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Japan's ODA and Philippine Saving and Growth

Maria Claret M. Mapalad* **

Abstract

This paper assesses the impact of Japan's ODA on Philippine saving and growth over the period of 1956-95 using regression and simulation methods. The approach taken here reflects a deliberate attempt to correct for specific weaknesses in the existing literature on economic assistance and its impact on the recipient country. In particular, the study focuses on a one donor-one recipient relation, employs systematic quantitative methods, and takes account of the role of policy environment in the recipient country. This paper finds that Japan's ODA over the 40 years span complemented Philippine saving and increased income growth. The TSLS model finds no support for the possibility that Japan's ODA was simply substituting for Philippine saving, while the simulation model finds Japan's ODA generated additional income for the Philippines. This paper also highlights the importance of complementarity between private and public sector investments in the Philippines, with Japan's ODA providing significant funding for the latter.

1. Introduction

Standard theories of international capital mobility tell us of the greater potential benefits of allowing capital to flow from countries where it is abundant to those where it is scarce. In the post-war period, such theories provided the economic motivation for the extension of foreign aid (or official development assistance, ODA) by donor countries to recipient countries.

Notwithstanding the above theories, a survey of empirical studies on the ef-

* Assistant Professor of Economics, College of Business, Alfred University, Alfred, NY 14802 U.S.A. 1-607-871-2687 (tel), 1-607-871-2114 (fax), mapalad@alfred.edu.

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fect of foreign aid on recipient countries' saving, growth, and development reveals a lack of consensus, owing to a number of reasons.

First, there is an implicit presupposition that ODA is extended by donor countries for the sole purpose of assisting recipients in their pursuit of higher saving, growth, and development. However, this presupposition ignores the multidimensional attribute of ODA, i.e., for many donors, ODA serves other objectives besides the humanitarian one noted above. Often, donors' ODA policies are part of a larger agenda which includes their recognition of the importance of world stability for both economic and political reasons (especially in an era of greater interdependence, integration, and globalization), as well as economic and commercial reasons such as the expansion of markets for their exports and the security of imported raw materials supply (especially oil). In the words of Yamazawa and Hirata (1992, p.6), "rationales (of ODA-giving by Japan, U.S., and Germany) are partly developmental, internationally minded, and partly self-interest motivated."

Second, existing studies tend to be too aggregative in that they "pool together" ODA programs of several donors and their effects on several recipients. There is however, the obvious problem that, on the one hand, there is no reason to believe that the impact of foreign aid from one donor will be the same, both in quality and magnitude, as that from another donor. On the other hand, even foreign aid from the same donor can have differential impacts on the saving behavior, as well as growth and development performance, of several recipients.

Third, although studies that analyze the impact of one donor on a particular recipient or group of recipients exist, they often lack quantitative analysis. Evaluation reports do exist, however, not having a numerical estimate of a project's positive or negative effect on the host country makes it difficult to assess how significant (or insignificant) this effect may be. This is particularly important when one tries to assess whether resources were actually used where their contribution would have been the greatest. These concerns are clearly reflected in the words of Stiglitz (1997, p. 8), "Some aid has been counterproductive ... But anecdotes, either of success or failure, do not suffice to give us a proper picture of the role that aid has — and can — play. For that, we need to take a look systematically at the data. Similarly, Yamada (1997, pp. 91-92) noted that "the evaluation report(s) of the MOFA ... lack quantitative analysis (and are) ... insufficient to analyze what the economic impact of Japan's ODA is (on) the macro economy of the country."[1] (Texts in parentheses are mine.)

Fourth, most studies fail to take explicit account of the policy environment within which ODA and other resources are utilized in order to meet recipients' development objectives [see Stiglitz (1997)].

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[1] Another reason for the lack of consensus on the effect of foreign aid on domestic savings and growth is that existing studies suffer from a number of methodological shortcomings. For a more detailed discussion of these issues, see White (1992) and Mapalad (1998a).

This paper aims to analyze and, to the extent possible, quantify the impact of Japan's ODA on Philippine saving and growth over the period 1956-1995. Attempts will also be made to explain the results of this study by, for instance, highlighting certain features of Japan's ODA program that could be attributed positive impacts on the Philippine economy, as well as those aspects that could be improved upon. Moreover, as a donor-recipient relationship is two-sided, an examination of the Philippine efforts will also be made, with particular interest in the ability of the Philippines, as a recipient, to take appropriate and complementary actions that will increase the effectiveness of this relationship.

It is hoped that the results of this study can be used in discussions which aim to identify the most effective way (through ODA or other channels) by which donor countries can assist recipient countries in the latter's continued pursuit of higher development. This concern gains more importance in an arena of greater market integration and globalization where problems of one country can become concerns of another country, and the failure of some countries to develop rapidly can constrain future expansions and prosperity of other countries.

This study is timely as it coincides with efforts by donor countries, including Japan, to refocus their ODA programs and reevaluate ODA effectiveness on the basis of broader development concerns.

This paper is organized as follows. Section 2 will provide an overview of Japan's ODA to the Philippines, respectively. Sections 3-4 will present attempts to analyze and quantify, whenever possible, the impact of Japan's ODA on Philippine saving and growth over the period 1956-1995. Section 5 will conclude the paper.

An Overview of Japan's ODA to the Philippines

The donor-recipient relation between Japan and the Philippines began in the signing of the San Francisco Peace Treaty in 1951, which stipulated that Japan make reparations to the Philippines for a total amount of US$550 million over the twenty year period commencing in 1956[2] The same period saw the beginnings of other forms of economic cooperation between the two countries: a yen loan credit (backed by future reparation payments) of US$14.2 million in 1959-61 and Japanese volunteers under JOCV program in 1961. Potter (1996, p.32) also noted of Japan's participation in UN relief aid programs, as well as provision of technical assistance in polio prevention, rice research (IRRI), and development of cottage industries in the late 1960s. In 1969, the first Yen Loan of Y10.8 billion ($30 million) for Pan-Phil (Maharlika) Highway was approved.[3] This was followed by the beginnings of food grant aid in 1970.

1971 marked an important turning point in the donor-recipient relation between

[2] This agreement was followed by Japan's provision of technical assistance to Asia when it joined the Colombo Plan in 1954.

