significant at almost the five percent level, the effect is economically insignificant.

Table 2.13: The Last Quarter Effect and Budget Policy

	(1)	(2)	(3)	(4)
Last fiscal quarter	7.773*	6.847**	7.411***	17.36**
	(3.932)	(2.909)	(2.505)	(6.563)
Last fiscal quarter	-1.712**	-2.296**	-1.711**	-2.456**
* bureaucratic quality	(0.662)	(0.950)	(0.632)	(0.943)
Bureaucratic quality	-0.491	-0.125	-0.613	-0.486
	(0.368)	(0.371)	(0.384)	(0.381)
Last fiscal quarter*	-0.0220			-0.596*
aid (ln)	(0.166)			(0.315)
Total aid (ln)	2.153**			1.777*
	(1.004)			(0.877)
Last fiscal quarter*		0.155**		0.322***
yearly contributions (ln)		(0.0591)		(0.0952)
Yearly contributions		0.211**		0.129
(ln)		(0.101)		(0.0968)
Last fiscal quarter*			-0.194	-0.191
late budget			(0.122)	(0.123)
Late budget			0.000604	-0.000913
			(0.0363)	(0.0252)
Fiscal year FE	Yes	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.716	0.720	0.710	0.726
N° of observations	1296	1296	1296	1296
N° of donors	27	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Uncertainty and Domestic Politics

Beyond late approval of budgets, politics are a major source of uncertainty in government administrations. A large literature on political business cycles shows that politics affect fiscal variables particularly in election years. Elections instill uncertainty in government agencies because of the possibility of imminent changes to department policy and direction. This may affect the size of the total and the agency's budget, lead to changes in senior staff and in spending priorities.[48]

An election effect on the size of YESS could be interpreted as evidence that those governments that expect to loose power spend all remaining discretionary parts of the budget according to their priorities right before the election. Finally, political business cycles are also a candidate explanation for uneven spending within the fiscal year. In the case of fund contributions, it is unlikely that election-related disbursement manipulations affect foreign aid in general and trust fund aid in particular: These financial flows target neither the marginal voters nor strengthen support from major voting blocs.[49]

The election effect is tested in Table 2.14: It shows the interaction of the last fiscal quarter dummy with an election quarter dummy (column 1) and an election year dummy (column 2) (own data extension of Beck et al. 2001). The interaction is insignificant in both cases.

[48] The uncertainty surrounding elections increases if the exact date of the vote is unclear or the outcome seems close ex ante. In the sample period, several EU countries held more than one election per year because no coalition governments could be formed. This led to the announcement of new elections on short notice. Unfortunately, there are no cross-country measures for the ex-ante degree of closeness of election results to test this argument.

[49] Despite these theoretical doubts, I econometrically tested for heightened spending in the two quarters before the election. The coefficient is insignificant independent of the inclusion or not of an interaction with the last quarter dummy, which also is insignificant.

Table 2.14: Uncertainty and domestic politics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Last fiscal quarter	7.117***	7.346***	7.198***	7.212***	7.236***	7.140***	7.122***	7.216***	5.042**
	(2.415)	(2.411)	(2.446)	(2.463)	(2.479)	(2.444)	(2.413)	(2.358)	(1.937)
Last fiscal quarter	-1.675**	-1.694**	-1.679**	-1.683**	-1.692**	-1.673**	-1.678**	-1.669**	-0.961**
* bureaucratic quality	(0.616)	(0.629)	(0.621)	(0.625)	(0.630)	(0.625)	(0.617)	(0.618)	(0.455)
Bureaucratic quality	-0.293	-0.319	-0.315	-0.309	-0.333	-0.346	-0.274	-0.319	-0.591
	(0.397)	(0.389)	(0.385)	(0.389)	(0.390)	(0.395)	(0.399)	(0.392)	(0.369)
Last fiscal quarter	1.157						0.961		
* election quarter	(1.444)						(1.215)		
Election quarter	-0.430						-0.450		
	(0.545)						(0.561)		
Last fiscal quarter		-0.286						-0.408	
* election year		(0.535)						(0.578)	
Election year		0.191						0.183	
		(0.198)						(0.251)	
Last fiscal quarter			-0.170				-0.366		
* quarter of government change			(1.388)				(1.207)		
Quarter of government change			1.160				1.210		
			(0.776)				(0.803)		

Table 2.14: (continues on next page)

Table 2.14: (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Last fiscal quarter				0.0453				0.230	
* year of government change				(1.000)				(1.162)	
Year of government change				0.274				0.197	
				(0.294)				(0.431)	
Last fiscal quarter					2.412***		2.438***		
* quarter of aid minister change					(0.777)		(0.776)		
Aid minister change					-0.611		-0.643		
					(0.822)		(0.824)		
Last fiscal quarter						0.620		0.691	
* year of aid minister change						(0.966)		(0.993)	
Year of aid minister change						-0.346		-0.425	
						(0.726)		(0.753)	
Last fiscal quarter									-1.072***
* independent aid agency									(0.358)
Fiscal year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.710	0.709	0.710	0.709	0.709	0.709	0.710	0.709	0.527
N° of observations	1296	1296	1296	1296	1296	1296	1296	1296	1104
N° of donors	27	27	27	27	27	27	27	27	23

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

If the government changes, a high level of uncertainty persists for some months because of potential policy changes affecting the budget size, allocation, and staff. Government changes may also affect spending within the fiscal year for a reason other than uncertainty. Outgoing governments may use the months they remain in office after the lost election and before the inauguration of the new government to allocate any remaining (discretionary) funds according to their priorities. The average number of months between a lost election and the subsequent inauguration of the new government is 1.4 months. Thus, such spending must be made expeditiously. For the same reasons as for year-end spending, trust funds are particularly attractive under this scenario because they separate the spending and the implementation stages and thus allow for rapid spending. In other words, trust funds allow for the intended earmarking of funds according to the outgoing government's priorities, most likely even without compromising on quality.[50] Column 3 tests the 'in-between-government' effect at the quarterly level while column 4 includes a dummy equaling one in those election years with a government transition.[51] Both interactions are insignificant.

With a new government typically comes a new minister but rotations in ministerial positions also occur in non-election years. A change in ministerial leadership affects the agency directly by instilling uncertainty about the continuation in the strategic goals and the expenditure plans. Columns 5 and 6 consider this possibility by respectively including interactions between the last fiscal quarter dummy and the quarter or year of a change in the aid minister (Fuchs and Richert 2015).Thee interaction with the quarter of the aid minister change is highly significant in column 5. This effect is absent using the annual variable in column 6

Because omission of alternative sources of uncertainty would lead to omitted variable bias, column 7 includes all variables related to domestic uncertainty at the same time. Column 7 uses the quartely measures of election, minister change, and government change while column 8 uses the annual ones. The results confirm the findings of previous columns.

One reason for the general lack of an effect of politics on aid agencies' YESS relatively little, is variation in the institutional protection from political interference across countries. In countries with 'protected' aid agencies, the interaction between the last quarter dummy and a measure of institutional independence would be negative. Column 9 includes a time-invariant dummy for an independent aid agency as defined in Bertoli et al. (2008). Data for four countries are missing.[52] The interaction with last quarter dummy

[50] See Section 2.5.5 for a discussion of the quality of trust fund aid in general and relative to alternative aid channels.

[51] A government change is defined as a change in government ideology (Beck et al. 2001, own extension to 2013).

[52] The coding by Bertoli et al. (2008) is based on OECD (2009) and no information for the Czech Republic, Island, Poland, and the Slovak Republic are available.

has the expected significantly negative coefficient while the main result for bureaucratic quality is preserved.

In sum, year-end trust fund contributions do not appear to be systematically and robustly related to uncertainty in domestic politics on average. There is some evidence that this lack of a result for the average donor country might be associated with different degrees of institutional independence.

Uncertainty and Macroeconomic Factors

In the wake of financial and economic crises and, more generally, in periods of economic uncertainty, tax revenues and the costs of lending at financial markets are less predictable. This uncertainty on the revenue side of the budget might instill uncertainty on the expenditure side.

Column 1 of Table 2.15 includes an indicator marking the start of a sovereign, banking or currency crisis (Valencia and Laeven 2012) and its interaction with the last fiscal quarter dummy. As expected, the interaction is significantly negative.

During crisis times, budgeting is further complicated by particularly imprecise projections about macroeconomic factors such as inflation that affect the cost of input goods and services bought by the government.[53] This relationship is tested by including the deviation from projected government spending, measured as the difference between projected and realized values (OECD 2016b), and its interaction with the last quarter dummy. A positive interaction would imply that YESS increases with the projection error. Column 2 shows the results for the deviation between the realized value and the last projected value available at least two months before a donor's budget year starts.[54] The interaction is insignificant.

The last column includes all variables related to economic uncertainty simultaneously. The results of previous columns are confirmed.

[53] I thank Jan-Egbert Sturm for suggesting this channel.

[54] The OECD Economic Outlook reports projections biannually in June and November. For donors with fiscal years starting on July 1, I thus use the December projection of the previous calendar year (see variable definition in Table A.1 in the Appendix to this Chapter). Results are robust to calculating the deviation from the most recent projection available prior to the start of the budget year (i.e., the June one in the exemplifying case) or any of the two-year forward projections.

Table 2.15: Uncertainty and Macroeconomics

	(1)	(2)	(3)
Last fiscal quarter	7.355***	6.753**	6.931***
	(2.446)	(2.446)	(2.410)
Last fiscal quarter	-1.695**	-1.547**	-1.566**
* bureaucratic quality	(0.617)	(0.618)	(0.605)
Bureaucratic quality	-0.339	0.0269	0.0326
	(0.395)	(0.397)	(0.405)
Last fiscal quarter	-1.627*		-1.808*
* economic crisis	(0.933)		(0.994)
Economic crisis	0.261		0.417
	(0.718)		(0.696)
Last fiscal quarter		0.0635	0.0646
* Deviation from projected		(0.0805)	(0.0804)
government net lending			
Deviation from projected		-0.118*	-0.119*
government net lending		(0.0649)	(0.0646)
Fiscal year FE	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes
Adjusted R-squared	0.710	0.690	0.690
N° of observations	1296	1198	1198
N° of donors	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Uncertainty and Fiscal, Political, and Macroeconomic Factors

To minimize potential omitted variable bias, Table 2.16 includes the potentially relevant fiscal, political, and macroeconomic factors of uncertainty simultaneously. This is analogous to Altonji et al.'s (2005) approach of assessing the importance of potentially omitted variables. The idea is to approximate how large a bias there would need to be in order to make the interaction of interest indistinguishable from zero. Specifically, one assesses the importance of the impact that unobserved variables would need to have on the interaction relative to the impact of observable variables.

The first two columns of Table 2.16 include almost all previously identified covariates. Specifically, they include all indicators of uncertainty, the demand shocks, and the potential omitted variables that interacted significantly with the last quarter dummy in Table 2.10, i.e., GDP per capita.[55] The quarterly and annual indicators for politics are included in columns 1 and 2 respectively. Because of the high collinearity between the size of annual trust fund contributions and a donor's aid budget, I include (logged and lagged) ODA, which is slightly less endogenous to the dependent variable.

Column 3 is more parsimonious and my preferred specification. I apply Altonji et al.'s (2005) approach by including all variables that interacted significantly with the last quarter dummy in the respective baseline specification. Thus, (logged and lagged) annual trust fund contributions rather than ODA is included. Arguably, column 3 might thus be closest to the 'true' model.

The interaction between the last quarter dummy and the ICRG bureaucratic quality variable remains significantly negative in all three columns of Table 2.16. Regarding the measures of uncertainty, their level and their interaction with the last quarter dummy are mostly insignificant as in the previous regressions. There is persistent evience that unexpected demand shocks negatively affect YESS: the interaction with the number of disaster-affected people is highly significant in all columns. The previous result that higher capita income is associated with lower YESS reemerges in column 3 while the result of the quarterly change in the aid minister is not confirmed.

Overall, the evidence for YESS and the mitigating effect of bureaucratic quality is confirmed. Following Altonji et al.'s (2005) approach, I did not find evidence for substantial omitted variable bias.

[55] I do not include the independent aid agency dummy tested in Table 2.14 because it is available only for a limited number of countries.

Table 2.16: Robustness of bureaucratic quality to the inclusion of all covariates

	(1)	(2)	(3)
Last fiscal quarter	45.60	46.91*	66.07***
	(26.87)	(27.20)	(19.76)
Last fiscal quarter	-1.029*	-1.134*	-0.877*
* bureaucratic quality	(0.551)	(0.579)	(0.491)
Bureaucratic quality	-0.686	-0.784*	-0.760*
	(0.457)	(0.402)	(0.388)
Last fiscal quarter	-1.324	-1.474	-1.186
* economic crisis	(1.013)	(1.012)	(0.960)
Economic crisis	0.409	0.458	0.338
	(0.620)	(0.586)	(0.643)
Last fiscal quarter	0.0832	0.0853	
* Deviation from projected government net lending	(0.0838)	(0.0888)	
Deviation from	-0.0907	-0.0870	
projected government net lending	(0.0615)	(0.0604)	
Last fiscal quarter	-2.878		-1.724
* quarter of aid minister change	(2.365)		(1.050)
Aid minister change	1.485		0.926
	(1.026)		(0.973)
Last fiscal quarter	-0.994		
* government change	(1.921)		
Government change	1.056		
	(1.013)		
Last fiscal quarter	2.500		
* election quarter	(1.537)		
Election quarter	-0.678		
	(0.653)		
Last fiscal quarter*	-0.243	-0.194	
late budget	(0.153)	(0.146)	
Late budget	-0.00713	-0.00517	
	(0.0508)	(0.0459)	
Last fiscal quarter*	-0.0399	-0.0505	
aid (ln)	(0.347)	(0.350)	

Table 2.16: (continues on next page)

Table 2.16: (continued)

	(1)	(2)	(3)
Total aid (ln)	1.724**	1.606*	
	(0.798)	(0.808)	
Last fiscal quarter*	0.685	0.654	
battle deaths (ln)	(0.831)	(0.848)	
Last fiscal quarter*	0.116	0.0924	
asylum seekers (ln)	(0.322)	(0.334)	
Asylum seekers (ln)	0.274	0.320	
	(0.216)	(0.213)	
Last fiscal quarter*	-1.409**	-1.401**	-1.848***
disaster affected (ln)	(0.668)	(0.649)	(0.575)
Last fiscal quarter	-1.967	-1.983	-2.587**
* GDP p.c. (ln)	(1.210)	(1.232)	(1.127)
GDP p.c. (ln)	4.323	5.278	6.635*
	(3.623)	(3.707)	(3.414)
Last fiscal quarter		-1.970	
* year of aid minister change		(1.571)	
Year of aid minister		1.174**	
change		(0.521)	
Last fiscal quarter		-0.387	
* year of government change		(0.588)	
Year of government		0.634*	
change		(0.354)	
Last fiscal quarter		0.187	
* election year		(0.641)	
Election year		-0.265	
		(0.240)	

Table 2.16: (continues on next page)

Table 2.16: (continued)

	(1)	(2)	(3)
Yearly contributions			0.0603
(ln)			(0.0929)
Last fiscal quarter*			0.0552
yearly contributions (ln)			(0.0432)
Donor FE	Yes	Yes	Yes
Fiscal year FE	Yes	Yes	Yes
Adjusted R-squared	0.695	0.694	0.714
N° of observations	1170	1170	1268
N° of donors	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2.5.5 Interpretation of the Evidence and Limits of the Analysis

The following subsections discuss the interpretation of the econometric findings on uncertainty , provide qualitative evidence on the three explanations for YESS , hint at further explanations for YESS that cannot be tested with the available data, and discuss concerns about the dataset used and the external validity of findings.The last subsection provides descriptive evidence that year-end spending is qualitatively different although not necessarily less efficient.

Discussion of the Evidence for the Relationship Between Uncertainty and YESS

Using measures of fiscal, political and macroeconomic uncertainty, I aimed to test the two main theories in the literature about year-end spending surges. There are a number of potential reasons why I do not find systematic support for either hypothesis.

First, two types of bureaucrats might work in a government agency: procrastinating and saving bureaucrats. The analyzed data are the aggregated result of the individual bureaucrat's behavior. Their behaviors could counteract each another, leading to a null effect on average.

Second, the level of precautionary savings may not be optimal for the empirically observed levels of uncertainty. In particular, the level of savings might be too high in some

years but too low in other years and this may vary across countries. Non-optimality of precautionary savings would make it impossible to detect a relationship with uncertainty.

Third, the proposed measures for uncertainty and for demand shocks may be inadequate or too few, although the Altonji et al. (2005)-inspired test suggests that no important covariates are missing.[56]

Finally, the data cover a specific discretionary budget item within the aid budget and might therefore be too narrow to investigate the competing hypotheses about the relationship between uncertainty and YESS.[57]

Qualitative Evidence About the Reasons for YESS

During the spring and summer of 2016, I talked to more than a dozen people with budget responsibility in private companies, government administration, international organizations, and universities about their experiences and explanations for YESS. Budget holders at various type of organizations generally find the bureaucracy explanation and precautionary savings argument convincing. They note that they often face uncertainty about spending demands, the timing of expenditures, and even the budget size. In the context of bilateral aid budgeting, a major issue is delays in high-level officials in donor countries signing contracts with recipient governments. Staff at aid agencies suggested to me that in such cases trust funds are created at the end of the budget year.

In contrast, budget holders find the procrastination hypothesis less convincing although procrastinating co-workers exist of course. Interviewees repeatedly remarked that managers observe the performance of their staff throughout the year and that the quality, and not only the amount of expenditures, matters. It was also proposed that workers might procrastinate on some particularly painstaking or boring tasks until the year-end.[58] This may explain YESS if these tasks are systematically associated with financially significant amounts.

[56] Uncertainty prior to events might differ from ex-post measures. Moreover, the proposed variables might not be specific enough as in the case of close elections, where no ex-ante measures of closeness are available.

[57] As trust fund aid is only one among probably multiple discretionary items in the aid budget, demand shocks would thus not necessarily affect the trust fund budget. As demand shocks are unlikely to affect trust fund spending, the trust fund budget represents an ideal store for "emergency" funds. YESS in trust fund contributions would thus only be observed in years without demand shocks (i.e., precautionary savings were not used or procrastinating bureaucrats were not presented with opportunities to easily spend funds earlier).

[58] I thank Stephen Knack for suggesting this interpretation of procrastination.

Alternative Explanations for YESS

Alternative explanations exist. The two following arguments are not fully developed and seem difficult to test empirically. Moreover, they seem to be relevant explanations for YESS in some situations only.

A first alternative explanation is that in some organizational units learning about the size of the remaining budget is costly in terms of time, effort and money, mostly due to opportunity costs. In these situations, it is optimal to collect information about the lapsing funds only as the fiscal year draws to a close. If the agents learns that sizeable funds are still available, this results in heightened spending at the end of the year.[59] An example for such a situation is an invididual professor's budget for himself and his PhD students at a German university. This is different in larger organizations: Information about the remaining budget is regularly provided to project managers. For example, the German implementing aid agency reports at least monthly to the project team whether their spending targets are reached. Testing this alternative explanation for YESS would require information about the (different types of) costs associated with up-to-date information about remaining funds.

A second alternative explanation for YESS is revenue maximization. The treasury or budget holders may seek to maximize income from interest by disbursing funds as late as possible.[60] As the relevant interest rate is unclear, this explanation is not tested in this Chapter.

Finally, a trust fund-specific explanations has been suggested to me: If the majority of trust fund contributions are determined in a meeting in the donor's aid agency in the end of the donor-specific FY, this would also result in a YESS. It seems however that contribution decisions are taken in a decentralized manner according to the OECD (2012) report and anecdotal evidence on the decision-making processes in donor agencies.

Discussion of the External Validity of the Findings

In this subsection, I will discuss three important aspects regarding the external validity of the findings in this Chapter.

First, readers might be concerned about both the importance of the fund aid relative to donors' aid budgets and about the representativeness of the data. Regarding the first concern, it is important to note that although trust fund aid might be a small fraction of a donor's aid budget, it is a much larger fraction of the discretionary part of the aid budget

[59] I thank Christoph Vanberg for suggesting this alternative explanation for YESS.
[60] I thank Jan-Egbert Sturm for suggesting this additional explanation.

for which bulk spending is likely.[61] YESS are generally observed for capital or investment expenditures rather than operative or current expenditures. YESS are less likely to occur in demand-driven or pre-committed or regular expenditure categories such as wages paid to staff (Liebman and Mahoney 2017; Baumann 2015). A large chunk of multilateral core aid consists of mandatory membership contributions and of additional voluntary (unearmarked) funding committed in previous years. Similarly, much of bilateral aid is already programmed for multi-annual development projects. Finally, an important share of the agency's budget covers current expenditures such as wages.

Second, the use of a specific budget item within the foreign aid budget raises the issue of external validity. I am duly cautious about generalizing from my finding and, as for empirical results in general, cross-validation of the findings in this paper in other contexts is highly important. However, I do not think that there are systematic differences in bureaucrats' behaviors, bureaucratic effectiveness, or in pay, career, and other incentives between the foreign aid agency and other governments departments.

Finally, the anaylzed data are different than the common-sense understanding of 'spending'. While contributions to World Bank funds are spent in the accounting sense, there are not expenditures as commonly understood in the literature. Indeed, donor countries may view trust funds as 'saving accounts' although imperfect ones. This would raise problems if I was to analyze the efficiency of year-end spending. However, it matters much less for the analysis of YESS. Indeed, this type of spending might allow for a cleaner identification of YESS as there are no absorption constraints on the recipient side (i.e., the World Bank funds). For other types of spending, absorption constraints of implementing agencies risk leading to an underestimation of YESS.

Evidence for Differential Use of Trust Funds at the End of the Fiscal Year

Liebman and Mahoney (2017) are the first to show that year-end spending is less efficient than funds spent in the remainder of the fiscal year.[62]

As discussed in the previous subsection, contributions to World Bank funds differ from the common understanding of 'spending'. Trust fund aid might be just as efficient than spending in the rest of the fiscal year. While I provide evidence that year-end contributions to trust funds are qualitatively different, I do not claim that this affects the quality of subsequent disbursements by these funds. It is not possible to rigorously evaluate the

[61] Trust fund aid as share of donors' total disbursements ranges from 0.07 percent for the United States in 2013 to 12 percent for the United Kingdom in 2007. The average share in 2012 was 2.23 percent.
[62] Fichtner and Greene (2014) review the little evidence available elsewhere.

effectiveness of trust fund aid provided at different times during a fiscal year because no systematic information about the quality of this aid type is available.

Despite potentially substantial YESS, I do not expect (but cannot thoroughly test) that these contributions are substantially less efficient than contributions made at other times of the year. Financial resources kept in trust funds do not lapse so that disbursements can be undertaken whenever high-quality projects are on offer.[63] Year-end contributions to trust funds should thus be no less effective than contributions made at other times of donors' fiscal years. Furthermore, consider the alternatives. In the unlikely case of the lapsing funds being returned to the general treasury, the efficiency of trust fund aid and other aid would need to be compared to that of public resources used in other sectors in the next fiscal year. Year-end disbursements to NGOs or for studies written by consultants are probably those of lower priority and therefore likely to be less efficient than if requested at other times of the year. Regarding the effectiveness of trust fund aid relative to bilateral and multilateral aid, the literature has not yet provided hard evidence.[64] Given that a large chunk of trust fund aid provided to funds is ultimately implemented by the World Bank, it is reasonable not to expect significant differences in the effectiveness of 'pure' multilateral and trust fund aid.[65] Thus, any conclusion on efficiency needs to be a cautious and relative one.

Thus, there is no reason to expect year-end contributions to be less efficient than contributions made at other times during the fiscal year. One possibility is to benchmark the year-end spending to the spending pattern in the first three quarters of the fiscal year. Deviations from this spending pattern could be interpreted as inefficient or, less normatively, as different – leaving open the question of what explains the different spending pattern.[66]

First, I consider trust funds that are used once or twice in the sample period by any donor. Such contributions might be less efficient because these types of funds tend to be small with largely fixed set-up costs.[67] Table 2.17 shows that of the 445 trust funds that

[63]Some large FIFs have multi-annual budgets. In Tables A.11 and A.12, I thus focus only on contributions to IBRD/ IDA trust funds, where the timing of disbursements is not constrained.

[64]Eichenauer and Knack (2016) (Chapter 2 of this thesis) show that trust fund aid is less politically motivated than traditional bilateral aid than traditional bilateral aid. If politically motivated aid is less effective (e.g., Dreher et al. 2016), then trust fund aid might be more effective than bilateral aid on average. For evidence on multi-donor trust funds see Barakat (2009) and Barakat et al. (2012).

[65]This is true in particular for IBRD/ IDA and IFC trust funds and less so for FIFs.

[66]The transaction costs and the efficiency of trust funds are a discussion of their own (e.g., IEG 2011a; Reinsberg et al. 2015; Reinsberg 2016a).

[67]Smaller trust funds are likely to be less efficient because transaction costs are high in relative terms as reflected by management fees. Recent World Bank reforms have increased the minimum size of trust funds and have sought to dissolve small trust funds (no threshold until World Bank fiscal year (WBFY) 2007; US$ 1 million threshold effective from WBFY 2008 to 2013; US$ 2 million threshold since WBFY 2013).

received only one contribution in the sample period, more than 40 percent were used in donors' last FQ (row 1). Row 2 shows that contributions to trust funds that were used twice in the sample period by any donor were most frequent in the last quarter, although the percentage share is lower than in row 1. This data pattern might be driven by trust funds set up recently that have not had much time to receive additional contribution. Rows 3 and 4 test for this possibility by focusing on observations prior to the calendar year 2010. The percentage shares in rows 3 and 4 are similar to rows 1 and 2, respectively. Row 5 shows that donors made unique contributions to any given trust fund in every quarter but that single usage peaks in the last FQ.

Second, I analyze whether donors use different types of funds at the end of the year. Donors might prefer to contribute to single-donor trust funds that allow them to maintain control of the future allocation of funds chapter 3. If the purpose of a trust fund is to de-annualize a part of the donor budget, single-donor trust funds are the better "savings accounts" than multi-donor trust funds. Column 1 in Table 2.18 finds contributions to single-donor trust funds to more than double in the last FQ.[68]

Finally, I test whether whether donors use lapsing funds for debt-related issues, a hypothesis inspired by Michaelowa's (2003) finding.[69] Column 2 compares the last quarter usage of debt-related trust funds with contributions to all other funds. The interaction is significantly negative. This can be interpreted as evidence that donors consider debt relief an important issue and address it early in the fiscal year rather than with left-over funds at the year-end.

