



MAGISTERARBEIT / MASTER'S THESIS

Titel der Magisterarbeit / Title of the Master's Thesis

„The determinants of bilateral inter-recipient aid
allocation“

verfasst von / submitted by

Lukas Papula, BSc

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Magister der Sozial- und Wirtschaftswissenschaften

(Mag.rer.soc.oec.)

Wien, 2015 / Vienna 2015

Studienkennzahl lt. Studienblatt /
degree programme code as it appears on
the student record sheet:

A 066 913

Studienrichtung lt. Studienblatt /
degree programme as it appears on
the student record sheet:

Magisterstudium Volkswirtschaftslehre

Betreut von / Supervisor:

Professor Alejandro Cuñat, PhD

Contents

1) Introduction	3
2) Official Development Assistance (ODA)	6
3) Criticism of ODA	8
4) The New Paradigm of ODA	11
5) Literature Review	15
6) Method	20
6.1 Limited Dependent Variable Models	21
6.2 Panel Data	26
7) Data	30
8) Results	36
8.1 Descriptive Statistics	36
8.2 Selection Stage	40
8.3 Allocation Stage	44
8.4 Random vs. Fixed Effects	49
9 Conclusion.....	51
10 Bibliography.....	53
11 Appendix	56

1) Introduction

My master thesis investigates the allocation of bilateral development aid over the 16 year period between 1995 and 2009. At the core lies the question, whether donor countries' geographic distribution of aid is driven primarily by strategic motives, such as trade relations or geo-political considerations, or rather by altruistic considerations addressing recipients' need and awarding recipient merit such as good policies.

Looking at the top recipients of individual donors, one encounters many combinations pointing at strategic interests dominating aid allocation. Whereas the US has throughout the decades distributed most of its aid to countries where its military was deployed, former colonial powers typically have selected their former colonies as top recipients. A glance at the mission statements of individual donor's aid agencies reveals the simultaneous existence of diverging motivations as regards granting aid. For instance, the US, as the foremost target of aid critics, admits that *'US foreign assistance has always the twofold purpose of furthering America's foreign policy interests in expanding democracy and free markets while improving the lives of the citizens of the developing world'*¹. On the contrary, Sweden, often quoted as the prototype of a benevolent donor, does not refer to political interests in its mission statement: *'The objective of Swedish development cooperation is to create opportunities for people living in poverty and under oppression to improve their living conditions'*². Some authors of past studies have therefore tried to classify donors according to their allocation practice.

Whereas the idea of aid, undisputedly, is to kick-start development in poor countries, the vast majority of past publications concluded that aid is mostly driven by opportunistic behavior on behalf of the donor. The observation that the flow of aid is determined by strategic considerations and, thereby, the optimal allocation is undermined, fuels the debate on aid efficiency, with many claiming that a distorted distribution evades good results. The literature review section discusses past findings in greater detail.

Research in the past has been numerous, nevertheless, convincing arguments exist why another investigation is worth being undertaken. First of all, the Development Assistance Committee (DAC), the OECD's donor countries' organization, has reacted to the criticism its aid allocation has provoked in the past. Not only have International Financial Institutions like

¹ USAID.com

² <http://www.sida.se/English/how-we-work/about-swedish-development-cooperation/>

the World Bank claimed that *'the allocation of aid has improved dramatically in recent years'* (World Bank 2002: 69), thereby implicitly conceding past allocative behavior as suboptimal. Furthermore, even the DAC has explicitly acknowledged its bad practices from the past on several occasions. In its publications since the mid-nineties, the DAC has undertaken great efforts to convince the public that a shift of its paradigm, at least a self-proclaimed one, has taken place. Most prominently, in its publication celebrating the DAC's 50th anniversary (DAC 2011) many themes aiming at aligning actual aid allocation with the most efficient allocation in terms of poverty reduction were broadly announced. One theme is *'putting the recipient country in the driver seat'* (OECD 2010), expressing the notion of ownership and acknowledging that the recipients should know best where to allocate aid most effectively. The DAC also speaks of inclusive partnerships in this regards and further emphasizes the accomplishment of the Millennium Development Goals (MDGs), which spoken in hindsight, have failed to materialize. Another theme is the emphasis of good governance. It recently became an explicit goal of the DAC, to reward development-friendly and democratic policies pursued by recipients. Other explicitly claimed drivers of aid distribution in the new era are gender equality and the so-called aid for trade program, with the latter being more than questionable in respect to benevolent intentions. Aid for trade in the form of tied aid conditional on imports from the donor country has actually been on the DAC's agenda for decades and has also provoked fierce criticism.

What has also been found distorting in the past, was that the DAC's recipients list was comprised of a much broader array of countries than only developing countries. Most prominently, Israel, as a highly developed economy, has ranked among the DAC's top recipients until its re-classification as a Part II country in 1996. Other middle income countries such as some oil-exporting Gulf states or former Eastern European transition economies, which were structurally quite different from the least developed countries in their need for foreign aid, were other examples distorting the picture. With a change in the classification of recipients, which was implemented in the mid-90s, the recipient list was purified. Middle-income countries were moved to a new category, denominated Part II countries, and flows they received were not qualified as Official Development Assistance (ODA) any longer, but as Official Aid.

Additionally, the general constellation of financial flows to developing countries has been subject to several profound changes over the last 20 years. The first change regards the receding relative importance of public financial flows in international development, as

private flows (grants, loans, remittances) are gaining importance at an ever-increasing pace and are already dwarfing the volume channeled through aid. Within the realm of public flows, multilateral aid has steadily been on the rise and has provided a large chunk of aggregate public aid, with institutions such as the World Bank or the UN agencies ranking among the largest multilateral donors.

Another major change on the aid landscape is the arrival of emerging donors. While the cold war was characterized by an aid race, in which development aid served as a foreign policy instrument for building alliances, with the fall of the eastern bloc the USSR ceased to rival the DAC in aid flows to win loyalty of each bloc's affiliated states. The departure of the Soviet Union initiated a period, in which the DAC practically had a monopoly in development aid. As the widely expected peace dividend failed to materialize, the total volume of aid subsequently decreasing during the nineties. The last decade, on the contrary, has been marked by the emergence of ever more donors, most notably China and India, which, at the same time, are DAC recipients. Especially China's development policies have received a lot of attention. The ascent of new donors should affect DAC, however it remains to be seen whether in a competitive form, as a coordinated joint effort or a mix of both.

Lastly, the dataset of this study is the most recent of its kind. Whereas the vast majority of past publications investigated the flows of aid up to the nineties, the most recent studies take into account a timeframe up until the early 2000s. However, these recent publications mostly use a dataset ranging back to a time before the re-classification of recipient countries was implemented and, thus, mingle two distinct sets of recipient countries. Therefore, my master thesis is the first econometric analysis that bases exclusively on the new dual classification.

To sum up, the fierce criticism DAC aid has met in past, and its reaction with the proclamation of a New Paradigm of development aid, points at a more altruistic allocation. So does the reduction of eligible recipient countries by removing greatly distorting recipients. The competitive race resulting from the emergence of new donors might further motivate the DAC to align its allocation more with recipient need. With these factors pointing at a more altruistic allocation, I expect to see the allocative pattern of DAC aid to mirror this. As opposed to past publications, which unanimously highlight donor strategic considerations as the main driver of aid, I expect more benevolent allocation of bilateral aid across countries.

2) Official Development Assistance (ODA)

Before analyzing the determinants of bilateral development aid, a brief introduction to the definition and state of development aid, as well as an overview of the criticism it aroused and the DAC's new paradigm for aid in the 21st century are provided.

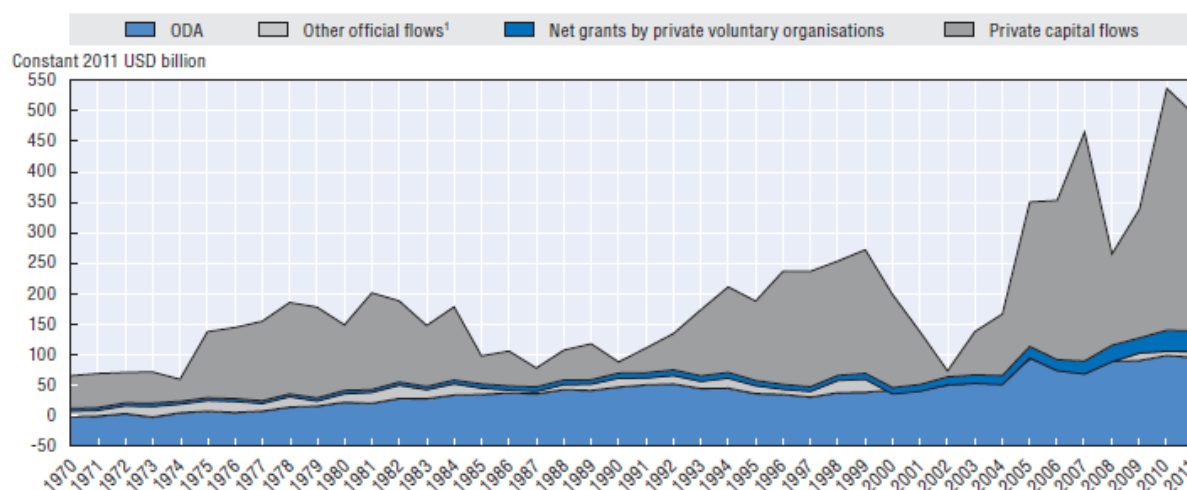
Development aid is only one of several financial flows from industrialized to developing countries and it is compared to the other flows rather small. Foreign direct investments comprise the largest share of financial flows from the developed to the developing world – followed by remittances. Private debt and portfolio equity investments are two further large private flows. FDI to developing countries amounted to roughly \$500 billion and remittances to \$ 350 billion in 2010, the last year in my dataset. Compared to these private flows, development aid appears somewhat modest. DAC aid, which by definition originates from the public domain, slightly exceeded \$120 billion in 2012. Hence, private flows are a multiple of public development aid. However, there is one crucial feature which development aid exhibits; compared to FDI, development aid is relatively stable and did not show such a pronounced sensitivity to the recent financial crises. Whereas development aid remained on its long term path, FDI figures were disrupted and plummeted almost 50 percent in reaction to the financial meltdown that started in 2008. Different from other private flows, remittances show a similarly stable path. Not all private flows, however, have the objective of contributing to the development and welfare of the recipient country like development aid. Nevertheless, large-scale private philanthropy, is on the rise.

Development aid, which is a voluntary transfer comprising public loans and grants to developing countries and territories, is either allocated by multilateral organizations such as the World Bank, regional development banks and the UN sub-organizations, or, bilaterally, by individual donors to a recipient country. In 2010 multilateral aid accounted for roughly 40 percent of gross ODA from the DAC. The single largest provider of multilateral aid is the World Bank.

Although multilateral aid is financed by bilateral donors as well, only bilateral aid from DAC donors is considered in the present analysis. The exclusion of multilateral aid follows the intuition that the donors have perfect control over bilateral, but not multilateral, aid allocation. Thus, bilateral aid flows better represent a donor's motives to allocate its aid budget. However, DAC donors are far from being the only source of aid. The history of development aid has seen the proliferation of emerging donors, i.e. non-DAC donors, with a sizeable junk of aid flows not originating from the DAC but from other developing countries. This so-called

South-South Co-operation has been steadily on the rise. Nevertheless, non DAC-donors are not in the sample, because reporting standards greatly diverge. In spite of the fierce criticism DAC reporting practices have aroused in the past, they are nevertheless homogenous for DAC members and, thus, provide comparable aid statistics. Although efforts like the DAC-China study group are undertaken to harmonize reporting standards, reporting guidelines for many non-DAC donors are not even published.

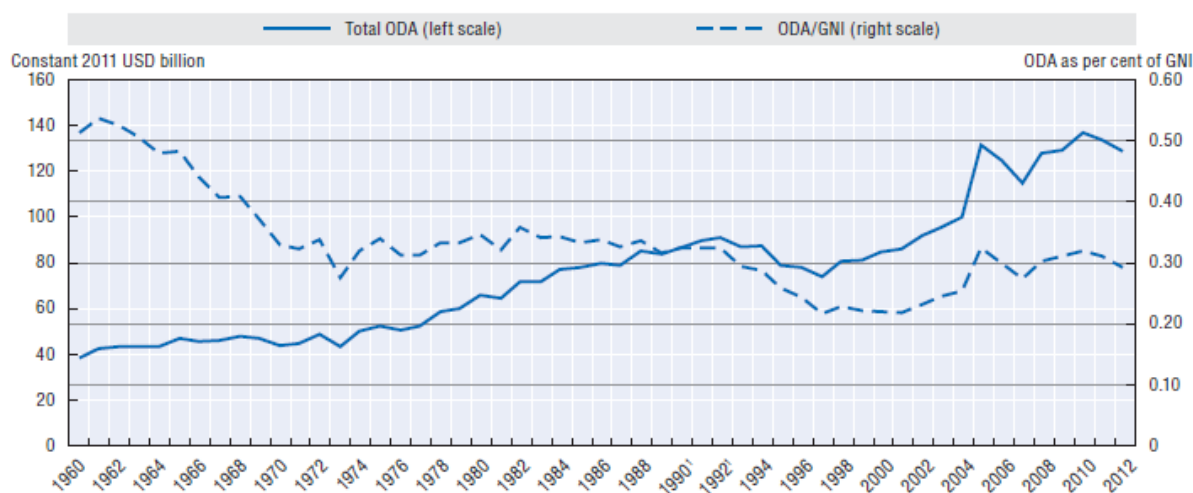
DAC member's total net resource flows to developing countries, 1970-2011



1. Net OOF flows were negative in 2000-01, 2003-04 and 2006-08.

StatLink <http://dx.doi.org/10.1787/888932896527>

Net official development assistance, 1960-2012



1. Total DAC excludes debt forgiveness of non-ODA claims in 1990, 1991 and 1992.

Source: OECD Development Co-operation Report 2013, p. 258

3) Criticism of ODA

Whereas criticism of development aid is actually beyond the scope of this paper, it is nevertheless treated briefly, because the assumption of allocative malpractice underlies the motivation for this paper. And this assumption that aid allocation is driven by donor self-interest, rather than recipient need and merit, constitutes a critique per se

In the past, aid critique has been emerging from different sources and can be categorized into two groups. One stream of critique seeks the outright discontinuation of aid, claiming aid finances wasteful public consumption instead of long-term investments, crowds out other productive activities and makes recipients dependent on aid transfers as well as it keeps corrupt regimes in power (e.g. Boone 1994, 1996). Advocates of this stream of critique ranged from Friedman (1958) to today's more popular accounts of William Easterly (2003) or Dambisa Moyo. They criticize that, historically, aid has hardly made poor countries richer and that many of the least developed countries are characterized by a strong dependency on aid, which undermines their incentives to develop on their own.

On the contrary, the second class of criticism argues that development aid works and, hence, its volume ought to be expanded and its nature improved. Under the label of a big push its advocates argue that only a substantial inflow of aid provides the necessary funding for capital formation and other civilian and social institutions, which enable a country to maneuver itself on a path to prosperity. These critics claim that current aid flows are too low in quantity and lack the necessary quality in the sense that they include too many transfers not primarily targeting the recipients' development. Nobel Laureate Gunnar Myrdal initiated this stream of critique, and Jeffery Sachs is probably the current most popular advocate of a big push. It is this second stream of critique, under which my thesis can be subsumed. In what follows, a brief overview of the main sources of discontent within the second stream will be presented.

Quantitative Critique – The generosity ratio

Development aid's historic precedent, the Marshall Plan, under which the US transferred between two and three percent of its economic output to Western Europe has equipped many observers with an idea of the magnitude of aid necessary to rapidly achieve economic development. However, past and current ODA commitments are quantitatively a far cry from the generosity of the Marshall Plan.