Japan and the Philippines. A balance of payments crisis in the latter following the election in 1969 led to the formation of the World Bank Consultative Group for the Philippines, with Japan as member. This allowed Japan to establish its ODA program of annual yen loans and, from 1972, grant aid, one that is quite apart from its reparations program so that, by 1976 (the last year of reparations), the transition into the ODA program as we know it today was complete. In the process, share of grants to total ODA declined from around three-quarters during the reparations period to 7.5% in 1996 while share of loans to total ODA stood at 87% in 1996 (the remainder was technical assistance).

The ratification of the Trade Treaty in 1972 ushered in a closer relation between Japan and the Philippine government. This was visible in the fact that Japan's ODA closely followed and supported the Philippine government's priorities, which were stated in a series of development plans.[4] Potter used an "accommodation" approach and represented the relation between Japan and the Philippine government as a repeated, cooperative game. Over time, both donor and recipient become familiar with each other and their relation evolves smoothly. This is consistent with Takahashi's (1993, p.67) observation of "... a strong tendency of Japan-Philippine aid programming to reflect the convergent interests of Japanese businesses and the Philippine political and economic elite in political stability and conservative socioeconomic reform in the Philippines."

Of course, there is no guarantee that the priorities of the Philippine government or those of the elite take into consideration the needs of the majority of the population. The limited direct benefits received by the masses from Japan's ODA, coupled with the Philippine government's lack of publicity about it, may explain the lack of recognition of the fact that Japan had been the largest donor to the Philippines throughout most of the 1970s and 1980s. Data show Japan's ODA averaged 0.5% of Philippine GDP during the period 1973-82, but increased to 0.9% during the crisis years of 1983-86 and to 1.2% during 1987-95. Corresponding figures for US ODA are lower, averaging 0.3% of Philippine GDP during the period 1956-83, increasing somewhat (i.e., to 0.7%) during the crisis years, and declining to 0.4% thereafter. That Japan's ODA is higher than the US's was a fact "not many Filipinos realized ... as they were aware only that the US helped them constantly since the days of independence" [Takahashi (1996, p.231)].

The crisis years between 1983 and 1987 coincided with a period during which the role that Japan's ODA has so far played in Philippine development, and to some extent, the Marcos dictatorship was critically reevaluated. What seemed ironic to most observers is the fact that the Philippines, which up to this time received Japan's ODA for almost 30 years, ended up in a situation not much better

[3] Request for this loan was first made by the Philippine government in 1966.

[4] See chapter 4 of Potter (1996) for an extensive review of Philippine development plans from 1971 to 1992 and the role that Japan's ODA played in meeting the priorities stated in these plans.

than it was in the 1950s (before it received Japan's ODA).[5] Although the country experienced some growth in the 1970s, it became apparent that this was overly dependent on the availability of foreign funds and could not be sustained during the debt crisis. This period presented a gloomy picture of a country where social and development conditions deteriorated, despite its many years of economic co-operation with Japan (and other donors, most notably, the US).

In 1986, the "Marcos scandals" raised a lot of questions about the administration and underlying principles of Japan's ODA to the Philippines. Although concerns were raised in the past [e.g., Takahashi (1993, p.64)], they intensified during this period, partly aided by regular media coverage that focused on only the negative aspects of Japan's ODA to the Philippines. One of the responses by the Japanese government to these criticisms was to sponsor (through JICA) a study entitled, "The First Country Study of the Impact of Japan's ODA on the Phiippines," which was published in 1987.[6]

Upon Aquino's assumption of the presidency, Japan (and the US) expressed support for the restoration of democracy by increasing ODA to the Philippines. One may raise the issue of whether Japan was reacting genuinely and voluntarily in support of democratization, or if it were simply responding to international (mostly US) pressure, brought on by Japan's increasing trade surplus. The observation by Yamada (1997, p.67), who was in charge of yen loans at the MOFA at the time, seems to support the former.

In 1989, Japan had the opportunity to improve its image as the largest donor, not only to the Philippines, but since that year, to the whole world (surpassing the historically leading donor, the US). It played a leading role in the Multilateral Assistance Initiative which was sponsored by the World Bank and given the task of coordinating the efforts of both bilateral and multilateral donors to the Philippines.

Japan's role in assisting Philippine development further increased in 1991-2 with the retreat of the US military from the Clark air and Subic naval bases in the Philippines. As a consequence, US ODA declined further while Japan's ODA continued to increase. This was precisely why Takahashi (1996, p.234) used the Japanese term "katagawari" to characterize the shift of assistance to the Philippines from the US to Japan. "Bearers become fresh but the route is the same." This is part of the increasing pressure on Japan to undertake "burden-sharing" in the political stability and security concerns in Asia. Inada (1990) offered an economic explana-

[5] In the words of Takahashi (1993, p.64), "there are few prepared to seriously argue that the Philippine economy in the 1990s has any better prospects than it has had in three previous decades. Significant levels of serious inequality, poverty, and corruption have persevered and have co-existed with significant commitments to at least the formal trappings of democracy."

[6] A second country study was published in 1994. Both studies were chaired by Professor Akira Takahashi.

tion for the concept of burden-sharing. He pointed out that, during this time and in the context of the foreign debt crisis, Japan was called upon to assist in restoring the stability of the international financial system by, among other things, preventing creditor banks from becoming insolvent.

The Impact of Japan's ODA on Philippine Saving

This section is the first of two sections that attempt to assess the economic contribution of Japan's ODA to the Philippines. In this section, the main concern is on the impact of Japan's ODA on Philippine saving, and in this regard, the possibility that the former may simply substitute for the latter. Under such circumstance, the availability of Japan's ODA would have discouraged the Philippines from generating its own resources to support its development objectives. This concern is expressed by Takahashi (1993, p.88) and Phelan (1995, p.32) but not shared by Pante and Reyes (1991, p.134). To shed light on this issue, an attempt is made in this section to measure the impact of Japan's ODA on Philippine saving.

The Model

The model used to quantify the impact of Japan's ODA on Philippine savings is based on the macroeconomic models used by Mapalad (1998a) and Fry (1993). Serious attempts were made to specify a saving equation that corrects for as many of the methodological shortcomings raised in the literature. In this model, it is hypothesized that Philippine saving rate is affected by the following explanatory variables: Japan's ODA and U.S. ODA to Philippines, real income growth, world real interest rate, and lagged savings rate, domestic real intersst rate, domestic inflation rate, and a dummy variable to indicate periods of economic crisis. The last three variables follow Morriset's (1989) model, as well as studies on Philippine saving by Burkner (1980), Okuda (1990), Tanhueco (1994), Phelan (1995), Lim (1996), and Mapalad (1998a). Table 1 presents the Japan ODA-Philippine Saving Model.

