Master thesis for the Master of Philosophy in Environmental and Development Economics

# Assessing Japanese Aid Allocation

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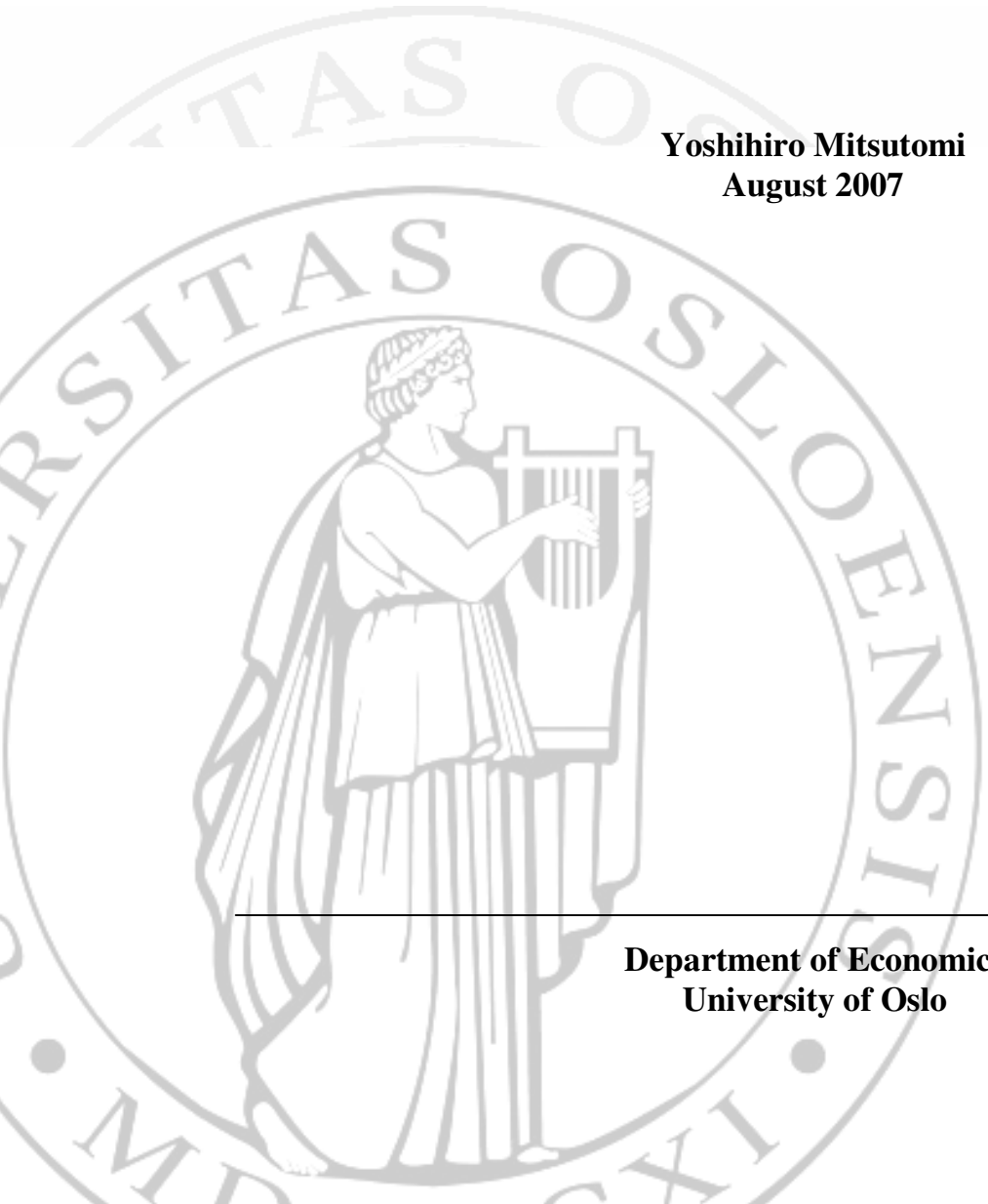
**August 2007**



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# Preface

First, I would like to thank the Department of Economics at University of Oslo for providing me with an excellent environment in which to grow as a student. I am grateful to my fellow students as well. I have learned from and enjoyed years of fruitful and intensive discussions with them.

I am forever indebted to my supervisor, Sheetal K. Chand for intellectual support, encouragement and patience, which made this thesis possible. I also thank him for devoting lots of time to correct many errors in the thesis.

I also would like to thank Kirby Thibeault for his essential advice and comments.

I express my sincere gratitude and deep respect to my family. They never have stopped offering their support and encouragement. Throughout the time spent working on my degrees, they made my circumstances ideal.

I hope this thesis contributes to understanding Japanese aid allocation. Responsibility for the thesis and its shortcomings, of course, rests with author alone.

Yoshihiro Mitsutomi
Oslo, 17th of August 2007

# Abstract

Many empirical studies reveal that Japanese aid allocative behaviour is not humanitarian. It is viewed as commercially motivated and geopolitically motivated. It is further reputed that Japanese development assistance program have earned a reputation being concentrated in Far East Asian region. I reexamine these issues. In this paper, I also perform an econometric analysis of aid allocation, covering 6 aid donors and 168 aid recipients over the period 1990-2002 and accounting for both altruistic and selfish donor motives but with more regional variation. The results indicate a significant difference in Japanese aid allocative behaviour towards Far East Asian region and the other regions. The behaviour is highly poverty focused in Far East Asia but selfish motives are also high. Comparing to aid allocation to Far East Asia, Japanese aid allocation to the other regions is less altruistic and selfish. It further confirms commercial motives have been less important in both regions while political motives have been enhanced in the other regions over time. At same time, altruistic motives have been weakened over time regardless of the regions. I also find the evidence that US pressure toward Japanese foreign aid policy has impact on Japanese aid allocation.

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# 1. Introduction

Japan has been one of the largest donors in most of years in 1990s for both bilateral and multilateral aid. Nishigaki and Shimomura (1998) assert that Japanese aid is open and fair due to high untied rate and low rate of winners of Japanese firms or organization in yen-loan projects. Nevertheless, Japanese aid is not free of criticism. Some studies insist that Japan used aid as an important instrument in the re-establishment of its trade and investment in 1950s and 1960s (Ozawa 1989; Tisch and Wallas 1994; The ministry foreign affairs of Japan 2007). Japanese government hasn't disregard improvement of its aid allocative behaviour. They mention humanitarian assistance in explaining in their motives in its official development assistance (ODA) charter and proclaim regarding policies. Cooray and Shahiduzzaman (2004), however, contend that Japanese aid policy is still simply a continuation of her domestic post-war economic recovery strategy; that is, concern for her domestic prosperity and security.

Japanese aid performance has not been evaluated favorably in many studies. Evaluation of donor performance by Easterly (2002) ranked Japan in 7$^{th}$ among 21 donors. He evaluated donors with unweighted average of rankings with five different criterion for donors' aid performances: high negative correlation of aid per capita with income of recipient, high partial correlation of aid per capita with good institutions in recipient, partial correlation of aid per capita with Burnside-Dollar policy index[1], low degree of tied rate, and the amount of aid relative to donor income. Berthelemy (2006b) evaluated selfish behaviours of donors and classified donors into three clusters: "altruistic", "moderately selfish", and "selfish". He classified Japan into "moderately selfish" cluster. He defined "moderately selfish" donors as donors who have a trade intensity parameter non-significantly different from other donors.

Both political and commercial motives have been featured in the criticisms. Alesina and Dollar (2000) examined the aid allocation of various donors over the period 1970 to 1994. They found that political motives had a positive impact on the amount of aid allocated by Japan. Isopi and Mavrotas (2006) examined them over period 1980 to 2003. They found

[1] The Burnside-Dollar policy index is a composite index of inflation, government budget surplus/deficit as percent of GDP, and the Sachs-Warner openness classification.

amount of Japanese bilateral aid is related to commercial motives. Other studies such as Berthelemy and Tichit (2002), Cooray and Shahiduzzaman (2004), and Canavire et al (2005) also concluded similarly. The study of Berthelemy (2006a) over period 1980 to 1999 found that the commercial motives even influenced on multilateral aid decisions. The study by Canavire et al (2005) further found that economic needs of recipients did not exert a relevant influence on Japanese aid allocation. The study by Isopi and Mavrotas (2006) also concluded that both economic and social needs did not exert significant influence. However, Berthelemy (2006b) asserts that those motives resulted in large amount of Japanese aid goes to Asia because those countries are important for Japan in terms of geopolitical strategy and commercial interests.

On the other hand, some studies such as Berthelemy and Tichit (2002), Dollar and Levin (2004), and Isopi and Mavrotas(2006) found that Japanese aid allocation is policy selective and does go to recipients with good policy and institution. Dollar and Levin (2004) also asserted that the pattern of giving large amount to Asia reflects this policy since many of Asian countries are well governed.

Both the criticisms and praises of Japanese aid policies seem to be ascribable to the pattern of giving large amount of aid to Asia. This study examines how aid allocation in that region differs from the other regions and changes in the bias of Japanese aid allocation to Asia over time.

The rest of paper is organized as follows. Section 2 gives descriptive analysis of Japanese aid. Section 3 describes data set. Econometric methodology issues are reviewed in section 4. Section 5 presents the econometric analysis for behaviour of collective donors and individual donors covering the period 1990-2002. In section 6 we conduct a sensitivity analysis to test the robustness of our results. The analysis is performed in two parts. First, we will investigate how various factors influence Japanese aid allocation. Second, we will compare the results with an alternative estimation method. The last section concludes the paper.

# 2. Japanese aid

This section, first, presents features of Japanese aid allocation, how current aid pattern has been formulated and overall regional distribution. In next sub-section, we discuss diversifications of Japanese aid distribution by region.

## 2.1 Features of Japanese aid allocation

### 2.1.1 How current Japanese allocation has been formulated

Although nowadays Japan is considered as a major donor, Japan used to be an aid recipient. From 1946 to 1951, American aid programmes such as Government and Relief in Occupied Areas (GARIOA) and Economic Rehabilitation in Occupied Areas (EROA) provided essential emergency assistance for helping recovery from the confusion and devastation of the immediate post WWII. From 1953 Japan had received loans from World Bank until 1966. To graduate from being an aid recipient and then go on not only to join the aid donors but to become one of the world's largest aid-giving countries is a unique history unparalleled in the annals of aid. This experience may reflect the tenet of Japanese aid giving activity, supporting "self-help", the attempt to change the status quo as much as possible by oneself without depending on outside help, to promote development by and for oneself.

Here, let us see historical backgrounds of Japanese aid. The Ministry of Foreign Affairs of Japan (2007) classifies history of Japanese aid into four periods.

**The first period (1954-1963): Period of reparations and commencing aid**

On 6th of October in 1954, Japan joined membership to the Colombo plan[2] and started with a technical cooperation program. At same time, with peace treaty and reparation and economic cooperation treaty with Burma[3], Japan commenced reparations to Asian countries to build up what had been damaged during the war. In 1958, Japan commenced the first economic

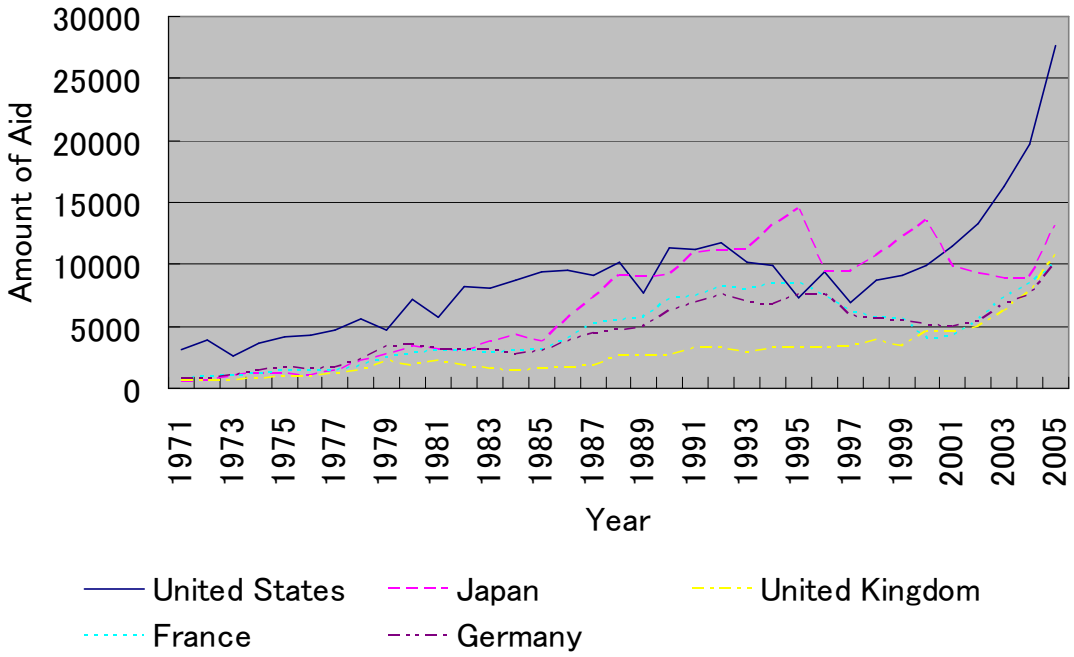
[2] The Colombo Plan was a system of regional cooperation with headquarters in Colombo, Sri Lanka, that was launched in 1950 to promote the economic and social development of South and Southeast Asia (Nishigaki and Shimomura 1998).
[3] Present Myanmar

cooperation to other countries, government loans to India. But the majority of both types of aid was tied aid[4]. Thus there were commercial motives behind its aid and they rendered its aid component weak in this period.

**The second period (1964-1976): expansion period**

Japanese foreign aid expanded quantitatively and become manifold with advance of international position due to rapid economic growth. Japan made endeavour for qualitative efficiency by commencing grant aid, enhancing untied aid, and so forth. Japan also expanded the list of recipients of its aid regionally. Japanese aid had been almost confined to Asia in the 1960s, however, the oil crisis of 1973 changed Japanese aid policy due to Japan's vulnerability from heavy energy imports. It has to be noted that aid was used as diplomatic tool to restore neutralist credibility and to placate Arab anger from Japan's alliance with USA and support to Israel.

**Figure 2-1 : Changes in the amount of aid of major donors for 1971-2005**




[Note] Amount is current price in US dollars.
Transaction is ODA.
Source: OECD (2007)

[4] The recipient of tied aid is obliged to spend it on goods and services in the donor country(Szirmai 2005).

**The third period (1977-1988): period for planned expansion**

Subsequent to completion of reparations, Japan implemented planned expansion of foreign aid with five periods. Through the plan, not only had Japan assisted economic infrastructure[5], but also Japan assisted social infrastructure[6]. Moreover, in this period, the aid was distributed to varieties of recipients, especially to the Middle East, Africa, and Latin America.

**The fourth period (1989-present): major donor period**

As we can see from figure 2-1, in 1989, Japan overtook USA and became the largest donor in the world. Japan retained lead until 2000 except 1990, despite stagnation. In 2001, Japan surrendered the position to USA. In subsequent period, although ODA of other major donors such as France, UK, and Germany increased considerably, Japan still retains second place.

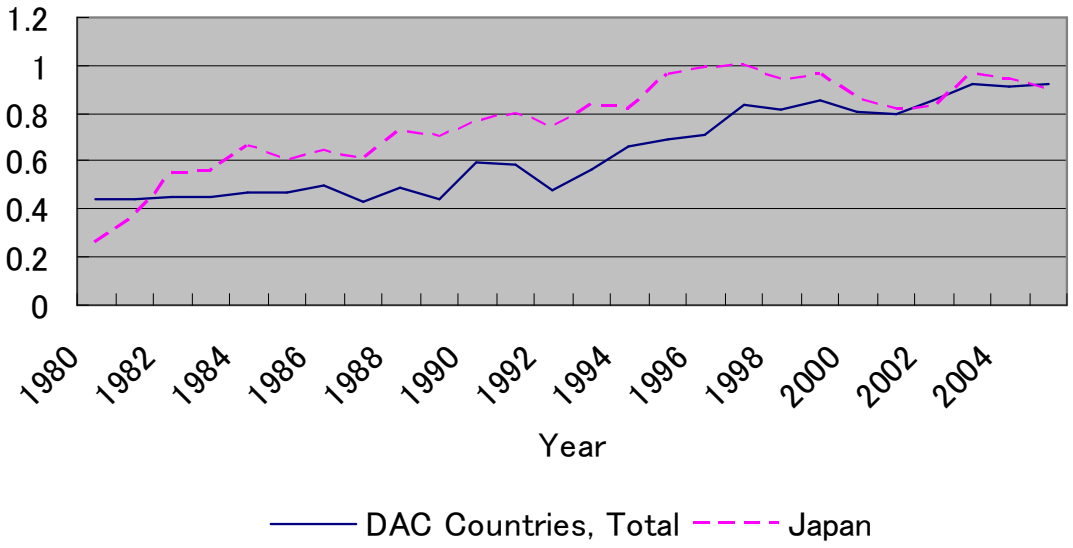
### 2.1.2 Tied Aid

As mentioned above, Japanese aid was initially highly tied in order to promote its export with the aim of own prosperity. Tied aid has been considered as an ineffective form of giving aid. Tied aid functions as an export credit for the donor country and it reduces the total value of aid, because recipient is not free to use the financial resources provided to buy the cheapest and best goods and services available on international or domestic markets. Often the prices of imports from the donor country will be 20 percent to 30 percent above world market prices. Moreover, it is very likely that the recipients are forced to buy goods that are not optimally suited to their needs and local circumstances. Furthermore, a country may end up with many different and incompatible brands of the same product from different countries (Szirmai 2005). Hence, over the years, the issue has been discussed in the the Development Assistance Committee (DAC)[7], culminating in agreement by Development Co-operation Ministers and Heads of Aid Agencies on a Recommendation to untie ODA to the

[5] Transportation, telecommunication, energy, and so forth.
[6] Education, health, and so forth.
[7] The Development Assistance Committee (DAC) is one of the key forums in which the major bilateral donors work together to increase the effectiveness of their common efforts to support sustainable development. (OECD 2007). Current members are Aurtralia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK, USA, and commission of the European Communities.

least developed countries[8] at the DAC High Level Meeting in April 2001. The objectives of the Recommendation are to untie ODA to the least developed countries to the greatest extent possible, to promote and ensure adequate ODA flows, in particular to the least developed countries, and to achieve balanced efforts among DAC Members in untying aid. The Recommendation also recognizes that reinforcing partner country responsibility for procurement and the ability of the private sector to compete for aid funded contracts are required in order for the Recommendation to deliver its full benefits.

