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## Danish Aid Policy

### Theory and Empirical Evidence

Tarp, Finn; Bach, Christian Friis; Baunsgaard, Søren; Hansen, Henrik

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Finn Tarp, Christian F. Bach,  
Henrik Hansen, Søren Baunsgaard

Stu­di­estræde 6, DK-1455 Copenhagen K., Denmark  
Tel.: +45 35 32 30 82 – Fax: +45 35 32 30 00  
<http://www.econ.ku.dk>

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# **Danish Aid Policy: Theory and Empirical Evidence**

**By Finn Tarp, Christian F. Bach, Henrik Hansen and Søren Baunsgaard\***

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## **Abstract**

This paper is a study of Danish aid policy from the early 1960s to 1995. It includes (i) a review of officially stated aims and criteria, (ii) a descriptive analysis of actual behaviour in international comparative perspective, (iii) a review of the theoretical and empirical aid allocation literature, and (iv) a series of panel data regressions to further explore how Danish bilateral aid was, in actual fact, distributed country-by-country. A theoretical model explaining how the allocation process took place is also formulated. It underpins the empirical analysis from which it transpires that a two step model is a useful way of analysing Danish aid allocations. The first step is whether to select a country or not, and the second involves the decision of how much aid to commit. The empirical analysis demonstrates that Danish aid has been guided in both steps by officially stated aims and criteria in an expected and statistically significant manner although a clear Eastern and Southern Africa bias was found. Another general result is that the relative weights of the explanatory variables have varied both from year-to-year and between sub-periods.

**Keywords:** Danish Foreign Aid, Modelling Aid Allocation, and Panel Data Analysis  
**JEL classification:** C33, F35, and O10

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\* Finn Tarp, Christian F. Bach and Søren Baunsgaard are at the Institute of Economics, University of Copenhagen, Studiestræde 6, DK-1455 Copenhagen K, Denmark (e-mail: finn.tarp@econ.ku.dk), whereas Henrik Hansen is at the Royal Veterinary and Agricultural University, Bülowvej 13, DK-2000 Frederiksberg, Denmark. We are grateful to World Bank staff and the Freedom House for giving us access to crucial data. Helpful comments, suggestions and support from a number of colleagues, including Rasmus Heltberg, Peter Hjertholm and Steen Asmussen, are gratefully acknowledged. The same goes for participants at the Meeting of the Danish Economic Society at Hindsgavl on 9-10 January 1998. The authors are responsible for any remaining errors of fact or interpretation.

## I. Introduction

Much of the academic literature on foreign aid and development has focused on estimating aid needs or assessing aid effectiveness, i.e. the impact of such resource transfers on economic growth and other development indicators in recipient countries. In contrast, the aid allocation literature summarised in McGillivray and White (1993), deals with:

- (i) The determination of the size of the overall aid allocation available; and
- (ii) The motives of individual donors and their procedures and criteria for allocating given aid budgets among different countries and sectors.

Such studies are not only of interest on their own account. A more profound understanding of the impact of aid on development cannot be achieved without clarifying aid allocation issues such as how much aid is given, to whom it is channelled, and how it is composed.

This paper is an attempt to analyse how Danish aid policy has evolved since the early 1960s. This is of particular interest due to the widespread perception that the aid policy of Denmark as a small donor, together with other like-minded countries such as Norway, Sweden, the Netherlands and Canada, is driven largely by the development needs of poor countries rather than by more self-interested and political motives. A formal model for the country allocation of Danish bilateral aid commitments is also proposed in this paper. It is argued that there are two key steps involved in the aid allocation process, and they are explicitly modelled in order to capture and explain the relationship between them. The theoretical model also underpins the cross-country panel data analysis, which is applied to derive conclusions about the significance and parameter signs of the different officially stated motives behind Danish bilateral aid allocations during the period 1976-94.

Following this introduction, Section II provides a descriptive analysis of Danish aid in a historical and international comparative perspective. In Section III, existing literature is reviewed, and the formalised model of how Danish bilateral aid is distributed among recipient countries is put forward. This framework is made quantifiable in Section IV, and the empirical analyses are summarised in Section V. Conclusions are drawn in Section VI.

## II. Descriptive Analysis

Danish international development assistance started emerging - as is the case with other Western aid - in the cold war atmosphere of the late 1940s. Multilateral contributions were made to the UN Expanded Programme of Technical Assistance (EPTA) already from 1950, but the amounts involved were small, both in absolute terms and relative to the contributions of other donors. Limited financial support was also provided in the 1950s for bilateral purposes, mainly in the form of technical experts and fellowships.<sup>1</sup> However, following (i) the independence of many former colonies around 1960, (ii)

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<sup>1</sup> The first commitment covering the period 1 July 1950 to 31 December 1951 amounted to only DKK 0.66 mill., which was equivalent to no more than US\$ 100,000. In 1953 the annual EPTA contribution was increased to DKK 3 mill., and it grew gradually to DKK 8 mill. in 1961. Total Danish aid (including a bilateral component of DKK 1 mill., support to the soft window of the World Bank, IDA, as well as humanitarian assistance) amounted to DKK 32

the establishment of the OECD Development Assistance Committee (DAC) in 1960, and (iii) pressure from Danish NGOs and business interests (Jørgensen, 1977), a formal legal basis for Danish aid emerged in the beginning of the first UN development decade.<sup>2</sup>

An institutional framework for the administration of Danish aid, including an expanding bilateral aid programme, was established in 1962 under the aegis of the Ministry of Foreign Affairs,<sup>3</sup> and during the following three decades, total official Danish aid grew consistently as shown in Figure 1.1. Denmark reached the UN official development assistance (ODA) target in 1978 as the fourth DAC-country after Sweden, Norway and the Netherlands, and the revised UN-target of 1 percent of GNP was achieved in 1992.

The above development is in sharp contrast to the profile of total DAC aid that remained between 0.30-0.35 percent of GNP during the period 1976-92, after which it started falling to around 0.26 percent in 1995 (Figure 1.2). This reflects both the drop in official development assistance from the group of like-minded donors (Figure 1.3), and in particular the pronounced decrease in American aid allocations. In 1995 Danes contributed almost nine times more aid than US citizens in per capita terms (Figure 1.4), while they until 1985 contributed twice the American figure. The considerable growth in Danish aid expense is also remarkable compared to other Danish public expenditure categories.

Another characteristic of Danish aid includes the more or less equal shares of multi- and bilateral aid (Figure 1.1). It follows that multilateral aid has been much larger in relative terms than what is commonly seen within DAC (Figures 1.1-1.3). This is caused by the traditionally strong Danish support to the UN and its system of specialised organisations. Denmark has - in spite of growing dissatisfaction with parts of the UN such as FAO - maintained a distinct political desire to support and strengthen the role of the UN in international development.<sup>4</sup>

[FIGURE 1 ABOUT HERE]

In fact, the UN has for decades remained one of the cornerstones of Danish foreign policy, and Danish aid policy has in this way tried to ensure that the aid giving process took place in a way that

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mill. in 1960-61 (Nyboe Andersen, 1986 p. 4). In comparison, Denmark received US\$ 300 mill. under the Marshall plan from 1948 to 1954 (Neergaard, 1985 p. 98).

<sup>2</sup> NGOs have consistently played a significant role in Danish aid. Business interests were originally concentrated on promoting Danish agriculture in the context of bilateral projects and through for example the World Food Programme (WFP). Yet, industrial interests have gradually become more pronounced, such as in the supply of machinery and other equipment and during recent years in the formulation of private sector support programmes. Denmark also has a significant number of consultancy firms that help formulate and design bilaterally funded projects and programmes, a characteristic that is in part caused by the fact that the official government aid administration has been relatively limited in size. The labour movement and trade unions did not play a significant role in Danish aid during the 1960s, but from the 1970s they have been more active, for example in strengthening links and helping build up trade unions in developing countries.

<sup>3</sup> The system consisted of a Board plus a Secretariat for Technical Co-operation with Developing Countries, which was renamed Danida in 1971.

<sup>4</sup> As an expression hereof Danida introduced a policy of "active multi-lateralism" in its strategy for development through the year 2000 (Danida, 1994). In this context, more direct and critical views of the UN and other multi-laterals are voiced when it is perceived that a particular organisation is not functioning according to its mandate or is in other ways ineffective. Moreover, greater selectivity and focus on areas prioritised by Denmark is pursued both among and within individual organisations.

would minimise recipient country economic and political dependence on individual donors (Holm, 1982 p. 23). Respect for the wishes and priorities of recipient countries and abstaining from linking aid with political conditionality were guiding principles for Danish aid from the early years. However, these principles have been increasingly challenged since the 1980s. Other channels for Danish multilateral aid have included the World Bank (including IDA), the Regional Development Banks, and since the early 1970s assistance through the EU has gradually come to play an important role. Consequently, whereas 80 percent of Danish multilateral aid was channelled through the UN in the early years, this share is now around 50 percent (Figure 2).

[FIGURE 2 ABOUT HERE]

In the implementation of bilateral aid, Danida has occupied and continue to occupy a central role, but a range of NGOs have also been active in the management and channelling of bilateral Danish aid.<sup>5</sup> In 1995, for example, they were responsible for implementing 16.7 percent of the total bilateral Danish aid (Danida, 1997 p. 107). The NGOs have also played a vocal role in influencing the principles of Danish aid, and they have helped maintain a high level of political and general public support to the aid programme. In this regard, it is relevant as well to note that substantial resources have over the years been devoted by Danida and the NGOs to information campaigns and educational activities focused on development issues and the problems of poor countries.

The widespread popular backing of Danish development assistance is by many observers explained with reference to its character as a common public cause, and aid is often perceived as one of the few areas where a small country such as Denmark has influence in “furthering peaceful development towards political freedom and social justice for all people” (Nyboe Andersen, 1986 pp. 9-10). Others, such as Paldam (1997) and Olsen and Udsholt (1995), put more emphasis on presenting Danish aid policy as a product of a continuous process of balancing general policy objectives against internal ministerial interests and external pressures on Danida.<sup>6</sup> The implication hereof is that Danish donor decisions may vary over time in an ad hoc manner, depending on the aid issue in focus.

Along the same lines of thinking, Holm (1982, Chapter II) points out that neutrality - externally in relation to recipient countries, as well as internally in Denmark - has from the outset been a guiding principle underlying Danish aid, and Danish aid has traditionally been an area where consensus rather than political confrontation was sought. Another characteristic referred to by Holm (1982) is that aid has been used by the Danish government as an instrument to increase the international reputation of Denmark both vis-à-vis developed country partners as well as in the developing world. Yet, it is clear from all of the studies referred to above that one does find, behind official Danish aid policy, a set of moral and idealistic motives concerned with helping poor people in need.

In sum, the general principles governing Danish aid from 1965 onwards certainly included a desire to achieve the UN ODA targets as soon as possible, equal shares of multi- and bilateral aid, and the absence of political conditionality. To this can be added that the wishes and priorities of developing countries, as expressed in their development planning, were respected. In 1965, Danish bilateral aid

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<sup>5</sup> They include for example the Danish Association for International Co-operation (MS-Denmark), Danish Red Cross, Danchurchaid, Ibis (formerly the World University Service) and many others such as Save the Children and Caritas Denmark. An umbrella organisation for small Danish NGOs has around 70 organisations associated.

<sup>6</sup> Various forms of tied aid is, for example, an area in which Danida has continuously had to maneuver in order to further consensus and ensure continued backing from industrial interests.

was concentrated on a very limited number of recipients (Figure 3.1), which were all among the poorest developing countries. They included India, Tanzania, Kenya, and Bangladesh, which received more than 40 percent of all Danish bilateral assistance from 1960 to 1995 (Figure 3.4). It is also characteristic that the concentration of Danish bilateral aid (as measured by the share of the five and 10 most important recipients) has over time shown a downward trend, although the degree of concentration was relatively high during the 1976-86 period. The downward trend in the concentration of aid is more uniform for the group of like-minded donors as a whole (Figure 3.2), but for total DAC aid the concentration ratios have been more stable (Figure 3.3).

[FIGURE 3 ABOUT HERE]

Physical infrastructure and modern agriculture were the main areas identified for Danish bilateral support in the early years in line with the then influential modernisation approach to development. Nevertheless, it was not until 1971 that a law on development co-operation was put in place, in which the official goals of Danish aid were formalised.<sup>7</sup> This Act has since been revised several times; but §1, which has by now remained unchanged for more than 25 years, continues to affirm that (i) economic growth, (ii) social progress, (iii) political independence, and (iv) the promotion of inter-cultural understanding and solidarity are overriding aims of Danish aid. It is also central in Danish policy statements that the fundamental principles of the UN are to be respected in the development process.