In sum, there is some evidence that the use of funds in the last quarter is different than in the other three fiscal quarters. The data does not allow to determine whether year-end contributions are less efficient than fund aid provided in other quarters, than other types of foreign aid, or than public funds spent through other government agencies in the donor country .

[68] In percentage: $100 * \left(e^{0.998} - 1\right) = 171.29$.

[69] Although general information about the sectors targeted by each trust fund is not available, in the case of debt it is relatively easy to identify the relevant trust funds through a keyword search of the trust fund names.

Table 2.17: Spending pattern within the fiscal year

		1^{st} quarter		2^{nd} quarter		3^{rd} quarter		4^{th} quarter		Total
(1)	N° of funds used only once	126	28%	65	15%	66	15%	188	42%	445
(2)	N° of funds used only twice	149	27%	85	15%	102	18%	216	37%	552
(3)	N° of funds used only once (< 2010)	100	30%	54	16%	44	13%	140	43%	338
(4)	N° of funds used only twice (< 2010)	120	30%	66	16%	72	18%	147	37%	405
(5)	N° of funds used only once by a given donor	293	30%	140	14%	135	14%	407	43%	975

Notes: Rows 1–4 shows the number (percentage) of funds used, as indicated in the row name, once or twice by *any* donor within the sample period (rows 1 & 2: 2002-2013; rows 3 & 4: 2002-2011).) Row shows the number (percentage) of funds used only once by a given donor within the sample period (2002-2013).

Table 2.18: Nested model for IDA/IBRD trust funds

	(1)	(2)
Last fiscal quarter	0.998***	1.108***
	(0.327)	(0.324)
Last fiscal quarter * single-donor TFs	0.894*	
	(0.493)	
SDTF	-6.076***	
	(0.743)	
Last fiscal quarter * debt trust funds		-0.964**
		(0.358)
Debt trust funds		-13.27***
		(1.096)
Constant	19.66***	15.76***
	(0.372)	(0.548)
Trust fund type	ALL vs. SDTF	ALL vs. DEBT
Donor-fiscal year FE	Yes	Yes
Adjusted R-squared	0.649	0.765
N° of observations	2592	2592
N° of donors	27	27

Notes: The dependent variables are (logged) contributions to the respective types of IDA/IBRD trust funds and cover the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2.6 Concluding Remarks

Above-average spending at the end of a budget period is common in private and public organizations. Academic research on the existence and the causes for YESS, the consequences for the quality of spending, and the institutional remedies for this dynamic inefficiency is still scarce. This Chapter contributes to the literature on subannual public spending in several ways.

This Chapter is the first to analyze YESS across countries. To assure comparability aross budgetary systems, I used accounting data on daily contributions from 27 OECD countries to World Bank funds during 2002-2013. Causal identification of YESS is achieved by exploiting variation in countries' fiscal years and the use of high-dimensional fixed effects. The results are robust to using different temporal definitions of the end of the fiscal year. As a new explanation for the size of spending spikes, I proposed bureaucratic quality. As a second contribution to the literature, this Chapter provided the first econometric analysis of the bureaucratic quality explanation and the two other theories for YESS proposed in the literature. I provided robust support for the mitigating role of bureaucratic quality on the size of year-end spending spikes. There is no conclusive evidence for the two alternative theories.

Quantitatively, I found spending to double in the last fiscal quarter. I show that bureaucratic capacity lowers YESS using a monthly indicator for bureaucratic quality. The finding is robust to using alternative measures of governance quality and to the inclusion of per capita income and other potential omitted variables. I also assessed whether the effect of bureaucratic quality conceals special budgetary institutions or policies. I did not find that changes in the accounting type or late budgets to affect year-end spending. Future research will need to examine different budgetary institutions and policies to open up the black box 'bureaucratic quality'.

While a higher level of bureaucratic quality reduces YESS, it does not fully explain above-average spending at the end of the fiscal year. The remaining YESS might be explained by one of the two explanations for YESS proposed in the literature: Precautionary savings (Liebman and Mahoney 2017) or procrastinating bureaucrats (Baumann 2015). Both accord an important role to uncertainty. In a first step, I established that unexpected exogenous demand shocks reduce YESS, which is predicted by both theories. Uncertainty seems to play a role in explaining the unexplained remainder of YESS: The demand shock mostly likely to be exogenous to the foreign aid budget, natural disasters in developing countries, reduces YESS substantially.

Regarding the relationship between the level of uncertainty and the size of YESS, the two theories make opposing predictions. In a second step, I thus analyzed the relationship

between YESS and uncertainty. I propose various political and macroeconomic indicators of uncertainty. Controlling for bureaucratic quality, I find no robust and conclusive evidence against the null hypothesis of no relationship between YESS and uncertainty. I discussed theoretical and empirical reasons why it does not follow that the two theories have no explanatory power.

Understanding the mechanism(s) for YESS is important to inform the choice of the policy to curb YESS and reduce dynamic inefficiencies in the (public) budget process. The results in this paper suggest that the extent of YESS and thus the associated inefficiency can be reduced by increasing bureaucratic capacity. As with all empirical findings, the question of external validity is important and the findings of this Chapter need to be validated in other contexts. Moreover, more (comparative) research about YESS and the effects of budgetary institutions is required to foster our understanding about the specific channels through which bureaucratic quality lowers YESS. Improved measures of uncertainty will allow to shed more light on the two alternative explanations for YESS.

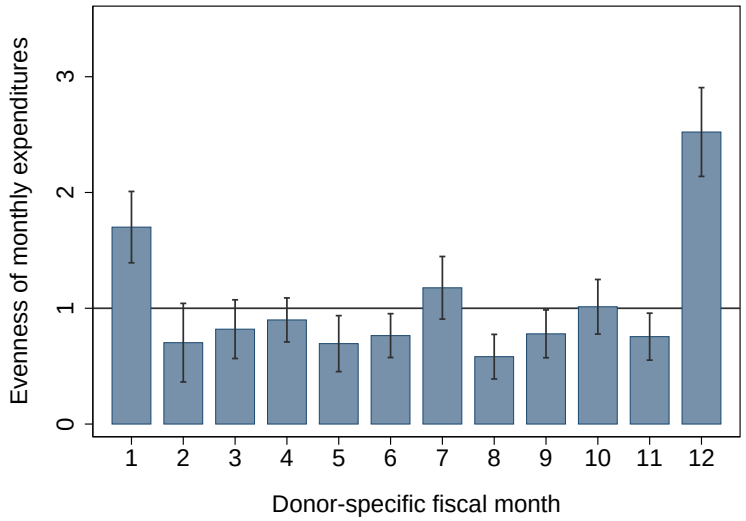
The limited understanding of the mechanisms behind YESS imply that the rules and procedures proposed to lower YESS must be critically assessed. They risk to create new costs and inefficencies.[70]

On a more aggregate level, future research might study the macroeconomic effects of YESS. Within a country, the fiscal year ends simultaneously for all public sector agencies (and often also for private firms). Because the public sector accounts for almost half of GDP in many OECD countries, YESS may contribute to the macroeconomic seasonality.

[70]Douglas and Franklin (2006) report the carry-over law increased paperwork in Oklahoma.

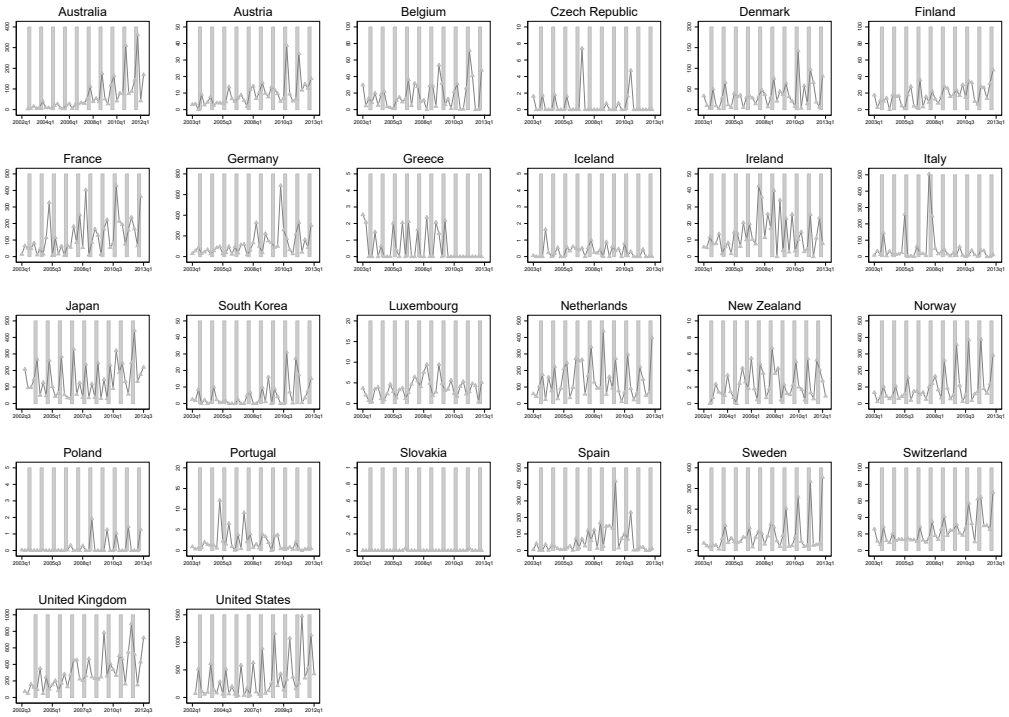
2.A Appendix: Figures and Tables for "December Fever in Public Finance"

Figure A.1: Fund contributions by donor-specific fiscal month



Notes: The y-scale shows shows the evenness of spending within the fiscal year and is defined as the actual monthly contributions divided by the average monthly contributions (i.e., annual fund contributions divided by 12). The vertical line at one represents even spending in the last fiscal quarter (i.e., one quarter of annual spending).

Figure A.2: Individual donors' contributions by donor-specific fiscal quarter



Notes: The grey-shared areas highlight changes in contributions between the third and the last fiscal quarter of donor-specific fiscal years.

Figure A.3: Extent of spending spike for the three largest donors

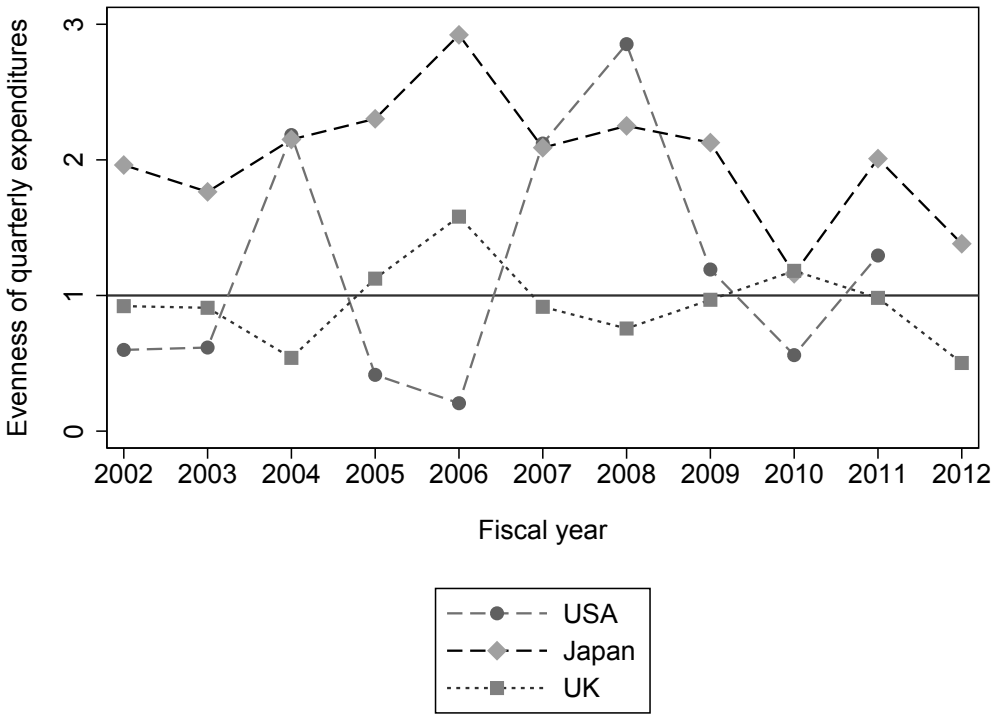


Table A.1: Sources and definitions

Variable	Definition	Original Source
Dependent Variables		
Quarterly fund contributions (ln)*	Quarterly transfers from a donor country to (a certain type of) World Bank funds (identified by PostingDate), logarithm.	World Bank (2013).
Monthly TF contributions (ln)*	Monthly transfers from a donor country to (a certain type of) World Bank funds, logarithm.	World Bank (2013).
Number of first contributions (ln)	Number of first transfers to a specific fund (identified by TrusteeFundName) by any donor in a fiscal quarter.	World Bank (2013).
Independent variables		
Monthly variables		
Last fiscal month	Binary variable indicating the last month in the fiscal year of the donor.	See Table 2.2: own coding.
Bureaucratic quality	Monthly score of Bureaucratic Quality.	International Country Risk Indicators by Howell (2011).
Quarterly variables		
Last fiscal quarter	Binary variable indicating the last quarter in the fiscal year of the donor.	Table 2.2: own coding.

Table A.1: (continues on next page)

Table A.1: (continued)

Variable	Definition	Original Source
End of IDA cycle	Binary variable equal to 1 for all donor countries in the final quarter of a replenishment cycle of the IDA. As the Bank's fiscal year runs from July 1 to June 30 and the IDA budget is replenished for a three-year period, the end period of IDA12-IDA16 fall in our sample period. They respectively ended on June 30 in the years 2002, 2005, 2008, and 2011.	Own coding based on World Bank (2016a); Tenney and Salda (2013); World Bank (2003).
Bureaucratic quality	Quarterly mean of the monthly scores of bureaucratic quality.	International Country Risk Indicators by Howell (2011).
G8 participant	Binary variable that takes the value of one for G8 members in quarters a G8 meeting is held.	G7/8 Information Centre.
Late budget	Number of months the annual budget is appropriated late. Early and on-schedule budget approvals are coded as zero.	Own coding based on internet research (sources available upon request).
Election quarter	Binary variable equal to 1 in the election quarter. Legislative elections are used for parliamentary and presidential systems because budget authority is always held by parliaments. In the United States of America (US) case, biannual legislative elections to the House of Representatives take place biannually.	Beck et al. (2001), own update for 2013.

Table A.1: (continues on next page)

Table A.1: (continued)

Variable	**Definition**	**Original Source**
Government change	Binary variable equal to 1 in the quarter between a lost election and the inauguration of the new government.An election is lost if the party of the Chief Executive changes as consequence of the election. Elections are all legislative elections.	Beck et al. (2001), own update for 2013. Own coding of inauguration date based on internet research (sources available on request).
Aid minister change	Binary variable equal to 1 in the quarter the minister responsible for the aid budget changes.	Fuchs and Richert (2015).
Annual variables		
Government effectiveness	Governance indicator measuring "the capacity of the governments to effectively formulate and implement sound policies."	World Governance Indicators (Kaufmann et al. 2011).
Regulatory quality	Governance indicator measuring "perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development."	World Governance Indicators (Kaufmann et al. 2011).
Avg. WGI score	Average of the six World Governance Indicators (Control of Corruption; Government Effectiveness; Law and Order; Political Stability; Regulatory quality; Voice and Accountability).	World Governance Indicators (Kaufmann et al. 2011).

Table A.1: (continues on next page)

Table A.1: (continued)

Variable	Definition	Original Source
Control of corruption, WGI	Governance indicator capturing "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests."	World Governance Indicators (Kaufmann et al. 2011).
GDP p.c.*	Gross Domestic Product per head in constant US$, fixed PPPs, seasonally adjusted, expenditure approach [HVPVOBARSA]*	OECD (2016a)
Primary balance (% of GDP)	Cyclically adjusted primary balance as share of GDP	IMF (2015).
Total aid (ln)*	Official Development Assistance disbursements by donor country, lagged by one fiscal year, logarithm	OECD (2015) via OECD Wizard.
Yearly contributions (ln)*	Sum of total fund contributions by a donor within a donor's fiscal year, lagged by one fiscal year, logarithm	World Bank (2013).
IMF transparency	Score for the comprehensiveness of government finance statistics, available since 2003	Wang et al. (2015).
Economic crisis	Binary variable equal to 1 in years countries are affected by a banking, sovereign or currency crisis	Valencia and Laeven (2012).
Deviation from projected government net lending	Difference between the projected government net lending as a percentage of GDP [NLGQ] as available at least two full months before the beginning of the donor's fiscal year and realized values as reported in November 2014.	OECD (2016b).

Table A.1: (continues on next page)

Table A.1: (continued)

Variable	Definition	Original Source
Accounting system	Binary indicator equal to 1 if the federal government uses accrual accounting systems and 0 for cash accounting systems and years of transition. Countries using accrual accounting in all sample years: Australia, Canada, Denmark, Spain, Finland, Iceland, New Zealand, Sweden, United States.Âă Countries using cash accounting in all sample years: Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway. First year of full accrual accounting for switching countries: Austria (2013), Czech Republic (2010), France (2006), Poland (2010), Republic of Korea (2006), Switzerland (2007), United Kingdom (2004), Slovak Republic (2010). No country switched from cash to accrual accounting during the sample period. I was unable to determine the accounting system for the following country-years: Finland (2001), Japan (2006-2013).	Own coding based on OECD (2003; 2004; 2005; 2013); confirmed through correspondence with accounting experts in different countries.
Total affected (ln)	Total number of people affected by natural disasters, logarithm	EM-DAT: The OFDA/CRED International Disaster Database by Guha-Sapir et al. (2015).

Table A.1: (continues on next page)

Table A.1: (continued)

Variable	**Definition**	**Original Source**
Aylum seekers (ln)	Number of asylum seekers per donor country, logarithm	OECD International Migration Statistics.
Battle deaths (ln)	Number of battle deaths [VC.BTL.DETH]	World Bank (2016c).
Independent aid agency	Binary variable based on the classification of the four organizational models of bilateral aid provision, one-year lag. Independent aid agency as defined in Fuchs et al. (2014) and combines the management models 3 and 4. Model 1: Development co-operation is an integral part of the ministry of foreign affairs, which is responsible for policy and implementation. Model 2: A Development Co-operation Directorate has the lead role within the ministry of foreign affairs and is responsible for policy and implementation. Model 3: A ministry has overall responsibility for policy and a separate executing agency is responsible for implementation. Model 4: A ministry or agency, which is not the ministry of foreign affairs, is responsible for both policy and implementation.	Definition from Fuchs et al. (2014); Classification from OECD (2009).

Table A.1: (continues on next page)

Table A.1: (continued)

Variable	Definition	Original Source
IDA replenishment year	Binary variable equal to 1 for all donor countries in the World Bank's fiscal year of replenishment of the IDA. As the Bank's fiscal year runs from July 1 to June 30 and the IDA budget is replenished for a three-year period, the end period of IDA12-IDA16 fall in our sample period. They respectively ended on June 30 in the calendar years 2002, 2005, 2008, and 2011.	Own coding based on World Bank (2016a); Tenney and Salda (2013); World Bank (2003).
Election year	Binary variable equal to 1 in the election year. Legislative elections are used for parliamentary and presidential systems because budget authority is always held by parliaments. In the US case, biannual legislative elections to the House of Representatives take place biannually.	Beck et al. (2001), own update for 2013.
Year of government change	Binary variable equal to 1 in the year between a lost election and the inauguration of the new government. An election is lost if the party of the Chief Executive changes as consequence of the election. Elections are all legislative elections.	Beck et al. (2001), own update for 2013. Own coding of inauguration date based on internet research (sources available upon request).
Year of aid minister change	Binary variable equal to 1 in the year the minister responsible for the aid budget changes.	Fuchs and Richert (2015)

Table A.2: Excluding one donor at the time I, quarterly level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Last fiscal quarter	6.566**	6.605**	6.872**	6.674**	6.713**	6.141*	6.609**	6.836**	7.150**	6.750**
	(2.853)	(2.855)	(2.861)	(2.861)	(2.862)	(3.049)	(2.856)	(2.863)	(3.059)	(2.863)
Last fiscal quarter	-1.501**	-1.514**	-1.605**	-1.538**	-1.551**	-1.409*	-1.515**	-1.593**	-1.655**	-1.564**
* bureaucratic quality	(0.722)	(0.724)	(0.724)	(0.725)	(0.726)	(0.769)	(0.724)	(0.725)	(0.774)	(0.726)
Bureaucratic quality	1.865***	1.865***	1.862***	1.864***	1.864***	1.815***	1.865***	1.863***	2.207***	1.864***
	(0.238)	(0.238)	(0.239)	(0.238)	(0.238)	(0.256)	(0.238)	(0.239)	(9.09e-11)	(0.238)
Donor	AUS	AUT	BEL	CAN	CHE	CZE	DEU	DNK	ESP	FIN
Donor-fiscal year FE	No	No	No	No	No	No	No	No	No	No
Adjusted R-squared	0.715	0.720	0.723	0.710	0.712	0.706	0.710	0.712	0.717	0.713
N° of observations	1248	1248	1248	1248	1248	1248	1248	1248	1248	1248
N° of donors	26	26	26	26	26	26	26	26	26	26

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Each column excludes the donor country mentioned below the table. ed effects. The acronyms refer to Australia (AUS), Austria (AUT), Belgium (BEL), Canada (CAN), Czech Republic (CZE), Germany (DEU), Denmark (DNK), Spain (ESP), and Finland (FIN). Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.3: Excluding one donor at the time II, quarterly level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Last fiscal quarter	6.750**	7.400**	6.634**	7.081**	6.790**	6.540**	7.637**	6.833**	5.388*
	(2.863)	(3.079)	(2.858)	(3.145)	(2.864)	(2.848)	(3.568)	(2.863)	(2.623)
Last fiscal quarter	-1.564**	-1.720**	-1.524**	-1.641**	-1.577**	-1.492**	-1.789*	-1.592**	-1.223*
* bureaucratic quality	(0.726)	(0.779)	(0.725)	(0.794)	(0.726)	(0.721)	(0.904)	(0.725)	(0.665)
Bureaucratic quality	1.864***	1.924***	1.865***	1.896***	1.863***	1.866***	1.934***	1.863***	1.751***
	(0.238)	(0.256)	(0.238)	(0.263)	(0.239)	(0.238)	(0.293)	(0.239)	(0.219)
Donor	FIN	FRA	GBR	GRC	IRL	ISL	ITA	JPN	KOR
Donor-fiscal year FE	No	No	No	No	No	No	No	No	No
Adjusted R-squared	0.713	0.711	0.707	0.721	0.724	0.727	0.723	0.709	0.739
N° of observations	1248	1248	1248	1248	1248	1248	1248	1248	1248
N° of donors	26	26	26	26	26	26	26	26	26

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Each column excludes the donor country mentioned below the table. ed effects. The acronyms refer to Finland (FIN), France (FRA), Great Britain (GBR), Greece (GRC), Ireland (IRL), Island (ISL), Italy (ITA), Japan (JPN), and Korea (KOR). Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.4: Excluding one donor at the time III, quarterly level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Last fiscal quarter	6.391**	6.833**	6.826**	6.695**	5.123**	7.274**	7.346**	6.829**	6.688**
	(2.823)	(2.863)	(2.863)	(2.863)	(2.369)	(3.111)	(3.094)	(2.863)	(2.861)
Last fiscal quarter	-1.441*	-1.592**	-1.590**	-1.545**	-1.157*	-1.689**	-1.707**	-1.591**	-1.543**
* bureaucratic quality	(0.710)	(0.725)	(0.725)	(0.726)	(0.603)	(0.786)	(0.782)	(0.725)	(0.725)
Bureaucratic quality	1.867***	1.863***	1.863***	1.864***	1.728***	1.913***	1.919***	1.863***	1.864***
	(0.237)	(0.239)	(0.239)	(0.238)	(0.197)	(0.260)	(0.258)	(0.239)	(0.238)
Donor	LUX	NLD	NOR	NZL	POL	PRT	SVK	SWE	USA
Donor-fiscal year FE	No	No	No	No	No	No	No	No	No
Adjusted R-squared	0.717	0.709	0.710	0.725	0.703	0.721	0.656	0.711	0.707
N° of observations	1248	1248	1248	1248	1248	1248	1248	1248	1248
N° of donors	26	26	26	26	26	26	26	26	26

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Each column excludes the donor country mentioned below the table. ed effects. The acronyms refer to Luxembourg (LUX), Netherlands (NLD), Norway (NOR), New Zealand (NZL), Poland (POL), Portugal (PRT), the Slovak Republik (SVK), Sweden (SWE), and the United States of America (USA). Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: The effect of lagged bureaucratic quality on year-end contributions

	(1)	(2)	(3)	(4)	(5)	(6)
Last fiscal quarter	7.235***	7.293***	7.388***	6.847**	7.871**	6.490**
	(2.476)	(2.513)	(2.533)	(2.899)	(3.626)	(3.112)
Last fiscal quarter	-1.694**	-1.703**	-1.726**	-1.584**	-1.733*	-1.576*
* bureaucratic quality (lagged)	(0.628)	(0.637)	(0.642)	(0.734)	(0.920)	(0.793)
Bureaucratic quality	6.430**	6.490**	0.147	1.121*	2.325***	0.0320
(lagged)	(2.404)	(2.405)	(0.506)	(0.603)	(0.233)	(0.465)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	No	No
Adjusted R-squared	0.231	0.236	0.710	0.714	0.722	0.712
N° of observations	1296	1296	1296	1296	584	712
N° of donors	27	27	27	27	27	27
Notes					> 2007	≤ 2007

Notes: The dependent variable is (logged) quarterly contributions to all funds to funds the World Bank's fiscal years 2002-2013. The quarterly mean of the ICRG bureaucratic quality is lagged by one year. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: The effect of the binary ICRG bureaucratic quality indicator on year-end contributions

