大東文化大学経済論集　89－8，2007.7

Capital Flow to Asian Developing Countries and Sustainability of External Debt

Erika Yokomizo*

1．Introduction

Does each type of capital flow to developing countries have the same characteristics in each recipient country？ In this paper, we try to explain the foreign capital outflow from developing countries from the sustainability of their external debt.

Capital flow can be classified into four categories : foreign direct investment, equity investment, bond investment, and loan. Figure 1 is the sum of equity investment, bond investment, and loan to Thailand. This figure shows that foreign capital turned into outflow in the second quarter of 1997. Talking about loan to Thailand, it turned into outflow in the second quarter of 1997 (Figure 1 c). And about bond investment, periods after the second quarter of 1997 are dotted with the inflow in the outflow keynote (Figure 1 b). Contrary to these flows, it cannot be said that equity investment has changed to outflow after the 2 nd quarter of 1997 (Figure 1 a). In the inflow keynote, it is rather dotted with the outflow period. What is the factor capital flows depend on？

Sarno and Taylor (1999) gauge the relative importance of permanent and temporary components of capital flows to Latin American and Asian developing countries over the period 1988－1997, for the broad categories of flows in the capital account. They find relatively low permanent components in equity flows, bond flows and official flows, while commercial bank credit flows appear to contain quite large permanent components and foreign direct investment flows are almost entirely permanent. Albuquerque, Loayza, and Serven (2005), using a large cross-country time-

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This paper is a part of outcome of the abroad research program in the academic year of 2005.
I appreciate to Daito Bunka University and George Washington University.

* Daito Bunka University, Department of Economics
E-mail : eyokomi@ic.daito.ac.jp

series data set, evaluate the dependence of foreign direct investment on global factors (i.e. factors that drive foreign direct investment across several countries). Fernandez-Arias (1996) studies the determinants of private capital flows to middle-income countries after 1989. His key question is whether these flows are 'pulled' by attractive domestic conditions or 'pushed' by unfavorable conditions in developed countries. And the answer is 'pushed', the decline in international interest rates.

This paper is organized as follows. Section 2 overviews the test of sustainability of external debt and operationalizes the test. Section 3 tries to explain foreign capital outflow by sustainability of external debt using the result of section 2. Section 4 is a concluding remark.

2. Sustainability of external debt

We refer to researches on sustainability of external debt. Trehan and Walsh (1991) test sustainability of U.S. external debt, using the time series data of U.S. trade balance and its external debt. Husted (1992) tests sustainability of U.S. current account deficit, using the time series data of U.S. exports and imports of goods and services. Similarly, Wu, Fountas and Chen (1996) test sustainability of U.S. and Canadian current account deficit, using the time series data of their exports and imports of goods and services.

First, the intertemporal constraint which makes the external debt sustainable is derived. Generally, an external debt is defined as follows :

$$(1) \quad S_t - S_{t-1} = r_t S_{t-1} + D_t,$$

S_t is the external debt at the end of period t. r_t is the interest rate applied to period t. Moreover, D_t expresses the current account deficit (net of the interest payment of an external debt) of period t.

It is assumed that r_t is the random variable which is $\mathrm{E}(r_{t+i} \mid I_{t-1}) = r$ about all $i \geq 0$. I_{t-1} expresses the information set of the private sector at the beginning of period t. Although it is assumed that S_{t-1} is in I_{t-1}, r_t and D_t are not in this information set. According to the information set I_{t-1}, the expected values of equation (1) are taken. The expected values of external debt are repeatedly removed, then

the following formula will be drawn.

$$(2)\quad S_{t-1}=-\sum_{j=0}^{\infty} R^{-(j+1)}E(D_{t+j}\mid I_{t-1})+\lim_{j\to\infty}R^{-(j+1)}E(s_{t+j}\mid I_{t-1}).$$

R_t expresses the realized gross earning rate, $1+r_t$. The expected value of R_t is shown by R. In order to fill the intertemporal budget constraint, in other words not to leave an external debt, the last term in the right-hand side of equation (2) should be zero.

$$(3)\quad \lim_{j\to\infty}R^{-(j+1)}E(s_{t+j}\mid I_{t-1})=0.$$

If the equation (3) is filled, then the discounted value of a future expected external debt converges to zero as a period approaches to the infinite. Here, it is interpreated that an external debt is sustainable if the discounted value of a future expected external debt converges to zero. According to the equation (2), in order to make the external debt sustainable, the present external debt S_{t-1} must be equal to the present and discounted future current balance surpluses excluded the interest payments of the external debt

$$-\sum_{j=0}^{\infty} R^{-(j+1)}E(D_{t+j}\mid I_{t-1}).$$

According to Trehan and Walsh (1991), if the processes of past current account deficits (excluding interest payments of external debt) and past external debts are observable, imposing restrictions on these movements can show that the equation (3) will be realized. The restrictions on the current account deficit and the external debt we will use in order to verify whether the equation (3) is realized are the implications obtained from the propositions Trehan and Walsh proved. These propositions are as follows.