While the legal underpinning of Danish aid has remained unchanged, it has nevertheless been subject to repeated public debates, and policy statements have evolved in distinct ways. In fact, the development strategies behind Danish aid policy reflect quite closely how development thinking has been changing over the years on the international scene.<sup>8</sup> While “growth and trickle-down” thinking was influential in the 1950s, the 1960s and the early part of the 1970, “redistribution with growth” and “basic human needs” (BHN) approaches therefore came more into focus in Danish aid from the mid-1970s.<sup>9</sup>

From 1975, poverty reduction certainly started occupying centre stage, and at the same time “women in development” appeared as a first cross-cutting issue of Danida in line with UN principles and thinking (Estrup, 1995). It is also illustrative that official statements by Danida in the late 1970s emphasised that bilateral aid should concentrate not only on the poorer developing countries but also be implemented in such a way that it benefited poorer groups of people.<sup>10</sup> Integrated projects with a clear focus on the poor became a common tool, to which reference was made. The broad categories in available statistics on the sector allocation of Danish bilateral aid (Table 1) cannot, however, reflect this development appropriately. Nevertheless, the increasing relative importance of social infrastructure and services and the decreasing importance of production sectors in the late 1970s do appear as a lagged response to the greater importance of BHN considerations in official policy statements from 1975.

<sup>7</sup> Act no. 297 on international development co-operation dated 10 June 1971 (Danida, 1997 p. 120).

<sup>8</sup> Several studies have traced this development. A useful summary is included in a Danida (1996) evaluation report.

<sup>9</sup> Redistribution with growth was originally put forward by the World Bank President Robert McNamara in 1973, and further detailed in Chenery et al. (1974). The Basic Human Needs strategy was adopted at the ILO World Employment Conference in 1976.

<sup>10</sup> For references see Holm (1982 p. 55).

[TABLE 1 ABOUT HERE]

A major review of the principles behind Danish aid was undertaken in the early 1980s, following the publication of the report of the influential Brandt Commission, entitled *North-South: A Program for Survival* (Brandt et al., 1980). Several changes in the aims and principles guiding Danish aid were indeed formulated in the 1982 “Bang-report”. However, no substantial political changes were pursued (Nyboe-Andersen, 1986 p. 7). Collaboration with the four main recipient countries at the time was supported politically, and no decisions were taken on adding new countries. In practice, Danish bilateral aid became more dispersed as regards the number of recipients (Figure 3.1).

In sum, during the earlier parts of the 1980s BHN and social sector concerns continued to influence Danida thinking, but little by little more attention was paid to the need for pursuing macro-economic policy reforms and structural adjustment across a large number of developing countries. The debt crisis became a major issue in international debates, but Danida bilateral aid did not really change focus. Programme aid remained a very small share of Danish aid (Table 1), and Danida has in general been more favourable to the messages contained in the UNICEF-study on adjustment with a human face (Cornia, Jolly and Stewart, 1987) than to the more orthodox liberalisation and reform packages, pursued by the IMF and the World Bank during most of the 1980s (as discussed in Tarp, 1993).

Accordingly, during the period 1988-94, total Danish balance of payments (BOP) support (i.e. programme assistance and action related to debt) remained low, at only DKK 2.2 billion or approximately 8 percent of the bilateral Danish aid budget for the whole period (Tarp and Kragh, 1996). Only a limited part of this support was explicitly linked to policy conditionality, although conditionality has gained increasing support in more recent years. The single major programme initiative during this period was actually the 1987 debt relief operation, in which the debt owed to Denmark by a number of Danish aid recipients was cancelled.

As a new development, environmental issues were added as a second Danida cross-cutting concern, following the publication of the important Brundtland Commission Report, entitled “Our Common Future” (Brundtland et al., 1987). Promoting “social development and sustainable growth”, while at the same time paying more attention to “human rights”, were also included in 1988 as explicit concerns in the “Danida Action Plan”. Subsequently, the Foreign Policy Committee of the Danish Parliament established in 1989 a check list of seven criteria to guide the selection of so-called programme countries to receive bilateral aid (Estrup, 1995).

These criteria can be summarised as follows:

- (i) The economic and social level of development and developmental needs and plans.
- (ii) The level of aid from other bilateral and multilateral donors and the ability to absorb and make use of aid.
- (iii) The possibilities for promoting sustainable development through policy dialogue.
- (iv) The possibilities for furthering human rights in accordance with internationally agreed standards.
- (v) The possibilities for addressing gender imbalances.
- (vi) Previous experiences of Danida from bilateral aid collaboration with the country in question.
- (vii) The possibilities for furthering the involvement of Danish business and employment.



The parliamentary committee highlighted in relation to the seventh criteria that it should only be considered after the first six dimensions were addressed. However, other potential trade-offs were not addressed, except that poverty reduction was retained as the overarching goal. Moreover, while the above list does not make reference to political conditionality, the goals of “good governance and democracy”, nevertheless started appearing in a variety of Danida documents, including the 1994 Danida “Strategy for Danish Development Policy towards the Year 2000”, accepted by Parliament in March 1994. As such Danida now operates with three cross-cutting concerns: gender imbalances, environment, and democracy and human rights. They are, however, all perceived as dimensions of the poverty reduction goal, and imply that while the need for economic growth is recognised, it is at the same time held that growth may not in itself reduce poverty.

Key features of the strategy report just referred to also include a concentration on 20 programme countries, mainly located in Africa and South Asia, and a focus on a few (two to four) sectors in each of these countries. In line with this approach, sector support programmes are of increasing importance as compared to the traditional project mode of aiding developing countries. Renewed attention to the importance of the agriculture sector is also appearing alongside the social sector focus of previous years although this is not yet reflected in statistics such as those reported in Table 1. In line with the changing balance between the role of the state and the private sector in development, policy statements also pay increasing attention to “supporting the private sector”.

In accordance with stated goals, Denmark has over the years consistently concentrated its bilateral aid on the poorest developing countries (Figure 4.1). In fact, the average GNP per capita of recipients of Danish aid has typically been at a level of only half that of the average for total DAC aid receiving countries. In addition, the average income level of recipients of aid from the group of like-minded donors has occupied the middle ground except in 1986. This is the only year during the 1973-95 period where the typical Danish aid recipient had a slightly higher GNP per capita than recipients of aid from the like-minded group of countries. Similarly, Danida has typically supported countries with a relatively low life expectancy as compared to the other two groups (Figure 4.4).

When it comes to GNP growth, it is difficult to discern any important differences between the three groups of aid recipients just referred to. Instead, it would appear that recipients of Danish aid have actually followed a growth path in per capita terms, which is almost identical to what happened in the group of countries receiving aid from DAC as a whole as well as in the group of aid recipients receiving aid from the like-minded countries (Figure 4.2). It must be kept in mind, however, that since countries, which receive aid from Denmark, are on average poorer than those who receive aid from, for example, DAC, GDP total growth has undoubtedly been somewhat higher in the typical Danida country as population growth is relatively high.

As regards political and civil rights of the average recipient country, which was referred to as the fourth criteria in the Danida check list, it is clear that Denmark scored rather poorly until the late 1980s. However, since then it appears that the increased focus on human rights has put Danish aid more in line with that of aid from other sources (Figure 4.3).

[FIGURE 4 ABOUT HERE]

The quality of policy in aid receiving countries has attracted increasing attention in recent years, and is likely to continue to do so following World Bank studies such as that of Burnside and Dollar

(1997). They argue that careful examination of experience with foreign aid shows that aid is an effective investment when the economic policies of a recipient country are sound. In their analysis they rely on an index of inflation, the government budget deficit, and the degree of openness of the economy, and an overall index of sound policy is derived on this basis. As is clear from Figure 5.1-5.4, economic policy in countries receiving Danish aid has been close to that of countries supported by DAC and the like-minded group, at least when it comes to inflation and the government budget deficit.

[FIGURE 5 ABOUT HERE]

Yet, the typical country aided by Danida has generally been a little less open than the other two groups. As such the overall value of the policy index of the average Danish aid recipient has over the years been on the low side, in particular during the 1980s. Yet, this is in all likelihood mainly due to the fact that poorer countries have to rely relatively more on taxes on international trade. The results of Burnside and Dollar are still subject to debate, but the above observations do highlight that it is sensible for Danida to monitor and analyse closely the quality of overall policy-making in the countries that receive Danish aid.

Turning now to the level of aid as a share of GNP in the average recipient country only minor differences can be identified until the mid-1980s among Denmark, the group of like-minded countries, and DAC. If anything, the typical recipient of DAC aid had a slightly higher aid inflow than what was the case for Danish aid recipients. However, this characterisation has since been modified significantly. The typical aid receiving country had in the late 1980s and the first half of the 1990s a much higher aid/GNP ratio than in previous decades. Moreover, already from 1986 Denmark started, more so than DAC, to focus its aid on countries (such as Tanzania and Mozambique) with relatively high aid/GNP ratios. The year 1991 is a particularly illustrative example (Figure 6.1). The impact of aid in highly aid dependent countries is therefore a subject which is highly relevant for Danida to grapple with.

When it comes to net private capital flows, there is little indication, however, that Danish aid recipient countries differ from the typical DAC case (Figure 6.2). Net private capital inflows, which were generally small as a share of GNP, but nevertheless positive from 1968 onwards, decreased in the early 1980s and even turned negative in the early 1990s. Since then a hesitant recovery has been recorded, but the inflow remains below 1 percent of GNP.

[FIGURE 6 ABOUT HERE]

In sum, the level of total Danish aid has been and remains exceptionally high as a share of GNP when compared to that of other donors, and this is so in particular when it comes to multilateral aid. In addition, the guiding principles governing Danish aid have mirrored changes in the international thinking on development theory and policy quite closely, except for a rather sceptical view of orthodox adjustment policy in the 1980s. Danish aid has therefore certainly adhered to the first criteria in its programme country check list, which stresses the developmental needs of aid-receiving countries. Countries receiving aid from Denmark are on average much poorer as measured by GNP per capita and by average life expectancy than countries, supported by DAC and the like-minded group.

As regards other indicators such as growth, political and civil rights, and the Burnside-Dollar economic policy index, it is hard, however, to find any special characteristics in the profile of a typical Danish aid recipient. Nevertheless, the increasing importance of human rights (fourth criteria in the Danida list) has gained importance. The policy index is on the low side, due to a low degree of openness of the economy. Yet, the data presented do not support wide-ranging claims that Denmark has generally supported countries that pursue policies, which are less sound, than what can be said for aid receiving countries in general. This is so, in particular, when the relatively low level of income (and the high degree of external indebtedness) in the typical Danida country is accounted for. In addition, it must be kept in mind that the group of countries for which data on the indicators that form part of the policy index are available is much smaller than the group of countries that actually receives Danish aid.<sup>11</sup> It follows that the notion of average recipient in Figure 5 should be taken as indicative only. This is much less so in relation to other figures where the data are more representative.

Similarly, Danish aid recipients have not been much different from other aid receiving countries when it comes to aid and net private capital flows as a share of GNP, although an interesting increase in the aid/GNP share can be noted in recent years. This indicates that Denmark is focusing on countries that are relatively aid dependent, a point which is potentially in conflict with the second criteria on the check list. As regards, the third (environment), fifth (gender), sixth (previous experience), and seventh (Danish business interests) criteria on the check list, it is difficult to generalise on the basis of the data used in this study. Yet, further observations on Danish business interests are included in subsequent sections. From Figure 7, a final distinguishing characteristic of Danish aid is clear. In 1995 some 41 percent of bilateral Danish aid went to African countries South of the Sahara as compared to only 25.6 percent for total DAC aid.

[FIGURE 7 ABOUT HERE]

### III. Existing Literature and Formal Modelling

#### A. Literature Review

Most studies that try to explain the allocation of aid point to the importance of political, strategic, commercial and humanitarian motives. Thus, multiple regression models at the core of these studies can be written as

$$A_i = a + b'_d D_i + b'_p P_i + b'_c C_i + e_i, \quad (1)$$

where  $A_i$  is a measure of donor aid to country  $i$ ,  $D_i$  is a vector of variables representing developmental requirements,  $P_i$  is a vector of variables representing political and strategic

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<sup>11</sup> The share of total bilateral aid going to the group of countries for which data are available to construct the Burnside-Dollar policy index was in some periods only 35-40 percent in contrast to the much better coverage for other indicators used in this paper. This implies that conclusions emerging from Figure 5 must be interpreted with due care. The problem of data availability is particularly pronounced with regard to public sector budgets and the Sachs-Werner dummy for openness of the economy, used by Burnside and Dollar.

importance to the donor,  $C_i$  is a vector of variables representing the country's commercial or economic importance to the donor, and  $e_i$  is a random error term.

McGillivray and White (1993) provide an excellent survey of studies dating up to the early nineties. Building on their study the models can be divided into five groups (see Appendix 1 for a list of studies within each group and a list of references underpinning this kind of work):

- (i) Recipient need models based solely on indicators of recipient need.
- (ii) Recipient need and donor interest models trying to estimate the two alternative models of aid allocation based on recipient need and on donor interest.
- (iii) Hybrid models which are comprehensively specified with variables for both political, strategic, commercial and humanitarian motives.
- (iv) Bias models that try to assert whether aid allocation has a bias towards for instance smaller or middle income countries.
- (v) Administrative/incremental models where bureaucratic factors influence the formulation and interpretation of the results.

In selecting amongst the various approaches the most general model is a hybrid model with a comprehensive set of explanatory variables that can subsequently be tested. This is eloquently demonstrated by McGillivray and White (1993). While models with a limited set of explanatory variables may be attractive in simplicity and transparency they may be mis-specified if the "true" model involves a broader range of explanatory variables.

