Chapter 4 The Impact of Japan’s ODA

4.1. Post Evaluation Activity of Japanese Government

The impact of Japan’s ODA can be measured through post evaluation of projects. Evaluation activities are handled by the Ministry of Foreign Affairs of Japan and aid implementing agencies, JICA\(^1\) and OECF\(^2\) in the Japanese government.

The Ministry of Foreign Affairs covers all types of Japanese ODA in its evaluation activities. There are three specific evaluation modes: 1) evaluation by study teams dispatched by the Ministry (country evaluation and joint evaluation with other donors); 2) evaluation by overseas diplomatic missions; and 3) evaluation commissioned by third parties (experts, private sector

\(^1\) JICA (Japan International Cooperation Agency) is a Japanese governmental body established in August 1974 under the supervision of the Ministry of Foreign Affairs of Japan. Out of three pillars of Bilateral ODA, JICA is in charge of technical assistance which includes receiving overseas trainees in Japan, dispatching Japanese experts and volunteers and conducting development studies. Although the Ministry of Foreign Affairs is operating the grant aid, JICA helps the Ministry in promotion and implementation of grant aid.

\(^2\) OECF (Overseas Economic Cooperation Fund) is a Japanese governmental body established in March 1961 under the supervision of the Economic Planning Agency. The agency needs a consensus of three other ministries, namely the Ministry of Foreign Affairs, the Ministry of Finance, and the Ministry of International Trade and Industry for the operation of the OECF. The OECF is in charge of ODA loan, so called Yen Loan, a soft loan with more than 25% of grant element.
organizations). The Ministry also conducts joint evaluation with other aid donors as a part of its efforts to promote aid coordination.

The Ministry performs some 140 evaluations per year. In FY 1994\(^3\), it conducted evaluations for 128 projects, out of which 64 projects were evaluated by third parties. Between FY 1982 and FY 1994, a total of 1,801 projects were evaluated. There are 3,300 completed projects which should be evaluated including both JICA's technical assistance and OECF's Yen Loan projects as of the end of 1993. The evaluations by the Ministry cover only half of them.

JICA has also carried out a variety of evaluations for its projects. Generally, there are two categories of evaluation, namely, specific project-oriented evaluation and sector-oriented evaluation which is conducted on a specific sector of a country in which JICA has implemented a large number of projects. It selects 50-60 projects every year which have been completed 3-10 years before. Project-oriented evaluation includes a joint evaluation with the recipient country, which is designed to bring the viewpoint of the recipient into the evaluation process, and evaluation by JICA's overseas posts. It is conducted three times in a project, i.e. immediately after the completion, 3 years and 8 years after the completion.

OECF also conducts post evaluation on projects under Yen

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\(^3\) Japanese Fiscal Year starts in April and ends in March of the following year. FY1994 means the period during April 1994 to March 1995.
Loan. Although most of OECF evaluation relate to individual projects, some of them are impact studies concerning specific regions and sectors. OECF selects around 20 projects for evaluation every year. As of 1995, it has completed evaluation for 300 projects since 1981. It covers almost all the projects which should be evaluated under Yen Loan. An evaluation report issued by OECF in 1996 carried evaluations for 17 projects, 6 out of which were detailed evaluation. Since OECF dispatches a consulting team to the site for 2-4 weeks in the detailed evaluation, it contains ample data and analysis. Apart from the above evaluation, OECF conducts project monitoring for every project 3 years and 7 years after the completion, by sending questionnaires to implementing agencies of the projects, asking present conditions of operations & maintenance.

4.2. Effect of Japan's ODA in Individual Project Level

4.2.1. The Evaluation by the Ministry of Foreign Affairs

The Ministry of Foreign Affairs of Japan has issued a number of evaluation reports since 1982. These reports have carried evaluations for 1,801 projects by 1994, and almost all the projects received positive evaluation. Projects were not rated as either successful or not successful. The report in 1995, however, disclosed figures of successful and unsuccessful projects for the first time. The report does not mention the reasons for disclosure, but some officials of the Ministry of Foreign Affairs suggested that revealing ODA operations would help the Japanese nation to understand ODA
better and thereby, secure their support for it. The 1996 Report published in July 1996, also discloses the figures of unsuccessful project.

There are 142 evaluations in the 1995 report, and 128 projects, excluding emergency assistance projects, which were divided into three groups; 1) successful projects without problems, 2) successful projects with minor problems, 3) unsuccessful projects with serious problems. The result is shown in table 4-1.

Table 4-1 Overall Evaluation by the MOFA

<table>
<thead>
<tr>
<th>Number of project</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful projects</td>
<td>98</td>
</tr>
<tr>
<td>(no problems)</td>
<td></td>
</tr>
<tr>
<td>Successful projects</td>
<td>27</td>
</tr>
<tr>
<td>(minor problems)</td>
<td></td>
</tr>
<tr>
<td>Unsuccessful projects</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
</tr>
</tbody>
</table>

Source: *Evaluation Report for Economic Cooperation 1995*

98% of the projects were evaluated as successful. Unsuccessful projects were only three, namely the transportation project in Mali (spare parts problem), electrification in Nepal (misuse of equipment), and irrigation in Thailand (delay of implementation). In the 1996 report, two projects out of 110 (also 2%) were categorized as unsuccessful.