The crucial concept of measuring ODA is the generosity ratio, the ratio between development aid and GNI. The generosity ratio is further the target of the vast majority of quantitative criticism of aid. Today, the threshold of 0.7 percent is widely accepted as the desirable level of aid grant, albeit without being scientifically validated. Furthermore, most donor countries have explicitly committed to reaching this level at several occasions throughout the past 50 years.

In 1974, Sweden became the first DAC member state to reach the 0.7 level, followed by the Netherlands (1975), Norway (1976) and Denmark (1978). The fourth Scandinavian donor, Finland, surpassed the target once in 1991. Luxemburg crossed the threshold in 2000 and the UK in 2013. Both countries have maintained aid transfers in excess of 0.7 percent ODA/GNI since reaching the target. The remaining donors, however, fall drastically short of this level, although almost all have promised to reach it. Today the DAC average is 0.29 percent of GNI (OECD 2015: 164)

Qualitative Critique of ODA – Broadening the definition of development aid

Many of the financial flows categorized as ODA in the past and present provoked fierce criticism. In the early days, DAC countries classified nearly all public financial flows to developing countries unrestrictedly as ODA, due to the absence of a clear-cut definition of which payments qualify as aid. Only in 1969, almost a decade into its existence, did the DAC come up with a definition of which financial commitments qualify as ODA. According to the still valid criteria, ODA is comprised of transactions originating from the public domain with the objective to promote economic and social development (OECD 2015: 342). These transactions further have to carry a minimum grant element of 25 percent, i.e. a non-repayable concession or simply a gift. Every other transaction which also originated from public finances was to be subsumed under Other Official Flows (OOF).

The criterion that ODA only has to have the objective of promoting economic and social development, but not actually have to achieve it, makes ODA, by definition, highly subjective and interpretative. The DAC's definition and thereby the disqualification of many transactions as ODA has contributed to the decline of aggregate DAC ODA/GNI since the early 70s.

Nobel Laureate Gunnar Myrdal was the first to criticize the DACs reporting standards (Myrdal 1970) and a fair share for the formulation of the ODA definition has to be attributed to his findings. A prominent malpractice he revealed, was Portugal's military spending for

fighting independence in its colonies, which the country declared as ODA. This practice was, somewhat modified, repeated by the DAC's largest donor, the US, roughly two decades later. During the first Gulf War, the country reported its military debt relief for Egypt over two years as ODA under the somewhat cynical label of *Gulf Aid* (Raffer & Singer 2002: 84).

Apart from the extreme examples of military spending reported as aid, the term "broadening" describes the practice of including doubtful payments in a donor's ODA report. Doubtful insofar, as their contribution to economic and social development is highly questionable. The list is long and includes, among others, debt relief, administrative costs, and first year expenses for migrants and costs for students from recipient countries, which are calculated at average cost – substantially higher than the real marginal costs incurred. Other doubtful ODA flows are catastrophe and emergency relief as well as export credits. What is more, the fact that, depending on the donor, varying shares of ODA are tied to the import of products from the donor has also been the target of fierce criticism. Raffer & Singer (2002: 86f) have tried to quantify the impact of these so-called broadening measures for the period 1989 to 1994 and concluded that ODA was up to 40 percent over-reported.

The latency between aid commitments and disbursements, i.e. actual payments, is a further source of discontent, as many recipients have had to wait for years before funds were actually made available. Lastly, the DAC's reporting practices have aroused wide suspicion. Self-monitoring and mutual control on behalf of the donors in the absence of an external supervision cannot be equated with optimal accountability.

4) Aid in the 21st century – the DAC's New Paradigm

The fall of the iron curtain not only brought about a massive decline in the quantity of ODA. Fueled by intensified critique of its allocations practices in the past from both, academia and the public, the DAC donor community further re-assessed its aid allocation and came to realize that their vastly different and uncoordinated approaches of the past had to be discontinued. Almost half a decade of development aid had helped some recipient countries kick-start their development but also had very detrimental effects on other recipients, with the overall results of aid being rather modest and many recipients heavily dependent on aid transfers as the major source of external finance and foreign currency.

A series of conferences was accompanied by bold announcements to harmonize aid efforts among donors and align allocation with recipient's need and, thus, a debate on aid efficiency was initiated. The 1992 UN-Conference on Environment and Development in Rio de Janeiro brought the idea of sustainable development on the aid agenda. A 700-page document named '*Agenda 21*', which was signed by most participants, calls for a renaissance in aid distribution³. The new spirit of aid allocation was manifested in broad and general goals. One feature was conceptualizing aid beyond purely economic terms, a trend which was accompanied by the creation of broader development indices such as the Human Development Index.

Subsequently, the DAC began to embark on a boldly proclaimed New Paradigm of development aid for the 21st century. A first step consisted of rebranding development aid as development co-operation to signal the henceforth more inclusive relationship between donors and recipients. Ever since the mid-nineties the DAC had been busy publishing documents and guidelines evidencing its commitment to this New Paradigm. In May 1995, the DAC published a document gathering new guidelines that would govern aid allocation in the 21st century. The document carried the promising title '*Development Partnerships in the New Global Context*' (OECD 1995), emphasizing that the relationship between donors and recipients was to be redefined. This notion of partnership, further expressed in terms such as ownership or participatory development, practically stood for integrating recipients into the aid decision process and steering allocations towards their needs. Another criteria for future aid allocation was a '*sound policy framework*' (ibid.: p. 1) as an essential precondition for aid to be effective. Donors promised to take '*good governance, democratic accountability,*

³Agenda 21: <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=52>

protection of human rights and the rule of law' (OECD 1996: p. 2) strongly into consideration when distributing aid. As a novel commitment, the document promised to make aid contingent on the societal *'participation of all people, notably women'* (ibid: p. 8). In 1996, a document named *'Shaping the 21st Century: The Contribution of Development Co-operation'* (OECD 1996) was released, a key document which specified the more vague and general announcements of the previous publications. The DAC was reflecting on its learning experience over its existence and came up with a series of targets, which were somewhat anticipating the MDGs that were agreed upon four year later. Goals to be achieved by the new inclusive development partnership were, among others, universal primary education, the alleviation of poverty, progress towards gender equality and the reduction of infant mortality by two-thirds (OECD 1996: p.2). Whereas such goals can be seen as a rather general theme that was already mentioned in the two previous publications, what was really novel was the DAC's acknowledgement that in the past aid was (partially) driven by self-interest motives from donors (OECD 1996: p.6). The report further contained a section *'lessons learned'*, in which the DAC looks back on past misguided practices: *'Set-backs have occurred, resources have been wasted, and ill-conceived and poorly managed aid has been counterproductive. Some countries have become excessively dependent on aid'* (OECD 1996: p. 8). Simultaneously, the DAC informs the reader that it has drawn its conclusion: *'In particular, we have learned that successful development strategies must integrate a number of key elements. They require a sound and stable policy framework; an emphasis on social development; enhanced participation by the local population, and notably by women; good governance, in the widest sense; policies and practices that are environmentally sustainable; and better means of preventing and resolving conflict and fostering reconciliation'* (ibid.). The report further contains the commitment to reach the 0.7 generosity ratio target *'as soon as possible'* (ibid.: p. 16). Further re-evaluating past aid practices, the DAC also conceded practices broadening the definition of ODA (OECD 1998: p.114); i.e. payments somewhat dubious in the development context, as inflating reported ODA figures.

In 2010, marking its 50th anniversary, the DAC reflects on its existence yet another time and states many of the features of the, at least self-proclaimed, new paradigm as achievements already reached⁴. Among them, the DAC lists prioritizing towards the neediest, empowering women or, again, having transformed the donor-recipient-relationship into a partnership of equals.

⁴ The DAC: 50 Years, 50 Highlights <http://www.oecd.org/dac/46717535.pdf>

But not only DAC specific activities and publications set the stage for the New Paradigm of Development Co-operation. A widely cited World Bank report on aid effectiveness, published in 1999, confirmed the DAC's assertion that aid works best when distributed to countries with sound institutions and policies (World Bank 1999). This notion that aid works under certain circumstances like a functioning institutional environment has been confirmed by many scholars (see for instance McGillivray (2003b), Burnside & Dollar (2000)). The 2002 UN conference in Monterrey further validated the potential of aid if allocated properly. The Monterrey Consensus on Financing for Development⁵, the conference's outcome, embraced sound policies as a means to successful development.

What followed the Monterrey conference was a series of four high level meetings on the effectiveness of aid. The first, staged in Rome in 2003, ended with the adoption of the Rome Declaration of Harmonization⁶. The declaration mirrored the donors' eagerly portrayed commitment to harmonization and co-ordination of aid efforts tailored for reaching the MDGs. One outcome of the Rome meeting was the establishment of a Task Force on donor practices. A follow up meeting in Paris in 2005 had the harmonization of monitoring, the evaluation of aid allocation as well as the assessment of aid effectiveness as its main agenda⁷. The Paris declaration came up with five principles of good aid practice, albeit they simply repeat what has been proclaimed before. However, one point strikingly stands out in the context of this thesis: the elimination of disproportions in aid allocation. This claim apparently addresses the practice of favoring certain recipients for reasons other than their need. Two further high level meetings on aid efficiencies were hosted in Accra, Ghana, and Busan, Korea, in 2008 and 2011, respectively. Again, they mostly parroted the various ingredients constituting the New Paradigm. What is worth mentioning about the Accra Agenda for Action, is that it rejected tied aid. And tied aid was indeed reduced massively. Between 1999 and 2008 the proportion of bilateral untied aid rose from 46 to 82 percent⁸.

Whereas the initiatives introduced in the last paragraph were not initiated by the DAC officially, its members were, nevertheless, among the signatories. And qualitatively these high level meetings did not diverge at all from the DAC's publications. What all these efforts have in common is a certain eagerness to portray a transformation of the aid landscape. If judged by their commitments, one can expect to observe aid flows following a different pattern that

⁵ Monterrey Consensus on Financing for Development

<http://www.un.org/esa/ffd/monterrey/MonterreyConsensus.pdf>

⁶ Rome Declaration of Harmonization <http://www.oecd.org/dac/effectiveness/31451637.pdf>

⁷ Paris Declaration <http://www.oecd.org/dac/effectiveness/45827300.pdf>

⁸ P. 17 in The DAC: 50 Years, 50 Highlights <http://www.oecd.org/dac/46717535.pdf>

they did in the past. The notion of partnerships/ownership/participatory development indicates that need factors should rank highest of all aid allocation drivers. Especially, expressions such as eliminating disproportions suggest that donors abandon pursuing their bilateral preferences towards strategically important partners and channel aid towards those in most need of it. In the past, not all donors have misbehaved in the sense of self-interest fueled aid distributions. Nevertheless, the notion of harmonization, as emphasized by the Paris declaration, nurtures expectations that donors will behave more homogenously than in the past. Previously, several attempts have been made to classify donors as self-oriented versus benevolent. Harmonizing aid efforts should result in self-oriented donors gradually adopting the practices of the Scandinavian donors in term of both, quantity relative to GNI as well as spatial allocation. The rhetoric of a new paradigm is bold and published on every occasion. My thesis runs the empirical experiment that investigates whether donors live up to their proclamations.

5) Literature Review

Since the early 70s development aid has been a subject of research across several academic disciplines, most notably economics, political science and development studies. General themes encountered in the literature are the actual aid allocation, normative analysis of optimal aid allocation, comparisons among different donors and recipient countries, as well as the comparison of aid flows over different time periods.

The literature on foreign aid in economics can be broadly divided into two streams. Whereas the first category of publications investigates the economic effects of aid on recipient countries (i.e. aid effectiveness), the second category examines the geographic allocation of aid flows.

Within the first stream, early research has not found any positive effects of aid on growth. Boone (1996) concludes that aid is mostly used by recipient countries for public consumption but not investments and, like Mosley (1981) before, he does not observe any systematic relationship between aid and growth. More recent publications confirm earlier results in respect to development aid's lacking impact on growth (Collier et al. 1997, Collier & Dollar 2001), but extend the investigations to the study of the relationship between aid and institutions or policies.

In this respect, Burnside & Dollar (2000) drew a different conclusion about the relationship between aid and growth. They found that the impact of aid on growth depends on the quality of institutions and policies and that under certain political arrangements, aid potentially caters quite positive effects on long-run growth. Hence, they reject the assumption that aid carries the same effects in any institutional environment. Today, there is a broad consensus that the impact of aid is maximized if it is allocated to poor countries employing development-friendly economic policies, a view also explicitly adopted by the World Bank (1998). Furthermore, most DAC donors were signatories of the Monterrey Consensus, elaborated at the 2002 UN International Conference on Financing for Development, which also adopted the view that aid is most effective when the incentive regime is sound.

In a second paper, Collier & Dollar (2002) investigated the effects of aid on infant mortality and develop a poverty-efficient allocation of aid. They argue that the actual allocation of aid deviated vastly from the poverty-efficient allocation and claim that aid effectiveness could be doubled if the poverty-efficient allocation was pursued. However, their model underlies the

notion of a poverty-efficient equilibrium in which the marginal dollar in aid given to any recipient country has the same effect – a somewhat unrealistic assumption. Apart from the fact that their sample only included 56 recipient countries, they found that multilateral aid is more sensitive to the quality of institutions than bilateral aid.

Besides these two large streams in the economic literature on development aid, there are a few rather isolated analyses like Alesina & Weder (2002) who researched whether less corrupt governments receive more aid and concluded that corruption is not penalized by donors. Another theme not classifiable into the large stream is the investigation of the determinants of donor aid budgets, as undertaken by Round & Odedokun (2004), Chong & Gradstein (2008) and Fleck & Kilby (2006).

This thesis stands in the tradition of the second stream, the one trying to determine what drives observed aid allocation. From previous studies a broad consensus has emerged over the allocative behavior of bilateral donors, according to which donors' strategic interests vastly outweigh variables indicating either, a recipient's need or merit in terms of development-friendly policies. The first publications were overtly anecdotal and purely descriptive before Dudley and Montmarquette (1976) introduced econometrics to the analysis of the spatial distribution of development aid. They pointed out that granting aid is a two-stage process. In a first step the donor decides whether or not to grant aid to a specific recipient. If a positive amount of aid is allocated, the donor has to decide this quantity allocated in a second step. The authors concluded that while the supply of aid was a decreasing function of per capita income, at the same time economic, political and colonial ties cater vastly more explanatory power. They further observed a bandwagon-effect, meaning there is a positive correlation between the amount of aid received from other donors and ODA received from the donor of interest.

McKinley and Little (e.g. 1977, 1979) published a series of papers investigating the allocation behavior of the then three major donors, the US, the UK and France in the 1960s. They found a gradual increase in both, the volume of aid supply and the number of recipients, two findings which reflect the quantitative evolution of ODA during the period investigated. Estimating two different models, one introducing recipient need variables and another measuring donor interest, they concluded that the allocation of aid stems from two distinct factors of motivation – recipient need and donor strategic interest, with the latter dominating.

Maizels and Nissanke (1984) followed their methodological approach and extended it not only to multiple bilateral donors, but also to multilateral donors. They found that the recipient

need equation properly describes the allocation behavior of multilateral donors, but fails to describe bilateral aid flows. Conversely, the donor interest equation captures the geographic distribution of bilateral donors, but falls short of explaining multilateral donors' allocation patterns, leading them to conclude that '*...bilateral aid allocations are made ... in support of donors' perceived foreign economic, political and security interests*' (Maizels & Nissanke 1984: p.891). Yet, estimating two separate equations gives rise to an omitted variable bias, and this is why models incorporating both set of variables (recipient need and donor interest) emerged.

After Dudley and Montmarquette (1976) first came up with the concept, the two-stage nature of the aid supply process had been neglected and was re-discovered only 15 years after their pioneering publication. In a series of two papers analyzing the British and Australian aid allocations in the 1980s, McGillivray and Oczkowski (1991, 1992) employed a two-stage model and Gang & Lehman (1990) estimated a Tobit model of the supply of US aid to Latin America.