A central issue in model selection is the problem of sample selection and aid eligibility which has been dealt with in a number of studies (Dudley and Montmarquette, 1976, 1978; McGillivray and Oczkowski, 1991,1992; Gang and Lehman, 1990; Eggelston, 1987; McGillivray, 1992). However, in our view this issue can still be explored. The main question is if the decision on whether or not to give aid is distinct from the decision on the amount of aid to be given? In this paper we argue that they are and this position forms the basis of the model specification in Section III.

The different studies vary widely in their theoretical approach to donor behaviour analysis, and most build on informal assumptions about donor behaviour. However, two contributions (Dudley and Montmarquette, 1976 and Trumbull and Wall, 1994) construct an explicit model of donor behaviour, and formalise the decision making process of aid allocation. This is done by formulating the aid allocation problem as a donor utility maximisation problem, where a utility function with a pre-specified set of the above mentioned motives is maximised under a budget constraint.

The model by Dudley and Montmarquette (1976) incorporates the decision on whether or not to grant aid by introducing positive administrative costs. Their model maximises a donor utility function of the form  $U = f(X, H)$ , where  $X$  is total consumption of other goods, and  $H$  is consumption of the subjectively measured impact of foreign aid.  $H$  is defined as the sum of the impact of the donor's aid on  $m$  receiving countries.

$$H = \sum_{j=1}^m H(n_j, a_j, y_j), \quad (2)$$

where

$n_j$  = population of recipient  $j$ ,

$a_j$  = aid per capita received by recipient  $j$ , and

$y_j$  = per capita GNP of recipient  $j$ .

The specific impact function chosen is

$$H_j = n_j^a \left(\frac{a_j}{y_j}\right)^g \quad 0 \leq a \leq 1, \quad 0 \leq g < 1. \quad (3)$$

The budget constraint with positive administrative costs is

$$X + \left[ \sum_{j=1}^m a_j n_j - c(a_j n_j)^d \right] = Y, \quad (4)$$

where  $Y$  is donor GNP and  $c$  is a constant and  $0 < d < 1$ . Maximising subject to the budget constraint yields an expression of the form

$$a_j^{1-g} + c d n_j^{d-1} a_j^{d-g} - k g n_j^{d-1} y_j^{-g} = 0 \quad (5)$$

where  $k$  is the marginal rate of substitution between aid impact and the other good. Given the assumption  $d = g$  an explicit solution is

$$a_j = (k g n_j^{g-1} y_j^{-g} - c g n_j^{g-1})^{1/(1-g)}. \quad (6)$$

Aid per capita depends on population, per capita GNP and administrative costs. The amount of aid will be positive if the expression in the parenthesis is positive, which leads Dudley and Montmarquette to formulate it as a two step procedure. The first step is the decision whether or not to grant aid, which will depend on the income and population of the recipient country . Thus

$$\Pr(a_j > 0) = g(y_j, n_j). \quad (7)$$

The second step is to decide on the level of aid which should approximate equation (6). In the final specification the number of explanatory variables in the impact function (3) and approximate equation (7) is expanded to:

$$a_j = b_0 + b_1 \ln y_j + b_2 \ln n_j + b_3 \ln(e_j + 1) + b_4 \ln w_j + \sum_{i=1}^r b_i^* Z_i + e_j, \quad (8)$$

where

$e_j$  = previous year's exports of the donor to recipient  $j$ , per capita of  $j$ ,

$w_j$  = aid of the rest of the world to recipient  $j$ ,

$Z_i$  = dummy variable taking the value 1 if there are previous political ties between the donor and the 1,...,  $r$  recipient countries, and  
 $e_j$  = a random disturbance.

Similarly, equation (6) is used to estimate the amount of aid to be given once the recipients have been chosen and is approximated by

$$\ln a_j = b_0 + b_1 \ln y_j + b_2 \ln n_j + b_3 \ln(e_j + 1) + b_4 \ln w_j + \sum_{i=1}^r b_i^* Z_i + e_j, \quad (9)$$

where the  $b$  parameters can be derived from the parameters in equation (6) and differ from the  $b$  parameters in equation (8).

This set-up leads Dudley and Montmarquette to use a Probit analysis for equation (8) and ordinary least squares for equation (9). They find strong support for their model with administrative costs. The probability of granting aid as well as the level of aid is found to be a decreasing function of the per capita income of recipient, as well as a function of exports, political ties and aid from other donors. The small country bias found in other studies is rebuted as being due to mis-specification of the foreign aid supply model.

Trumbull and Wall (1994) generalise the model by Dudley and Montmarquette to allow for the existence of several donors and subsequently analyse the allocation of total bilateral ODA from all donors.<sup>12</sup> They assume that donors maximise the weighted sum of the total impact of their aid budget on the recipients, subject to the budget. Hence, using their notation,

$$\begin{aligned} \max L_i &= \sum_{i=1}^R \frac{w_i a_i^d}{z_i^q n_i^{r-1}}, \\ \text{s. t. } B_i &= \sum_{i=1}^R a_{ij} n_i. \end{aligned} \quad (10)$$

Solving the maximisation problem leads to the expression

$$\log a_{it}^* = a_i + r_t + b' \log z_{it} + q \log n_{it}, \quad (11)$$

where

$a_{it}^*$  is per capita ODA received by country  $i$  in period  $t$ ,

$a_i$  is a recipient specific fixed effect (the same in all years),

$r_t$  is the period fixed effect (the same for all recipient countries within a given year),

$z_{it}$  is an indicator of per capita well-being (per capita income, infant mortality or political/civil rights), and

$n_{it}$  is the population size.

<sup>12</sup> Trumbull and Wall (1994) use a model without cost terms (i.e.  $c=0$  in (6)).

Trumbull and Wall find that the recipient effects are decisive for the model, and that recipient needs are indeed important in a model with recipient effects. However, rather than per capita income they find that infant mortality and political/civic rights were the most important variables.

### *B. A Two-Step Model of Aid Allocation*

The general theoretical approach pursued by Dudley and Montmarquette is further developed in what follows. This is done by explicitly formulating the aid-giving process as a two-step decision procedure, involving (i) the choice of recipient (eligible) countries, and (ii) decisions on the actual levels of aid to be received by the selected countries. In a Danish context, it could certainly be hypothesised that the political process behind the country selection is different from the way in which aid is allocated in the second step. Parliament takes an active stance in the choice of aid recipients, whereas the aid administration (i.e. Danida) has in all likelihood a stronger hand in actual aid allocations.

Actual aid allocations involve operational planning and a wide range of day-to-day decisions of a more detailed nature. In addition, the composition of interest groups, which are active in the first step in influencing policy makers will differ from the composition in the second step. “Loosing groups” from the first step will drop out in the second step, and some interest groups will only be active in the second round. Moreover, it is unlikely that the lobbying influence of participating interest groups is the same in the two steps. It is, however, a testable hypothesis whether the variables, which have influenced decision making, have had a different impact in the two steps, and this question will therefore be addressed in this paper.

The first step decision identified here is whether or not to give aid to a specific country. In this country selection process the decision makers identify  $K$  different country specific indicators,  $x_{jt,1}, \dots, x_{jt,K}$  mirroring the existing donor motives. Each of these indicators is furthermore assigned different weights,  $g_1, \dots, g_K$ . Assuming  $m$  countries are potential recipients, these variables are summarised in an eligibility index, which takes the following form for country  $j$  in period  $t$ :

$$I_{jt} = \prod_{k=1}^K x_{jt,k}^{g_k}, \quad j = 1, \dots, m \quad (12)$$

Subsequently, the country specific eligibility index is used to decide whether a country should or should not receive aid according to the following rule:

$$D_{jt} = \begin{cases} 1 & \text{if } I_{jt} \geq k \cdot B_t^{-d} \\ 0 & \text{if } I_{jt} < k \cdot B_t^{-d} \end{cases} \quad (13)$$

where  $D_{jt} = 1$  specifies that country  $j$  should receive aid in year  $t$  and  $B_t$  is the total aid budget for the given year, which is assumed to be predetermined, and  $k$  is a constant. Accordingly, potential recipients are ranked following the eligibility index and only those with a value greater than or equal to the threshold line  $k \cdot B_t^{-d}$  are chosen as recipients. If  $d \neq 0$  the decision rule is dependent on the total budget whereas it is constant when  $d = 0$ .

For each country it is then possible to assign a probability of being selected as eligible to receive Danish aid, i.e.  $\Pr(D_{jt} = 1)$ , according to:

$$\Pr(D_{jt} = 1) = \Pr(I_{jt} \geq k \cdot B_t^{-d}) = \Pr\left(\sum_{k=1}^K g_k \log(x_{it,k}) + d \log(B_t) - \log(k) \geq 0\right) \quad (14)$$

Once the decision whether or not to give aid to a specific country has been made the decision making problem changes in several ways in the subsequent aid allocation step. Assume that countries  $j = 1, \dots, l$  are selected in the first step. This implies that  $l \leq m$ . It is now assumed that the donor allocates the per capita aid ( $a_{jt}$ ) to recipient  $j$  at time  $t$  in such a way that donor utility is maximised given donor motives and the pre-determined aid budget constraint. The donor motives can be expressed in a utility function,  $W$ , by assigning different weights to each donor criteria in the following way:

$$\begin{aligned} \max_{a_{jt}} &= \sum_{j=1}^l W(a_{jt}) = \sum_{j=1}^l \left[ a_{jt}^t n_{jt}^v \prod_{k=1}^K (x_{jt,k})^{u_k} \right] \\ 0 &< t < 1 \\ \text{st.} & \quad B_t = \sum_{j=1}^l [n_{jt} a_{jt}], \end{aligned} \quad (15)$$

where  $t_{jt}$  is total population in country  $j$  at time  $t$  and  $t$ ,  $v$ , and  $u_1, \dots, u_K$  are the weights assigned by the donor. This has the solution

$$a_{jt} = \left(\frac{t}{l_t}\right)^{\frac{1}{1-t}} (n_{jt})^{\frac{v-1}{1-t}} \left(\prod_{k=1}^K (x_{jt,k})^{u_k}\right)^{\frac{1}{1-t}}, \quad (16)$$

where  $L_t$  represents the shadow price of the total aid budget. This expression can be transformed to

$$\begin{aligned} \log(a_{jt}) &= p_0 + p_t + p_n \log(n_{jt}) + \sum_{k=1}^K p_k \log(x_{jt,k}) \\ p_0 &= \frac{1}{1-t} \log(t), p_t = -\frac{1}{1-t} \log(l_t), p_n = \frac{v-1}{1-t} p_k = \frac{u_k}{1-t} \end{aligned} \quad (17)$$

Following the above outline, the same set of explanatory variables will be relied on in the two steps in the empirical analysis in Section V, and it is investigated whether their impact is the same in the two steps.

A potential econometric problem is simultaneity between the total amount of aid available for distribution and that allocated to each country. This could be acute if either total aid or the distribution between bilateral and multilateral aid depend on an assessment of need or donor interest in recipient countries. In the current context it is assumed that this problem is minor, as the distribution between bilateral and multilateral aid has remained fairly constant (see Section II). It can also be noted that it is assumed that donor decisions are taken independently in each period.



## IV. Quantifying the Formal Model

In the descriptive analysis of Danish aid in Section II a check list of officially stated criteria to be used in the selection of programme countries was identified. It will be taken for granted here that these broad goals adequately capture the complex process of interaction among interest groups and policy makers referred to in Section II. This is sensible since NGOs as well as business interests and political parties have all played an active role in formulating Danish aid objectives, and frequent reference is made to these criteria in public discussion.

Nevertheless, individual actors may well have considered other more sophisticated variables and indicators in the process. Moreover, their priorities are likely to have been more narrowly focussed. Such dimensions are best studied in country specific analyses from which it may, however, be difficult to generalise. The present cross-country analysis aims instead at identifying the broad and generalised characteristics of Danish aid allocation decisions. We therefore rely on relatively few, quantifiable explanatory variables, available for a majority of the aid recipient countries, and we are particularly concerned about arriving at statements about the statistical significance of Danish aid motives and their positive or negative influence on aid allocations.

All developing country characteristics listed below should, in principle, be included as explanatory variables in cross-country econometric modelling of Danish bilateral aid allocations along the lines set out in Section III:

- (i) Level of development and poverty.
- (ii) Level of support from other donors.
- (iii) Absorptive capacity (a euphemism for recipient country ability to use aid productively).
- (iv) Environmental policy.
- (v) Democracy and human rights.
- (vi) Gender imbalances.
- (vii) Experiences from past collaboration.
- (viii) Danish business and employment interests.

For practical as well as methodological reasons it has not been possible to establish quantified indicators for all of the above variables. In particular, data limitations imply that proxys for environmental policy, gender imbalances,<sup>13</sup> and experiences from past collaboration, cannot be derived for an acceptable number of countries and years in the period under study here. Thus, they are not considered in what follows. As regards the remaining characteristics, the following mapping was used.