Proposition 1 [1] If S_t is expressed by the equation (1) for all $j \geq 0$ in which $E(r_{t+1}\mid I_{t-1})=r$, and $(1-\lambda L)D_t$ (L is a lag operator) is a mean zero stationary stochastic process with $0 \leq \lambda < R$, then the necessary and sufficient condition in which the equation (3) is realized will be that there exists a linear combination of D_t and S_{t-1} that is stationary.

[1] See the proof in Trehan and Walsh (1991).

Proposition 2[2] When R_t is contained in the enough large closed section exceeding 1 and $(1-L)S_t$ is a stationary process, then intertemporal budget constraint is satisfied.

According to Trehan and Walsh, if the expected interest rate is fixed and $(1-L)D_t$ is stationary, a condition that the current account deficit including the interest payment of an external debt is stationary becomes necessary and sufficient for the intertemporal budget constraint being satisfied. When this condition is generalized, it is that D_t and S_t are co-integrated. This condition will be satisfied when the assumption about D_t is loosen to that $(1-\lambda L)D_t$ is stationary. However, the co-integration test is not generalized to the case that the rate of expected interest changes. As long as the expected interest rate takes a positive value, that $(1-L)S_t$ is stationary becomes the sufficient condition which shows that intertemporal budget constraint is satisfied.

Here, we will test the sustainability of an external debt using two propositions proved by Trehan and Walsh. When the expected interest rate is constant, we can test the intertemporal budget constraint using Proposition 1. If D is in the stochastic stationary process (i.e., if $0 \leq \lambda < 1$), the necessary and sufficient condition for satisfying the intertemopral budget constraint is that S is also in stochastic stationary process. If D is unstationary (i.e., if $1 \leq \lambda < R$), S must also be unstationary and a stationary linear combination of S and D must exist.

In the 1 st step, we will perform the ADF test on external debt (S) and current account deficit excluding interest payments on external debt (D). Consequently, if the existence of a unit root is rejected for both S and D (i.e., if it becomes clear that they are in the stationary stochastic process), the intertemporal budget constraint is satisfied. When one is stationary but the other is unstationary, it cannot be said that the budget constraint is satisfied. Moreover, if it becomes clear that both are unstationary, we will progress to the next verification. In the 2 nd step, the orders for S and D are specified. Consequently, when they have the same order, we can go on to the 3 rd step, the co-integration test. When they have different orders, we cannot perform the co-integration test.

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[2] See the proof in Trehan and Walsh (1991).

Thus, it cannot be said that the intertemporal budget constraint is satisfied. When it becomes clear that S and D are co-integrated, the intertemporal budget constraint is satisfied. If they are not co-integrated, it cannot be said that the budget constraint is satisfied.

On the other hand, when the expected interest rate changes, we will use Proposition 2. ADF test will be carried out on the differences of S, i.e., $(1-L)S$. Consequently, when the existence of unit root on $(1-L)S$ is rejected, i.e., $(1-L)S$ is in the stationary stochastic process, it becomes clear that the intertemporal budget constraint is satisfied. When existence of a unit root is confirmed, it cannot be said that the budget constraint is satisfied.

Here we will test the sustainability of the ASEAN 4 countries' external debts, using the technique by Trehan and Walsh. The quarterly data on current account balance and the investment net return in U.S. dollar after the 3rd quarter of 1993 are taken from *IMF, Balance of Payments Statistics* CD-ROM version[3,4]. The quarterly data on external debt in U.S. dollar after the 3rd quarter of 1993 are taken from *BIS, IMF, OECD and World Bank, Joint BIS-IMF-OECD-World Bank Statistics on External Debt*. An external debt consists of bonds issued overseas, trade credit (non-bank trade credit publicly guaranteed from 25 nations of OECD), loans from international organizations, bilateral credit accommodations, and liabilities to the banks of 23 nations.

The result of testing the sustainability using propositions 1 and 2 are presented in Tables 1-4[5,6]. In some periods, the result based on Proposition 1 is different from that on Proposition 2. Then we go back to the difference between the assumptions of Proposition 1 and Proposition 2. It is premised that expected future interest rates are constant by Proposition 1. Therefore, we would like to perform the ADF test on expected interest rates if possible. If it becomes clear that the

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[3] D is the current account deficit excluding the interest payments on the external debt. However, the quarterly data of interest payments on external debt was unavailable. Instead we will use the quarterly data of the net investment return that constitutes the income balance.

[4] Since the data of the external debt was available after the 3rd quarter of 1993, we will use the data of current account balance after that period.

[5] Since the quarterly data of Malaysian current account balance is unavailable, we will carry out a test based only on the proposition 2 using its external debt.

[6] Here, we will omit mentioning the results of ADF test and co-integration test about S and D and their degrees of integration to tables.

expected interest rate is stationary, we should verify the sustainability using Proposition 1. If it doesn't, we should verify using Proposition 2 . However, since the data of expected interest rate is not available, it will be thought that the expectation about the movement of the future interest rate is formed from that of past interest rate. It will be appropriate that when unstationarity is rejected the result we got by Proposition 1 is regarded as the final, and that when unstationarity is received the result by Proposition 2 is regarded as the final.

The results we carried out ADF test about the past interest rate are also presented in the tables[7]. For example, using the data until the 2nd quarter of 2002, it was verified that Thai past interest rate is unstationary. Thus, the result by Proposition 2, i.e., that the external debt is sustainable, was adopted as the final judgment. In the next section, we will try to explain a foreign capital outflow using these results about the sustainability.