However, the above figures should examined because there are problems according to the writer's experience at the Japanese
Embassy in Burma. The first problem was the quality of the evaluator. Out of 142 evaluations, 72 were conducted by Japanese embassy staff, 64 by third party experts, 4 by recipient countries and 2 by other donors according to the report. Embassy staff, who are not experts in relating sectors in most cases, visit project sites only once (staying for a few hours) in normal cases, and evaluate through an interview and questionnaire to officials of the implementing agency. Those evaluations are more likely general impressions of the projects rather than proper evaluations.

A second problem is the shortage of time spent for evaluation. Evaluation by third party experts also have this problem. The report in 1995 published twelve country evaluations by third party experts, who stayed in a country for 12 days on average, according to the evaluation period of the report (10 days after deducting transportation days to and from Japan). Third party experts, who are not experts for those sectors but university staff or press people, have visited 4-5 projects in these days. It is difficult for them to find out substantial problems of a project in such a short visit.

A third problem is the shortage of information on these projects. The Ministry does not have sufficient information concerning these projects. It especially lacks information on operation & maintenance carried out after the completion of a project. These problems were also pointed out by administrative inspectors of the Japanese Government. They recommended the
Ministry to collect and stock data systematically. The inspector's report gave an example of lack of information, which was that the Ministry itself selects projects for evaluation, not on its own, but by existing year books.

4.2.2. Evaluation by OECF

OECF has published evaluation reports every year, which does not rate projects either successful or unsuccessful. The reason for non-disclosure is not clear. But it is supposed that, if OECF discloses the number of unsuccessful projects, it is open to criticism from the press or Diet members, which OECF fears because of shortage of staff. However, OECF has an evaluation study, by which effectiveness of projects can be estimated quantitatively. This is done by monitoring survey conducted for every Yen Loan project after 3 years and 7 years of its completion. OECF sent questionnaires for 91 projects and received answers from 78 projects on the survey in FY 1994. The questionnaire asked the overall evaluation to the project by choosing one of 3 categories; i.e. good (satisfactory), fair (permissive), and poor (unsatisfactory). This question reflects the reputation of the recipient agency. Results are shown in table 4-2.
Table 4-2 Overall Evaluation by Recipients for OECF Projects in 1994

<table>
<thead>
<tr>
<th>Number of projects</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>48</td>
</tr>
<tr>
<td>Fair</td>
<td>19</td>
</tr>
<tr>
<td>Poor</td>
<td>3</td>
</tr>
<tr>
<td>No answer</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
</tr>
</tbody>
</table>

Source: Report for Monitoring Survey, 1994

85% of the projects received an evaluation better than fair. Three projects received "poor" reputations. These are the communication project in Indonesia (the project cannot be operated well due to shortage of operations and maintenance costs), the medical equipment project in Korea (the project cannot be profitable due to the burden caused by the appreciation of Yen), and the agriculture project in Egypt (technology is not diffused due to its difficulties). Even this evaluation is not completely reliable, because it is evaluated by the executing agency of the recipient country itself. No one would like to admit his own failure in operations and maintenance.

The above evaluations of both MOFA and OECF have room to be examined in detail. Nevertheless, it has shown a rough estimate in that a major portion of Japan's ODA projects achieve fair performance as expected. Apart from the figures such as 98% or 85%, it is a fact that many projects under Japan's ODA have run smoothly and effectively.
On the other hand, some books\(^5\) criticized Japan's ODA focusing on its failure. They said that Japan's ODA puts emphasis on large scale infrastructure, which does not benefit grass roots people, or promotes environmental deterioration without considering environmental issues. The others criticized that Japan helps a recipient government to neglect the human rights of local people through its ODA.

Some criticism are no doubt valid. But they tend to focus on sacrifices of the projects and neglect or minimize their benefits. The important thing is the comparison of cost and benefit. In case the benefit is much larger than the cost, the project should be implemented and evaluated positively. For example, some people may say resettlement by a dam construction project costs so much if there is even one person against the resettlement, then the dam should not be constructed. However the important point is how a government compensates for resettlement. The procedure and decision process for resettlement are carried out democratically.

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\(^5\) For instance following books criticize Japan's ODA projects
- Murai Yoshitaka, 無責任援助大国ニッポン, musekinin enjo taikoku nippon, (Japan without responsibility for assistance), Tokyo, JCC Press, 1989
- Sumi Kazuo, きらわれる援助－世銀・日本の援助とナルマダ・ダム, kirawareru enjo, segin, nippon no enjo to namunada damu, (Assistance hated by recipients--World Bank/ Japan and Narumada Dam), Tokyo, Tsukigi Press, 1990
- Sumi Kazuo, ODA援助の現実, ODA enjo no genjitu, (Reality of ODA Assistance), Tokyo, Iwanami Press, 1989
- Nishikawa Jun, 援助と自立, enjo to jiritsu, (Assistance and Development), Tokyo, Doubunkan, 1991
- Sumi Kazuo, ノーモアODAぱらまき援助, nó moa ODA baramaki enjo, (No More ODA for Waste), Tokyo, JCC Press, 1992
- Taga Chikako, ODAと環境・人権, ODA to kankyō, jinken, (ODA and Environment/ Human Rights), Yūhikaku, 1992
Donors, too, have to examine closely the cost and benefits of the project with the recipient government and the people involved in the project.