First, GNP per capita,  $p_{jt}$  and life expectancy,  $h_{jt}$  were chosen as indicators of the level of development and poverty in recipient countries. Secondly, total gross disbursements of aid from other donors,  $w_{jt}$  was used to measure the level of aid that originates from non-Danish sources. This variable, in fact, captures both the possibility that Denmark may choose to reduce aid to countries

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<sup>13</sup> Indicators for these variables could for example be female labour market participation rates, secondary education levels, CO<sub>2</sub> emission and electricity consumption.

which are heavily supported by other donors, and alternatively that Denmark may act in accordance with the so-called donor “bandwagon effect”. Thirdly, absorptive capacity is tentatively measured in this study by the level of private capital inflows. This indicator is certainly subject to debate, since it is implicitly assumed that private investors are capable of assessing the capacity of recipient countries to use foreign capital (i.e. including public resource transfers such as aid) wisely, and that they act accordingly. Thus, as an additional way of trying to capture the impact of the broad and difficult concept of absorptive capacity, growth of GNP per capita,  $g_{jt}$  was included as an explanatory variable.<sup>14</sup> Fourthly, the “Freedom House” index of political and civil rights,  $c_{jt}$  was introduced to represent the fifth criteria listed above (i.e. democracy and human rights).<sup>15</sup> Higher values of this index indicate fewer rights on a scale from 2 to 14. Finally, it was assumed that Danish exports to a given recipient,  $e_{jt}$  capture Danish commercial and other similar interests in the particular developing country.

In accordance with the second step of the theoretical model and existing aid allocation literature, the Danida criteria were supplemented with the total population of the recipient countries,  $n_{jt}$ . Furthermore, a regional dummy,  $d$  for Eastern and Southern African countries was included to investigate whether there has been a systematic bias favouring these countries in comparison with other potential aid recipients as suggested in Section II.

In the general model, the different parameters listed above are allowed to change over time. It is an empirical question whether they did, in fact, change or remained constant, and this question will therefore form part of the analysis in Section V.

Decision makers in donor countries face information lags. Thus, the recipient country indicators must be lagged. Here the average of the indicator values of period t-1 and t-2 were used as explanatory variables, referred to below as t-s.<sup>16</sup>

The data matrix  $\mathbf{X}$  of explanatory variables is of dimension  $mt \times K$  in the first step, as  $m$  countries are under consideration in the country selection process, and of dimension  $lt \times K$  in the second step as only  $l$  countries are actually selected. In both cases, the representative vector,  $x_{jt}$  is

$$x'_{jt} = [p_{j,t-s}, h_{j,t-s}, c_{j,t-s}, e_{j,t-s}, g_{j,t-s}, w_{j,t-s}, n_{j,t-s}, d] \quad (18)$$

The corresponding vector of parameters,  $q_{j,t}$  is

$$q'_{j,t} = [q^p, q^h, q^c, q^e, q^g, q^w, q^n, q^d]. \quad (19)$$

It is not evident which category of aid should be used to represent the dependent variable,  $a_{jt}$ . However, Danish bilateral development assistance *commitments* were chosen in preference of the

<sup>14</sup> Absorptive capacity is particularly hard to capture in empirical analyses as it reflects the composite impact of the complex environment in which aid is disbursed. Thus, the quality of economic policy making as well as other economic and institutional fundamentals all impact on absorptive capacity.

<sup>15</sup> The authors are grateful to “Freedom House” for the willingness to make available this index. All responsibility for the way it is being interpreted here rests, however, with us.

<sup>16</sup> Note that this choice is the same as that of Trumbull and Wall (1994).

various *disbursement* variables, regularly used in the literature, see McGillivray and White (1993). This was done as commitments are seen as a more accurate measure of donor supply as originally argued by Dudley and Montmarquette (1976).

To reduce heteroscedasticity problems, private capital flows, aid from other donors, and exports were all normalised with the size of the total population in the countries included in the sample as performed by Trumbull and Wall (1994).

The initial data set, also used in Section II, comprise 148 countries covered by the OECD/DAC data set on aid distribution for the period of 1960-95. Due to data limitations, however, this set had to be cut down to an unbalanced panel with 1,768 observations of 132 countries during the period of 1976-94. A detailed listing of data sources is included as Appendix 2, and descriptive statistics, including a correlation matrix can be found in Appendix 3.

## V. Empirical Analysis

The aid allocation process can, as discussed in Section III, be conceptualised as a two-step process in which the donor decision makers decide, first, on the set of recipient countries, and, secondly, on the amounts to allocate to selected countries given the overall budget constraint. In what follows, results from econometric analyses based on this two-step model are reported.

In the first step, the probability of a country receiving aid, i.e  $\Pr(D_{jt} = 1)$ , was in accordance with Section III and IV, explained by the set of explanatory variables included in  $\mathbf{X}$ . Moreover, an error component structure with country-specific effects,  $\eta_j$  as well as a “well behaved” error term,  $\eta_{jt}$  were chosen to capture country heterogeneity.

In the second step, all variables were, following Trumbull and Wall (1994), indexed each year by the average of the variable for all countries in the given year’s sample. Hence, if the sample includes countries  $i = 1, \dots, l$ , then<sup>17</sup>

$$\tilde{x}_{jt,k} = \frac{x_{jt,k}}{\frac{1}{l} \sum_{j=1}^l x_{jt,k}} \quad (20)$$

According to equation (17) this procedure removes the time-specific effect,  $l_t$ , and as such there should be no need to include a variable capturing this effect in the estimations.<sup>18</sup>

It is assumed that the error components are normally distributed. Accordingly, the parameters of the explanatory variables were, in the first step, estimated in the following one-way random effects probit model:

<sup>17</sup> Note from now on the subscript will not be used to indicate normalised variables.

<sup>18</sup> This is, however, done by Trumbull and Wall, who include a yearly dummy variable in their estimation of our equation (17).

$$\Pr(D_{jt} = 1) = \Pr\{q_0 + \sum_{k=1}^K q_k \ln(x_{jt,k}) + m_j + v_{jt} > 0\} \quad (21)$$

$$m_j \sim IIN(0, s_m^2), n_{jt} \sim IIN(0, s_m^2)$$

In the second step, aid is according to the theoretical model proposed in Section III only allocated to countries selected in the first round. Thus,  $a_{jt}$  is only observed when  $D_{jt} = 1$ . In other words, step two of the aid allocation process is dependent on step one. To clarify the empirical method applied to address this dependency, a variable,  $a_{jt}^*$  can be created by calculating second step values for all potential recipients using equation (17).

With an error component structure including country-specific effects,  $h_j$  as well as the standard error term,  $e_{jt}$  it follows that

$$\ln(a_{jt}^*) = b' \ln(x_{jt}) + h_j + e_{jt} \quad (22)$$

$$h_j \sim IIN(0, s_h^2), e_{jt} \sim IIN(0, s_e^2).$$

In the above formulation the aid allocated to country  $j$  in period  $t$ ,  $a_{jt}$  is a variable which is established as follows:

$$a_{jt} = a_{jt}^* \quad \text{for } D_{jt} = 1 \quad (23)$$

$$a_{jt} = 0 \quad \text{for } D_{jt} = 0$$

The objective of the empirical analysis in this paper is not only to explain country selection but also the amount of aid allocated to countries selected. It is, in other words, necessary to model  $E(a_{jt} | D_{jt} = 1) = E(a_{jt}^* | D_{jt} = 1)$ . If the error terms from the two steps are correlated, this model resembles what Amemiya (1985) calls a Type 2 Tobit model. If the two error terms have a bivariate normal distribution of  $N(0, 0, s_n^2, s_e^2, r)$ , the expected value of  $(a_{jt} | D_{jt} = 1)$  in this model is:

$$E(a_{jt} | D_{jt} = 1) = b' \ln(x_{jt}) + h_j + e_{jt} + s_e r \frac{f(a_{jt})}{\Phi(a_{jt})} = b' \ln(x_{jt}) + h_j + e_{jt} + b_1 l_{jt} \quad (24)$$

$$l_{jt} = \frac{f(a_{jt})}{\Phi(a_{jt})}, \quad a_{jt} = \frac{q_0 + \sum_{k=1}^K q_k \ln(x_{jt,k})}{s_v}$$

Accordingly, the model was estimated using a Heckman two-step procedure, where Heckman's  $l$  (the "inverse Mill's ratio") was calculated for each observation on the basis of the first step probit estimation and included in the second step regression as an explanatory variable.

A second step estimation without Heckman's  $l$  would only give unbiased estimates if the two error terms were independent. This means that for a country, which receives aid, eligibility would be independent of the amount of aid received. This may not always be the case. For example, if a

country experiences a drought, that makes it eligible for aid, it may also receive more aid than would otherwise be the case.

Turning to the control of the model, it can first be noted that the hypothesis that country specific effects can be ignored was rejected in both the probit model and the second step linear regression.

In the second step regression relied on in this paper, a Hausman test was carried out. This test did not reject the hypothesis that the explanatory variables and the random error components are uncorrelated. Had the opposite been the case, a fixed effect model would be preferable to the random formulation used here since this would produce unbiased estimates. It follows that the random effects model is acceptable in the present context. Moreover, in a fixed effects model it would not be directly possible to estimate the time invariant regional dummy as this would be perfectly correlated with the country dummies capturing the fixed effects.

A key general result of this study is as shown in Table 2 that the explanatory variables, which are statistically significant in the first step also have a statistically significant impact in the second step, and parameter signs are the same in the two steps. Hence, there is consistency between the Danish criteria which govern respectively country selection and the amounts of aid actually decided on. The only exception is the life expectancy variable, which is significant with the expected negative sign in the first step while insignificant in the second step. Once a country has been selected it is therefore not likely to receive more aid as a consequence of low life expectancy. It is recalled that people in the average Danish aid recipient has in any case a relatively low life expectancy as discussed in Section II.

[TABLE 2 ABOUT HERE]

Turning now to variables, which are significant in both steps, it can first of all be noted that GNP per capita has the expected negative impact on aid allocations. In line with the descriptive analysis in Section II, it is therefore clear that Danish aid policy has certainly been poverty oriented. Poorer countries have had a bigger chance of being selected, and once selected they have received more aid and vice-versa.

Similarly, aid from other donors has been a significant variable in Danish aid with the expected positive sign in both steps. Hence, there is indication that the so-called “bandwagon” effect has been at work in Danish aid allocations. As such Danish aid policy has indeed tended to augment the amount of aid going to recipients that already receive aid from elsewhere.

In addition, it follows from the results in Table 2, that Danish aid decisions have been affected by economic performance as measured by the growth variable. High growth has tended to increase the probability of being selected and amounts of aid allocated have also gone up as a result of higher growth. In the past, sound macro-economic policy along “Washington consensus” lines of thinking has not, as pointed out in Section II, been used as an explicit criteria for giving aid. However, if sound macro-economic policy is a precondition for growth - as often argued - Denmark has in practice been more inclined to support such countries.

The civil and political rights variable also has a statistically significant impact in steps one and two, which is - as expected - negative. This indicates that good human rights policies have been important

as a screening criteria in the selection of countries as well as in decisions about the amount of aid to allocate. Thus, Danish reactions to changes in human rights have not only taken the form of excluding previous aid recipients when human rights worsened and including countries, which were previously excluded, when human rights improved. Aid committed to countries actually chosen in the first step has also been affected by their human rights performance. It would therefore appear that the principle of constructive dialogue, where a donor remains in an aid receiving country in spite of some human rights violations and tries to have an impact through the amount of aid allocated, has been adhered to by Denmark - at least up to a point.

It can be noted that in the second step, the civil and political rights variable is strongly insignificant during the first half of the period under study, while it becomes strongly significant in the second half of the period. The analysis therefore confirms that a marked shift in the importance of this variable took place in the mid-1980s as already referred to in Section II.

Also the export variable is statistically significant in both steps and it has the expected positive sign. It follows that if Danish exports increase to a given country, then the chance of it being selected improves subsequently. Similarly, the amount of aid received will tend to increase. Danish commercial interests would therefore definitely appear to have played a role in Danish aid allocations, and it is highlighted that with the chosen lag structure, this analytical result does not reflect the presence and effects of aid tying.

Moreover, Table 2 demonstrates as expected that when the total aid budget increases, the chance that countries are selected in the first step is *ceteris paribus* larger. Finally, belonging to the countries in Eastern and Southern Africa has clearly increased the chance of getting selected as aid recipient as well as the amounts of aid committed. Thus, there has been a consistent regional bias which has favoured countries in Eastern and Southern Africa at the expense of countries belonging to other regions. It can, in this regard, be observed that running the regressions without the statistically significant regional dummy introduces discrepancies in the significance levels of the variables between step one and step two. For example, the growth and civil rights variables are insignificant in the second step under this specification.

Turning now to the population and private capital flows variables, they are insignificant in both steps. Hence, smaller countries do not receive more aid per capita than larger countries and vice-versa. This implies that the so-called "small-country bias" is not present in the second aid allocation step in the Danish case. This is the same conclusion as that of Dudley and Montmarquette (1976), but it is in contrast to what is widely held in the literature. The inclusion of other explanatory variables removes the apparent tendency to allocate more aid per capita to small countries. Moreover, the fact that the population size of a country does not affect the possibility of being selected as an aid receiving country in the first step indicates that a large population does not per se increase the value of the eligibility index relied in the selection process on as described in III.b.

Private capital inflows are also insignificant in both steps, and as such they have played no role in the aid allocation process. This is not in accordance with stated Danish aid policy if this indicator is accepted as a valid measure of absorptive capacity. However, it could also be argued that Danish aid has intentionally been directed to countries which have had limited access to international private capital. If this is a correct interpretation the result appears more in accordance with the general aims of Danish aid policy.