3. Foreign capital outflow

In this section, we will test the hypothesis that the foreign capital outflow was occurred when the external debt was unsustainable.

Fernandez-Arias (1996) uses portfolio flows, both equity and bond, as dependent variables. Besides equity investment and bond investment, we will use loan as a dependent variable. As independent variables, Fernandez-Arias uses annualized ten-year U.S. bond nominal yields and debt secondary market prices. He uses U.S. bond yield as an external, 'push', factor. And he uses secondary market price as a country's capacity to pay, in other words, a 'pulled' factor. As independent variables, we will use an interest rate gap with the United States or Japan and unsustainable dummy. We put unsustainable dummy of 1 when the external debt was unsustainable, and 0 in the other periods. For example, talking about Thailand, a test in Section 2 tells us that its external debt is not sustainable through the movement of it before the 3rd quarter of

[7] We will use Thai government bond yield, Indonesian lending rate and Philippine Treasury Bill rate as their interest rates. Data source is IMF, *International Financial Statistics* CD-ROM version.

2002. Then during the next period, i.e., the 4th quarter of 2002, foreign capital would be outflowed from Thailand based on the unsustainability of its external debt. In order to check this relationship, the unsustainable dummy of 1 was put in at the 4th quarter of 2002. Besides a constant dummy, we will put a coefficient dummy to the interest rate gap. As interest rate rises, careful borrowers are more likely to decide not to borrow, while borrowers with the riskiest investment projects are often willing to pay the highest interest rates. In the situation that the external debt is not sustainable, the quality of potential borrower is deteriorated. The higher interest rate increases the likelihood that the lender is lending to a bad credit risk. Lenders recognize that higher interest rates are likely to react by taking a step back from their business of financial intermediation and limiting the number of loans they make.

If the constant dummy is significant, the null hypothesis that there is no relation between foreign capital flow and sustainability of external debt will be rejected. Furthermore if the coefficient is negative, there was more capital outflow or less inflow during the period when the external debt was not sustainable. If the coefficient dummy put into the interest rate gap is negative and significant, investors are prudent.

Seven equations are estimated about each form of capital flow.

(4) $Flow_t = \alpha_1 + \beta_{11}\, itrgap\ US_t + \beta_{12}\, dummy_t + u_1,$

(5) $Flow_t = \alpha_2 + \beta_{21}\, itrgap\ US_t + \beta_{22}\, itrgap\ US_t^*\ dummy_t + u_2,$

(6) $Flow_t = \alpha_3 + \beta_{31}\, itrgap\ US_t + \beta_{32}\, itrgap\ US_t^*\ dummy_t + \beta_{33}\, dummy_t + u_3,$

(7) $Flow_t = \alpha_4 + \beta_{41}\, itrgap\ JP_t + \beta_{42}\, dummy_t + u_4,$

(8) $Flow_t = \alpha_5 + \beta_{51}\, itrgap\ JP_t + \beta_{52}\, itrgap\ JP_t^*\ dummy_t + u_5,$

(9) $Flow_t = \alpha_6 + \beta_{61}\, itrgap\ JP_t + \beta_{62}\, itrgap\ JP_t^*\ dummy_t + \beta_{63}\, dummy_t + u_6,$

(10) $Flow_t = \alpha_7 + \beta_{71}\, itrgap\ US_t + \beta_{72}\, itrgap\ US_t^*\ dummy_t + \beta_{73}\, itrgap\ JP_t + \beta_{74}\, itrgap\ JP_t^*\ dummy_t + \beta_{75}\, dummy_t + u_7.$

Flow is the amount of foreign capital flow. *ItrUS* is the interest rate gap between the recipient

country and the United States and *itrJP* is the gap between the country and Japan. *Dummy* is the unsustainable dummy. The amount of foreign capital flow is the numbers on the part of the debt of the investment account in the balance of payment statistics. If the amount is positive, it means net foreign capital inflow. If negative, it means outflow. We will test three categories of foreign capital flow : equity investment, bond investment, and loan. As interest rates, we use Thai lending rate, U. S. bank prime loan rate, and Japanese lending rate to equity investment and loan to Thailand. About bond investment, we use their government bond yield. About equity investment, bond investment, and loan to Indonesia, we use Indonesian working capital loan rate, U.S. bank prime loan rate and Japanese lending rate. About equity investment and loan to the Philippines, we use Philippine average commercial lending rate, U.S. bank prime loan rate, and Japanese lending rate. About bond investment to the Philippines, we use government bond yields. Data sources are *Balance of Payments Statistics* CD–ROM version for the amount of the capital inflow and *International Financial Statistics* CD–ROM version for the interest rate. They are quarterly data. Since the quarterly data of foreign capital flow was unavailable, Malaysia was omitted.

Contrary to our expectation, constant dummy and coefficient dummy were not significant about equity and bond investment to Thailand (see table 5 a and 5 b)[8]. However, about loan, a constant dummy and a coefficient dummy put into the interest rate gap with Japan are significant (see table 5 c). The coefficient dummy was negative, but the constant dummy was positive. Therefore during the period that external debt was not sustainable, foreign capital inflow to Thailand in the form of loan had increased. It also becomes clear that as the interest rate gap with Japan expanded, foreign capital outflow in the form of loan was increased.