4.3. Effect of Japan's ODA in Sector Level

The evaluation reports of the Ministry of Foreign Affairs and JICA carried country evaluation and sector, or specific theme evaluation. These were general impressions or an evaluator's opinion, to the project and sector, lacking quantitative analysis as mentioned previously. Therefore, those reports cannot be utilized to measure impact in sector level.

For this purpose, OECF conducted a sectoral quantitative analysis survey for Yen Loan projects. It was done by the writer when he worked in OECF in 1989. This analysis was based on the assumption that Yen Loan was extended to specific sectors of Southeast Asia in considerable amounts, for more than 30 years, and thereby, accumulated contribution by Yen Loan should occupy a certain share in the total stock. Since Yen Loan's contribution to sector evaluation was not publicly known, the result was summarized in a table such as table 4-3, and it was published in the annual report of OECF. Data have been revised every year since then. Table 4-3 is the latest version in the 1996 annual report.

Based on this analysis, several institutions conducted the same kind of analysis. The latest study entitled "Quantitative

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Chapter 4 IMPACT

Evaluation of Japan's ODA in Economic Development of Southeast Asia" was issued by a Japanese research institute in March 1995. Three countries were selected, namely, Thailand, Indonesia and Malaysia. Quantitative surveys were conducted in various sectors in each country. The results of this survey are shown in figure 4-1 to 4-23, which are more comprehensive than table 4-3.
<table>
<thead>
<tr>
<th>Country</th>
<th>Electric Power</th>
<th>Transportation</th>
<th>Telecommunications</th>
<th>Agriculture, Fisheries, Water Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>• Construction of 46% (1,036 MW) of total installed capacity of hydroelectric power stations.&lt;br&gt;• Construction of 7% (300 MW) of total installed capacity of thermal power stations.&lt;br&gt;• Construction of 9% (338 MW) of total installed capacity of diesel power stations.&lt;br&gt;• The above-mentioned facilities account for 14% of Indonesia's total installed capacity (excluding small-scale facilities).</td>
<td>• Construction and rehabilitation of 12% (99 km) of total railways.&lt;br&gt;• Construction of 15% (56 km) of total toll roads.</td>
<td>• Construction of 56% (2,540 km) of microwave route.&lt;br&gt;• Construction of 73% of total junction network in Jakarta.</td>
<td>• Construction of irrigation facilities covering 9% (2,790,000 hectares) of total irrigated area.&lt;br&gt;• Construction of 64% (770,000 tons/day) of total treatment facilities for water supply in Jakarta.</td>
</tr>
<tr>
<td>China</td>
<td>• Construction of hydroelectric power stations with capacity of 4,830 MW and thermal power stations with capacity of 2,700 MW, totaling 7,530 MW (includes work in progress), for 3% of total installed capacity of 218,000 MW.&lt;br&gt;• Provided loans for 8% (5,950 MW) of new capacity (25,000 MW) built under the 8th five-year development plan (1991–1995).</td>
<td></td>
<td></td>
<td>• Provision of loans for the construction of 6 chemical fertilizer plants with a total production capacity of 1.35 million tons (includes work in progress), accounting for 25% of the 5.70 million tons of capacity added during the 8th five-year plan (1991–1995).</td>
</tr>
<tr>
<td>Philippines</td>
<td>• Construction of 8% of the geothermal power stations, 4 units of power plant barge systems, 1 coal-fired thermal power stations, total 7,333 MW (34% of total geothermal power capacity and 39% of coal-fired thermal power capacity).&lt;br&gt;• Construction of 4% (274 km) of the permanent transmission line network.</td>
<td>• Electrofication of 39% (3,542 km) of total electrified railway of 9,941 km (includes work in progress).&lt;br&gt;• Construction of 18% (56 km) of total number of 326,000 km total harbor berths.</td>
<td>• Construction of approximately 3% (1,386 million circuit) of total digital circuits of 57,01 million (includes work in progress).&lt;br&gt;• Currently laying 4,700 km of long-distance transmission optical fiber cable between Lingzhi and Harbin, accounting for 9% of total installed capacity (10,000 km).</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>• Construction of 8% (7,831 MW) of total installed capacity (includes work in progress).</td>
<td></td>
<td></td>
<td>• Construction of 3% (9,000) of regional telephone circuits.</td>
</tr>
<tr>
<td>Thailand</td>
<td>• Construction of 15% of the hydroelectric power stations, 2 thermal power stations, total 2,831 MW of total installed capacity (includes work in progress).&lt;br&gt;• Electrification of 23% (14,440 villages) of electrified villages in rural areas.</td>
<td>• Construction of 9 of the major 13 bridges in Bangkok.&lt;br&gt;• Construction of 34% (45.8 km) of expressway in Bangkok.&lt;br&gt;• Construction of Bangkok International Airport, which handles 5% of total international air passengers (21.01 million people/year) and 3% of total international air cargo (790,000 tons/year).&lt;br&gt;• Procurement of 52% (116 cents) of all diesel rpadding owned by State Railway of Thailand.</td>
<td>• Procurement of all of the public coin telephones for direct, wireless communications with regional and remote areas.</td>
<td>• Construction of small-scale irrigation facilities covering 3% (1.5 million households) of total agricultural households.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>• Construction of 26% of hydroelectric power stations, 4 thermal power stations, total 2,731 MW of total installed capacity in Peninsular Malaysia (33% of 66 MW) of installed capacity of hydroelectric power stations in Sabah state, 18% (366 MW) of installed capacity of hydroelectric power stations in Sarawak state.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MALAYSIA