Trumbull and Wall (1994), were the first to introduce panel data to the debate. They estimated a Heckman model of the determinants of aid allocation based on a two-dimension panel dataset, taking aid transfers from both, bilateral and multilateral donors, into considerations. Their analysis covered 86 recipient countries over the five-year period from 1984 to 1989. However, as Maizels and Nissanke (1984) had already shown, bilateral and multilateral donors behave differently in their allocation behavior. Therefore, doubts remain whether aggregating total aid flows, irrespective of the source, is an adequate approach.

McGillivray (2003a), who examined earlier publications in great detail, summarized that in past studies strategic variables clearly drove aid supply. Past investigations revealed little importance of '*developmental or humanitarian concerns*' (McGillivray 2003a: 7).

The most cited economic publication investigating bilateral aid supply, is a paper by Dollar & Alesina (2000). Like earlier research, they concluded that donor strategic interests explain a vastly greater part of the allocation of aid than variables suggesting recipients' needs. They further employ a thus far unseen large time frame, covering a period of 25 years 1970 and 1994. Nevertheless, they used a rather simple methodology, relying on five-year averages for the period studied, and performing cross-sectional as well as individual recipient time-series analysis, which fails to take time-invariant unobservable effects potentially correlated with the regressors into account. Yet, they were pioneering the study of the individual behavior of certain bilateral donors, concluding that bilateral donors exhibit great heterogeneity among

their allocation patterns. To their credit, they were also the first to make use of several variables such as bilateral UN General Assembly voting scores and institutional measures.

Berthélemy and Tichit (2004) explored the break in aid allocation after the fall of the iron curtain and employed a random-effects Tobit model to estimate their data. Consistent with descriptive statistics, which indicate a steep decrease in the amount of total aid allocated, they found marked differences between the 1980s and 1990s. More specifically, they argued that the end of the cold war has reduced the bias towards former colonies in favor of trade partners and further found that donors take the quality of governance into considerations when allocating aid.

In a follow up study Berthélemy (2006) tested the validity of Dollar & Alesina's (2000) finding that different donors indeed applied diverging criteria when distributing aid. This time, a Craig's two-step model was applied. Berthélemy presented his conclusions in a three dimensional taxonomy, categorizing donors as altruistic, moderately egoistic and egoistic.

Fleck and Kilby (2010) researched the difference in US aid between the Cold War period and the decade in the aftermath of 9/11, and identified a receding consideration for need variables.

Dollar and Levin (2006) investigated the question whether donors are selective with respect to need and merit variables, leaving donor strategic interest variables out of consideration. They found that those donors which are poverty-selective are also policy-selective. However, their exclusion of self-interest variables lead them to conclude that the UK was a country exhibiting a high value in both, need and policy-selectivity, which is highly at odds with Berthélemy's categorization of the UK as an egoistic donor (2006).

Hoeffler and Outram (2011) used the largest dataset hitherto applied to the estimation of bilateral aid allocation and extended existing research to investigating the relative importance of recipient countries' need and merit, as well as, donor countries' strategic interest. They found that the previous literature had vastly overstated the importance of donors' strategic interests as determinants of bilateral aid flows and that recipient need is the primary driver for aid commitments, whereas awarding good policies is negligible – accounting for only two percent of the total variation in bilateral aid flows. However, their study suffered from the drawback that they include Part II countries, which are technically not development aid recipient countries.

Whereas the most frequently cited publications and their findings have been summarized above, the number of past studies is actually far greater. However, in spite of the existence of

a vast amount of academic investigations of aid allocation, only a few truly research the allocation of bilateral aid.

Most publications suffer from various flaws when it comes to their sample concerning either, donor or recipient countries. For instance, many publications only look at a limited amount of donor countries, most notably the largest ones. While this focus is useful in many perspectives, it is not representative. Another supply side sample distortion found in the literature is the combination of bilateral and multilateral aid in a single dependent variable, although it has been well established that bilateral aid allocation behaves differently from multilateral allocation. As far as recipient side sample selection problems are concerned, a frequently found drawback is the inclusion of Part I, as well as, Part II countries into the analysis. This is done in refutation of an existing clear-cut definition, according to which Part II countries explicitly do not qualify for receiving ODA – because these countries are essentially middle-income states.

A closely related sample selection problem are the frequently encountered regressions for single donors and their strictly positive observations. Since the sample of recipient countries is not identical for all donors, this potentially introduces a sample selection problem.

Furthermore, many publications in the past used aid disbursements (i.e. actual transfers) rather than concessions as the dependent variable. Given the observed latency between aid concessions and disbursements this practice might suggest an incorrect picture of what is going on. In the section introducing the variables, the higher appropriateness of aid concessions will be elaborated.

6) Method of estimation

As briefly mentioned in the last section, econometric models applied to estimate the determinants of aid allocation have become increasingly more sophisticated. Early pioneers in the field like McKinley & Little or Maizels & Nissake, estimated separate simple linear models for variables measuring a recipient's need and a donor's strategic interests and simply comparing variation explained by the coefficients of the two equations (R^2). As both categories of variables jointly determine the allocation of aid, in this approach each equation suffered from an omitted variable bias.

Subsequent publications, combined both categories of variables in a single equation. Nevertheless, these approaches mostly estimated separate equations for each donor or any other sub-sample of the DAC, thereby encountering another obstacle: the selectivity of small donors. Whereas most large donors tend to give at least some positive amount of aid to almost every recipient, smaller donors are very selective. This observation is possibly caused by the larger aid budgets of larger donors and by their presumably broader foreign policy agenda. However, also for larger donors the recipients do not perfectly overlap. Thereby, the approach of estimating donor-specific equations and then comparing the results falls prey to comparing coefficients, which are obtained from using different samples. As cross-country OLS regressions tend to be very sensitive to the inclusion of certain countries with extreme values (outliers), comparison across different samples might be misleading. Roodman (2007), who examined the results of Burnside & Dollar (2000) finds that their results heavily rely on outliers. An approach by Hoeffler & Outram (2011) to mitigate the effect of estimating over different samples, is to restrict the sample to those recipients which receive aid from all donors under consideration. Needless to say, this approach can only be realized at great expense in respect to the sample size, unless – as they do - only the largest five donors are investigated.

With small donors being very selective, the sample contains numerous zero-observations. The problem OLS encounters when having a lot of zero-observations, is that estimates become biased, because many non-positive observations underestimate the value of the coefficients. Moreover, OLS estimation does not take the non-linear nature of aid distribution into account. Furthermore, the selection of recipients is not undertaken according to a random draw, which violates a core assumption of OLS and introduces a sample selection bias.

Another misguided estimation practice in earlier publication was the treating aid allocation data as cross sectional. The true panel nature of the data was circumvented by averaging arbitrary periods and estimating these averages with OLS. It was employed in the most frequently cited paper in aid allocation (Dollar & Alesina 2000), in which five year periods were averaged over a timeframe of 25 years.

Only quite recently have limited dependent variable models entered the study of aid distribution. As Dudley and Montmarquette already rightly pointed out in 1976 the aid allocation decision is a two-step process. The first decision is whether to give aid to a certain recipient at all. The subsequent, second, decision is about how much aid to supply to every selected recipient. The nature of aid as a dependent variable is indeed a limited dependent variable, provided that the researcher looks at commitments. Aid commitments are truly censored from below at zero, i.e. less than zero cannot be committed to any recipient by definition. On the contrary, if aid disbursements are studied, the nature of the dependent variable is not censored but continuous over the full range (commitments are only continuous for strictly positive observations). Hence, disbursements have to be artificially censored by the researcher, which comes at the cost of loss of data, because bilateral disbursements can turn negative for certain years due to the potential quantitative dominance of loan repayments over the actual aid transfer.

6.1.) Limited Dependent Variable Models

Past studies have talked about two concepts when describing aid commitments' bounded nature. They either speak of censoring or truncation. Both concepts imply that the data is either bounded from below or above – with the first case accurately describing aid commitments over its full range of observations. What differentiates these concepts from each other is the treatment of the limited observations. Censoring includes the limited observation in the sample, which truncation does not.

$$y = \begin{cases} y^*, & y^* > L \\ L, & y^* \leq L \end{cases}$$

Censoring

$$y = y^* \text{ if } y^* > L$$

Truncation

As illustrated above, truncation comes at the cost of loss of information, as limited observations are dropped. Therefore the truncated sample is not representative, whereas the censored sample is. Nevertheless, due to many limited observations the censored sample's mean for the dependent variable is not representative and, in case of censoring from below, downward biased. However, if one intends to study the complete aid commitment sample, one deals with a censored model. If only strictly positive observations are taken into account the model is truncated. The truncated approach, or rather said concentration on strictly positive aid flows, was predominant in the past and used by most authors.

In the literature three models have been suggested to deal with the censored nature of the dependent variable (Neumayer 2003, McGillivray 2003b); a two-step model, a Heckman sample selection model and a Tobit random effects model. The choice between these approaches depends on the conceptual assumption about the nature of the two-stage decision process. As mentioned before, a discrete binary decision (selection equation) is followed by a continuous decision (allocation decision) on how much aid to allocate to chosen recipients. The crux is whether one assumes these two decisions to be independent from each other or not. The three limited dependent variable models available differ from each other in this assumption. Note, that all limited dependent variable models use a Maximum Likelihood estimator to obtain results (Wooldridge 2006: 578).

Cragg's two-step model

The two-part model was developed by Cragg (1971) and assumes the two decisions to be independent of each other, i.e. $cov(u_{discrete}, u_{continuous}) = 0$. As one possible approach, a two-part model or also known as Cragg's hurdle model, has been estimated in the past by Berthélemy (2006) and Fleck & Kilby (2007). It is further recommended in a methodological review by McGillivray (2003a).

In a first step a Probit model estimates the probability of receiving aid in a selection equation, where Φ is the normal standard cumulative distribution function.

$$Prob(y^* > 0) = \Phi(x'\gamma) + u$$

For the sub-sample of positive aid recipients, an OLS regression estimates the amount of aid allocated (allocation equation).

$$E(y|y^* > 0) = x'\beta + \sigma \lambda\left(\frac{x'\beta}{\sigma}\right) + v$$

Note that in the two equations above two potentially different set of regressors determine the outcome, γ in the binary decision and β in the continuous allocation equation. This is because, the two-step model features the possibility that the regressors, or the sign and magnitude of the coefficients in the selection equation are different from those in the allocation equation, which implies $cov(u, v) = 0$. While this assumptions allows for independence of the two stages from each other, it risks introducing a sample selection bias into the allocation equation. And this risk is quite large, since there is, on the one hand, hardly any theoretical intuition why these two decisions should be qualitatively different from each other. On the other hand, no distinct regressors for the selections equation have been suggested in the past. The two-step model was applied because it is appropriate when the zero observations are genuine zeros, which is the case with aid commitments but wouldn't be the case with aid disbursements. Moreover the two-part model would further be appropriate, if the continuous decision follows the discrete decision in chronologic sequence (Humphreys 2013: p.7) – which can be assumed to be the case in aid allocation. Furthermore, both studies, which have pursued this approach, Bertélemy (2006) and Fleck & Kilby (2007) have found the residuals from the two equations to show only little correlation. This suggests, that the allocation decision is indeed independent of the selection decision, albeit the same parameters determine both and independence is difficult to argue conceptually.

Heckman's sample selection model

An alternative is using a Heckman sample selection model, proposed by Heckman (1979) and initially applied to the study of female income in the presence of housewives, who opted out of the sample (ibid.). As the term sample selection suggests, the Heckman procedure is mainly used for survey data where respondents select themselves into a category. Opposed to the two-part model, the limited dependent variable can therefore be represented as a latent variable, which is only incompletely observed when the limit-constraint is binding. The sample selection model resembles the two-step model in the sense that it combines a binary Probit model with a truncated linear regression.

$$Prob(z = 1) = \Phi(w'\gamma) + u$$

After a Probit model estimated the binary selection equation in a first step, the Heckman approach computes the so-called inverse Mills-ratio to correct for sample selection in the allocation equation, which was a pioneering idea at the time.

$$\hat{\lambda}(\mathbf{w}'\gamma) = \frac{\phi(\mathbf{w}'\hat{\gamma})}{\Phi(\mathbf{w}'\hat{\gamma})}$$

The inverse Mills-ratio is the ratio between the standard normal probability distribution function ϕ and the standard normal cumulative distribution function Φ , evaluated at $\mathbf{w}'\hat{\gamma}$ (Wooldridge 2002: p. 672). The inverse Mills-ratio, $\hat{\lambda}(\mathbf{w}'\gamma)$, is introduced together with the regressors into the allocation equation to correct for the fact that the truncated sample of observations strictly above the censored level is not representative.

$$E(y|z = 1) = \mathbf{x}'\beta + \rho\sigma\hat{\lambda}(\mathbf{w}'\gamma) + v$$

However, and contrasting to the hurdle model, the Heckman model does not assume the two decisions to be independent from each other. The main difference between the two-step model and the Heckman approach, is the inclusion of the inverse Mills-ratio $\hat{\lambda}(\mathbf{w}'\gamma)$, also called Heckman's lambda, to correct for sample selection. Moreover, and as already stated, the (normally distributed) error terms of the two equations u and v are not independent, but exhibit $cov(u, v) = \rho \neq 0$, which enters the allocation equation as a scale factor (Wooldridge 2002: p. 698). The Heckman model, however, features one serious drawback. While it allows for different coefficient signs across the binary and continuous regression, robust results rely on the identification of a separate regressor that is relevant for the selection, but not the allocation decision. Just as in Cragg's model, this finding is very difficult to tackle, as it suggests the presence of an exclusion criteria, which determines being selected but not how much aid to receive. Such an exclusion criteria is hard to find in the study of aid allocation. However, unlike in the Heckman method, robust estimates in the Cragg's model are not conditional on the presence of an exclusion parameter. Even in the absence of such a variable the Heckman model was used in the context of aid allocation by Trumbull and Wall (1994) as well as by Berthélemy (2006) to provide a benchmark against which to test the two-step results.

Tobit model

A third alternative is the Tobit model, the most commonly used estimation technique when the dependent variable is censored from below at zero. The model was developed by Nobel

Laureate James Tobin (1958) and it is a special case of the general Heckman model, which also employs the latent independent variable approach. Therefore, the convention was established to call the standard Tobit model the Tobit I model, and the more general Heckman model the Tobit II model (Wooldridge 2002: 690). Contrary to the two previous model, the Tobit model combines the selection and allocation in one equation, which, nevertheless, can be separated into a Probit model and truncated regression. It is also referred to as the censored regression for its property of controlling for the endogenous selection in one equation (Wooldridge 2002: p. 667). Contrary to the two preceding models, the Tobit approach restricts the coefficients to be the same in both, the selection and the allocation equation.

$$Prob(y > 0) = \Phi(x'\beta)$$

After a Probit model has determined what makes a country eligible for aid receipt, a truncated OLS regression estimates the drivers of the quantity of aid received by the reduced (truncated) sample.

$$E(y|y > 0) = x'\beta + \sigma \lambda \left(\frac{x'\beta}{\sigma} \right)$$

The Tobit model's precedent application was in consumer economics, where consumers were assumed to have a latent preference for any good but, because of negative latent preferences, buy a zero quantity of it (Stewart 2009: p. 4). Put differently, the consumer would derive maximum utility from negative consumption of good x in order to free resources for the purchase of good y. For the estimation of such corner solution dependent variables the Tobit model is the most frequently applied method (Wooldridge 2006: p.587). The assumption of negative latent outcomes would be perfectly appropriate for the study of aid disbursements ≥ 0 , when negative actual aid flows (due to servicing debt outnumbering commitments) are restricted by a non-negativity constraint. Although employed in the past (e.g. Abrams & Lewis (1993), Alesina & Weder (2000), Gang & Lehman (1990), Berthélemy & Tichit (2004)), the assumption of a possibly negative latent (desired) outcome renders the Tobit model somewhat problematic for estimating aid commitments. Perhaps some donors would like to squeeze money from some recipients (the US and Nord Korea would possibly be a candidate) to make resources available for distributing to others, but have to settle with the best available option - allocating zero (Neumayer 2003: p. 35). However, this assertion is as problematic in the present context as it is impractical and unrealistic.