**Figure 2-2: The change of share of untied aid in overall aid from 1980 to 2005**




[Note] Aid status is bilateral commitment..
Source: OECD (2007)

As shown in figure 2-2, Japan has attained high untied rate. From 1980s, not only did Japanese untied rate catch up with other donors, but it exceeded their level. Furthermore, a study by Nishigaki and Shimomura (1998) showed that around 70 percent of winners for yen-loan projects in 1990s are non-Japanese bidders, and what's more, most of the non-Japanese winners are not even local subsidiaries of Japanese firms. Those facts allow us to infer decreasing commercial motives.

[8] The agreement was issued on 14th of May in 2001 and the progress of implementation of the agreement was reported in OECD (2006a). The review was subject to some amendments. The latest version can be found in OECD(2006b).

### 2.1.3 Share in total GNI

If we examine the absolute amount of ODA of Japan in table 2-1, it is the second highest among all DAC countries after USA and its share in total ODA exceeds 10 percents.

**Table 2-1: Donor profile**

| | ODA (US million $) | shares in total ODA | ODA per capita | ODA as % of GNI | | |
|---|---|---|---|---|---|---|
| | | | | 2003 | 2004 | 2005 |
| All Donors, Total | 120402.57 | 100.00 | 121.54 | - | - | - |
| DAC Countries, Total | 106777.11 | 88.68 | 123.47 | - | - | - |
| Australia | 1680.16 | 1.40 | 82.64 | 0.25 | 0.25 | 0.25 |
| Austria | 1573.32 | 1.31 | 191.17 | 0.2 | 0.23 | 0.52 |
| Belgium | 1963.36 | 1.63 | 188.24 | 0.6 | 0.41 | 0.53 |
| Canada | 3756.34 | 3.12 | 116.01 | 0.24 | 0.27 | 0.34 |
| Denmark | 2108.92 | 1.75 | 388.38 | 0.84 | 0.85 | 0.81 |
| Finland | 901.94 | 0.75 | 171.47 | 0.35 | 0.37 | 0.46 |
| France | 10026.22 | 8.33 | 165.07 | 0.4 | 0.41 | 0.47 |
| Germany | 10082.16 | 8.37 | 122.22 | 0.28 | 0.28 | 0.36 |
| Greece | 384.22 | 0.32 | 34.65 | 0.21 | 0.16 | 0.17 |
| Ireland | 718.94 | 0.60 | 179.74 | 0.39 | 0.39 | 0.42 |
| Italy | 5090.9 | 4.23 | 86.98 | 0.17 | 0.15 | 0.29 |
| Japan | 13146.58 | 10.92 | 103.02 | 0.2 | 0.19 | 0.28 |
| Luxembourg | 256.39 | 0.21 | 569.76 | 0.81 | 0.83 | 0.86 |
| Netherlands | 5114.69 | 4.25 | 313.02 | 0.8 | 0.73 | 0.82 |
| New Zealand | 273.52 | 0.23 | 66.88 | 0.23 | 0.23 | 0.27 |
| Norway | 2786.05 | 2.31 | 600.44 | 0.92 | 0.87 | 0.94 |
| Portugal | 377.12 | 0.31 | 36.47 | 0.22 | 0.63 | 0.21 |
| Spain | 3018.3 | 2.51 | 69.85 | 0.23 | 0.24 | 0.27 |
| Sweden | 3361.68 | 2.79 | 371.46 | 0.79 | 0.78 | 0.94 |
| Switzerland | 1766.56 | 1.47 | 237.12 | 0.39 | 0.41 | 0.44 |
| United Kingdom | 10767.26 | 8.94 | 179.45 | 0.34 | 0.36 | 0.47 |
| United States | 27622.48 | 22.94 | 93.19 | 0.15 | 0.17 | 0.22 |

[Note] ODA is measured by net disbursements
The first three columns are records of 2005
Source: OECD (2007)

Absolute amount of aid, however, cannot explain fully donor's contribution. As used in evaluation by Easterly (2002), amount of aid relative to donors' income is also widely adopted as an indicator of donors' contribution. In 2002, world leaders pledged to make concrete efforts towards the targets of 0.7 percent of their GNI in foreign aid in order to achieve the Millennium Development Goals (MDGs)[9] at the Monterrey Financing for

[9] The MDGs are eight goals to be achieved by 2015 that respond to the world's main development challenges, eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality and empower women, reducing child mortality, improving maternal health, combating HIV/AIDS, malaria and other diseases, ensuring environmental sustainability, and developing a global partnership for

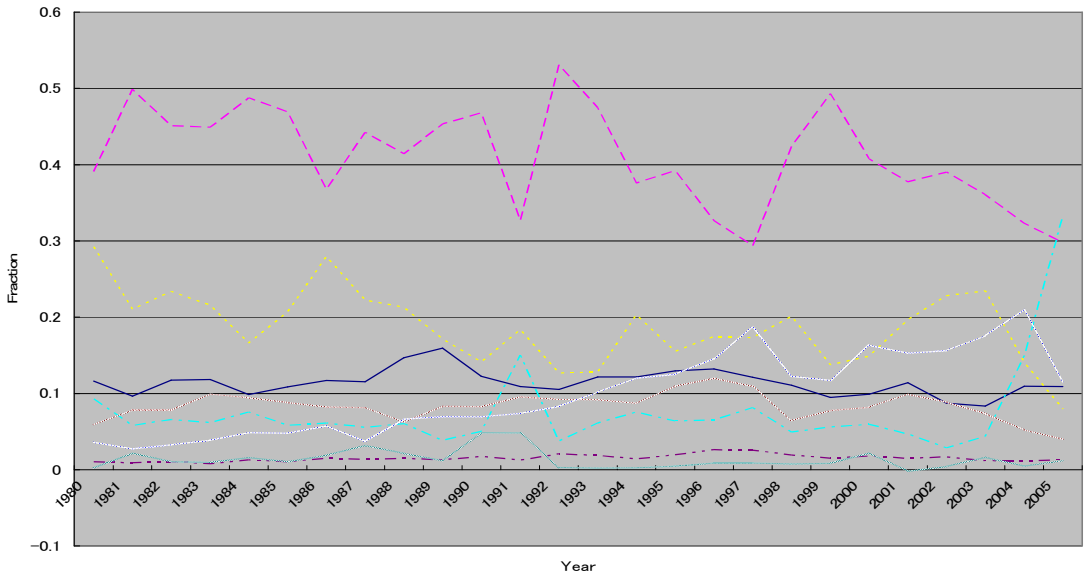
Development Conference of UN. Notwithstanding all DAC donor countries except Denmark, Luxembourg, Netherlands, Norway, and Sweden do not fulfill the target. That of Japan is far from the target and the 6th smallest among all DAC donor countries after Greece, Portugal, USA, Australia, and New Zealand. Even if we compare with ODA per capita, it is 8th smallest. This was one of the factors dragging the ranking by the Easterly (2002) down. Notwithstanding, if we compare with highly populous donors such as USA, UK, Italy, Germany, France, and Spain, it is not notably small. Furthermore, the condition is improving. From 2002 to 2005, the share of Japanese ODA in its GNI increased 0.08 percent, from 0.20 percent to 0.28 percent. In this period, as we can see from the figure 2-1, absolute amount of ODA was increased despite shrinking national income[10].

### 2.1.4 Regional Distribution

Even though Japanese aid has been dispersed more regionally, there still is criticism, for example, Berthelemy (2006b) that large amount of Japanese aid is prone to go to Asian countries. It can be confirmed from figure 2-3.

**Figure 2-3: Changes in the Japanese ODA distribution by region for 1980-2005**

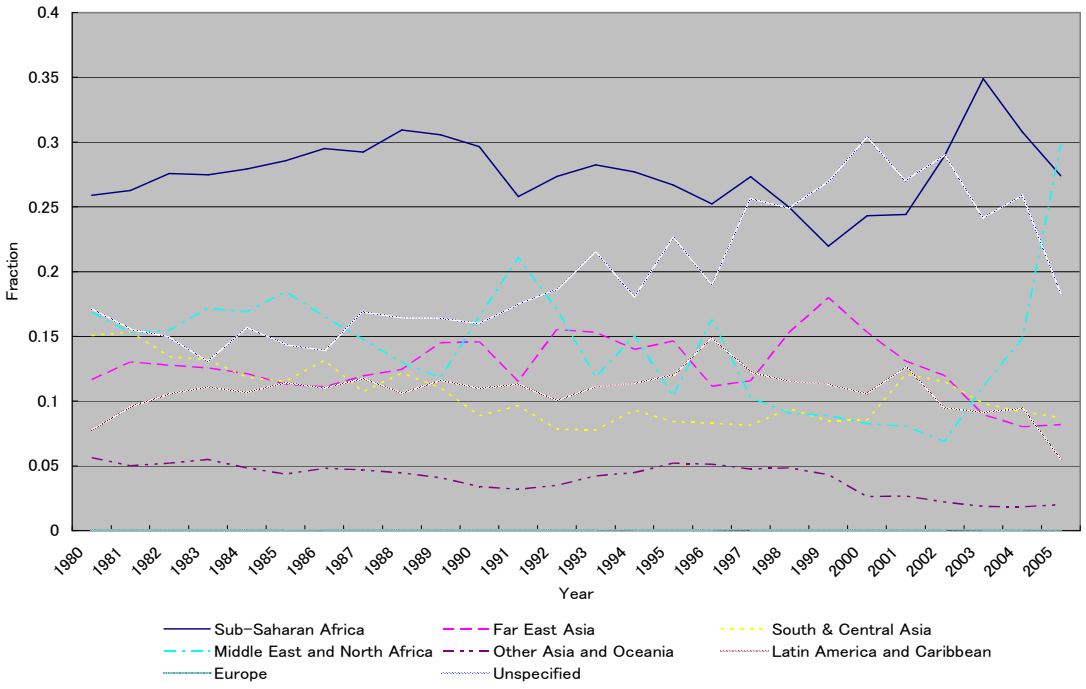
**(a) Japan**




development .They were drawn at the UN Millennium Summit in September 2000. For further information see (UN 2007).

[10]The GNI for Japan were 4 759 021.28 US million dollars in 2004, and 4 675 017.26 US million dollars in 2005. (OECD 2007)

**(b) DAC countries, total**




[Note] ODA is measured by net disbursements
Amount type is converted into 2004 US constant price.
Countries have been classified in the OECD sense. For further information (see OECD 2007)
Source: OECD (2007)

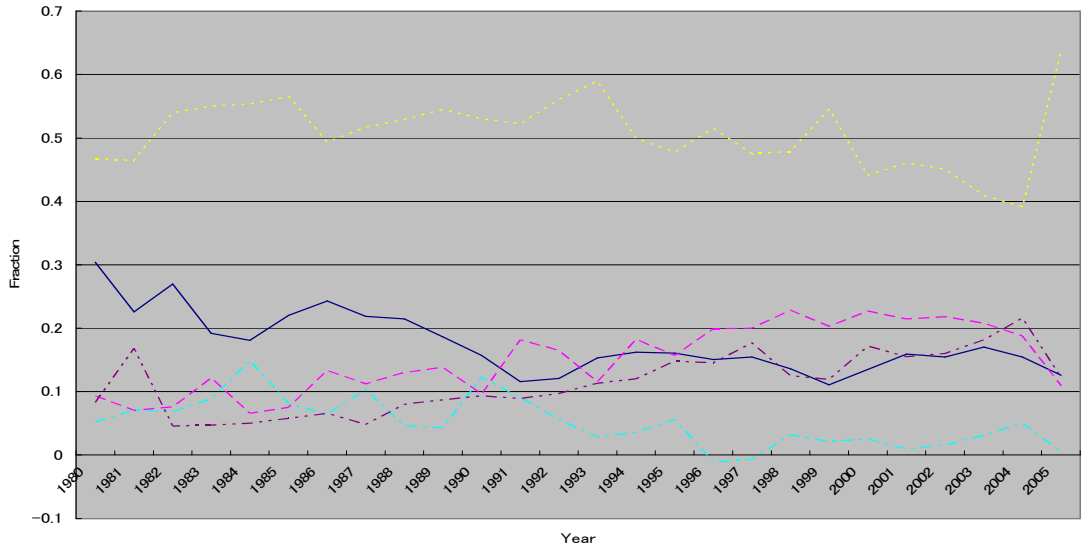
During sample years, from 1980 to 2005, Far East Asia has been the leading destination of Japanese aid except 2005. The abrupt rise of the share in the Middle East attributes to demeanour of Japanese government sympathizing USA's foreign policy to the Middle East. Comparing with total DAC donors, the share in Asia is notably higher. On the other hand, share of sub Saharan Africa is significantly small even though it is the major destination from total DAC donors. Eradicating poverty in sub-Saharan Africa has been discussed as an important issue at several conferences of UN and, what's more, major donors proclaimed to intensify aid to the region on Kananaskis summit on June in 2002 (Shirai 2004). Many donors moved into action and the share in the region had dramatically risen afterwards. We can ascribe recent decrease to abrupt rise of share in the Middle East. During this period, the sub-Saharan African share in Japanese aid has been almost stable.

### 2.1.5 Distribution by Income

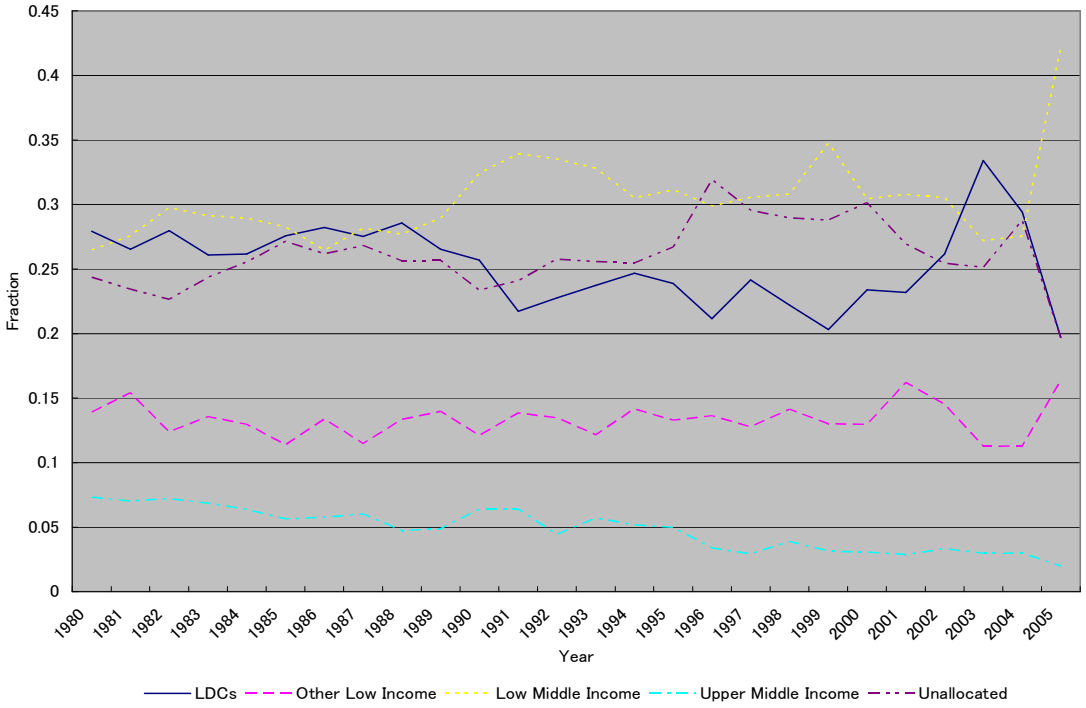
As we can see from figure 2-4, the share of low middle income countries in Japanese ODA has fluctuated around 50 percent through all sample years, from 1980 to 2005, while that in total DAC countries has fluctuated around 30 percent. USA, the largest donor, is also prone to allocate more ODA to low middle income countries, especially to Egypt. ODA to low middle income countries from USA and Japan accounts approximately 60 percent of ODA from total DAC countries. It implies that share of Japanese ODA allocation to low middle income countries is much larger than other DAC donors excluding USA, in practice. Moreover, the share of Least Developed Countries (LDCs) in Japanese ODA has been much lower than that in total DAC countries. Although many of leading recipients of Japanese ODA, especially countries in Far East Asia such as China, Indonesia, Thailand, and Philippines, the second, third, fourth, and fifth largest recipient of Japanese ODA respectively in 2005, already sloughed off from LDCs, Japan retains them as leading recipients.

**Figure 2-4: Changes in the Japanese ODA distribution by income class for 1980-2005**

**(a) Japan**



**(b) DAC countries, total**




[Note] ODA is measured by net disbursements
Amount type is converted into 2004 US constant price.
Countries have been classified in the OECD sense. For further information (see OECD 2007)
Source: OECD (2007)

## 2.2 How aid toward Asia and other regions differ

As we have discussed so far, recipients in Far East Asia are dominant in Japanese aid. The preference towards the area is clearly indicated in ODA charter provided by the Ministry of Foreign Affairs of Japan. It describes Asia as Japan's priority region, a region with close relationship to Japan and which can have major impact on Japan's stability and prosperity (The Ministry of Foreign Affairs of Japan 2007). It further mentions that they diversify assistance approaches by region. For Far East Asia, the aim for aid is to correct disparity within the region, to sustain their growth, and to enhance relationship between Japan. For other regions, it only makes allusions to support them based on individual conditions and in order to eradicate poverty and promote peace. This philosophy might create diversification between aid toward Far East Asia and others. This sub-section explores how Japanese aid component toward Far East Asia is distinct from the others.