Equation [1] below represents Philippine saving rate, followed by equations [2] to [6] which represent five explanatory variables (Japan's ODA, US ODA, real income growth rate, inflation rate, and domestic real interest rate, respectively) that are endogenously determined.

Test Hypotheses

Exactly how each explanatory variable noted above affects the saving behavior of the Philippines is explained below[7]

One of the main concerns of this paper is to find out the impact of Japan's ODA on Philippine saving. As such, particular interest is placed on whether (and by what magnitude) Japan's ODA has a positive, negative, or no impact on Philippine saving. Equivalently, one can say Japan's ODA and Philippine saving are comple-

[7] Tables can be found in the appendix.

Table 1: Japan's ODA-Philippine Saving Model

$$\underline{s} = a0 + a1\,\underline{joda} + a2\,\underline{usoda} + a3\,g + a4\,\pi + a5\,\underline{r} + a6\,rw + a7\,\phi + \alpha 8\,s\text{-}1 \quad [1]$$

$$\underline{joda} = joda\ (IV) \quad [2]$$

$$\underline{usoda} = usoda\ (IV) \quad [3]$$

$$g = g(IV) \quad [4]$$

$$\underline{\pi} = \pi\ (IV) \quad [5]$$

$$\underline{r} = r\ (IV), \quad [6]$$

where underlined variables are endogenous and *IV* is a vector of instrumental variables, given by $IV = (joda\text{-}1, usoda\text{-}1, g\text{-}1, \pi\text{-}1, r\text{-}1, dc\text{-}1, ln(tot), psbr, \pi oil, gDC)$.

Definition of Variables

s is the domestic (or national) saving rate

joda is net disbursement of ODA from Japan as proportion of GDP

usoda is net disbursement of ODA from the U.S. as proportion of GDP

dc is domestic credit-GDP ratio

psbr is the public sector borrowing requirement as proportion of GDP

g is annual growth of real income

r is the real domestic interest rate, given by one-year time deposit rates adjusted for CPI-based domestic inflation

π is the growth of domestic CPI

rw is the real world interest rate, given by U.S. Treasury bill rates adjusted for U.S. CPI-inflation

πoil is the growth of oil price

gDC is the real income growth rate average for industrialized countries.

ln(tot) is the natural log of the terms of trade, given by the ratio of export to import price indexes.

ϕ is a dummy variable which represents crisis years (i.e., ϕ is unity in the years 1958, 1970, 1974, 1980, 1983, 1991 and zero otherwise).

Notes

1. Two measures of Philippine savings are used to test for the sensitivity of results to the savings variable used. These are gross domestic savings rate (i.e., GDP minus private and government consumption as proportion of GDP) and gross national savings rate (i.e., GNP minus private and government consumption as proportion of GNP). The results obtained were qualitatively similar regardless of the savings variable used.

2. Alternative regressions that included other forms of foreign savings such as direct or portfolio investments as explanatory variables yielded insignificant coefficients and lower overall significance of the model. This is also true when Japan's ODA was decomposed into its grant and loan components.

3. Using data over 1956-1995, the above model is processed using a two-stage least squares method. Regression results are reported in the tables below.

ments (as argued by standard growth model), substitutes (as posed by the revisionist view), or independent of each other. To facilitate comparison, the impact of U.S. ODA on Philippine saving is also examined.

The effect of real income growth on saving is expected to be positive, according to Mason's (1981) rate-of-growth effect.

Higher inflation discourages saving and leads to capital flight, especially when prices grow at very high rate (e.g., above 20%) or fluctuate in an unpredictable way. In addition, to the extent that nominal interest rates may not adjust to higher inflation so as to leave real return to savers low or even negative, saving falls. There may also be a consumption effect, e.g., "panic" or early buying as present inflation is expected to be inertial. All of these arguments suggest that higher inflation has a negative effect on saving. However, a positive value such as what Lim(1996, p.37) called "forced saving effect" cannot be ruled out.

Financial liberalization hypothesis suggests a positive relation between domestic real interest rate (as the real reward to savers) and saving rate.

Given that world real interest rate is the real reward to holding a substitute asset (i.e., a foreign financial investment), one would expect a negative impact on saving.

At the onset of a balance of payments crisis and in the years of slower growth which follow, saving rates are expected to fall. This suggests that the dummy variable exerts a negative effect on the saving rate.

The coefficient on previous period's saving is expected to be positive but not to exceed unity. It represents adjustment lag in savings, as well as serial correlation in the data series.

In constructing the above model, two issues were particularly noteworthy. Firstly, two measures of saving (namely, gross domestic saving rate and gross national saving rate) are used to test for the sensitivity of results to the saving variable used. As will be seen below, the results obtained were qualitatively similar regardless of which measured is used.

Secondly, alternative regression models that included other forms of foreign saving such as direct or portfolio investments as explanatory variables were processed but they yielded insignificant coefficients and lower overall significance for the model. This is also true when Japan's ODA was decomposed into its grant and loan components.

Regression Results

In this study, the six-equation model described above is processed using Philippine data over 1956-95 and a two-stage-least-squares method. Regression results are reported in Table 2 and discussed below.