In Indonesia, constant dummy and coefficient dummy were not significant about equity investment and loan (see table 6 a and 6 c). However, about bond investment, coefficient dummy with Japan was significant (see table 6 b). But the coefficient was positive.

In the Philippines, constant dummy and coefficient dummy became significant in equity investment (see table 7 a). Moreover, the coefficients of these variables were negative. In bond

[8] The numbers in the parenthesis of table 5 a- 5 c, table 6 a- 6 c, and table 7 a- 7 c are p–values.

investment, constant dummy and coefficient dummy were not significant (see table 7 b). About loan, constant dummy and coefficient dummy were significant (see table 7 c). The coefficient of constant dummy was negative but that of coefficient dummy put into interest rate gap with the United States was positive.

During the periods that external debt was not sustainable, there was capital outflow in the form of loan and equity investment from the Philippines. And during these periods, as the interest rate gap with the United States and Japan was widened, there was more capital outflow in the form of equity investment from the Philippines. What happened to Thailand was similar to the Philippines. As the interest rate gap with Japan was widened, there was more capital outflow in the form of loan from Thailand.

But talking about loan to Thailand during the periods that its external debt was not sustainable, there was less capital outflow. Even during the periods that external debt was not sustainable, as the interest rate gap with Japan was widened, there was more capital inflow in the form of bond investment to Indonesia. Also as the gap with the United States was widened, there was more capital inflow in the form of loan to the Philippines. One possible explanation is a safety net from international agencies.

4. Concluding remarks

In this paper, we try to explain foreign capital outflow from ASEAN 4 countries by sustainability of their external debt. During the periods that external debt was not sustainable, there was capital outflow in the form of loan and equity investment from the Philippines. And during these periods, as the interest rate gap with the United States and Japan was widened, there was more capital outflow in the form of equity investment from the Philippines. What happened to Thailand was similar to the Philippines. As the interest rate gap with Japan was widened, there was more capital outflow in the form of loan from Thailand.

But there is a possibility that sustainability of external debt depends on foreign capital flow. Lipsey (2001) pointed out that U.S. manufacturing affiliates in financial and exchange rate crisis

countries have tended to sustain their capital expenditure levels during the crisis and have switched their sales from host-country to export markets to a greater extent and for a longer period than other host-country firms.

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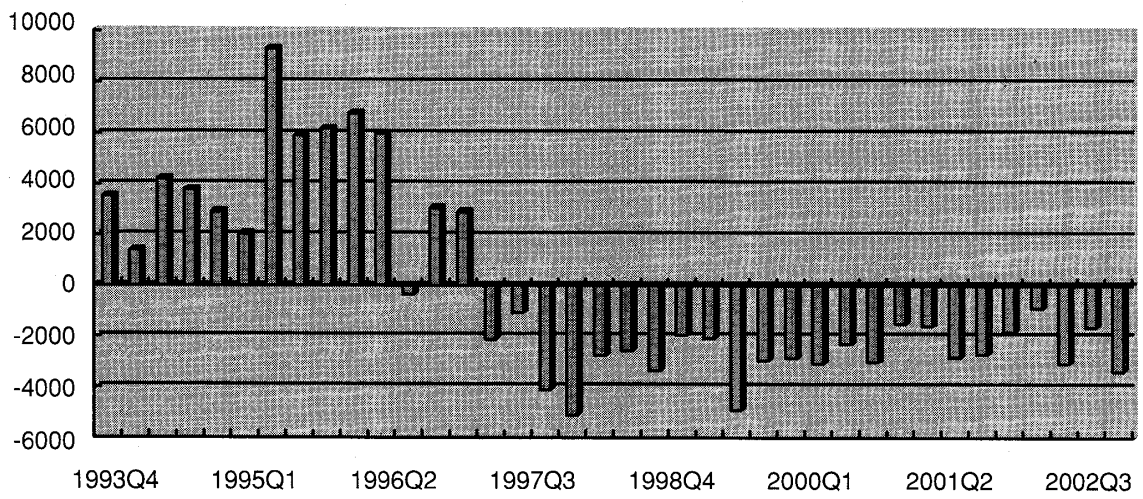
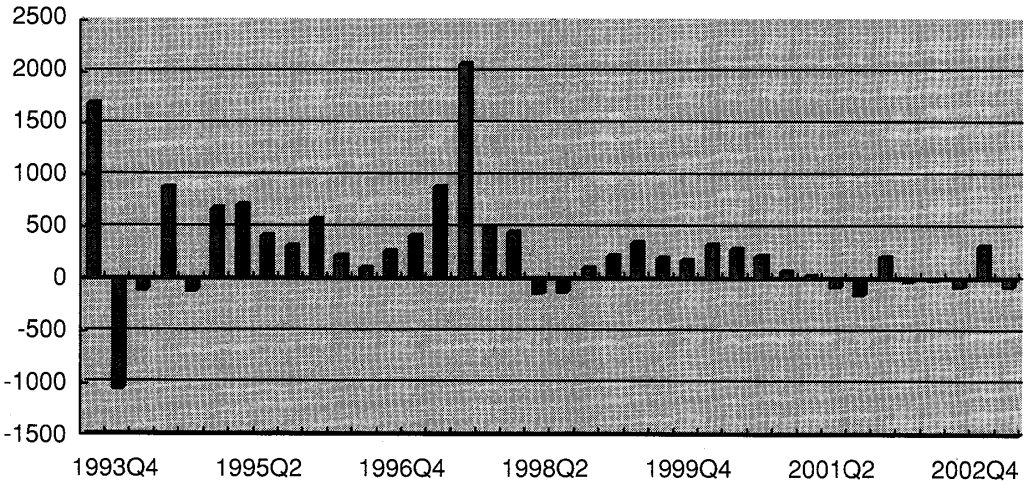
Fig. 1 Foreing Capital Flow to Thailand