**Table 2-2: Flow of ODA to developing countries in 2005(net disbursement basis)**

| | Total DAC | | Japan | |
|---|---|---|---|---|
| | Amount (US million dolllars) | Share in total ODA(%) | Amount (US million dolllars) | Share in total ODA (%) |
| ODA | 106777.11 | 100 | 13146.58 | 100 |
| Bilateral ODA | 82133.43 | 76.92 | 10406.21 | 79.16 |
| Grant aid[11] | 83109.26 | 77.83 | 9194.68 | 69.94 |
| Investment Project aid | 6266.92 | 5.87 | 696.04 | 5.29 |
| Programme aid | 11849.55 | 11.10 | 274.63 | 2.09 |
| Technical cooperation | 20925.60 | 19.60 | 1873.09 | 14.25 |
| Developmental food aid | 886.54 | 0.83 | 58.44 | 0.44 |
| Emergency / Distress Relief | 7169.46 | 6.71 | 515.85 | 3.92 |
| Debt forgiveness | 24962.63 | 23.38 | 4775.69 | 36.33 |
| Support to NGOs | 2374.74 | 2.22 | 282.83 | 1.15 |
| Others(including administrative costs) | 6602.71 | 6.03 | 718.11 | 5.46 |
| Non-grant | -975.83 | -0.91 | 1211.53 | 9.216 |
| Loans by government | 1790.42 | 1.68 | 2433.77 | 18.51 |
| Offsetting Entry for debt forgiveness | -2766.26 | -2.59 | -1222.24 | -9.30 |
| Multilateral ODA | 24643.71 | 23.08 | 2740.37 | 20.84 |
| Grants and capital subscriptions | 24659.91 | 23.09 | 2740.37 | 20.84 |
| Concessional lending | -16.21 | -0.01 | 0 | 0 |

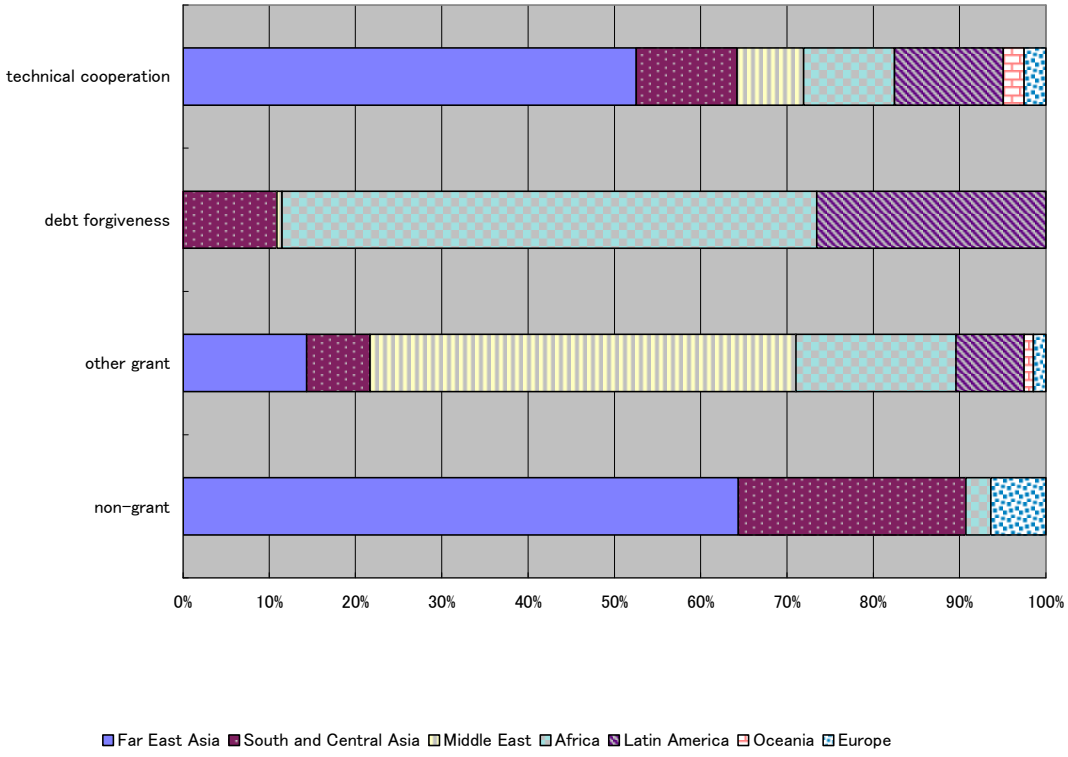
[Note] Amount type is in constant 2005 US dollars.
Source: OECD (2007)

[11] The form of financial cooperation that helps developing countries acquires what they need but does not require repayment in return.

From table 2-2, we can see several clear distinctions. First, share of project aid dominates that of programme aid in Japan whereas total DAC shows opposite state. Second, share of debt forgiveness in Japan is much higher, approximately 13 percent, than that in total DAC. Third, share of non-grant element in Japan is also larger than that in total DAC. Especially, the share of loans by government is considerably larger, more than 16 percent. Subsequently in this sub-section, we will investigate further whether these distinctions were ascribable to the regional diversification.

Figure 2-5 depicts how each component is distributed by region. Each component shows peculiar regional pattern.

**Figure 2-5: Regional distribution by each component of Japanese ODA in 2004**

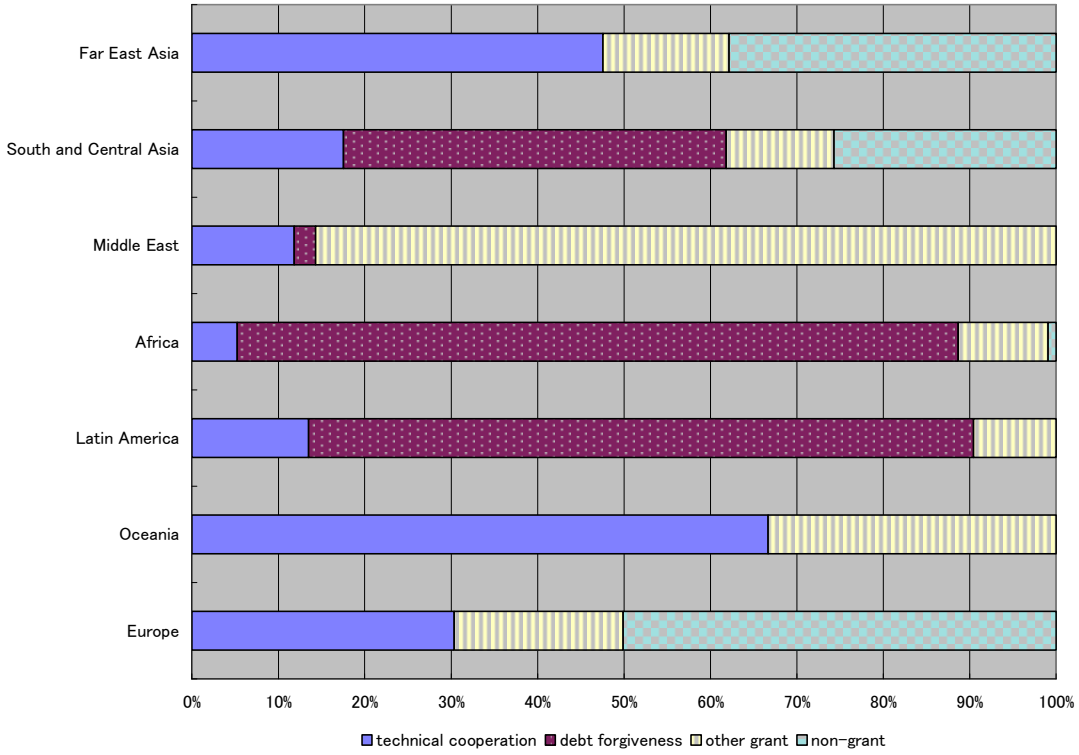



[Note] Source: the Ministry of Foreign Affairs in Japan (2007)

For technical cooperation, Far East Asia occupies more than half of total technical cooperation. Technical cooperation is defined as activities the primary purpose of which is to augment the level of knowledge, skills and technical know-how in developing countries (Szirmai 2005). Japanese government recognizes this type of aid can be effective regardless

of recipients' income. Indeed, although Far East Asia occupies large part, this component is relatively fairly distributed regionally.

**Figure 2-6: Components of Japanese ODA by region in 2004**




[Note] Source: the Ministry of Foreign Affairs in Japan (2007)

The reason the amount for this aid is large in Japan may be ascribable to the extremely few staff members involved in distributing Japanese aid. Thus debt forgiveness does not require high degree of interference of decision makers in affairs of other countries, and a large amount of money can be disbursed. Then Japan can keep its operational budget at modest level.

If we look at the regional distribution, Africa occupies more than half of total debt forgiveness while none of debt forgiveness is given to Far East Asia. Japan gives debt forgiveness mainly to comply with two things; one is an agreement at the Trade and Development Board (TDB) of United Nations Conference on Trade and Development (UNCTAD) in 1978 which urged donor countries to provide debt relief to developing countries, and the other is an outcome of a comprehensive review by IDA and the IMF,

including public consultations, Enhanced Heavily Indebted Poor Countries Initiatives[12], which is stipulated to ensure deep, broad, and fast debt relief and thereby contribute toward growth, poverty reduction, and debt sustainability in the poorest, most heavily indebted countries. Hence, low income countries likely receive it. Indeed, debt forgiveness is principal ODA component in Africa, south and central Asia, and Latin America where many countries are in distress.

One of the Japanese aid tenets is utilizing non-grant aid, loans, to induce recipients' effort for "self-help". Loans are given in the belief that a recipient of non-grant aid is motivated not only to use the money more effectively but also to make every effort to complete the project and make it work due to the obligation to pay interest and repay the principle. Thus, contrary to the international perceptions that more grant aid should be allocated, non-grant aid share takes large part in Japanese aid. Project loan[13] is dominant component in Japanese non-grant aid. The role for government loan is complement for essential resource for its development. Japan thinks economic and social infrastructures are inevitable in order to materialize sustainable growth. However, it is too burdening for developing countries to establish those infrastructure only through their own market mechanism (the Ministry of Foreign Affairs 2007). Therefore, Japan highly involves projects for economic and social infrastructures by giving governmental loan, especially so large projects that cannot be managed by project grant aid. From an international perspective, this is one of the unique features of Japanese aid. Söderberg (1996) asserts that the reason Japan puts stress on large non-grant aid ascribes to sources of ODA. About 50 percent of the money for aid comes from the General Account Budget whereas another 50 percent comes from the Fiscal Loan and Investment Programme which consists of money from postal savings, pensions and other civilian savings which people expect to be repaid with interest. This makes it difficult to give money in the form of grants. Also, loan projects in the field of infrastructure is safety investment since empirically it has directly generated money.

More than 60 percent of non-grant aid was given to Far East Asia. Loans are considered unsuitable for the poorest countries of the world as their ability to repay debt appears

[12] For further information, see World Bank (2007).
[13] A project loan is made for a specific project plan undertaken for the purpose of economic development. The most representative example would be support for simple cohesive unit of plan and equipment investment, for example, the building of infrastructure such as power plants, dams, ports, roads and filtration plants, or the construction of oil refineries, fertilizer factories and other types of plants (Nishigaki and Shimomura 1998).

doubtful. This may be the one of the reasons that non grant aid predominates in the aid to Far East Asia. In addition to that and geopolitical stakes, Söderberg (1996) asserts that projects of economic infrastructure in Far East Asia will give benefits to Japan in long run through increase trade and possibilities to locate production in the area where wages are lower and it is geographically convenient.

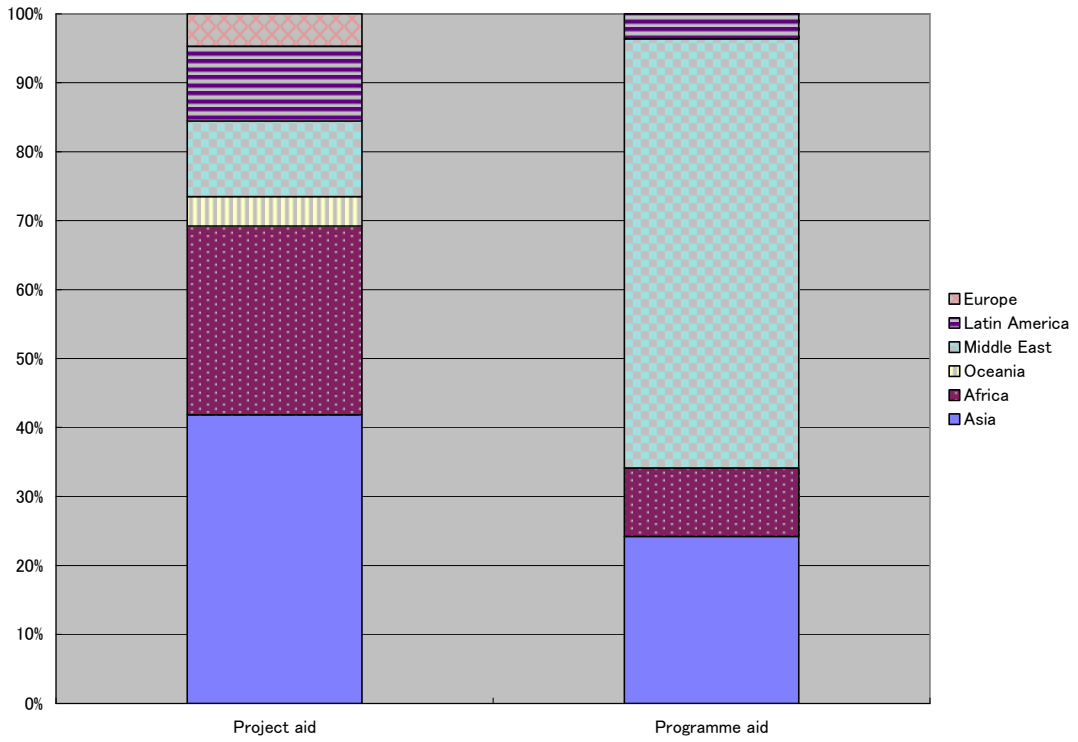
If we glance at the component of grant aid, the amount of project aid[14] dominates that of programme aid[15] in spite of that total DAC shows opposite pattern. Since the early 1980s, donors have realized that any positive impacts of aid are nullified if bad macro-economic policies are being pursued, or if institutions at the micro level are hostile to entrepreneurship, investment or growth of production and productivity. Hence, since then, aid has been increasingly linked with a "policy dialogue", aimed at improvement of macro-economic policy and institutional reform. Also the dialogue element in programme aid requires the active commitment and involvement of policy makers of recipient countries. In this context, there has been a shift from project aid to programme aid (Szirmai 2005). Although Japan diverges in their emphasis on programme aid, the Ministry of Foreign Affairs in Japan have set policies for programme aid such as in "ODA inspection and reform" which is proclaimed in 2006. Therefore, this pattern is likely changed in the future.

Some detail of Japanese project aid and programme aid is presented in figure 2-7. Asia's share in project aid is the largest among all regions while that in programme aid is not large, below 25 percent. Japanese preference on project aid to Asia which is discussed above for non-grant aid may be consequent the pattern. The Middle East's share in programme aid exceeds 60 percent. This is because Japan disbursed large amount for establishment for peace and prevention for conflict which is accounted as programme aid. In this connection, the countries in Middle East receive large amount of Emergency aid as well which is accounted as other grant aid in table 2-2, thereby, the Middle East's share in other grant is large in figure 2-5.

[14] Under the heading of project aid, support is provided for a consistent set of activities with a specified duration and a well-defined objective. Project aid makes available specific capital assets or packages of technical assistance. An important component of project aid consists of infrastructural works, such as roads, harbours, dams, irrigation projects, energy projects or telecommunications projects (Szirmai 2005).

[15] In the case of programme aid, financial support is provided to governments in the form of financial grants or concessional loans in support of economic policy programmes. Programme aid may be provided for the benefit of the entire economy or for specific sectors (Szirmai 2005).

**Figure 2-7: Regional distribution of Japanese project and programme ODA in 2004**




[Note] Source: the Ministry of Foreign Affairs in Japan (2007)
Due to unavailability of data, aggregated Asia data is reported here.

In this section, we have investigated how aid towards Far East Asia differs from others. The aid to the region is mainly project loan and project investment, and technical cooperation whereas Africa and other poor countries receive large portion of debt forgiveness and countries in the Middle East are given large portion of programme aid and emergency aid. The aid to Far East Asia can be considered as effective with aim of sustain growth, but at same time, they have possibility to give benefit to Japan. So far, aid to Africa does not seem to be distorted by selfish motives, however, only small amount of aid is given. But evident so far is not enough to justify it. In subsequent sections, we will investigate further by quantitative analysis whether commercial motives and political motives are really behind the allocation, if there are, in what magnitude. We will also explore regional distinctions, especially Far East Asia and the others. Then we will examine whether the findings in previous studies such as Alesina and Dollar (2000) are still upheld.

# 3. Preliminary data analysis and data definition

The sample for this study covers 168 aid recipients, 6 donors including Japan, spanning the period from 1990 to 2005. USA, UK, France, and Germany are chosen as a proxy of leading donors in DAC of the OECD. Norway is chosen as a proxy of a donor which earns a reputation for altruistic donors that put emphasis on democracy and human rights in their development assistance among the DAC donors in many previous studies.(e.g., Gates and Hoeffler 2004; Isopi and Mavrotas 2006)

The dependent variable in this study is per capita net ODA disbursements[16]. In some of other related studies, however, commitments[17] are opted as dependent variable on behalf of disbursements (e.g., Isopi and Mavrotas 2006; Berthelemy 2006a). Both options possess intrinsic advantages. Disbursements reflect the resource transfers actually taking place more accurately whereas commitments better reflect donors' decision because donors have total control of the commitments, compared to disbursements which depend in part on the recipients' willingness and administrative capacity to request committed resources. Despite the existence of controversy, Neumayer (2003) showed that estimations are unlikely to be affected much by the choice of either commitments or disbursements as the two are highly correlated. In order to neutralize the effect of inflation, all values for the variable are converted into US dollars at 2004 constant price. Some of the values are negative. This is due to the re-payments of loans.

Explanatory variables are chosen in terms of recipients' needs, policy performance, self-interest motives of donors, and other factors which can be stimulants to the dependent variable.

[16] Disbursements represent the actual international transfer of financial resources. They may be recorded at one of several stages: provision of goods and services, placing of funds at the disposal of the recipient in an earmarked fund or account, withdrawal of funds by the recipient from an earmarked fund or account, payment by the donor of invoices on behalf of the recipient, etc. The disbursement mechanism used tends to vary as a function of the type of financial (or technical) co-operation flow involved (OECD 2007).

[17] A Commitment is a firm obligation expressed in an agreement or equivalent contract and supported by the availability of public funds, undertaken by the government, an official agency of the reporting country or an international organisation, to furnish assistance of a specified amount under agreed financial terms and conditions and for specific purposes, for the benefit of a recipient country(OECD 2007).