Our results reveal the lack of negative impact (or substitution effect) of Japan's ODA on Philippine saving. Although the estimated coefficient of –1.41 using

domestic saving rate and –0.97 using national saving rate are of the sign consistent with the presence of a substitution effect, corresponding t-ratios (-0.62 and –0.47, respectively) suggest these estimates to be not statistically significantly different from zero. We hence conclude that Philippine saving efforts are not discouraged by the inflow of ODA from Japan. This may be due to the focus of Japan's ODA on economic infrastructural projects (true not only in the Philippines but in most major

Table 2: Regression of Philippine Saving Rate
(Annual Data 1956-95, Two Stage Least Squares Method)

Explanatory Variables ↓	Gross domestic savings rate	Gross national savings rate
0 Constant	-0.88	-0.35
	(-0.44)	(-0.18)
1 Japan's ODA/Philippine GDP^	-1.41	-0.97
	(-0.62)	(-0.47)
2 US ODA/Philippine GDP^	+1.70	+1.65
	(0.40)	(0.43)
3 Real income growth rate^	+0.6	+0.65
	(1.90)*	(1.99)*
4 Inflation rate^	+0.14	+0.22
	(0.43)	(0.63)
5 Domestic real interest rate^	+0.12	+0.17
	(0.38)	(0.54)
6 World real interest rate	+0.10	+0.02
	(0.42)	(0.07)
7 Dummy for crisis years	+0.95	+0.47
	(0.73)	(0.33)
8 Dependent Variable (-1)	+0.84	+0.76
	(3.56)***	(3.36)***
R-squared	*0.9074*	*0.9059*
Adjusted R-squared	*0.8827*	*0.8808*
F-statistic	*35.57****	*34.93****
Durbin-Watson statistic	*2.31*	*2.31*

Endogenous variable. t-statistics in parentheses. *, **, *** Coefficient is statistically significant at a 10, 5, 1 percent level.

recipients) as necessary for or a precondition to faster growth and development [Yanagihara and Emig (1991, p.133)]. All these contribute to growth directly (although the time lag is usually much longer) and indirectly through greater political and social stability (e.g., in rural areas and through job creation). Together with US ODA, Japan's ODA created a positive economic and political environment in the Philippines, hardly the kind that will discourage overall saving.

Our findings also suggest that Philippine saving behavior depends positively and significantly on strong and sustainable income growth. This result is consistent with those of other studies cited earlier. This is particularly true in the 1973-82 period when the economy's growth averaged 5.5% per year. At the same time, domestic saving rate had an unmistakably upward trend. The converse is also true, as observed during the crisis years in 1983-86 when growth slowed and even turned negative and domestic saving rate fell precipitously from 27.4% in 1983 to 18.8% in 1985. Only during the recovery of the economy in 1987 did domestic saving rate begin rising again.

As growth is found to have a major effect on saving, and sustainable growth is expected to bring forth higher saving rate, it is important to understand how such growth can be achieved and sustained. In this regard, results of the "first" stage regression, presented in Table 3 below, provide a guideline on how to design appropriate policies to encourage sustainable growth. In particular, our results highlight the importance of skillful macroeconomic management and use of appropriate policies which yield low inflation rates, positive) real interest rate, and a competitive exchange rate. That lower inflation rate enhances growth is conveyed by the negative coefficient of inflation in the growth equation (-0.67, with t-ratio of –3.3, see (a) in Table 3). This study also suggests that maintenance of low inflation must take account of the findings that inflation tends to be inertial, i.e., highly influenced by its value in the previous period. This point is borne by the estimated coefficient of 1.2 of previous year's inflation rate on current year's inflation rate, with a t-ratio of 1.98 (see (b) in Table 3).

A lower, but presumably positive, real interest rate is also found conducive to growth, with this relationship represented by an estimated coefficient of –0.79 and t-ratio of –3.14 (see (c) in Table 3). Lastly, the positive effect of competitive exchange rates on growth is consistent with declining terms of trade and is captured by the negative coefficient of –7.76 and a t-ratio of –2.57 (see (d) in Table 3).

In addition, "first" stage regression provides other interesting results, two of which are most related to the present concerns and are thus noted below.

On Japan's ODA, first, we find that one of its determinants is its value in the previous period, i.e., Japan's ODA this year can be forecasted relatively well by looking at its value last year. This is exactly what Imai, et al. (1992, p.21) called the "incrementalist" nature of Japan's ODA. It also reflects the "balancing" of Japan's ODA among ASEAN recipients, as noted by Potter (1996, p.32), which has the

Table 3: Regression of Endogenous Variables

Endogenous → Variables ® ↓ Regressor (IV)	Japan's ODA(1)	US ODA(1)	Real income growth rate	Inflation Inflation rate-	Domestic real interest rate
0 Constant	+1.41 (2.16)**	+0.49 (1.18)	17.64- (3.35)***	27.62 (-1.77)*	24.51 (2.42)**
1 Japan's ODA / Philippine GDP	+0.34 (e) (1.85)*	-0.02 (-0.18)	-0.27 (-0.18)	+1.74 (0.39)	-2.65 (-0.93)
2 US ODA / Philippine GDP (-1)	+0.15 (0.45)	+0.25 (1.19)	-2.13 (-0.79)	+1.74 (0.39)	-2.95 (-0.57)
3 Real income growth rate (-1)	-0.03 (-1.12)	-0.02 (-1.07)	-0.13 (-0.53)	+0.98 (1.30)	-0.46 (-0.95)
4 Inflation rate (-1)	-0.01- (-0.37)	0.001 (-0.08)	-0.67 (a) (-3.30)***	+1.20 (b) (1.98)*	-0.44 (-1.14)
5 Domestic real interest rate (-1)	-0.17 (-0.55)	-0.007 (-0.34)	-0.79 (c) (-3.14)***	+1.32 (1.77)*	-0.50 (-1.03)
6 Domestic Credit/GDP (-1)	-0.02 (f) (-2.57)**	-0.005 (-1.04)	-0.13 1.96)*	+0.51-0 (2.68)**	.36 (12) (-2.90)***
7 Natural log of terms of trade	-0.75 (-1.99)*	-0.18 (-0.74)	-7.76 (d) (-2.57)**	+9.39 (1.04)	-12.26 (-2.11)**
8 PSBR/GDP (-1)	+0.002 (0.04)	+0.002 (0.79)	+0.25 (0.53)	-0.9 (-0.66)	+0.711 (0.79)
9 Oil price inflation	-0.0003 (-0.16)	+0.00009 (0.08)	+0.005 (0.38)	+0.81 (2.14)**	-0.08 (-3.08)***
10 OECD Growth	+0.048 (1.49)	-0.08 (1.28)	+0.36 (1.39)	-0.01 0.02)	+0.06 (0.11)
R-squared	0.6546	0.4091	0.5637	0.5647	0.6117
Adjusted R-squared	0.5312	0.1981	0.4079	0.4093	0.4730
F-statistic	5.31***	1.94*	3.61**	3.63**	4.41***
Durbin-Watson statistic	2.32	2.28	1.88	1.85	1.78