From Table 2 it can be seen that Heckman's  $\lambda$  is significant. This seems to indicate that there is - as one would expect - correlation between steps one and two. The two-step formulation proposed in this paper therefore provides more correct estimates of the parameters in the aid allocation process than the approach followed by Dudley and Montmarquette (1976) where the two steps are treated as independent of each other.

Finally,  $R^2$  reveals a satisfactory degree of explanatory power of the second step regression, and the same goes for the frequency table in Table 3 covering actual and predicted outcomes in the first step.

[TABLE 3 ABOUT HERE]

As the data set covers a relatively long time period, the hypothesis that the slopes (i.e. the marginal effect) of the explanatory variables were stable during the period under study was tested in different ways as indicated in Table 4.

[TABLE 4 ABOUT HERE]

The data set was, first, divided into two sub-sets of equal size covering the periods 1976-84 and 1985-94. This should capture the presence of possible structural shifts in the beginning of the 1980s, hypothesised based on Section II. Secondly, the period 1990-94 was compared to the period 1976-89 to capture more recent changes. Thirdly, the estimations in the second step were carried out on a yearly basis.

Likelihood Ratio tests carried out in the first step probit model indicate that the hypothesis of stable parameters for the model as a whole is rejected in the first two of the above cases. It therefore appears that the relative weight of the criteria governing country selection did indeed vary as one would conclude from the discussion in Section II. It would be necessary to study carefully on a case-by-case basis the selection of the set of aid recipients to substantiate this further. Yet, the review in Estrup (1995), demonstrates, for example, that the number of cases, in which Danish aid programmes have been terminated due to adverse developments in human rights policies, has actually gone up in recent years. This observation is supported by the fact that the civil and human rights parameter increases in size and significance in the 1990-94 sub-sample as compared to previous periods.

Similarly, Chow-tests carried out in the second step regressions show that the hypothesis of constant parameters is also rejected in the above three cases. This indicates that the criteria for allocating aid amounts have not been constant in Denmark over the period under study as discussed in Section II. Finally, there were significant ad hoc fluctuations in the amounts of aid allocated to recipient countries, around the levels, which can be derived from the statistically significant explanatory variables identified in this study.

## VI. Conclusions

It is concluded that this study has captured critical aspects of the Danish aid process. Many of the parameters in focus here are statistically significant with the expected sign, and there has in addition

been a high degree of consistency among decisions in steps one and two of the Danish aid allocation process.

It is equally clear from the empirical analysis that Danish aid has certainly been guided by officially stated aims and criteria. Developing country needs and socio-economic characteristics have influenced Danish bilateral aid allocations alongside for example commercial interests and increasingly over time political pre-occupations with human rights. The officially declared focus on allocating aid to the poorest among the developing countries is a particularly striking and consistent feature of Danish bilateral aid in international comparative perspective. It is however also noteworthy that there has been a consistent Eastern and Southern African bias in Danish aid allocation decisions.

To this comes the fact that a very high share of total Danish aid is channelled to recipient countries through the multilateral system of agencies, which assumedly pay a relatively high degree of attention to recipient needs rather than donor interests. It is highlighted, however, that no simple conclusions can be derived on the basis of this study about the effectiveness of aid in reducing poverty.

Another characteristic of Danish aid allocations is that the so-called “small country bias”, according to which smaller countries tend to receive more aid per capita than larger countries, is not present in the data. In contrast, there is evidence of the “band wagon effect”, which indicates that Denmark tends to supply more aid to countries that are increasingly favoured by other donors. Moreover, contrary to what might be expected, Denmark has in practice rewarded countries, which improved their macro-economic policies and punished those with increasing problems of macro-economic management. This assumes that growth is correlated with macro-economic policy. Whether these conclusions reflect desired and deliberate donor behaviour is not, however, entirely clear based on the available policy statements on Danish donor aims and criteria.

There have indeed been important ad hoc fluctuations in the allocation of Danish aid both from year-to-year and one sub-period to the next. Both political decision making in the country selection step and the more administration intensive second step decisions on aid amounts to allocate have therefore been pursued in a flexible manner. Nevertheless, these shifts followed no clear pattern.

Finally, while this study has uncovered a set of broad and general characteristics of Danish aid, this kind of aid allocation research remains prone to methodological and data problems. The methodological problems have to some extent been taken account of through the formulation and subsequent estimation of an explicit theoretical model.

## References

**Amemiya, Takeshi.** *Advanced Econometrics*. Oxford: Basil Blackwell. 1985.

**Andersen, P. Nyboe.** “Dansk Bistandstækning og -Praksis i 25 År.” *Danida Annual Report 1986*. 1986.

**Baltagi, B.** *Econometric Analysis of Panel Data*. New York: John Wiley & Sons. 1995.



**Burnside, C. and Dollar, D.** "Aid, Policies, and Growth." *World Bank Working Paper no. 1777*, June 1997. Washington, 1997.

**Brandt, W. et al.** "North - South: A Programme for Survival." *Report of the Independent Commission on International Development Issues*. Cambridge: MIT Press, 1980.

**Brundtland, G. H. et al.** "Our Common Future. World Commission on Environment and Development." Oxford: Oxford University Press, 1987.

**Chenery, H. B. et al.** "Redistribution With Growth." Oxford: Oxford University Press, 1974.

**Cornia, G. A., Jolly, R., and Stewart, F.** "Adjustment With a Human Face." Oxford: Clarendon Press, 1987.

**Danida.** "En Verden i Udvikling. Strategi for Dansk Udviklingspolitik Frem Mod år 2000." *Ministry of Foreign Affairs, Danida*. 1994.

**Danida.** "Evaluation Report. Poverty Reduction in Danish Development Assistance." *Ministry of Foreign Affairs, Danida*. 1996.

**Danida.** "Danidas årsberetning." *Ministry of Foreign Affairs, Danida*. 1997.

**Dudley, L. and Montmarquette, C.M.** "A Model of the Supply of Bilateral Foreign Aid." *American Economic Review*, Vol. 66, No. 1, pp. 132-142. 1976.

**Dudley, L. and Montmarquette, C.M.** "The supply of Canadian Foreign Aid: An Explanation and Evaluation." *Economic Council of Canada*. Quebec 1978.

**Eggelston, R.C.** "Determinants of the Levels and Distribution of PL480 Food Aid: 1955-79." *World Development*, Vol. 15, No. 6, pp. 797-808. 1987.

**Estrup, J.** "Politiske Betingelser i Dansk Bistandspolitik." *Institute of Economics, University of Copenhagen*. Økonomi og Politik nr. 2 - 1995. Jurist- og økonomiforbundets forlag 1995.

**Gang, I.N. and Lehman, J.A.** "New Directions or Not: USAID in Latin America." *World Development*, Vol. 18, No. 5, pp. 723-732. 1990.

**Olsen, Rye G. and Udsholt, L.** "The Danish Aid Administration: Between Politics and Technical" *Center for Development Research, Working Paper 95.12*. December 1995.

**Holm, H.H.** "Hvad gør Danmark: En Analyse af Dansk U-landspolitik" Aarhus: Forlaget Politica, 1982.

**Jørgensen, K.** "Hjælp Fra Danmark." Odense: Odense Universitetsforlag, 1977.

**McGillivray, M.** "Food Aid, Domestic Food Requirements and Donor Interests: An Economic Investigation of the Distribution of Foodgrain Aid." *Scandinavian Journal of Development Alternatives*. 1992.

**McGillivray, M. and Oczkowski, E.** "Modelling the Allocation of Australian Bilateral Aid: Two-part Sample Selection approach." *Economic Record*, Vol. 67, No. 197, June, pp. 147-152. 1991.

**McGillivray, M. and Oczkowski, E.** "A Two-part Sample Selection Model of British Bilateral Aid Allocation." *Applied Economics*, Vol. 24, pp. 1311-1319. 1992.

**McGillivray, M. and White, H.** "Explanatory Studies of Aid Allocation Among Developing Countries: A Critical Survey." *Working Paper Series No. 148*. Mimeo, April 1993.

**Neergaard, F.** "Danmarks U-landsbistand - Målsætning og landevalg." *Internationale Udviklingsstudier, Roskilde Universitet*. Roskilde: GeoRuc, Februar 1984.

**Paldam, M.** "Dansk U-landshjælp - Altruismens Politiske Økonomi." Aarhus: Aarhus Universitets Forlag, Rockwoolfonden, 1997.

**Tarp, F.** "Stabilization and Structural Adjustment." London: Routledge, 1993.

**Tarp, F. and Kragh, M. V.** "Danish Balance of Payments Support." *Institute of Development Studies*, DIS bulletin: Evaluating Programme Aid. Volume 27 number 4, October 1996., pp. 49-58.

**Trumbull, W. and Wall, H.** "Estimating Aid-Allocation Criteria With Panel Data." *The Economic Journal*, Vol. 104, July, pp. 876-882. 1994.

## Appendix 1. Aid allocation studies - an overview

Study/ Dependent variable/ Statistical method	Explanatory variables	Result
<b>I. RECIPIENT NEED ONLY</b>		
Davenport (1970) <u>Per capita aid</u>	Per capita income Foreign reserve position of recipient Absorptive capacity (foreign capital inflow)	
Anyadike-Danes and Anyadike-Danes (1992) <u>Aid from European Development Fund</u>	Population Per capita income Nigeria dummy LDC country dummy	
Trumbull and Wall (1994) <u>Per capita aid (logarithmic)</u>	Per capita income Infant mortality Political/civil rights Population Fixed recipient effects Fixed period effects	Models without recipient specific variables will be inadequate. ODA allocations are not determined by recipient income levels, but rather by infant mortality and political/civil rights.
<b>II. RECIPIENT NEED AND DONOR INTEREST MODELS</b>		
Wittkopf (1973) (only donor interest)		
McKinlay and Little (1977, 1978, 1978a, 1979), McKinlay (1978) <u>Absolute aid</u> <u>Absolute aid multiplied by the ratio of per capita GDP to population</u> <u>Gross aid as % of GDP</u>		No support for recipient need model for the US aid (1979), but strong confirmation of donor interest model
Maizels and Nissanke (1984) <u>Per capita aid</u>	<u>Recipient need model:</u> Population; Per capita GNP; Physical Quality of life index (life expectancy, adult literacy and infant mortality); GNP growth rate; Current account balance as % of GDP <u>Donor interest model:</u> Donor arms transfers to recipient; Former colony/regional-strategic interest dummy; Number of affiliates/subsidiaries of donor TNCs; Value of imports from donor as % of world imports; Exports to the donor as % of world exports to donor; Exports of strategic materials dummy.	Recipient need model is rejected

Frey and Schneider (1986) <u>IBRD loans and IDA credits</u>	<u>Needs model</u> : Per capita income; Rate of inflation; Government budget; Balance of payments, External debt. <u>Deserts model</u> : Rate of inflation; Government budget; Balance of payments, External debt; Past growth; Political instability. <u>Benevolence</u> : Per capital income, Balance of payments; External debt; “Capitalist climate”. <u>Politico-economic</u> : Per capita income; Rate of inflation; Government budget; Balance of payments, External debt; Past growth; Political instability; Former colony; Share of exports from donor.	The politico-economic model performs best
Tsoutsoplides (1991) <u>Per capita aid from EC</u>	<u>Recipient need model</u> Population Per capita GDP Physical quality of life indeks GDP growth rate Balance of payments to GDP ratio <u>Donor interest model</u> : EC military interest/border dummy Political dummies (colonial affiliation) Number of donor TNC affiliates/subsidiaries EC share of total imports into recipient Exports of strategic materials dummy.	Recipient need model yields a better explanation of EC aid than the donor interest model.
<b>III. HYBRID MODELS</b>		
Levitt (1968) <u>UN and US aid levels (loans, grants)</u>	Population Per capita income Per capita electricity consumption Electricity consumption growth % of the population attending school Growth in gold and foreign exchange reserves US exports to recipient US military aid to recipient Voting behaviour at the UN General Assembly	
Kato (1969) <u>US total aid</u> Introduces lagging of explanatory variables	Per capita income US Balance of Payments deficit Aid to GNP ratio Presence of communist subversion/aggression Proximity to communist border Military alliance Trade with the Soviet Union Political support to US foreign policy in UN Soviet bloc aid Contribution to US trade by recipient.	
Wittkopf (1972) <u>Aid level</u> Introduces other aid as an explanatory variable.	Per capita income Trade balance Export growth Population Years of independence Trade with donor Borders on a communist state dummy Total trade with Soviet bloc states	