Since income per capita may be the most straightforward indicator of needs, here, we use GDP per capita as a proxy of recipients' needs. With same reason of net ODA per capita, this variable is also converted into US dollars at 2004 constant price. If aid is allocated on the basis of recipient needs, in another words donors are poverty focused, poorer countries should receive more aid, and richer countries receive less. With this regards, the expected sign for coefficient of this variable is negative.

Recently, there is general consensus that aid works better in a good institutional policy environment. So-called good policy environment would be environment under maintained private property rights, highly open to foreign trade, low level of corruption, vigorous investment in education, and so forth. Under weak institutional policy environment the effective and efficient use of society's resources is inhibited, therefore, it is adverse to effective use of aid. Indeed, Collier and Dollar (2001) found that as polices and institutions are improved, the cost of poverty reduction is lowered, so that for a given amount of aid more people can be lifted out of poverty. This suggests donors take quality of institutional and policy environment of recipients into account in their aid allocation. An indicator which measure quality of recipients' governance should be introduced to this analysis. The quality of governance is difficult to measure and there are no unanimous indicators for that. Here, I opt for "the Freedom House index of civil liberty"[18] as an index of sound institution/policy of recipients. This index measures freedom according to two broad categories: political rights and civil liberties. Political rights enable people to participate freely in the political process, including the right to vote freely for distinct alternatives in legitimate elections, compete for public office, join political parties and organizations, and elect representatives who have a decisive impact on public policies and are accountable to the electorate. Civil liberties allow for the freedoms of expression and belief, associational and organizational rights, rule of law, and personal autonomy without interference from the state (Freedom House 2007). Each country is assigned a numerical rating, on a scale of 1 to7, for political rights and an analogous rating for civil liberties; a rating of 1 indicates the highest degree of freedom and 7 the least amount of freedom. I take the average of these two indicators for each recipient for each year. I refer to this indicator as "government" onwards. With the

[18] In principle, the World Bank's Country Policy and Institutional Assessment(CPIA) (see IDA 2003 and earlier versions) or Kaufmann index (see Kaufmann et al 2006) may be better indicator for assessment of governance because they contain more comprehensive aspects. Due to the unavailability of sufficient data, I opt freedom house index for this study.

premise that good governance attracts more aid and donors are policy focused, I expect this independent variable gives positive effect on amount of aid, namely negative sign.

It can be expected that absolute amount of aid increases with population of the recipient. Nevertheless, Isenman (1976) and Dowling and Hiemenz (1985) pointed out that less populous countries receive more per capita aid than more populous ones. Namely, the absolute amount of aid may increase with population whereas rate of return decreases with it. A wide range of reasons is offered in explanation of this bias from decreasing marginal benefits of aid allocation as population increases, to the limited capacity of large countries to absorb additional amounts of aid and potentially greater aid effectiveness in small countries. For this reason, expected sign for the coefficient of this variable is negative since my dependent variable is aid per capita, not overall aid to a recipient.

Table 3-1 presents the Spearman rank correlation[19] between the bilateral aid per capita and each of variables introduced so far. All variables for all periods show signs as what we expected above at statistically significant level. These results are, however, only indicative, since they do not take into account of the overall context in which the performances are observed.

**Table 3-1: Spearman rank correlation between bilateral aid per capita and variables of recipient countries**

| | 1990-1994 | 1995-1998 | 1999-2002 |
|---|---|---|---|
| GDP per capita | -0.165*** | -0.187*** | -0.222*** |
| Freedom house index | -0.243*** | -0.249*** | -0.202*** |
| population | -0.478*** | -0.504*** | -0.422*** |

[Note] ***, **, and * denote significance at 1, 5 and 10 percent level respectively under the test bilateral aid per capita and lagged export ratio are independent

Of all self-interest motives of donors, commercial motives and political and strategic motives can be considered as principal components. Let us take a look for commercial motives first. Aid can be exploited as an instrument of export promotion. Szirmai (2005)

[19] Spearman rank correlation is a measure of the strength of the associations between two variables. It can be used to give an R-estimate which is a robust estimation based on a rank test, and is a measure of monotone association that is used when the distribution of the data make Pearson's correlation coefficient undesirable or misleading (Wolfram 2007). Since Spearman rank correlation does not require interval scales and Freedom house index and population are discreet variables, it is plausible to adopt Spearman rank correlation.

asserts that aid can be used to support firms exporting to development countries, and to help new export markets. He further insists that sometimes the only motive is blatant self-interest, with firms in donor countries lobbying for aid functioning as a form of export credit in disguise. Sometimes there is a genuine conviction that the promotion of economic development in a developing country is compatible with an expansion of exports to this country. For this reason, I introduce, here, "export" which is expressed by a share of bilateral exports of a donor to recipients in the donor's total export as a proxy for commercial motive. Nevertheless, if aid is tied, a simultaneity bias might arise as more tied will lead to more imports from the respective donor. Canavire et al (2005) also suggested that this problem can be mitigated by taking values of the variable that is lagged one year. Thus, I take the indicator with one year behind as he did in his study. If commercial motives do not exist behind the determination of aid, the expected sign for the coefficient of this variable would not be significantly positive.

In addition to exports, imports from developing countries are also important for Japan. First, since Japan is resource poor country, Japan depends on foreign country to supply own energy resource consumption, and mineral resource consumption. Second, cheaper labours in developing countries are attractive for business in Japan such as manufacturing, automobile and so forth. As it was discussed above, Japan supports projects for economic infrastructures, especially in Far East Asia, through aid, and the consolidating infrastructure can consequently enable Japanese firms easier to engage in business there. Indeed, if we compare top ten importers from Japan and exporters to Japan by table 3-2, there are 4 developing countries in top ten importers from Japan while there are 5 developing countries in top ten exporters from Japan.

**Table 3-2: Top ten trade partners of Japan; exporters and importers (2005)**

| | Importers from Japan (Japan exports) | exporters to Japan (Japan imports) |
|---|---|---|
| 1 | United States | China |
| 2 | China | United States |
| 3 | Korea | Saudi Arabia |
| 4 | Chinese Taipei | United Arab Emirates |
| 5 | Hong Kong | Australia |
| 6 | Thailand | Korea |
| 7 | Germany | Indonesia |
| 8 | Singapore | Chinese Taipei |
| 9 | United Kingdom | Germany |
| 10 | Netherlands | Thailand |

[Note] Source: OECD (2007)

It suggests that imports from developing countries are also important commercial strategy for Japan. Thus, I introduce a share of bilateral imports of Japan from recipients in the Japan's total import as another proxy for commercial motive.

Another self-interest motive of donors, political and strategic motives, can be measured by political allegiance. Political allegiance can be influenced by historical tie and contemporaneous relationship. As we have discussed in above, Japan has emphasized relationship between Far East Asia from the initial stage of its annals of aid. To capture the additional impact on the area by other effects fixed, I use dummy variable which is set "one" for all recipients where are classified in Far East Asia by OECD (2007) sense. For other donors, colonial ties can explain historical tie between a donor and a certain recipient. Hence, I introduce colonial dummy variables for them. Since former colonial ties vary in donors, the variables which correspond with each of donors must be specified. With the reason that Norway has not colonized any recipient countries in the sample, this variable which corresponds with Norway is not introduced. Also even though Japan had colonized several countries before until of WWII, colonial dummy for Japan is not introduced since countries colonized by Japan are mostly in Far East Asia and it may incur multicollinearity. The variable is set equal to "one" for all recipients that were former colonies of corresponding donor countries. If self-interest motive is behind donors' determination of allocation of aid, coefficient of this variable would be significantly positive.

With regard to the study of Alesina and Dollar (2000) and others, I adopt UN voting pattern as a variable which explains contemporaneous political allegiance. UN voting pattern can be interpreted in two ways. Number one, some donors might want to use aid as a tool to buy UN votes in favour of their country. Number two, UN voting pattern correlates with alliance and similarity of economic and geopolitical interest. The study insisted the latter interpretation is plausible. Also the study concluded that Japanese aid allocation has positive relationship with this. Here, the affinity of nation index[20] which Gartzke and Jo (2002) created to measure the interest similarity among pairs of all UN members is used. The index ranges from -1 to 1 with higher values indicating more similar voting patterns and all pairs of a certain donor and a certain recipient are available. This variable will be called "UN friend"

[20] For further description of the indicator, see Gartzke and Jo(2002)

onwards. If donors' determinations of aid allocation are distorted by such self-interests, the coefficient of this variable would be significantly positive.

Some studies such as Alesina and Dollar (2000) and Gates and Hoeffler (2004) showed Egypt and Israel had been prone to receive more aid than other recipients due to political strategic reasons, especially from USA. Here, I take dummy variable for those recipients to control the effect.

Aid allocation may be affected by decision makers. In order to test this hypothesis, I further control a variable which explains effect of change decision maker. Whether government party is right wing or left wing can capture the decision makers' notion in broad sense. For this reason, I add a dummy variable for right wing as well. This variable is set "1" if government party is right wing at beginning of certain year.

# 4. Estimation Methodology

## 4.1 Choice of Method

The data include every country that has received aid from each donor in the period under the examination. It is unlikely to have all countries receive aid from every donor. Moreover, for some recipients, donors may not disburse definite aid for all years during the sample period as recipients may have grown enough to stop being recipient, or a deterioration of relationship, and so forth. Thus, the data likely contain zero bilateral aid flows and it renders the dependent variable partly continuous with positive probability mass at value zero. The ordinary least squares (OLS) model without treating the truncated nature of the dependent variable is inappropriate because OLS estimations depend on the assumption that the expected value of the dependent variable is linear in the independent variables, which is violated if the independent variable has positive probability mass at value zero. In my dataset, however, there are very few zeroes in the dependent variable, especially dataset for Japan, and therefore, results with and without treating the truncated nature likely differ only to a small extent.[21] Furthermore, my dataset is panel data and estimations from non-linear models estimated with fixed effects are typically inconsistent if the length of the panel is fixed due to an incidental parameter problem (Greene 2002). For those reasons, here, in line with Alesina and Dollar (2000), Dollar and Levin (2004), and Gates and Hoeffler (2004), I employ log-linear model. I substituted very small values, 0.0001[22], for recipients not receiving any aid from a donor before taking logarithm in order to avoid missing values as Alesiana and Dollar (2000) and Dollar and Levin (2004) did. For double checking, I have estimated with Tobit model, a non-linear model which can treat truncated nature. The comparison given in section 6 showed the differences are negligible for the analysis of Japanese aid allocation.

[21] Actual comparison between the results with and without treating the truncated nature is given in section 6.
[22] The minimum value of strictly positive aid per capita in my dataset is 0.0001933, therefore, I adopted the threshold for zero value, 0.0001, which is smaller than the minimum value.

## 4.2 Choice of Model

The aid budgets are likely to vary over time. Indeed, Lloyd et al (2001) found time plays a very important role in the allocation of aid; besides, the effects are likely to vary with donors. Hence, donor-yearly time effects ought to be taken into account in the estimation. Roughly speaking, there are at least two types of effects, fixed effects and random effects. A single approach cannot be applied to all estimations since their behaviours vary with each donor. In this context, this study will explore the most appropriate approach from either no-donor-yearly effects, donor-yearly-fixed effects, or donor-yearly-random effects for each regression. Following describes detail of each of those approaches.

I. No donor-yearly effects - OLS

Pooled OLS without controlling donor-yearly effects. This approach is adopted in Alesina and Dollar (2000), and Gates and Hoeffler (2004).

II. Fixed effects – OLS

There are several strategies for estimating fixed effects model. The least squares dummy model which takes dummy variables as each donor-yearly effects is widely used because it is relatively easy to estimate and interpret substantively. The model, however, becomes problematic when there are a number of groups in panel data. Our sample period spans from 1990 to 2002, and our set of donor-yearly groups is somewhat large. It may lead an excessive parameter problem, therefore, we use another strategy, "the within effect model". The within effect model does not use dummy variables, but uses deviations from group means. Let us consider following equation.

$$Y_{i,j,t} = \alpha + \beta X_{i,j,t} + \omega_{i,t} + \varepsilon_{i,j,t} \qquad (1)$$

where $i$ stands for the donor, $j$ for the recipient and $t$ for the year. $Y$ is the dependent variable, i.e. the amount of aid disbursement per capita, $X$ is the vector of the explanatory variables. $\alpha$ is intercept and $\beta$ is the vector of the parameters associated with the regressors. $\omega_{i,t}$ is donor-yearly effects and $\varepsilon_{i,j,t}$ is disturbance term.

The average of the function (1) within the group of donor-year is

$$\overline{Y}_{i,t} = \alpha + \beta \overline{X}_{i,t} + \omega_{i,t} + \overline{\varepsilon}_{i,t} \qquad (2)$$

where $\overline{Y}_{i,t}$ , $\overline{X}_{i,t}$ , and $\overline{\varepsilon}_{i,t}$ are averages of each variable within the group. This is known as "between-effects estimator". Within estimator can be obtained by subtracting each side of the between-effects equation, (2) from equation (1).

$$\begin{aligned} Y_{i,j,t} - \overline{Y}_{i,t} &= \alpha - \alpha + \beta X_{i,j,t} - \beta \overline{X}_{i,t} + \varepsilon_{i,j,t} - \overline{\varepsilon}_{i,t} + \omega_{i,t} - \omega_{i,t} \\ &= \beta\left(X_{i,j,t} - \overline{X}_{i,t}\right) + \varepsilon_{i,j,t} - \overline{\varepsilon}_{i,t} \qquad (3) \end{aligned}$$

The estimation of a grand average, average of total observations, is added to (3). Namely,

$$Y_{i,j,t} - \overline{Y}_{i,t} + \overline{\overline{Y}} = \beta\left(X_{i,j,t} - \overline{X}_{i,t} + \overline{\overline{X}}\right) + \varepsilon_{i,j,t} - \overline{\varepsilon}_{i,t} + \overline{\overline{\varepsilon}} + \overline{\omega}$$

where $\overline{\overline{Y}}$ , $\overline{\overline{X}}$ , $\overline{\overline{\varepsilon}}$, and $\overline{\omega}$ are grand average of each variable

Here, we assume $E\left(\varepsilon_{i,j,t}\right) = 0$ .

$$Y_{i,j,t} - \overline{Y}_{i,t} + \overline{\overline{Y}} = \beta\left(X_{i,j,t} - \overline{X}_{i,t} + \overline{\overline{X}}\right) + \eta_{i,j,t}$$

where $\eta_{i,j,t} = \varepsilon_{i,j,t} - \overline{\varepsilon}_{i,t} + \overline{\omega}$

In order to justify adopting this approach, F-test, which tests whether the null hypothesis that all the fixed effects are collectively equal to zero, should be performed. If the null hypothesis is rejected, we may conclude that the fixed effect model is better than the pooled OLS model.

III. Random effects - GLS

This approach treats donor-yearly effects as random variables. This approach, further, requires an assumption that donor-yearly effects are uncorrelated with explanatory variables.

$$Y_{i,j,t} = \alpha + \beta X_{i,j,t} + u_{i,j,t} + v_{i,t} \qquad (4)$$

where

$u_{i,j,t} \sim IID(0,\sigma_u^2)$ and $v_{i,t} \sim IID(0,\sigma_v^2)$

Then, error term for equation (3) can be expressed as one term.

$w_{i,j,t} = u_{i,j,t} + v_{j,t}$

From the assumption, $u_{i,j,t} \sim IID(0,\sigma_u^2)$ and $v_{i,t} \sim IID(0,\sigma_v^2)$, we can say

$$\begin{aligned} \operatorname{cov}(w_{i,j,t}, w_{i,l,t}) &= \sigma_u^2 + \sigma_v^2 && \text{for } j = l \\ &= \sigma_v^2 && \text{for } j \neq l \\ \operatorname{cov}(w_{i,j,t}, w_{k,l,s}) &= \sigma_u^2 + \sigma_v^2 && \text{for } \forall_{j,l} \text{ if } i \neq k \text{ or } t \neq s \end{aligned}$$

That implies errors $u_{i,j,t}$ and $v_{i,t}$ correlates within groups. Namely errors are heteroskedastic and estimates from OLS are likely to be biased. Kitamura (2002) suggests that the generalized least squared (GLS) can deal this problem and provide efficient estimates.

GLS is performed in following way.

First, we can obtain following variance-covariance matrix from above conditions,

$$\underset{T \times T}{\Omega} = \begin{bmatrix} \sigma_u^2 + \sigma_v^2 & \sigma_u^2 & \cdots & \sigma_u^2 \\ \sigma_u^2 & \sigma_u^2 + \sigma_v^2 & \cdots & \sigma_u^2 \\ \cdots & \cdots & \cdots & \cdots \\ \sigma_u^2 & \sigma_u^2 & \cdots & \sigma_u^2 + \sigma_v^2 \end{bmatrix}$$

where $T$ denotes the number of approaches.

If this matrix is known, you can derive $\theta = 1 - \sqrt{\frac{\sigma_v^2}{T\sigma_u^2 + \sigma_v^2}}$ and proceed with the procedure in next paragraph. Nevertheless, in most of cases, the matrix is unknown, therefore, we have to estimate $\theta$ by using $\hat{\sigma}_u^2$ and $\hat{\sigma}_v^2$ which are derived from the sum of squares due to error (SSE) of the within effect model[23] or the deviation of residuals from group means of residuals (through the between effect model[24]).

[23] See Park (2005) for detail of this method

[24] See Park (2005) for detail of this method

$$\hat{\theta} = 1 - \sqrt{\frac{\hat{\sigma}_v^2}{T\hat{\sigma}_u^2 + \hat{\sigma}_v^2}} = 1 - \sqrt{\frac{\hat{\sigma}_v^2}{T\hat{\sigma}_{between}^2}}$$

Next, transform variables by using $\hat{\theta}$.

$Y^*_{i,j,t} = Y_{i,j,t} - \hat{\theta}\overline{Y}_{i,j,t}$

$X^*_{i,j,t} = X_{i,j,t} - \hat{\theta}\overline{X}_{i,j,t}$ for all explanatory variables.

$\alpha^* = 1 - \hat{\theta}$

Then we can obtain following equation and run OLS.

$Y^*_{i,j,t} = \alpha^* + \beta^* X^*_{i,j,t} - \varepsilon^*_{i,j,t}$

The pooled OLS and fixed effects OLS are special version of this, when $\hat{\theta} = 0$ and $\hat{\theta} = 1$ respectively.