Notes: t-statistics in parentheses. *, **, *** indicate coefficients statistically significant at 10, 5, and 1 percent level. (1) as proportion of Philippine GDP.

effect of ODA to all countries increasing proportionately.[8]

Second, we find a negative association between domestic credit and Japan's ODA, represented by an estimated coefficient of –0.02 and a t-ratio of –2.57, which is significant at a one percent level (see (f) in Table 3). This may reflect critical periods in the Philippines, most notably the debt crisis in 1983-85, during which domestic credit was reduced substantially to correct imbalances in the economy. At the same time, as most commercial credit dried up and obtaining new funds from the IMF required acceptance of policy conditionalities, Japan extended commodity loans to finance the purchase of essential imports. Similarly, domestic credit fell during the recession in 1990-91, which coincided with natural calamities such as the eruption of Mt. Pinatubo, for which Japan extended emergency aid. In addition, these episodes are noteworthy in that they show the sensitivity of Japan's ODA to urgent needs of the Philippines

In contrast, our results show U.S. ODA to be largely independent of Philippine economic conditions. This is consistent with the finding that none of the regressors in the US ODA equation is found to be statistically significant at the ten percent level or better (see the third column in Table 3). This confirms the fact that U.S. ODA-giving possesses a greater political and strategic motivation than Japan's ODA, as it was particularly true for the Philippines (i.e., ODA in exchange for the use of Clark air and Subic naval bases).[9]

The Impact of Japan's ODA on Philippine Macroeconomy

The model used to quantify the contribution of Japan's ODA to the Philippine economy is based on two studies undertaken by the International Development Center of Japan under the request of the Ministry of Foreign Affairs[10] The first study, undertaken in 1984, attempted to quantify the impact of Japan's ODA on the economies of recipient countries such as Indonesia, Malaysia, Philippines, and Indonesia over the period 1961-80.

The second study, done in 1995, excluded the Philippines from the group of recipients and covered a more recent period, 1971-91.

Both studies attempted to characterize the evolution of each recipient's economy over the time period studied using a set of behavioral and definitional equations to describe (or model) what actually happened. Then, a simulated model, which was intended to approximate the actual situation, is produced and used for considering the hypothetical scenario that Japan's ODA is not received. The two studies are

[8] Of course, this will no longer be the case as the Fiscal Structural Reform Law calls for cuts in Japan's ODA budget by no less than 10% in the three years beginning in 1998.

[9] Imai et al. (1992), Shishido and Minato (1994), and Mapalad (1998b) found Japan's ODA program to have a stronger "humanitarian" motivation than U.S. ODA program.

[10] The author is highly appreciative of the work by Dr. Junichi Yamada of the OECF, which provided the information about these studies. As they were written only in Japanese, the author is grateful to Dr. Yamada for his discussion of these studies in English [Yamada (1997)].

essentially the same, except that the second one used a simplified model (with less equations) than the first.

The model in the present study is patterned more closely to the second model due to its more manageable data requirements.

Mechanism of the Model

The model assumes that Japan's total ODA, exclusive of technical assistance, is used to finance government investment, raising government and (consequently) total capital stock. Higher capital stock, combined with labor, allows greater production to take place (i.e., higher GDP). Higher GDP, through feedback and repercussion, affects total employment, government revenue, government and private investment, and private consumption, exports and imports. A list of the variables used in the model and their data source aregiven in Table 4 below.

Two sets of models will be simulated: The actual situation where Japan's ODA is received by the Philippine government and the above mechanism is allowed to work itself out, and a counterfactual model where it will be assumed that no Japan's ODA was received since 1956. Contribution of Japan's ODA to GDP, employment, exports, imports, private investment, and other variables will be calculated by comparing (i.e., taking the difference of) the values of these variables under the actual scenario and the counterfactual scenario. For instance, Philippine income in 1995 would have been x% lower than it was if Japan's ODA were not received since 1956. In addition, attempts will be made to measure the growth impact of Japan's ODA.

Preparation of the Model

The basic objective is to come up with a simulation model—a set of structural/behavioral and definitional equations—which can explain the evolution of the Philippine economy over the period 1956-95. Such model should be able to "fit" the actual data available.

The search for this best-fitting model (i.e., the simulation model) was done by generating OLS regression equations and judging them on the basis of R-squared, adjusted R-squared, Durbin-Watson statistics of autocorrelation, and F-statistics of overall significance of a regression model. Similar statistics were used in the IDCJ study. The estimated coefficients were then used as parameters of the simulation model. This model is judged to be "good" or "accurate" on the basis of how close the simulated values are to the actual values. The difference between them (i.e., the errors) was kept within 10% of actual values, except for the exports variable for which the errors averaged at 18%. Average error for each variable is given in Table 5.

Several runs of regression and simulations were performed before the final model was reached. The final simulation model is presented in Table 6 and the results of simulation are contained in Table 7.

Table 4: List of Variables and Data Requirements

Except for real GDP and employment which were taken from NEDA and NSCB, all others were taken from various issues of IMF, *International Financial Statistics Yearbook* and are referenced by line numbers (as indicated below).

Endogenous Variables		**Reference line number**
BP	Balance of Payments	derived
BPC	Current Account Balance	78ald
BPK	Capital Account Balance	78bcd+78bjd
CG	Government consumption	91f/64
CP	Private consumption	96f/64
E	Employment	NEDA, NSCB
FED	Foreign reserves	1d.d
GDP	Gross Domestic Product	NEDA (in 1985 pesos)
I	Gross fixed investment	93e/99bip
IG	Gross Government fixed investment	(82-91f)/99bip
IP	Gross Private fixed investment	derived
J	Inventory investment	93i/99bip
K	Total capital stock	derived
KG	Government capital stock	derived
KP	Private capital stock	derived
M	Imports	98c/75
N	Population	99z
PGDP	GDP deflator	99bip
RG	Government revenues	81/99bip
X	Exports	90c/74
Exogenous Variables		
JODA	Japan's net ODA to the Philippines less technical assistance	MOFA
BPKDI	Net foreign direct investment	78bdd+78bed
BPKPI	Net foreign portfolio investment	78bfd+78bgd
BPKO	Net other foreign flows	78bhd+78bid
BPTR	Net transfers	78ajd+78akd
DEPG	Depreciation on government capital stock	assumed
DEPP	Depreciation on private capital stock	assumed
M2	Money supply	34+35
NEO	Net errors and omissions	78cad
PI	Capital goods price index	63
PM	Imports price index	75
PX	Exports price index	74
PXW	World price index	001
RATE	Exchange rate (peso/US$)	rf
T	Time trend	assumed

Dummy Variables

D1 = 1 for 1956-72; 0 otherwise
D2 = 1 for 1973-82; 0 otherwise
D3 = 1 for 1983-86; 0 otherwise
D4 = 1 for 1987-95; 0 otherwise
DIP = 1 for 1960-73; 1985-95; 0 otherwise

Table 4... Continued

Preparation of Data

1 All data are in millions of 1985 pesos, except FED which is in million of US dollars. Price indexes all have 1985 as base year. RATE is given by pesos per US dollar (annual average). E and N are in millions of people.