(Portfolio Investment + Other Investment) (Millions USD)



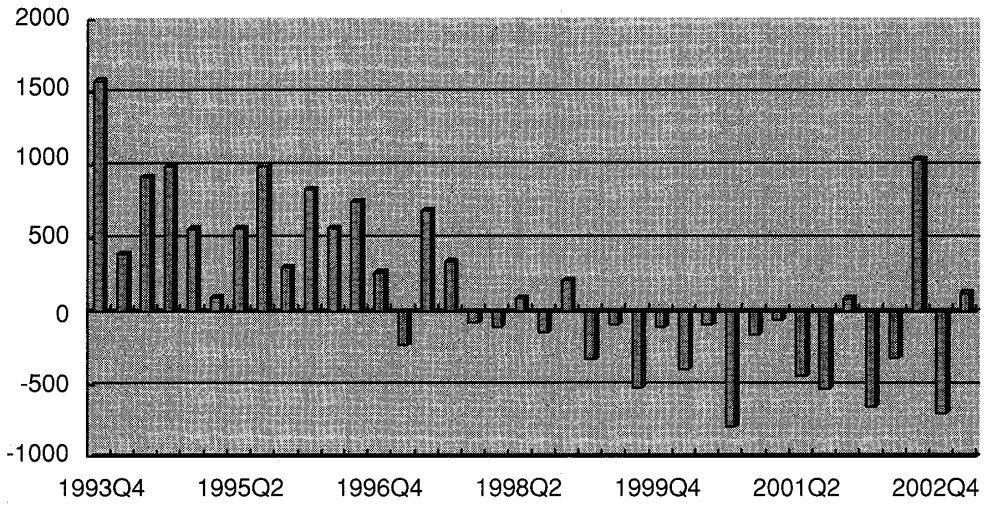
(Source) IMF, *International Financial Statistics*

Figure 1a Foreign Capital Flow to Thailand (Equity) (Millions USD)



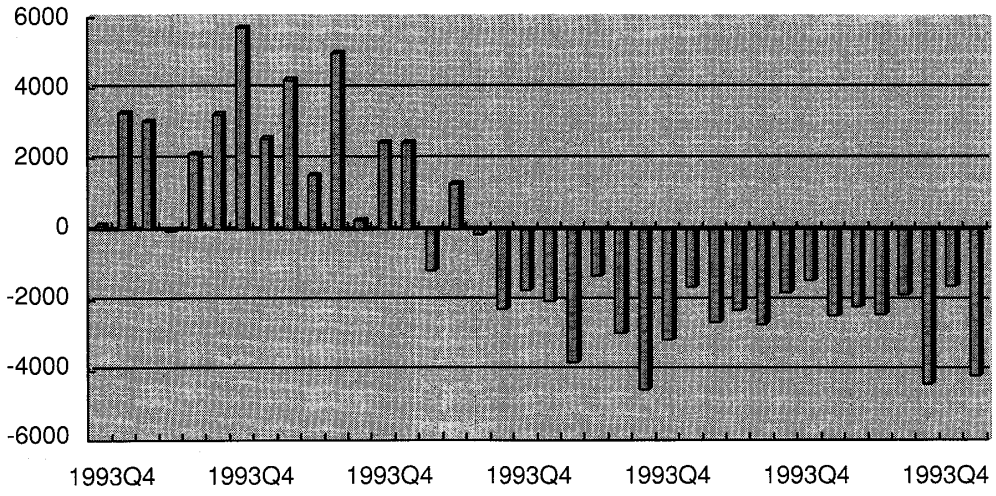
(Source) IMF, *International Financial Statistics*

Figure 1b Foreign Capital Flow to Thailand (Bond) (Millions USD)



(Source) IMF, *International Financial Statistics*

Figure 1c Foreign Capital Flow to Thailand (Loan) (Millions USD)



(Source) IMF, *International Financial Statistics*

Table 1 Thailand Sustainability of External Debt

	~1995Q 3	~1995Q 4	~1996Q 1	~1996Q 2	~1996Q 3	~1996Q 4
Proposition 1	×	×	×	×	×	○
Proposition 2	×	×	○	×	×	×
Interest Rate	−	−	unsteady	−	−	unsteady
Sustainability	×	×	○	×	×	×