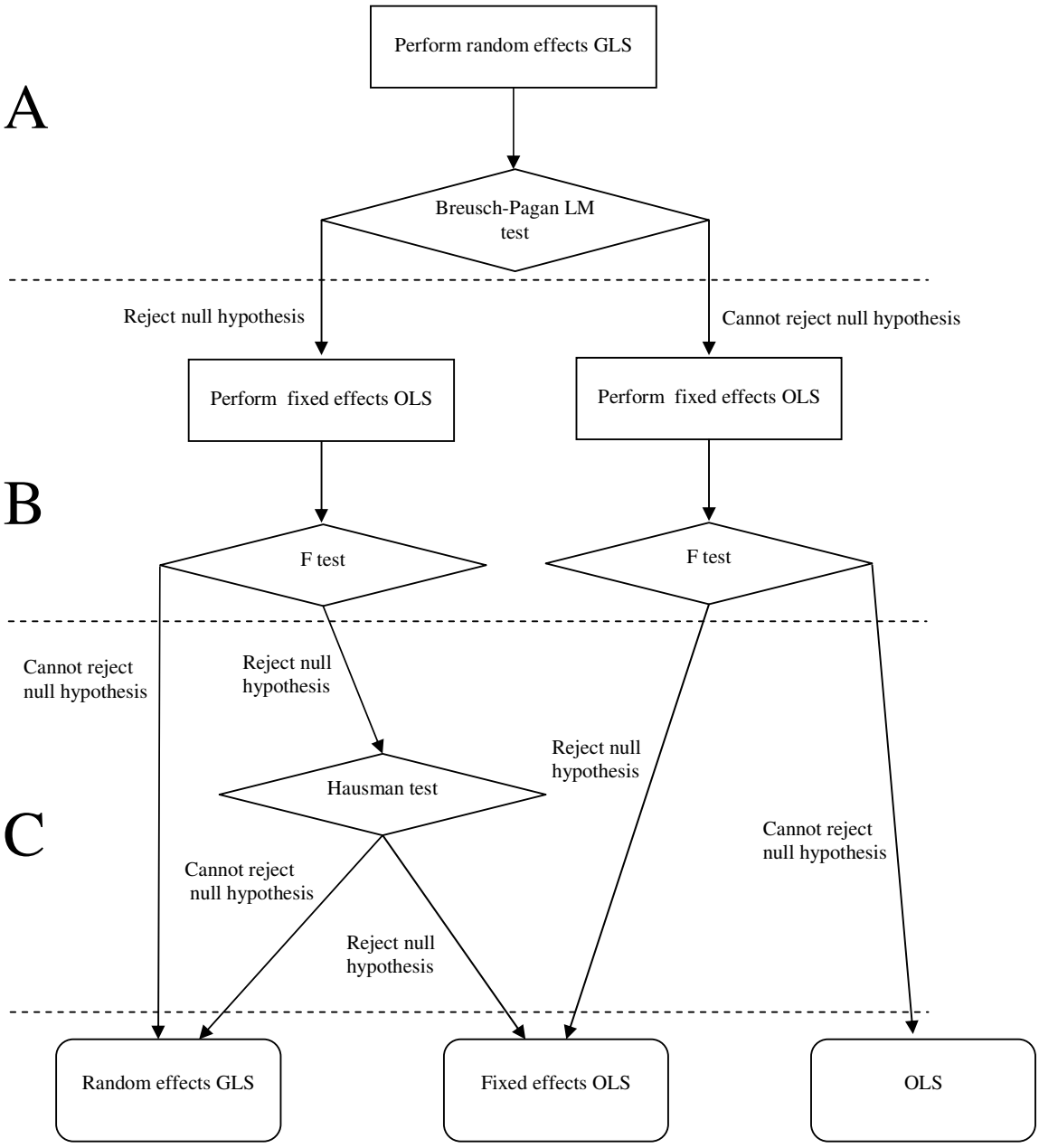
In order to test validity of the estimation, Breusch-Pagan Lagrange Multiplier (LM) test and Hausman test should be performed after the regression. The former tests whether random effect GLS is preferable to OLS. It tests the null hypothesis that the estimated variances of the residuals from a regression are not dependent on the values of the explanatory variables, namely, no heteroskedasticity in the model. If the null hypothesis, $Var(v_{j,t}) = 0$, is rejected, random effect GLS is preferable to pooled OLS model. The latter tests whether random effects estimation would be almost as good as fixed effect estimation. If the null hypothesis that random effects would be consistent and efficient is not rejected, random effect model is justified to be used. If random effect GLS model produced biased estimators, the null hypothesis would be rejected.

Since we have three measures for the estimation, we will adopt appropriate model for each regression based upon the procedure depicted in figure 4-1 for each regression. First, random effects GLS is performed, then Breusch-Pagan LM test is performed to test whether the random effects GLS is preferred to OLS. If null hypothesis for the test is rejected and random effects model is preferred, we go to left part in the phase “B” in that figure and we compare random effects model with fixed effects model. If not, we go right part of it and compare fixed effect model and OLS. In phase B, we perform fixed effects OLS, then apply F-test to test whether fixed effects model is preferred to OLS. If null hypothesis for the test is not rejected, we discard results from fixed effects OLS. That implies if we are in left side in

phase B, results from random effects GLS is concluded to be the most preferable estimation and if we are in right side, OLS is performed and the results is regarded as the most appropriate. In the case of that its null hypothesis is rejected and results from fixed effects OLS is preferred to OLS, if we are in the left side in phase “B”, Hausman test is performed to compare random effects GLS and fixed effects OLS and judge which results to adopt. If the test cannot reject null hypothesis, we adopt the results from random effects GLS and if it can, we adopt the results from fixed effects OLS. If we are in the right side in phase “B”, fixed effects OLS is performed and the results is regarded as the most appropriate.

All calculations are executed using STATA version 9.0.

**Figure 4-1** : **Flow chart for opting model**



# 5. Results

## 5.1 Aggregated data

We begin with regressions explaining aggregate bilateral aid flows for different periods. The data contains aid flows from all our sample donors, USA, Japan, France, UK, Germany, and Norway.

**Table 5-1: Estimation results of aggregated data**

| | 1990-2002 | 1990-1996 | 1997-2002 |
|---|---|---|---|
| LN(GDP per capita) | -1.174 | -1.255 | -1.083 |
| | (-36.94)*** | (-28.15)*** | (-23.94)*** |
| LN(population) | -0.273 | -0.324 | -0.204 |
| | (-11.43)*** | (-9.81)*** | (-5.93)*** |
| LN(lagged exports) | 0.420 | 0.442 | 0.392 |
| | (21.19)*** | (16.06)*** | (13.73)*** |
| Government | -0.257 | -0.290 | -0.223 |
| | (-14.5)*** | (-11.43)*** | (-9.03)*** |
| UN Friend toward | 1.670 | 1.130 | 2.229 |
| Donors | (12.22)*** | (5.57)*** | (12.18)*** |
| Colonial dummy | 1.383 | 1.630 | 1.116 |
| | (13.97)*** | (11.45)*** | (8.19)*** |
| Intercept | 12.963 | 14.807 | 10.723 |
| | (21.07)*** | (17.45)*** | (12.02)*** |
| Observations | 11584 | 6097 | 5487 |
| R-squared | 0.156 | 0.162 | 0.155 |
| Breusch-Pagan LM test, P-value | 0.000 *** | 0.000 *** | 0.000 *** |
| F-test for collective fixed effect, P-value | 0.000 *** | 0.000 *** | 0.000 *** |
| Hausman test, P-value | 0.000 *** | 0.000 *** | 0.019 ** |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: Fixed effects OLS
Fixed effects depends on both the year of observation and the donor
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effect, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively

The first column of table 5-1 reports the result of whole sample period, from 1990 to 2002. This time period allows us to analyze characteristics of the donors during this period when the end of cold war induced donors to change behaviours (Berthelemy and Tichit 2002). From this period, donors started being selective on political governance of recipients (Dollar and Levin 2004) because only in good policy environments will aid be growth enhancing. Table 1 also provided estimates for two separate periods, from 1990 to 1996 and from 1997 to 2002 respectively, to test structural breaks over time in the parameters of the model. The procedure specified in figure 4-1 was adopted throughout. This is illustrated in table 5-1 for example on follows: looking at the first column, results of Breusch-Pagan LM test indicates the result of random effects GLS is preferred to OLS. Then, fixed effects OLS was performed and the results of F-test for collective fixed effects imply that the result is preferred to OLS. Since we are in the left side in phase "B" in figure 4-1, Hausman test was performed to test which model to adopt and the result implies result from fixed effects OLS ought to be adopted.

First, let us see the result from whole sample period. All estimated coefficients are statistically significant. Most of estimated signs of coefficients are in line with what we have expected above. Negative sign for the coefficient of income, natural logarithm of GDP per capita, implies that donors are poverty focused. The relationship between natural logarithm of recipients' population and aid flow indicates that small countries receives higher amount of aid per capita. The positive sign for the coefficient of natural logarithm of lagged export share, proxy of donors' commercial motives, suggests commercial motive is behind aid allocation at certain extent. To capture whether the behaviour of the donor is driven by well governed recipients, the variable "government", measure of political rights and civil liberties, is introduced in the regression. The negative sign for the coefficient supports prevalence of policy selective behaviour among donors. Since the pattern of UN votes strongly correlates with alliances and similarity of economic and geopolitical interest (Alesina and Dollar 2000), UN vote pattern, named as "UN friend" in the regression, was introduced to capture political motives on the aid flow. My result, its positive sign, shows its positive relationship with aid flows. Colonial dummy variable is introduced to capture influence of historical tie on their aid decision and its positive sign implies donors prefer recipients with historical ties to those without them.

If we compare the results for the period 1990-1996 and the period 1997-2002, all the regressors maintain the same sign and significance. However, we can see notable transformations of magnitude for some regressors over the periods. Smaller coefficients for GDP per capita and government in the latter period confirm that donors have been less poverty focused and less policy focused. Namely humanitarian aid giving behaviour has been weakened over time in collective donors' behaviour. Nevertheless, some of the selfish motives have also been weakened over time. Commercial motive and historical tie have become less important. However, the motive from geopolitical interests has been increased over time.

## 5.2 All Sample donors for period 1990-2002

In order to fully capture the differences in the aid allocation process among individual sample donors, I ran separate regressions for each donor. The result of estimation for all sample donors for period from 1990 to 2002 is reported in table 5-2 to compare Japanese aid allocative behaviour with other major donors and Norway as a proxy of reputed as humanitarian donor.

First, let us look at altruistic terms. The per capita GDP has, as expected, a significantly negative impact on aid allocation among all sample donors. All sample donors are poverty selective. But Japan is relatively less poverty focused than the other donors. Japan is the third least after Germany and France. That of USA, UK, and Norway is far above. All sample donors are policy selective. Japan is relatively policy focused in line with previous studies. USA, UK and Japan are the most policy selective whereas France, Germany, and Norway are far below than them. The regressor for Norway is not even relevant.

The results indicate selfish motives are behind all donors' aid allocation. Japanese aid allocation is distorted by commercial motives but neither political motives nor historical ties. Both export and import significantly influence Japanese aid allocation. The magnitude, however, is not very large. That is larger in France, UK, and USA. It contrasts with the finding of Canavire et al (2005). As we have expected, if Japan imports more, the recipient receives more aid. If we see the political motives, contrary to our expectation and other empirical studies such as Alesina and Dollar (2000), Gates and Hoeffler (2004), and so forth,

**Table 5-2: Estimation results for all sample donors, 1990-2002**

| | Japan (random) | USA (random) | France (OLS) | UK (OLS) | Germany (fixed) | Norway (fixed) |
|---|---|---|---|---|---|---|
| LN(GDP per capita) | -0.972<br>(-16.2)*** | -1.722<br>(-17.34)*** | -0.953<br>(-15.37)*** | -1.415<br>(-15.39)*** | -0.779<br>(-11.7)*** | -1.375<br>(-18.43)*** |
| LN(population) | -0.811<br>(-18.93)*** | -0.085<br>(-1.20) | -0.825<br>(-16.5)*** | -0.246<br>(-3.66)*** | -0.081<br>(-1.44) | 0.322<br>(6.02)*** |
| LN(lagged exports) | 0.309<br>(7.88)*** | 0.371<br>(6.42)*** | 0.910<br>(21.86)*** | 0.622<br>(9.33)*** | 0.278<br>(6.05)*** | 0.114<br>(2.73)*** |
| LN(imports) | 0.187<br>(6.66)*** | – | – | – | – | – |
| Government | -0.419<br>(-12.61)*** | -0.544<br>(-9.18)*** | -0.076<br>(-2.26)** | -0.538<br>(-12.39)*** | -0.112<br>(-3.62)*** | -0.068<br>(-1.52) |
| UN Friend | -0.178<br>(-0.52) | 1.704<br>(5.79)*** | 0.520<br>(1.75)* | 1.760<br>(4.85)*** | 1.442<br>(4.59)*** | 2.547<br>(5.42)*** |
| Far East Asia Dummy | 0.191<br>(0.83) | – | – | – | – | – |
| Own colonial Dummy | - | 1.508<br>(4.23)*** | 1.771<br>(11.17)*** | 1.443<br>(8.59)*** | 0.363<br>(2.11)** | – |
| Egypt | 1.955<br>(2.91)*** | 3.950<br>(3.57)*** | 1.550<br>(2.29)** | -1.017<br>(-1.13) | 0.726<br>(1.17) | -1.232<br>(-1.39) |
| Israel | -2.521<br>(-3.65)*** | 7.203<br>(6.30)*** | 0.435<br>(0.63) | -5.023<br>(-5.56)*** | 3.402<br>(3.05)*** | -0.126<br>(-0.14) |
| Right Wing Dummy | 0.044<br>(0.36) | -0.049<br>(-0.18) | 0.066<br>(0.59) | 0.650<br>(4.31)*** | – | – |
| Intercept | 23.598<br>(21.36)*** | 15.757<br>(8.87)*** | 22.082<br>(17.07)*** | 14.555<br>(7.91)*** | 7.192<br>(4.83)*** | 0.096<br>(0.07) |
| Observations | 1927 | 1828 | 1944 | 1960 | 1900 | 1925 |
| R-squared | 0.267 | 0.246 | 0.350 | 0.216 | 0.159 | 0.305 |
| Breusch-Pagan LM test, P-value | 0.072 * | 0.000 *** | 0.336 | 0.449 | 0.027 ** | 0.000 *** |
| F-test for collective fixed effects, P-value | 0.033 ** | 0.000 *** | 0.764 | 0.648 | 0.008 *** | 0.000 *** |
| Hausman test, P-value | 0.650 | 0.158 | - | - | 0.000 *** | 0.000 *** |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects GLS, "fixed" represents fixed effects OLS, and "OLS" represents OLS)
Both random effects and fixed effects depend on the year of observation
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effects, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively
"Right Wing Dummy" is dropped in the regression of Germany and Norway in order to avoid the estimation from being inconsistent because the variable can be interpreted as yearly effects in certain years

Japanese aid allocation is not driven by either geopolitical motives or historical ties. The pattern of UN votes does not give positive impact on Japanese aid allocation and it even gives negative impact. Nevertheless, the impact is not statistically significant. If we compare with other sample donors, the pattern of UN votes has positive impact on all other sample donors at statistically significant level. Surprisingly, that of Norway is prominently high. UK and USA follow after Norway. The coefficient for Far East Asia dummy variable is positive, but the effect is not statistically significant contrary to our expectation. On the other hand, aid allocation of other donors, USA, France, UK, and Germany, are distorted by historical ties at statistically significant level.

The pattern of additional reward to Egypt and Israel varies with sample donors. Japan gives additional aid to Egypt while the impact on Israel is negative at statistically significant level. The impact on Egypt is quite large, the second largest after USA. As we have expected, USA gives positive reward to both Egypt and Israel. Each impact is the highest among all sample donors. France rewards Egypt while not Israel. On the other hand, Germany rewards in opposite pattern, rewards to Israel but not to Egypt. Both UK and Norway do not give additional aid to those countries.

Whether that donor is governed by right wing party explains the aid allocation is not significant factor in most of sample donors including Japan. It can explain only in the regression of UK. If UK is governed by right wing political party, recipients receive more aid with all other factors fixed. The coefficients for the variable are not reported in the regression of Germany and Norway because they are estimated by fixed effect model with yearly fixed effects. Since it can be interpreted the variable as yearly fixed effects in certain years, they were dropped in order to avoid from the estimation biased.

Summing up, Japanese aid allocation is explained by both altruistic and selfish motives. Japan is poverty selective and policy selective, but poverty selectivity is relatively weak. Japanese aid allocation is driven by commercial motives but not by political motives. Notwithstanding, if there are trend breaks within the period, findings here are not consistent. For this reason, I will have analysis with separation in the period; one is from 1990 to 1996 and the other one is from 1997 to 2002.

## 5.3 All sample donors for period 1990-1996 and 1997-2002

As we have done in 5.1, here, we investigate structural transformation of factors affecting aid allocation over time for individual donors. I separated the sample period into two periods, 1990 to 1996 and 1997 and 2002 in line with section 5.1. Year 1997 is the turning point for Japanese aid allocation because of the East Asian financial crisis. Financial crisis in the region where is important for Japan both in terms of economic and politics was influential incident for Japanese aid allocation. Indeed, the MOFA proclaimed to utilize aid for the recovery from the crisis and as we can see from figure 2-3, there is an abrupt rise of share in Far East Asia since 1997. The estimation results are reported in table 5-3.

All donors have been less poverty focused over time as we have seen in the result of aggregate data. In spite of the decline, all donors are still poverty focused. The decrease in US, UK, Germany, and Norway is quite small while that in Japan and France is considerable. On the other hand, Japan became more policy focused. The transition of policy selectivity varies with donors. USA became more policy selective whereas UK became less and the impact of policy selectivity of other donors, France, Germany, and Norway, is not statistically significant in the latter period.

The transition of commercial motives also varies with donors. The bias from commercial motives on their aid allocation becomes weaker in Japan and France while it was enhanced in USA, UK, and Germany. That in Norway is not significant factor anymore in the latter period, i.e. commercial motives cannot explain Norwegian aid allocation in the latter period. However, its extent in France is still the highest among all sample donors. Despite the decline, Japanese aid allocation is still distorted by commercial motives at statistically significant level.