2 IG is given by the difference between government consumption and total government expenditures, both in current values. PGDP is used as deflator.

3 IG0 is given by government investment in current values less JODA.

4 JODA is Japan's net ODA to the Philippines net of technical assistance and expressed in millions of 1985 pesos.

5 Calculation of capital stock is based on studies by Sanchez (1983) and Paderanga (1988) which gave estimates of capital-GDP ratio. Their annual estimates were numerically different, except in 1972, when both estimated the ratio to be 3.72. This was used to derive the value of capital stock in 1972, given real GDP for that year. Based on the ratio of government to private construction investment which was approximately 1:5-1:4, it was assumed that in 1972, 25% of capital stock was public and 75% was private. Depreciation rates were assumed to be roughly 10% per year. This is decomposed into 6% on public capital and 12% on private capital. Tax concessions on corporate income and accounting procedures suggest that private capital stock depreciation rate would be higher than that for public capital. Casual observation of public building and other structures, as well as equipment and machinery suggest the tendency of public capital stock to be older than private capital stock. On the basis of these assumptions, annual values of public and private capital stocks were generated, starting from the assumed 1972 values and given the depreciation rate above.

7 Price indexes for exports and imports are based on unit values of exports and imports from IFSY until 1985. Thereafter, indexes were based on implicit export and import deflators derived from comparing exports and imports figures in current and constant (1985) prices as reported in PSY. PXW is index for world export values from 1960 onwards. For earlier years, index for export values for the U.S. is used.

8 BPK is the capital account balance until 1966 and the financial account balance thereafter.

9 FECID=foreign reserves (in US dollars) revaluation due to changes in exchange rates between U.S. and other currencies held as reserves—was not necessary as FED is already expressed in U.S. dollar values and already reflects revaluation.

Table 5: Percent Deviation Between Actual and Simulated Values

Variable	% Deviation	Variable	% Deviation
GDP	3.71	KG	4.42
CP	0.84	K	5.49
CG	0.45	X	18.04
IP	4.75	M	2.63
IG	1.20	RG	3.45
I	7.17	E	3.84
KP	5.85		

Table 6: Japan's ODA- Philippine Macroeconomy Simulation Model (Final Version)

(1) GDP = -124514+0.1227K+16.4338E+80000D1+156896.6D2+75573.42D3
R2 = 0.985649; Adj R2 = 0.983539; DW = 1.093125; F-statistic= 467.0391

(2) CP = 0.637CP(-1) +0.118GDP +1822.247N
R2 = 0.991547; Adj R2 = 0.990823; DW = 1.482411; F-statistic= 1368.575

(3) CG = 3897.8 +0.6698CG(-1) +0.1887RG
R2 = 0.976292; Adj R2 = 0.974975; DW = 1.166616; F-statistic= 741.2414

(4) IP = 0.52IP(-1) +1.0478CG(-1) -15600.74DIP
R2 = 0.865319; Adj R2 = 0.853775; DW = 1.479325; F-statistic= 74.9576

(5) IG = -7498.467 +0.412281RG +7738.255D1 +1.7637JODA
R2 = 0.914515; Adj R2 = 0.907391; DW = 1.968661; F-statistic= 128.3749

(6) X = 0.4056X(-1) +0.086GDP
R2 = 0.903163; Adj R2 = 0.888265; DW = 1.734305; F-statistic= 60.62304

(7) M = 9340 +0.064GDP +0.69M(-1) +0.5446(FED*RATE)
R2 = 0.955504; Adj R2 = 0.95169; DW = 1.796101; F-statistic= 250.5313

(8) RG = -7731.5 +0.045GDP +0.2238M +873.327TREND
R2 = 0.977413; Adj R2 = 0.97553; DW = 1.743201; F-statistic= 519.2729

(9) E = 3927 +0.616E(-1) +0.00749GDP -1871.9D1 -1765.2D2 -922.5D3
R2 = 0.993088; Adj R2 = 0.992041; DW = 2.509663; F-statistic= 948.2716

(10) N = 1.0211N(-1)
R2 = 0.999896; Adj R2 = 0.999893; DW = 2.234839; F-statistic= 354795.4

(11) I = IP + IG

(12) KP = KP(-1) + (1-0.12) IP

(13) KG = KG(-1) + (1-0.06) IG

(14) K = KP + KG

(15) PGDP given

(16) PBC = X (PX/100) - M (PM/100) + BPTR

(17) BPK = BPKDI (PI/100) + BPKPI + BPKO

(18) BP = BPC + BPK + NEO

(19)FED = FED(-1) + BP

(20) J = GDP - (CP+CG+I+X-M)

Notes:

1 To improve the fit of the simulated model to the actual values of GDP, the intercept of equation (1) was modified as follows:

1956-61: -124514;	*1962: -114514:*	*1963-64: -104514;*
1965: -100514;	*1966: -97514;*	*1967: -90000;*
1968: -85000;	*1969: -80000;*	*1970: -75000*
1971: -70000;	*1972: -65000;*	*1973-95: -120000*