Other bilateral and multilateral aid		
Dudley and Montmarquette (1976) ODA from each DAC member Dudley and Montmarquette (1978) Canadian aid. <i>Sample selection study</i>	Population Per capita income Political and economic self-interest Colony and geopolitical dummies Donor exports Aid from other donors	!976: Strong support for model with administrative costs. The probability of granting aid as well as the level of aid was found to be a function of the recipient's per capita income, exports, political ties and aid from other donors. The small country bias found in other studies is rebutted as being due to misspecification.
Eggelston (1987) US food aid <i>Tobit estimator</i>	Per capita agricultural output Current agricultural production as a proportion of previous years US commercial agricultural sales to recipient Foreign exchange reserves Net recipient exports as a % of GDP Population Share of US military and educational training grants And others.	The most important variables where US agricultural sales, domestic agricultural production and US military and training grants.
Bowles (1987, 1989) <u>EEC Aid per capita</u> Shift towards greater focus on developmental variables and less to Cold War considerations Lagged variables Per capital aid as dependent variable is new	Population Per capita income Savings rate Change in the savings rate Economic growth rate Share of EEC exports to recipient Stock of direct investment from DAC countries Friendly ex-colony of EEC states dummy Total aid disbursed to all recipients Total other aid	
Gang and Lehman (1990) US aid to Latin America <i>Tobit estimator</i>	Child mortality Frequency of riots and protest demonstrations (stability) Share of total Latin American imports from the US Per capita GDP	Import share and stability variables significant. Per capita GDP and child mortality insignificant.
McGillivray and Oczkowski (1991, 1992) Logarithmic, lagged one period. <i>Positive cut-off allocation</i>	Per capita GNP Population LLDC dummy British exports British commonwealth dummy Arms transfers Total DAC gross ODA	
McGillivray (1992) Australian bilateral food grain aid <i>Tobit estimator</i>	Similar to Eggleston	
Burnside and Dollar (1997) <u>Aid as a percent of GDP</u>	Initial GDP per capita Population	Donor interest variables have a greater explanatory

	Ethnic fractionalization Assassinations Institutional quality Money supply (M2) as a fraction of GDP Budget surplus Inflation Openness Government consumption Strategic interest (regional dummies) Arms Imports	power than policy variables.
Other hybrid models: Frey and Schneider (1986) (see section III, the political-economic model); Grilli and Riess (1992)	Generally dominant aid and international relations	
<b>BIAS MODELS</b>		
Isenman (1976) <u>Absolute aid</u>	Population and (population) <sup>2</sup> Balance of Payments Political and other variables.	
Dowling and Hiemenz (1985) <u>Per capita aid</u> Logarithmic transformation Excluded countries with strong political interest	Population Per capita income (Per capita income) <sup>2</sup>	
Karunaratne (1980) <u>Absolute bilateral aid from Australia</u>	Population and (population) <sup>2</sup> Per capita income and (per capita income) <sup>2</sup> Political leverage dummy Australian exports Physical quality of life index	
<b>BUREAUCRATIC/ INCREMENTAL MODELS</b>		
McGillivray (1986)		
Gulhati and Nallari (1988) <u>Total aid level</u>	Subjective performance rating for recipient Famine and crop damage dummy Donor political relations (based on arms sales and colonial ties) Donor exports net of aid to recipient Lagged aid level.	
Gang and Khan (1990) <u>Aid level to India</u> Based on target aid allocation	Latent variables based on factor analysis GDP growth rate Trade balance Lagged aid level.	
Gounder (1991) <u>Share of Australian aid to region</u>	Linear time trend Post-review dummy Multiplicative dummy based on both.	



- Isenman, P.** "Biases in Aid Allocations Against Poorer and Larger Countries." *World Development*, Vol. 4, No. 8, pp. 631-641. 1976.
- Kato, M.** "A Model of United States Foreign Aid Allocation: an Application of a Rational Decision-  
In Mueller, J.E. (editor), *Approaches to Measurement in International Relations*, Appelton-Century-Crofts, New York, 1969.
- Karunaratne, N.D.** "An Analysis of Contemporary Australian Aid strategy." *Economic Activity*, Vol. 23, No. 4, pp. 15-21. 1980.
- Levitt, M.S.** "The Allocation of Economic Aid." *Journal of Economic Studies*, Vol. 3, pp. 75-91. 1968.
- Maizeles, A. and Nissanke, M.K.** "Motivations for Aid to Developing Countries." *World Development*, Vol. 12, No. 9, pp. 879-900. 1984.
- McGillivray, M.** "An Examination of Australian Bilateral Aid allocations." *Economic Papers*, Vol. 5, No. 3, pp. 43-51. 1986.
- McGillivray, M.** "Food Aid, Domestic Food Requirements and Donor Interests: An Economic Investigation of the Distribution of Foodgrain Aid." *Scandinavian Journal of Development Alternatives*. 1992.
- McGillivray, M. and Oczkowski, E.** "Modelling the Allocation of Australian Bilateral Aid: Two-part Sample Selection approach." *Economic Record*, Vol. 67, No. 197, June, pp. 147-152. 1991.
- McGillivray, M. and Oczkowski, E.** "A Two-part Sample Selection Model of British Bilateral Aid Allocation." *Applied Economics*, Vol. 24, pp. 1311-1319. 1992.
- McKinlay, R.D. and Little R.** "A Foreign Policy Model of U.S. Bilateral Aid Allocation." *World Politics*, Vol. XXX, No. 1, pp. 58-86. 1977.
- McKinlay, R.D. and Little R.** "A Foreign Policy Model of the Distribution of British Bilateral Aid, *British Journal of Political Science*, Vol. 8, No. 3, pp. 313-332. 1978.
- McKinlay, R.D. and Little R.** "The French Aid Relationship: A Foreign Policy Model of the Distribution of French Bilateral Aid, 1964-70." *Development and Change*, Vol. 9, pp. 459-78. 1978a.
- McKinlay, R.D. and Little R.** "The U.S. Aid Relationship: A Test of the Recipient Need and Donor Interest Models of the Distribution of German Bilateral Aid, 1961-1970." *Europaen Journal of political research*, Vol. 6, pp. 235-257. 1978.
- McKinlay, R.D. and Little R.** "The German Aid Relationship: A Test of the Recipient Need and Donor Interest Models." *Political Studies*, Vol. XXVII, No. 2, pp. 236-250. 1978.



**Trumbull, William N. and Wall, Howard J.** “Estimating Aid-Allocation Criteria with Panel Data.” *Economic Journal*, Vol. 104. No. 425, pp. 876-82. July 1994.

**Tsoutoplides, C.** “The Determinants of the Geographical Allocation of EC Aid to the Developing” *Applied Economics*, Vol. 23, pp. 647-658. 1991.

**Wittkopf, E.R.** “Western Bilateral Aid Allocations: A Comparative Study of Recipient State” *Sage, Beverly Hills*. 1972.

**Wittkopf, E.R.** “Foreign Aid and United Nations Votes: A Comparative Study.” *The American Political Science Review*, Vol. 67, pp. 868-888. 1973.

## Appendix 2. Data sources

a. The following variables were all taken from the World Bank WDI-database:

**GNP per capita.** A country's GNP divided by its population, calculated by the World Bank in US\$ according to the Atlas method.

**GNP per capita Growth.** Yearly growth in a country's GNP per capita.

**Life expectancy.** Average life expectancy of adults in a given country.

b. The following variables were all taken from the DAC CD-rom version of "Geographical Distribution of Financial Flows to Aid Recipients":

**Population.** Total Population in a given country.

**Danish ODA commitments.** Total Overseas Development Assistance committed by Denmark to a specific country.

**ODA from other donors.** Total Overseas Development Assistance disbursements from DAC Donors excluding Denmark.

c. These two variables were kindly provided by the organisation "Freedom House":

**Civil rights.** This index is Freedom House/Gastil's measure of the civil rights of a country's citizens.

**Political rights.** This is Freedom House/Gastil's measure of political freedom in a given country.

d. Finally, the following variable was provided by "Danmarks Statistik":

**Exports.** Danish exports of goods (f.o.b.) to a certain country.

### Appendix 3. Descriptive statistics and correlation matrix

#### A. THE FIRST STEP LINEAR REGRESSION ANALYSIS

##### DESCRIPTIVE STATISTICS

Variable	Mean	Std. Dev.	Skew.	Kurt.	Minimum	Maximum	Cases
Danish ODA Commitments	-1.8166	2.2833	-0.4	2.6	-9.6761	2.6090	598
Eastern and Southern Africa	0.3227	0.4679	0.8	1.6	0.0000	1.0000	598
Heckman's I	0.6186	0.7264	-0.5	3.7	-2.1549	2.4725	598
Private Net Capital Flows	-1.4523	1.6291	-0.4	3.3	-6.0637	2.5447	598
Exports	-0.7230	1.1247	-0.3	3.1	-4.2289	2.7910	598
GNP per Capita	-0.2390	0.7513	0.2	2.3	-2.1745	1.4409	598
GNP per Capita Growth	-0.0039	0.0716	-0.9	7.6	-0.4486	0.2219	598
Population	-1.2975	1.6071	0.3	3.3	-5.5164	3.0441	598
Civil and Political Rights	-0.0964	0.3767	-1.2	4.5	-1.5978	0.4786	598
ODA from other Donors	-0.5123	1.0206	-0.7	3.6	-4.0474	1.5775	598
Life Expectancy	-0.0009	0.1660	-0.4	3.5	-0.7614	0.3301	598

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## B. CORRELATION MATRIX

	Danish ODA Commitments	Eastern and Southern Africa	Heckman's I	Private Net Capital Flows	Exports	GNP per Capita	GNP per Capita Growth	Population	Civil and Political Rights	ODA from other Donors	Life Expectancy
Danish ODA Commitments	1.000										
Eastern and Southern Africa	0.3095	1.000									
Heckman's I	0.3514	-0.3224	1.000								
Private Net Capital Flows	0.4546	0.2304	0.2557	1.000							
Exports	0.2391	0.0421	0.1945	0.3767	1.000						
GNP per Capita	-0.1030	-0.1613	0.3598	0.1565	0.5124	1.000					
GNP per Capita Growth	-0.0412	-0.0856	0.0454	-0.0830	0.0631	0.2114	1.000				
Population	-0.4469	-0.2187	-0.2547	-0.9865	-0.3698	-0.1506	0.0826	1.000			
Civil and Political Rights	0.0468	0.3156	-0.1008	-0.0676	-0.1315	-0.3769	-0.1580	0.0703	1.000		
ODA from other Donors	0.5239	0.2212	0.1231	0.7662	0.3741	0.0615	-0.0376	-0.7654	-0.0581	1.000	
Life Expectancy	-0.2035	-0.2236	0.1937	-0.2158	0.2126	0.6132	0.2083	0.2196	-0.4224	-0.1705	1.000

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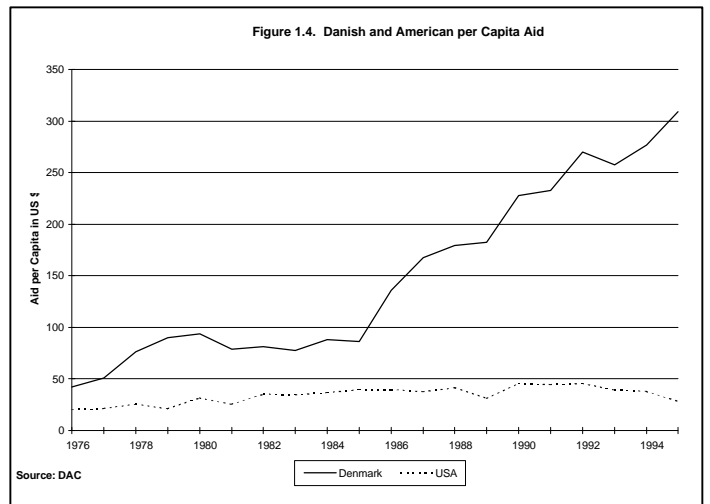
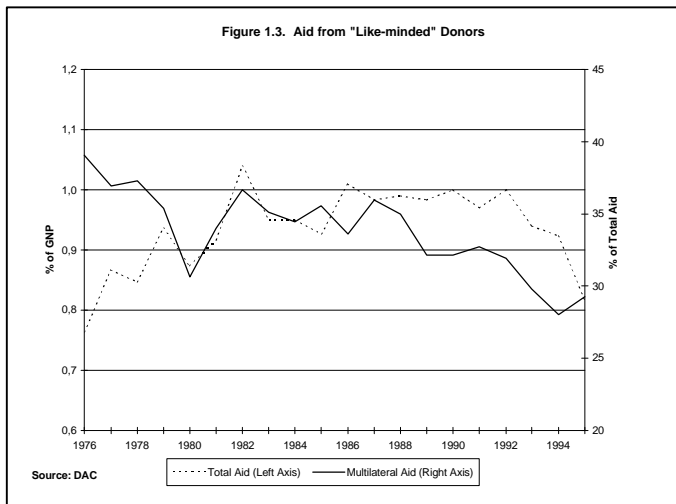
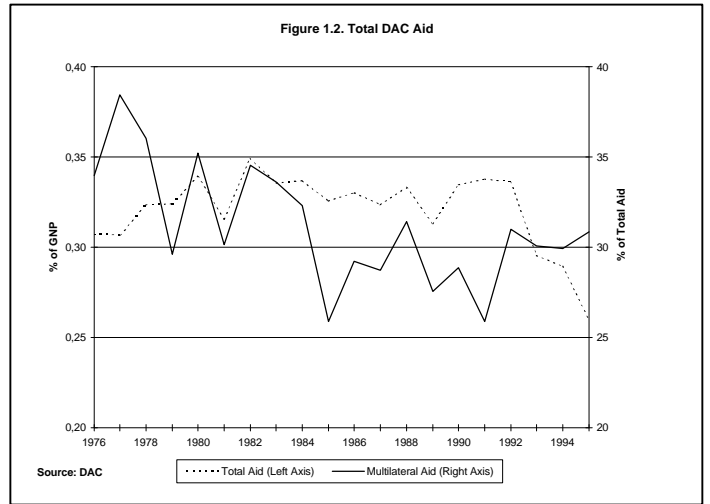
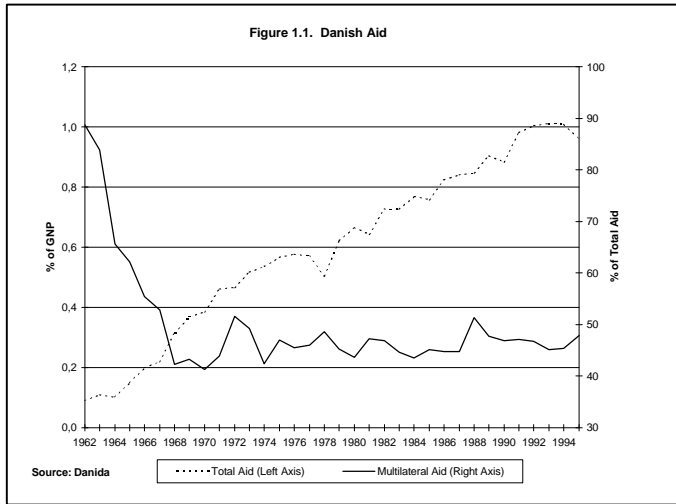


FIGURE 1. SELECTED AID FLOWS

*Note:* Aid is defined according to DAC's definition. It includes all official capital flows "provided with the promotion of the economic development and welfare of developing countries as its main objective" which "is concessional in character and contains a grant element of at least 25 percent". The group of "Like-minded" Countries consists of the Netherlands, Canada, Norway and Sweden.