If we see the factors of political motives, it is enhanced over time in Japanese aid allocation. The negative impact of UN vote pattern on Japanese aid allocation becomes a significantly positive impact in the latter period. Furthermore, Far East Asia dummy had abrupt rise from negative impact to positive impact. Among all sample donors, Japan and USA are the only donors which both geopolitical ties and historical ties are enhanced over time. The impact of UN vote pattern in UK had a considerable increase whereas the impact of historical ties was

**Table 5-3: Estimation results for all sample donors, 1990-1996 and 1997-2002**

**(a) Japan, USA, and France**

| | Japan | | USA | | France | |
|---|---|---|---|---|---|---|
| | 1990-1996 (OLS) | 1997-2002 (OLS) | 1990-1996 (OLS) | 1997-2002 (fixed) | 1990-1996 (OLS) | 1997-2002 (OLS) |
| LN(GDP per capita) | -1.153 (-13.87)*** | -0.813 (-9.56)*** | -1.759 (-11.9)*** | -1.743 (-14.22)*** | -1.174 (-13.28)*** | -0.681 (-7.96)*** |
| LN(population) | -0.910 (-15.19)*** | -0.720 (-11.88)*** | 0.000 (0.00) | -0.260 (-2.93)*** | -0.912 (-13.04)*** | -0.699 (-9.90)*** |
| LN(lagged exports) | 0.417 (7.65)*** | 0.209 (3.75)*** | 0.392 (4.75)*** | 0.410 (5.40)*** | 1.016 (17.08)*** | 0.772 (13.45)*** |
| LN(imports) | 0.258 (6.46)*** | 0.126 (3.29)*** | – | – | – | |
| Government | -0.393 (-8.50)*** | -0.436 (-9.35)*** | -0.418 (-4.63)*** | -0.656 (-9.28)*** | -0.104 (-2.15)** | -0.056 (-1.23) |
| UN Friend | -1.827 (-3.75)*** | 1.353 (2.91)*** | 1.681 (3.89)*** | 1.956 (5.67)*** | 0.478 (1.15) | 0.421 (1.00) |
| Far East Asia Dummy | -0.283 (-0.88) | 0.629 (1.96)* | – | – | – | – |
| Own colonial Dummy | – | – | 0.703 (1.29) | 2.125 (5.03)*** | 1.781 (7.85)*** | 1.763 (8.09)*** |
| Egypt | 2.287 (2.45)** | 1.571 (1.68)* | 3.860 (2.30)** | 4.044 (3.06)*** | 1.322 (1.36) | 1.762 (1.90)* |
| Israel | -2.027 (-2.13)** | -2.861 (-2.94)*** | 8.153 (4.73)*** | 5.871 (4.29)*** | 1.417 (1.44) | -0.763 (-0.81) |
| Intercept | 28.358 (18.65)*** | 19.269 (12.28)*** | 13.904 (5.42)*** | 19.612 (8.72)*** | 25.544 (14.02)*** | 17.698 (9.69)*** |
| Observations | 1019 | 908 | 978 | 850 | 1032 | 910 |
| R-squared | 0.290 | 0.280 | 0.204 | 0.340 | 0.382 | 0.311 |
| Breusch-Pagan LM test, P-value | 0.513 | 0.213 | 0.157 | 0.000 *** | 0.356 | 0.577 |
| F-test for collective fixed effects, P-value | 0.162 | 0.886 | 0.950 | 0.000 *** | 0.708 | 0.543 |
| Hausman test, P-value | - | - | - | 0.000 *** | - | - |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("fixed" represents fixed effects OLS, and "OLS" represents OLS)
Fixed effects depend on the year of observation
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effects, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively

**(b) UK, Germany, and Norway**

| | UK | | Germany | | Norway | |
|---|---|---|---|---|---|---|
| | 1990-1996 (OLS) | 1997-2002 (OLS) | 1990-1996 (fixed) | 1997-2002 (OLS) | 1990-1996 (OLS) | 1997-2002 (OLS) |
| LN(GDP per capita) | -1.416 (-12.04)*** | -1.358 (-9.86)*** | -0.831 (-9.01)*** | -0.729 (-7.75)*** | -1.413 (-13.51)*** | -1.284 (-11.97)*** |
| LN(population) | -0.355 (-4.17)*** | -0.058 (-0.57) | -0.212 (-2.71)*** | 0.063 (0.80) | 0.306 (4.13)*** | 0.380 (4.91)*** |
| LN(lagged exports) | 0.488 (5.62)*** | 0.683 (6.92)*** | 0.261 (3.99)*** | 0.298 (4.72)*** | 0.141 (2.47)** | 0.057 (0.92) |
| LN(lagged imports) | – | – | – | – | – | – |
| Government | -0.677 (-12.12)*** | -0.360 (-5.58)*** | -0.145 (-3.35)*** | -0.070 (-1.62) | -0.134 (-2.11)** | -0.022 (-0.35) |
| UN Friend | 1.030 (2.30)** | 3.319 (5.75)*** | 1.531 (3.46)*** | 1.750 (4.02)*** | 2.484 (3.35)*** | 2.215 (3.77)*** |
| Far East Asia Dummy | – | – | – | – | – | – |
| Own colonial Dummy | 1.859 (8.44)*** | 1.098 (4.48)*** | 0.572 (2.32)** | 0.169 (0.73) | – | – |
| Egypt | -0.623 (-0.55) | -1.462 (-1.08) | 1.293 (1.50) | 0.080 (0.09) | -0.922 (-0.73) | -1.612 (-1.29) |
| Israel | -4.442 (-3.87)*** | -5.255 (-3.86)*** | 3.569 (3.12)*** | – | 1.272 (0.98) | -2.037 (-1.59) |
| Intercept | 17.259 (7.49)*** | 9.947 (3.58)*** | 9.719 (4.70)*** | 4.143 (1.96)** | 0.663 (0.33) | -1.259 (-0.62) |
| Observations | 1013 | 947 | 1006 | 894 | 998 | 927 |
| R-squared | 0.560 | 0.215 | 0.135 | 0.234 | 0.280 | 0.322 |
| Breusch-Pagan LM test, P-value | 0.427 | 0.124 | 0.028 ** | 0.239 | 0.807 | 0.539 |
| F-test for collective fixed effects, P-value | 0.672 | 0.984 | 0.008*** | 0.858 | 0.250 | 0.139 |
| Hausman test, P-value | - | - | 0.096 * | - | - | - |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("fixed" represents fixed effects OLS, and "OLS" represents OLS)
Fixed effects depend on the year of observation
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effects, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively
"Israel" is dropped in the regression of Germany for the period 1997-2002 because there were no positive aid giving to the country in the period

weakened. Germany made similar pattern but the increase in UN vote pattern is not considerably large. Both impacts in France are almost stable and UN vote pattern in Norway was slightly declined.

Japan has given less reward toward Egypt with other factors fixed over time and the negative reward toward Israel with other factors fixed also has been swelled over time. The reward toward Israel from USA has also declined whereas the reward toward Egypt has been enhanced over time. The reward from UK to Israel has been declined, too. The reward toward Egypt from France became positively significant in the latter period. Germany rewarded Israel in the former period, however, the variable is dropped in the latter period because Germany does not give positive aid due to the repayments of loan. All that means Israel cannot be considered as an aid recipient for most of donors in the latter period.

During this sample period, Japan has less valued recipients' income whereas stressed policy selectivity. For selfish terms, Japanese commercial motive has been weakened whereas political motives seem to be strengthened. For regional distribution, the reward toward recipients in Far East Asia is strengthened as we have expected while that toward Egypt was weakened.

## 5.4 Comparison of Japanese aid allocation with Far East Asia and the others

As we have seen above, Far East Asia is the destination with special interest for Japan. Indeed, Japanese government recognizes that the there are manifold stakes such as economic and security ties with the region. Sub-section 5.3 revealed Japanese aid rewards the region more over time. This sub-section investigates whether the patterns we have seen can be upheld if we distinguish the region and analyze in same way. The results are reported in table 5-4.

First, let us take a look on results for overall period. Altruistic terms influence aid allocation positively in both regions, but the patterns are different over the regions. Japan is more poverty focused in Far East Asia, but is less policy focused in the area. Selfish terms also show different pattern over regions. If we see the coefficient of lagged export, it is

**Table 5-4: Comparison between Far East Asia and other regions**

| | Far East Asia | | | Other regions | | |
|---|---|---|---|---|---|---|
| | 1990-2002 (random) | 1990-1996 (random) | 1997-2002 (random) | 1990-2002 (random) | 1990-1996 (OLS) | 1997-2002 (OLS) |
| LN(GDP per capita) | -1.009<br>(-1.52) | -2.655<br>(-2.87)*** | 0.338<br>(0.33) | -0.981<br>(-16.67)*** | -1.149<br>(-14.02)*** | -0.836<br>(-10.18)*** |
| LN(population) | -0.205<br>(-0.43) | -1.368<br>(-2.09)** | 0.820<br>(1.09) | -0.823<br>(-19.56)*** | -0.900<br>(-15.22)*** | -0.753<br>(-12.84)*** |
| LN(lagged exports) | 1.036<br>(2.58)*** | 1.728<br>(2.92)*** | 0.311<br>(0.53) | 0.278<br>(7.11)*** | 0.387<br>(7.10)*** | 0.183<br>(3.33)*** |
| LN(imports) | -0.629<br>(-2.34)** | -0.177<br>(-0.38) | -0.854<br>(-2.43)** | 0.192<br>(6.96)*** | 0.257<br>(6.54)*** | 0.136<br>(3.68)*** |
| Government | -0.874<br>(-5.44)*** | -0.843<br>(-3.73)*** | -0.872<br>(-3.74)*** | -0.369<br>(-11.05)*** | -0.340<br>(-7.33)*** | -0.385<br>(-8.32)*** |
| UN Friend | 4.287<br>(2.57)*** | 4.536<br>(2.10)** | 6.475<br>(2.32)** | -0.256<br>(-0.76) | -2.180<br>(-4.46)*** | 1.450<br>(3.24)*** |
| Right Wing Dummy | -0.035<br>(-0.07) | – | – | 0.061<br>(0.52) | – | – |
| Intercept | 12.299<br>(0.93) | 44.430<br>(2.51)** | -17.623<br>(-0.84) | 23.573<br>(21.81)*** | 28.149<br>(18.83)*** | 19.587<br>(12.93)*** |
| Observations | 146 | 78 | 68 | 1781 | 941 | 840 |
| R-squared | 0.327 | 0.395 | 0.327 | 0.273 | 0.301 | 0.294 |
| Breusch-Pagan LM test, P-value | 0.010 ** | 0.062 * | 0.097 * | 0.027 ** | 0.462 | 0.327 |
| F-test for collective fixed effects, P-value | 1.000 | 0.999 | 0.995 | 0.018 ** | 0.150 | 0.754 |
| Hausman test, P-value | - | - | - | 0.376 | - | - |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects GLS, "fixed" represents fixed effects OLS, and "OLS" represents OLS)
Both random effects and fixed effects depend on the year of observation
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effects, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively

statistically significant in both regions and it is much larger in Far East Asia, almost three times higher. The magnitude is even higher than for France for whose the coefficient is the largest among all sample donors in same period. But imports do not explain in regression of Far East Asia whereas it explains in regression of other regions. That implies that aid may be exploited to have sustainable energy supply. The UN vote pattern does not explain in other

regions while it is relevant in Far East Asia. Whether government party is right wing or not is not significant factor in both regions.

If we see the transition over time, we can find drastic changes in Far East Asia. The impact on poverty selectivity is considerably large, and the extent is much larger than any other donors that we have seen above in the earlier periods, while it is not statistically significant anymore in latter period. The magnitude of policy selectivity is almost constant over time. Commercial motives have been weakened over time. Export used to be a positive factor at statistically significant level in the earlier period while it is not statistically significant anymore in the latter period. Import has not given positive impact in both periods. On the other hand, the pattern of UN vote has been enhanced over time. The impact is dramatically large comparing to other donors.

The pattern toward the other regions does not exhibit drastic change. Japan has been less poverty selective over time. Policy selectivity has been almost constant over time. Commercial motives have been weakened. The coefficient for both lagged export and lagged import are decreased in latter period. Besides, as we can see from the coefficient of UN Friend, distortion from political motives has been also weakened.

As we have expected, the pattern of Japanese aid allocation differs with regions. According to the result, Japanese aid allocation to Far East Asia is more altruistic than that to the other regions. On the other hand, that to Far East Asia is driven by more selfish motives. Besides, geopolitical motive is enhanced over time in Far East Asia while commercial motive has been weakened over time. Most of selfish motives in the other regions are not as strong as that in Far East Asia.

# 6. Robustness Checks

In this section we examine the robustness of results of our examination above. First, we will investigate the possibility of other factors which may influence Japanese aid allocation. One special factor is Japanese relationship with USA. It may diverge from original intension of Japanese aid policies. The first subsection explores the possibility. In the next subsection, we will confirm whether our results are consistent because we estimated without treating non-linearity. We will compare results above with results from an alternative method Tobit model for double checking.

## 6.1 Influence of US pressure on Japanese aid decision

### 6.1.1 Propounding the problem

If we consider Japanese foreign policies, the leverage of USA's foreign policies over Japanese policies must be taken into account. Orr (1990) and Miyashita (1999) argued that Japan is highly sensitive to USA reaction to its foreign aid policy, and it often changes the course of action under explicit or tacit pressure from USA, since Japan has strong desire to avoid a major disruption in bilateral relationship with USA. If such pressure from USA alters the Japanese foreign aid policy, it has to be controlled in our estimations.

Miyashita argued that Japan's responsiveness to USA pressures stems in large part from the asymmetry of interdependence[25] between two countries. Japan is more dependent on the USA than vice versa because of two crucial commodities: export market and security.

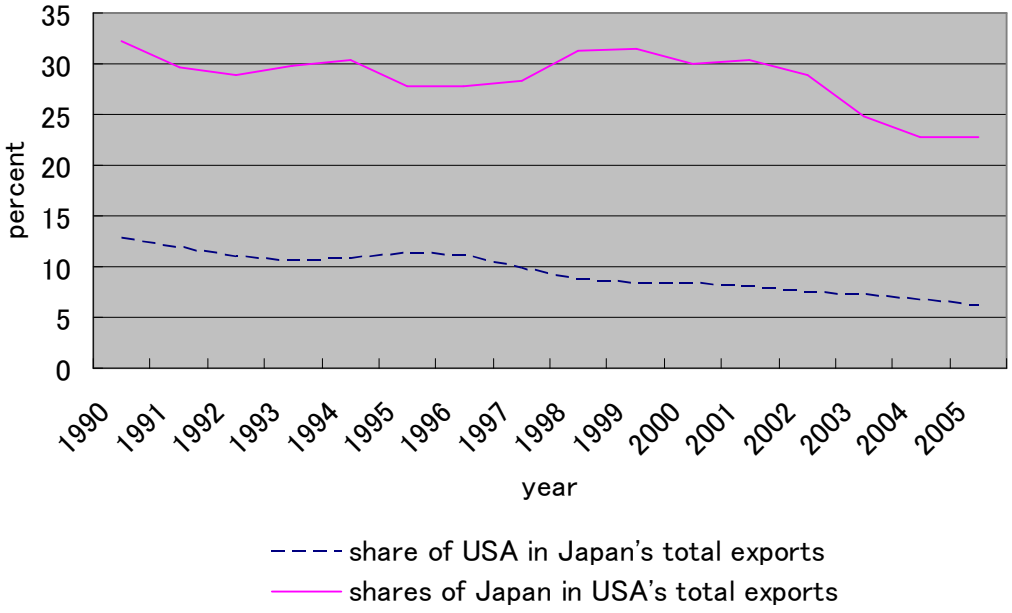
As shown in figure 6-1, Japan has been more dependent on USA than USA on Japan for export market. For all years in the period, the share of USA in Japan's total exports has accounted for more than twice of the share of Japan in USA's total exports. The significance of Japan's dependence on the USA market can be shown in another comparative context. Countries that pursue more independent policy of USA pressure, for instance France and Germany, account for lesser degree of dependence on the USA market. In 2005, USA

[25] The term "dependence" is used in this study to refer to reliance of a country on another for goods and services and will be distinguished from "dependency".

accounted for share of France's and Germany's total exports 7.17% and 8.88% respectively. Furthermore, industries highly depend on foreign sales such as manufacture high technology and capital intensive products are important part of Japanese economy and employ 20 percent of Japanese labour force (Miyashita 2003). There are no other foreign market which are capable of absorbing Japan's high technology and capital intensive products as much as USA. Those facts imply that the cost of terminating the bilateral trade is higher for Japan than for USA.

Under the USA–Japan security treaty, USA is obliged to defend Japan when the latter is under attack, while Japan has no reciprocal obligation. In addition to providing military protection against potential external threat, the bilateral security treaty allowed postwar Japan to stay lightly armed while putting efforts and resources into economic recovery from the devastation of World War II. Disruption of the treaty is tremendously costly for Japan because there is no alternative to USA as the provider of security to Japan and own remilitarization is foreseeable to have strong domestic and international opposition.

**Figure 6-1: Flow chart for opting model**




[Note]Source: OECD (2007)

Hence, given the fact that Japan depends on USA more than USA depends on Japan for trade and security, and availability for substitute providers is much more limited for Japan than for the USA, the USA has substantial bargaining leverage over Japan. Miyashita (2003), indeed, found out several cases where Japanese foreign aid policies were altered due to the pressure from USA. Type 2 and type 5 in table 6-1 are indicative.

**Table 6-1: Types of Japanese interests and USA pressure**

| Japanese interests | USA pressure: To start/increase aid | USA pressure: To suspend aid |
|---|---|---|
| Strong interests in giving aid | Type 1<br>"Confluence of interests"<br><br>South Korea (1983)<br>Thailand (1978-80)<br>Philippines (1988)<br>Egypt (1977-82) | Type 2<br>"Conflict of interests"<br><br>China (1989)<br>Iran (1994-99)<br>Vietnam (1990-92) |
| No/weak interests in either giving or not giving aid | Type 3<br>"Neither confluent nor conflictive"<br><br>Pakistan (1982)<br>Jamaica (1981/83)<br>Carribean Basin (1982)<br>Sudan (1982) | Type 4<br>"Neither confluent nor conflictive"<br><br>Haiti (1991)<br>Nigeria (1994)<br>Sudan (1992)<br>Kenya (1991) |
| Strong interests in not giving aid | Type 5<br>"Conflict of interests"<br><br>Russia (1991-93)<br>North Korea (after 1994) | Type 6<br>"Confluence of interests"<br><br>Russia (before 1991)<br>North Korea (before1994) |

[Note]Source: Miyashita (2003)

The finding implies that the variables employed in the estimation above do not explain all factors which influence Japanese aid allocation. Notwithstanding, plausible variable for controlling it has not been discovered yet. But if we still include the data for the aid flow which was generated on contrary to Japanese interest, we cannot analyze sheer Japanese interest. The estimation would be likely biased. Thus, here, I would omit the data which is altered due to the USA pressure and estimate again with the corrected dataset.