Yen Loan Portion
46% (construct
10 power stations
totalled 3.425 MW)

Figure 4.1 Contribution to
installed capacity of power
station in Malaysia as of
1993.
(Source: OECF Annual Report
1994)

Yen Loan Portion
20% (construct
182 km of
expressway)

Figure 4.2 Contribution to
expressway in Malaysia
as of 1993.
(Source: OECF Annual Report
1994)

Yen Loan Portion
43% (purchase
51 railcars)

Figure 4.3 Contribution to
railcars in Malaysia as of
1993.
(Source: OECF Annual Report
1994)

Yen Loan Portion
16% (handle 8.2
million ton)

Figure 4.4 Contribution to
cargo handling volume in
West Malaysia as of 1993
(Source: Yearbook of
Statistics 1992)
Yen Loan Portion
54% (construct plant with capacity of 9.60001/s)

Yen Loan Portion
20% (construct 2.063MW)

Figure 4-5 Contribution to filtration plant in Jakarta as of 1993.
(Source: IDE Report)

Figure 4-6 Contribution to installed capacity of power plant in Indonesia as of 1992.
(Source: Statistical Yearbook of Indonesia, 1993, 1988, 1982)

Yen Loan Portion
15% (construct 56km of expressway)

Yen Loan Portion
12% (construct or rehabilitate 799 km of railways)

Figure 4-7 Contribution to expressway in Indonesia as of 1993.
(Source: OECF Annual Report 1994)

Figure 4-8 Contribution to railways as of 1993.
Yen Loan Portion 50% (construct 2,500 km of microwave)

Figure 4.9 Contribution to communication in Indonesia as of 1993.
(Source: OECF Annual Report 1994)

Yen Loan Portion 60% (construct 39 route of network)

Figure 4.10 Contribution to junction network in Jakarta as of 1993.
(Source: OECF Annual Report 1994)

Yen Loan Portion 5% (construct 154,000 ha of irrigation facility)

Figure 4.11 Contribution to irrigation in Indonesia as of 1992.
(Source: Indikator Pertanian 1989, 1984)
Japan's Grant Portion 27% (educate 1,324 nurses)

Figure 4.12 Contribution to number of nurses in Zone 7 of Thailand as of 1992. (Source: Ministry of Health of Thailand)

Japan's Grant Portion 45% (install 804 beds in Hospital)

Figure 4.13 Contribution to hospital in Naconsitamarae district in Thailand as of 1994. (Source: Ministry of Health of Thailand)

Yen Loan Portion 21% (construct plant with capacity of 963,000 ton/day)

Figure 4.14 Contribution to filtration Plant in Thailand as of 1993. (Source: Key Statistics of Thailand)

Yen Loan Portion 14% (construct 11 power plants totaled 11,730 mw)

Figure 4.15 Contribution to installed capacity of power plant in Thailand as of 1993. (Source: Bangkok Japanese Commerce & Industry Association Report 1993)
**THAILAND -2**

Yen Loan Portion
23% (electrification of 14,000 villages)

Figure 4.16 Contribution to village electrification in Thailand as of 1993.
(Source: OECF Annual Report 1994)

Yen Loan Portion
6% (construct 2,850 km of roads)

Figure 4.17 Contribution to road in Thailand as of 1993.
(Source: Japan's Contribution to Thailand 1992)

Yen Loan Portion
69% (purchase 108 railcars)

Figure 4.18 Contribution to diesel cars of Thai National Railways as of 1993.
(Source: OECF Annual Report 1994)

Yen Loan Portion
18% (construct ports with 333,000 TEU capacity)

Figure 4.19 Contribution to handling volume of container in Thailand as of 1994.
(Source: Thai Port Authority)
Figure 4.20 Contribution to airport in Thailand as of 1993

(Yen Loan Portion
93% (construct Bangkok International Airport with capacity 13 million passengers annually)

Figure 4.21 Contribution to telephone line in Bangkok as of 1993

(Yen Loan Portion
5% (construct 64,000 lines)

Figure 4.22 Contribution to industrial estate in Thailand as of 1993

(Yen Loan Portion
12% (construct 12,000 ha of industrial estate)

Figure 4.23 Contribution to irrigation facility in Thailand as of 1993

(Yen Loan Portion
30% (construct irrigation for 1.5 million household)

(Source: OECF Annual Report 1994)

(Source: Thai Industrial Estate Authority)
There are various contributions in some sectors. Based on this survey, the following findings can be deduced.