	(1)	(2)	(3)	(4)	(5)	(6)
Last fiscal quarter	2.294***	2.315***	2.339***	2.211***	1.910**	2.798**
	(0.659)	(0.668)	(0.674)	(0.781)	(0.774)	(1.036)
Last fiscal quarter	-1.868**	-1.878**	-1.887**	-1.729**	-1.778**	-1.871*
* bureaucratic quality dummy	(0.685)	(0.693)	(0.699)	(0.810)	(0.815)	(1.075)
Binary bureaucratic	7.347***	7.384***	-0.287	1.914***	-0.412	2.357***
quality	(2.276)	(2.274)	(0.392)	(0.260)	(0.351)	(0.270)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	No	No
Adjusted R-squared	0.266	0.270	0.710	0.714	0.713	0.722
N° of observations	1296	1296	1296	1296	712	584
N° of donors	27	27	27	27	27	27
Notes					≤ 2007	> 2007

Notes: The dependent variable is (logged) quarterly contributions to all funds to funds the World Bank's fiscal years 2002-2013. The bureaucratic quality dummy is one for country-year observations above the sample mean of the ICRG bureaucratic quality variable. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: The effect of the yearly average of the bureaucratic quality variable on year-end contributions

	(1)	(2)	(3)	(4)	(5)	(6)
Last fiscal quarter	6.959***	6.990***	7.292***	6.749**	7.871**	6.380**
	(2.465)	(2.498)	(2.507)	(2.874)	(3.626)	(3.042)
Last fiscal quarter	-1.623**	-1.628**	-1.702**	-1.560**	-1.733*	-1.549*
* yearly bureaucatic quality	(0.625)	(0.633)	(0.635)	(0.728)	(0.920)	(0.775)
Yearly bureaucratic	6.284**	6.318**	-0.516	32.39***	2.325***	-0.765*
quality	(2.406)	(2.413)	(0.424)	(0.632)	(0.233)	(0.403)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	No	No
Adjusted R-squared	0.223	0.227	0.710	0.714	0.722	0.712
N° of observations	1296	1296	1296	1296	584	712
N° of donors	27	27	27	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds to funds and covers the World Bank's fiscal years 2002-2013. The yearly bureaucratic quality variable is the average of the monthly ICRG bureaucratic quality within a donors' fiscal year. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: The effect of bureaucratic quality on contributions in the last fiscal month

	(1)	(2)	(3)	(4)	(5)
Last fiscal month	9.113***	9.215***	9.218***	8.856***	8.930***
	(2.923)	(2.929)	(2.937)	(3.090)	(3.087)
Last fiscal month	-1.676*	-1.691*	-1.687*	-1.588*	-1.614*
* bureaucratic quality	(0.847)	(0.848)	(0.849)	(0.890)	(0.888)
Bureaucratic quality	6.267***	6.320***	-2.195***	5.479***	5.479***
	(2.049)	(2.050)	(0.368)	(0.0693)	(0.0694)
Fiscal year FE	No	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	Yes
Calendar year FE	No	No	No	No	Yes
Adjusted R-squared	0.183	0.193	0.514	0.526	0.525
N° of observations	3879	3879	3879	3879	3879
N° of donors	27	27	27	27	27

Notes: The dependent variable is (logged) monthly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Alternative governance measures at the quarterly level I

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Last fiscal quarter	3.336***	3.232***	3.119**	3.928***	3.869**	3.825**	3.512***	3.468***	3.364**
	(1.073)	(1.074)	(1.261)	(1.366)	(1.393)	(1.701)	(1.150)	(1.172)	(1.403)
Last fiscal quarter	-1.549**	-1.476**	-1.406*						
* government effectiveness	(0.612)	(0.609)	(0.716)						
Government	7.171***	0.370							
effectiveness	(2.058)	(1.066)							
Last fiscal quarter				-2.113**	-2.055**	-2.018*			
* regulatory quality				(0.863)	(0.883)	(1.082)			
Regulatory quality				9.358***	3.871***				
				(2.338)	(1.372)				
Last fiscal quarter							-1.880**	-1.835**	-1.761*
* Avg. WGI score							(0.739)	(0.755)	(0.906)
Avg. WGI score							7.994***	5.284**	
							(2.247)	(2.240)	
Fiscal year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Donor FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Donor-fiscal year FE	No	No	Yes	No	No	Yes	No	No	Yes
Adjusted R-squared	0.287	0.711	0.717	0.245	0.715	0.717	0.259	0.715	0.717
N° of observations	1242	1242	1242	1242	1242	1242	1242	1242	1242
N° of donors	27	27	27	27	27	27	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Government effectiveness and regulatory quality are annual variables from the World Governance Indicators (WGI) (Kaufmann et al. 2011). Avg. WGI score is the annual averageof all six WGI indicators. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: Alternative governance measures at the quarterly level II

	(1)	(2)	(3)
Last fiscal quarter	3.839**	2.490**	1.881*
	(1.554)	(0.993)	(1.045)
Last fiscal quarter	-0.672*		
* corruption, ICRG	(0.329)		
Last fiscal quarter		-0.990*	
* control of corruption, WGI		(0.528)	
Last fiscal quarter			-0.0131
* IMF transparency			(0.0148)
Fiscal year FE	Yes	Yes	Yes
Donor FE	Yes	Yes	Yes
Donor-fiscal year FE	Yes	Yes	Yes
Adjusted R-squared	0.714	0.717	0.719
N° of observations	1296	1242	1134
N° of donors	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Column 1 includes the quarterly average of the monthly ICRG corruption variables, column 2 the WGI control of corruption measure, column 3 the IMF fiscal transparency index (Valencia and Laeven 2012) and column 4 and 5 the open budget index, with interpolated values in column 5. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.11: Last fiscal quarter effect for IBRD/IDA trust funds

	(1)	(2)	(3)	(4)	(5)	(6)
Last fiscal quarter	1.663***	1.653***	1.717***	1.679***	1.618***	3.152**
	(0.372)	(0.391)	(0.438)	(0.423)	(0.443)	(1.356)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	Yes	Yes	Yes	Yes
Donor-calendar year FE	No	No	No	No	Yes	Yes
Calendar year FE	No	No	No	Yes	Yes	Yes
Calendar quarter FE	No	No	No	No	No	Yes
Adjusted R-squared	0.00909	0.0154	0.636	0.634	0.629	0.635
N° of observations	1296	1296	1296	1296	1296	1296
N° of donors	27	27	27	27	27	27

Notes: The dependent variable is (logged) quarterly contributions to IBRD/IDA trust funds and covers the World Bank's fiscal years 2002-2013.Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.12: Last fiscal month effect for IBRD/IDA trust funds

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Last fiscal month	3.133***	3.166***	3.205***	3.179***	3.137***	2.955***	3.389***
	(0.598)	(0.618)	(0.625)	(0.613)	(0.619)	(0.717)	(1.208)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	Yes	Yes	Yes	Yes	Yes
Calendar year FE	No	No	No	Yes	Yes	Yes	Yes
Donor-calendar year FE	No	No	No	No	Yes	Yes	Yes
Calendar quarter FE	No	No	No	No	No	Yes	Yes
Month FE	No	No	No	No	No	No	Yes
Adjusted R-squared	0.0130	0.0188	0.516	0.515	0.515	0.517	0.519
N° of observations	3874	3874	3874	3874	3874	3874	3874
N° of donors	27	27	27	27	27	27	27

Notes: The dependent variable is (logged) monthly contributions to IBRD/IDA trust funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.13: The effect of bureaucratic quality on contributions in the last quarter for IBRD/IDA trust funds

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Last fiscal quarter	4.806*	4.840*	4.809*	4.154	2.367	7.355	5.740	5.299**
	(2.635)	(2.643)	(2.674)	(3.146)	(3.056)	(4.870)	(3.372)	(2.109)
Last fiscal quarter	-0.861	-0.858	-0.847	-0.667	-0.279	-1.412	-1.039	-1.019*
* bureaucratic quality	(0.710)	(0.711)	(0.718)	(0.840)	(0.854)	(1.240)	(0.872)	(0.575)
Bureaucratic quality	6.854***	6.913***	-8.826***	-1.071***	-8.358***	4.468***	-8.793***	-8.824***
	(2.340)	(2.348)	(0.454)	(0.245)	(0.478)	(0.334)	(0.507)	(1.554)
Fiscal year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	No	No	No	No
Adjusted R-squared	0.221	0.233	0.625	0.636	0.623	0.647	0.435	0.635
N° of observations	1296	1296	1296	1296	712	584	1056	1200
N° of donors	27	27	27	27	27	27	22	
Notes					≤ 2007	> 2007	5 minor	WB year

Notes: The dependent variable is (logged) quarterly contributions to IBRD/IDA trust funds the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.14: The effect of bureaucratic quality on contributions in the last fiscal month for IBRD/IDA trust funds

	(1)	(2)	(3)	(4)	(5)
Last fiscal month	4.766	4.908	4.845	4.472	4.590
	(4.307)	(4.300)	(4.310)	(4.465)	(4.445)
Last fiscal month	-0.446	-0.467	-0.450	-0.346	-0.386
* bureaucratic quality	(1.189)	(1.189)	(1.190)	(1.231)	(1.222)
Bureaucratic quality	5.831***	5.888***	-5.491***	2.167***	2.166***
	(1.776)	(1.774)	(0.341)	(0.106)	(0.106)
Fiscal year FE	No	Yes	Yes	Yes	Yes
Donor FE	No	No	Yes	Yes	Yes
Donor-fiscal year FE	No	No	No	Yes	Yes
Calendar year FE	No	No	No	No	Yes
Adjusted R-squared	0.162	0.170	0.496	0.516	0.514
N° of observations	3874	3874	3874	3874	3874
N° of donors	27	27	27	27	27

Notes: The dependent variable is (logged) monthly contributions to all funds and covers the World Bank's fiscal years 2002-2013. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

CHAPTER 3

Poverty and Policy Selectivity of World Bank Trust Funds

Joint with Stephen Knack

Multilateral trust funds at the World Bank and at other international organizations are increasingly popular with donors of foreign aid. These new funding modalities allow donor governments to cooperate with like-minded donors only, and to earmark their aid for specific countries, sectors or objectives as with "traditional" bilateral aid. In contrast to traditional bilateral ai, these new funds use the financial and implementation infrastructure of the multilateral organization hosting them.[1] The increasing importance of this multi-bi aid channel raises questions about its distinctiveness in relation to unearmarked multilateral aid and other bilateral aid, particularly with respect to country allocation patterns. Trust funds could potentially undermine the policy- and poverty-selectivity of the World Bank's International Development Association (IDA) aid. Undermining would occur if donors' earmarked contributions come partly at the expense of their core contributions to the IDA, and if trust fund allocations are not sensitive to recipients' quality of governance or income levels.

In this Chapter, we exploit a novel and rich data set on World Bank trust fund disbursements from 2002 to 2012 to analyze the determinants of trust fund allocations across countries. WE also offer allocation analyses differentiating trust funds by type and sector.[2] We specifically compare the policy- and poverty-selectivity of multi-bi aid to that of other bilateral aid and of the World Bank's IDA disbursements. We find that trust funds are similar to the IDA, and different from other bilateral aid, in being highly sen-

[1] Because trust fund contributions are earmarked, they are officially classified by the OECD/DAC as bilateral aid, although multilaterals are the implementing agencies.

[2] Our datasets only contains disbursements by trust funds and none by pass-through multilaterals, which are available in different formats from the respective institution's website. We thus analyze only the allocation of direct multi-bi aid at the World Bank.

sitive to recipient's income and quality of governance. Multi-bi funds administered by the World Bank thus do not appear to undermine the IDA's allocation criteria, even if donors' contributions to them partially crowd out their IDA contributions. We leave for future research the question of whether the increase in trust funds has had an impact on core contributions to the IDA, their potential effects on other aspects of World Bank operational policies, and the effectiveness of trust funds relative to traditional bilateral and multilateral core aid.[3]

The remainder of the Chapter is structured as follows. Section 3.2 provides background information on World Bank trust funds and reviews related literature. Section 3.3 presents theoretical considerations regarding donor motives on allocation of trust funds. Section 3.4 describes the data and Section 3.5 discusses the methods and presents the main results for aggregate and sector-specific disbursements. Section 3.6 concludes.

3.2 Background and Related Literature

Over the last decade, trust funds at the World Bank have proliferated. The total number of trust funds considered in this Chapter exceeds 1,200, excluding the largely independent Financial Intermediary Funds (FIFs) and trust funds at the International Finance Corporation (IFC). These funds disbursed more than US$ 22.5 billion over the fiscal years 2002-2012, our sample period.[4] To put this number into perspective, gross disbursements by the IDA, the fund accounting for most concessional lending by the World Bank, amounted to US$ 10.9 billion in the 2012 fiscal year.[5] Figure 3.2 shows the significant increase in trust fund disbursements over the last decade and how its volume compares to IDA funds. Most disbursements were made to specific countries, while smaller shares are allocated to a region or for global goods. Donors are very heterogeneous in their use of trust funds to deliver their foreign aid. In the 2002-2012 sample period, the largest sovereign contributors to World Bank funds, excluding FIFs, were the United Kingdom, the European Commission, the United States, and the Netherlands.[6]

[3]Chapter 1 presents a model with a multilateral agent governed by multiple principals with heterogeneous preferences to better understand the trade-offs donors face when choosing bilateral, multilateral or trust fund aid. Assuming a fixed aid budget, Eichenauer and Hug's (2016) findings (Chapter 1 of this thesis) suggest that the possibility of trust fund contributions decreases bilateral and multilateral 'core' aid in most cases. During recent IDA replenishment negotiations, the World Bank has placed a moratorium on solicitations of trust funds from donors by its staff members, indicating that it believes trust funds can (partially) displace core contributions. Reinsberg (2016a) discusses implications for the World Bank.

[4]Programs funded from FIFs are typically monitored by these separate agencies, such as GAVI, the Vaccine Alliance, or the Global Fund to Fight Aids, Tuberculosis and Malaria (GFATM), and not by World Bank staff. The Bank mainly provides financial administration for FIFs.

[5]The fiscal year at the World Bank runs from July 1 to June 30.

[6]This information is based on contributions data with donor-specific information.

Three sets of actors are involved in the recent trust fund trend: donor countries, international organizations such as the World Bank, and recipient countries. Donor governments may use trust funds to target their foreign aid to priority countries and development issues, while, and in contrast to bilateral aid, delegating responsibility for its management and implementation to the multilateral organization. Evidence collected by the Bank's evaluation unit through structured interviews with 55 officials of eight donor countries finds that six out of eight donor countries use trust funds to target priority issues or countries (IEG 2011b). From the perspective of the multilateral organization, trust funds allow expanding its global role and operations, and increasing its staff and assets under management.

From a recipient country perspective, trust funds may have several positive implications. For middle-income countries seeking technical assistance but are reluctant to borrow for this purpose, trust funds make technical assistance available at grant terms (IEG 2011b: 7). Trust funds have also supported post-conflict and post-disaster countries and territories that are ineligible to borrow from the IDA or the IBRD (e.g., Timor-Leste, Aceh in Indonesia, West Bank and Gaza). Moreover, trust funds have encouraged the provision of global public goods (IEG 2011b: viii). While multi-donor trust funds could, theoretically, improve donor coordination prior to implementation, reducing excessive and harmful donor fragmentation in the field (Huq 2010; IEG 2011b), its effects on donor harmonization seem ambiguous (IEG 2011b: 43; Barakat et al. 2012: 34f) as trust funds usually do not replace existing bilateral and multilateral projects (Barakat 2009: 112).

An evaluation of World Bank trust funds (IEG 2011b: 7) highlights their importance for countries in arrears or entities, where the IDA is legally forbidden to engage and bilateral donors prefer not to engage alone. Looking at aggregate official aid flows, however, it is still unclear whether, and in what sectors or countries, trust fund aid substitutes for (i.e., "crowds out") or complements multilateral or bilateral aid, or if, alternatively, it is additional to traditional aid. Using data on donors organized in the OECD's DAC, Reinsberg et al. (2015) find some evidence that earmarked or multi-bi aid is additional to multilateral core aid. As they note, some of their estimations may however suffer from potential reverse causality and simultaneity. Based on data for the World Bank through 2009, Huq (2010) finds that the sectoral allocation of trust funds executed by recipients is "aligned" (or positively correlated) with IDA but not with IBRD disbursements.

Donor countries might prefer using trust funds rather than bilateral or multilateral aid for a number of reasons. Donors might seek to supplement IDA funding for particular countries, sectors and/or projects, and trust funds are often used to co-finance IDA projects. In other cases, bilateral donors may use trust funds to complement their bilateral programming when their aid agencies do not have sufficient presence or expertise in

countries to implement programs effectively (OECD 2010: 40, 2011: 29). Donor officials state that the proliferation of trust fund aid is associated with a need for a new type of aid that is complementary to the existing multilateral and bilateral aid. They claim that multilateral core contributions to the World Bank and other MDBs cannot achieve some aims because contributions cannot be earmarked (IEG 2011b). The evaluation by the World Bank's International Evaluation Group (IEG) (2011b: 6) thus concludes: "trust funds are a way to circumvent the allocation system of the MDBs' country-based business model."[7]

Eligibility for IDA funds is based on being under a per capita GNI threshold and on a lack of access to non-concessionary lending. Replenishments of the IDA, and IDA policies regarding allocations and other issues, are negotiated every third year by donor countries. Throughout our sample period, IDA resources were allocated according to an explicit rule taking into account recipient need (as measured by low per capita income) and the quality of economic policies and governance, where the latter is assumed to increase aid effectiveness (e.g., Burnside and Dollar 2000, 2004). The World Bank's Country Policy and Institutional Assessments (CPIA) measure the quality of policies and institutions, and are the most important element in the formula determining allocations for most IDA countries.[8] The IDA donors, largely working in concert with Bank management and staff, determine the content of the CPIA and its weight in the allocation formula. Morrison (2013) finds that during the Cold War IDA-eligible countries received more IDA commitments when they held seats on the World Bank Executive Board. However, he reports that this effect is absent after 1989, when IDA's performance-based allocation system became more formal and transparent, reducing any discretion in the process. He found no support for the hypothesis that the CPIA ratings at the core of this allocation system are influenced by the Bank's shareholders.

Not all donors, however, are equally supportive of current IDA allocation policies. For example, some donor countries have called for increasing the weight accorded to need in the allocation formula, so that countries emerging from conflict may benefit from increased funding (see Manning 2014).[9] Such donors might reduce their contributions to IDA and

[7]The IEG (2011b) also found that six out of eight donors direct aid resources through trust funds "to issues or countries of national policy or public interest" and that five out of eight donors use trust funds to influence the World Bank. A UK official stated that his government supports large global funds in climate change, health and education because of "impatience with the existing multilateral system" (IEG 2011b: 6).

[8]The CPIA measures numerous aspects of policies and institutions, grouped into four "clusters" or broad policy areas: (macro)economic management, structural policies, equity and social inclusion, and public sector management and institutions. A detailed description can be found on the World Bank's website, e.g., for the WBFY 2012: http://siteresources.worldbank.org/PROJECTS/Resources/40940-1244163232994/6180403- 1372096800800/CPIAcriteria2012.pdf (accessed on September 15, 2016).

[9]Donor countries can and, surprisingly, do unilaterally increase their IDA contributions beyond what is seen as their fair share (Manning 2014). These additional contributions do not increase the formal

divert them to supporting trust funds that complement IDA funding. While donors could also shift these funds to their respective bilateral aid budgets, they might want some share of it implemented by the Bank. The IEG (2011b: 6f) evaluation suggests that donors appreciate the World Bank as a trustee because of its capacity, expertise and strong working relations with recipient country governments. If trust fund aid is used in this way to complement the (cross-country) allocation of the IDA funds, then trust fund aid should be more weakly related to the quality of policies in IDA-eligible recipient countries than IDA funds – and the relationship could even be negative.

Trust funds are often used to respond to natural disasters and other humanitarian crises, and to fund environmental and other projects with significant spillovers across national borders that do not always conform well to IDA's country-based approach. To the extent humanitarian and cross-border problems are not correlated with per capita income and policy quality, allocations of trust funds responding to these problems are likely to be less poverty- and policy-selective than IDA allocations. For several reasons, therefore, trust funds can potentially undermine IDA's "performance-based allocation" system intended, first, to direct more aid to countries where its development impact is likely to be greater, and, second, to create incentives for policy improvements in recipient countries.

Our data on disbursements by World Bank trust funds for the 2002-2012 period allow us to study whether and how trust fund aid is allocated differently from bilateral and multilateral aid, particularly with respect to policy- and poverty-selectivity. We analyze trust fund disbursements using linear regression models that account for time-invariant recipient characteristics and common year-specific shocks. Because motives are likely to vary with the type of trust funds (Reinsberg et al. 2017), we consider single-donor and recipient-executed trust funds separately, as types where an individual donor has the greatest control over where and how the funds are used. We also run separate tests for three sectors in which trust funds are relatively popular with donors – health, education, and environment – and where the CPIA includes measures of the quality of sectoral policies.

Several studies (e.g., Annen and Knack 2015; Dollar and Levin 2006) have shown that IDA disbursements are highly responsive to per capita income and to the quality of policies, as intended by the IDA's performance-based allocation system. Specifically, they show that disbursements increase with the quality of policy controlling for per capita income (and population), and that they decrease with per capita income, controlling for the quality of policy (and population). Aid from some bilateral donors is also very poverty-

voting power of the donor, although higher voluntary contributions might function as an informal leverage effect for their preferences. It could be that these additional contributions are popular domestically (Milner 2006). For example, the United Kingdom committed more than the United States to IDA15 and IDA17 replenishments (Manning 2014).

and/or policy-selective, but bilateral aid overall is much less selective than multilateral aid, and IDA is more selective than aid from most other multilaterals (Knack et al. 2011; Dollar and Levin 2006). Although multilaterals' allocations are sometimes influenced by influential donor countries' political or economic interests (e.g., Barro and Lee 2005; Kuziemko and Werker 2006; Dreher et al. 2009a,b), those interests matter much more for bilateral aid allocations (e.g., Alesina and Dollar 2000). Both multilateral and bilateral donors' aid allocations have become more selective with respect to the quality of the institutional environment in recipient countries since the end of the Cold War (Dollar and Levin 2006; Claessens et al. 2009).

Very few analyses have been done of the selectivity of World Bank trust funds. World Bank (2007a) reported that "the distribution of IDA disbursements" among IDA-eligible countries does not follow a discernible performance-based or needs-based pattern. In fact, the report found a negative correlation with CPIA ratings but it did not explain its method: e.g., it is not clear whether it controlled for per capita income in testing the relationship of trust fund disbursements with CPIA ratings. A few years later, another World Bank study (Huq 2010) reported a positive but not very strong unconditional correlation between commitments per capita from recipient-executed trust funds (RETF)s and the CPIA ratings, which assess recipients' policy performance and institutional capacity.

An evaluation of the World Bank's implementation of its 2007 Governance and Anti-Corruption Strategy reports a positive coefficient on the CPIA rating in RETF allocation regressions, using aggregate GNI rather than GNI per capita. However, this positive coefficient is insignificant for RETF disbursements and only marginally significant for RETF commitments (IEG 2011c: 154). When the sample is limited to IDA-eligible countries, CPIA is not significant even for RETF commitments. The analysis is limited to the years 2004-2010, and it uses only one of the four "clusters" (on public sector management and institutions) of policy areas in the CPIA. Wagner (2016: 19) finds that RETF commitments for IDA-eligible countries during the 2009-2013 period are significantly correlated with GNI per capita, population, and CPIA ratings. He stresses, however, that the collective explanatory power of these three variables is much lower for RETF allocations than for IDA allocations, suggesting that "trust funds are mainly allocated according to a different set of criteria."

3.3 Theoretical Considerations

The World Bank allocates IDA funds among eligible recipients mainly based on its CPIA index that measures recipients' policy performance and institutional capacity, and on per

capita income.[10] This reliance on the CPIA index reflects donors' view that resources are more likely to be used productively in countries with favorable policies and strong public management systems (e.g., Burnside and Dollar 2000, 2004). However, donors' motives when creating World Bank-managed trust funds may be very different, and the relationship between CPIA ratings and allocations of trust funds could be positive or negative. Donors might want to direct more trust funds to higher performing countries for the same reasons as with IDA funds. Alternatively, trust funds might be a way for some donors to compensate partially for IDA's performance-based country allocations, if they perceive some lower-performing countries as under-aided.

Any impact of CPIA ratings – whether positive or negative – should apply more to IDA-eligible recipients than to other countries, because the CPIA ratings are used by the Bank only for IDA allocations. For this reason we run separate regressions for all developing countries and for IDA-eligible countries only.[11] Because the CPIA does not affect Bank funding to non-IDA countries, donors have no reason to compensate for any under-provision of aid to low-rated recipients.

When we focus on all recipient countries, we include a dummy for effective IDA eligibility. The dummy for effective IDA eligibility might influence the probability and size of trust fund resources with a sign that could go in either direction. On the one hand, IDA recipients might be less likely than IBRD countries or non-member states and territories to receive trust fund aid because they already benefit from IDA resources. On the other hand, bilateral donors might view IDA countries as those countries in particular need of additional resources (Knack et al. 2014) and where the Bank has an advantage in expertise, and thus channel more of their "bilateral" aid to those countries through the Bank in the form of trust funds. In many cases, trust funds are even used to "co-finance" IDA projects. If such cases are very common, trust fund aid should be positively correlated with the IDA dummy, or with net IDA flows, which we control for in some regressions.

We also control for other donor motives in establishing World Bank-managed trust funds. Bilateral donors state that they use trust funds to complement their bilateral programming when their aid agencies do not have sufficient presence or expertise in countries to implement programs effectively (OECD 2010: 40, 2011: 29), and appreciate the World

[10] Lack of access to capital markets at market rates of interest is another criterion for IDA eligibility. However, the World Bank's assessments of creditworthiness are not disclosed, so we cannot control directly for this variable. We can control for per capita income and country size (population), which are likely to be important determinants of creditworthiness.

[11] This dummy equals one for country-year observations where there are positive IDA flows or the country is on the list of eligible IDA recipients. We apply these two criteria which are not perfectly congruent. Some countries might not want to borrow from the IDA while some countries still borrow because they are just above the eligibility cutoff (blend countries). Note that according to Huq (2010: foonote 9), financial support from IDA is not available to Sudan because of outstanding arrears. Therefore, we set the IDA eligibility dummy for Sudan to zero.