### 6.1.2 Result

Table 6-2 (a) depicts estimation results of Japan for all recipients with three periods, 1990 – 2002, 1990 – 1996, and 1997 – 2002 respectively. Comparing the results with that in section

**Table 6-2: Corrected estimation results for Japan**

**(a) all recipients**

| | 1990-2002 (random) | 1990-1996 (OLS) | 1997-2002 (OLS) |
|---|---|---|---|
| LN(GDP per capita) | -0.971<br>(-16.93)*** | -1.144<br>(-14.28)*** | -0.829<br>(-10.34)*** |
| LN(population) | -0.814<br>(-19.87)*** | -0.904<br>(-15.63)*** | -0.740<br>(-12.96)*** |
| LN(lagged exports) | 0.291<br>(7.77)*** | 0.397<br>(7.55)*** | 0.198<br>(3.77)*** |
| LN(imports) | 0.189<br>(7.03)*** | 0.263<br>(6.82)*** | 0.125<br>(3.48)*** |
| Government | -0.388<br>(-12.15)*** | -0.368<br>(-8.24)*** | -0.394<br>(-8.92)*** |
| UN Friend | -0.183<br>(-0.56) | -1.853<br>(-3.95)*** | 1.388<br>(3.17)*** |
| Far East Asia Dummy | 0.991<br>(4.31)*** | 0.394<br>(1.22) | 1.552<br>(4.94)*** |
| Egypt | 1.956<br>(3.04)*** | 2.271<br>(2.53)** | 1.585<br>(1.79)* |
| Israel | -2.417<br>(-3.66)*** | -1.981<br>(-2.17)** | -2.670<br>(-2.91)*** |
| Right Wing Dummy | 0.047<br>(0.42) | – | – |
| Intercept | 23.452<br>(22.22)*** | 28.072<br>(19.16)*** | 19.447<br>(13.16)*** |
| Observations | 1905 | 1006 | 899 |
| R-squared | 0.286 | 0.306 | 0.309 |
| Breusch-Pagan LM test, P-value | 0.036 ** | 0.493 | 0.240 |
| F-test for collective fixed effects, P-value | 0.020 ** | 0.154 | 0.851 |
| Hausman test, P-value | 0.299 | - | - |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects GLS, "fixed" represents fixed effects OLS, and "OLS" represents OLS)
Both random effects and fixed effects depend on the year of observation
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effects, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively

**(b) Far East Asia and other regions**

| | Far East Asia | | | Other regions | | |
|---|---|---|---|---|---|---|
| | 1990-2002 (OLS) | 1990-1996 (OLS) | 1997-2002 (OLS) | 1990-2002 (random) | 1990-1996 (OLS) | 1997-2002 (OLS) |
| LN(GDP per capita) | -1.752<br>(-4.58)*** | -2.476<br>(-4.07)*** | -1.844<br>(-5.08)*** | -0.978<br>(-16.65)*** | -1.142<br>(-13.97)*** | -0.837<br>(-10.18)*** |
| LN(population) | -0.872<br>(-3.19)*** | -1.559<br>(-3.62)*** | -0.730<br>(-2.75)*** | -0.818<br>(-19.46)*** | -0.890<br>(-15.06)*** | -0.753<br>(-12.84)*** |
| LN(lagged exports) | 1.245<br>(5.35)*** | 1.279<br>(3.22)*** | 1.274<br>(6.08)*** | 0.279<br>(7.14)*** | 0.389<br>(7.17)*** | 0.181<br>(3.30)*** |
| LN(imports) | -0.424<br>(-2.76)*** | 0.208<br>(0.65) | -0.610<br>(-5.19)*** | 0.191<br>(6.94)*** | 0.257<br>(6.56)*** | 0.134<br>(3.61)*** |
| Government | -0.325<br>(-3.38)*** | -0.401<br>(-2.56)** | -0.102<br>(-1.19) | -0.374<br>(-11.2)*** | -0.346<br>(-7.47)*** | -0.389<br>(-8.38)*** |
| UN Friend | 3.513<br>(3.73)*** | 4.368<br>(3.06)*** | 3.973<br>(4.19)*** | -0.230<br>(-0.68) | -2.158<br>(-4.43)*** | 1.457<br>(3.26)*** |
| Right Wing Dummy | -0.027<br>(-0.09) | – | – | 0.076<br>(0.64) | – | – |
| Intercept | 27.991<br>(3.71)*** | 44.843<br>(3.85)*** | 24.825<br>(3.33)*** | 23.473<br>(21.74)*** | 27.968<br>(18.75)*** | 19.584<br>(12.92)*** |
| Observations | 132 | 70 | 62 | 1773 | 936 | 837 |
| R-squared | 0.414 | 0.392 | 0.716 | 0.273 | 0.300 | 0.295 |
| Breusch-Pagan LM test, P-value | 0.291 | 0.145 | 0.317 | 0.051 * | 0.608 | 0.333 |
| F-test for collective fixed effects, P-value | 0.873 | 0.956 | 0.731 | 0.027 ** | 0.197 | 0.746 |
| Hausman test, P-value | - | - | - | 0.625 | - | - |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects GLS, "fixed" represents fixed effects OLS, and "OLS" represents OLS)
Both random effects and fixed effects depend on the year of observation
"Breusch-Pagan LM test, P-value" represents P-value obtained from Breusch-Pagan LM test
"F-test for collective fixed effect, P-value" represents P-value obtained from F-test the hypothesis that all the fixed effects are collectively equal zero
"Hausman, P-value" represents P-value obtained from Hausman test
*t* statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively

5, most of the results are almost maintained except impact of Far East Asia dummy. The variable turns to be positively significant, confirming Japan's preference to the region as we have expected. But the magnitude is not relatively large. The magnitude of historical tie in USA, France, and UK is much larger. The results from the comparative analysis of the two periods are also maintained the same sign and almost the same level of significance except

the Far East Asia dummy. The positive impact in the latter period increases to more than twice as large as that in the analysis from pre-corrected dataset. The impact in the former period, despite the insignificance, turns from negative to positive.

Table 6-2 (b) in appendix depicts the results with different regions, Far East Asia and the others, and with the three periods. The notable changes can be seen only in the results for Far East Asia. Let us take a look the whole period first. Comparing to the previous result, poverty selectivity is strengthened and policy selectivity is weakened. Overall change in selfish motives is ambiguous, too. The impact on exports strengthens while the effect on UN vote pattern declines. For the former period, the impact on both altruistic terms, poverty selectivity and policy selectivity, are weakened while commercial motives are also weakened. The coefficient for exports declines without losing significance. The change in impact on UN vote pattern is subtle. We see drastic changes of results in the latter period. The variables, income, population, and exports, turn to be relevant. Government, however, turns out in opposite way. Policy selectivity is not a determinant of the aid allocation anymore in the period. On the other hand, poverty selectivity becomes so strong that none of other sample donors exhibit in that extent. The impact of exports is notably enhanced. The impact on political motive is decreased, but the impact is still large comparing to other sample donors. For over the periods, the aid allocation in Far East Asia has been less altruistic in both poverty selectivity and policy selectivity, but selfish motives have become less important over time.

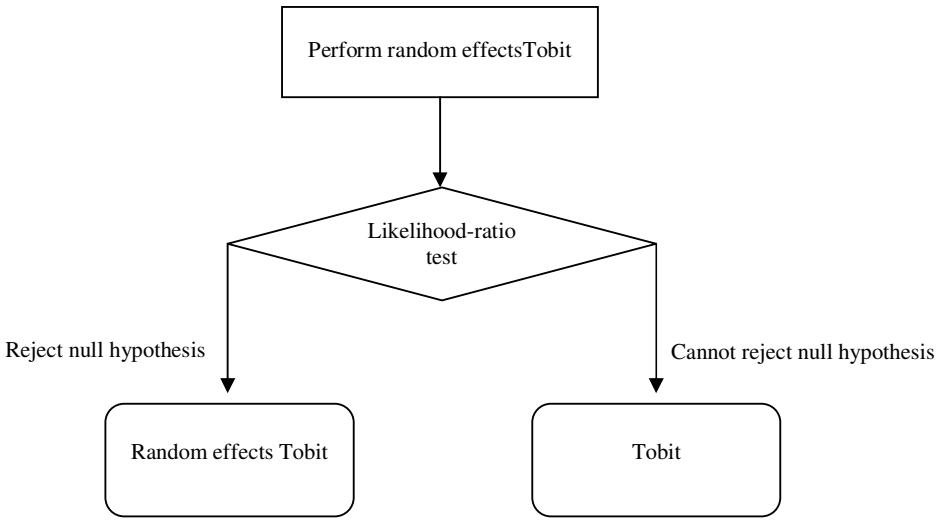
## 6.2 Comparison with the results from alternative method (Tobit model)

We employed log-linear model for our estimation because it can treat fixed effects, not significantly large number of zero data, and for computational reasons, even though it does not take into account for the non-linearity in the relationship. There, however, exists criticism on the method. For instance, Roodman (2004) pointed out the drawback in the method Dollar and Levin (2004) took which employed log-linear model for estimation as we did. Thus, here, we perform with a method which treats truncated nature for double checking. We employ Tobit model[26]. The results are reported in table 6-3. As long as computation is

[26] The context of choosing Tobit model is discussed in appendix.

feasible, the following test procedure depicted in figure 6-2 would be adopted to determine whether a random effects Tobit model or Tobit model is appropriate. We, first, perform random effects Tobit model and then have a likelihood-ratio test the random effects model with the pooled Tobit model. If the null hypothesis that random effects are collectively zero is not rejected, random effects Tobit is preferred to pooled Tobit model. If not, Tobit model is performed and its result is adopted.

**Figure 6-2: Flow chart for opting model for Tobit model**




With the regressions with very few zero data, namely cases in Japan, France, and Germany, the results are extremely similar to the results from log-linear model. On the other hand, the results are discrepant in the regressions which contain a number of zero data, namely, aggregated data, USA, UK, and Norway.

In previous section, the aggregated data was estimated with log-linear model with donor-year fixed effects. Nevertheless, non-linearity is not negligible because approximately 15 percent of the data is censored as we can see from table 6-3. Thus, the estimation ought to be performed with the model which treats non-linearity, even though it cannot treat fixed effects. The table reports that all signs are maintained from the results by log-linear model,

**Table 6-3: Tobit results, (a) collective behaviour in all periods and for all sample donors excluding Japan, 1990-2002**

| | Aggregated data | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1990-2002 (Tobit) | 1990-1996 (Tobit) | 1997-2002 (Tobit) | USA (Tobit) | France (Tobit) | UK (random) | Germany (random) | Norway (random) |
| LN(GDP per capita) | -1.518 | -1.639 | -1.403 | -2.219 | -0.991 | -1.592 | -0.810 | -1.806 |
| | (-39.12)*** | (-29.68)*** | (-25.58)*** | (-16.78)*** | (-15.05)*** | (-14.66)*** | (-11.65)*** | (-17.33)*** |
| LN(population) | -0.405 | -0.485 | -0.334 | 0.038 | -0.829 | -0.188 | -0.091 | 0.663 |
| | (-14.14)*** | (-12.01)*** | (-8.12)*** | (0.42) | (-15.64)*** | (-2.39)** | (-1.54) | (8.94)*** |
| LN(lagged exports) | 0.629 | 0.685 | 0.579 | 0.430 | 0.954 | 0.679 | 0.303 | 0.100 |
| | (26.58)*** | (20.45)*** | (17.12)*** | (5.59)*** | (21.45)*** | (8.60)*** | (6.30)*** | (1.76)* |
| Government | -0.295 | -0.325 | -0.256 | -0.801 | -0.072 | -0.612 | -0.103 | -0.139 |
| | (-13.45)*** | (-10.31)*** | (-8.43)*** | (-10.33)*** | (-2.02)** | (-11.95)*** | (-3.20)*** | (-2.23)** |
| UN Friend | 1.376 | 1.520 | 1.271 | 1.982 | 0.652 | 2.286 | 1.387 | 4.234 |
| | (12.25)*** | (9.37)*** | (8.22)*** | (5.58)*** | (2.08)** | (5.21)*** | (4.23)*** | (6.22)*** |
| Own colonial Dummy | 0.801 | 1.238 | 0.304 | 1.569 | 1.766 | 1.499 | 0.338 | – |
| | (7.01)*** | (7.55)*** | (1.93)* | (3.44)*** | (10.5)*** | (7.62)*** | (1.89)* | |
| Egypt | - | - | - | 4.335 | 1.460 | -1.014 | 0.670 | -1.233 |
| | | | | (3.14)*** | (2.03)** | (-0.98) | (1.04) | (-1.06) |
| Israel | - | - | - | 8.047 | 0.436 | -5.495 | 3.585 | -0.339 |
| | | | | (5.64)*** | (0.60) | (-5.03)*** | (3.09)*** | (-0.24) |
| Intercept | 18.575 | 20.755 | 16.555 | 18.068 | 22.465 | 16.251 | 7.689 | -2.233 |
| | (25.51)*** | (20.35)*** | (15.71)*** | (7.82)*** | (16.35)*** | (7.57)*** | (4.92)*** | (-1.14) |
| Uncensored observations | 10068 | 5226 | 4842 | 1436 | 1820 | 1669 | 1817 | 1395 |
| Censored observations | 1516 | 871 | 625 | 392 | 124 | 291 | 83 | 530 |
| likelihood-ratio test, P-value | - | - | - | - | 1.00 | 0.00 *** | 0.010 *** | 0.001 *** |
| Pseudo R-squared | 0.032 | 0.035 | 0.029 | 0.051 | 0.083 | 0.209 | 0.158 | 0.291 |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects Tobit model, and "Tobit" represents Tobit model)
Random effects depend on both the year of observation and the donor
Data is left censored at natural log of 0.0001
"likelihood-ratio test, P-value" represents P-value obtained from a likelihood-ratio test comparing the random effects model with the pooled (Tobit) model
t statistics are reported in brackets
***, **, and * denote significance at 1, 5 and 10 percent level, respectively

**(b) all sample donors excluding Japan, 1990-1996 and 1997-2002**

| | USA | | France | | UK | | Germany | | Norway | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1990-1996 (Tobit) | 1997-2002 (random) | 1990-1996 (Tobit) | 1997-2002 (Tobit) | 1990-1996 (Tobit) | 1997-2002 (Tobit) | 1990-1996 (random) | 1997-2002 (Tobit) | 1990-1996 (random) | 1997-2002 (random) |
| LN(GDP per capita) | -2.536 (-11.8)*** | -2.089 (-13.19)*** | -1.237 (-12.96)*** | -0.704 (-7.86)*** | -1.565 (-11.74)*** | -1.618 (-9.53)*** | -0.851 (-8.90)*** | -0.740 (-7.53)*** | -1.934 (-12.61)*** | -1.634 (-11.49)*** |
| LN(population) | 0.114 (0.76) | -0.240 (-2.13)** | -0.929 (-12.32)*** | -0.699 (-9.45)*** | -0.327 (-3.41)*** | -0.002 (-0.02) | -0.217 (-2.67)*** | 0.081 (0.97) | 0.703 (6.53)*** | 0.651 (6.36)*** |
| LN(lagged exports) | 0.566 (4.68)*** | 0.479 (4.92)*** | 1.083 (16.66)*** | 0.802 (13.29)*** | 0.511 (5.20)*** | 0.837 (6.79)*** | 0.279 (4.10)*** | 0.308 (4.65)*** | 0.123 (1.51) | 0.054 (0.67) |
| Government | -0.658 (-5.21)*** | -0.818 (-9.64)*** | -0.105 (-2)** | -0.049 (-1.03) | -0.757 (-11.91)*** | -0.403 (-5.12)*** | -0.140 (-3.12)*** | -0.063 (-1.40) | -0.215 (-2.29)** | -0.074 (-0.90) |
| UN Friend | 2.417 (4.12)*** | 2.378 (5.91)*** | 0.612 (1.36) | 0.459 (1.04) | 1.104 (2.18)** | 4.085 (5.72)*** | 1.349 (2.91)*** | 1.861 (4.06)*** | 5.217 (4.19)*** | 3.379 (4.31)*** |
| Own colonial Dummy | 0.489 (0.65) | 2.106 (4.26)*** | 1.762 (7.23)*** | 1.755 (7.71)*** | 1.910 (7.70)*** | 1.111 (3.73)*** | 0.567 (2.22)** | 0.146 (0.60) | – | – |
| Egypt | 4.079 (1.85)* | 4.377 (2.88)*** | 1.203 (1.15) | 1.683 (1.74)* | -0.562 (-0.44) | -1.607 (-1.00) | 1.257 (1.41) | 0.020 (0.02) | -0.908 (-0.54) | -1.644 (-1.05) |
| Israel | 9.254 (4.07)*** | 6.076 (3.83)*** | 1.469 (1.40) | -0.840 (-0.85) | -4.188 (-3.26)*** | -7.049 (-3.73)*** | 3.657 (3.09)*** | - | 2.859 (1.53) | -18.817 (-0.04) |
| Intercept | 18.398 (5.00)*** | 24.323 (8.38)*** | 26.362 (13.38)*** | 17.885 (9.36)*** | 18.095 (6.96)*** | 10.917 (3.20)*** | 10.143 (4.72)*** | 3.865 (1.75)* | -4.491 (-1.54) | -3.723 (-1.39) |
| Uncensored observations | 711 | 725 | 955 | 865 | 894 | 775 | 996 | 851 | 691 | 704 |
| Censored observations | 267 | 125 | 79 | 45 | 119 | 172 | 40 | 43 | 307 | 223 |
| likelihood-ratio test, P-value | 1.000 | 0.000 *** | 1.000 | 1.000 | 1.000 | 1.000 | 0.049 ** | 1.000 | 0.002 *** | 0.002 *** |
| Pseudo R-squared | 0.047 | 0.223 | 0.090 | 0.076 | 0.058 | 0.050 | 0.143 | 0.059 | 0.285 | 0.237 |