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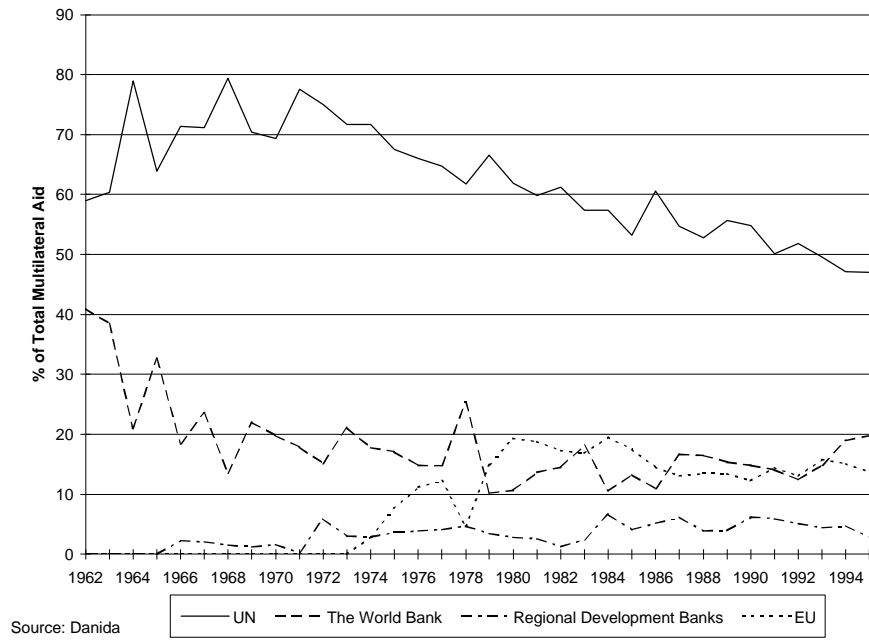


FIGURE 2. DANISH MULTILATERAL AID

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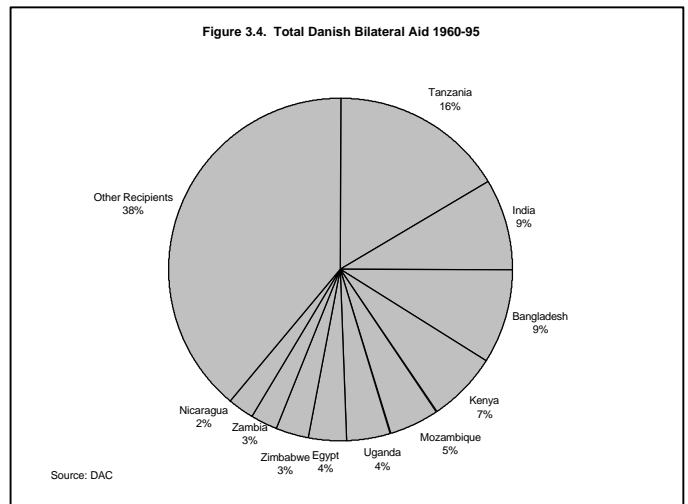
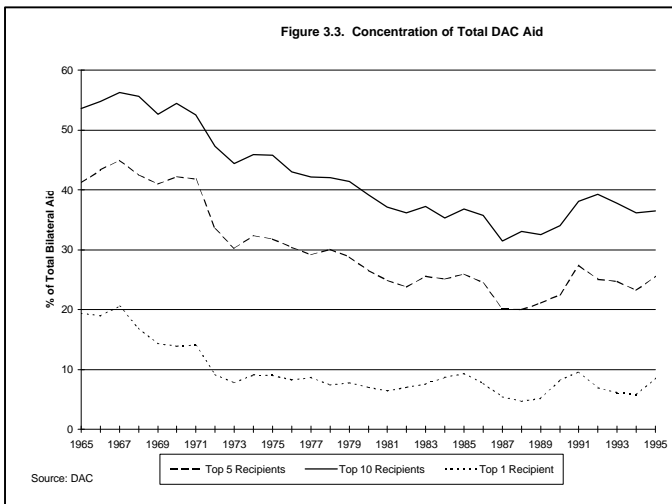
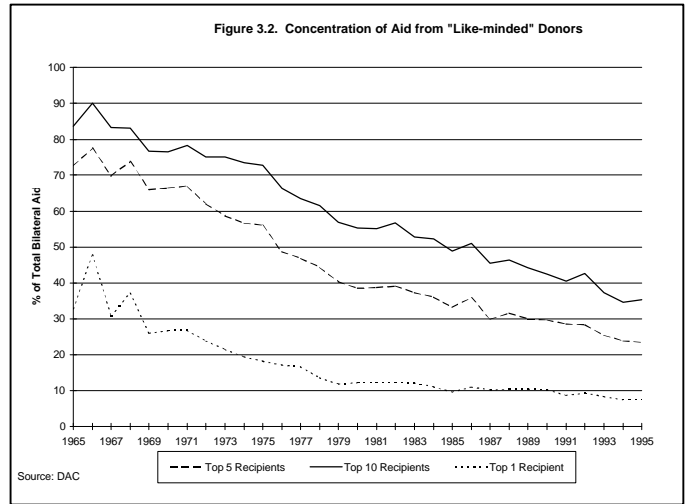
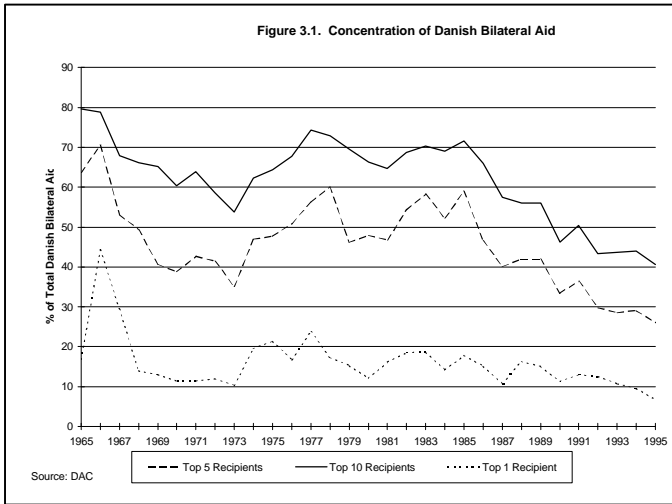


FIGURE 3. CONCENTRATION OF AID FLOWS

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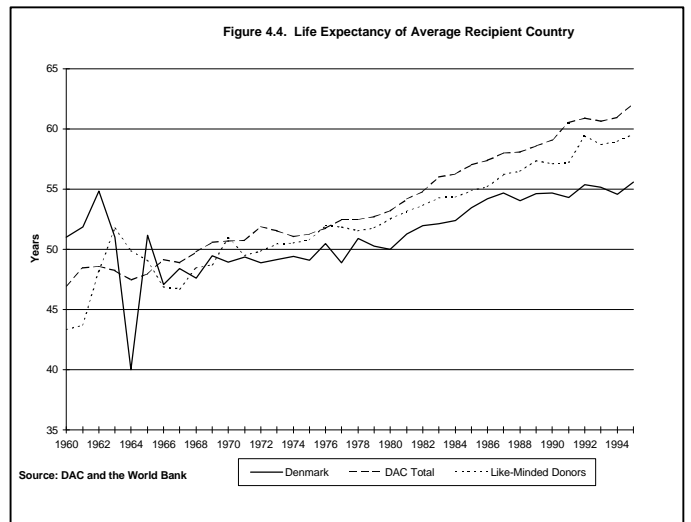
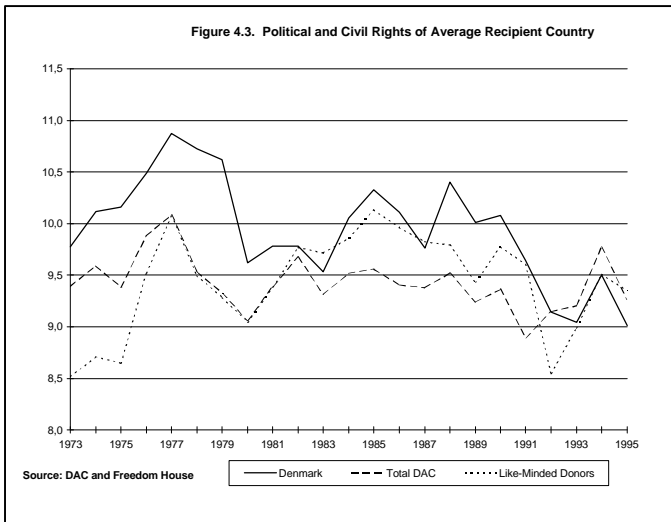
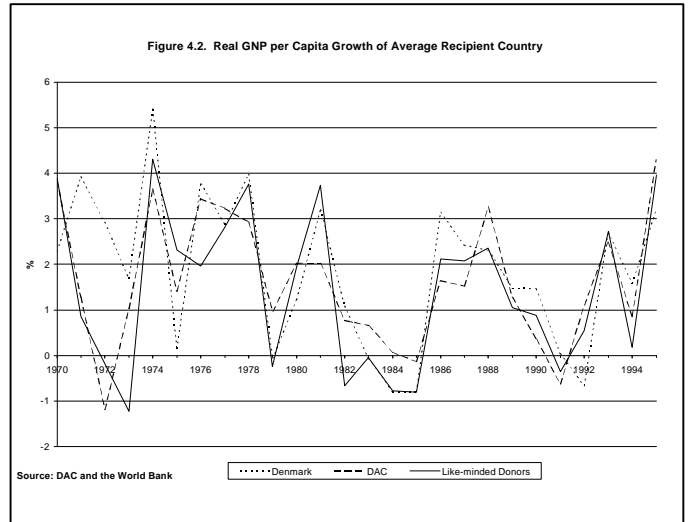
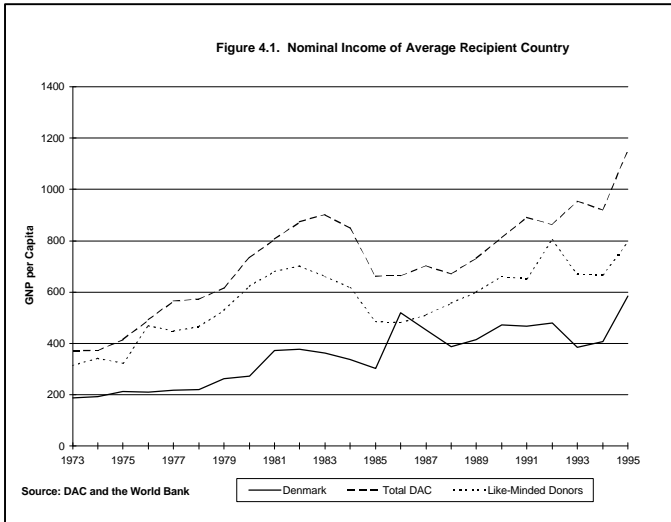


FIGURE 4. CHARACTERISTICS OF AID RECHIEVING COUNTRIES

Notes: Figure 4.1. The increase in GNP per capita in 1995 can be explained by the depreciation of the US \$ and increases in aid to relatively affluent countries in Eastern and Central Europe. Figure 4.3. Higher Values on the index which goes from 2 to 14 means lower rights