Bank as a trustee because of its capacity, expertise and strong working relations with governments (IEG 2011b: 6f). Specifically, donors might provide funding through the Bank rather than directly in circumstances where they do not want to be present in recipient countries themselves. For example, donors might want to delegate the implementation of projects to the Bank in fragile countries because it allows diffusing accountability about aid effectiveness, because sending bilateral staff is politically sensitive, or because donors want to act in concert through the Bank to avoid harmful fragmentation in aid activities. We test the relationship between trust fund and bilateral aid by directly including bilateral development assistance in some regressions.

Rhetoric by donors and the World Bank also suggests that trust funds are a useful instrument in fragile contexts. We expect fragile countries to be more likely to receive aid from trust funds rather than from IDA. On the one hand, the World Bank might be restricted by its legal mandate when governments in fragile contexts change repeatedly, making it virtually impossible to negotiate programs. Fragile states also have low CPIA scores by definition, limiting the IDA resources available for this country mechanically due to the allocation rule.[12] On the other hand, some bilateral donors may view the IDA performance-based allocation system as under-aiding fragile countries confronted with challenging situations. Moreover, some donors might be more concerned than other donors with security, refugee and other problems associated with specific fragile and conflict-affected states. Such donors might be geographically proximate to the fragile situation, or have high reputation or economic stakes in the fragile country, such as former colonial powers. World Bank (2007a) reports that RETF disbursements to fragile states increased from US$ 130 to 679 million between fiscal years 2002 and 2006.

Donors also use trust funds to fill "gaps in the multilateral system," in particular to provide a rapid response to "emergencies such as natural disasters, disease outbreaks, and the end of armed conflict, where donors want to coordinate their bilateral aid and where the MDBs do not grant resources to engage on a sufficient scale" (IEG 2011b: 5). We test these motives by including dummy variables for disaster-affected, post-conflict, and fragile states. Given the multitude of motives for using trust funds, we use multivariate statistical analysis that allows assessing the relative importance of these simultaneous motives while keeping time-invariant characteristics and year-specific shocks constant.

[12] A small number of post-conflict countries receive supplemental IDA funding for a limited number of years.

3.4 Data

Our dependent variable is (logged) disbursements of trust funds to recipient countries based on the financial accounting tables of the World Bank.[13] In the disbursements data, recipient countries are almost always indicated but donors are unknown, so that we cannot discriminate between the sources of funds.[14] The unit of analysis thus is the recipient country-year, rather than donor-recipient-year. For purposes of comparing the overall aid selectivity of World Bank trust funds to the IDA and to other bilateral aid, this is the appropriate unit of analysis, because it implicitly weights larger trust fund donors more heavily in the analysis. With donor-recipient-year observations, each donor-recipient pair would receive an equal weight. If selectivity of trust fund aid differed systematically for large and small donors, selectivity coefficients could be a misleading indicator of overall selectivity.[15]

The structure of the disbursements data is depicted in Figure 3.1. The figure indicates that trust funds may differ along three dimensions: by the number of contributors (Figure 3.2 (b)), the country-specific, regional or global mandate, and by their execution type (Figure 3.2 (c)). We analyze a subset of the universe of World Bank funds, IBRD/IDA trust funds, which are most numerous. The Bank makes a technical distinction among three types of trust funds. The Bank only provides financial services to FIFs.[16] The number of trust funds of the IFC is relatively minor and has different objectives than IBRD/IDA trust funds. IBRD/IDA trust funds, the focus of this analysis, are classified further by RETFs, which are implemented by a third party but supervised by the Bank, and Bank-executed trust funds (BETF)s, which support the Bank's work directly. While RETFs are similar to the IDA or IBRD in terms of being disbursed to recipient countries, BETFs are more similar to Bank administrative expenses, and often but not always finance Bank activities that are not country-specific and thus not relevant for our research question (Figure 3.2 (c)).

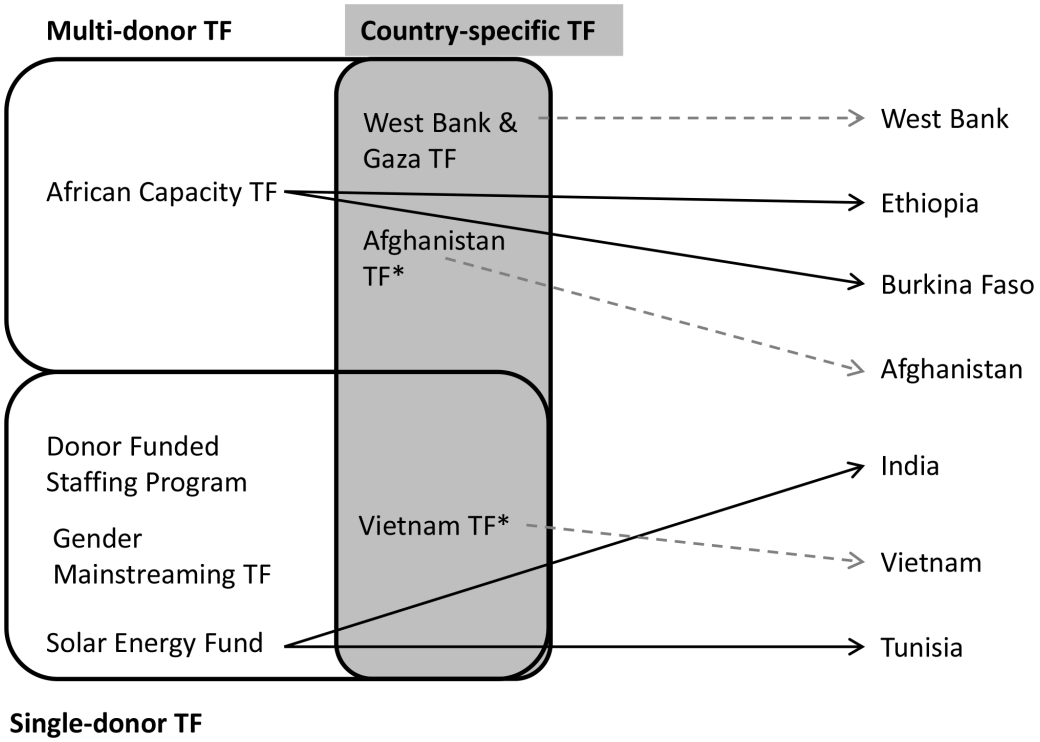
[13] We use the data from Reinsberg et al. (2017) as obtained from the Bank's Trust Funds and Partnerships Department.

[14] The by far most important contributors to trust funds are DAC countries, accounting for 80 percent of contributions over the period of study. Non-DAC donor countries, private companies, NGOs and multilateral organizations are relatively minor contributors (see also Eichenauer and Reinsberg 2017).

[15] In Wagner (2016), CPIA ratings are significant in regressions based on recipient-year observations, but not in regressions based on donor-recipient-year observations.

[16] Our data set does not contain the information on country allocation by FIFs, which have their own governance and disbursement systems (see Reinsberg et al. 2015).

Figure 3.1: Illustration of disbursement data



Notes: The choice of recipient countries and trust funds as well as the allocation choices of trust funds are fictive. The "Donor Funded Staffing Program" and "Gender Mainstreaming" trust funds do not allocate aid to specific countries but support Bank programs. * mark recipient-executed trust funds (RETF).

In testing for poverty- and policy-selectivity of trust funds and other aid, we control for the natural logarithm of population. The IDA allocation formula provides more aid to larger countries, but with an elasticity of less than one. Studies typically show a "small country bias" for IDA disbursements – i.e., aid increases less than proportionately with population – but this bias is smaller than for aid from most other donors (e.g., Annen and Knack 2015). Due to missing and low-quality data on actual poverty rates (e.g., the percentage share of the population living on less than US$ 2 per day), income per capita is used as a proxy for poverty in the IDA formula. In the tests we report below we follow the IDA allocation formula specifically by using GNI per capita, smoothed for exchange rate changes using the Atlas method, rather than GDP per capita, which is used more commonly in the aid allocation literature. The World Bank also uses GNI per capita in its lending classifications (including eligibility for IDA) and its income classifications. Unsurprisingly, poverty-selectivity of World Bank-administered aid (IDA or trust funds) tends to be somewhat weaker if we use GDP per capita in our regressions instead of the measure the World Bank uses in its own allocation policies, GNI per capita. The choice of GNI or GDP makes little difference, however, for most other results, including the policy-selectivity of aid.[17] Data for both income measures and for population come from the World Development Indicators (World Bank 2016b).

Aggregated and partially-disaggregated CPIA scores for IDA-eligible countries are publicly available from the World Bank (2016c) since 2005, and range from a minimum score of 1 (lowest quality policies) to a maximum of 6 (highest quality). For non-IDA countries and prior years, scores are not publicly available, but were obtained with the necessary permissions by one of the authors from internal World Bank databases. In contrast to Wagner (2016), we are therefore able to include observations dating to 2002, and for non-IDA as well as IDA countries. In a few cases, CPIA scores are not assigned after countries fall into arrears with the World Bank and are no longer classified as active borrowers. This typically is the case when the quality of policies and governance are very low, as indicated by their CPIA scores for years when they were active borrowers. In these cases, we replace the missing score with the lowest score received by any other country in this year, but results are not sensitive to dropping these observations instead.

Our main tests do not include other control variables, because our interest is mostly in comparing selectivity across aid sources. We control in some tests for a fragile state dummy, because some donors in recent years have given them favored status in allocating aid. A very small share of IDA funds are set aside for a handful of "post-conflict" countries that overlap considerably with fragile state status. We create a dummy variable for fragile

[17]Full results using GDP per capita are available from the authors upon request. In reporting results below we note two instances in which significant results for one variable become insignificant when GDP is used instead of GNI.

country status from the official World Bank list of fragile and conflict situations, first produced in 2006 and updated annually. When we include the fragile dummy, we limit the sample to the fiscal years 2006-2012, where the dummy equals one in those country-years in which a country was on the official lists of fragile situations.[18] We create a separate dummy for countries eligible for special "post-conflict" funding (World Bank 2014a). In some specifications, we also control for (logged) bilateral aid and development aid received from official donors through channels other than trust funds and IDA using OECD/DAC data (2015) and World Bank data for (logged) IDA flows. If other aid flows are to some extent policy- and poverty-selective, these aid flows are collinear with our measures of policy quality and poverty for which the coefficients are then imprecisely estimated.

In robustness tests, we control for several donor-interest variables, following the literature on allocation of bilateral aid (e.g., Alesina and Dollar 2000). First, we measure geopolitical interests by the alignment of votes between recipient countries and important donor countries in the United Nations General Assembly (UNGA) using data from Voeten (2013). Annual measures of voting alignment range from 0 to 1 with higher values implying higher similarity and are calculated as in Kilby (2013) using all UN votes. We calculate the mean alignment of the largest three sovereign trust fund donors (United Kingdom, United States, Netherlands), which we label as "the G3."[19] We exclude the European Commission, the second largest donor, because its preference aggregation process is more complex (e.g., Michaelowa et al. 2017). Second, we add a dummy for a colonial relationship between a G3 donor and the recipient country. Third, commercial interests are measured by total G3 exports, using data from the IMF (2015). A thorough test of the importance of these donor-interest variables in aid allocation decisions would require a different data set, with donor-recipient-year observations. In our analysis, we merely use these as control variables.

Table 3.1 displays the descriptive statistics for the dependent and control variables in our sample. The average recipient country receives US$ 1.8 trust fund aid per capita, a relatively minor inflow compared to average per capita aid of US$ 6.7 from IDA and US$ 67 from other sources.[20] However, trust fund volumes have increased over the sample period and represent significant inflows for some recipient countries as indicated by the maximum value of more than US$ 82 trust fund aid per capita. Average GNI per capita

[18]The absence of a list prior to 2006 likely reflects the lack of any influential view among donors that "fragility" was an important concept or that fragile states should be treated differently.

[19]In the fiscal years 2002-2012, these donors contributed constant US$ 4.08, 2.47, and 2.04 billion respectively. The European Commission contributed US$ 2.47 billion while Canada as the fifth largest donor contributed US$ 1.12 billion.

[20]Table 3.1 is based on the sample of all developing countries. Among IDA eligible countries, the figure is US$ 10.3 per capita. These high per capita figures are driven by island states.

is US$ 2,744, which the Bank classified as a lower middle income country in the fiscal year 2012. The mean of the aggregate CPIA rating is just below the median value of 3.5, and the maximum value is almost 5. Recipient countries' education, health and environmental policy ratings range between 1 and 6 with an average value similar to the aggregate CPIA score. With regard to the political and economic variables, the data show that average voting affinity with the largest donors is slightly higher than the median value of 0.5. Total exports per capita from the G3 trust fund donors (UK, US, and Netherlands) vary substantially around the mean value of 202 US$ per capita. The table further shows that one third of recipient countries in our sample are former G3 colonies, while fragile countries make up 17 percent, and IDA-eligible countries 65 percent of observations.

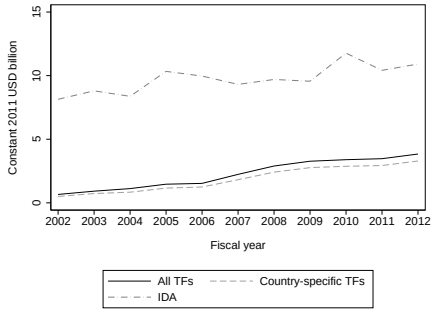
Table 3.1: Descriptive statistics

	Mean	St. Dev.	Min.	Max.
Aid flows per capita				
Trust fund aid per capita	1.68	6.15	0.00	79.07
IDA aid per capita	6.73	11.50	0.00	138.62
Other aid per capita	66.85	180.83	0.00	2'469.26
Performance variables				
GNI per capita, constant US$	2'744	2'743	131	14'532
Population in millions	42	156	0.00	1'344
Agg. CPIA score	3.43	0.57	1.40	4.91
CPIA, Education	3.54	0.68	1.00	6.00
CPIA, Health	3.50	0.67	1.00	6.00
CPIA, Environment	3.31	0.65	1.00	6.00
Political economy variables				
Voting affinity in UNGA (G3)	0.56	0.15	0.21	0.92
Total exports per capita, US$ (G3)	203	432	1.00	4'818
Former colonies (G3)	0.35	0.48	0.00	1.00
Other control variables				
Total disaster affected (3-year total)*	2'048	14'209	0.00	185'932
Fragile countries	0.02	0.16	0.00	1.00
Post conflict situation	0.17	0.38	0.00	1.00
IDA eligible countries	0.65	0.48	0.00	1.00

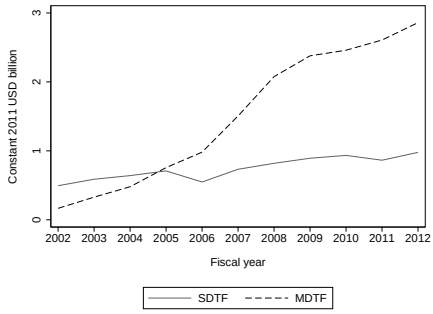
Note: *In thousands

Figure 3.2: Different types of trust funds

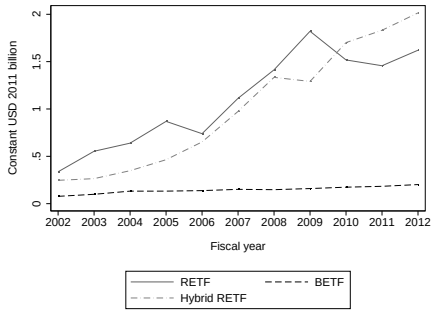
(a) Trust fund contributions and IDA disbursements



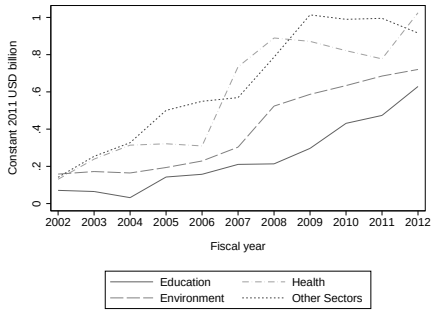
(b) Disbursements by single- and multi-donor trust funds



(c) Trust fund disbursements by execution type



(d) Trust fund disbursements by sectors



Notes: World Bank trust fund data, 2002-2012. Disbursements by FIFs and IFC trust funds are not included.

3.5 Estimation Method and Results

This section compares the selectivity of trust fund aid to IDA and bilateral aid. We use panel models with year- and recipient-fixed effects without a selection stage, because almost all recipient countries receive positive trust fund disbursements at least once during our sample period. Our sample includes all countries that the OECD's DAC considered developing countries in a given year.

As is common in the aid allocation literature, our baseline regression model looks as follows:

$$\begin{aligned} Log\ (disbursements)_{i,t} = \ & \alpha \ + \ \beta\, CPIA_{i,t-1} \ + \ \gamma\, ln\,(population)_{i,t-1} \\ & + \ \delta\ ln(\ GNIp.c.\ )_{i,t-1} \ + \ \lambda'\, X_{i,t-1} \ + \ \theta_i \ + \ \sigma_t \ + \ \epsilon_{i,t} \end{aligned} \tag{3.1}$$

where i refers to the recipient country and t to the Bank's fiscal year. Errors are robust to heteroscedasticity and clustered at the recipient country level. We include year-fixed effects σ_t and, in most regressions, recipient-fixed effects θ_i.

The inclusion of recipient fixed effects controls for any time-invariant recipient characteristics that may influence aid allocations: estimates of poverty- and policy-selectivity are then informed only by changes over time within countries in aid, GNI per capita, and quality of policy.[21] However, we also report results from pooled OLS (with standard errors clustered by recipient), in which estimates are informed primarily by cross-country rather than over-time variation in the data. The CPIA ratings are designed to compare the quality of policies across countries at a point in time using all relevant information at that time. Changes in ratings from one year to the next sometimes reflect newly-available information rather than actual changes in the quality of policies and institutions, and ratings from prior years are not "corrected." Over-time variations in the data therefore are likely to incorporate substantially more measurement error than the cross-sectional variation. Reassuringly, the fixed effects estimates (which minimize omitted variable bias) reported below are largely consistent with the pooled OLS estimates (which are likely based on less noisy data).

Table 3.2 shows results with recipient- and year-fixed effects for all IDA countries (columns 1-3) and all developing countries (columns 4-6). Trust funds and IDA provide significantly higher aid to poorer and better-governed (i.e., higher CPIA) countries (columns 3 and 1 respectively). Trust fund allocations are thus much more similar to IDA than to other ODA in terms of poverty- and policy-selectivity.[22] Coefficients on (log of)

[21] Hausman tests show that fixed effects are preferred over random effects.

[22] There is no statistical difference between the coefficients on the selectivity variables for IDA and TF aid, while coefficients are significantly different between trust fund aid and other aid flows (*p-value*=0.002 for GNI p.c. and *p-value*=0.023 for the CPIA score). We test the equality of coefficients using Stata's

Table 3.2: Comparison of poverty-and policy-selectivity across TF aid, IDA aid, and other aid, fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)
GNI p.c. (ln)	-1.899**	0.764	-2.518***	-1.028**	1.396	-3.430***
	(0.828)	(0.813)	(0.815)	(0.508)	(0.962)	(0.783)
CPIA score	3.031***	-0.33	2.088***	1.953***	-0.827	2.596***
	(1.013)	(0.891)	(0.761)	(0.717)	(0.856)	(0.794)
Population (ln)	3.082	0.018	2.864	3.034	-5.64	2.23
	(2.523)	(3.302)	(3.206)	(1.975)	(6.261)	(2.737)
IDA eligible				15.538***	-2.52	0.656
				(1.506)	(2.556)	(1.031)
Dependent variable	IDA	Other	TF	IDA	Other	TF
Sample	IDA	IDA	IDA	All	All	All
Estimation	FE	FE	FE	FE	FE	FE
Adjusted R-squared	0.075	0.002	0.189	0.316	0.015	0.166
N° of observations	900	900	900	1375	1375	1375
N° of countries	89	89	89	133	133	133

Notes: The dependent variables is the natural logarithm of the aid type noted in the bottom of the respective column and covers the Bank's fiscal years 2002-2012. All regressions include dummies for the World Bank's fiscal year. Robust standard errors in parentheses clustered at the recipient country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.3: Comparison of poverty- and policy-selectivity across TFs, IDA aid, and other aid, OLS

	(1)	(2)	(3)	(4)	(5)	(6)
GNI p.c. (ln)	-1.571***	-0.735*	-0.647	-1.238***	-0.817*	-0.783**
	(0.512)	(0.374)	(0.403)	(0.362)	(0.436)	(0.356)
CPIA score	5.337***	-0.502	1.809**	2.601***	-0.424	0.924
	(1.330)	(0.445)	(0.714)	(0.849)	(0.475)	(0.624)
Population (ln)	0.771***	0.511***	1.088***	0.495**	0.353*	1.156***
	(0.262)	(0.150)	(0.204)	(0.200)	(0.182)	(0.155)
IDA eligible				15.011***	0.000	1.137
				(0.777)	(0.840)	(0.741)
Dependent variable	IDA	Other	TF	IDA	Other	TF
Sample	IDA	IDA	IDA	All	All	All
Estimation	OLS	OLS	OLS	OLS	OLS	OLS
Adjusted R-squared	0.392	0.140	0.361	0.804	0.081	0.379
N° of observations	900	900	900	1375	1375	1375
N° of countries	89	89	89	133	133	133

Notes: The dependent variable is the natural logarithm of the aid type noted in the bottom of the respective column and covers the Bank's fiscal years 2002-2012. All regressions include dummies for the World Bank's fiscal year. Robust standard errors in parentheses clustered at the recipient country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

GNI per capita (and on log of population) are interpretable as elasticities, so a 1 percent increase in per capita GNI reduces IDA flows by 1.9 percent (column 1) and TF aid by 2.5 percent (column 3). A 1-point increase in the CPIA rating (measured on a 1 to 6 scale) is associated with a nearly 20-fold increase in IDA flows ($= e^{3.031} - 1$) and 7-fold increase in TF aid ($= e^{2.088} - 1$). Note, however, that a 1-point increase in CPIA is very large in relative terms, equal to nearly two standard deviations.

Even for a sample that includes non-IDA countries (column 6), trust funds are very policy-selective (although marginally insignificant at conventional level of significance) as well as poverty-selective. As shown in Table 3.3, this holds true in OLS regressions with year-fixed effects that allow for the inclusion of time-invariant variables. The main difference is that the estimated effects of country size are more consistent and significant. The coefficients on population for other aid types in Table 3.3 reflects the bias in favor of small-countries (in per capita terms) frequently noted in the literature (Fleck and Kilby (2010: e.g.,)), but this bias is nearly absent for trust fund aid, where the coefficient on population is even slightly above one. When we include a dummy for fragile countries and limit the sample to the post-2005 years accordingly, we do not find that these countries receive more trust fund aid (Table 3.4, column 2). Moreover, the inclusion of this dummy has only trivial effects on coefficients for the selectivity variables (comparing columns 1 and 2).

Potentially, allocating aid partly for commercial and political motives could weaken the policy- and poverty-selectivity of trust funds. If so, then when we control for those factors the absolute value of the selectivity coefficients should increase, i.e., "conditional" selectivity should be stronger than "unconditional" selectivity. We include measures for commercial and political motives in Table 3.4 (column 3), but find the coefficients on the selectivity variables to change little compared to Table 3.2 (column 6). The commercial and political variables – UNGA voting alignment with the G3, and (log of) total G3 exports – are significant, with the expected positive signs.[23] In column 4 of Table 3.4 we drop the country-fixed effects, so we are able to add a second political interest variable, a dummy for former colonies of G3 donors. The colonial heritage dummy is not significant and its inclusion increases the size and significance level of the selectivity coefficients (comparing Table 3.4, column 4 and Table 3.3, column 6). The last column in Table 3.4 controls for (logged) other aid flows and IDA aid to the recipient country, where the latter coefficient is positive and marginally significant.[24] This finding reinforces the idea that trust fund allocations look a lot more like the IDA's than like other aid. But, more

suest command.

[23] In column 3, the coefficient falls from 6.1 to 4.2 and becomes insignificant if we measure income using GDP instead of GNI per capita.

[24] For the IDA sample, IDA flows are significant in the fixed and random effects models.

Table 3.4: Robustness checks for trust fund aid

	(1)	(2)	(3)	(4)	(5)
GNI p.c. (ln)	-4.955***	-4.961***	-3.759***	-0.839**	-3.274***
	(1.386)	(1.389)	(0.806)	(0.373)	(0.801)
CPIA score	3.594**	3.541**	2.380***	1.058**	2.324***
	(1.515)	(1.571)	(0.804)	(0.473)	(0.840)
IDA eligible	0.841	0.840	0.781	1.866***	-1.459
	(1.070)	(1.070)	(1.163)	(0.676)	(1.475)
Population (ln)	4.169	4.035	1.234	0.978***	1.751
	(4.414)	(4.395)	(2.735)	(0.260)	(2.739)
Fragile situation		-0.154			
		(0.507)			
G3 UNGA-Alignment			6.149*	8.439***	
			(3.581)	(2.251)	
Total G3 exports (ln)			0.622**	0.130	
			(0.304)	(0.214)	
G3 colonial heritage				-0.692	
				(0.456)	
Other aid (ln)					-0.013
					(0.025)
IDA aid (ln)					0.134*
					(0.080)
Sample	> 2005	> 2005	All	All	All
Estimation	FE	FE	FE	OLS	FE
Adjusted	0.164	0.164	0.177	0.391	0.173
R-squared	887	887	1332	1332	1375
N° of observations	133	133	128	128	133

Notes: The dependent variable is the natural logarithm of trust fund aid and covers the Bank's fiscal years 2002-2012. All regressions include dummies for the World Bank's fiscal year. Robust standard errors in parentheses clustered at the recipient country level.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

importantly, it is showing that donors' trust fund allocations are not just guided by IDA flows, including co-financing of IDA projects: even controlling for IDA flows, their trust fund allocations are separately influenced by IDA policies, namely poverty- and policy-selectivity.

Donor countries might prefer RETFs, which are under more direct control of donors, over trust funds more generally.[25] In particular, some BETF allocations by country are determined by staff. Therefore, RETFs could be guided by political and commercial objective to a larger extent and therefore less poverty- and policy- selective. Column 2 of Table 3.5 replicates the method and specification of Table 3.4, column 3, but for RETFs instead of all TFs. In this fixed effects test, GNI per capita is not significant, and its coefficient is reduced in absolute value compared to the case of all TFs. The political and commercial variables are not significant either. In the OLS test, per capita income is also insignificant while political alignment is associated with significantly larger RETFs allocations (Table 3.5, column 4). In the OLS tests (comparing column 3 to column 4), the coefficient for CPIA increases and becomes significant by controlling for political and commercial interests. This provides evidence for "conditional" policy-selectivity but neither for "conditional" nor "unconditional" poverty-selectivity.

