Geographical Distribution of Japan's Bilateral ODA

In 1961, the Ministry of Trade and Industry (MITI) in Japan wrote in its report that Japan undertook economic cooperation toward developing countries not for political objectives, nor as support for developmental objectives, but in order to develop Japanese domestic industry. MITI emphasized in the 1960's that economic cooperation was part of an overall trade policy whose intention was to benefit the Japanese economy (Moss and Ravenhill p.66).

If the statement of MITI represents Japan's official policy stance towards developing countries, there should be a correlation between the volume of Japanese private business activity and the amount of aid Japan gives to developing countries. This statement leads me to propose a hypothesis that the more Japanese private companies are active in trading and investment in a region, the more Japanese government allocates its aid to that same region in order to back up the private companies.

I conducted a regression to see the correlation between Japan's official aid disbursement and private business activities by region. For ODA data, I got figures from Moss & Ravenhill's *Emerging Japanese Economic Influence in Africa* for 1963-81, from Owoeye's *Japan' Policy in Africa* for 1984-86. For export and import data, I used two sources: Loutfi's *The Net Cost of Japanese Foreign Aid* for 1962-71, and MITI's data for 1973-86. For investment data, I used Loutfi's figures for 1963-67, and Moss & Ravenhill's figures for 1981.

I chose four regions which receive Japanese official aid; Asia, Middle East, Central/South America and Africa. Japanese private business activities are represented by the regional share of export, import and investment because those are major indicator of business activity between two countries. The method of ordinary least square is used. The summary of regression is in Table 1.
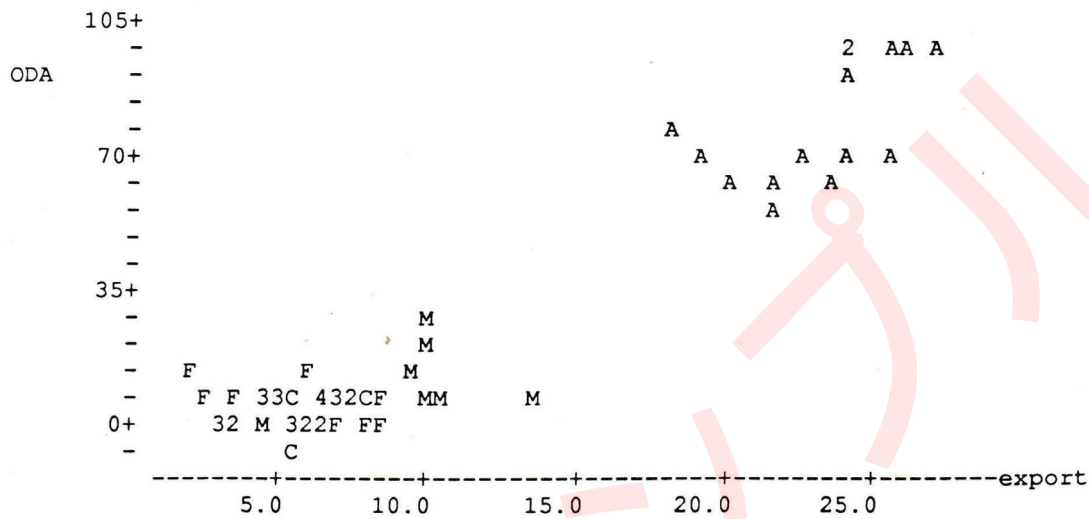
Table 1: Correlation between ODA and business activity

	variable	coefficient		t-ratio	p-value	R-squared	sample size
Model 1	export	constant:	-18.2	-8.29	0.000	0.909	60
		export:	4.1	24.09	0.000		
Model 2	import	constant:	2.0	0.31	0.756	0.246	60
		import:	1.8	4.35	0.000		
Model 3	investment	constant:	-14.9	-1.19	0.258	0.646	12
		investment:	1.7	4.48	0.000		
Model 4	export	constant:	-16.5	-7.06	0.000	0.914	60
	import	export:	4.3	21.07	0.000		
		import:	-0.3	-1.83	0.073		
Model 5	export	constant:	-29.8	-10.01	0.000	0.987	12
	import	export:	4.6	13.65	0.000		
	investment	import:	-0.4	-1.62	0.139		
		investment:	0.3	2.24	0.052		

Data used for regression: 1963-1981: Moss & Ravenhill, "*Emerging Japanese Economic Influence in Africa*," p.79; 1984-1986: Owoeye, "*Japan's Policy in Africa*," p.169. 1962-71 export and import: Loutfi, "*The Net Cost of Japanese Foreign Aid*," p.22; 1973-86 export: MITI, "*Tsusho Sangyosho 1974-1987*"; 1963-67 investment: Loutfi, "*The Net Cost of Japanese Foreign Aid*," p.64; 1981 investment: Moss & Ravenhill, "*Emerging Japanese Economic Influence in Africa*," p.43.