2. Equation (6) is based on a regression model using 1956-72 data only.

Table 7: Impact of Japan's ODA Over Entire Period

YEAR	GDP	CP	CG	IG	IP	I	KG	KP	K	X	M	RG	E
Additional Values (in millions of 1985 pesos) Made Possible by Receipt of Japan's ODA													
1956-95	411780	115946	16656	196829	30111	226940	2263580	232464	2496044	56242	71030	34427	6421
1956-72	19226	4824	638	21419	956	22375	120064	3694	123758	2501	2880	1510	246
1973-82	94074	25318	3485	56611	5755	62366	554696	29562	584258	12647	15304	7658	1362
1983-86	61256	17929	2631	20433	4952	25386	328832	34113	362944	8504	11062	5232	1018
1987-95	237225	67875	9902	98366	18447	116812	1259989	165095	1425084	32590	41784	20026	3795
Additional Values as % of Actual Values													
1956-72	0.0042	0.0013	0.0015	0.0825	0.0017	0.0270	0.0297	0.0003	0.0069	0.0040	0.0019	0.0028	0.0014
1973-82	0.0176	0.0066	0.0066	0.2175	0.0052	0.0456	0.1131	0.0019	0.0288	0.0145	0.0107	0.0110	0.0089
1983-86	0.0250	0.0103	0.0136	0.1971	0.0130	0.0525	0.1230	0.0037	0.0305	0.0154	0.0190	0.0179	0.0134
1987-95	0.0369	0.0142	0.0152	0.1904	0.0212	0.0842	0.1454	0.0066	0.0423	0.0149	0.0162	0.0181	0.0182

Table 8: Impact of Japan's ODA on the Philippine Economy Over the Period 1973-95

YEAR	GDP	CP	CG	IG	IP	I	KG	KP	K	X	M	RG	E
Additional Values (in billions of 1985 pesos) Made Possible by Receipt of Japan's ODA													
1956-95	155755	41369	5685	110479	9354	119833	923902	50494	974396	20783	24989	12602	2203
1956-72	0	0	0	0	0	0	0	0	0	0	0	0	0
1973-82	20066	4869	624	22786	859	23645	128731	2448	131179	2580	2879	1547	242
1983-86	19726	5251	725	17225	1208	18433	117804	5498	123302	2625	3177	1599	280
1987-95	115963	31249	4335	70467	7287	77755	677367	42547	719914	15579	18933	9456	1681
Additional Values as % of Actual Values													
1956-95	0.0083	0.0029	0.0031	0.0969	0.0032	0.0295	0.0455	0.0008	0.0116	0.0049	0.0041	0.0048	0.0036
1956-72	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1973-82	0.0038	0.0013	0.0012	0.0875	0.0008	0.0173	0.0262	0.0002	0.0065	0.0030	0.0020	0.0022	0.0016
1983-86	0.0081	0.0030	0.0037	0.1662	0.0032	0.0381	0.0441	0.0006	0.0104	0.0048	0.0055	0.0055	0.0037
1987-95	0.0180	0.0065	0.0067	0.1364	0.0084	0.0560	0.0782	0.0017	0.0214	0.0071	0.0073	0.0085	0.0080

Simulation Results

This study finds Japan's ODA received by the Philippines over the period 1956-1995 has had a positive effect on the latter's economy. In particular, additional income in the magnitude of 2.2% of total income earned during the period or 411.78 billion 1985 pesos was made possible by the receipt of Japan's ODA (see (a) in Table 7).[11] This is equivalent to a per-person lump-sum "income subsidy" of about 14 thousand pesos in 1995 (measured in current prices), or an annualized additional income of 200 pesos per person received over a period of 40 years. The impact is found to be significant during the crisis years of 1983-1986 when income actually fell by -11% (in real terms) and would have fallen further (by 2.5%) had Japan not extended ODA during this period. Our results show an increase in the contribution of Japan's ODA (in terms of additional income) over time, from a mere 0.42% during most of the reparations period (1956-72) to 3.69% during the post-debt crisis period (1987-95) (see sub-period averages in Table 6).

As one would expect, this higher income exerted positive effects on other variables, through feedback and repercussion. For instance, employment was approximately 1.05% higher than it would have been, exports 1.33%, and imports 1.16% (see (b), (c), and (d), respectively, in Table 7). The latter two results combine to suggest a positive effect on the net trade account (in goods and services). These results are generally supported by findings from individual project evaluations conducted by MOFA and other aid administrators, as well as private organizations.[12]

A particularly important result of this study is the impact of Japan's ODA on private investment. Our results suggest that private investment would have been 1.03% less, if not for Japan's ODA to the Philippines since 1956 (see (e) in Table 7). This gives a measure of the extent to which ODA encouraged or complemented private sector participation in the economy. An increasing link between Japan's ODA and private investment in the Philippines over time is also found.

As regards Japan's ODA growth-enhancing effect, this was confirmed by this study. In particular, the average growth rate of Philippine GDP over the period 1956-95 would have been 0.21 percentage points lower, or would have averaged 3.76% per annum instead of 3.97% had Japan's ODA not been received since 1956. However, it must be noted that this higher growth effect was found not to be statistically significant using the regression model in the previous section. An attempt to explain this is made later.

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[11] At the prevailing exchange rate of 18.607 pesos per US dollar in 1985, this figure is equivalent to approximately US$22 billion (in real terms).

[12] Increased employment was noted by project evaluation reports by the Sakura Institute of Research and Center for Pacific Business Studies, 1996; higher net trade or foreign exchange earnings and savings noted by a MOFA team report, 1983; and higher foreign direct investments by an OECD-RIDA evaluation report, 1996).

Certainly, this contribution would have been higher had the policy environment in the Philippines been much better (i.e., stable macroeconomic policies, transparent, accountable governance and outward-oriented, competitive markets [Stiglitz (1997, p.6)], especially during the 1980s. It is interesting to find that Japan's ODA contributed most to Philippine growth during the 1973-82 sub-period (growth was higher by 1.11 percentage points). At the broader macro level, this highlights the importance of state-led growth (although doubts are cast on the financial and institutional sustainability of such a strategy, as well as its tendency for unbalanced, uneven social impact and narrow participation). At the micro level, this reflected the strong donor-recipient relation between Japan and the Philippines during the period and how well they accommodated and knew each other, as noted by Potter (1996). In contrast, Japan's ODA had the least contribution to Philippine growth during the 1956-72 sub-period (approximately, the period of reparational ODA), increasing growth rate by merely 0.09 percentage points. This is consistent with Takahashi's (1993, p.66) observation of "many cases of misallocation, misuse and waste (of capital goods) ... considerable portions distributed among established business groups, but resources were hardly used in ways that generated systematic industrial development and modernization."