Single-donor trust funds could be used by an individual donor country to support strategic interests, while multi-donor trust funds (MDTFs) should look more like IDA: other things equal, as an MDTF includes more donors, it will look more like the full set of IDA donors. Compared to an SDTF donor, donors in MDTFs should therefore have a stronger collective interest in selectivity while disagreement about countries to benefit from favors should limit the role of political and commercial factors in determining aid allocations. Columns 5–8 of Table 3.5 replicate columns 1–4, but for SDTFs instead of RETFs. We find some support for the hypothesis that political interests matter more for SDTFs, as coefficients on voting alignment are somewhat larger in columns 6 and 8 than in columns 3 and 4, respectively, of Table 3.4.[26] These coefficients are not much larger, however, and selectivity for policy and poverty is still strong. In sum, we find that, despite being guided by political and commercial motives to a somewhat larger extent than aggregate trust fund aid, RETFs remain policy-selective while SDTFs remain both policy- and poverty-selective.

[25] RETF disbursements exclude disbursements by 'hybrid' trust funds that are classified as both RETF and BETF (Figure 3.2 (d)).

[26] In column 6 of Table 3.7, the coefficient falls from 7.4 to 6.2 and becomes insignificant if we measure income using GDP instead of GNI per capita.

Table 3.5: Recipient-executed and single-donor trust funds

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GNI p.c. (ln)	-1.559	-1.757	-0.517	-1.039	-3.188***	-3.080***	-0.901***	-0.734*
	(1.159)	(1.212)	(0.552)	(0.669)	(0.807)	(0.833)	(0.327)	(0.372)
CPIA score	2.969***	2.806**	1.139	1.556**	3.349***	3.449***	1.625**	1.867***
	(1.033)	(1.075)	(1.082)	(0.735)	(0.902)	(0.939)	(0.712)	(0.550)
IDA eligible	-0.402	-0.324	4.864***	5.397***	1.134	1.162	1.210	1.961***
	(2.340)	(2.440)	(1.194)	(0.939)	(0.932)	(1.006)	(0.766)	(0.687)
Population (ln)	11.090*	11.003*	1.112***	0.973***	-0.975	0.163	0.998***	1.027***
	(5.727)	(5.991)	(0.184)	(0.353)	(2.880)	(3.036)	(0.138)	(0.235)
G3 UNGA-Alignment		6.341		23.500***		7.439*		10.455***
		(7.416)		(4.684)		(4.193)		(2.337)
Total G3 exports (ln)		0.651		0.232		0.051		-0.075
		(0.492)		(0.311)		(0.372)		(0.216)
G3 colonial heritage				-0.301				-1.027**
				(0.759)				(0.500)
Dependent variable	RETF	RETF	RETF	RETF	SDTF	SDTF	SDTF	SDTF
Sample	All	All	All	All	All	All	All	All
Estimation	FE	FE	OLS	OLS	FE	FE	OLS	OLS
Adjusted R-squared	0.055	0.057	0.241	0.312	0.560	0.568	0.498	0.534
N° of observations	1375	1332	1375	1332	1502	1453	1502	1453
N° of countries	133	128	133	128	134	128	134	128

Notes: The dependent variable is the natural logarithm of the TF aid noted in the bottom of the respective column and covers the Bank's fiscal years 2002-2012. All regressions include dummies for the World Bank's fiscal year. Robust standard errors in parentheses clustered at the recipient country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.6 tests whether donors use trust funds to provide extra funding for post-conflict and disaster-affected countries in a coordinated manner. We find no systematic evidence that these motives explain trust fund allocations. Neither a post-conflict dummy variable nor a measure of the number of people affected by a disaster are significantly related to TF aid, in either fixed effects or pooled OLS regressions, for either the IDA sample or the full developing-country sample. The poverty- and policy-selectivity is unchanged when we control for these specific trust fund purposes.

Table 3.6: Selectivity with respect to disaster- and conflict-affected countries

	(1)	(2)	(3)	(4)
GNI p.c. (ln)	-2.448**	-2.983***	-0.528	-1.788***
	(1.002)	(0.854)	(0.389)	(0.322)
CPIA score	2.210***	2.213***	1.255**	1.755***
	(0.837)	(0.799)	(0.555)	(0.600)
Population (ln)	3.09	4.262	0.870***	0.848***
	(3.663)	(3.042)	(0.186)	(0.170)
Post-conflict country	-0.549	-0.238	-2.28	-0.913
	(1.046)	(0.940)	(4.837)	(2.265)
Affected (ln)	0.109	-0.011	0.079	0.006
	(0.077)	(0.067)	(0.076)	(0.063)
Dependent variable	TF	TF	TF	TF
Sample	IDA	All	IDA	All
Estimation	FE	FE	OLS	OLS
Adjusted R-squared	0.214	0.157	0.312	0.303
N° of observations	768	1156	768	1156
N° of countries	86	127	86	127

Notes: The dependent variable is the natural logarithm of trust fund aid and covers the Bank's fiscal years 2002-2012. All regressions include dummies for the World Bank's fiscal year. Robust standard errors in parentheses clustered at the recipient country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In Table 3.7, we disaggregate the data to analyze three specific sectors – education, health, and environment – that are popular among trust fund donors (Figure 3.2 (d)), and for which sector-specific indicators of the quality of policies (CPIA sub-ratings) are produced. For this analysis, we use the relevant sector-specific IDA disbursements, as well as the sector-specific CPIA sub-ratings. Most projects in the sample have objectives in multiple sectors, and we assign projects to the sector which has the largest sectoral share. We focus on the two sectors for which we have a respective CPIA subscore, namely education and health. For environment, we use the theme code and the corresponding

Table 3.7: Sector-specific selectivity of trust fund aid

	(1)	(2)	(3)	(4)	(5)	(6)
GNI p.c. (ln)	-2.407***	-1.614*	-1.635***	-1.328	-0.486**	-0.557
	(0.323)	(0.973)	(0.358)	(0.942)	(0.245)	(0.561)
Population (ln)	0.884***	14.531***	1.188***	10.615**	1.285***	15.249***
	(0.156)	(4.508)	(0.149)	(5.235)	(0.137)	(2.715)
CPIA, Education	2.047***	1.647***				
	(0.475)	(0.547)				
CPIA, Environment			1.017**	0.847		
			(0.496)	(0.614)		
CPIA, Health					0.397	-0.168
					(0.359)	(0.357)
Dependent variable	TF	TF	TF	TF	TF	TF
Sample	Edu.	Edu.	Health	Health	Environ.	Environ.
Estimation	OLS	FE	OLS	FE	OLS	FE
Adjusted R-squared	0.256	0.034	0.242	0.012	0.299	0.060
N° of observations	1367	1367	1368	1368	1368	1368
N° of countries	132	132	132	132	132	132

Notes: The dependent variable is the natural logarithm of the aid type noted in the bottom of the respective column and covers the Bank's fiscal years 2002-2012. Edu. refers to the education sector and Environ. to the environmental sector. All regressions include dummies for the World Bank's fiscal year. Robust standard errors in parentheses clustered at the recipient country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

CPIA rating.[27] We find health and education aid to be poverty- and policy-selective in OLS regressions with time dummies (Table 3.7, columns 1 and 3). While education aid is responsive also to policy improvements over time within countries (column 2), health aid is not (column 4). In contrast, environmental aid is responsive neither to policy improvements over time within countries (i.e., in the fixed effects regression reported in column 6) nor between countries (column 5).

In summary, we find consistent evidence that the cross-country allocation of aggregate trust fund aid is poverty- and policy-selective and allocated more similarly to IDA aid than to other aid. Controlling for population, per capita income, and the quality of policies, we find no evidence that fragile, post-conflict, or disaster-affected countries receive more trust fund aid. Sector-specific analyses, using sector-specific policy indicators, show that trust fund aid in education and (to a lesser extent) health is sensitive to population, income and the quality of policies, but allocations of environmental trust funds are unrelated to the quality of environmental policies.

3.6 Conclusion

This Chapter provides the most comprehensive analysis to date of the cross-country allocation of trust funds, a relatively new aid channel that can be described as a hybrid between bilateral and multilateral aid. Donor rhetoric suggests that some World Bank-administered trust funds are intended to support countries neglected by the IDA for legal, political, and other reasons. Potentially, therefore, the cross-country allocation of these trust funds may compensate for the performance-based allocation of IDA funds, "diluting" the poverty- and policy-selectivity of total World Bank-administered aid. We test whether donors' allocations of trust funds tend to favor recipients with lower per capita incomes and more favorable policy environments, as measured by the Bank's CPIA. Results show that World Bank trust fund allocations are similar to IDA, and dissimilar to other bilateral aid (summed over all DAC donors) in terms of their policy- and poverty-selectivity.

The allocation of recipient-executed and single-donor trust funds, which are under closer control of donor countries, appears to be more strongly motivated by strategic interests of donor countries than trust fund aid in general. However, a more complete investigation of the role of donor interest variables would require a different data set and different unit of analysis (donor-recipient pairs) than we use in this Chapter.[28] We also explore trust

[27] Criteria for the education, health and environment policy ratings in the CPIA can be found at http://siteresources.worldbank.org/PROJECTS/Resources/40940-1244163232994/6180403-1372096800800/CPIAcriteria2012.pdf (accessed on September 15, 2016).

[28] Factors related to donors' and recipients' domestic political economies are investigated by Dietrich (2016) and Eichenauer and Reinsberg (2017).

fund disbursements for three specific sectors, and find evidence that health and education trust funds, but not environmental trust funds, are policy- and poverty-selective across countries.

Overall, the evidence indicates that multi-bi funds administered by the World Bank do not undermine the IDA's allocation criteria, even if donors' contributions to them might partially crowd out their IDA contributions. There is very little evidence regarding the latter issue of crowding out. We leave for future research the question of whether the increase in trust funds has affected core contributions to IDA, and their potential effects on other aspects of World Bank operations.[29] The question of the additionality of earmarked funds at the aggregate level remains open as donors might just reshuffle funds away from multilateral organizations other than the World Bank they perceive as less effective. Finally, as experience with trust fund aid accumulates, another important research question will be its effectiveness, relative to core multilateral and traditional bilateral aid, in contributing to growth and human development outcomes.

[29] One review of World Bank non-lending technical assistance projects rated the quality of fully-trust funded projects lower than projects that were wholly or partially Bank-financed, and concluded that the difference was attributable in part to less attention by management and staff to trust funded projects (see IEG 2011b: Chapter 3).

Table 3.8: Sources and definitions

Variable	Definition	Original Source
Trust fund disbursements	Disbursements by World Bank trust funds, logarithm, FY*	Trust Funds and Partnerships Department at the World Bank.
Other aid disbursements	Bilateral ODA disbursements by all donors net of trust fund and IDA aid, logarithm*	DAC, Table DAC2a ODA Disbursements (OECD 2015).
GNI per capita	Gross national income per capita, Atlas method, logarithm*	World Bank (2016b).
GDP per capita	Gross domestic product per capita in PPP, logarithm*	World Bank (2016b).
Population	Population of recipient and donor countries, logarithm	World Bank (2016b).
IDA aid	ODA by the IDA, logarithm, FY*	World Bank data from S. Knack.
IDA dummy	IDA eligible countries and IDA recipient countries (incl. blend countries, FY)	S. Knack and IDA aid data.
G3 colonial heritage	Colonial heritage of the largest three sovereign trust fund donors (G3: United Kingdom, United States, Netherlands)	Central Intelligence Agency (CIA) Factbook and other sources.
G3 UNGA-Alignment	Voting alignment in United Nations General Assembly, calculated as in Kilby (2013), G3 refers to largest three sovereign trust fund donors (United Kingdom, United States, Netherlands)	Voeten (2013), important years from C. Kilby.

Table 3.8: (continues on next page)

Table 3.8: (continued)

Variable	Definition	Original Source
Total G3 exports	Total value of exports from the largest three sovereign trust fund donors (G3: United Kingdom, United States, Netherlands) to recipient country, logarithm, lagged*	(IMF 2015).
CPIA scores	Aggregated and sector-disaggregated Country Policy and Institutional Assessment scores (1-6)	Aggregated CPIA since 2006 from World Bank (2016b); Previous years from S. Knack.
Post-conflict situation	Dummy equals one for country-years eligible for IDA special allocations for post-conflict countries	(World Bank 2014a).
Fragile state dummy	Dummy equals one for country-years classified as fragile situation by the World Bank	Own coding based on World Bank (2014b).
Disaster affected (total)	Number of disaster-affected people in the recipient country, moving 3-year total, (contemporaneous, once and twice lagged), logarithm	EM-DAT: The OFDA/CRED International Disaster Database by Guha-Sapir et al. (2015).
DAC recipients	Historical list of DAC recipients (1997-2013)	Dreher and Langlotz (2015).

Notes: Data in calendar years if not marked as fiscal year (FY).

* Values are transformed to 2011 constant US$ using the GDP deflator from World Bank (2016b).

CHAPTER 4

Geopolitics, Aid and Growth

Joint with Axel Dreher and Kai Gehring

> *"UNSC membership offers a quasi-experiment to assess the impact of unconditional aid."*
> — Bueno de Mesquita and Smith

The debate on whether or not foreign aid is effective in promoting growth in recipient countries is ongoing and heated. Some papers find aid to be effective (Galiani et al. 2017), while others show that the effectiveness of aid is conditional on policies or institutions (Svensson 1999; Burnside and Dollar 2000). Still others find that aid has no effect on growth at all (Rajan and Subramanian 2008; Nowak-Lehmann et al. 2012). Arguably, much of this controversy is due to the lack of an accepted identification strategy. Endogeneity between aid and growth looms large, and no consensus exists in the academic literature as to which of the many papers contributing to the debate convincingly address the identification problem.[1] In this Chapter, rather than suggesting a new identification strategy to estimate the effect of aid on growth, we narrow the lens and investigate whether an important type of aid – aid given for political reasons – is less effective than other types of aid.

Specifically, this Chapter investigates whether foreign aid given to temporary members of the UNSC is less effective in promoting growth than aid given at other times. We discuss a number of reasons why donors' motives for giving aid can influence its effectiveness.[2] As we explain in more detail in Section 4.2, if donors are motivated purely by self-interest, their allocation decision might not take into account the way the recipient uses the aid. Donors may then fail to include growth-promoting policy conditions or waive them in case

[1] Dreher and Langlotz (2015) provide a detailed discussion.

[2] A handful of studies consider the impact of donor characteristics on aid effectiveness (Bobba and Powell 2007; Dreher and Kilby 2010; Bearce and Tirone 2010; Minoiu and Reddy 2010; Bermeo 2011). None of these studies provides a convincing identification strategy.

of non-compliance. Additionally, favoritism might allow projects to be pursued where important preconditions are not met or might reduce the time and resources devoted to the preparation of a project. The recipient might choose to use disbursed aid for purposes other than development if punishment for non-compliance is less likely, resulting in inferior growth outcomes on average. What is more, a politically motivated allocation of aid may result in the approval of lower-quality aid projects in favored countries instead of more promising projects elsewhere.

We exploit temporary membership on the UNSC to identify how geostrategic donor motives change the effect of aid on recipient country economic growth. As we detail in Section 4.2, temporary membership gives countries a powerful voice on the international stage. Such power is associated with benefits. Kuziemko and Werker (2006) show that temporary members receive a substantial increase in foreign aid commitments from the United States in years they serve as temporary members of the UNSC. This pattern holds for a broad range of donors, as shown in Dreher et al. (2009a,b) and Vreeland and Dreher (2014): The United States, Japan, Germany, as well as multilateral organizations such as the International Monetary Fund, the World Bank, the Asian Development Bank, the African Development Bank, and UNICEF, where major shareholders can to some extent steer the organizations' funds in line with their geopolitical interests.

We test whether and to what extent the aid received during a country's tenure on the UNSC affects growth differently compared to aid given at other times. We test the effect of a recipient country's geostrategic importance on the effectiveness of aid in promoting growth by adding UNSC membership and its interaction with aid to specifications that are otherwise identical to Clemens et al.'s (2012) first-difference permutations of Burnside and Dollar (2000). Specifically, we interact aid disbursements with nonpermanent UNSC membership at the time the aid was committed. Our approach thus resembles a difference-in-difference strategy, where we identify the differential effect of aid on growth as temporary membership on the UNSC varies.[3] The estimated effect of UNSC membership on aid effectiveness is causal to the extent that the difference in growth between members and non-members of the UNSC following changes in aid cannot be attributed to changes other than receiving more aid. The appropriateness of this approach is supported by Bueno de Mesquita and Smith (2010), who show that economic growth is not significantly different in countries at times they are elected to the UNSC compared to other times.[4] Pre-UNSC growth trends indicate that the common-trend assumption is

[3]This follows Dreher et al. (2013), who investigate the effect of recipient countries' geostrategic importance on the evaluation of World Bank projects. Their results show that for projects approved during times of macroeconomic crisis temporary UNSC membership reduces the probability of a positive evaluation upon completion.

[4]Bueno de Mesquita and Smith (2010) show that temporary members grow more slowly as a consequence of serving on the UNSC and argue that this reflects the negative effects of aid. They do not include

reasonable in our analysis.

While aid itself is arguably endogenous to contemporaneous growth, we are interested in the interaction of aid with UNSC membership rather than the effect of aid. UNSC membership is allocated quasi-randomly with respect to growth, aid and other potential determinants of aid and growth (Bueno de Mesquita and Smith 2010; Dreher et al. 2014). We thus assume that UNSC membership is exogenous to (future) growth and interpret the coefficient of the interaction term causally. More specifically, while the causal interpretation of the effect of aid on growth rests on the assumptions in Clemens et al. (2012), we do not have to rely on these assumptions to interpret the differential effect between politically motivated and other aid in a causal way. We explain this in more detail below. In a nutshell, omitted variables would have to be related to growth and to the interaction between UNSC membership and aid, and follow a very specific time-structure to affect our results. We perform placebo tests for different timings and a series of tests that include potentially important omitted variables. None of this changes our conclusions.

Based on a sample of 54 countries over the 1974–2009 period, we find that the effect of aid on growth is reduced by UNSC membership (see Section 4.4). This result holds when we restrict the sample to Africa, which follows the strictest norm of rotation on the UNSC and thus where UNSC membership can most reliably be regarded as exogenous (Vreeland and Dreher 2014) and is robust to a battery of other tests. Our results have at least two important implications. First, to the extent that aid is given for geostrategic reasons, it should not be considered "development" aid. It might be effective in achieving the donors' geostrategic objectives, but it is less effective than other aid in promoting developmental outcomes such as growth. Including such political aid in the category of development aid is likely to blur the potentially measurable effects of "true" development aid and is likely to add to frustration in the populations of donor countries granting the aid, ultimately reducing even those parts of aid that could be effective in raising growth.

The second implication of our results concerns the instrumental variables scholars use to identify the effect of aid on growth. A large number of studies base their analysis on instruments that proxy the geopolitical importance of a recipient country to the donor, implicitly or explicitly generalizing the Local Average Treatment Effect (LATE) to be representative of all aid, rather than political aid exclusively.[5] If geopolitical aid or aid given to recipients with political leverage more generally is less effective than other aid, the literature using political connections as instruments would not provide evidence of the

aid in any of their models however.

[5]The number of papers is too large to cite them all. A number of recent papers use (changes in) voting alignment between the donor and recipient in the United Nations General Assembly (e.g., Gary and Maurel 2013; Bjørnskov 2006; Creasey et al. 2015). Others use temporary membership in the United Nations Security Council, which is the focus of this Chapter (Christensen et al. 2011; Drometer 2013; Breitwieser and Wick 2016).

ineffectiveness of overall aid, but rather of aid given to politically important countries. Their estimates would represent a lower bound for the effects of overall aid, which could explain the lack of a positive effect of aid on growth in a large number of studies (e.g., Rajan and Subramanian 2008).

4.2 A Theory of Politically Motivated Aid

It seems intuitive to assume that politically motivated aid is less effective than aid mainly given to promote development.[6] As Rajan and Subramanian (2008: 655) point out, however, "to characterize strategic aid as 'bad' aid is mixing motives and consequences." According to Dreher et al. (2013), there are indeed good reasons why politically motivated aid may be just as effective as other forms of aid. Cold War donors, for example, may have wanted not only to curry favor with their client states, but also to help their allies succeed economically. A case in point, the East Asian Tigers received tremendous amounts of politically motivated assistance during the Cold War that does not appear to have impeded their economic development. Once an aid allocation decision has been made, the donor's aid bureaucracy must deliver the aid. The bureaucrats may want to implement effective programs regardless of the motivations of the donor, so that the existence of political favoritism in the allocation of aid need not imply its ineffectiveness. What is more, at any given time there may be a plethora of unfunded investment projects with similar potential effectiveness. Choosing among these projects according to political criteria may not necessarily reduce the average effectiveness of aid.

However, Dreher and Kilby (2010) and Dreher et al. (2013) stress that there are also strong reasons to expect that politically motivated aid is indeed less effective than average aid. The first is that a politically motivated allocation of aid may result in the approval of lower-quality aid projects in favored countries instead of more promising projects elsewhere. This presumes that the allocation decision is made in the presence of declining marginal returns, and political motivation results in projects with lower returns getting priority.

A second argument supporting the hypothesis of ineffective political aid is that politically motivated projects reduce the motivation of the donor and/or recipient to invest as much in the success of the project as they would otherwise. On the donor side, bureaucrats will arguably take account of their employer's incentive structure to some extent, as that might help them to advance in their careers or just spare them tedious work. To

[6] Consider as example Morgenthau (1962: 303, as cited in Werker 2012): "Bribery disguised as foreign aid for economic development makes of giver and recipient actors in a play which in the end they may no longer be able to distinguish from reality. In consequence, both may come to expect results in terms of economic development which in the nature of things may not be forthcoming."

the extent that developmental outcomes do not enter the employer's utility function, less effort might be spent on the ground to promote developmental objectives. Favoritism might thus allow projects to be pursued where important preconditions are not met or might reduce time and resources devoted to the preparation of a project (Kilby 2013, 2015). From the recipient's perspective, aid inflows may delay important policy reforms that would, among other things, also promote economic growth.

Focusing on the IMF and the World Bank, Stone (2008), Kilby (2009), and Noorudddin and Vreeland (2010) suggest that political favoritism undermines the credibility of conditionality, rendering it ineffective. Dreher and Jensen (2007) find that the conditions attached to loans given to political allies of the IMF's most important shareholders are less stringent. The results of Nielsen (2013) show that donors punish nonallies when they violate human rights by reducing aid but not their political allies. This does not imply that politically important countries necessarily follow unsound economic policies. Sometimes donors and recipients agree on policy; some recipient governments even invite policy conditionality (Vreeland 2003). Other times, governments may follow a different policy course than that recommended by the donor and still be successful. At other times, however, politically important recipient countries may be unable or unwilling to follow the donors' conditions even though their economy would benefit from the proposed adjustments.

Political motivations may also reduce the effectiveness of aid through a more subtle channel: Faye and Niehaus (2012) show that politically motivated aid might help facilitate political business cycles, as donors provide more aid to their political allies prior to elections. Aid thus helps incumbent governments to distort their economy, which can reduce growth rates directly (after the short-term stimulating effect of expansionary electoral policies evaporates). More importantly, this type of aid makes it more difficult for voters to select the "best" politicians, as they receive distorted signals of competence. What is more, election-related aid can be seen as a valuable prize, increasing the number of incompetent political actors who enter the political stage or even leading to coup d'états (Werker 2012). This can on average lead to less competent politicians and might thus reduce growth rates. Finally, Bobba and Powell (2007) suggest that aid-receiving allies might feel more obliged to spend politically motivated aid in the donor country than recipients of developmentally-oriented aid, even if goods and services could be bought at a lower price and/or higher quality elsewhere.

In summary, while it is theoretically unclear whether political aid has a different effect, there are many good reasons to expect that it is less effective than aid intended to promote development. We therefore turn to the empirics to answer this question.

4.3 Data and Method

Our proxy variable for geostrategic importance is a measure that has been shown in previous research to induce political favoritism: temporary membership on the UN Security Council. Ten temporary members are elected by the UN General Assembly, while five members serve on a permanent basis. Temporary members serve two-year terms, which are not immediately renewable. A number of studies show that temporary members of the UNSC receive substantial increases in aid, arguably due to the powerful geostrategic positions these countries enjoy during their tenure on the Council. Donors who have been shown to increase aid to members of the UNSC include the United States (Kuziemko and Werker 2006), Germany (Dreher et al. 2015), and Japan (Vreeland and Dreher 2014), as well as a number of multilateral organizations whose major shareholders have a substantial say over the allocation of resources and can to some extent sway these organizations' decisions according to their political interests (Vreeland and Dreher (2014) provide a summary).

Even if formally elected by the UNGA, most decisions on who gets elected to the UNSC are made at regional caucuses, where norms and rules differ between regions.[7] Dreher et al. (2014) and Vreeland and Dreher (2014) investigate these rules. They show that African nations typically rotate; Latin America and Asia hold competitive elections where regional hegemons win most often; Western Europe mixes rotation and competitive elections; and since the end of the Cold War, Eastern Europe shows no systematic pattern. Though which countries get elected to the UNSC is not strictly random, hardly any variable reliably predicts the timing of membership across regions. As Dreher et al. (2014) summarize their results, "UNSC election appears to derive from a compromise between the demands of populous countries to win election more frequently and a norm of giving each country its turn. We also find evidence that richer countries from the developing world win election more often, while involvement in warfare lowers election probability. By contrast, development aid does not predict election." We control for GDP per capita and (internal and external) conflict either in all models, or in our tests for robustness, while the effect of population size is hardly relevant in first differences. Controlled for the variables in the model, UNSC membership can thus be considered exogenous to growth. Arguably, the rotation among African countries provides the most reliably exogenous variation on when countries serve on the UNSC across our sample period.[8] We make use

[7] In around 80 percent of the elections only one country – nominated by a specific region – runs for election (Vreeland and Dreher 2014). Decisions at the regional caucuses are thus crucial in these elections.