1. Contribution of Japan's ODA, Yen Loan in most cases, to electric power sector (46% for Malaysia, 20% for Indonesia, 14% for Thailand) is notable, taking into consideration the fact that these figures are against the whole country's capacity. Electricity has been the targeted sector for Japan's ODA. Electricity benefits both industrial and domestic sectors, therefore, Japan's ODA has been contributing economically and socially to those countries.

2. Japan's ODA has also contributed to transportation sectors such as expressway (20% for Malaysia, 15% for Indonesia, 6% of roads for Thailand) and railways (51% of railway cars for Malaysia, 12% of railways for Indonesia, 69% of railway cars for Thailand). As such, Japan's ODA has been invested in economic infrastructure such as power, transportation and communication.

3. Irrigation figures differ between the two countries (5% for Indonesia, 30% for Thailand). This is because Indonesia possesses large stock of irrigation facilities, especially in Java. In recent years, Japan has assisted in implementing irrigation development. This has contributed to the increment of irrigated areas in Indonesia. As for Thailand, the large percentage comprises Japan's loan in the construction of 1,200 small scale irrigation ponds, which
have benefited 30% of household farmers in Thailand.

4. On the other hand, contribution to social infrastructure such as water supply (54% for Jakarta, 21% for Thailand), is limited. This is due to the fact that, in the past, Japan's grant aid has resulted in low economic returns. Therefore, Japan's contribution is relatively small as regards this type of aid. With the growth of economy in Southeast Asian countries, however, Yen Loan has gradually been shifted to social sectors. So that much more contribution can be expected in social sectors in the future.

5. Figure 4-22 and 4-23, gauge contributions of grant aid projects, showing shares in one zone and one district of Thailand. Since grant aid and technical assistance contribute little to capital stock, other methods of evaluation should be developed to measure a contribution.

4.4. Effect of Japan's ODA in Macro Economic Level

The evaluation report of the Ministry of Foreign Affairs includes country evaluation. For instance, the country evaluation of Papua New Guinea (PNG) was published in 1995, and Syria, Jordan, Pakistan and Bolivia in 1994. However, these evaluations introduced just an outline of Japan's ODA to the country and future direction of assistance. Their findings were based on interviews with the recipient, and explanation by an executing agency. Though
these give an estimation of the position of Japan's ODA in the country, they do not provide quantitative data of Japan's contribution, because all of them lack quantitative analysis. So an evaluation of MOFA's report is insufficient to analyze what the economic impact of Japan's ODA is to the macro economy of the country. The evaluation reports of JICA and OECF present similar problems.

Instead of the above evaluation reports, the Japanese Government has contracted with research institutes or universities to study the effect of Japan's ODA in macro economic level with the objective of justifying Japan's ODA from the macro economic point of view. Four reports have been published recently, which have analyzed the impact of Japan's ODA to the macro economy of some of the Southeast Asian countries. The following are reviews of these studies.

4.4.1. Econometric Model of International Development Center Japan (IDCJ) in 1984

The Economic Planning Agency of the Japanese Government gave a contract to IDCJ in 1983 to research "macro economic effect of Japanese assistance to selected Asian countries". A report was published in March 1984 with the same title. Four countries, namely Indonesia, Malaysia, the Philippines and Thailand were selected for case study. The study was to measure the impact of Japan's financial assistance to the macro economy, through increment of government capital stock by Japan's ODA. In other words, Japan's ODA contributes to capital stock which push up the GDP of the
country. IDCJ established an econometric model. For instance, the Thai model has 43 equations, including 31 for presumption and 12 for definition formulae.

Characteristics of the model are;

● GDP is defined as the sum of productions of primary (Y1), secondary (Y2) and tertiary industry (Y3)
● Y1, Y2, Y3 are decided by capital stock (k) and labor supply (E)
● In order to calculate the contribution of Japan's assistance by sector, government capital stock was divided by sectors, i.e. agriculture, industry, energy, transportation, education and others.
● The effect of Japan's assistance was measured by the difference between GDP derived from a model using actual data, and, GDP calculated by using data assuming that Japan's ODA has not been received since 1961.
● Technical assistance was excluded from the amount of Japan's ODA because it does not contribute to capital stock.

Results of simulation by this model is shown in table 4-4.
### Table 4-4 Result of Simulation without Japan’s ODA

<table>
<thead>
<tr>
<th></th>
<th>Indonesia (billion Rp)</th>
<th>Malaysia (million RM)</th>
<th>Philippines (million peso)</th>
<th>Thailand (million baht)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Reduction of GDP at 1980</td>
<td>315.9</td>
<td>369.0</td>
<td>1,272.9</td>
<td>2,529.6</td>
</tr>
<tr>
<td>(2) Ratio of GDP (1)/GDP</td>
<td>0.65%</td>
<td>0.69%</td>
<td>0.48%</td>
<td>0.38%</td>
</tr>
<tr>
<td>(3) Sum of reduction of GDP 1961-1980</td>
<td>1,600.8</td>
<td>1,985.7</td>
<td>6,827.5</td>
<td>11,555.5</td>
</tr>
<tr>
<td>(4) Sum of Japan's ODA 1961-1980</td>
<td>1,055.8</td>
<td>687.0</td>
<td>3054.5</td>
<td>7,854.9</td>
</tr>
<tr>
<td>(5) ((3)/(4))</td>
<td>1.51</td>
<td>2.89</td>
<td>2.23</td>
<td>1.47</td>
</tr>
<tr>
<td>(6) Internal Rate of Return (IRR)</td>
<td>7.5%</td>
<td>16.4%</td>
<td>18.8%</td>
<td>12.3%</td>
</tr>
</tbody>
</table>