A Brief Comparison with the IDCJ 1995 Findings

Below is a comparison of impact of Japan's ODA on the Philippine economy obtained from this study with the results of the IDCJ 1995 study for Indonesia, Malaysia, and Thailand. As the IDCJ 1995 study covered the period 1971-91, the results for the Philippines must cover a comparable period. As such, the period 1973-95 is used and the simulation results are presented in Table 8.

The IDCJ 1995 study found that Japan's ODA over the period 1971-91 produced additional incomes for Indonesia, Malaysia, and Thailand, as well as induced effect on employment, exports, and imports. These estimates are reported in Table 9 below and are compared with this study's estimates for the Philippines during the period 1973-95.

In all four variables, it is clear that Japan's ODA had the smallest positive impact on the Philippines, the largest on Thailand, and intermediate impacts on Malaysia and Indonesia. One explanation for this result can be made on the basis of the sectoral distribution of OECF loans in these countries. The OECF 1996 Report shows that OECF projects in the Philippines in the power and transportation sectors accounted for smaller shares of total capacity as compared to those in Indonesia, Malaysia, and Thailand. For instance, OECF projects in power accounted for 8% of total installed capacity in the Philippines, as compared to higher corresponding figures of 14% in Indonesia, 24% in Malaysia, and 15% in Thailand. Similarly, OECF projects in transportation comprised 11% of total national roads in the Philippines while they were 15% of total toll roads in Indonesia, 19% and 34% of expressway in Malaysia and Thailand, respectively [cited in Yamada (1997, p.83)].

Table 9: Comparison of the Impact of Japan's ODA on Selected Economic Variables
(as percent of actual values)

Country	Real Income	Employment	Exports	Imports
IDCJ (1995) Estimates for the Period 1971-91:				
Indonesia	3.3	1.6	2.9	5.0
Malaysia	1.4	0.9	2.1	2.6
Thailand	5.3	2.3	9.5	7.3
This Study's Estimates for the Period 1973-95:				
Philippines	0.83	0.36	0.49	0.41

The above results can also be explained by pointing out that the period of study for Indonesia, Malaysia, and Thailand includes years of very strong economic performance while that for the Philippines includes the period of severe economic crisis (1983-85) and recession (1990-91). As the impact of ODA is heavily influenced by the macroeconomic conditions and policy environment in the recipient country, as suggested by the World Bank 1997 study, the above results will not be surprising [Stiglitz (1997)].

A comparatively more positive impact Japan's ODA on Thailand (as found by IDCJ) than on the Philippines (as we found in this study) is in keeping with the conclusions reached by Potter and Phelan. Potter (1996, p.70) pointed to the latter's "double view of the possible uses of aid" (i.e., using aid for investment, on the one hand, and for balance of payments and budgetary support, on the other hand) as compared to the former which used aid primarily to finance investment projects. In the same vein, Phelan (1995, p.24) noted "the majority of OECF loans are coursed through the central government (in the Philippines) ... This setup made the Philippine ODA more vulnerable to political influence than that of Thailand."

A last word of caution: One must keep in mind the limitations of the above simulation model and use judgment in interpreting the above results. That the simulation model assumes that the entire ODA from Japan was invested by the Philippine government and that the productivity of overall investments were constant (as opposed to declining during this period[13]) suggest that our results may

[13] Estimates of the incremental capital-output ratio (ICOR) show it was relatively constant (at 4) from 1950s to the mid-1970s and increased in the 1980s (e.g., ICOR was 6 in 1980 and 10 in 1982).

represent the upper-limit the positive impact of Japan's ODA on Philippine income growth. This is probably the main reason for why the regression result in section 3 finds no statistically significant positive effect (see Table 3 that shows a t-ratio of -0.18 on the coefficient of Japan's ODA on Philippine income growth) while the simulation model supports a positive effect, however small in magnitude it might be.

Conclusion

This study finds that Japan's ODA made available to the Philippines funds that complemented domestic and national saving and allowed the country to increase its investments in economic and, to a lesser extent, social infrastructure. These investments generated additional income for the Philippines and resulted in slightly higher growth. In addition, one could argue that even the part of Japan's ODA that may not have paid for investments (e.g., a large share of ODA during the critical period between 1983 and 1986 was used for budgetary support and balance of payments relief) still had an indirect effect of enhancing income growth by restoring stability of the economy and, together with US ODA, by establishing more democratic political and social institutions. These factors could go a long way in encouraging a more rapid and sustainable economic growth.

That the positive effect of Japan's ODA on Philippine saving and growth extends to other broader aspects of economic and social development is not an automatic process but rather one that involves conscious, appropriate, carefully designed interventions in order to turn "sheer" growth into one that is consistent with and supportive of equitable, sustainable, and participatory development.

To the extent that Japan's ODA program administrators subscribe to the philosophy that ODA, once given, falls within the recipient government's control highlights the need for a convergence, in earnest, between priorities of the Philippine government and the needs of the population that it supposedly represents. Japan's ODA must continue to encourage greater democratization and participation of the Filipino people in national priorities-setting and policy formulation. The restoration of democracy in 1986 was an important step in achieving this convergence. Needless to say, the process continues to be imperfect (i.e., corruption and rent-seeking activities still abound) and efforts to put the necessary institutional reforms in place remains crucial. The same process must also be complemented by the Philippine government's greater emphasis and more expedient action on enhancing the capabilities of the people through an improvement, both in magnitude and quality, of its social services (e.g., education, health, and information).

Furthermore, one must not underestimate the importance of sufficient (perhaps, moderate) and sustained income growth in bringing about overall development and welfare improvements. The Philippine experience particularly highlights the "asymmetric nature of growth" where, on the one hand, the lower income

groups benefit, although disproportionately less than other income groups, from a growing economy, while on the other hand, they bear a disproportionately heavier burden of an economic slowdown. Clearly, the first scenario is preferred and Japan's ODA can indeed contribute to enhancing economic growth in the Philippines, even if it were the "sheer" type.

Lastly, whatever "kind" of growth and development will be generated by Japan's ODA and other resources available to the Philippines ultimately rests with the government, in how it complements and supplements these resources, by how it spends or redistributes the additional income which growth makes available (e.g., in areas "neglected" by Japan's ODA for one reason or another), and in the kinds of policies it pursues, institutions it creates, and the alliance it forges with the society

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