[Note] Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects Tobit model, and "Tobit" represents Tobit model)
Random effects depend on both the year of observation and the donor
Data is left censored at natural log of 0.0001
"likelihood-ratio test, P-value" represents P-value obtained from a likelihood-ratio test comparing the random effects model with the pooled (Tobit) model
t statistics are reported in brackets.***, **, and * denote significance at 1, 5 and 10 percent level, respectively
"Israel" is dropped in the regression of Germany for the period 1997-2002 because there were no positive aid giving to the country in the period

**(c) Japan in all periods and regions**

| | All regions | | | Far East Asia | | | Other regions | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1990-2002 (random) | 1990-1996 (Tobit) | 1997-2002 (tobit) | 1990-2002 (tobit) | 1990-1996 (Tobit) | 1997-2002 (tobit) | 1990-2002 (random) | 1990-1996 (Tobit) | 1997-2002 (tobit) |
| LN(GDP per capita) | -1.017 | -1.190 | -0.950 | -1.784 | -2.482 | -1.862 | -0.996 | -1.153 | -0.839 |
| | (-17.24)*** | (-14.69)*** | (-11.93)*** | (-4.75)*** | (-4.18)*** | (-5.35)*** | (-16.47)*** | (-13.7)*** | (-10.11)*** |
| LN(population) | -0.836 | -0.915 | -0.791 | -0.879 | -1.555 | -0.733 | -0.831 | -0.895 | -0.753 |
| | (-19.64)*** | (-15.41)*** | (-13.65)*** | (-3.28)*** | (-3.71)*** | (-2.89)*** | (-19.1)*** | (-14.71)*** | (-12.71)*** |
| LN(lagged exports) | 0.314 | 0.424 | 0.280 | 1.297 | 1.287 | 1.306 | 0.290 | 0.396 | 0.183 |
| | (8.08)*** | (7.99)*** | (5.41)*** | (5.55)*** | (3.32)*** | (6.44)*** | (7.22)*** | (7.07)*** | (3.30)*** |
| LN(imports) | 0.190 | 0.267 | 0.148 | -0.457 | 0.205 | -0.630 | 0.196 | 0.260 | 0.135 |
| | (6.88)*** | (6.81)*** | (4.03)*** | (-2.96)*** | (0.65) | (-5.53)*** | (6.96)*** | (6.45)*** | (3.59)*** |
| Government | -0.373 | -0.359 | -0.365 | -0.322 | -0.406 | -0.098 | -0.373 | -0.349 | -0.391 |
| | (-11.44)*** | (-7.81)*** | (-8.09)*** | (-3.42)*** | (-2.66)*** | (-1.20) | (-10.97)*** | (-7.34)*** | (-8.35)*** |
| UN Friend | 0.071 | -1.785 | 1.737 | 3.758 | 4.618 | 4.094 | -0.228 | -2.226 | 1.459 |
| | (0.22) | (-3.74)*** | (3.98)*** | (3.98)*** | (3.27)*** | (4.47)*** | (-0.66) | (-4.44)*** | (3.23)*** |
| Far East Asia Dummy | 0.943 | – | – | – | – | – | – | – | – |
| | (4.02)*** | | | | | | | | |
| Intercept | 23.961 | 28.628 | 21.268 | 28.102 | 44.642 | 24.892 | 23.917 | 28.217 | 19.611 |
| | (21.87)*** | (19.26)*** | (14.39)*** | (3.78)*** | (3.93)*** | (3.49)*** | (21.5)*** | (18.36)*** | (12.81)*** |
| Uncensored observations | 1860 | 974 | 886 | 129 | 68 | 61 | 1731 | 906 | 825 |
| Censored observations | 45 | 32 | 13 | 3 | 2 | 1 | 42 | 30 | 12 |
| likelihood-ratio test, P-value | 0.032 ** | 0.258 | 1.000 | 1.000 | 1.000 | 0.331 | 0.043 ** | 0.309 | 1.000 |
| Pseudo R-squared | 0.252 | 0.070 | 0.070 | 0.136 | 0.128 | 0.252 | 0.257 | 0.070 | 0.073 |

[Note]
Dependent variable is natural log of net ODA disbursement received from a certain donor per capita
Method of estimation: shown in parenthesis below the title of regression("random" represents random effects Tobit model, and "Tobit" represents Tobit model)
Random effects depend on both the year of observation and the donor
Data is left censored at natural log of 0.0001
"likelihood-ratio test, P-value" represents P-value obtained from a likelihood-ratio test comparing the random effects model with the pooled (Tobit) model
t statistics are reported in brackets.***, **, and * denote significance at 1, 5 and 10 percent level, respectively
"Israel" is dropped in the regression of Germany for the period 1997-2002 because there were no positive aid giving to the country in the period

however, we can see several notable changes on their extent, especially UN friend. Geopolitical motive has been enhanced over time in the previous estimation whereas it has been weakened. All the results imply that in the collective donors' behaviour, altruistic motives have been weakened while selfish motives have also been weakened over time.

Although magnitude of coefficients notably changed in regressions for USA, UK, and Norway, most of arguments made above can be maintained except two. UK has been more poverty focused and geopolitical motive has been weakened in the US aid allocation over time.

## 6.3 Analysis of the results

All the argument so far reveals that the results from section 6.1 are valid estimation results. As we have expected after the East Asian financial crisis extra impact on the aid flow to Far East Asia, with other factors fixed, is increased. The comparative analysis of different regions supports the patterns of factors which drive aid flow are different among the regions.

Japan is relatively poverty focused with respect to Far East Asia. The magnitude is quite large. Japan, in practice, rewards fewer income recipients in other regions as well. But the magnitude is much smaller than what it does for Far East Asia, and also relatively small. It incurs that Japanese poverty selectivity is relatively weak. Before the financial crisis, Japan used to be policy focused to Far East Asia but the effect has disappeared in the latter period. On the other hand, policy selectivity has been enhanced over time in the other regions.

If we see the terms of commercial motives, Japan gives more aid to the recipients with more imports from Japan regardless of regions. The impact has been almost stable over the periods in Far East Asia while it has been less important in the other area. On the other hand, commercial motives to promote Japan's imports only exist for aid allocation to the other regions. That implies that in contrast to the expectation, Japanese project aid in Far East Asia does not incur Japanese imports promotion whereas Japanese aid to the other region may be exploited in order to sustain Japanese resource imports. It can be inferred from table 6-2. Countries in the Middle East, South America, and Africa play important role in Japanese resource imports whereas their contribution in Japanese export market are relatively weak. Besides, resource imports are crucial part in Japanese trade. On the other hand, Asia plays

very important role in Japanese export markets; it is major destination in most of major commodities.

**Table 6-4: Breakdown in Japanese trade**

| | Major Commodity Groups | share | Regional Share | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Asia | Middle East | Europe | North America | Central America | South America | Africa | Oceania |
| Export | Total | – | 0.48 | 0.03 | 0.17 | 0.25 | 0.01 | 0.01 | 0.02 | 0.03 |
| | Vehicles other than railway, tramway | 0.21 | 0.13 | 0.07 | 0.22 | 0.45 | 0.01 | 0.02 | 0.04 | 0.07 |
| | Electrical, electronic equipment | 0.21 | 0.60 | 0.01 | 0.16 | 0.20 | 0.00 | 0.00 | 0.01 | 0.01 |
| | Nuclear reactors, boilers, machinery, etc | 0.20 | 0.48 | 0.02 | 0.20 | 0.26 | 0.00 | 0.01 | 0.02 | 0.02 |
| | Optical, photo, technical, medical, etc apparatus | 0.06 | 0.58 | 0.01 | 0.16 | 0.22 | 0.00 | 0.01 | 0.01 | 0.01 |
| | Iron and steel | 0.04 | 0.87 | 0.02 | 0.02 | 0.06 | 0.00 | 0.01 | 0.01 | 0.02 |
| Import | Total | – | 0.44 | 0.17 | 0.14 | 0.15 | 0.00 | 0.02 | 0.03 | 0.05 |
| | Iron and steel | 0.04 | 0.87 | 0.02 | 0.02 | 0.06 | 0.00 | 0.01 | 0.01 | 0.02 |
| | Mineral fuels, oils, distillation products, etc | 0.26 | 0.21 | 0.64 | 0.02 | 0.02 | 0.00 | 0.00 | 0.02 | 0.09 |
| | Electrical, electronic equipment | 0.12 | 0.79 | 0.00 | 0.06 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Nuclear reactors, boilers, machinery, etc | 0.10 | 0.64 | 0.00 | 0.15 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Optical, photo, technical, medical, etc apparatus | 0.04 | 0.34 | 0.01 | 0.27 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Ores, slag and ash | 0.03 | 0.20 | 0.00 | 0.02 | 0.08 | 0.00 | 0.33 | 0.07 | 0.32 |

[Note] Source: OECD (2007)
Only top 5 commodity groups are reported in the table.

Of The other selfish motives, geopolitical motive, are strikingly strong in Far East Asia. That in the other region is also not negligible. There were no geopolitical motives in the former period whereas it has positive effects at statistically significant level in the latter period.

Since the prosperity in the surrounded region is beneficial to Japan due to a number of stakes, Japan may be poverty focused and policy focused with an intension of poverty alleviation throughout the region even though the magnitude has been weakened over time. However, the regional importance also drives both commercial motives and political motives although the motives have become smaller over time. The aid allocation to the other region also has

been less altruistic and pattern of selfish motives have been changing over time. Geopolitical tie has been more important and commercial motive has been less.

# 7. Concluding remarks

In this paper, we were interested in major determinants why Japanese aid allocation differs by countries and regions. We performed an aid allocation analysis that accounts for pattern of Japanese aid allocation being different between recipients especially in Far East Asia and the other regions. We first have seen how the components of aid allocation to Far East Asia and the other region differ. It revealed that one of the distinctive features of the components of aid allocation to Far East Asia is that bulk is non-grant aid and technical cooperation and project aid occupies large portion.

In line with Dollar and Levin (2004) and Canavire et al (2005), the impact of poverty focused aid is relatively weak in the Japanese aid allocation to recipients in the other regions. However, Japanese aid allocation to the recipients in Far East Asia is more poverty focused according to the econometric results. In practice, the impact is large compared to other donors considered in my sample. Weak poverty selectivity in the other regions leads overall weak poverty selectivity of Japan. We employed as a variable "government" which indicates level of governance in the recipients as another altruistic indicator. Japanese aid giving behaviour is policy focused regardless of region but Japan is more policy focused with respect to the other regions than that for Far East Asia. Project aid predominates in the aid to Far East Asia. Canavire et al (2005) argued project aid would tend to be given to less well-governed recipients and under strict surveillance by donors, while programme aid, at least in principle, would be tilted in favor of well governed recipients and involve less external control. Furthermore, since many of recipients in Far East Asia is relatively well-governed, the variable government does not vary significantly, especially in recent years. The altruistic terms are significant in the allocative behaviour to the recipients in Far East Asia, although selfish terms are also quite significant. The export related self interest provides a fairly strong incentive to grant aid to recipients in Far East Asia. Strong political motives are also behind the aid allocation. For other regions, export related self interest is not so strong but import related self interest is behind Japanese aid allocation. It allows us to infer that Japan exploits aid to obtain sustainable resource imports. Hence, the allocative behaviour is clearly different by region; allocative behaviour to Far East Asia is strongly altruistic but also

strongly selfish and that to the other region is altruistic at certain extent and not strongly selfish.

The allocative pattern changes over time, especially before and after the financial crisis in East Asia in 1997. For Far East Asia, it became less altruistic, and also furthermore weaker political motives. For the other regions, Japan has been more policy focused but less poverty focused. The pattern of selfish motives also has changed over time, commercial motive has been less important but geopolitical motive has been more emphasized.

My study revealed that empirical findings in the literatures cannot be applicable if we decompose recipients by regions. Canavire et al (2005) find out that Japan is not poverty focused compared to other donors. My study also agreed with the analysis without decomposition but decomposition shows that Japan is strongly poverty focused regarding Far East Asia. Studies of Berthelemy and Tichit (2002), Dollar and Levin (2004), and Isopi and Mavrotas(2006) show Japan is relatively policy focused. Contrast to insistence of Dollar and Levin (2004) that Japanese policy selectivity ascribes to its preference to Far East Asia, Japan is highly policy focused among the region before financial crisis in East Asia. However, Japan is not policy focused among the region after the incident. Berthelemy and Tichit (2002), Cooray and Shahiduzzaman (2004), Canavire et al (2005), and Isopi and Mavrotas (2006) assert that strong commercial motive is behind Japanese aid allocation. This finding can be applicable to Japanese aid allocative behaviour to Far East Asia but not to the other regions. The finding of Alesina and Dollar (2000) that strong geopolitical motive is behind Japanese aid allocation is applicable with respect to Far East Asia but not to the other regions in especially earlier period.

In order to attain the Millennium Development Goals, putting less weight on its self-interest in providing aid is indispensable. We can see improvement in Japanese aid allocative behaviour to Far East Asia. But the improvement is scanty. For the other regions, we see converse phenomenon, stronger import and geopolitical motives. Furthermore altruistic terms in both regions have been weakened. The pictures indicate that there still have a lot of rooms to improve to accomplish the goals.

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# Appendix A: Choice of Non-linear models

In earlier literature such as Berthelemy and Tichit (2002), Canavire et al (2005), and so forth, following three measures have been introduced to deal with this type of situation, all based on the maximum likelihood method.

- ***Two-part model***: in the first step, a Probit model determines the probability of receiving aid (selection equation), and in a second, a linear model explaining aid disbursement is estimated, based only on strictly positive observations (allocation equation).

  $P(Y_{ijt} > 0) = F(cZ_{ijt} + v_{ijt})$

  $Y_{ijt} = bX_{ijt} + u_{ijt}$

  Where $i$ stands for the donor, $j$ for the recipient and $t$ for the year, $u$ and $v$ are independent and normally distributed error terms, and

  $Y$ : the dependent variable, i.e. the amount of aid disbursement per capita.

  $Z$ and $X$ : explanatory variable for the selection equation and the allocation equation respectively. $b$ and $c$ are corresponding vectors.

  $F(.)$ : the cumulative distribution function

- ***Heckman's method***: the procedure is the same as for the two-part model, except that $u$ and $v$ are not assumed independent. It can be implemented either in two-step estimation method, or in a one-step maximum likelihood procedure. In the two-step method, one first estimates the Probit selection equation. Then in a second step, the inverse Mill's ratio obtained from the first step is introduced together with explanatory variables, in order to correct selection bias due to the endogenous nature of the allocation of the selection process.

  $P(Y_{ijt} > 0) = F(cZ_{ijt} + v_{ijt})$

  $$Y_{ijt} = bX_{ijt} + \frac{\rho\sigma f(cZ_{ijt} + v_{ijt})}{F(cZ_{ijt} + v_{ijt})} + u_{ijt}$$

  Where $u$ and $v$ are normally distributed error terms, with $\text{cov}(u, v) = \rho$ and $f$ stands for the partial distribution function and $\sigma$ for the variance of $u$ .

- ***Tobit model***: estimates the aid disbursements in only one-step, taking directly into account its truncated nature. The difference with the Heckman's method is that exogenous variables are supposed to have the same impact on the probability of receiving aid and on the amount of aid allocated thereafter: aid received is described as the maximum of zero and of a linear combination of the explanatory variables.

  $Y_{ijt} = Max(bX_{ijt} + u_{ijt}, 0)$

Canavire et al (2005) insist that crucial assumption underlying two-part model is that the choice of the recipient and the amount of aid allocated are independent from each other ($u$ and $v$ are not correlated). If this assumption does not hold, which appears to be highly plausible, the regression in the second step suffers from a selection bias. In the Heckman procedure, if the same set of independent variables is employed in both equations, estimates can become unreliable due to severe multicollinearity problem. Since it is very difficult to find appropriate exclusion variables for the first step of Heckman procedure, the study opted for the Tobit model. Many other studies such as Berthelemy and Tichit (2002), and Isopi and Mavrotas (2006) have also opted the approach. Notwithstanding, Tobit model is not without disadvantages. Berthelemy (2006b) insists that the Tobit model, with a very large database, is hardly manageable with a large number of explanatory variables, for computational reasons. Furthermore, some of the equations of my study were concluded that introducing the fixed effects was the best choice, however, this raises a technical issue[27], an incidental parameters problem. Greene (2002) insists that the fixed effects maximum likelihood estimator is inconsistent when the length of the panel is fixed. In the models that have been examined in detail, it appears also to be biased in finite samples.

[27] At least, the command for Tobit model with conditional fixed effects is not available in STATA, as there does not exist a sufficient statistic allowing the fixed effects to be conditioned out of the likelihood.

# Appendix B: Data and Sources

| Variable | Description | Source |
|---|---|---|
| Aid per capita | Net disbursements of official development assistance without emergency relief divided by the population of the recipient country; US dollars in constant 2004 price | OECD Development Aid Committee database(international development statistics) |
| Donor exports | Share of exports of donor country *i* to recipient country *j* in total exports of donor country *i*; percent; lagged one year behind | OECD (International Trade Statistics) |
| Japanese imports | Share of imports of recipient country *j* to Japan in total imports of Japan; percent | OECD (International Trade Statistics) |
| Population | Total population in recipient countries | OECD (Population Statistics) |
| Government | Freedom House democracy index. Average of indices for political rights and civil liberties. Both indicators are assessed into from 1 to 7. 1 represents the most free and 7 the least free rating. | Freedom House(Freedom in the World Historical Rankings) |
| GDP per capita | Real GDP per capita; US dollars in constant 2004 price | United Nations Statistics Division |
| Far East Asian Dummy | Set equal to "1" if recipient belongs to Far East Asian region. The list of the countries is Cambodia, China, Chinese Taipei, Hong Kong, Indonesia, Korea Dem. Rep., Korea Laos, Macao, Malaysia, Mongolia, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam. Set equal to "0" for otherwise. | OECD |
| Colonial Dummy | Set equal to "1" for former colonies. Set equal to "0" for otherwise. This variable is derived individually to USA, UK, France, and Germany. | World Statesmen |
| UN-friend | Based on UN voting patterns, the UN-friend index ranges from -1 to 1, with higher values indicating more similar voting patterns. | Gartzke and Jo(2000)(The Affinity of Nations: Similarity of State Voting Positions in the UNGA) |
| Right Wing Dummy | Set equal to "1" if government party is right wing at beginning of certain year. Set equal "0" for otherwise. | |