[8] For Africa, Vreeland and Dreher (2014) find representation to be more likely for those countries with higher debt service payments, larger GNI per capita, greater voting alignment with the United States in the UNGA, and more corruption, controlling for country fixed effects. We control for these variables

of this exogeneity by replicating our results for Africa.

To allow comparability with existing research, our analysis closely follows the approach in Clemens et al. (2012), adding our variables of interest to their models. Clemens et al. (2012) show that the most prominent previous attempts to control for the potential endogeneity of aid rely on invalid instruments. Instead of suggesting more valid ones, they address the potential endogeneity of aid by differencing the regression equation and lagging aid, so that it can reasonably be expected to cause growth rather than being its effect. Thus, they assume that the main (short-term) effects of aid on growth occur, on average, one four-year-period after its disbursement. We base our analysis on their permutations of Burnside and Dollar (2000) – the study that arguably gained most attention in the recent literature on aid and growth. While we believe as do Clemens et al. (2012) that OLS regressions are superior to two-stage least squares regressions with questionable instruments, we stress that our estimate of whether aid affects growth could be biased in either direction,[9] and we refrain from interpreting the aid-growth relationship as causal. Instead, we focus on how temporary UNSC membership causally changes the effect of aid on growth.

In terms of timing, we follow Clemens et al. (2012) and assume that disbursed aid on average takes one four-year-period to become effective in increasing or decreasing economic growth.[10] We also assume that bottlenecks in the donor and recipient administrations prevent aid committed from being disbursed immediately, so that the bulk of aid committed in one four-year-period is disbursed one period later, on average.[11] In accordance with these assumptions about the timing of the aid disbursement and growth effects of aid we are interested in growth rates two periods after UNSC membership. We illustrate the timeline derived from our considerations in Figure 4.1 (but also test different timings below).

We expect that aid committed in period $(t-2)$, which is disbursed in period $(t-1)$, is less effective in promoting growth in period (t) for countries that are UNSC-member

either in all regressions or in the Section 4.A.

[9] For example, donors might grant more aid to a new reform-oriented government. Increased growth resulting from these reforms could then spuriously be attributed to the increases in aid. On the other hand donors might give more aid to countries where they anticipate shocks to reduce future growth rates.

[10] As summarized in Headey (2008), aid affects growth most substantially 5–9 years after it has been disbursed, on average. If aid is disbursed evenly over time, the average positive distance between a dollar being disbursed and growth in the contemporaneous four-year-period is 16 months (Roodman 2007; Headey 2008). Headey (2008) thus lags aid by one four-year period, so that the average positive distance between disbursements and their potential effects is five years and four months.

[11] For example, a 1999 report of the British House of Commons' Select Committee on International Development reports a delay between European Commission aid commitments and disbursements of almost five years (cited in Odedokun 2003: 7). See OECD (2003) for an in-depth discussion of reasons for delayed disbursements.

during period $(t-2)$. Figures 4.2 – 4.4 provide a first impression of the data. Figure 4.2 shows total aid commitments (in constant 2000 million US$) from all DAC-donors for four-year-periods, to countries that either do not serve in any of the periods shown in the figure, serve one, or serve two years of a period on the UNSC.[12] We also show the amount of aid UNSC members received in the period before serving on the UNSC (i.e., period $(t-3)$) and the first period in which they no longer serve (i.e., period $(t-1)$). As can be seen, aid commitments are substantially larger for countries that have served one or two years out of a four-year-period on the UNSC, compared to countries that do not serve. They are also larger for UNSC members compared to what these same countries received in the previous period and to what they receive in the period after they have been on the UNSC (these differences are statistically significant at the one-percent level).

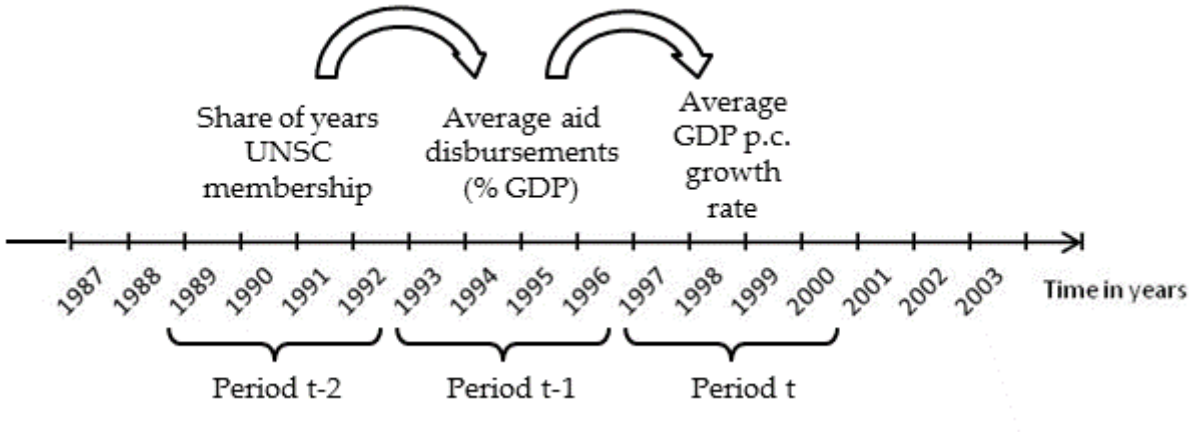
Figure 4.3 focuses on net aid disbursements (also in constant 2000 million US$) one four-year-period after a country has been on the UNSC. For comparison, the figure also shows aid disbursements for countries that have not been on the UNSC in any of the periods shown in the figure, as well as disbursements at the time the country is on the UNSC (i.e., UNSC$(t-2)$), and two periods later (i.e., UNSC(t)). The figures support the hypothesized pattern: While commitments increase in the contemporaneous four-year-period of membership (t-2); the accompanying disbursements increase in the period following UNSC membership $(t-1)$. Thus, aid commitments during UNSC membership indeed seem to be disbursed on average one period later. Both commitments and disbursements move back to their initial levels in periods $(t-1)$ and (t), respectively, increasing our confidence in this time structure. Overall, the effects coincide with UNSC membership, and disappear after the temporary member loses its extraordinary geopolitical importance.

Figure 4.4 shows mean yearly growth rates of per capita GDP for different lags of UNSC membership. The first bar displays the growth rates for countries that are not members of the UNSC. The other bars show the growth rates for different lags of UNSC membership: Growth during UNSC membership, one period before, one period later, two periods later, and three periods later. Figure 4.4 shows that compared to countries not on the UNSC, temporary members subsequently experience lower growth rates.[13]

As expected, growth is lowest two periods after UNSC membership. Note that growth rates are substantially higher one further period later $(t+1)$. This pattern is in line with our hypothesis that the increased aid committed in period $(t-2)$ during temporary UNSC membership (Figure 4.2), which is disbursed in large parts in period $(t-1)$ (Figure 4.3), has an adverse effect on how aid affects growth in period (t) (Figure 4.4). While these descriptive statistics imply no causality, their pattern lends support to our story.

[12]This is in line with Bueno de Mesquita and Smith (2010).
[13]This is in line with Bueno de Mesquita and Smith (2010).

Figure 4.1: The proposed timeline



Notes: The figure shows the lag that we expect between aid commitments and its effect on growth. We expect aid committed due to temporary membership on the UNSC in one four-year period to be disbursed in the next, and to be effective (or not) yet one four-year period later.

Next we turn to our econometric specification. According to Clemens et al. (2012), the appropriate method to test the effect of aid on economic growth accounts for the non-linear effect of aid through a square term, removes country fixed-effects through first-differencing, and lags aid by one period. As they argue, this minimizes potential misspecification due to reversed causality between aid and growth, and omitted variables bias.[14] This is also our preferred estimation strategy. Following Clemens et al. (2012) our reduced-form empirical model is at the country-period level:

$$\begin{aligned}\Delta Growth_{i,t} = \alpha \; + \; \beta \, \Delta Aid_{i,t-1} \; + \; \gamma \, \Delta(Aid^2_{i,t-1}) \; + \; \delta \, UNSC_{i,t-2} \\ + \; \zeta \, UNSC_{i,t-2} \; * \; \Delta Aid_{i,t-1} \; + \; \Delta X'_{i,t} \, \eta \; + \; \Delta \epsilon_{i,t}\end{aligned} \tag{4.1}$$

where $Growth_{i,t}$ is a country i's average yearly real GDP per capita growth over period (t). $Aid_{i,t-1}$ denotes the amount of aid (as a percentage of GDP) disbursed in the previous period; $UNSC_{i,t-2}$ indicates the share of years country i was a temporary member of the UNSC two periods before.[15] As we expect that aid commitments are, on average, disbursed one period later, we twice-lag the share of temporary membership on the UNSC ($UNSC_{i,t-2}$).

All regressions include the complete set of (time-variant) control variables used by Clemens et al. (2012), which we denote $X_{i,t}$.[16] These variables are GDP per capita in the first year of each period, Assassinations, the interaction of Ethnic Fractionalization with Assassinations, M2/GDP (lagged), Policy, and period dummies.[17] Our preferred specification also includes aid squared to test decreasing returns to aid, again following Clemens et al. (2012). Finally, we allow for a heteroskedastic error term that may be arbitrarily correlated within countries.

Three potential concerns about our identification strategy deserve attention: First, one could argue that UNSC membership should be included in differences instead of levels. To us, it seems intuitive that the level rather than changes in UNSC membership conditions the effectiveness of changes in aid. Nevertheless, our results are robust to first-differencing the share of UNSC membership, as we show below. Second, it could be argued that

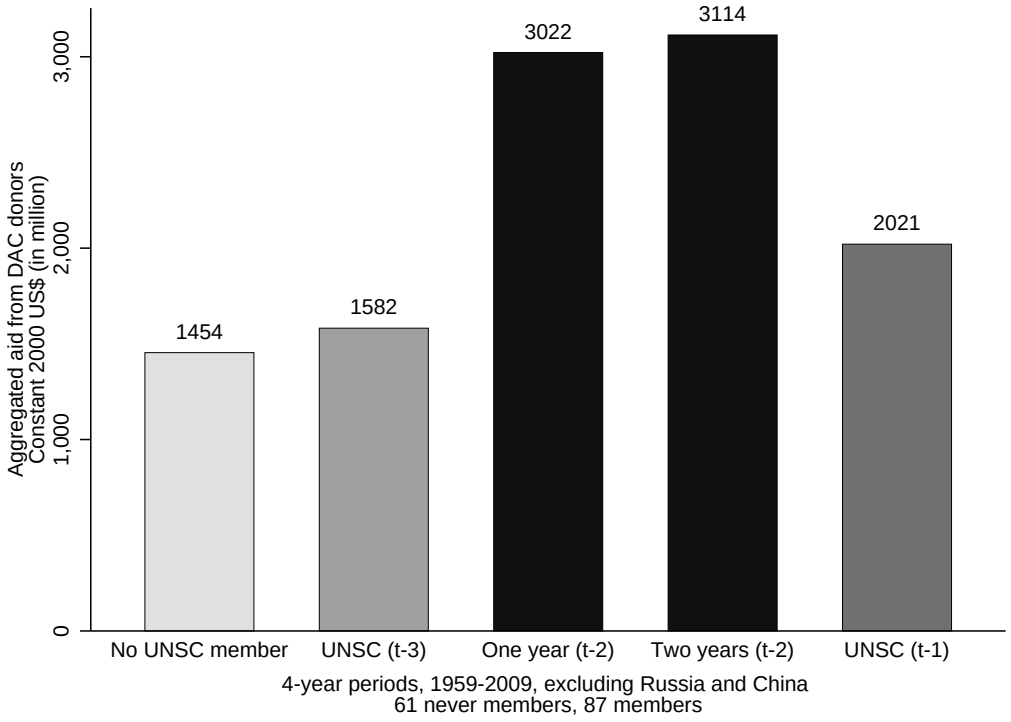
[14] In addition, they seem to prefer a measure of early-impact aid over all aid. This measure has been shown to not be a robust predictor of growth (Rajan and Subramanian 2008; Bjørnskov 2013). What is more, a major drawback with this measure is that disaggregated aid disbursements are not available for the entire period, so that disbursements have to be estimated based on commitments. We therefore prefer to focus on overall aid. However, we replicate the analysis using early-impact aid instead of all aid below.

[15] We exclude the permanent UNSC members Russia and China from the analysis.

[16] Table A.1 reports the sources and definitions of all variables, while we show descriptive statistics in Table A.2.

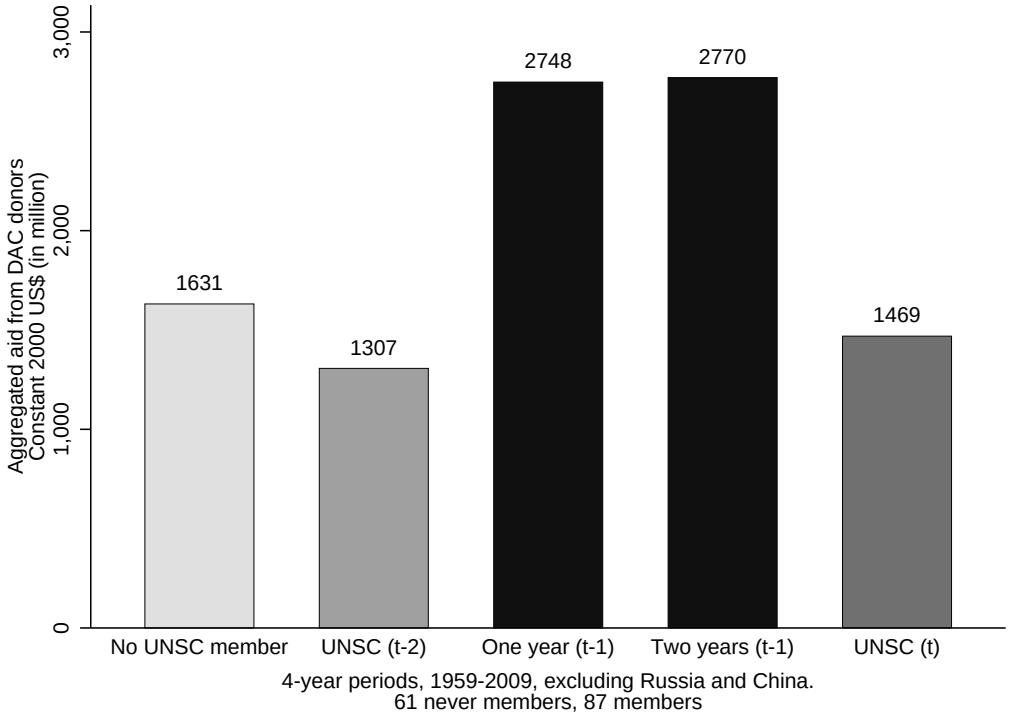
[17] The policy index is based on measures of budget balance, inflation, and openness to trade. The original Burnside and Dollar (2000) study also includes time-invariant variables that are removed here as in Clemens et al. (2012) through taking first-differences.

Figure 4.2: Total aid commitments and temporary UNSC membership



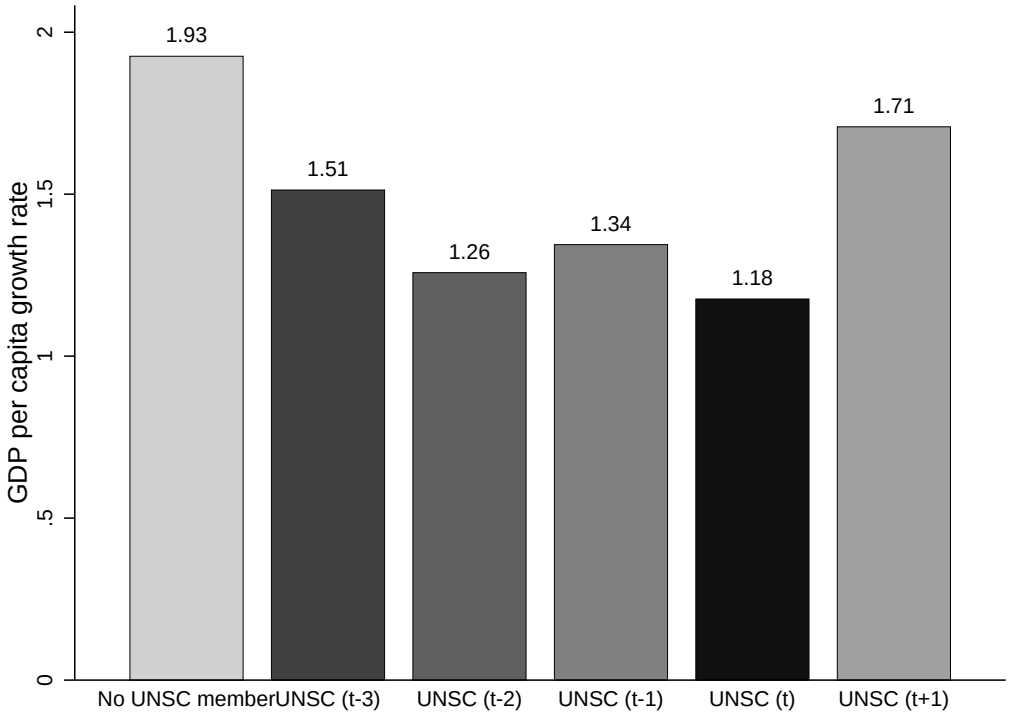
Notes: The figure shows total aid commitments, where (t) refers to the period we expect the aid to impact on growth. "No UNSC" refers to countries that are not temporary member of the UNSC in any of the periods shown; $(t-2)$ is the period of temporary UNSC membership. We show aid committed while countries serve on the UNSC either one or two years of a four-year period (in $t-2$), the amount of aid committed to those who will serve on the UNSC in the next period $(t-3)$ and those who have served in the previous period $(t-1)$. *Source*: Own calculations; see Appendix Table A.1 for variable definitions and sources.

Figure 4.3: Total aid disbursements and temporary UNSC membership



Notes: The figure shows total aid disbursements, where (t) refers to the period we expect the aid to impact on growth. "No UNSC" refers to countries that are not temporary member of the UNSC in any of the periods shown; $(t-2)$ is the period of temporary UNSC membership. We show aid disbursed while countries have served on the UNSC in the previous period for either one or two years of a four-year period (i.e., in $(t-1)$), the amount of aid disbursed to those who serve on the UNSC in the current period $(t-2)$ and those who have served two periods ago (t). *Source*: Own calculations; see Table A.1 in the Appendix of this chapter for variable definitions and sources.

Figure 4.4: Mean GDP per capita growth rate in percent (in period t) and temporary UNSC membership



Notes: The figure shows GDP p.c. growth (averaged over four-year periods), according to whether or not countries have served as temporary members of the UNSC, where (t) refers to the period we expect the aid to impact on growth. "No UNSC" refers to countries that are not temporary member of the UNSC in any of the periods shown; $(t-2)$ is the period of temporary UNSC membership. Growth rates are lowest two periods after membership (i.e., in (t)). *Source*: Own calculations; see Table A.1 in the Appendix of this chapter for variable definitions and sources.

temporary UNSC membership should be interacted with aid squared as well. Political motivation would then not only change the level of the marginal effect of aid, but also its slope. Such an interaction effect, however, is not significant in our models (the p-value being 0.99 in our preferred specification) and of a very small magnitude. As its inclusion is not compelling in terms of theory and complicates the interpretation of results, we do not include it here. Note however that this choice does not affect the results.[18]

A third and important concern is the potential endogeneity of aid. However, our coefficient of interest is the interaction between aid and UNSC membership (ζ in Equation 4.1). This coefficient can be estimated consistently under a set of assumptions that do not require aid to be exogenous. Following Bun and Harrison (2014) and Nizalova and Murtazashvili (2016), 4.A in the Appendix of this chapter provides a formal presentation of these assumptions.

The first assumption is the exogeneity of nonpermanent UNSC membership, conditional on the variables in the model. The second is that the endogeneity of aid due to any omitted variable bias must be independent of UNSC status. More specifically, we assume that any bias resulting from the (potential) endogeneity of aid (in $t-1$) is the same in countries on and off the UNSC (in $t-2$). Both assumptions find support in previous research. Bueno de Mesquita and Smith (2010), Dreher et al. (2014), and Vreeland and Dreher (2014) test the possibility that countries that become politically or economically more important over time receive more aid, have a higher probability of being elected to the UNSC and have higher rates of economic growth simultaneously. Temporary members of the UNSC might be able to draw attention to their legitimate developmental needs, giving them access to additional funds that are unrelated to political motives. These authors find that election to the UNSC is hardly related to variables that also affect the amount of development aid a country receives or that systematically affect growth across regional caucuses. We tested whether growth differs in the period before countries enter the UNSC compared to all other periods. It does not (p-value: 0.47).[19] We tested whether economic volatility differs between countries on and off the UNSC. To the extent that the economies of countries elected to the UNSC are more volatile, such volatility could reduce the effect of aid on growth. The variance of economic growth of countries on and off the UNSC does not differ (p-value: 0.58). Finally, we make use of the varying regional norms in how members get elected to the UNSC introduced above. As emphasized in Vreeland and Dreher (2014), rotation of seats in the African region most strongly conforms to the assumption of randomly assigned membership status. We therefore replicate our regressions focusing on a sample of African countries and confirm our main results. Overall,

[18] See Table A.9 in Section 4.A in the Appendix of this chapter.

[19] This also holds two or three periods earlier, making the "common-trend assumption" plausible (see column 2, row 1 of Table 4.2).

conditional on the variables in our models, it seems reasonable to assume that UNSC membership provides exogenous variation in the geopolitical importance of a country for the two years of membership.[20] Of course, the exogeneity of temporary UNSC membership does not guarantee that membership has no effect on growth two periods later through channels other than aid. The existence of alternative channels would not affect the consistency of the estimated interaction term except in the case that such an omitted variable is also correlated with aid in a manner consistent with our timing. While we control for several potential determinants of growth that UNSC membership could most plausibly affect in section 4.A in the Appendix of this chapter, it is impossible to rule out that other such variables exist. However, changes in these variables would need to change the effect of aid on growth in order to threaten our results. While a large number of variables have been suggested to increase or decrease the effectiveness of aid, many of these interactions have been shown to be fragile (e.g., Doucouliagos and Paldam 2009). But even if the effectiveness of aid depends on omitted variables that change due to temporary membership on the UNSC, we can still test whether UNSC membership causally changes the effectiveness of aid (though a differential effect of aid would then be caused by changes in external circumstances rather than by changes in the quality of the aid).

This would no longer be the case if donors allocate their aid in response to UNSC membership in a way that depends on omitted variables that in turn affect growth. For example, donors might allocate more aid to countries experiencing economic downturns when these countries are UNSC members, so that the endogeneity of aid due to economic downturns would depend on UNSC status. Dreher et al. (2013) test whether the effect of UNSC membership on the number of (World Bank) aid projects depends on borrowing countries' need. They find this not to be the case. To further test the importance of potentially omitted variables in our regressions, we follow the approach of Altonji et al. (2005). We compare the relative impact that unobserved variables would need to have on our coefficients of interest compared to observable variables to make the interaction of UNSC membership and aid indistinguishable from zero. To this end, we include the interactions of temporary UNSC membership with variables indicating economic and political crises (as well as the respective variables in levels) to our preferred specification.[21] The

[20] Alternatively, we can replace the assumption that nonpermanent UNSC membership is exogenous with the less restrictive assumption that any channel by which future growth affects UNSC status is independent of aid. More specifically, we would have to assume that any bias resulting from the (potential) endogeneity of UNSC$(t-2)$ is independent of ΔAid_{t-1}. While this assumption is more lenient than assuming exogeneity of UNSC membership, it comes at the cost that the coefficient of UNSC membership itself is no longer estimated consistently. What is more, we are convinced of the exogeneity of UNSC membership, so we report this modified assumption for completeness only (see Section 4.A in the Appendix of this chapter).

[21] Specifically, we include interactions with debt (as share of GNI), short term debt (as share of total external debt), GDP per capita at the beginning of each period, and assassinations to our baseline

coefficient of interest becomes larger rather than smaller and more precisely estimated. Overall, we consider a violation of our identifying assumptions unlikely.

To convince the reader of the reliability of our estimations, we control for a large number of variables in addition to those used in Clemens et al. (2012) which could potentially affect how UNSC membership changes the effect of aid on growth, and follow the time pattern we suggest: (changes in) the share of foreign direct investment, trade, and imports in recipient countries' GDP, various facets of institutional quality including internal and external conflict, and voting alignment with the United States in the UNGA. Controlling for these variables further increases our confidence that the difference-in-difference-like estimation we suggest identifies a causal difference in the effect of aid on growth depending on UNSC membership.

4.4 Results

Table 1 shows the main results, covering the 1974–2009 period. All variables are averaged over four years. The dependent variable is the average annual growth rate of real GDP per capita; aid is measured as net Official Development Aid (ODA) as a percentage of GDP.[22] When we do not account for diminishing returns to aid by including aid squared, the coefficient of the interaction term is negative and significant at the five-percent level (column 1). When we include aid squared, the interaction becomes significant at the one-percent level (column 2).[23] According to column 2, for any increase in ΔAid, the effectiveness of this change in aid disbursements decreases with the share of the period the recipient country has spent on the UNSC two periods before (i.e., when the aid has been committed). The causal effect of a one percentage point increase in aid as a percentage of GDP on yearly economic growth is 0.64 percentage points higher if the recipient has not served on the UNSC compared to if it has served two years (i.e., 1/2 of the four-year period). Compared to the average growth rate of about 1.34 percentage points in our sample, this is a substantial reduction of almost half the average growth rate. The results thus support our hypothesis that aid committed during times of short-term political importance is indeed less effective.

Figure 4.5 shows the marginal effects for the model of column 2 and the corresponding

regression. Detailed results are available on request.

[22] The original source for GDP per capita growth is the World Bank's World Development Indicators; ODA is total net ODA in current US$ from Table 2 of the OECD's Development Assistance Committee in percent of GDP in current US$, taken from the World Development Indicators (see the Technical Appendix to Clemens et al. 2012). Data for the 2006–2009 period are from Minasyan (2016) and World Bank (2016c).