Source: *Macro-Economic Effects of Japanese Assistance to Selected Asian Countries*, 1984

The following findings are deduced from this result.

1. The ratio of GDP increment against the sum of the given aid, (5) of table 4-4, are large figures for Malaysia and the Philippines. It means that the aid contributed to those countries has been productive. Since the aid to Malaysia concentrated on the energy sector. The ODA to Malaysia has directly stimulated the economic growth. The high ratio for the Philippines is caused by improvement in its economy during the 1960s and the 1970s. Taking this fact into consideration that its economic performance had been worse during post-Marcos era, this ratio should be worse if the data of the 1980s is added.
2. In order to measure the impact of investment for Japan's ODA, the internal rate of return (IRR) was calculated for each country. According to (6) in table 4-4, the Philippines showed the biggest IRR because of the above reason, and figures for Malaysia and Thailand are above 10% which is judged as effectively fair investment. IRR of Indonesia is 7.5% which is relatively lower, because of its slow economic growth until 1980 even though it received the large scale of Japan's ODA.

4.4.2. Econometric Model of Chulalongkorn University in 1990

In order to evaluate the impact of Yen Loan to Thailand, OECF concluded a contract of research with the Chulalongkorn University of Thailand and Sanwa Research Institute of Japan in 1989. This research covered various types of analysis such as a historical overview analysis, evaluation through macro economic model and sector economic models, Bangkok Metropolitan area perception analysis, rural development perception analysis and institutional impact analysis. The report was issued in March 1990 entitled "Overall Evaluation on the Role of OECF Loans in the Economic Development in Thailand". Out of this report, an outline of the evaluation through the macro economic model has been extended as follows;

- This model only covers Thailand. It has 88 equations including 13 equations for presumptions. Regression analysis based on 1970-1988 data was used for making the following presumptions.
GDP is measured from the growth rate of function such as capital stock, labor supply and cultivated land. Capital stock is the function of private investments and government investments which includes Japan's ODA.


Result is shown in table 4-5. Case IV is the simulation to measure the significance of Japan's ODA (Yen Loan in this case). It displayed that Thailand's GDP in 1988 would decline by 6.7 billion baht without Yen Loan which would result in 130,000 persons unemployed. Though the current accounts and public sector accounts improved, and total external debts outstanding declined, the debt service ratio increased, due to more private sector borrowing from abroad with less favourable terms and conditions.
Table 4.5  Result of Simulation by Chulalongkorn Model

<table>
<thead>
<tr>
<th></th>
<th>Case I</th>
<th>Case II</th>
<th>Case III</th>
<th>Case IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (bil. Baht)</td>
<td>-61.3</td>
<td>0.0</td>
<td>-53.8</td>
<td>-6.7</td>
</tr>
<tr>
<td>Ratio to actual GDP</td>
<td>4.1%</td>
<td>0.0%</td>
<td>3.5%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Current account (bil. Baht)</td>
<td>15.7</td>
<td>0.0</td>
<td>13.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Public sector deficit (bil. Baht)</td>
<td>22.1</td>
<td>0.0</td>
<td>17.6</td>
<td>4.6</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>4.2%</td>
<td>0.0%</td>
<td>3.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Total debt service ratio</td>
<td>4.1%</td>
<td>0.5%</td>
<td>2.3%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Total debt share in GDP</td>
<td>-15.2%</td>
<td>-0.4%</td>
<td>-14.4%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Total external debt (US$)</td>
<td>-7,956</td>
<td>-184</td>
<td>-7,547</td>
<td>-409</td>
</tr>
<tr>
<td>GNP per capita (Baht)</td>
<td>-1,083</td>
<td>0.0</td>
<td>-953</td>
<td>-130</td>
</tr>
</tbody>
</table>

Note: Case I No public sector external borrowing 1970-88
Case II Substitution of OECF loans by IBRD loan 1970-88
Case III No public sector external borrowing except OECF loans 1970-88
Case IV No public sector borrowing from OECF 1970-88

Source: Overall Evaluation of the role of OECF Loans in the Economic Development in Thailand

6.7 billion baht of GDP is a larger figure than that calculated by the IDCJ model, (1) of table 4-4, i.e. 2.5 billion baht in 1980. It accounted for 0.44% of GDP in 1988, while 2.5 billion was 0.38% of GDP in 1980. Both models have used similar concepts though the latter has added cultivated land as a factor. The resulting difference of figures may depend on supplied data, i.e. the former using 1963-1980, while the latter 1970-1988. It will not be wrong to assume that the influence of Japan's ODA in 1988 increased compared to in 1980.