Furthermore, the Tobit method's restriction on the coefficients to be exactly the same in both equations fails to consider several potential outcomes. If, hypothetically, being a colony gets a recipient selected eligible for aid receipt, but, simultaneously, being a colony does not increase the amount of aid received, this cannot be captured by the Tobit model. The model would assume that being a colony has the same effect on both decisions.

6.2.) Panel Data

All three model have been applied to the study of aid allocation in the past, although in the vast majority of cases to cross-sectional data. However, the study of aid allocation provides the researcher with a potentially large panel dataset, which should be exploited. Estimation of panel data, which exhibits a cross-sectional and a time-series dimension, brings about a vastly greater precision following from higher degrees of freedom due to the many more observations. One standard assumption is the existence of correlation for given individuals over time but independence between these individuals (Wooldridge 2002: p. 6). For instance, what recipient A receives in year two should be correlated with what it received in year one, but it should not be correlated with what recipient B receives in year two. Due to its multidimensionality, panel data estimation allows for several types of variation; overall, as well as between and within variation.

$$\bar{x}_i = \frac{1}{T} \sum_t x_{it}$$

Individual mean

$$\bar{x} = \frac{1}{NT} \sum_i \sum_t x_{it}$$

Overall mean

Starting with calculating both, the individual and overall mean, the three types of variances are easily obtained:

$$s_{Between}^2 = \frac{1}{N-1} \sum_i (\bar{x}_i - \bar{x})^2$$

$$s_{Within}^2 = \frac{1}{NT-1} \sum_i \sum_t (x_{it} - \bar{x}_i)^2$$

The between variation measures the variation across individuals (in this case across donor-recipient pairs) whereas the within variation measures variation within individuals across time

(e.g. aid commitments from US to China over the time-series). The overall variation, which measures both, variation between and within individuals, and is roughly the sum of within and between variations.

$$s_{Overall}^2 = \frac{1}{NT - 1} \sum_i \sum_t (x_{it} - \bar{x})^2$$

$$s_{Between}^2 + s_{Within}^2 \approx s_{Overall}^2$$

What makes panel data more difficult to estimate than cross-sectional samples is the presence of time-invariant regressors. These do not change over time for individuals and, hence, have zero within variation. The special relationships of a certain donor-recipient pair constitute such time-invariant effects in the present context, with the most prominent example in econometrics probably being innate ability in wage regressions. These individual specific effects can either be modelled as unknown constants (i.e. fixed effects) or as realizations of random variables, as is the case with random effects estimation. The statistical distinction between the two is whether individual specific effects α_i are allowed to correlate with the regressors, as is the case with fixed effects.

The fixed effects estimator includes the individual specific effects as the intercept of the equation:

$$y_{it} = \alpha_i + \mathbf{x}'_{it}\beta + u_{it}.$$

Thus, α_i , assigns a different constant to every individual measures what cannot be explained by the model. Note, that the missing time subscript denotes these effects as time-invariant. To recover (predicted) individual effects, one simply subtracts the fitted coefficients multiplied by the time-invariant average of individual regressors from the time-invariant individual dependent variable: A drawback of fixed effects estimation is that binary regressors drop out. In my sample, however, colonial ties, is the only binary variable.

$$\hat{\alpha}_i = \bar{y}_i - \bar{\mathbf{x}}'_i \hat{\beta}$$

Random effects models, on the contrary, include α_i in the error term, thereby assuming no correlation between α_i and $\mathbf{x}'_{it}$:

$$y_{it} = \mathbf{x}'_{it}\beta + (\alpha_i + e_{it})$$

In random effects estimation, individual specific effects are incorporated into a composite error term:

$$\varepsilon_{it} = \alpha_i + e_{it}$$

Having introduced fixed effects and random effects, we have arrived at the ‘*holy grail*’ of aid allocation estimation. Given the nature of aid flow data, one can quite surely assume that time-invariant unobserved heterogeneity prevails. Many donor-recipient pairs are characterized by a somewhat special relationship, which is not captured by the explanatory variables (e.g. colonial history or bilateral trade volumes). Not only do donors greatly vary from each other in their overall allocation pattern, they vary even more in respect to their bilateral commitments to individual recipients. Whereas, for instance, Morocco matters a lot to Spain, it does not necessarily do so to Luxemburg to the same extent. Indeed, a glance at the data reveals a myriad of special relationships when it comes to bilateral aid flows, with the US and Egypt probably being the prime example. Anticipating the results section, the Hausman test, which is used to choose between fixed and random effects, indicates that my dataset has to be fitted into a fixed effects model. Estimating aid data with a fixed effects estimator is insofar a novel approach, as nobody before has done it before. Although Bertélemy (2006) as well as Hoeffler and Outram (2011) have claimed to do so, they actually estimate a random effects model, which is evidenced by the fact that they report binary regressors in their supposedly fixed-effects outcome. As outlined before, this is impossible, given the properties of the fixed-effects estimator.

The base specification model I will estimate can be expressed as the following equation;

$$y_{it} = \mathbf{x}'_{it}\beta + (\alpha_i + u_{it})$$

The dependent variable, y_{it} , denotes the logarithm of aid per capita commitments and $\mathbf{x}'_{it}$ is a vector of explanatory variables. As the inclusion of the individual specific time-invariant α_i in the error term indicates, the base specification is a random effects model, which I opted for due to its application in preceding studies. It serves as a benchmark against past findings, which suggest a dominance of strategic variables.

In an alternative specification I will extend the base specification and include donor dummies, as well as, interaction terms between donors and regressors;

$$y_{it} = \mathbf{x}'_{it}\beta + D_i + \gamma D_i \mathbf{x}'_{it} + (\alpha_i + u_{it})$$

Another specification will introduce recipient dummies. As established before, the aid committed is a limited dependent variable and needs therefore be estimated with one of the three methods introduced above. More generally, maximum likelihood estimators do not

exhibit the desired asymptotic properties when fixed effects are included, and, subsequently, Probit selection models don't (Honoré 1992: p. 543). Nevertheless, some approaches exist. Greene (2004a, 2004b) claims that if introducing fixed effects into LDV models estimations only suffer from a very small bias as long as the time dimension is larger than five. Kyriazidou (1997) and Wooldridge (1995) also proposed remedies to incorporate fixed effects in sample selection models. However, regression programs⁹ do not permit these operations. Of the limited dependent variable models introduced, Stata only features a Tobit estimation for a random-effects panel estimation. Although the other two models can be imitated with random reffects, fixed effects estimation is not feasible for either of the three. Moreover, another drawback is that limited dependent variable models are inconsistent when introducing fixed effects. Clearly, this state is unsatisfactory and it restricts the estimation of the censored sample to the usage of a random-effects estimator. Only for the truncated sample can a fixed-effects estimator be applied.

In line with prior suggestions I will use a two-step estimation as my base model. In order to establish its validity the covariance of the two stages' error terms will be evaluated. If the covariance is found to be zero, the two-step approach is appropriate. This is consistent with the difficulty of finding a regressor, which determines selection but not allocation. However allowing different coefficient values and even different signs for the same regressors across the two stages, is intuitively plausible and which is why the two-step approach is preferred over the Heckman model. Nevertheless, in order to provide a benchmark – but equally constrained by Stata's estimation methods – I will further run a Tobit random effects and a Heckman estimation of the censored sample.

In order to consider fixed effects I will also estimate a model including only the strictly positive observations (truncated sample) with a fixed-effects estimator. Apart from the fact that binary regressors drop out, little correlation in some regressors, will render inefficient coefficients, i.e. their sample distribution exhibits higher variances than a better estimator. And variation is definitely different across the explanatory variables in the sample. Lastly, although aid flows entail two questions, a between estimator which averages observations for every individual over time is suitable for identify the determinants of actual inter-recipient allocation, whereas intra-recipient variation is probably driven by many factors not captured in the mode.

⁹ For this thesis Stata is used

7) Data

The dataset is comprised of 23 donors and 139 recipient countries over a 16-year time-period ranging from 1995 to 2010. To my knowledge it is not only the most recent dataset analyzed, but it is, due to its timeframe, further capturing the spirit of the New Paradigm and the MDGs. The dependent variable is bilateral aid commitment per capita and year at constant prices. Hence, every aid flow from one donor to one recipient in one year equates one observation. The regressors measure two dimensions of determinants: recipient country need & merit (which I will combine) as well as donor country interest. As shown in the literature review section, some authors distinguish between need and merit. This is a challenging endeavor, as these two dimensions mostly center on the same variables. Rewarding recipient merit is further better studied in time series, since it involves a specific donor-recipient pair over time. Furthermore, donors supposedly vary in their reaction to award a recipient's achievements.

The sample is further comprised of DAC donors exclusively. The DAC does not include all donors and emerging donors are on the rise. And although the DAC's definition of ODA has been severely criticized, the OECD's donor club, nevertheless, provides at least a common reporting standard for its members, which allow for comparability among DAC donors. Reporting practices of non-DAC donors might diverge from the DAC standard – if they are publicly available at all.

Four new members of the DAC were excluded from the sample since they joined only very recently. Data on the aid supply of the Czech Republic, Poland, Slovenia and Slovakia did not even cover half of the timeframe in consideration. The European Union, which, like in other international organizations, is per se a member of the DAC, was also excluded for the reason that according to its nature the EU is rather a multilateral than bilateral donor. Although Korea joined the DAC only in 2010, the country was included in the sample, as it reported its aid commitments prior to the inclusion in the DAC according to the OECD's reporting practices.

Lastly, recipient countries included in my model are exclusively drawn from Part I Countries. In 1995 a re-arrangement of recipient countries took place, moving former Eastern bloc and middle-income countries to the so-called Part II list of countries. This re-arrangement draws a sharper distinction in the sense that it separates low und least-developed countries from more advanced ones. Lastly, the data on bilateral aid flows is publically available at the OECD's aid database.

Dependent Variable

The dependent variable is bilateral ODA commitment per capita and period. An alternative would be to use ODA disbursement, or actual payment. Both have been used in past studies, although the majority uses commitments. It has been argued (McGillivray 2003a) that commitments better reflect the decision making process of donor country governments. The lag between commitments and disbursements can be great in specific cases, and can also be caused or magnified by recipients' actions. On the contrary, the decision of allocating aid is one of true donor discretion. Of probably greater relevance, is the fact that financial flows only qualify as ODA if they contain a grant element of 25 per cent. The remaining 75 per cent have to be paid back with interest by the recipient. This has resulted in donor-recipient-year constellations in which actual bilateral aid flows (disbursements) were negative, as servicing debt outnumbered aid transfers. Commitments, on the contrary, are by definition non-negative. Dollar & Levin (2006) have used disbursements, albeit gross disbursements, which, contrary to net disbursements, are not corrected for loan repayments, which should converge towards commitments, albeit with a time lag. Generally, the choice of either should not weigh large on estimation results as they highly correlate.

As has also been established as a convention in applying econometrics to the study of aid allocation, the dependent variable will be expressed in per capita terms. Regressing the total volume of aid on explanatory variables, like it is done by Canavire et al. (2006) fails to take country size into consideration. Clearly, China or India receive substantially more ODA in absolute terms. Being two relatively poor countries, which comprise roughly a third of the global population (and hence, an even larger portion in the sample of aid recipient countries) but only receiving modest figures of per capita ODA, China and India constitute one the key drivers of the small country bias observed in past studies. Measuring ODA in per capita terms instead of absolute allocations controls for the size of the recipient country and ensures comparability of aid commitments across recipients, although it changes the overall picture, as the largest ODA recipients in absolute terms are usually not the major recipients in per capita terms.

Contrary to Dollar & Alesina (2000), who averaged aid flows over five-year periods, the present model measures bilateral aid flows for a one-year period. This is not only due to the convention that aid figures are published annually, but furthermore that aid budgets are allocated annually.

Another measure found in the literature has been employed by Svensson (1999), who isolated the grant element of DAC aid. While it is true that the grant element is a more accurate representation of the degree of benevolence on the donor's behalf, using total ODA commitments, including the elements which are subject to repayment, offers greater variation.

Need & Merit Variables

In line with the consensus about aid-effectiveness, presented in the penultimate section and according to which aid is best allocated to poor countries that employ development-friendly economic policies, a first set of variables aims to measure not only a recipient's degree of need but also performance in terms of good governance.

Economic output per capita has been used as the main indicator of a recipient's need. Here, GDP per capita figures from the Penn World Tables¹⁰ are used. Potential alternative measures include the Human Development Index (HDI), which, apart from GDP, also considers education and health when measuring a country's degree of development. However, the HDI correlates strongly with GDP. Therefore, I will, alternatively, isolate one of HDI's other components, more particular, life expectancy, and include it in a separate specification. As a third and a fourth proxy for development, I gathered data on the infant mortality rate (below the age of five) as well as on internet access from the World Bank Database. However, in the base specification I will use GDP per capita, on the one hand, since it is not only very straight forward and intuitively plausible, but also most frequently used in preceding studies. On the other hand, I will also include infant mortality in the base specification as it measures a different dimension of need than the average GDP per capita.

Some authors have introduced GDP growth as a proxy for economic-development friendly policies and institutions. Whereas their choice has been criticized (e.g. Feeny and McGillivray 2008), and the obvious fact that GDP growth is fueled by substantially more factors than solely government policies and institutions, GDP growth is practical in terms of data availability. A feasible option to include it in the regressions would be including the derivative of GDP. However, here I prefer to use an institutional indicator. Alesina & Dollar used two metrics developed by the Heritage Foundation. Application of their variables would either reduce the sample size by roughly one-third or result in a highly unbalanced panel. Another metric used in the past, is the Country Policy and Institutional Assessment score,

¹⁰ Penn World Tables: <http://cid.econ.ucdavis.edu/pwt.html>

which unfortunately is not available as a time-series. More generally, while many political and country risk indices exist, many of them are prohibitively expensive to use. What I found more convenient for the course of this paper, is to use a composite index developed by Freedom House¹¹, which is composed of various sub-indicators measuring the rule of law, freedom from corruption and the respect of property rights. The index ranges from zero to 100, with the latter indicating the best possible value.

Finally, the proportion of women in national parliaments measures the association between aid and female societal participation. However, this metric is anything but straightforward. It might either measure a desirable gender equality allowing any women to rise to the ranks of an MP. Alternatively, the measure might suggest the presence of a disparate society in which a few women from selected backgrounds make it to the highest public positions. Additionally, this regressor shows the difficult distinction between need and merit. In the effort to promote gender equality, does a recipient get more aid as a reward for female participation and thus a high percentage of female MPs? Or does a predominantly patriarchal country receive more aid to boost its share of female MPs? Conversely, this notion is true for the institutional measure as well.

Strategic Variables

A second set of regressors includes indicators for donors' political and economic interests in the bilateral relationship with a recipient. In the past it has been concluded, that these explanatory variables accounted for the largest part of variation in the supply of aid.

The first variable representing donor interest will be the volume of bilateral trade between the donor and the recipient, expressed as the sum of imports and exports. In the past authors have sometimes expressed bilateral trade solely as donors' exports, claiming this metric probably reflects the donor's trade interest more accurately. Nevertheless, in the case of raw material exporting states one can well assume a significant interest in importing those. Moreover, exclusively taking exports into account would not do justice to certain trade relationships and interdependencies, most notably US-Chinese trade. However, exports will be tested in an alternative model specification anyhow. The base specification draws on the sum of both, exports and imports. Due to a potential simultaneity bias, especially if aid is tied, bilateral trade will be lagged by one period. One of the DAC's aid priorities is called "aid for trade",

¹¹ Freedom House: <https://freedomhouse.org>

which explicitly sought to award trade volume with aid commitments. While this aspect might be better controlled for with a variable measuring general openness to trade, which is introduced below, it should also result in a larger coefficient for the volume of bilateral trade. Bilateral trade data was sourced from the COW-Database¹².