In the first model, regional share of Japan's total ODA is regressed to the corresponding regional share of Japan's total export. As the Table 1 shows, the correlation between ODA and export shows very strong correlation with R^2 of 90.9%, with t-ratio of 24.09, and p-value is 0.000. I also plotted a graph taking ODA as dependent variable and export as independent variable (Graph 1).

Graph 1

Correlation between Japan's ODA disbursement and the corresponding Japan's export
by region

```
     105+
ODA    -                                                    2   AA A
       -                                                        A
       -
       -                                           A
      70+                                            A      A  A  A
       -                                               A  A   A
       -                                                   A
       -
       -
      35+
       -                               M
       -                               M
       -         F          F          M
       -       F F  33C 432CF    MM         M
      0+         32 M 322F FF
       -           C
         --------+---------+---------+---------+---------+-------export
             5.0       10.0      15.0      20.0      25.0
```

F : Africa

C : Central/South America

M : Middle East

A : Asia

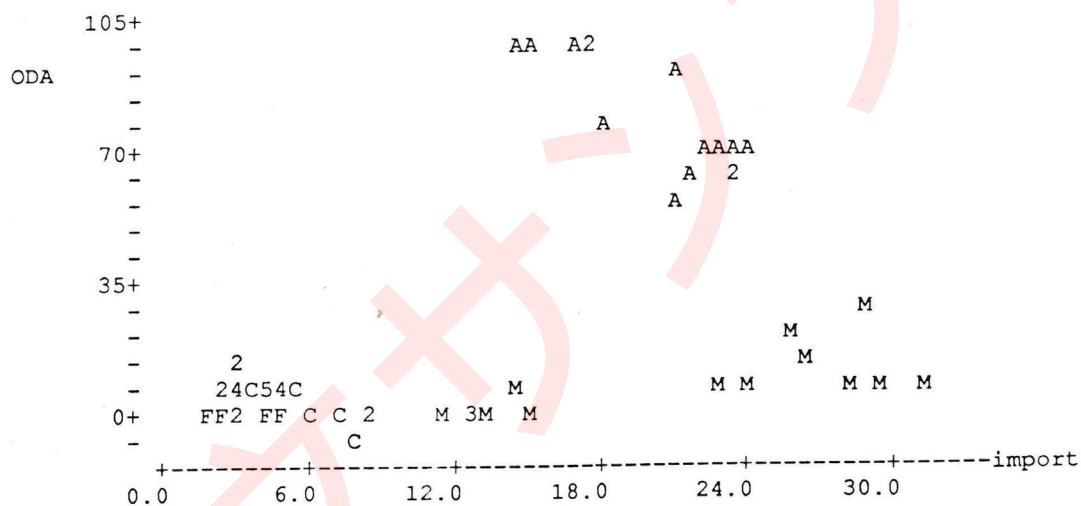Number : The number of occurrence when there are more than two

Data used for the graph: 1963-1981 ODA: Moss & Ravenhill, "*Emerging Japanese Economic Influence in Africa*," p.79; 1984-1986 ODA: Owoeye, "*Japan's Policy in Africa*," p.169. 1962-71 export: Loutfi, "*The Net Cost of Japanese Foreign Aid*," p.22; 1973-86 export: MITI, "*Tsusho Sangyosho 1974-1987*."

One might suspect that the magnitude of ODA correlates to the magnitude of export because a part of Japan's aid could have been tied; the developing countries had to buy Japanese products with the fund they receive from Japan. If this is true, Japan's ODA directly translates into exports. However, since the size of ODA relative to export volume is very small, tying of aid does not fully explain the strong correlation between ODA and exports.

In the second model, ODA is regressed to import which resulted in a low R^2 of 24.6%. The t-ratio in this model is 4.35 with p-value of 0.000. The graph is plotted in Graph 2. As the graph shows, the correlation between ODA and import fails to be linear because the Middle East is included; Japan imports heavily from this region (mainly oil), while it does not award ODA to the region in proportion to the import volume.

<u>Graph 2</u>

Correlation between Japan's ODA disbursement and the corresponding Japan's import by region

```
     105+
        -                          AA   A2
ODA     -                                    A
        -
        -                              A
      70+                                 AAAA
        -                                 A  2
        -                                 A
        -
        -
      35+                                              M
        -                                         M
        -                                         M
        -        2                              M M     M M  M
        -     24C54C            M
      0+  FF2 FF C C 2      M 3M   M
        -          C
          +---------+---------+---------+---------+---------+------import
        0.0       6.0      12.0      18.0      24.0      30.0
```

F : Africa
C : Central/South America
M : Middle East
A : Asia
Number : The number of occurrence when there are more than two

Data used for the graph: 1963-1981 ODA: Moss & Ravenhill, "*Emerging Japanese Economic Influence in Africa*," p.79; 1984-1986 ODA: Owoeye, "*Japan's Policy in Africa*," p.169. 1962-71 import: Loutfi, "*The Net Cost of Japanese Foreign Aid*," p.22; 1973-86 import: MITI, "*Tsusho Sangyosho 1974-1987*."