4.4.3. Econometric Model of Mitsui Research Institute on 1991
In 1990, the Economic Planning Agency (EPA) of the Japanese Government contracted with Mitsui Research Institute of Japan, to evaluate the effect of Yen Loan. Mitsui applied a macro economic model, which was developed by EPA in 1989, to Thailand and Indonesia. The concept of the model is the same as IDCJ's model in 1984, but some variables were changed to suit actual data. GDP was also defined as the sum of Y1, Y2, Y3, which were derived from capital stock and labor supply. Data during 1971-1988 were used for conclusions by regression analysis. The $R^2$ value of regression analysis for Y1, Y2, Y3 were 0.9777, 0.9627, 0.9847 respectively, which were an improvement to the IDCJ model in 1984, of 0.9944, 0.8670, 0.8814.

<table>
<thead>
<tr>
<th>Table 4-6 Result of Simulation without Yen Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia (billion Rp)</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>(1) Reduction of GDP at 1988</td>
</tr>
<tr>
<td>(2) Ratio of GDP</td>
</tr>
<tr>
<td>(3) Sum of reduction of GDP 1971-1988</td>
</tr>
<tr>
<td>(4) Sum of Japan's ODA 1971-1988</td>
</tr>
<tr>
<td>(5) (3)/(4)</td>
</tr>
<tr>
<td>(6) Internal rate of Return (IRR)</td>
</tr>
</tbody>
</table>

Source: Report on Evaluation of Effect of Yen Loan, as modified by the writer.

Based on the result of simulation, the following findings were deduced:

1. Reduction of GDP in 1988 was 0.78% and 0.23% of the
actual GDP in Indonesia and Thailand respectively. This ratio was 0.65% for Indonesia and 0.38% for Thailand in 1980 by the IDCJ model shown in (2) of table 4-4. It means that the influence of Japan's ODA became larger in Indonesia, reflecting the large size of ODA contributed to the country, while it was less for Thailand. It is understood that ODA worked efficiently in Indonesia, thus reflecting its big role in the public sector in Indonesian economy, whereas it had a relatively small effect in Thailand.

2. IRR of Yen Loan are 70.5% for Indonesia and 34.0% for Thailand. These are much larger than the figures derived from the IDCJ model in table 4-4 (7.5% for Indonesia, 12.3% for Thailand). Several reasons are raised to explain this. One reasonable conclusion is that of the better ICOR (Incremental Capital Output Ratio) which could have pushed up the IRR with the development of infrastructure in 1980s, in both countries. The second reason is that the Mitsui model handled only Yen Loan which had higher returns than the grant projects, while the IDCJ model included both Yen Loan and grant.

4.4.4. Econometric Model of IDCJ in 1995

The Ministry of Foreign Affairs placed an order to IDCJ to research the effect of Japan's ODA to Indonesia, Malaysia and Thailand in 1994. The report issued was titled "Fundamental study for aid policy for specific theme-- Quantitative Analysis of Japan's
ODA in economic development of Southeast Asia”. The model has the characteristics that, GDP is decided by capital stock and labor supply, similar to the previous model in 1984. The difference is that this model did not divide the type of industry that existed, such as primary, secondary and tertiary. The model had 18 equations, including 9 equations for presumptions, which were simpler than the previous model. This simply means the low reliance of the model, showing an $R^2$ value for GDP presumption of 0.855. 1971-1991 data were used for regression analysis. This model measured not only GDP, but employment, export, import and foreign reserve.

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP at 1991</td>
<td>3.3%</td>
<td>1.4%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Employment</td>
<td>1.6%</td>
<td>0.9%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Export</td>
<td>2.9%</td>
<td>2.1%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Import</td>
<td>5.0%</td>
<td>2.6%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Foreign reserve</td>
<td>7.4%</td>
<td>4.0%</td>
<td>11.3%</td>
</tr>
</tbody>
</table>

Source: Quantitative Analysis of Japan’s ODA in Economic Development of Southeast Asia

Table 4.7 summarizes the result of the impact of assistance for the final year of the model, i.e. 1991. Japan’s ODA helped to increase GDP in 1991 by 3.3%, 1.4%, 5.3% in Indonesia, Malaysia and Thailand respectively. The greatest effect in Thailand showed high ICOR, 0.817. The ICOR of Indonesia was 0.570, while for Malaysia it was 0.214. However, this result is not consistent with the Mitsui model. Reasons for inconsistency may depend on the data.
as well as the observation period. The small effect in Malaysia could be explained by small net transfer of Japan's ODA in late 1980s to Malaysia because of increasing repayment.