A second variable, which had long been used in the political science literature about aid allocation, but was introduced to economics by Dollar & Alesina (2000), is UN General Assembly voting, serving as a proxy for political alliances or, at least, a common geo-political orientation. I collected data on bilateral affinity scores from Erik Voeten's and Anton Strezhnev's database¹³. The dyadic score ranges from zero, expressing a perfectly oppositional voting behavior, to one, in case both countries exhibited exactly the same voting behavior over one year. A value of 0.5 indicates a donor-recipient-pair agreed over half of the votes and disagreed over the other half. With absenteeism dropped from the data, UN General Assembly voting outcomes become binary (Yes & No) and, hence, only votes, in which both participate count towards the score.

Estimation of such UN voting data was rejected or foregone in some publications and, admittedly, profound weaknesses are attached to its use. First, no heuristic exists, according to which one can rank various UN votes in respect to their importance, as clearly not all issues carry the same importance. I have included all votes with the same weight, an alternative might be to weigh them by participation. Furthermore, the question remains, whether certain geo-political interest groups, such as the G7, exhibit a common voting pattern. A correlation matrix of large donors' voting behaviors reveals that this is not the case, and that distinct voting patterns exist even among the large donors.

Whereas in past studies a "UN-Friend" dummy has been constructed and several of the where included in the same regressions, I will use bilateral data for every donor-recipient-year constellation. The previous approach also measured the impact of, for instance, a US-UN friend dummy on the aid flows from, e.g., France to Ghana.

The third variable measuring donor strategic interest is a dummy variable, which indicates former colonial ties between a donor-recipient pair. Alesina & Dollar, for instance, used the number of years a recipient was a colony of a donor in the 20th century, whereas the majority of other studies implemented the dummy variable approach. Alesina & Dollar's approach fails to take the Spanish empire into account, as most colonies gained independence already in the

¹² Correlates of War Project: <http://correlatesofwar.org/data-sets/bilateral-trade>

¹³ Data on UN GA voting: <https://dataverse.harvard.edu/dataverse/Voeten>

first half of the 19th century. However, regardless of the specification, colonial ties have proved to be significant determinants (Alesina & Dollar 2000). Colonial history are further an indicator of cultural ties, which is the past was also instrument for by language or religion.

Finally, it can be well assumed that these three variables measure distinct dimensions of donors' strategic interest. A look at the data reveals that most colonies are located in Africa and are not among donors' largest trade partners in the sample.

Controls

In order to control for a recipient country's size, its population enters the equation. As in past studies, the coefficient is expected to be significant with a negative sign, reflecting the small country bias mentioned above. This small country bias is driven on the one hand by low per capita aid commitments to China and India and, on the other hand, by some small island states constituting outliers for which ODA per capita figures are basically off the scale

Donor herd behavior has been observed by most authors introducing such a measure and will be tested by including the amount of aid received by other DAC donors than the one in the particular donor-recipient pair. Whereas aid from other donors can be complementary or substitutional the history of development aid is characterized by examples of darlings and orphans of the donor club.

Openness to trade enters the model to measure a recipient's principal commitment to trade enhancing policies regardless of the bilateral trade volume. In the past the Sachs & Warner index was used to measure openness to trade. Unfortunately, the index was not publicly available for the total time period estimated. Therefore, openness to trade will be measured as the sum of total exports and total imports over the recipients GDP, as proposed by Frankel and Romer (1999), which is a more direct measurement of a country's trade.

Foreign Direct Investment have been used in most past studies, but never found to be a significant driver of aid. Alesina & Dollar (2000) who compared aid to FDI, argue that FDI responds to economic incentives, whereas aid is mostly sensitive to political and strategic incentives. Nevertheless, to honor the convention of its usage it the past, FDI will be tested for.

8) Results

8.1) Descriptive Statistics

A first descriptive glance at the data reveals some interesting facts. While the DAC donor community is steadily growing, an old pattern still prevails. A few countries account for the vast bulk of DAC aid. The US, the DAC's leading donor in absolute dollar terms, accounts for roughly 25 percent of the total amount of aid committed over the 16-year timeframe. The contributions of the top five donors - further including Japan, Germany, France and the UK – add up to more than 60 percent of overall aid commitments, in the year 2003 to even more than 70 percent. Whereas these large donors distribute aid to almost all recipient countries, the smaller donor countries exhibit a strong selectivity.

DONOR	Nr. of zero-Obs.	%
JAPAN	71	3.19
FRANCE	134	6.03
GERMANY	134	6.03
USA	189	8.5
CANADA	292	13.13
UK	363	16.32
KOREA	394	17.72
NORWAY	542	24.37
AUSTRIA	561	25.22
BELGIUM	580	26.08
ITALY	589	26.48
SWITZERLAND	637	28.64
NETHERLANDS	651	29.27
SPAIN	719	32.33
FINLAND	813	36.56
SWEDEN	826	37.14
IRELAND	900	40.47
GREECE	1091	49.06
AUSTRALIA	1132	50.9
NEW ZEALAND	1173	52.74
LUXEMBURG	1226	55.13
DENMARK	1408	63.31
PORTUGAL	1661	74.69

Table 1

Table 1, which depicts the number and share of zero-observations clearly illustrates the selectivity of smaller donors. Out of 2,224 observations each donor provides, Portugal allocates zero aid in 1,661 cases (74.69%). This makes the country the most selective donors. On the other hand, Japan is the prime example of a donor allocating to almost every recipient

every year. Out of all 51,152 observations, 16,086 are zero-observations, which is 31.44 percent. Only 19.64 percent of all aid flows are larger than one dollar per capita,

The maximum per capita amount of aid allocated to a single recipient in a single year is \$18,951.03 and corresponds to the US' aid commitment to Palau in 1995, the first year of interest. This is a really huge and unique outlier, as the second largest observation stands at \$2,062.72, which is another US-Palau observation from 1999. In the entire dataset, only ten observations exceeded \$10,000 in aid commitments and they are US-Palau observations. This suggest introducing a dummy to control for this seemingly unique relation. The time-series shows the extreme value of 1995.

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
0	0	240.9	463.36	33.39	0	20.18	18.37	17.94	17.56	17.49	17.23	16.93	15.19

US aid commitments to Palau 1992 – 2005, USD millions

What is more, among the 50 highest annual bilateral aid per capita allocation in the sample only seven originate not from the US. The 50th highest allocation amounts to \$ 482.48. The recipients of 47 of these top 50 flows were either Palau, the Marshall Islands or Micronesia. This is a first indication towards the small country bias observed in past studies. Surprisingly, 42 observations were negative commitments, albeit within close range to zero – except for one observation, the UK's allocation to the Seychelles in 2007. After having re-affirmed that these 42 observations were indeed reported negative in the OECD database¹⁴, their values were replaced and set at zero without further investigation.

The mean of aid commitments per capita over the whole sample, which comprises 51,152 observations, is \$3.42. This number drops to \$2.19 if only the top 50 observations are left out. With the deletion of the top observations the standard deviation also drops from 89.57 to 12.85. Moreover, the average aid allocation for recipients with a population above one million is \$1.43, whereas average per capita aid commitments to recipients with less than a million inhabitants, surge to \$11.72, a further strong indication of the small country bias. Of all aid flows, only 2,128 observations are above \$10 (4.16%) and only 198 exceed \$100 (0.39%).

¹⁴ QWIDS – OECD's development statistics database: <http://stats.oecd.org/qwids/>

Explanatory Variable	Mean	Std. Dev.	Min	Max
Population	3,630,000	1.43E+08	17,255	1.34E+09
GDP per capita in \$	5631.566	5623.91	204.71	36289
Former Colony	0.0385	0.1923384	0	1
Bilateral Trade in \$	722,222,000	8242.033	0	486886.6
Bilateral Exports in \$	296,659,400	3084.494	0	166468
UN votes	0.727	0.2419081	0	1
Institutions	51.774	14.28406	8.9	78.6
(IM+X)/GDP	76.697	46.07923	0.309	531.7374
Women in Parliament	10.016	9.590314	0	56.3
Childmortality	68.11/	55.02953	5.3	278.7
FDI	189,000,000	1.05E+10	-4.55e+09	2.73E+11
ODA other donors	75.31	433.54	0	19276.15

Table 2

	Aid per capita average	Nr. of Observations
Former Colony	\$ 14.848	2,016
Not former Colony	\$ 2.952	49,136

Table 3

Table 2 provides the averages of explanatory variables for all explanatory variables. The sample mean for population is particularly small (a tenth of what global population divided by the 192 UN member states would yield), which indicates it is driven by the smallest countries in the sample, small island states. The sample average GDP per capita in purchasing power parity at constant 2005 prices is \$5,631, indicating that, overall, the sample is mainly comprised of the world's poorest nations. As Table 3 shows, colonial ties are expected to be a main driver of aid. Bilateral trade, as the sum of a donor's exports and imports, exhibits a sample mean of \$722.22 million, bilateral exports average at \$296.66 million. On average, any donor-recipient pair exhibits a dyadic UN votes score of 0.73, which suggests that, overall, recipients tend to vote rather confirmative with donors in the General Assembly. One reason for this might be because the votes in consideration are of a global concern. However, as outlined in the data section, the qualification that UN votes a presumably not the best instrument for measuring a recipient's strategic importance for a donor. The institutional measure, ranging from 0 to 100, has a sample mean of 51.77. Over the whole sample imports plus exports constitute 76.7 percent of recipients' GDP at the mean. On average, the share of female MPs in recipient countries' parliaments is 10.01 percent. Unfortunately, 68.11 out of 1,000 children below the age of five die in recipient countries in the sample on average.

Finally, FDI to recipient countries in absolute terms, show a sample mean of \$ 189 million, with a high variation though.

	ODA	UN	Colony	Bilat-Trade	Bilat-EX
ODA	1				
UN	-0.048	1			
Colony	0.109	-0.036	1		
Bilat-Trade	0.143	-0.1314	0.0675	1	
Bilat-EX	0.148	-0.145	0.0612	0.8191	1

Table 4

	GDP	Life Exp.	Infant. Mort.	Internet	Women Parl.	Policy-Inst
GDP	1					
Life Exp.	0.328	1				
Child. Mort.	-0.569	-0.676	1			
Internet	0.518	0.33	-0.457	1		
Women Parl.	0.126	0.089	-0.125	0.281	1	
Policy-Inst.	0.28	0.244	-0.24	0.211	0.104	1

Table 5

	ODA	FDI	Remit.	(IM+X)/GDP
ODA	1			
FDI	0.03	1		
Remit.	0.05	0.376	1	
(IM+X)/GDP	0.04	0.279	0.142	1

Table 6

Tables 4, 5 and 6 show various correlations in the dataset. Table 4 shows the correlation of aid per capita with the donor interest regressors. It reveals that choosing between bilateral trade and bilateral exports should not weigh heavy on results as they are highly correlated. Table 5 exhibits the correlation among need and merit variables, all of which correlate with the expected sign. Very high correlation among two variables suggests they somewhat express the same intuition, as evidenced by the example of life expectancy and child mortality for which the interpretation is straight forward. Lastly, ODA seems to be only slightly correlated with both, FDI and remittances. However, and as seems plausible, FDI is correlates a lot stronger with trade openness than ODA. Yet, these correlations only provide a first intuition as they are not obtained within the context of all explanatory variables.

Finally, the dataset is strongly balanced, i.e. it contains observations of almost all donor-recipient pairs in every time period. What is more, although the dataset is rich in both, individual as well as time dimensions, it is rather a short panel as the observations on individuals outnumber time periods by far.

8.2) Selection Stage

I estimated the allocation equation first, setting a binary outcome variable as the dependent variable. Thereby, I estimated the first stage estimation of all three limited dependent variable models. The value one is assigned to this binary variable if aid per capita commitments between a donor-recipient pair per year are strictly positive, and zero otherwise.

$$y = \begin{cases} 1, & y^* > 0 \\ 0, & y^* \leq 0 \end{cases}$$

Then I stored the residuals of this discrete estimation and proceeded to estimate an OLS random-effects of the strictly positive aid commitments and stored the residuals obtained from this allocation regression as well. Computing the covariance of error terms from both estimations, the selection and allocation stage, reveals a confirming result: $cov(u_{discrete}, u_{continuous}) \approx 0$. Strictly speaking, the error term covariance is slightly different from zero: $cov(u_{discrete}, u_{continuous}) = 0.00087$. However, this is acceptably close to zero to conclude that the two decisions are independent from each other (at least dependence can be dismissed), which is fortunate insofar, as it permits analyzing both decisions separately. This results suggests that the two-part model is the appropriate estimation method of choice, since it assumes error terms to exhibit zero covariance. On the contrary, robust results of a Heckman sample selection model rely, on the one hand, on the identification of an exclusion variable, which determines selection but not allocation. On the other hand, the Heckman model assumes $cov(u_{discrete}, u_{continuous}) \neq 0$. Moreover, this result further renders the usage of a Tobit model improper, as it assumes the two decisions to be the same. These seemingly uncorrelated error terms further confirm the conclusion of methodological studies investigating the best fitting limited dependent variable model for aid datasets; they concluded that Cragg's two-step method to be the most suitable (McGillivray 2003a, Neumayer 2003). Lastly, if the error term covariance is not truly zero, the coefficients in the allocation equation become biased. Nevertheless, with $cov(u_{discrete}, u_{continuous}) = 0 + \varepsilon$, and ε only marginally different from zero, this bias is negligible. A comparison of coefficients obtained from the two-stage allocation equation and random effects OLS estimation of strictly positive aid flows reveals that this bias is no source of concern in the present case.

Table 7 displays the results of the first stage selection equation under alternative specifications. Column two introduced donor specific effects with the US being omitted as

base category¹⁵, column three substitutes these for recipient specific effects¹⁶. Neither of the two alternative specifications significantly alters either the coefficients' signs or their relative magnitudes. Only minor changes can be observed. The specification introducing donor specific effects with the US as base category, renders UN votes and trade openness insignificant at even the ten percent level, after they have been significant at the five percent level in the base specification. At least as far as UN voting is concerned, there is a lot of heterogeneity in the data. Whereas the correlation between aid and affirmative UN voting is high for some donors, other donors do not seem to take UN votes into consideration when distributing aid, or even punish affirmative voting. Furthermore, the coefficient of UN votes is comparatively small in all specification, suggesting it does not determine aid selection to a great extent in the whole sample at least. Moreover, when trying two alternative specifications, with donor and recipient specific effects, UN votes in the recipient specific effects Probit model are highly significant but not in donor specific model

Due to maximum likelihood estimation of the Probit model, the magnitudes of coefficients are not accurate. Nevertheless, their signs and relative magnitudes are revealed in the coefficients. For appropriately assessing the influence of regressors on the probability of receiving aid, Table 8 shows the partial effects at regressor's mean for the base specification. All explanatory variables are (jointly) significant, at least at the 10 percent level.

Evaluating the factors contributing to the probability of being selected as a recipient, one notices that the estimating the selection equation yields a positive sign for population. Accordingly, the probability of receiving a positive amount of aid increases with population, which contradicts the previous finding of a small country bias. This might be due to high selectivity of small donors, since these possibly won't have the smallest recipients in the sample, small island states, high on their aid agenda. The positive correlation between population and aid is magnified if donor specific effects are included, and, on the contrary, this correlation is weakened when controlling for recipient specific facts.