	~1997Q 1	~1997Q 2	~1997Q 3	~1997Q 4	~1998Q 1	~1998Q 2
Proposition 1	○	×	×	×	×	×
Proposition 2	×	×	×	×	×	×
Interest Rate	unsteady	−	−	−	−	−
Sustainability	×	×	×	×	×	×

	~1998Q 3	~1998Q 4	~1999Q 1	~1999Q 2	~1999Q 3	~1999Q 4
Proposition 1	×	×	×	×	×	×
Proposition 2	×	×	×	×	○	○
Interest Rate	−	−	−	−	unsteady	unsteady
Sustainability	×	×	×	×	○	○

	~2000Q 1	~2000Q 2	~2000Q 3	~2000Q 4	~2001Q 1	~2001Q 2
Proposition 1	×	×	×	×	×	×
Proposition 2	○	○	○	○	○	○
Interest Rate	unsteady	unsteady	unsteady	unsteady	unsteady	unsteady
Sustainability	○	○	○	○	○	○

	~2001Q 3	~2001Q 4	~2002Q 1	~2002Q 2	~2002Q 3	~2002Q 4
Proposition 1	×	×	×	×	×	×
Proposition 2	○	○	○	○	×	×
Interest Rate	unsteady	unsteady	unsteady	unsteady	−	−
Sustainability	○	○	○	○	×	×

	~2003Q 1	~2003Q 2	~2003Q 3	~2003Q 4
Proposition 1	×	−	−	−
Proposition 2	×	×	×	×
Interest Rate	−	−	−	−
Sustainability	×	×	×	×

Table 2　Indonesia Sustainability of External Debt

	~1995Q 3	~1995Q 4	~1996Q 1	~1996Q 2	~1996Q 3	~1996Q 4
Proposition 1	×	×	×	×	○	○
Proposition 2	○	○	×	×	○	○
Interest Rate	unsteady	unsteady	-	-	-	-
Sustainability	○	○	×	×	○	○

	~1997Q 1	~1997Q 2	~1997Q 3	~1997Q 4	~1998Q 1	~1998Q 2
Proposition 1	○	○	○	○	×	×
Proposition 2	○	○	○	○	×	×
Interest Rate	-	-	-	-	-	-
Sustainability	○	○	○	○	×	×

	~1998Q 3	~1998Q 4	~1999Q 1	~1999Q 2	~1999Q 3	~1999Q 4
Proposition 1	×	×	×	×	○	○
Proposition 2	○	○	○	○	○	○
Interest Rate	unsteady	unsteady	unsteady	unsteady	-	-
Sustainability	○	○	○	○	○	○

	~2000Q 1	~2000Q 2	~2000Q 3	~2000Q 4	~2001Q 1	~2001Q 2
Proposition 1	○	○	○	○	○	×
Proposition 2	○	○	○	○	○	○
Interest Rate	-	-	-	-	-	unsteady
Sustainability	○	○	○	○	○	○

	~2001Q 3	~2001Q 4	~2002Q 1	~2002Q 2	~2002Q 3	~2002Q 4
Proposition 1	×	×	×	×	×	×
Proposition 2	○	○	○	○	×	×
Interest Rate	unsteady	unsteady	unsteady	unsteady	-	-
Sustainability	○	○	○	○	×	×

	~2003Q 1	~2003Q 2	~2003Q 3	~2003Q 4
Proposition 1	×	-	-	-
Proposition 2	×	×	×	×
Interest Rate	-	-	-	-
Sustainability	×	×	×	×

Table 3 Malaysia Sustainability of External Debt

	~1995Q 3	~1995Q 4	~1996Q 1	~1996Q 2	~1996Q 3	~1996Q 4
Proposition 2	○	×	×	×	○	○
Sustainability	○	×	×	×	○	○

	~1997Q 1	~1997Q 2	~1997Q 3	~1997Q 4	~1998Q 1	~1998Q 2
Proposition 2	×	×	○	○	○	○
Sustainability	×	×	○	○	○	○

	~1998Q 3	~1998Q 4	~1999Q 1	~1999Q 2	~1999Q 3	~1999Q 4
Proposition 2	○	○	○	○	○	○
Sustainability	○	○	○	○	○	○

	~2000Q 1	~2000Q 2	~2000Q 3	~2000Q 4	~2001Q 1	~2001Q 2
Proposition 2	○	○	○	○	○	○
Sustainability	○	○	○	○	○	○

	~2001Q 3	~2001Q 4	~2002Q 1	~2002Q 2	~2002Q 3	~2002Q 4
Proposition 2	○	○	○	○	○	○
Sustainability	○	○	○	○	○	○

	~2003Q 1	~2003Q 2	~2003Q 3	~2003Q 4
Proposition	○	○	○	○
Sustainability	○	○	○	○

Table 4 Philippines Sustainability of External Debt

	~1995Q 3	~1995Q 4	~1996Q 1	~1996Q 2	~1996Q 3	~1996Q 4
Proposition 1	×	×	○	×	×	×
Proposition 2	○	○	○	○	○	○
Interest Rate	unsteady	unsteady	-	unsteady	unsteady	unsteady
Sustainability	○	○	○	○	○	○