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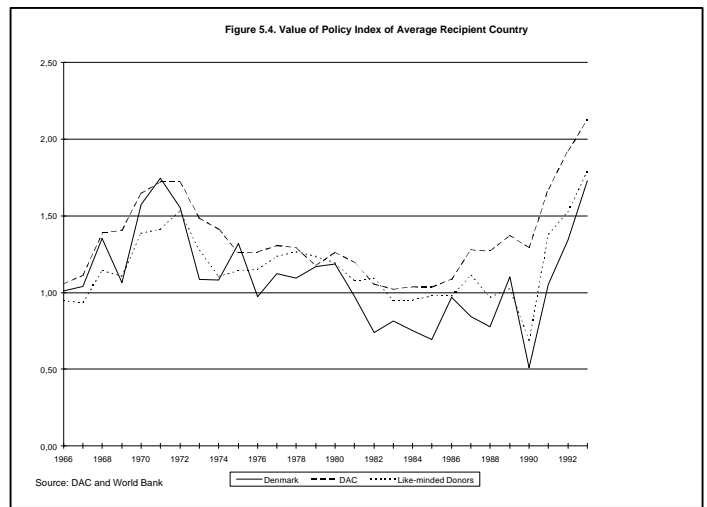
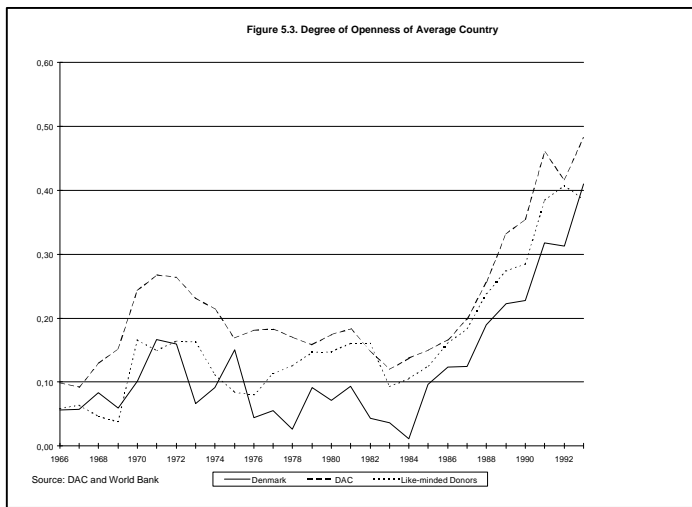
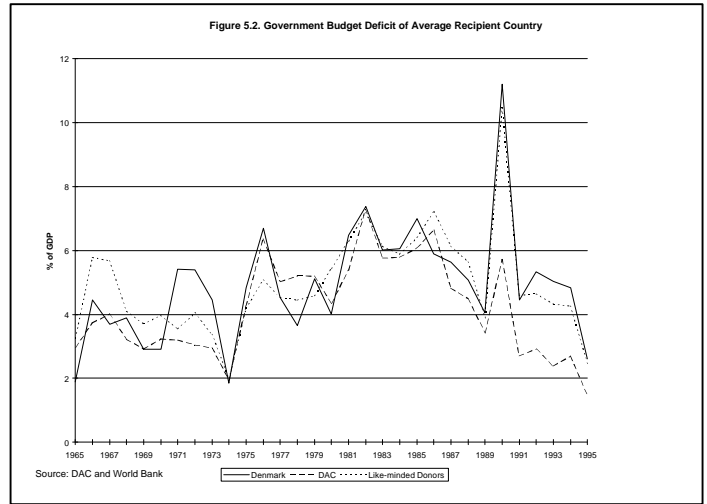
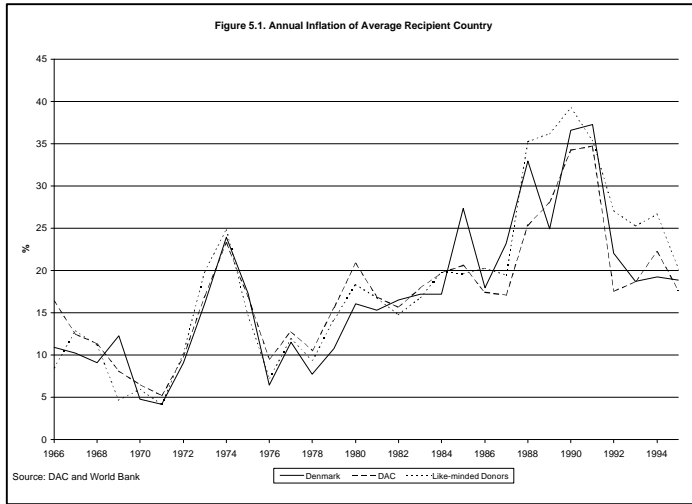


FIGURE 5. POLICY INDICATORS

Note: Figure 5.3. Openness is measured with Sachs and Werner's dummy variable where the value 1 indicates an outward-oriented trade policy. Figure 5.4. The policy index is calculated according to Burnside and Dollar (1997)'s formula:  $Policy = 1.3 + 5.4 * Budget\ Surplus - 1.4 * Inflation + 2.1 * Openness$ .

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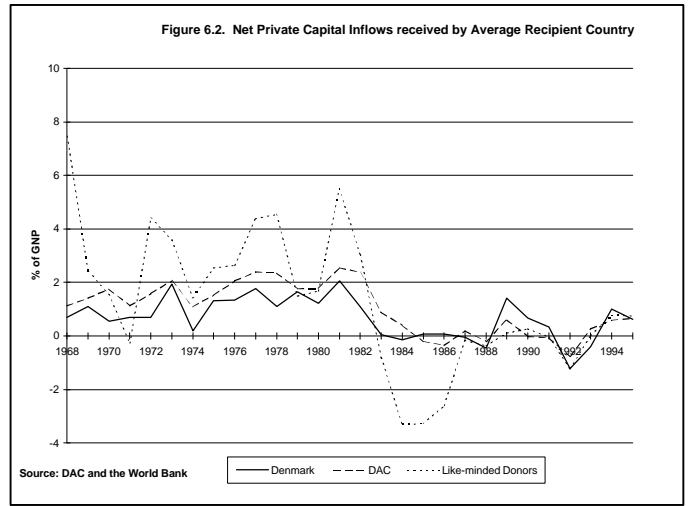
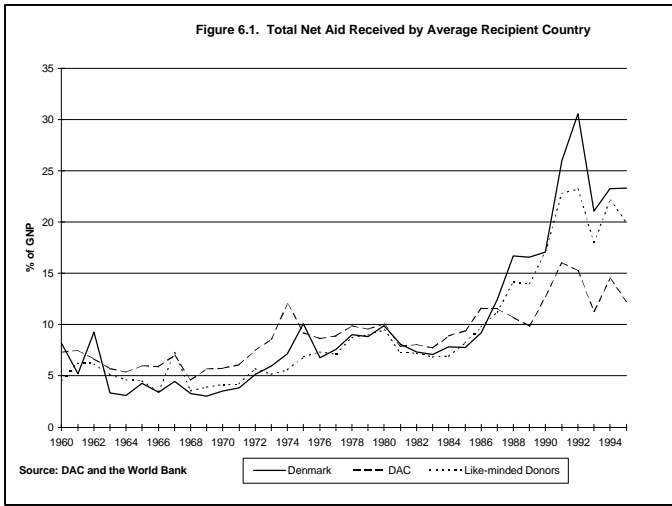


FIGURE 6. AID AND NET CAPITAL INFLOWS

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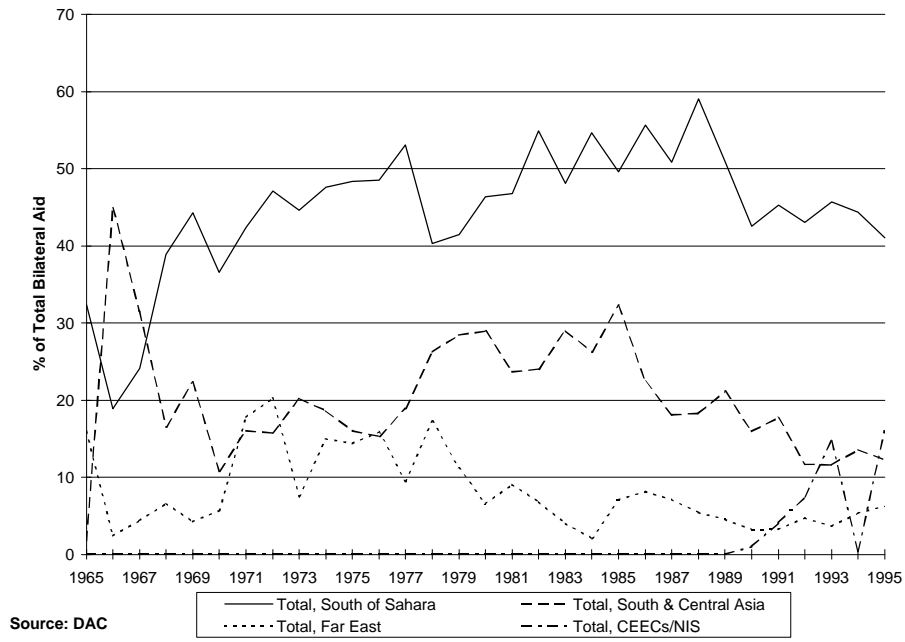


FIGURE 7. DANISH BILATERAL AID BY REGION

## DANISH AID POLICY: THEORY AND EMPIRICAL EVIDENCE

TABLE 1-DANISH AID BY SECTOR

SECTOR TYPE	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Social Infrastructure and Services	11.6%	22.2%	8.8%	25.3%	32.0%	16.0%	24.5%	14.3%	29.4%	34.2%
Economic Infrastructure and Services	0.0%	5.9%	11.4%	4.6%	18.6%	4.7%	0.6%	22.7%	23.4%	17.4%
Production Sectors	50.0%	51.6%	41.3%	23.5%	20.0%	51.6%	38.6%	20.2%	24.4%	42.4%
Multisector	0.0%	3.3%	36.4%	3.7%	28.1%	11.6%	27.4%	37.5%	17.7%	4.6%
Programme Assistance	37.7%	16.7%	2.0%	42.7%	1.2%	15.0%	8.8%	5.1%	0.1%	0.0%
Action Relating to Debt	0.0%	0.2%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%
Emergency Assistance	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unallocated/Unspecified	0.05	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	4.9%	1.3%
Total	100.0%	99.9%	100.0%	99.9%	100.0%	100.0%	100.0%	99.9%	99.9%	99.9%

TABLE 1-CONT.

SECTOR TYPE	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Social Infrastructure and Services	23.7%	17.0%	12.7%	31.0%	49.8%	26.1%	45.6%	42.9%	23.2%	23.7%
Economic Infrastructure and Services	33.6%	20.9%	27.8%	44.6%	12.4%	16.1%	10.2%	11.1%	32.7%	14.7%
Production Sectors	33.3%	39.8%	51.2%	16.3%	22.6%	27.0%	15.3%	12.8%	15.6%	6.5%
Multisector	6.8%	2.0%	2.1%	7.8%	12.7%	18.1%	20.3%	31.9%	24.0%	20.0%
Programme Assistance	0.0%	3.7%	2.3%	0.0%	0.6%	10.8%	5.9%	1.1%	1.5%	1.8%
Action Relating to Debt	0.0%	14.7%	1.7%	0.0%	1.1%	1.7%	2.7%	0.1%	3.0%	20.2%
Emergency Assistance	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.0%
Unallocated/Unspecified	2.7%	1.9%	2.1%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	5.1%
Total	100.0%	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%

## DANISH AID POLICY: THEORY AND EMPIRICAL EVIDENCE

TABLE 2-TWO-STEP REGRESSIONS

Variable	Probit Regression			Linear Regression		
	Estimate	z-value	p-value	Estimate	z-value	p-value
GNP per Capita	-0.11	-3.65	0.00	-0.81	-5.59	0.00
Life Expectancy	-0.37	-2.77	0.01	-0.18	-0.27	0.79
GNP per Capita Growth	0.18	2.28	0.02	1.24	1.94	0.05
Civil and Political Rights	-0.15	-3.27	0.00	-0.59	-2.66	0.01
Exports	0.05	3.43	0.00	0.37	5.46	0.00
Total Population	10.97	0.52	0.60	0.10	0.58	0.56
ODA from other Donors	0.10	7.41	0.00	0.55	4.56	0.00
Private Net Capital Flows	10.80	0.51	0.61	0.19	1.24	0.21
Eastern and Southern Africa	0.33	5.42	0.00	1.80	4.91	0.00
Heckman's I				1.60	21.56	0.00
Total ODA Budget	0.09	4.02	0.00			
Obs.		1768			598	
Countries		132			70	
R <sup>2</sup>		-			0.52	

TABLE 3-ACTUAL AND PREDICTED OUTCOMES IN PROBIT MODEL

Actual	Predicted		Total
	0	1	
0	1070	120	1190
1	310	268	578
Total	1380	388	1768

TABLE 4-TESTS OF PARAMETER STABILITY

Hypothesis	Probit Regression			Heckman Regression		
	Likelihood Ratio Tests			Chow Tests		
	LR-tests	Distribution	p-value	Test	Distribution	p-value
Model10 vs. Model 1	-	-	-	1.49	F(180,417)	0.001
Model10 vs. Model 2	64.28	$\chi^2$ (11)	0.000	11.86	F(11,575)	0.000
Model10 vs. Model 3	86.38	$\chi^2$ (11)	0.000	15.23	F(11,575)	0.000

Model0: One parameter for the whole period

Model1: One parameter per year

Model2: One parameter for 1976-84 and one for 1985-94

Model3: One parameter for 1976-89 and one for 1990-94