¹⁵ Note that the US serves as the base category in all donor specific effects equations throughout the analysis

¹⁶ Cuba serves as the base category for recipient specific effects

Probit Selection Stage

DV = binary aid	Base Specification	Incl. Donor specific effects	Incl. Recipient specific effects	Donor specific Pooled Probit	Recipient specific Pooled Probit
LN(population)	0.328*** (0.021)	0.412*** (0.019)	0.547*** (0.038)	0.109*** (0.007)	0.08*** (0.011)
LN(GDP per capita)	-0.563*** (0.041)	-0.541*** (0.037)	-0.135*** (0.06)	-0.441*** (0.015)	-0.142*** (0.031)
Colony	1.528*** (0.199)	1.161*** (0.196)	1.409*** (0.192)	0.648*** (0.059)	0.45*** (0.052)
LN(bilateral trade)	0.130*** (0.009)	0.057*** (0.009)	0.15*** (0.009)	0.151*** (0.005)	0.268*** (0.004)
UN votes	-0.125** (0.06)	-0.003 (0.061)	-0.126** (0.06)	0.099* (0.044)	-0.221*** (0.038)
Institutions	0.010*** (0.002)	0.013*** (0.002)	0.003 (0.002)	0.009*** (0.001)	-0.002*** (0.001)
(IM+X)/GDP	0.001** (0.001)	0.001 (0.001)	0.002*** (0.000)	-0.001** (0.000)	0.001** (0.000)
% of female MPs	0.032*** (0.002)	0.033*** (0.002)	0.027*** (0.002)	0.018*** (0.001)	0.007*** (0.001)
Infant mortality	-0.004*** (0.001)	-0.003*** (0.001)	-0.005*** (0.000)	-0.00007 (0.000)	0.003*** (0.000)
LN(aid other donors)	0.146*** (0.015)				
LN(FDI)	0.076*** (0.008)	0.082*** (0.008)	0.067*** (0.009)	0.031*** (0.005)	0.014** (0.007)
Life expectancy		-0.005*** (0.001)	-0.004** (0.002)	-0.002*** (0.000)	-0.001 (0.001)
_cons	-0.36 (0.545)	-0.503 (0.5)	-6.739*** (0.881)	2.481*** (0.174)	0.135 (0.312)
# Observations	44,174	44,174	44,174	44,174	44,174
Rho	0.716	0.613	0.685		
Pseudo R2				0.326	0.278

1) Standard errors in brackets

2) ***, **, *, significant at 1%, 5%, 10% level

Table 7

Probit Selection Stage Base Specification, Partial Effects

dy/dx	Partial Effects
LN(population)	0.32*** 0.021
LN(GDP per capita)	-0.542*** 0.041
Colony	1.523*** 0.200
LN(bilateral trade)	0.132*** 0.009
UN votes	-0.14** 0.059
Institutions	0.01*** 0.001
(IM+X)/GDP	0.001*** 0.0003
% of female MPs	0.033*** 0.001
Infant mortality	-0.003*** 0.001
LN(aid other donors)	0.147*** 0.015
LN(FDI)	0.08*** 0.008

Table 8

Evaluating the factors contributing to the probability of being selected as a recipient, one notices that the estimating the selection equation yields a positive sign for population. Accordingly, the probability of receiving a positive amount of aid increases with population, which contradicts the previous finding of a small country bias. This might be due to high selectivity of small donors, since these possibly won't have the smallest recipients in the sample, small island states, high on their aid agenda. The positive correlation between population and aid is magnified if donor specific effects are included, and, on the contrary, this correlation is weakened when controlling for recipient specific facts.

As expected, the coefficient for GDP per capita, yields a negative sign, indicating that poorer countries are indeed more eligible for receiving aid. Past colonial ties exhibit a positive coefficient, which, moreover, is the largest of all coefficients. Considering the marginal effect, having colonial ties increases the probability of receiving aid by over 150 percent, *ceterus paribus*. Bilateral trade also has a positive marginal effect on aid and is significant at the one percent level. When introducing recipient specific effects, bilateral trade even show the largest relative marginal effect, suggesting that trade positively drives recipient allocation when recipient specific factors are absorbed. This is further validated by the fact that the

coefficient's magnitude decreases vastly when estimating the model with donor specific effects. Thus, donors do take bilateral trade relations into account and it seems they are rewarding recipients for trade volumes – a finding also explicitly expressed in the DAC's aid for trade program.

Contrary to expectations, UN votes show a negative correlation with aid and they are significant at the five percent level. Exhibiting significance renders the assumption that UN votes do not count for aid allocation invalid, although the sign is negative, which is at odds with expectation. At least in the model estimating only aid from the top five donors UN votes show a positive sign as well as a large relative magnitude. Thus, receipt of large donor aid is an increasing function of UN consensus. Smaller donors do not seem to award UN votes, which drives its negative sign in the complete sample.

Freedom House's composite indicator of institutions has a positive sign but only a negligible magnitude. Although the result is significant at the one percent level in the base category, the influence of institutional improvement is small. In numerical terms a one unit increase in this indicator is associated with one percent higher probability of receiving aid.

The share of women in parliament is also significant at the one percent level and its positive partial effects amounts to 0.033, meaning that a one percent increase in the share of female MPs corresponds to a 3.3 percent increase in the probability being selected as a recipient.

Infant mortality is, as expected, negatively correlated with the chances of receiving aid and its partial effect is 0.0033, which is negligible. Finally, FDI is significantly positively associated with the probability of receiving aid and aid received from other donors exhibits the same properties. Clearly, herd behavior can be seen and the existence of aid darlings is confirmed at the selection stage.

6.3) Allocation Stage

After having presented the results from the first stage decision, attention is now drawn to the second stage; the allocation decision. Therefore, aid per capita is log-transformed which treats zero-observations as genuine missing variables, as the logarithm of zero is not defined. Table 9 summarizes the results from the allocation equation.

First indications are provided by pooled OLS models (results reported in Appendix A1) with different specifications accounting for time-specific effects. However, a Preusch Pagan

Lagrange Multiplier test reveals that a random effects panel regression, which also constitutes the second step of Cragg's two-part model, is more appropriate than pooled OLS. The null hypotheses, according to which variances across donor-recipient pairs are zero, is rejected in favor of existence of time-invariant random effects.

Column one in Table 9, exhibits the results for the base specification. It reveals that the parameter for population has changed its sign, showing that there exists a small country bias in positive aid allocations. And this effect is large. Given the log-log transformation of both the dependent variable and population, GDP per capita, bilateral trade, FDI and aid from other donors, the interpretation of these regressors' magnitudes is straight forward. It is simply an elasticity. Hence all other regressors kept equal, a one percent change in population is associated with roughly half a percent (-0.438%) decrease in aid per capita. For GDP per capita, also negatively correlated with aid and significant, a one percent change is negatively associated with 0.336 percent change in aid. The coefficient for colonial ties is 1.5, and is interpreted in the way, that having colonial ties increases aid by 150 percent. After controlling for donor specific effects as well as interaction terms between donor dummies and regressors, this coefficient is even magnified to 2.843, rendering colonial ties the single largest aid determinant. Contrary to the selection equation, UN votes shows a positive coefficient in the second stage, which, however, turns negative once controlled for either recipient or donor specific effects plus interaction terms. Population, GDP per capita, colonial ties, bilateral trade, UN votes and aid from other donors are all highly significant (1%-level) and show the expected sign. Institutions are negatively but, simultaneously, weakly correlated with aid and the same counts for trade openness. Both regressors keep their properties under any specification. In the base specification both are significant at the ten percent level. The share of women in parliament is significant at the one percent level and the coefficient stand at 0.007, suggesting a one percent increase in the share of female MPs corresponds to a 0.7 percent increase in aid. Like in the first step decision, FDI is also significant, however, its sign changes dependent on the specification form.

Lastly, the constant is 11.896, which computes into a level average of \$2.477 aid commitments per capita. This is somewhat far off from the total sample mean of \$3.42, because the log transformation of trade drops many small country outlier observations from the sample. Many of these recipients do not have bilateral trade relationships with donors, and if they had, the COW database does not include them. Examples of recipients with missing

trade data are Palau, Micronesia and the Marshall Island, all of which constitute outlier observations.

When comparing the two stages of aid commitments, one notices a few differences. First of all, the population parameter seems to be positively correlated with the probability of receiving aid but negatively correlated with the actual amount of aid at the same time. This suggests that population might be used as an exclusion criteria. From the first to the second stage UN votes and the institutional measure have their sign changed from negative to positive. No variable loses its significance at the allocation stage and could, therefore, be used as a first stage estimator in a Heckman model, for which robustness relies on the identification of variables affecting one stage but not the other. In the Heckman model, which is estimated for comparative purposes and exhibited in column two of table A3, population loses its significance since it correlates positively with aid selection but negatively with aid allocation. UN votes and institutions also change their sign but retain their significance, which suggests the effects in the selection stage dominate those in the allocation stage after having controlled for sample selection by the inclusion of the inverse Mills ratio. Finally, the Tobit model, which (as shown in the present context, wrongly) restricts the coefficients to be same in both stages, renders results very similar to the allocation equation, albeit with downwardly biased coefficients.

Random Effects Allocation Stage (Table 9)

DV = binary aid	Base Specification	Incl. Recipient specific effects	Incl. Donor specific effects	Donor specific & interactions	Base with all DVs lagged	Fixed Effects Estimation
LN(population)	-0.438*** (0.021)	-0.356*** (0.039)	-0.525*** (0.012)	-0.264*** (0.062)	-0.601*** (0.021)	0.578*** (0.148)
LN(GDP per capita)	-0.336*** (0.033)	-0.062 (0.054)	-0.591*** (0.033)	-0.639*** (0.143)	-0.682*** (0.039)	0.185*** (0.556)
Colony	2.43*** (0.167)	2.27*** (0.16)	2.1*** (0.164)	2.843*** (1.335)	2.334*** (0.175)	omitted
LN(bilateral trade)	0.182*** (0.009)	0.213*** (0.009)	0.128*** (0.009)	0.114*** (0.01)	0.181*** (0.009)	0.449*** (0.01)
UN votes	0.015*** (0.05)	0.106** (0.048)	0.278*** (0.049)	-0.948** (0.359)	0.0424 (0.048)	0.178*** (0.048)
Institutions	-0.09*** (0.002)	-0.015*** (0.002)	-0.009*** (0.002)	-0.011 (0.007)	-0.008*** (0.002)	-0.008*** (0.02)
(IM+X)/GDP	0.001*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	-0.002 (0.001)	0.002*** (0.000)	0.002*** (0.000)
% of female MPs	0.007*** (0.001)	0.000 (0.001)	0.009*** (0.001)	0.027*** (0.005)	0.0098882*** (0.001)	0.004*** (0.001)
Infant mortality	-0.006*** (0.000)	-0.005*** (0.001)	-0.005*** (0.000)	-0.008*** (0.002)	-0.008*** (0.001)	-0.002** (0.001)
LN(aid other donors)	0.448*** (0.011)					0.397*** 0.012
LN(FDI)	0.076*** (0.007)	0.111*** (0.006)	0.123*** (0.007)	0.111*** (0.031)	0.099*** (0.007)	0.064*** 0.007
Life expectancy		0.002 (0.002)	0.000 (0.002)	-0.002 (0.002)		
_cons	11.896*** (0.519)	3.972 (0.845)	13.1567*** (0.49)	10.326*** (1.719)	12.743*** (0.527)	13.734*** (2.459)
# Observations	31,345	31,345	31,345	27,054	29,802	31,345
Rho	0.6745	0.637	0.604	0.553	0.687	0.849
R2 Between	0.0681	0.0358	0.0305	0.0911	0.0273	0.0798
R2 Within	0.6586	0.4104	0.5402	0.6492	0.3069	0.1522
R2 Overall	0.3254	0.3491	0.4545	0.5634	0.2758	14.32

TOP 5 Donors vs. Scandinavian Donors vs. Other Donors

Results for clustering the donors in three categories, the five top donors, Scandinavian countries plus the Netherlands (grouped for their generosity ratio > 0.7) and the rest, are exhibited in table A4. One has to qualify that this grouping is arbitrary and leads to some obstacles. First, the sample is not the same across clusters and, secondly, there is no reason to assume that because Scandinavian countries plus the Netherlands commit more aid relative to their GDP, these donors allocate their aid differently than more stingy donors. However, while one has to evaluate individual donor equations as provided in the appendix, the cluster still provides a first indication.

Apparently, Scandinavian countries plus the Netherlands do not exhibit a small country bias, as the coefficient for population is not significant at any level. The other two groups show a significant small country bias, which is largest for the top five donors. A glance at the coefficient for GDP per capita reveals that, contrary to past findings, the top five donors seem to take need most into consideration, given that one accepts GDP per capita as the main indicator for recipient need. The coefficient is more than double as large as the one for the Scandinavians plus the Netherlands and five times the size of the others. Colonial ties matter in all three clusters, and do most so, surprisingly, in the second cluster. Within this cluster only the Netherlands had colonies and a comparison between the second cluster equation and one for sole Dutch aid, reveals that the Netherlands drive this result. Apparently, they treat their former colonies just as favorable as all other former colonial power do. The others-cluster is comprised of four former colonial powers; Belgium, Italy, Spain and Portugal. And donor-individual regressions reveal that they all strongly favor former colonies.

One finding, which is in line with the assertion that top donors are motivated rather by interest than by need, is that the share of female MPs, as well as infant mortality, loose their significance for the top five donors, whereas they retain significance in the other two groups. While this might suggest that top donors do not take this need variables into account, the opposite has already been confirmed as regards the coefficient for GDP per capita. Moreover, the coefficients for both are the ones with the smallest magnitudes among all coefficients in all three groups, which indicates a very small effect if there is one.

Lastly, looking at the constants one finds that the top donor's intercept is 5.94, which is roughly four and a half times larger than the constant of the other two groups. This is a result from larger aid budgets of top donors compared to their peers. Top donors allocate significantly more aid per capita to any recipient.

8.4) Random Effects vs. Fixed Effects

The preceding analysis leaves one crucial topic to be discussed. When looking at the composition of the overall variation of aid commitments, one finds that the within variation ($s_{Within}^2 = 79.17$) is roughly double as large as between variation ($s_{Between}^2 = 41.91$). Hence the variation over time in the aid flows between any donor-recipient pair contributes doubles as much to the overall variation as variation between recipients. Put in other words; intra-recipient variation is vastly greater than inter-recipient variation. What has been done in the past and also in the present analysis so far, is employing random effects models, which assume no correlation between individual specific-effects and the error terms. This method serves very well when evaluating inter-recipient aid allocation and the results so far are also pretty much in line with what has been found in the past. Using a between estimator, which averages aid for any donor-recipient pair over time and then compares these averages across the donor-recipient pairs, it can be shown that inter-recipient allocation can be explained pretty accurately. Using the most extensive specification, including donor dummies and donor-regressor interaction terms, exhibited in column four of table A2, one can explain 73 percent of between variation and 59 percent of overall variation. But the matter of intra-recipient allocation is more challenging and good estimations have not been undertaken so far. Past studies have included specific effects, but have not applied fixed effects estimators, a practice which has resulted in some meaningless reports of coefficients. Berthelemy (2006) and Hoeffler and Outram (2011) claim to have introduced fixed effects, but then report coefficients on binary variables in fierce violation of panel econometrics, since it is easily derived that discrete outcome variables are omitted in a fixed-effects estimation. Whatever these authors did, and subsequently reported, it cannot be based on fixed-effects estimators by definition.