	~1997Q 1	~1997Q 2	~1997Q 3	~1997Q 4	~1998Q 1	~1998Q 2
Proposition 1	×	×	×	×	×	×
Proposition 2	○	×	○	○	○	×
Interest Rate	unsteady	-	unsteady	unsteady	unsteady	-
Sustainability	○	×	○	○	○	×

	~1998Q 3	~1998Q 4	~1999Q 1	~1999Q 2	~1999Q 3	~1999Q 4
Proposition 1	×	×	×	×	×	×
Proposition 2	○	○	○	○	○	○
Interest Rate	unsteady	unsteady	unsteady	unsteady	unsteady	unsteady
Sustainability	○	○	○	○	○	○

	~2000Q 1	~2000Q 2	~2000Q 3	~2000Q 4	~2001Q 1	~2001Q 2
Proposition 1	×	×	×	×	×	×
Proposition 2	○	○	○	○	○	○
Interest Rate	unsteady	unsteady	unsteady	unsteady	unsteady	unsteady
Sustainability	○	○	○	○	○	○

	~2001Q 3	~2001Q 4	~2002Q 1	~2002Q 2	~2002Q 3	~2002Q 4
Proposition 1	×	×	×	×	×	×
Proposition 2	○	○	○	○	×	×
Interest Rate	unsteady	unsteady	unsteady	unsteady	-	-
Sustainability	○	○	○	○	×	×

	~2003Q 1	~2003Q 2	~2003Q 3	~2003Q 4
Proposition 1	×	-	-	-
Proposition 2	×	×	×	×
Interest Rate	-	-	-	-
Sustainability	×	×	×	×

Table 5 a Equity Investment to Thailand (1995Q 4 ~2003Q 1)

constant	85.76	124.89	99.77	−120.52	−39.61	−158.44	−310.68
	(0.459)	(0.245)	(0.406)	(0.592)	(0.892)	(0.739)	(0.576)
itrgapUS	12.47	−15.10	−11.79				−39.72
	(0.744)	(0.787)	(0.836)				(0.563)
itrgapJP				36.30	23.69	42.75	75.54
				(0.279)	(0.638)	(0.587)	(0.450)
dummy	238.03		134.62	142.67		195.03	142.30
	(0.258)		(0.627)	(0.470)		(0.749)	(0.851)
itrgapUS *dummy*		69.35	44.87				−50.57
		(0.240)	(0.564)				(0.756)
itrgapJP *dummy*					18.39	−7.92	23.16
					(0.515)	(0.927)	(0.871)
adjusted R^2	0.05	0.06	0.03	0.09	0.09	0.06	0.01

Table 5 b Bond Investment to Thailand (1995Q 4 ~2003Q 1)

constant	−397.34	−474.12	−489.63	−566.07	−599.08	−522.87	−266.02
	(0.009)	(0.005)	(0.021)	(0.026)	(0.073)	(0.339)	(0.620)
itrgapUS	157.06	207.77	214.26				246.92
	(0.006)	(0.023)	(0.045)				(0.064)
itrgapJP				85.71	83.91	76.94	−56.10
				(0.052)	(0.189)	(0.474)	(0.650)
dummy	−132.99		42.11	2.72		−53.50	−149.09
	(0.493)		(0.899)	(0.989)		(0.935)	(0.824)
itrgapUS *dummy*		−66.09	−78.41				−92.44
		(0.345)	(0.515)				(0.681)
itrgapJP *dummy*					1.44	10.50	42.16
					(0.967)	(0.929)	(0.814)
adjusted R^2	0.24	0.26	0.23	0.12	0.12	0.09	0.17

Table 5 c Loan to Thailand (1995Q 4 ~2003Q 1)

constant	-2173.92	-2384.02	-2174.05	-5242.62	-6683.94	-9638.38	-9272.25
	(0.001)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.001)
itrgapUS	578.40	606.33	578.62				95.53
	(0.007)	(0.048)	(0.063)				(0.766)
itrgapJP				578.61	852.15	1326.10	1254.46
				(0.002)	(0.002)	(0.001)	(0.009)
dummy	1126.12		-1125.18	-1219		4848.59	5388.65
	(0.305)		(0.442)	(0.231)		(0.096)	(0.137)
itrgapUS *dummy		-204.98	-0.409				303.67
		(0.509)	(0.999)				(0.690)
itrgapJP *dummy					-263.91	-918.11	-1115.61
					(0.064)	(0.030)	(0.105)
adjusted R^2	0.22	0.21	0.19	0.29	0.34	0.39	0.35

Table 6 a Equity Investment to Indonesia (1995Q 4 ~2002Q 4)

constant	691.66	804.14	863.26	1335.05	1506.97	1705.11	2625.05
	(0.320)	(0.263)	(0.280)	(0.149)	(0.116)	(0.116)	(0.074)
itrgapUS	-69.77	-78.28	-82.02				185.19
	(0.133)	(0.114)	(0.132)				(0.328)
itrgapJP				-83.36	-92.82	-102.40	-283.14
				(0.071)	(0.057)	(0.061)	(0.146)
dummy	484.15		-368.18	575.59		-1046.42	48342.12
	(0.508)		(0.852)	(0.246)		(0.667)	(0.599)
itrgapUS *dummy		31.48	50.07				10001.96
		(0.428)	(0.642)				(0.591)
itrgapJP *dummy					29.48	71.46	-9532.83
					(0.331)	(0.486)	(0.594)
adjusted R^2	0.02	0.02	-0.01	0.06	0.07	0.04	0.01