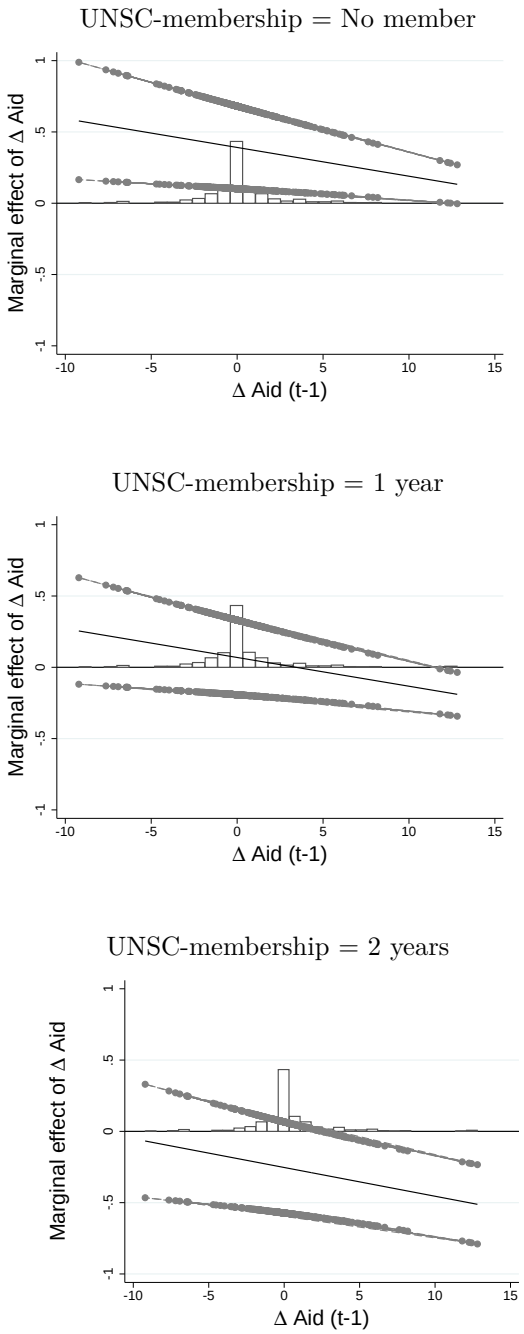
[23] We also tested whether the effect differs when we only take important years of UNSC membership into account, as suggested in Kuziemko and Werker (2006). The results remain unchanged.

Table 4.1: Politically motivated aid and growth, OLS, 1974-2009

	(1)	(2)	(3)	(4)
ΔAid (t-1)	0.116	0.473**	0.142	0.345
	(0.085)	(0.208)	(0.139)	(0.329)
ΔAid squared (t-1)		-0.010**		-0.006
		(0.004)		(0.006)
UNSC (t-2)	-1.384	-1.368	-1.737	-1.732
	(0.832)	(0.836)	(1.216)	(1.247)
UNSC (t-2) * ΔAid (t-1)	-0.981**	-1.289***	-1.446***	-1.547***
	(0.429)	(0.379)	(0.295)	(0.338)
ΔGDP p.c. at start of period	-3.607*	-3.731**	-1.472	-1.770
	(1.904)	(1.801)	(4.068)	(3.745)
ΔAssassinations	-0.198	-0.184	0.695	0.486
	(0.179)	(0.169)	(0.942)	(0.969)
ΔAssassinations *	0.337	0.307	-3.610	-3.172
ΔEthnolinguistic Fractionalization	(0.341)	(0.327)	(3.354)	(3.417)
ΔM2/GDP	-0.003	-0.004	0.043*	0.039*
	(0.016)	(0.014)	(0.024)	(0.020)
ΔPolicy	0.923***	0.940***	0.918**	0.913***
	(0.160)	(0.165)	(0.330)	(0.324)
Sample	All	All	Africa	Africa
Adj. R-Squared	0.171	0.190	0.139	0.142
Number of Observations	393	393	145	145
Number of countries	54	54	24	24

Notes: The dependent variable is growth of real GDP per capita and covers the 1970–2009 period. All regressions use averages over four years, include variables in first differences (except for the UNSC variable) and include period dummies. Robust standard errors in parentheses clustered at the recipient country level. *Source*: Own calculations; see section A.1 in the appendix of this Chapter for variable definitions and sources.

Figure 4.5: Marginal effect of ΔAid



Notes: Marginal effect of changes in aid disbursements on changes in economic growth conditional on varying temporary UNSC membership and the control variables (based on Table 4.1, column 2). The histogram shows the distribution of ΔAid in the regression sample: The upper and lower lines show the 90% confidence interval with dots representing individual observations. Note that the significant interaction term in the regression shows that these marginal effects differ significantly from each other. The derivation of the marginal effects can be found in Section 4.A in the Appendix of this Chapter. *Source*: Own calculations; see Section A.1 in the Appendix of this Chapter for variable definitions and sources.

90%-confidence intervals. The marginal effect of changes in aid on changes in growth depends on the magnitude of the change in aid and on membership on the UNSC. As the marginal effects depend on ΔAid and $\Delta\left(Aid^2\right)$, any quantitative interpretation obviously depends on whether the coefficients of these variables are estimated consistently, and thus on the identifying assumptions in Clemens et al. (2012). As can be seen, the effect declines for higher values of ΔAid, reflecting diminishing returns to aid.[24] The aid-growth relationship is positive for countries that have not served on the UNSC when aid has been committed,[25] while being largely insignificant for countries that have served one year, and significantly negative for those who served two years. For a country with the median aid-to-GDP ratio (1.59 percent of GDP) the estimated effect of this aid on growth is 0.72 when the country has not served on the UNSC, but 0.21 when the country has served one year on the UNSC, and 0.30 when it has served two years. The negative consequences of the donors' political motivations are thus not only statistically but also economically significant. Columns 3 and 4 of Table 4.1 reproduce the regressions focusing on Africa only. African nations follow the strictest norm of rotation on the UNSC among all regional election caucuses, making the exogeneity of UNSC membership particularly hard to challenge (Dreher et al. 2014). The coefficient on the interaction term is negative and significant at the one-percent level independent of whether we exclude aid squared (in column 3) or include it (in column 4). We also tested whether the effect of UNSC membership on the effectiveness of aid is different for Africa, compared to other regions of the world. We find this not to be the case, at conventional levels of significance (p-value: 0.69).[26] The results so far are in line with our proposed timeline. However, this does not preclude the potential importance of other sequences between membership on the UNSC and aid disbursements. Thus, Table 4.2 reports results where we replicate the regressions of column 2 in Table 4.1 using alternative timelines to examine whether and to what extent other possible sequences are supported by the data. We test whether the effectiveness of aid disbursed in periods (t), $(t-1)$, and $(t-2)$ is affected by UNSC membership in periods $(t+1)$, (t), $(t-1)$, and (t-2). For example, if aid disbursed to UNSC members would prove to be less effective in the period of membership (rather than one period later), an explanation could be that contemporaneous membership affects compliance with conditionality and thereby makes the aid less effective. While Table 4.2 shows the coefficients and standard errors of the interaction terms only, note that the respective aid, aid squared and UNSC variables are included in each regression (as are the remaining

[24] The marginal effect of a change in aid is linear in the lagged difference and in the twice-lagged level of aid (see Section 4.A in the Appendix of this Chapter).

[25] This holds unless the change in aid exceeds 10 percent of GDP.

[26] Figure A.2 in Section 4.A in the Appendix of this Chapter shows the marginal effects. To the extent that the effects of UNSC membership on aid effectiveness are homogeneous across regions this indicates that selection on unobservables in the other regions is of no significant amount.

control variables). As can be seen, the only significant coefficient is the one following our previously proposed and theoretically most likely timeline ($Aid_{t-1} * UNSC_{t-2}$) that we show here for comparison. The regressions thus support our proposed timeline, and our considerations behind it. The table shows that this also holds when we focus on future UNSC membership, which we included here as a placebo test.

We further test the robustness of our results in a number of ways. First, we replace the share of years a country has served on the UNSC with a binary indicator variable for a country's presence on the UNSC. Second, we first-difference the UNSC variable rather than including it in levels. Third, we lag all control variables by one period rather than including them contemporaneously. Fourth, we employ early-impact aid as defined in Clemens et al. (2012) instead of all aid.

Fifth, in light of the identifying assumptions discussed above, we include a number of additional variables (as changes between $(t-2)$ and $(t-1)$) which could potentially induce omitted variables bias. Most importantly, we control for changes in the institutional environment by including the ICRG variables measuring Bureaucracy Quality, Corruption, Democratic Accountability, Ethnic Tensions, External Conflict, Government Stability, Internal Conflict, Investment Profile, Law & Order, Military in Politics, Political Risk Rating, and Religious Tensions. One at the time, we also include imports of goods and services (as a share of GDP), trade (as a share of GDP), Foreign Direct Investment inflows (as a share of GDP), the recipient country's voting alignment with the United States in the UN General Assembly, and debt service (as share of GNI). Controlling for these additional influences considerably reduces any remaining risk of omitted variable bias. As our final test for robustness, we employ Clemens et al.'s (2012) permutations of Rajan and Subramanian (2008) instead of those of Burnside and Dollar (2000).[27]

The results are shown in Table 4.3. They show that our main result is unaffected by all of these additions. The robustness of our results to the inclusion of a large number of variables increases our confidence that the main specification above does not violate the identifying assumptions, so that the estimates above are consistent.

Finally, we turn to explanations for our results. As we have discussed in Section 4.2, the previous literature identified a number of transmission channels for individual donors. Dreher et al. (2013) show that political motives reduce the quality of World Bank projects. Also for the World Bank, Kilby (2015) reports that political allies are allowed to start projects with inferior preparation. Stone (2008) finds that political favoritism undermines the credibility of IMF conditionality.

[27] In a previous version of this Chapter we estimated all main models in this framework and also show regressions using those of Bueno de Mesquita and Smith (2010). See Dreher et al. (2014) for details.

Table 4.2: Politically motivated aid and growth, different timelines

(1)		(2)		(3)	
Interaction	Coefficient/ Std.err.	Interaction	Coefficient/ Std.err.	Interaction	Coefficient/ Std.err.
ΔAid(t)* UNSC(t+1)	-0.360	ΔAid(t-1)*UNSC(t+1)	-0.215	ΔAid(t-2)*UNSC(t+1)	0.575
	(0.694)		(0.480)		(0.741)
ΔAid(t)*UNSC(t)	-0.377	ΔAid(t-1)*UNSC(t)	0.157	ΔAid(t-2)*UNSC(t)	0.104
	(0.444)		(0.915)		(0.539)
ΔAid(t)*UNSC(t-1)	0.270	ΔAid(t-1)*UNSC(t-1)	0.003	ΔAid(t-2)*UNSC(t-1)	0.407
	(0.470)		(0.412)		(0.421)
ΔAid(t)*UNSC(t-2)	0.152	ΔAid(t-1)*UNSC(t-2)	-1.289***	ΔAid(t-2)*UNSC(t-2)	-0.114
	(0.166)		(0.379)		(0.384)

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years and include variables in first differences (except for the UNSC variable). They include the corresponding aid, aid squared, and UNSC terms and all other control variables (as in column 2 in Table 4.3). The dependent variable covers the 1974–2009 period. Robust standard errors in parentheses clustered at the donor country level. *Source*: Own calculations; see Section A.1 in the Appendix of this Chapter for variable definitions and sources.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In order to test these transmission channels in our broad sample of donors, we would require data on aid conditionality and compliance with these conditions, project success, and time and resources invested in project preparation. These data do not exist for a broad sample of donors. Data exist, however, on different aid modalities and the sectoral composition of aid across recipient countries that are on the UNSC and those that are not. Previous research argues that the effectiveness of aid depends on the sector the aid is given to and the modalities through which it is delivered (Bjørnskov 2013). To the extent that UNSC membership affects composition and modalities,[28] the effectiveness of aid would change.

Table A.10 in Section 4.A in the Appendix of this Chapter reports the amount of aid committed to individual sectors while countries have been temporary members of the UNSC compared to other times (in constant 2011 million US$), for the 1973–2011 period. There are substantial differences between those countries on the UNSC and the rest. When we perform a simple t-test for equality of a certain category's share in total aid committed to UNSC members and nonmembers we find that the share increases significantly in 7 of the 26 sectors, and decreases in one sector. For example, UNSC members receive larger general budget support (+46%), more aid for other social infrastructure (+105%), more food aid (59%), but less emergency aid (+39%). According to Nunn and Qian (2014), US food aid increases the risk of civil conflict. Bjørnskov (2013) shows that a category of aid that includes emergency aid increases growth. Both increases in food aid and reductions in emergency aid are thus likely to reduce the effectiveness of aid.

Strong differences also arise when we focus on the aid modality (as we show in Table A.11 in Section 4.A in the Appendix of this Chapter). The results indicate increases in all types of aid for temporary members of the UNSC. In particular, budget aid increases by 192% during UNSC membership, while the increase in project aid is 95%. Loans increase by 137% and grants by 32%. The increases of these types of aid in a recipient's overall aid are all statistically significant at the five-percent level. Note that budget support is the type of aid that offers most flexibility to the recipient government and is thus particularly attractive to use for political reasons. To the extent that these different types of aid affect economic growth differently, the different composition of aid could also explain the effect that we identified.

[28] Bayer et al. (2014) provide initial evidence. Their results show that countries prefer to work with UN agencies rather than the World Bank in implementing projects under the Global Environment Facility while being on the UNSC.

Table 4.3: Tests for robustness

		Interaction coefficient	Observations
(1)	UNSC dummy	-0.626***	393
(2)	UNSC in first-differences	-0.384**	393
(3)	Control variables lagged	-1.012**	359
(4)	"Early impact" aid	-1.470*	354
(5)	Including all ICRG institutional measures	-0.975**	214
(6)	Including Imports/GDP	-1.254***	378
(7)	Including Trade/GDP	-1.261***	378
(8)	Including FDI/GDP	-1.125***	317
(9)	Including voting with U.S. in UNGA	-1.260***	385
(10)	Including Debt/GNI	-1.397***	367
(11)	Rajan & Subramanian specification	-1.365**	351

Notes: The dependent variable is growth of real GDP per capita and covers the 1974–2009 period. All regressions use averages over four years, include variables in first differences (except for the UNSC variable, which is estimated in first differences in row 2 only) and add additional controls as indicated. All regressions include the corresponding aid, aid squared, and UNSC terms and, except for row 11, the same control variables as column 2 in Table 4.1. Row 1 includes a binary indicator for temporary UNSC members instead of the share of years, while row 2 includes the share of UNSC membership in first differences rather than in levels. Row 3 lags all control variables by one period. Row 4 substitutes (net) Aid with (gross) "Early impact" aid as defined in Clemens et al. (2012) and, following their models, also includes repayments/GDP and (repayments/GDP) squared. We interact the linear "Early impact" and the repayment term with the UNSC variable. Row 5 includes the ICRG variables (Bureaucracy Quality, Corruption, Democratic Accountability, Ethnic Tensions, External Conflict, Government Stability, Internal Conflict, Investment Profile, Law and Order, Military in Politics, Political Risk Rating, and Religious Tensions), all of which are available since 1984 only. Row 6 includes the (lagged) first difference of Imports of goods and services (as a share of GDP), row 7 adds Trade (as a share of GDP), row 8 adds Net FDI inflows (as a share of GDP), row 9 adds the recipient country's voting alignment with the United States in the UN General Assembly, and row 10 includes total debt service (as a share of GNI). Row 11 focuses on Clemens et al.'s (2012) permutations of Rajan and Subramanian (2008). Their control variables are Aid Squared, Initial GDP/capita, Initial Policy, (log) Initial Life Expectancy, Institutional Quality, (log) Inflation, Initial M2/GDP, Budget Balance/GDP, Revolutions, and period dummies; all data are averaged over five-year-periods. Variations in sample size arise from incomplete information on the additional variable(s) included. For each of the above tests for robustness, Section 4.A in the Appendix of this Chapter shows full results for the aid and UNSC variables and their interaction. Robust standard errors in parentheses clustered at the recipient country level. *Source*: Own calculations; see Section Table A.1 in the Appendix of this Chapter for variable definitions and sources.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.5 Conclusion

In this Chapter we addressed the question of whether a recipient country's short-term geopolitical importance reduces the effectiveness of the development aid it receives. We made use of a straightforward proxy for the geopolitical importance of a country. Specifically, we exploited the quasi-random variation in aid disbursements resulting from the recipient being of extraordinary geopolitical importance during its temporary membership on the UNSC. The previous literature has shown that temporary members of the UNSC receive substantial increases in aid (Kuziemko and Werker 2006; Dreher et al. 2009a,b). To the extent that political motives for the allocation of aid negatively affect its consequences, the aid a country receives while serving on the UNSC should be less effective on average. The literature also shows that the time spent to prepare aid projects, the number of aid conditions as well as punishment of non-compliance with such conditions differ for politically important aid recipients. Overall, we therefore expect aid given to countries of short-term political importance to be less effective in promoting growth than aid given at other times.

Rather than suggesting our own econometric model, we augment Clemens et al.'s (2012) permutations of Burnside and Dollar (2000) with our exogenous measure of politically motivated aid. Our results show that aid committed while a recipient is a member of the UNSC is less effective in increasing economic growth. This holds when we restrict our sample to African countries, which follow the strictest norm of rotation for UNSC membership.

While we did not aim to test whether aid is effective, but rather, whether aid effectiveness is reduced due to the short-term political importance of recipients, our findings have direct implications for the existing and future aid effectiveness debate. To the extent the reader accepts the regressions presented in Clemens et al. (2012) as a causal test for the effectiveness of aid, our results imply that overall aid increases growth, while aid given to countries at the time they are of geopolitical importance is insignificant or harmful to growth. In any case, aid to important countries is less effective than aid given at other times. Political motives channel more aid to temporary UNSC members whose subsequent growth rates might increase to the extent that the marginal effect of aid remains positive. This increase could however come at the cost of reduced aid and larger losses in growth elsewhere, inducing UNSC-related cycles in growth.

An important implication of our results relates to the identification strategy in the previous aid effectiveness literature, much of which tries to identify the causal effects of overall aid by instrumenting for aid using political variables. Our results show that geopolitical variables are of limited use as instruments for overall aid when "political aid"

is different. More specifically, our results suggest that the estimated effects of politically motivated aid – often reported as the effect of all aid in previous studies using such instruments – represent the lower bound of the true effect of all aid.

In terms of increasing the effectiveness of aid, there are arguably two possibilities. First, the giving of foreign aid could be separated from political motives, so that it truly becomes "development aid." Given the incentives of donors to use aid to achieve their geopolitical goals this is unlikely to happen. Second, researchers should identify the exact channels through which geopolitical motives reduce the effectiveness of aid. The choice of a suitable remedy would depend upon which of the channels outlined above is responsible for the reduced effectiveness of aid. We leave such analysis for future research.

4.A Appendix: Figures, Tables and Additional Notes for "Geopolitics, Aid and Growth"

Table A.1: Sources and definitions

Variable	Definition	Original source
UNSC Membership	Share of years a country has served as a temporary member on the UNSC in a given period.	Dreher et al. (2009b).
Democracy	Dummy that is 1 if the country is a democracy during at least half the period under consideration.	Cheibub et al. (2010).
Dummy for Africa	Dummy that is 1 if the recipient is an African country.	World Bank (2012b).
GDP p.c. growth	Average over annual growth rates of real GDP p.c. based on constant local currency.	World Bank (2007b)*.
Net ODA	Net total Official Development Assistance in % of GDP.	DAC (2007), Table DAC2a*, World Bank (2016c)**.
Log Initial GDP/capita	Logarithm of initial GDP p.c. in international prices.	Penn World Tables 6.2*.
Budget Balance	Overall Budget Balance, including grants. Measured as cash surplus/deficit in % of GDP.	World Bank (2007b), World Bank (2016c)**, IMF (2005)*.
Inflation	Natural log of (1+ Consumer Price Inflation).	World Bank (2005), World Bank (2007b), IMF (2005)*.
M2 (% of GDP)	Money and Quasi-Money (M2) in % of GDP.	World Bank (2007b)*.
Assassinations	Average number of assassinations.	Banks (2012, 2007)*.
Assassinations x Ethnolinguistic Fractionalization	Interaction between Assassinations and Ethnolinguistic Fractionalization.	Banks (2012, 2007), Easterly and Levine (1997), Roeder (2001)*.

Policy	Good Policy Index based on Budget Balance/GDP, Inflation and Trade Openness (cf. Burnside and Dollar (2000)	Clemens et al. (2012).
Openness	Wacziarg-Welch (2008) extension of the Sachs and Warner (1995) Openness Index.	Wacziarg and Welch (2008), updated by Clemens et al. (2012)*.
UNGA alignment U.S.	Voting alignment of recipient country with the U.S. on all votes in the United Nations General Assembly.	Voeten (2013).
ICRG Institutions	Government Stability, Socioeconomic Conditions, Investment Profile, Internal Conflict, External Conflict, Corruption, Military in Politics, Religion in Politics, Law and Order, Ethnic Tensions, Democractic Accountability, Bureaucracy Quality.	Howell (2011).
US Bilateral Development Aid	Official Development Aid Disbursements from the US in % of GDP.	DAC (2012), Table DAC2a (ODA Disbursements), February 2012.
ODA Commitments/GDP	ODA commitments, total, in % of GDP.	DAC (2007), Table DAC3a.
Total debt service	Total debt service, in % of gross national income.	World Bank (2012b).
Short-term debt	Short-term debt, in % of total external debt.	World Bank (2012b).
Imports/GDP	Imports of goods and services as share of GDP.	World Bank (2012b).
Trade/GDP	Trade as share of GDP.	World Bank (2012b).
FDI/GDP	Foreign Direct Investments net inflows as share of GDP.	World Bank (2012b).

Notes: *Our source is Clemens et al. (2012), http://www.cgdev.org/doc/Working\%20Papers/CRBB-Replication-Files.zip, accessed 06.06.2012. Data for the 2006-2009 period are from Minasyan (2016). More details are provided in "Technical Appendix to Counting chickens when they hatch: Timing and the effects of aid on growth," http://www.cgdev.org/doc/Working\%20Papers/counting_chickens_technical_appendix.pdf, last accessed 12.05.2016.

** When updating Clemens et al.'s (2012) data until 2009, we used data from the World Bank accessed via the wbopendata module in Stata, which cover more countries than Minasyan (2016). Due to data availability for the 2005-2009 period, the budget balance is defined as revenue (including grants) minus expense and minus net acquisition of nonfinancial assets.

Table A.2: Descriptive statistics

Variables	Count	Mean	SD	Min.	Max.
Net ODA/GDP	393	4.41	6.16	-0.13	42.52
UNSC membership, share	393	0.08	0.17	0.00	0.50
UNSC membership dummy	393	0.21	0.41	0.00	1.00
GDP per capita growth	393	1.34	3.28	-12.96	17.05
Log Initial GDP/capita	393	8.04	0.80	6.14	10.06
Budget Balance	393	-0.16	1.12	-7.25	6.70
Inflation	229	0.28	0.45	-0.01	3.22
M2/GDP	393	4.50	16.01	0.02	135.78
Institutional Quality	393	4.34	1.48	1.58	8.14
Assassinations	393	0.46	1.30	0.00	11.50
Policy	393	1.60	1.32	-3.86	3.91
Openness	229	0.29	0.43	0.00	1.00
ODA Commitments/GDP	389	0.06	0.08	0.00	0.44
US Aid/GDP	393	0.68	1.22	0.00	12.48
Democracy (t-2)	386	0.41	0.49	0.00	1.00
Autocracy (t-2)	386	0.59	0.49	0.00	1.00
Imports/GDP	384	30.97	14.62	0.00	92.96
Trade/GDP	384	58.87	27.67	11.44	203.36
FDI/GDP	381	1.59	2.63	-28.62	15.59
Total debt service	367	67.15	67.73	4.22	939.35
Short-term debt	379	13.80	8.73	0.73	54.97
Average Voting Alignment with U.S.	389	33.62	10.69	14.2	64.55
Bureaucracy Quality	311	1.74	0.93	0.00	3.50
Corruption	311	2.60	0.93	0.00	5.00
Democratic Accountability	311	3.38	1.23	0.00	6.00
Law & Order	311	2.93	1.13	0.67	6.00
Political Risk Rating	310	57.11	11.36	26.96	80.83
Ethnic Tensions	311	3.72	1.49	0.33	6.00
Religious Tensions	311	4.32	1.37	0.00	6.00
Military in Politics	311	3.05	1.55	0.00	6.00
Internal Conflict	311	7.78	2.42	0.31	12.00
External Conflict	311	9.33	2.15	2.17	12.00
Government Stability	311	6.97	2.09	1.85	11.00
Investment Profile	311	6.39	1.91	1.17	11.50

Table A.3: Sensitivity to coding of the UNSC variable and additional covariates

	(1)	(2)	(3)
	UNSC dummy	UNSC differenced	Lagged explanatory variables
ΔAid (t-1)	0.484**	0.404**	0.379**
	(0.211)	(0.195)	(0.153)
ΔAid squared (t-1)	-0.010**	-0.009**	-0.006*
	(0.004)	(0.004)	(0.003)
Dummy UNSC (t-2)	-0.511		
	(0.333)		
Dummy UNSC (t-2) * ΔAid (t-1)	-0.626***		
	(0.165)		
ΔUNSC (t-2)		0.039	
		(0.844)	
ΔUNSC (t-2) * ΔAid (t-1)		-0.384**	
		(0.182)	
UNSC (t-2)			-1.814*
			(1.003)
UNSC (t-2) * ΔAid (t-1)			-1.012**
			(0.402)
Adj. R-Squared	0.19	0.19	0.22
Number of Countries	54	54	54
Number of Observations	393	393	393

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years and include (first differences of) Initial GDP/capita, Assassinations, Ethnic Fractionalization*Assassinations, M2/GDP (lagged), Policy, and period dummies. The dependent variable covers the 1970-2009 period. Column 1 includes a dummy for temporary UNSC membership instead of the share of years on the Council. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.4: Sensitivity to using early impact aid

	(1)
ΔEarly Impact Aid (t-1)	0.576**
	(0.231)
ΔEarly Impact Aid squared (t-1)	−0.032**
	(0.014)
UNSC (t-2)	−1.635
	(0.980)
UNSC (t-2) * ΔEarly Impact Aid	−1.470*
(t-1)	(0.750)
Adj. R-Squared	0.197
Number of Countries	54
Number of Observations	354