In the third model, private investment is picked as independent variable. The model shows weaker correlation than the ODA-export model, but stronger correlation than the ODA-import model. R^2 is 64.6%, t-ratio is 4.48 with p-value of 0.000.

The fourth regression uses both exports and imports as independent variables. This model shows a stronger correlation with ODA than when the export alone is used as variable, with R^2 of 91.4%. T-ratio for the coefficient of export is 21.07 with p-value of 0.000 that is significant as in the first model. However, t-ratio for import is -1.83 with p-value of 0.073 that is not significant.

In the fifth model, all the three variables (export, import and investment) are regressed. The result has the highest R^2 of 98.7%. T-ratios for export, import, and investment are 13.65, -1.62 and 2.24, respectively. In this model, p-value for export is very significant at 0.000, but p-value for import is only 0.139, and for investment 0.052.

Among the variables used, there are some reasons to suspect collinearity. First, there can be collinearity between volume of import and that of export because governments usually try to control trade imbalances. A regression analysis between exports and imports showed moderate correlation, with R^2 of 33.7% (Table 2), and significant p-value of 0.000 for variable.

Table 2 Collinearity among variables

dependent variable	independent variable	coefficient		t-ratio	p-value	R-squared	sample size
export	import	constant:	4.3	3.09	0.003	0.337	60
investment	trade imbalance	constant:	23.9	4.62	0.000	0.220	12
		trade imbalance	1.2	1.76	0.106		
ODA	trade imbalance	constant:	27.4	6.64	0.000	0.138	60
		trade imbalance	1.6	3.05	0.003		
ODA + investment	trade imbalance	constant:	49.4	3.27	0.007	0.281	12
		trade imbalance	4.2	2.07	0.062		

Data used for regression: 1963-1981: Moss & Ravenhill, "*Emerging Japanese Economic Influence in Africa*," p.79; 1984-1986: Owoeye, "*Japan's Policy in Africa*," p.169; 1962-71 export and import: Loutfi, "*The Net Cost of Japanese Foreign Aid*," p.22; 1973-86 export: MITI, "*Tsusho Sangyosho 1974-1987*"; 1963-67 investment: Loutfi, "*The Net Cost of Japanese Foreign Aid*," p.64; 1981 investment: Moss & Ravenhill, "*Emerging Japanese Economic Influence in Africa*," p.43.

Second, there can be collinearity between trade imbalance and capital flow. If Japan's trade surplus with a particular region is invested by Japan in the same region that incurrent the trade deficit, there should be strong correlation between the bilateral current account and capital account by region. ODA may also flow to a region that carries a bilateral trade deficit with Japan. If this is the case, ODA is merely recycling trade surplus. In my model, first, collinearity is suspected between ODA and trade imbalance (export minus import). Second, collinearity is suspected between private investment and trade imbalance.

Third, there can be also collinearity between trade imbalance and the combined capital flow from Japan, that is ODA plus private investment. However, as Table 2 shows, collinearity among those variables is mild or rather insignificant in each case.

There are many other variables missing in my models that might be important. For instance, magnitude of ODA may be related to the size of population, GDP, or geographical proximity. Also, decision on the allocation of ODA depends on whether the recipient country is one of the former Japanese colonies. In this case, ODA serves as war reparation. (However, the relationship between variables may be complicated by the

fact that former colonies may have been selected for natural resource potential.) The decision also depends on whether the economy of the country in question is capitalist, socialist or communist. These are the important variables to consider for future studies.

In summary, the correlation between ODA and export is statistically very significant. The correlation between ODA and import and investment is also significant. However, one should be cautious before drawing a conclusion because other important determinants of ODA such as population size are missing in the model.

(省略)

Conclusion

Japan's economic aid in Africa has been criticized as an instrument for promoting its economic interest. The data suggest that Japan has indeed awarded ODA to regions with which it has traded and invested, as with Asia or the Middle East. However, within Africa, this is not the case. The detailed data imply that the trade volume between Japan and individual African countries has not affected Japanese allocation of ODA.

The scope of this paper is limited to the quantitative analysis because of the lack of data: It is not clear, beyond the sectoral break-down, how the fund is used within individual African countries, for instance, whether it is used to promote innovation and invention, diversification of local industries, nurturing of local enterprises including small and medium-size ones. To bet a better picture, it is crucial to obtain the data that show how much of the fund goes the kinds of ventures that may lead to sustained economic growth in the way described in Part I of this paper.

In recent years, Japan's ODA to Africa has tremendously increased in volume, and in some African countries, Japan has become the top-donor. Despite the criticism Japan gets, African leaders often have high expectations regarding Japanese assistance. Therefore, the question of whether or not Japan's aid promotes changes in African economies in the qualitative sense is an important area for future studies.