Table 6 b Bond Investment to Indonesia (1995Q 4 ~2002Q 4)

constant	249.14	432.79	450.19	320.53	547.03	638.90	720.02
	(0.443)	(0.191)	(0.222)	(0.463)	(0.221)	(0.207)	(0.205)
itrgapUS	−9.75	−23.16	−24.27				16.11
	(0.651)	(0.305)	(0.329)				(0.825)
itrgapJP				−10.72	−22.78	−27.76	−43.06
				(0.621)	(0.312)	(0.283)	(0.565)
dummy	880.32		−107.78	889.45		−478.25	−121427
	(0.016)		(0.905)	(0.015)		(0.674)	(0.002)
itrgapUS *dummy		52.79	58.25				-24490.9
		(0.007)	(0.244)				(0.002)
itrgapJP *dummy					41.24	60.48	23585.02
					(0.007)	(0.214)	(0.002)
adjusted R^2	0.15	0.20	0.16	0.15	0.20	0.17	0.41

Table 6 c Loan to Indonesia (1995Q 4 ~2002Q 4)

constant	-956.62	-995.3	-1319.25	-1266.9	-1330.07	-1842.59	-1957.31
	(0.107)	(0.106)	(0.050)	(0.110)	(0.107)	(0.045)	(0.112)
itrgapUS	47.79	53.17	73.68				−23.09
	(0.217)	(0.199)	(0.100)				(0.884)
itrgapJP				50.39	55.23	80.00	102.54
				(0.193)	(0.179)	(0.078)	(0.525)
dummy	216.23		2017.41	183.36		2706.70	65638.65
	(0.723)		(0.219)	(0.765)		(0.189)	(0.400)
itrgapUS *dummy		−3.93	−105.82				12743.18
		(0.906)	(0.236)				(0.419)
itrgapJP *dummy					−2.58	−111.17	-12351.7
					(0.921)	(0.199)	(0.415)
adjusted R^2	0.00	−0.00	0.02	0.01	0.01	0.04	−0.01

Table 7 a Equity Investment to Philippines (1996Q 1 ~2003Q 1)

constant	97.36	79.37	62.38	106.68	43.53	−25.92	64.28
	(0.457)	(0.534)	(0.640)	(0.633)	(0.840)	(0.916)	(0.841)
itrgapUS	14.95	18.93	21.36				21.63
	(0.478)	(0.366)	(0.327)				(0.645)
itrgapJP				6.64	12.86	18.84	−0.31
				(0.736)	(0.507)	(0.392)	(0.995)
dummy	−309.23		285.92	−293.62		326.06	120.11
	(0.076)		(0.601)	(0.092)		(0.541)	(0.896)
itrgapUS *dummy		−53.90	−95.39				124.15
		(0.040)	(0.258)				(0.890)
itrgapJP *dummy					−31.02	−58.95	−116.80
					(0.046)	(0.227)	(0.807)
adjusted R^2	0.06	0.10	0.07	0.04	0.08	0.06	0.00

Table 7 b Bond Investment to Philippines (1995Q 4 ~2003Q 1)

constant	1551.46	1534.73	1449.25	1416.16	1347.78	1113.26	202.53
	(0.002)	(0.002)	(0.006)	(0.024)	(0.031)	(0.124)	(0.766)
itrgapUS	−128.56	−125.54	−115.64				−414.95
	(0.021)	(0.028)	(0.059)				(0.005)
itrgapJP				−77.01	−70.12	−50.57	315.64
				(0.134)	(0.178)	(0.404)	(0.022)
dummy	−29.00		628.20	−185.06		861.59	1523.58
	(0.939)		(0.636)	(0.639)		(0.526)	(0.284)
itrgapUS *dummy		−8.98	−72.58				600.14
		(0.821)	(0.605)				(0.279)
itrgapJP *dummy					−22.22	−89.78	−581.49
					(0.491)	(0.421)	(0.146)
adjusted R^2	0.14	0.14	0.11	0.02	0.03	0.01	0.26

Table 7 c　Loan to Philippines（1995Q 4 ～2003Q 1 ）

constant	−80.16	−75.42	30.47	−620.05	−583.00	−364.81	−588.03
	(0.689)	(0.701)	(0.871)	(0.058)	(0.066)	(0.289)	(0.147)
itrgapUS	54.48	49.52	34.18				−53.54
	(0.101)	(0.132)	(0.268)				(0.359)
itrgapJP				77.01	72.35	53.52	100.91
				(0.010)	(0.013)	(0.086)	(0.094)
dummy	85.42		−1798.13	166.15		−1027.12	−2861.62
	(0.743)		(0.026)	(0.491)		(0.172)	(0.018)
itrgapUS **dummy*		40.85	301.90				2645.25
		(0.300)	(0.015)				(0.024)
itrgapJP **dummy*					25.48	113.54	−1302.72
					(0.239)	(0.097)	(0.036)
adjusted R^2	0.04	0.07	0.21	0.17	0.20	0.23	0.34