Figure 4-24 shows change of the push up effect of Japan's ODA. In the 1970s, the figures for Thailand have been less than those of Indonesia and Malaysia. It improved in the 1980s and surpassed those of Indonesia and Malaysia by 1983. This may be due to the following reasons. For Indonesia, which has a larger role in government sector, the effect of Japan's ODA was used for the government's investment thus resulting in a stable performance. On the other hand, Thailand used Japan's ODA for infrastructure in the 1970s, and activities of the private sectors were stimulated in the 1980s by this development which led to a high growth rate of economic development. Malaysia, suffering from increasing repayment in the late 1980s by borrowing for heavy industrialization and Yen appreciation, did not receive large amounts of Yen Loan by 1989. Thus, the effect of Japan's ODA became moderate there.
4.4.5. Problems of the Models and Summary of Findings

Four econometric models were reviewed in the previous part. Each model has common characteristics, such as 1) measuring effect of ODA by GDP, 2) assumption that GDP is the function of the capital stock, for which Japan's ODA is used, and 3) use of regression analysis by a method of least squares determining the coefficient of the models. The above models are presumed as reliable in GDP shown on the figures of $R^2$ value of each model. However, one must
However, one must keep in mind that the above models have the following problems which are to be solved in the future:

1. Firstly, they do not consider the interest of Japan’s ODA in the model. Though effective assistance should be measured ultimately by an increase in the national income, the models measured it by GDP which did not include the transmission of income to other countries in which interest is counted. GNP is a better index than GDP in this case, because transmission of income is deducted already in GNP. As a result of this, the interest amount was not deducted in the models and the effect of ODA was overestimated by this portion. In addition, the model used net disbursement figures as Japan’s ODA which equals to gross disbursement minus principal repayment. Therefore it is understood that the models completely ignored the interest amount of Japan’s ODA. Actual interest cannot be neglected in terms of local currency due to Yen appreciation even though the interest rate is lower than a private loan. The Chulalongkorn model takes into consideration the interest payment of the external debt sub-model, to measure the size of external debt, but this sub-model did not affect GDP.

2. Secondly, all of the models except the Chulalongkorn model, were based on the assumption that the investment of a government was automatically reduced by the equivalent amount to Japan’s ODA, in case the government had not
received ODA from Japan. They did not consider the amount that would have been substituted by other sources such as IBRD or ADB. As shown in case II of the Chulalongkorn model, GDP had no influence without Japan's ODA if it was substituted by other funds. Therefore, the possibility for the substitution of Japan's ODA by other funds should be examined. Also, any influence on external debts in such substitution cases should be evaluated.

3. Thirdly, the models did not sufficiently cover the problem of time lag between investments and returns. Projects financed by Japan's ODA are large and these cover economic infrastructure, such as power stations, roads and ports. They need a longer time to produce returns than private investments. But the models used the same structure for both private and public investments, in which production was decided upon investment of the previous year. The model, also, did not cover the whole project life of ODA projects, which are more than 30 years in normal cases.

4. Lastly, these models did not have built-in mechanisms for accumulation of capital, which improves productivity of industries, and this in return, drives export through strong competitiveness. Export contributes to GDP and leads growth of domestic industry in the next stage. This mechanism is especially important for Southeast Asia. But all the four models used a similar formula structure for
their whole observation period. They never assumed any change in the structure of an industry in view of economic growth. So this pattern of development should be built in the models in the future.

Taking the above problems into consideration, below is a summary of results derived from the different models:

Table 4-8 Summary of Push Up Effect of Japan's ODA by the Four Models

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Philippines</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) IDCJ model</td>
<td>0.65%</td>
<td>0.69%</td>
<td>0.48%</td>
<td>0.38%</td>
</tr>
<tr>
<td>GDP at 1980</td>
<td>(0.44%)</td>
<td>(0.22%)</td>
<td>(0.22%)</td>
<td>(0.49%)</td>
</tr>
<tr>
<td>(2) Chulalongkorn model</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>0.44%</td>
</tr>
<tr>
<td>GDP at 1988</td>
<td></td>
<td></td>
<td></td>
<td>(0.37%)</td>
</tr>
<tr>
<td>(3) Mitsui model</td>
<td>11.60%</td>
<td>n.a</td>
<td>n.a</td>
<td>1.61%</td>
</tr>
<tr>
<td>GDP at 1988</td>
<td>(1.00%)</td>
<td></td>
<td></td>
<td>(0.37%)</td>
</tr>
<tr>
<td>(4) IDCJ model</td>
<td>3.30%</td>
<td>1.40%</td>
<td>n.a</td>
<td>5.30%</td>
</tr>
<tr>
<td>GDP at 1991</td>
<td>(0.80%)</td>
<td>(0.30%)</td>
<td></td>
<td>(0.31%)</td>
</tr>
</tbody>
</table>

( ) indicates Japan's ODA amount at 1980/GDP at 1980 in (1)
Yen Loan amount at 1988/GDP at 1988 in (2),(3)
Japan's ODA amount at 1991/GDP at 1991 in (4)

Each model has different figures of the push up effect of Japan's ODA to GDP as shown in table 4-8. All figures show positive effects, with the smallest figure being 0.38%, and the highest 11.6%. All the figures are bigger than the figures in parentheses except for Thailand in (1). As the figures in parentheses show the size of Japan's ODA in the same year, push up effect of GDP can be much
bigger than the amount of ODA. It means Japan's ODA has been used well to simulate economic growth. It can be concluded that Japan's ODA has contributed to a considerable growth of GDP in the recipient countries.