From a Hausman test, which tests fixed versus random effects and in my case rejects the null hypothesis $H_0: COV(\alpha_i, x_{it}) = 0$, I obtained the insight that a fixed effects model has to be employed. This result further implies that all random-effects estimators so far are inconsistent, whereas a fixed effects estimator would be consistent. Column 6 in table 9 shows the results of the base specification estimated with a fixed-effects estimator. As one can see this changes the picture dramatically, inverting the signs of many key coefficients. The change in sign for GDP suggests that the fixed-effects model renders a purely donor interest driven allocation pattern. Contrary to past research claiming to have estimated a fixed effects model, the binary variable for colonial ties is omitted. The high correlation between error terms and regressors,

here $\text{corr}(u_i, x'_{it}\beta) = -0.8$, shows that the assumptions of the random effects model are violated in the dataset. Furthermore, rho, the interclass correlation of the error term, stands above 0.84. This means that over 84 percent of the variance in the error term results from individual-specific effects. Clearly, individual-specific effects strongly dominate the error terms. In the fixed effects model the error term's mean is very close to zero (here 0.000000000661), which means the model predicts aid allocations very close to their actual values. At the same time, however, the base model specification is not a good fit for the fixed-effects in the data as it can only explain 7.98 percent of within variation. Compared to the base specification estimated with random effects, the share of overall and between variations explained, drops to 14.32 percent and 15.22 percent, respectively. This can be caused by several reasons. One might be that different regressors should be employed when estimating intra-recipient allocation than those used for inter-recipient allocation. However, like in the case of an exclusion variable, such variables are conceptually hard to come up with. Another reason might be how the dataset is set up, which caters problems as well. There is actually not that much variation in the data as the dimensionality of the dataset suggests. Although theoretically the datasets features up to 51.152 observations depending on data availability, there actually is only a vastly smaller number of different regressor values in the sample. Take population as an example; every recipient has 16 observations regarding their population between 1995 and 2010. However, these observations are the same for every donor-recipient pair, which means that instead of observing 51.152 different values for population, the sample features only 16 values for every recipient and includes them 23 times, for every donor. Hence, we truly only see at most only 2224 ($51.152 / 23 = 139 * 16$) values for every regressor.

9) Conclusion

One can summarize that the inter-recipient aid allocation is jointly determined by both, donor strategic interest and recipient need. Both set of variables are jointly significant and show the expected signs in the allocation equation. This confirms what previous research has concluded. According to the categorization of variables from the data section, strategic variables outweigh those indicating need in magnitude. Colonial ties are the strongest indicator for predicting the amount of aid received. Bilateral trade also significantly affects the receipt of aid in a positive way, as trade partners clearly receive more aid at the margin. Of the donor interest variables, only UN votes are somewhat contradictory, as they seem to negatively influence the probability of being selected as a recipient while positively influencing the actual amount of aid receipt. However, one has to remind oneself of the probable inappropriateness of this measure for capturing strategic alliances, as outlined before. Furthermore all donors seem to have somewhat common preferences as regards individual recipients, as the amount allocated by the DAC donor community is significantly positively associated to the amount an individual donor assigns to a specific recipient. Turning our attention to recipient need, GDP, the main need variable, is significant and of great effect on aid. As donor individual regressions (Appendix) show, for the overwhelming majority of donors, GDP per capita significantly corresponds to aid commitments. Moreover, infant mortality is significant for almost all donors, further confirming recipient need as aid motives. Estimates of life expectancy and internet access can be drawn from the results, whenever they were included.

Although the decision and the allocation equations seem to be independent of each other, they are nevertheless similar in most of its coefficients except of three. Apart from the coefficient of population, also the coefficients of UN votes and institution change their sign. This suggests that smaller countries are less probable of being selected as a recipient, but also that small countries are favored in actual aid allocation. Affirmative UN votes seem to be awarded when the actual allocation is positive, but seem to be lowering the probability of receiving a positive amount of aid. However, referring back to the mean of UN votes (0.74 out of 1), there is broad consensus in the General Assembly anyway. The coefficient of the institutional measure behaves like the population parameter; it is positive in selection and negative in allocation. In both cases the institutional coefficient is small though. Institutions are at the heart of the distinction between need and merit. Here, however, the institutional measure,

which strongly and positively correlates with GDP, seems to indicate need in the allocation decision, as it is associated with a negative effect on aid commitment. On the contrary, in the binary decision the correlation is positive, which can be interpreted that very corrupt governments receive less aid and that donors expect a minimum level of the rule of law. Open countries also get more aid, all other things equal, although trade openness is not a big factor.

Referring back to the new paradigm, the announcement to put the “neediest first” is supported by the coefficient for GDP per capita, and to a lesser extent to child mortality below the age of five. However, the share of women in parliament might be as a measure of female societal participation, it is significant and positively correlated with aid. Donors do reward female MPs. Although larger donors drive the results because of their quantitatively dominant share in DAC ODA, comparing all individual donors’ estimations reveals that, overall, they have harmonized in their distribution pattern. This is in accordance with the Rome Declaration of harmonization. Past classifications as egoistic and altruistic are somewhat misleading and arbitrary. In intra-recipient allocation, every donor is egoistic and altruistic at the same time.

Contrary to inter-recipient aid distribution, intra-recipient allocation, which accounts for roughly two thirds of overall variation, is not explained well by the model. In donor-recipient time series large breaks occur. The US-Palau pair is an example. Palau receives an amount which equates the largest per capita observation in the sample in 1995. Two years later the US commits nothing to Palau. Such sharp spikes in aid commitments do not occur in inter-recipient allocation. Moreover, such events are hard to come by as they are so frequent and would have to be treated as specific effects. These events could have been mitigated by adding explanatory variables, for which an obvious candidate some measure of US military involvement would be. In order to conclude, my experiment can predict inter-recipient allocation to a great extent, the large within variation, however, remains a challenge.

10) Bibliography

- Abrams, B. A., & Lewis, K. A. (1993). *Human rights and the distribution of US foreign aid*. *Public Choice*, 77(4), 815-821.
- Alesina, A., & Dollar, D. (2000). *Who gives foreign aid to whom and why?*. *Journal of economic growth*, 5(1), 33-63.
- Alesina, Alberto, and Beatrice Weder. 2002. *Do Corrupt Governments Receive Less Foreign Aid?* *American Economic Review* 92(4): 1126–37.
- Berthélemy, J. C., & Tichit, A. (2004). *Bilateral donors' aid allocation decisions—a three-dimensional panel analysis*. *International Review of Economics & Finance*, 13(3), 253-274.
- Berthélemy, J. C. (2006). *Bilateral donors' interest vs. recipients' development motives in aid allocation: do all donors behave the same?*. *Review of Development Economics*, 10(2), 179-194.
- Berthélemy, J. C., Beuran, M., & Maurel, M. (2009). *Aid and Migration: Substitutes or Complements?*. *World Development*, 37(10), 1589-1599.
- Boone, P. (1996). *Politics and the effectiveness of foreign aid*. *European economic review*, 40(2), 289-329.
- Boone, P. (1994). *The impact of foreign aid on savings and growth*. London School of Economics and Political Science, Centre for Economic Performance.
- Burnside, C., & Dollar, D. (2000). *Aid, policies, and growth*. *American economic review*, 847-868.
- Canavire-Bacarreza, G., Nunnenkamp, P., Thiele, R., & Triveño, L. (2006). *Assessing the allocation of aid: developmental concerns and the self-interest of donors*. *The Indian Economic Journal*, 54(1), 26-51.
- Chong, A., & Gradstein, M. (2008). *What determines foreign aid? The donors' perspective*. *Journal of Development Economics*, 87(1), 1-13.
- Collier, P., Guillaumont, P., Guillaumont, S., & Gunning, J. W. (1997). *Redesigning conditionality*. *World Development*, 25(9), 1399-1407.
- Collier, P., & Dollar, D. (2001). *Can the world cut poverty in half? How policy reform and effective aid can meet international development goals*. *World development*, 29(11), 1787-1802.
- Collier, P., & Dollar, D. (2002). *Aid allocation and poverty reduction*. *European Economic Review*, 46(8), 1475-1500.
- Collier, P., & Hoeffler, A. (2004). *Aid, policy and growth in post-conflict societies*. *European economic review*, 48(5), 1125-1145.
- Cragg, J. G. (1971). *Some statistical models for limited dependent variables with application to the demand for durable goods*. *Econometrica: Journal of the Econometric Society*, 829-844.
- Dollar, D., & Levin, V. (2006). *The increasing selectivity of foreign aid, 1984–2003*. *World Development*, 34(12), 2034-2046.
- Dreher, A., Nunnenkamp, P., & Thiele, R. (2008). *Does aid for education educate children? Evidence from panel data*. *The World Bank Economic Review*, 22(2), 291-314.
- Dudley, L., & Montmarquette, C. (1976). *A model of the supply of bilateral foreign aid*. *The American Economic Review*, 132-142.
- Easterly, W. (2003). *Can foreign aid buy growth?*. *Journal of Economic Perspectives*, 23-48.

- Feeny, S., & McGillivray, M. (2008). What determines bilateral aid allocations? Evidence from time series data. *Review of Development Economics*, 12(3), 515-529.
- Feeny, S., & McGillivray, M. (2009). Aid allocation to fragile states: absorptive capacity constraints. *Journal of international development*, 21(5), 618-632.
- Fleck, R. K., & Kilby, C. (2010). Changing aid regimes? US foreign aid from the Cold War to the War on Terror. *Journal of Development Economics*, 91(2), 185-197.
- Gang, I. N., & Lehman, J. A. (1990). New directions or not: USAID in Latin America. *World Development*, 18(5), 723-732.
- Greene, W. (2004a). The behaviour of the maximum likelihood estimator of limited dependent variable models in the presence of fixed effects. *The Econometrics Journal*, 7(1), 98-119.
- Greene, W. (2004b). Fixed effects and bias due to the incidental parameters problem in the Tobit model. *Econometric Reviews*, 23(2), 125-147.
- Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the econometric society*, 153-161.
- Hoeffler, A., & Outram, V. (2011). Need, Merit, or Self-interest —What Determines the Allocation of Aid?. *Review of Development Economics*, 15(2), 237-250.
- Honoré, B. E. (1992). Trimmed LAD and least squares estimation of truncated and censored regression models with fixed effects. *Econometrica: journal of the Econometric Society*, 533-565.
- Humphreys, B. R. (2013). *Dealing With Zeros in Economic Data*.
- Kyriazidou, E. (1997). Estimation of a panel data sample selection model. *Econometrica: Journal of the Econometric Society*, 1335-1364.
- Maizels, A., & Nissanke, M. K. (1984). Motivations for aid to developing countries. *World Development*, 12(9), 879-900.
- McGillivray, M., & Oczkowski, E. (1991). Modelling the Allocation of Australian Bilateral Aid: A Two-Part Sample Selection Approach*. *Economic Record*, 67(2), 147-152.
- McGillivray, M., & Oczkowski, E. (1992). A two-part sample selection model of British bilateral foreign aid allocation. *Applied Economics*, 24(12), 1311-1319.
- McGillivray, M. (2003a). Modelling aid allocation: issues, approaches and results (No. 2003/49). *WIDER Discussion Papers//World Institute for Development Economics (UNU-WIDER)*.
- McGillivray, M. (2003b). Aid effectiveness and selectivity: Integrating multiple objectives into aid allocations (No. 2003/71). *WIDER Discussion Papers//World Institute for Development Economics (UNU-WIDER)*.
- McKinlay, R. D., & Little, R. (1977). A foreign policy model of US bilateral aid allocation. *World Politics*, 30(01), 58-86.
- McKinley, R. D., & Little, R. (1979). The US aid relationship: a test of the recipient need and the donor interest models. *Political Studies*, 27(2), 236-250.

- Myrdal, G. (1970). *The challenge of world poverty. A world anti-poverty programme in outline. The challenge of world poverty. A world anti-poverty programme in outline*
- Neumayer, Eric (2003) *The pattern of aid giving: the impact of good governance on development assistance. Routledge studies in development economics. Routledge, London, UK.*
- OECD, DAC. (1995). *Development Partnerships in the New Global Context*
- OECD, DAC. (1996). *Shaping the 21st Century: The Contribution of Development Co-operation*
- OECD, DAC. (1998). *Development Cooperation Report 1997.*
- OECD, DAC. (2010). *The DAC: 50 Years, 50 Highlights*
- OECD, DAC. (2015). *Development Cooperation Report 2014.*
- Raffer, K., & Singer, H. W. (2002). *The economic North-South divide: six decades of unequal development. Edward Elgar Publishing.*
- Roodman, D. (2007). *The anarchy of numbers: aid, development, and cross-country empirics. The World Bank Economic Review, 21(2), 255-277.*
- Round, J. I., & Odedokun, M. (2004). *Aid effort and its determinants. International Review of Economics & Finance, 13(3), 293-309.*
- Stewart, J. (2009). *Tobit or not Tobit?.*
- Svensson, J. (2000). *When is foreign aid policy credible? Aid dependence and conditionality. Journal of development economics, 61(1), 61-84.*
- Thiele, R., Nunnenkamp, P., & Dreher, A. (2007). *Do donors target aid in line with the Millennium Development Goals? A sector perspective of aid allocation. Review of World Economics, 143(4), 596-630.*
- Tobin, J. (1958). *Estimation of relationships for limited dependent variables. Econometrica: journal of the Econometric Society, 24-36.*
- Trumbull, W. N., & Wall, H. J. (1994). *Estimating aid-allocation criteria with panel data. The Economic Journal, 876-882.*
- White, H., & McGillivray, M. (1995). *How well is aid allocated? Descriptive measures of aid allocation: a survey of methodology and results. Development and Change, 26(1), 163-183.*
- Wooldridge, J. M. (1995). *Selection corrections for panel data models under conditional mean independence assumptions. Journal of econometrics, 68(1), 115-132.*
- Wooldridge, J. M. (2006). *Introductory econometrics: A modern approach. Mason, OH: Thomson/South-Western.*
- Wooldridge, J. M. (2002). *Econometric Analysis of cross section and panel data. MIT University Press, Cambridge, Massachusetts*
- World Bank. (1999). *Assessing aid: What works, what doesn't, and why. World Bank Group.*
- World Bank (2002). *The Role and Effectiveness of Development Assistance: Lessons from World Bank Experience. Research Paper from the Development Economics Vice Presidency. Washington, D.C., mimeo.*

11) Appendix

Pooled OLS Allocation Stage

DV = binary aid	Base Specification	Donor specific Pooled Probit	Incl. Donor specific effects
LN(population)	-1.042*** (0.01)	-0.885*** (0.01)	-0.655*** (0.027)
LN(GDP per capita)	-1.114*** (0.023)	-0.891*** (0.023)	-1.376*** (0.085)
Colony	1.544*** (0.056)	1.820*** (0.055)	5.645*** (0.987)
LN(bilateral trade)	0.488*** (0.006)	0.346*** (0.008)	0.313*** (0.008)
UN votes	-0.723*** (0.056)	0.644*** (0.067)	2.016*** (0.359)
Institutions	-0.006*** (0.056)	-0.006*** (0.001)	0.014** (0.005)
(IM+X)/GDP	-0.002*** (0,000)	-0.002*** (0.000)	-0.003** (0.001)
% of female MPs	0.0214*** (0.001)	0.023*** (0.001)	0.041*** (0.005)
Infant mortality	-0.002*** (0.000)	-0.002*** (0.000)	-0.005*** (0.001)
LN(FDI)	0.048*** (0.01)	0.055*** (0.008)	0.123*** (0.034)
Life expectancy		0.005*** (0.001)	-0.001 (0.001)
_cons	22.86*** (0.27)	20.143*** (0.264)	19.297*** (0.899)
# Observations	31,345	27,054	31,345
R2	0.3591	0.4975	0.6157
Adjusted R2	0.3586	0.4967	0.6117