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years and include (first differences of) Initial GDP/capita, Assassinations, Ethnic Fractionalization*Assassinations, M2/GDP (lagged), Policy, and period dummies. The dependent variable covers the 1970-2005 period. "Early impact" aid is defined following Clemens et al. (2012) and the specification also includes repayments/GDP its square as in their specifications, since "early impact" ODA is a gross flow while aggregate aid is a net flow. Consistent with our modification of other regressions, we interact the linear repayment term with our UNSC variable. Otherwise, the specification is similar to Table 1, column 2. Robust standard errors in parentheses clustered at the donor country level.
** $p < 0.05$, *** $p < 0.01$

Table A.5: Sensitivity to additional covariates

	(1)	(2)	(3)	(4)	(5)	(6)
	ICRG	Imports/GDP	Trade/GDP	FDI/GDP	UNGA	Debt/GNI
ΔAid (t-1)	0.269*	0.464**	0.461**	0.325**	0.502**	0.453*
	(0.135)	(0.209)	(0.207)	(0.126)	(0.212)	(0.245)
ΔAid squared (t-1)	-0.006**	-0.009**	-0.010**	-0.007***	-0.011**	-0.010**
	(0.002)	(0.004)	(0.004)	(0.002)	(0.004)	(0.005)
UNSC (t-2)	-2.251**	-1.573*	-1.553*	-1.64	-1.376	-1.347
	(1.077)	(0.896)	(0.889)	(1.020)	(0.840)	(0.865)
UNSC (t-2) * ΔAid (t-1)	-0.975**	-1.254***	-1.261***	-1.125***	-1.260***	-1.397***
	(0.386)	(0.357)	(0.370)	(0.361)	(0.358)	(0.411)
Adj. R-Squared	0.28	0.19	0.18	0.23	0.19	0.18
Number of Countries	53	54	54	54	54	51
Number of Observations	214	378	378	317	385	367

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years, include variables in first differences (except for the UNSC variable) and include period dummies. Control variables are Initial GDP/capita, Assassinations, Ethnic Fractionalization*Assassinations, M2/GDP (lagged), Policy, and period dummies. The dependent variable covers the 1970-2009 period. Column 4 includes the International Country Risk Guide (ICRG) variables Bureaucracy Quality, Corruption, Democratic Accountability, Ethnic Tensions, External Conflict, Government Stability, Internal Conflict, Investment Profile, Law and Order, Military in Politics, Political Risk Rating, and Religious Tensions (available from 1984). Column 2 adds imports of goods and services (as a share of GDP), column 3 adds Trade (as a share of GDP), column 4 adds net Foreign Direct Investments inflows (FDI, as a share of GDP), Column 5 includes the recipient country's voting alignment with the United States in the UN General Assembly, and column 6 adds debt service (as a share of GNI). The specification is similar to Table 1, column 2. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

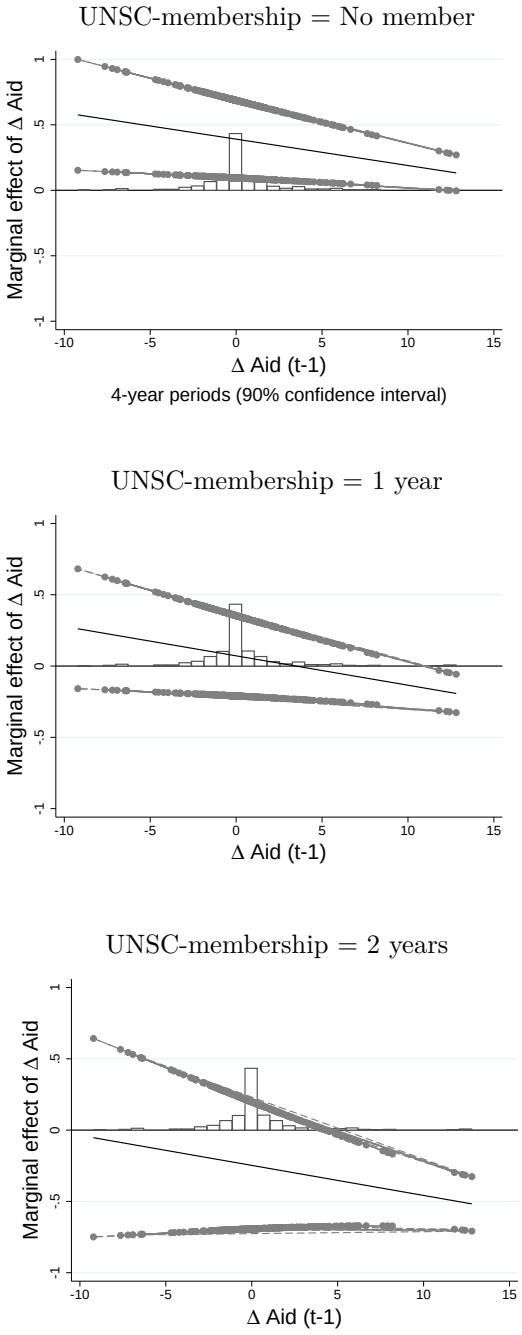
Table A.6: Results for democracies and autocracies

	Democracy (t-2) (1)		Autocracy (t-2) (2)		Democracy (t-1) (3)		Autocracy (t-1) (4)	
ΔAid (t-1)	0.078	(0.089)	0.156	(0.125)	0.118	(0.074)	0.137	(0.141)
UNSC (t-2)	0.416	(0.823)	-2.677*	(1.412)	0.184	(0.784)	-2.157	(1.392)
UNSC (t-2) * ΔAid (t-1)	-0.006	(0.306)	-1.273***	(0.335)	-0.452	(0.518)	-1.221***	(0.433)
Adj. R-Squared	0.256		0.149		0.238		0.162	
Number of Countries	32		46		36		45	
Number of Observations	157		236		180		213	
	(5)		(6)		(7)		(8)	
ΔAid (t-1)	0.632***	(0.209)	0.406	(0.246)	0.596***	(0.142)	0.411	(0.290)
ΔAid squared (t-1)	-0.013***	(0.004)	-0.008	(0.005)	-0.012***	(0.003)	-0.009	(0.006)
UNSC (t-2)	0.293	(0.807)	-2.645*	(1.430)	0.066	(0.769)	-2.167	(1.404)
UNSC (t-2) * ΔAid (t-1)	-0.731*	(0.422)	-1.407***	(0.322)	-0.701**	(0.320)	-1.578**	(0.541)
Adj. R-Squared	0.288		0.158		0.274		0.171	
Number of Countries	32		46		36		45	
Number of Observations	157		236		180		213	

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years and include (first differences of) Initial GDP/capita, Assassinations, Ethnic Fractionalization*Assassinations, M2/GDP (lagged), Policy, and period dummies. The dependent variable covers the 1970-2009 period. A regime is defined as democratic if it is classified as such in at least half a period by Cheibub et al. (2010). In columns 3 and 4 the regime type refers to the period of aid disbursement (t-1). Otherwise, the specification is similar to Table 1, column 2. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure A.1: Sensitivity of marginal effects to the addition of a triple interaction between aid squared and the share of years of UNSC membership



Notes: Marginal effect of changes in aid disbursements on changes in economic growth conditional on varying temporary UNSC membership. The marginal effect is based on a regression that includes aid, aid squared, the interaction between aid and UNSC membership and between aid squared and UNSC membership. The histogram shows the distribution of ΔAid in the regression sample.

Table A.7: Politically motivated aid commitments and aid disbursements, OLS

	(1)	(2)	(3)	(4)	(5)
Aid disbursements (t-1)	0.499**		0.105		0.487**
	(0.236)		(0.091)		(0.226)
Aid disbursements squared (t-1)	-0.011**				-0.011**
	(0.005)				(0.004)
Aid commitments (t-2)	-10.140**	-9.299**	-9.084**	8.455	6.324
	(4.244)	(4.596)	(4.494)	(11.931)	(12.221)
Aid commitments squared (t-2)				-41.872*	-40.826*
				(23.343)	(23.117)
UNSC (t-2)	-1.28	-1.645*	-1.378	-1.516*	-1.234
	(0.860)	(0.888)	(0.825)	(0.897)	(0.825)
UNSC (t-2)*Aid disbursements (t-1)	-1.306***		-0.955**		-1.343***
	(0.400)		(0.438)		(0.380)
UNSC (t-2)*Aid commitments (t-2)		10.66	10.039	5.527	6.573
		(24.061)	(23.374)	(20.583)	(18.801)
Adj. R-Squared	0.195	0.164	0.171	0.171	0.201
Number of Observations	383	383	383	383	383

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years and include (first differences of) Initial GDP/capita, Assassinations, Ethnic Fractionalization*Assassinations, M2/GDP (lagged), Policy, and period dummies. The dependent variable covers the 1970-2009 period. The table adds aid commitments (and their interaction with UNSC membership) to the regression from Table 1, column 2. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: Politically motivated aid and growth, OLS, Rajan & Subramanian specification

	(1)	(2)
ΔAid (t-1)	0.149*	0.356**
	(0.085)	(0.148)
ΔAid squared (t-1)		-0.007
		(0.004)
UNSC (t-2)	-0.866	-0.947
	(1.420)	(1.402)
UNSC (t-2) * ΔAid (t-1)	-1.094*	-1.365**
	(0.590)	(0.647)
Adj. R-Squared	0.30	0.31
Number of Countries	64	64
Number of Observations	351	351

Notes: The dependent variable is growth of real GDP per capita. The regressions use averages over five years and include (first differences of) Initial GDP/capita, Initial Policy, (log) Initial Life Expectancy, Institutional Quality, (log) Inflation, Initial M2/GDP, Budget Balance/GDP, Revolutions, period dummies. The dependent variable covers the 1966-2005 period (using the full extended sample provided by Clemens et al. 2012: Table 9). Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

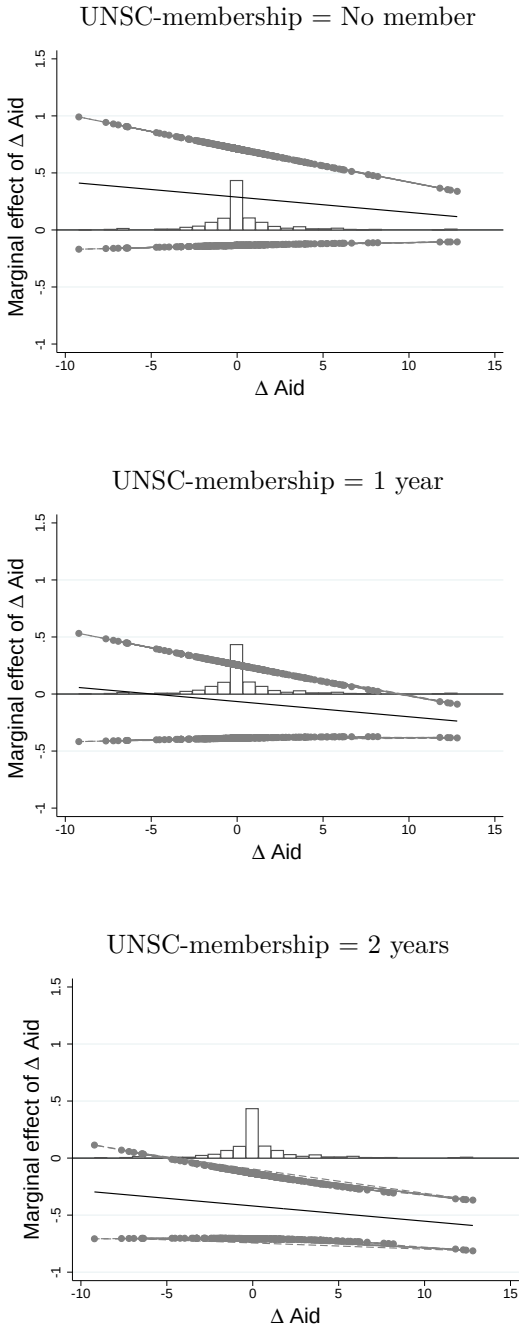
Table A.9: Sensitivity to the addition of a triple interaction between aid squared and the share of years on the UNSC

	(1)
ΔAid (t-1)	0.476**
	(0.213)
ΔAid squared (t-1)	-0.010**
	(0.004)
UNSC (t-2)	-1.228
	(0.835)
UNSC (t-2) * ΔAid(t-1)	-1.302
	(0.799)
UNSC (t-2) * ΔAid squared (t-1)	0.000
	(0.021)
Adj. R-Squared	0.184
Number of Countries	54
Number of Observations	393

Notes: The dependent variable is growth of real GDP per capita. All regressions use averages over four years and include (first differences of) Initial GDP/capita, Assassinations, Ethnic Fractionalization*Assassinations, M2/GDP (lagged), Policy, and period dummies. The dependent variable covers the 1970-2009 period. Robust standard errors in parentheses clustered at the donor country level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure A.2: Marginal effects for the subsample of African countries from a nested model



Notes: Marginal effect of changes in aid disbursements on changes in economic growth in African countries conditional on varying temporary UNSC membership. The marginal effect is based on a nested model that includes the interaction between the Africa indicator and all explanatory variables. The point estimate for [UNSC(t-2)*ΔAid(t-1)*Africa] is negative but insignificant, suggesting that the growth effect of politically motivated aid is not significantly different in Africa. The histogram shows the distribution of ΔAid in the regression sample.

Assumptions for Consistent Estimation of the Interaction Term

In the following, we sketch the two alternative sets of assumptions that assure the consistent estimation of the interaction term. The first set of assumptions is based on Bun and Harrison (2014) and Nizalova and Murtazashvili (2016). For consistency of presentation, we keep the notation as in Chapter 4 but refer directly to the relevant assumptions in Bun and Harrison (2014). For clarity of presentation, we omit exogenous control variables, period-fixed effects and aid squared, all of which do not affect the result about the consistency of the interaction term. As Bun and Harrison (2014: 4) note, the addition of the other control variables "does not change the theoretical results. The analysis below holds exactly when we replace y, w and x [their notation] by the residuals of their projection on these additional exogenous regressors."

Notation

The simplified version of our main model is

$$\Delta Growth_{i,t} = \alpha + \beta \Delta Aid_{i,t-1} + \delta UNSC_{i,t-2} + \zeta UNSC_{i,t-2} * \Delta Aid_{i,t-1} + \Delta\epsilon_{i,t} \quad (4.2)$$

where i refers to the countries and t to the 4-year periods. $\Delta Aid_{i,t-1}$ is the endogenous variable, referred to as x_i in the notation of Bun and Harrison (2014). The error can be written as:

$$\Delta\epsilon_{it} = \lambda \Delta Z_{i,t-k} + \Delta\upsilon_{i,t} \quad (4.3)$$

with $Z_{i,t-1}$ being a potentially time- and country-varying unobserved effect, $k \{\in 0, 1, 2, 3, \dots\}$, and

$(\Delta Aid_{i,2}, \dots, \Delta Aid_{i,T-1}, UNSC_{i,1}, \dots, UNSC_{i,T-2}, \Delta\epsilon_{i,3}, \dots, \Delta\epsilon_{i,T})$ being i.i.d.

Assumption set 1

Assumption 1.1

$$E\left[\Delta\epsilon_{i,t} \mid UNSC_{i,t-2}\right] = 0, \quad (4.4)$$

i.e., UNSC membership is exogenous (cf., Bun and Harrison 2014: 4). In their notation, the exogenous regressor is $\omega_{i,t}$.

Assumption 1.2

$$E\left[\Delta Aid_{i,t-1}\Delta\epsilon_{i,t} \mid UNSC_{i,t-2}\right] = \left[\Delta Aid_{i,t-1}\Delta\epsilon_{i,t}\right], \tag{4.5}$$

i.e., the "degree of endogeneity" (direction and extent of omitted variable bias) of the endogenous variable does not depend on the exogenous variable (cf., Bun and Harrison 2014: 5, Eq. 2.5). Then we have:

$$Cov\left(UNSC_{i,t-2}\Delta Aid_{i,t-1}, \Delta\epsilon_{i,t}\right) = E\left[UNSC_{i,t-2}\right] * E\left[\Delta Aid_{i,t-1}\Delta\epsilon_{it}\right] = 0, \tag{4.6}$$

assuming that $E\left[UNSC_{i,t-2}\right] = 0$ (cf., Bun and Harrison 2014: 5, Eq. 2.6).[29] Assumption 1.2 is a relatively weak condition, present in various statistical data generating processes. In our setting, the assumption is plausible because temporary UNSC membership is quasi-exogenously assigned.[30] Moreover, the assumption is also reasonable in the case of relevant omitted variables as discussed by Bun and Harrison (2014: 6) because the endogeneity in our case is not caused by simultaneity. The OLS estimator of the coefficient of the interaction is consistent under additional reasonable conditions. Bun and Harrison (2014) derive the following term as part of the expression for the inconsistency of the interaction term:[31]

$$\begin{aligned} &E\left[\Delta Aid_{i,t-1}UNSC_{i,t-2}\right] E\left[\Delta Aid_{i,t-1}UNSC_{i,t-2}^2\right] \\ &-E\left[UNSC_{i,t-2}^2\right] E\left[\Delta Aid_{i,t-1}^2 UNSC_{i,t-2}\right] \end{aligned} \tag{4.7}$$

This term equals zero under typical conditions regarding higher-order dependencies between the endogenous and the exogenous variables of interest.[32] So in many empirical applications, the term leading to inconsistent estimation of the interaction term is zero. For example, it holds in all cases when the relation between $\Delta Aid_{i,t-1}$ and $UNSC_{i,t-2}$ follows a linear form (c.f., Bun and Harrison 2014: 7-8)). Note that the coefficient δ for UNSC membership, assumed to be exogenous, is also consistently estimated under Assumptions 1.1 and 1.2. While we are convinced that UNSC membership positions are quasi-randomly allocated among UN members and exogenous to growth two 4-year periods after UNSC membership, the following assumptions would assure the consistency of our interaction term even if UNSC membership would not be exogenous. Note that

[29] The assumption of a mean of zero comes without loss of generality and is made to simplify the analysis. Because we always include a constant in the regression, all results also hold with rescaling of these variables Kiviet and Niemczyk (2012).

[30] See discussion about randomly assigned treatment in Bun and Harrison (2014: 5), last paragraph.

[31] See Proposition 1 in Bun and Harrison (2014: 7).

[32] As Bun and Harrison (2014: 7) note "multivariate elliptical distributions are sufficient, but not necessary, for these higher-order dependencies to vanish."

this second set of assumptions is weaker than the first set of assumption because they do not imply consistent estimation of the UNSC coefficient.

Assumption set 2

If Assumption 1.1 is violated, i.e., $UNSC_{i,t-2}$ is not exogenous to growth

$$E\left[\Delta\epsilon_{i,t} \mid UNSC_{i,t-2}\right] \neq 0 \tag{4.8}$$

we need to assume that:

Assumption 2:
We need that $E\left[\Delta Aid_{i,t-1}UNSC_{i,t-2}, \Delta\epsilon_{i,t} = 0\right]$ to consistently estimate the coefficient of the interaction term.

This condition is fulfilled if the "degree of endogeneity" of one endogenous variable of interest is independent of the other endogenous variable of interest. Note that the endogeneity of the two variables might therefore not be caused by the same omitted variable. Formally,

Assumption 2.1 (equivalent to Assumption 1.2):

$$E\left[\Delta Aid_{i,t-1}\Delta\epsilon_{i,t} \mid UNSC_{i,t-2}\right] = E\left[\Delta Aid_{i,t-1}\Delta\epsilon_{i,t}\right] \tag{4.9}$$

i.e., the correlation of aid with the error term is independent of UNSC membership.

Assumption 2.2

$$E\left[UNSC_{i,t-2}\Delta\epsilon_{i,t} \mid \Delta Aid_{i,t-1}\right] = E\left[UNSC_{i,t-2}\Delta\epsilon_{i,t}\right] \tag{4.10}$$

The correlation of UNSC with the error term is independent of changes in aid flows.
Framed in terms of the structure of potential omitted variables

$$E\left[\Delta Aid_{i,t-1}\Delta Z_{i,t-k} \mid UNSC_{i,t-2}\right] = E\left[\Delta Aid_{i,t-1}\Delta Z_{i,t-k}\right] \tag{4.11}$$

i.e., the correlation between the omitted variable and the dependent variable is independent of UNSC membership (e.g., the effect of institutions on growth is not affected by past UNSC membership) and

$$E\left[UNSC_{i,t-2}\Delta Z_{i,t-k} \mid \Delta Aid_{i,t-1}\right] = E\left[UNSC_{i,t-2}\Delta Z_{i,t-k}\right] \tag{4.12}$$

i.e., the relationship between the omitted variable and the regressor does not depend on the level of aid.

Marginal Effect of a Change in Aid

$$\begin{aligned}[Growth_{i,t} - Growth_{i,t-1}] = \alpha &+ \beta\left[Aid_{i,t-1} - Aid_{i,t-2}\right] + \gamma\left[Aid^2_{i,t-1} - Aid^2_{i,t-2}\right] \\ &+ \delta UNSC_{i,t-2} + \zeta\left[Aid_{i,t-1} - Aid_{i,t-2}\right] * UNSC_{t-2} \\ &+ \left[X_{i,t} - X_{i,t-1}\right]'\eta + \mu_{i,t}\end{aligned} \tag{4.13}$$

$$\begin{aligned}[Growth_{i,t} - Growth_{i,t-1}] = \alpha &+ \beta\left[Aid_{i,t-1} - Aid_{i,t-2}\right] \\ &+ \gamma\left[Aid_{i,t-1} + Aid_{i,t-2}\right] * \left[Aid_{i,t-1} - Aid_{i,t-2}\right] \\ &+ \delta UNSC_{i,t-2} + \zeta\left[Aid_{i,t-1} - Aid_{i,t-2}\right] * UNSC_{i,t-2} \\ &+ \left[X_{i,t} - X_{i,t-1}\right]'\eta + \mu_{i,t}\end{aligned} \tag{4.14}$$

$$\begin{aligned}[Growth_{i,t} - Growth_{i,t-1}] = \alpha &+ \beta\left[Aid_{i,t-1} - Aid_{i,t-2}\right] \\ &+ \gamma\left[Aid_{i,t-1} - Aid_{i,t-2} + Aid_{i,t-2} + Aid_{i,t-2}\right] \\ &* \left[Aid_{i,t-1} - Aid_{i,t-2}\right] \\ &+ \delta UNSC_{i,t-2} + \zeta\left[Aid_{i,t-1} - Aid_{i,t-2}\right] * UNSC_{i,t-2} \\ &+ \left[X_{i,t} - X_{i,t-1}\right]'\eta + \mu_{i,t}\end{aligned} \tag{4.15}$$

Replacing $Aid_{i,t-1} + Aid_{i,t-2} = \Delta Aid_{i,t-1}$:

$$\begin{aligned}[Growth_{i,t} - Growth_{i,t-1}] = \alpha &+ \beta\left[\Delta Aid_{i,t-1}\right] \\ &+ \gamma\left[\Delta Aid_{i,t-1} + Aid_{i,t-2} + Aid_{i,t-2}\right] * \left[\Delta Aid_{i,t-1}\right] \\ &+ \delta UNSC_{i,t-2} + \zeta\left[\Delta Aid_{i,t-1}\right] * UNSC_{i,t-2} \\ &+ \left[X_{i,t} - X_{i,t-1}\right]'\eta + \mu_{i,t}\end{aligned} \tag{4.16}$$

$$\begin{aligned}\frac{\delta\left[Growth_{i,t} - Growth_{i,t-1}\right]}{\delta\left[\Delta Aid_{i,t-1}\right]} = \beta &+ \gamma * 2 * \left(Aid_{i,t-2} + \Delta Aid_{i,t-1}\right) \\ &+ \zeta \Delta Aid_{i,t-1} * UNSC_{i,t-2}\end{aligned} \tag{4.17}$$

Transmission Channels

Table A.10: Sectoral allocation of total aid committed, 1973-2011, constant 2011 million US$

Sector	Non-UNSC member (mean)	UNSC member (mean)	Increase in %	t-test (p-value)
Education	37.62	56.36	50%	0.00
Health	27.48	34.70	26%	0.09
Population	25.79	40.38	57%	0.01
Water and Sanitation	36.62	68.99	88%	0.00
Government /Civil Society	47.78	56.19	18%	0.43
Other Social Infrastructure	18.44	37.74	105%	0.00
Transport and Storage	62.16	93.57	51%	0.00
Communication	10.38	19.70	90%	0.00
Energy Generation and Supply	53.87	100.60	87%	0.00
Banking and Financial Services	13.30	16.93	27%	0.28
Business and other Services	10.14	11.15	10%	0.78
Agriculture and Fishing	53.73	138.60	158%	0.00
Industry/Mining	26.75	69.36	159%	0.00
Trade/Tourism	4.85	5.33	10%	0.77
Environment	14.48	37.49	159%	0.00
Other Multisector	32.96	45.04	37%	0.01
General Budget support	81.13	118.40	46%	0.09
Food Aid	29.10	46.36	59%	0.01
Other Commodity Assistance	33.78	64.37	91%	0.00
Debt	78.08	110.00	41%	0.46
Emergency Reponse	27.50	16.86	-39%	0.15
Reconstruction Relief	14.47	11.37	-21%	0.71
Disaster Prevention	3.26	1.95	-40%	0.57
Admin of Donors	1.73	2.12	23%	0.43
Refugees	3.33	1.92	-42%	0.33
Unspecified	7.03	12.79	82%	0.01

Notes: Differences in aid commitments by aid type for temporary UNSC and non-UNSC members. The t-value indicates significance of the difference between the shares of the respective aid type for UNSC and non-UNSC members.*Source:* OECD/DAC Creditor Reporting System (CRS) aid activities database.

Table A.11: Allocation of total aid committed, 1973-2011, constant 2011 million US$

Type of Aid	Non-UNSC member (mean)	UNSC member (mean)	Increase in %	t-test (p-value)
Budget Aid	69.71	203.60	192%	0.00
Project Aid	240.20	469.40	95%	0.00
Tied Aid	66.44	121.20	82%	0.00
Partially tied Aid	85.40	181.00	112%	0.00
Untied Aid	189.70	308.50	63%	0.00
Loans	229.60	545.10	137%	0.00
Grants	268.80	354.60	32%	0.03

Notes: Differences in aid commitments by aid type for UNSC members and non- members. The t-value indicates significance of the difference between the shares of the respective aid type for UNSC members and non-members.*Source:* OECD/DAC CRS aid activities database.

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