Table A1

Between Estimator Allocation Stage

DV = binary aid	Base Specification	Donor specific Pooled Probit	Incl. Donor specific effects	Incl. Recipient specific effects
LN(population)	-1.07*** (0.029)	-0.603*** (0.073)	-0.926*** (0.031)	-0.938*** (0.057)
LN(GDP per capita)	-0.964*** (0.073)	-1.236*** (0.237)	-0.908*** (0.064)	-0.335** (0.176)
Colony	1.503*** (0.176)	3.241*** (1.418)	1.75*** (0.167)	1.389*** (0.163)
LN(bilateral trade)	0.54*** (0.019)	0.352*** (0.023)	0.397*** (0.023)	0.5689*** (0.018)
UN votes	-1.045*** (0.214)	4.381*** (1.235)	1.293*** (0.329)	-1.612*** (0.215)
Institutions	-0.007** (0.003)	-0.004 (0.012)	-0.01*** (0.003)	-0.001 (0.007)
(IM+X)/GDP	-0.002** (0.001)	-0.008** (0.004)	-0.003** (0.001)	-0.003 (0.002)
% of female MPs	0.029*** (0.005)	0.046*** (0.017)	0.031*** (0.004)	-0.027*** (0.011)
Infant mortality	-0.002** (0.01)	-0.002 (0.004)	-0.002* (0.001)	0.005** (0.003)
LN(FDI)	-0.015 (0.035)	0.061 (0.123)	0.02 (0.03)	-0.036 (0.074)
Life expectancy	0.000 (0.004)	0.001 (0.004)	-0.001 (0.004)	-0.016** (0.008)
_cons	22.270*** (0.791)	1.65*** (0.394)	20.647*** (0.737)	16.218*** (2.006)
# Observations	31,345	27,054	31,345	31,345
R2				
Between	0.000	0.0138	0.0057	0.0045
Within	0.4391	0.7322	0.5891	0.5481
Overall	0.3533	0.5876	0.4853	0.4092

Table A2

Allocation Stage RE vs. Heckman vs. RE Tobit

DV = binary aid	RE Base Specification	Heckman Sample Selection	RE Tobit
LN(population)	-0.604*** (0.021)	-0.002 (0.005)	-0.167*** (0.011)
LN(GDP per capita)	-0.598*** (0.038)	-0.530*** (0.013)	-0.294*** (0.019)
Colony	2.32*** (0.174)	0.507*** (0.051)	0.879*** (0.076)
LN(bilateral trade)	0.196*** (0.009)	0.229*** (0.004)	0.117*** (0.006)
UN votes	0.124*** (0.048)	-0.153*** (0.035)	0.04 (0.025)
Institutions	-0.01*** (0.001)	0.005*** (0.001)	-0.001* (0.001)
(IM+X)/GDP	0.002*** (0.000)	-0.002*** (0.000)	0.00047*** (0.000)
% of female MPs	0.007*** (0.001)	0.025*** (0.001)	0.003*** (0.001)
Infant mortality	-0.006*** (0.000)	-0.001*** (0.000)	-0.003*** (0.000)
LN(FDI)	0.119*** (0.006)	0.036*** (0.005)	0.042*** (0.003)
_cons	11.896*** (0.519)	3.919*** (0.152)	4.942*** (0.27)
# Observations	31,345	42,509	24,493
rho	0.73	0.325	0.519
Mills Ratio		12829	

Table A3

Random Effects Allocation Stage, Donor Clusters

DV = binary aid	TOP 5	Scandics + NED	Rest
LN(population)	-0.2*** (0.019)	-0.008 (0.009)	-0.044*** (0.006)
LN(GDP per capita)	-0.305*** (0.033)	-0.125*** (0.016)	-0.048*** (0.01)
Colony	0.324*** (0.096)	4.22*** (0.415)	1.006*** (0.073)
LN(bilateral trade)	0.126*** (0.01)	0.016*** (0.004)	0.019*** (0.002)
UN votes	0.073* (0.046)	0.139*** (0.027)	0.016 (0.011)
Institutions	0.000 (0.001)	-0.002*** (0.001)	-0.001** (0.000)
(IM+X)/GDP	0.001*** (0.000)	0.0004*** (0.000)	0.0002** (0.000)
% of female MPs	0.001 (0.001)	0.002*** (0.001)	0.002*** (0.000)
Infant mortality	-0.003 (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
LN(FDI)	0.046*** (0.006)	0.021*** (0.003)	0.022*** (0.001)
_cons	5.94*** (0.461)	1.3*** (0.22)	1.256*** (0.14)
# Observations	31,345	27,054	31,345
R2	0.3591	0.4975	0.6157
Adjusted R2	0.3586	0.4967	0.6117

Table A4

Random Effects Allocation Stage, Individual Donors

DV = binary aid	USA	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	IRELAND
LN(population)	-0.305*** (0.082)	-0.563*** (0.068)	-0.03 (0.078)	-0.415*** (0.064)	-0.399*** (0.741)	-0.395*** (0.089)
LN(GDP per capita)	-0.592*** (0.142)	-0.988*** (0.136)	-0.134 (0.13)	-0.048 (0.114)	-1.022*** (0.147)	-0.607*** (0.159)
Colony	omitted	2.436*** (0.872)	1.098** (0.523)	1.591*** (0.222)	1.616*** (0.243)	omitted
LN(bilateral trade)	0.25*** (0.04)	0.225*** (0.041)	0.108** (0.05)	0.179*** (0.037)	0.108** (0.054)	-0.008 (0.035)
UN votes	-0.579** (0.264)	0.896*** (0.226)	0.829*** (0.0177)	0.303 (0.186)	1.34*** (0.257)	0.458** (0.256)
Institutions	-0.02*** (0.006)	0.019*** (0.006)	0.003 (0.006)	0.009* (0.005)	0.009 (0.006)	-0.015** (0.007)
(IM+X)/GDP	0.000 (0.001)	0.002** (0.001)	0.001 (0.001)	0.002** (0.001)	0.002 (0.001)	0.009*** (0.002)
% of female MPs	0.023*** (0.004)	-0.006 (0.005)	-0.015*** (0.004)	0.007** (0.004)	0.007 (0.005)	0.04*** (0.005)
Infant mortality	-0.009*** (0.002)	-0.012*** (0.002)	0.002 (0.002)	0.002 (0.002)	-0.004** (0.002)	-0.007*** (0.002)
LN(FDI)	0.112*** (0.023)	0.106*** (0.027)	0.0413* (0.21)	0.065*** (0.021)	0.131*** (0.027)	0.169*** (0.027)
_cons	10.043*** (1.966)	14.99*** (1.799)	-0.021 (1.841)	4.117*** (1.591)	10.886*** (1.972)	7.076*** (2.196)
# Observations	1831	1909	1520	1910	1726	1208
Rho	0.6927	0.447	0.8794	0.5747	0.4654	0.6839

Table A5

DV = binary aid	FINLAND	SWEDEN	NORWAY	DENMARK	NETHERLANDS	BELGIUM
LN(population)	-0.424*** (0.087)	-0.612*** (0.103)	-0.417*** (0.09)	-0.5*** (0.13)	-0.411*** (0.107)	-0.527*** (0.1)
LN(GDP per capita)	-0.615*** (0.151)	-0.938*** (0.173)	-0.502*** (0.16)	-0.709*** (0.23)	-1.05*** (0.186)	-0.592*** (0.165)
Colony	omitted	omitted	omitted	omitted	5.97*** (1.813)	3.738*** (0.95)
LN(bilateral trade)	0.034 (0.039)	0.121*** (0.043)	0.053* (0.031)	-0.015 (0.089)	0.067 (0.067)	0.15*** (0.055)
UN votes	0.054 (0.033)	0.58** (0.273)	0.41 (0.03)	0.886 (0.543)	0.27 (0.307)	0.598*** (0.261)
Institutions	-0.023*** (0.007)	-0.014* (0.008)	-0.011 (0.007)	-0.006 (0.01)	-0.013* (0.008)	-0.005 (0.007)
(IM+X)/GDP	0.002 (0.002)	0.002 (0.02)	-0.002 (0.002)	0.003 (0.003)	0.002 (0.002)	0.000 (0.001)
% of female MPs	0.036*** (0.005)	0.012** (0.005)	0.017*** (0.005)	0.011 (0.008)	-0.009 (0.006)	0.005 (0.005)
Infant mortality	-0.006*** (0.002)	-0.004** (0.002)	-0.002 (0.002)	-0.002 (0.003)	-0.001 (0.002)	-0.006*** (0.002)
LN(FDI)	0.116*** (0.031)	0.104*** (0.032)	0.126*** (0.029)	0.069 (0.058)	0.121*** (0.034)	0.133*** (0.03)
_cons	9.2*** (2.217)	15.249*** (2.351)	8.562*** (2.16)	11.212*** (3.097)	13.195*** (2.582)	9.81*** (2.3)
# Observations	1295	509	1495	755	1428	1508
Rho	0.4825	0.5572	0.6067	0.4465	0.5767	0.623

DV = binary aid	LUXEMBURG	SWITZERLAND	SPAIN	PORTUGAL	AUSTRIA	ITALY
LN(population)	-0.759***	-0.38***	-0.538***	-0.95***	-0.538***	-0.911***
	(0.1)	(0.1)	(0.098)	(0.118)	(0.103)	(0.017)
LN(GDP per capita)	-0.449***	-0.597***	-1.05***	-0.062	-0.381***	-0.593***
	(0.169)	(0.16)	(0.185)	(0.235)	(0.17)	(0.189)
Colony	omitted	omitted	2.315***	3.926***	3.578***	2.621***
			(0.434)	(0.608)	(1.137)	(1.091)
LN(bilateral trade)	-0.01	-0.048	0.299***	-0.116**	0.125***	0.366***
	(0.028)	(0.046)	(0.054)	(0.066)	(0.044)	(0.069)
UN votes	-0.927***	0.582***	-0.249	-0.188	0.599***	0.858***
	(0.347)	(0.11)	(0.295)	(0.534)	(0.273)	(0.331)
Institutions	-0.003	0.013**	-0.012	-0.001	0.011	-0.02***
	(0.008)	(0.007)	(0.008)	(0.011)	(0.007)	(0.008)
(IM+X)/GDP	-0.001	0.000	0.005***	-0.001	-0.002	0.001
	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)
% of female MPs	0.008	-0.002	0.0316***	0.004	0.002	0.012***
	(0.005)	(0.005)	(0.006)	(0.009)	(0.005)	(0.006)
Infant mortality	-0.008***	-0.001	-0.017***	0.002	-0.002	0.001
	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)
LN(FDI)	0.082***	0.118***	0.2***	0.158***	0.062***	0.126***
	(0.031)	(0.028)	(0.035)	(0.067)	(0.03)	(0.035)
_cons	13.538***	8.972***	14.402***	10.793***	6.988	15.029***
	(2.25)	(2.321)	(2.563)	(3.161)	(2.502)	(2.614)
# Observations	863	1463	1391	509	1524	1487
Rho	0.884	0.6102	0.5827	0.5572	0.5735	0.469

DV = binary aid	GREECE	CANADA	S. KOREA	AUSTRALIA	NEW ZEALAND
LN(population)	-0.719*** (0.073)	-0.385*** (0.068)	-0.582*** (0.078)	-1.048*** (0.09)	-0.923*** (0.071)
LN(GDP per capita)	-0.402*** (0.147)	-0.812*** (0.137)	-0.545*** (0.155)	-0.79*** (0.2)	-0.477*** (0.175)
Colony	omitted	omitted	omitted	omitted	omitted
LN(bilateral trade)	0.176*** (0.037)	0.103*** (0.033)	0.212*** (0.041)	0.343*** (0.046)	0.117*** (0.03)
UN votes	-0.568*** (0.286)	-0.472*** (0.212)	-0.071 (0.319)	0.268 (0.359)	0.035 (0.327)
Institutions	-0.025*** (0.007)	-0.01 (0.006)	-0.024*** (0.007)	-0.04*** (0.009)	-0.017*** (0.008)
(IM+X)/GDP	0.004** (0.0019)	0.0004 (0.0012)	0.003** (0.002)	0.001 (0.002)	0.003*** (0.002)
% of female MPs	0.016*** (0.006)	-0.0004 (0.0044)	0.025*** (0.006)	-0.011 (0.007)	0.017*** (0.005)
Infant mortality	-0.011*** (0.002)	-0.005*** (0.002)	-0.017*** (0.002)	-0.006*** (0,003)	-0.005** (0.002)
LN(FDI)	0.207*** (0.035)	0.123*** (0.027)	0.172*** (0.035)	0.139*** (0.042)	0.106*** (0.03)
_cons	11.3*** (1.921)	11.459*** (1.853)	10.977*** (2.066)	21.166*** (2.463)	15.03*** (2.135)
# Observations	1020	1759	1614	959	883
Rho	0.5063	0.5017	0.4175	0.567	0.844

German Abstract:

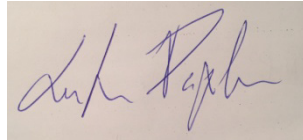
Meine Magisterarbeit untersucht die Determinanten der bilateralen Entwicklungshilfevergabe. Im Mittelpunkt steht die Frage ob sich Entwicklungshilfegeberländer in ihrer Gewährung von Entwicklungshilfe einerseits von strategischen sowie handels- und geopolitischen Zielen leiten lassen oder andererseits von der Bedürftigkeit von Empfängerländern. Dafür werden Variablen erhoben, welche beide Dimensionen ausdrücken. Einerseits handelt es sich dabei um Determinanten welche strategischen Interessen des Geberlandes symbolisieren. Zu dieser Kategorie zählen ehemalige Kolonialbeziehungen, bilaterales Handelsvolumen sowie bilaterales Abstimmungsverhalten in UN Generalversammlungen. Zur zweiten Dimension, welche die Bedürftigkeit eines Entwicklungshilfeempfängerlandes ausdrückt, zählen das Pro-Kopf Einkommen, die Kindersterblichkeitsrate, die Lebenserwartung sowie der Internetzugang.

Drei ökonometrische Methoden wurden angewandt, um die Forschungsfrage zu beantworten und als Resultat zeigt sich, dass obzwar Geberländer sowohl Bedürftigkeit als auch eigene strategische Interessen in Betracht ziehen, wenn sie ihre Entwicklungshilfevergabeentscheidung treffen, dass gleichsam aber letztere überwiegen, bzw die Höhe der empfangenen Entwicklungshilfe eines Empfängerlandes besser vorherzusagen zu vermögen, als Variablen, welche die Bedürftigkeit ausdrücken.

Eidesstattliche Erklärung

Ich erkläre hiermit an Eides Statt, dass ich die vorliegende Arbeit selbstständig und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sind als solche kenntliche gemacht. Die Arbeit wurde bisher in gleicher oder ähnlicher Form keiner anderen Prüfungsbehörde vorgelegt und auch noch nicht veröffentlicht.

Neapel, am 22.10.2015

A handwritten signature in blue ink, appearing to read 'Lukas Papula', is written on a light-colored rectangular piece of paper.

Lukas Papula

CV

Lukas Papula, BSc

Rembrandtstraße 9/10
1020 Vienna
Austria
Lukas.papula@hotmail.com



Education

Oct. 2013 PhD in International Business, WU Vienna
Oct. 2013 – Sept. 2015 Master International Development, University of Vienna
Oct. 2012 – Law, JKU University Linz (projected as long term project and hobby)
Oct. 2012 – July 2015 Master Economics, University of Vienna
Oct. 2011 – Sept. 2013 Master CEMS International Management, WU Vienna
(GPA 1.48, 1.00 best) Graduation with Honors
Sept. – Dec. 2012 Exchange Semester, London School of Economics
Oct. 2007 – July 2011 Undergraduate Business Administration, WU Vienna
(GPA 1.86, 1.00 best) Graduation among the top 5 percent
Jan. – June 2011 Exchange Semester, Baruch College, New York, NY
(GPA 3.84, 4.00 best)
1997 - 2006 High School & Vocational School for Media Design, Linz, Austria

Professional Experience

2014 Austrian Press Agency (APA), Finance (5 Weeks)
2013 Merrill Lynch, Private Wealth Management, NY (16 Weeks)
- Portfolio strategies and rebalancing for high network clients and 401k plans
- Intensive research for investment strategies and seminars for training purposes
- Communication and sales with clients from the US and Germany
2011 Uni Credit CEE, Vienna (12 Weeks)
- Strategy Department for CEE Retail
2008 & 2009 Career Days, Vienna
- Corporate Responsible for then Austria's biggest student organized recruitment fair
2006 - 2007 Institut Tereziňské Iniciativy, Prague, Czech Republic (13 Months)
- Editing publications in the field of Holocaust Research
- Organizing the digitalisation of Terezin victims' documents of the National Police Archive
2004 E-tone Webdesign Agency, Nuremburg, Germany (12 Weeks)