

A Flexible Exchange Rate, Capital Control, or a Currency Board? The Stock and Flow Equilibrium under the Currency Crisis

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Abstract

A financial crisis erupts when a sudden dislocation of asset demand takes place. Once a dramatic shift in asset demand occurs against a country's currency, the country has to go through a painful recovery process with the depreciated home currency, inflation and a recession. This paper considers the recovery process by the portfolio approach to the exchange rate determination. In other words, it studies the interaction between the slow adjustment in the markets of flows and the instantaneous adjustment in the markets of stock variables. Across many countries around the Pacific, a sudden depreciation of the home currency was followed by a gradual process of accumulating current account surpluses. We study the recovery processes in the Pacific Rim countries.

There is a well-known incompatible trinity, that is, the fixed exchange rate, capital mobility, and monetary autonomy. The IMF usually recommended discarding the fixed exchange rate as in Mexico, Thailand, Indonesia and South Korea. The portfolio approach to the balance of payments can explain the post-crisis adjustment process of those countries under flexible exchange rates. On the other hand, Chile attempted to restrict capital inflows preemptively, and Malaysia attempted to prevent capital outflows after capital was invested in Malaysia. These experiences seem to show the advantages as well as disadvantages of capital regulation. Hong Kong and Argentina gave up monetary autonomy and adopted the currency board system. Both countries had to stabilize the money market against speculations. Hong Kong could afford to widen its monetary base because it was backed by its own reserves, but Argentina had to rely on the stand-by agreement with foreign lenders. The relative cost and benefit of these alternative measures for coping crises should be determined by empirically estimating the output, employment and inflation cost during the adjustment process.

JEL Classification F4

Key words: Asian currency crisis, capital control, currency board system, portfolio approach to exchange-rate determination

I. Introduction

From observing the Asian currency crisis and other crisis on the Pacific Ocean, one cannot help feeling that it is not sufficient enough for the mere fundamentals to create a crisis. In the first generation, fundamental explanation of the currency crisis, the basic trends in economic variables are there even before the outbreak of a crisis. Therefore economic variables should not jump drastically because the future profit opportunities must have been exploited even before the crisis. The sudden depreciation of currency is observed in many countries. Therefore we need to appeal to some sudden expectation changes that would trigger the sudden reversal of capital movement.

Human nature is subject to misjudgment. “To err is human,”¹ and economic calculation is under no exception. Economic agents try to optimize, or at least “satisfice” in the sense of Simon, but due to imperfect as well as incomplete information and to limited processing capacity, their activities are always subject to errors. Since market participants often regard the market as divine, they tend to expect that the market will forgive their errors. But the market can at most correct their errors, and if it does, not instantaneously. And, unlike the salvation, the correction brings about pains to participants.

Before the collapse of currencies of a nation, there was a coincidence of errors between lenders and borrowers. Since “it takes two to tango,” it takes at least two parties of a loan to agree on a potentially delinquent loan. The role of the market is often supposed to correct errors by giving its proper signals to economic agents (Hayek, 1949). But it often sustains incorrect beliefs and even magnifies the incidence from errors as is observed in many instances of bubbles in financial and currency markets.

Once the market manages to correct the errors, there will be a collapse of the bubble, a sudden revaluation of currencies, and a sudden reversal of funds (Cf., Radelet and Sachs, 1998). Then begins the task of retrieval, readjustment and reconstruction. Since many studies exist on the causes of financial collapses, in this paper we will discuss mainly the adjustment process after a collapse.

A financial crisis erupts when a sudden dislocation of asset demand takes place. Once a dramatic shift in asset demand occurs against a country’s currency, the country has to go through a painful recovery process with the depreciated home currency, inflation and a recession. This paper considers the recovery process by the portfolio approach to the exchange rate determination. In other words, it studies the interaction between the slow adjustment in the markets of flows and the instantaneous adjustment in the markets of stock variables. Across many countries around the Pacific, a sudden depreciation of the home currency was followed by a gradual process of accumulating current account surpluses.

¹ “To err human, to forgive divine (Alexander Pope).”

The methodological apparatus used in this paper an old analytical framework called “the portfolio approach” or “the asset approach” to the balance of payments. Introduced by Kouri (1976), Branson and Henderson (1985) and others, this approach was appreciated as the way to take account of imperfect substitutability in international assets and to incorporate country risks into analysis. This approach was at the same time criticized because of its insufficient power to explain exchange rate movements and the degree of effectiveness of sterilized interventions. We will show below, however, that the portfolio approach is a proper tool to understand the occurrence of a currency crisis and the recovery process from it. The approach can be used to evaluate the effects of alternative policy measures to cope with a financial crisis.

What the portfolio approach captures is the interaction between the adjustment in the flow dimension and the adjustment in the stock (asset) dimension. For example, the current account balance and the government budget balance are magnitudes in flow dimensions. On the other hand, the asset holding behavior between foreign and home assets is a decision in stock dimensions. When the International Monetary Fund (IMF) recommends a tighter budget, it aims to work on the flow dimension. When it recommends a higher interest rate, it aims to work on the stock dimension. This distinction is often crucial to evaluate the policy effects.

This paper describes my attempt to understand the courses of economic events in many troubled Asian and Latin American in a simple but consistent framework.²

Already, the IMF, *World Economic Outlook* in 1995 had characterized as in Table 1 the basic difference between the average Asian Economy and the average Latin American economies before the Asian currency crisis. Asian countries were generally higher saving, their government budgets were more balanced, and their monetary authorities were much more disciplined than their counterparts in Latin America. Real GDP growth rates were higher in Asia, and in particularly, inflation rates were much more constrained in Asia than in Latin America. However, these high saving-high investment economies flourished so well that deep pitfalls were hidden. Fueled with optimistic expectations that almost reached the stage of euphoria, Asian countries were vulnerable to the change in expectations. Disillusionment triggered the crisis in these overconfident economies in Asia. In this paper, we present a simple analytical framework that is intended to provide proper coordinates to the events. We will also compare countries that have similar experiences across the Pacific.

² . Naturally, as you will easily find, my knowledge and understanding of Latin American countries lags behind of those of Asian countries. I hope this third visit to this continent will supplement this still incomplete paper.

Table 1, From the World Economic Outlook, first two column.

Selected Developing Countries: Macroeconomic Indicators

(Annual averages: in percent of GDP, unless otherwise noted)

	<u>1983-89</u>	<u>1990-94</u>
Asia¹		
Real GDP	6.2	5.5
Consumer prices	6.9	8.4
Money growth	20.0	18.1
Private consumption	62.8	58.5
Private saving	16.8	22.4
Fiscal balance	-4.8	-2.8
Current account balance	-1.9	-2.7
Real effective exchange rate	-6.3	-3.0
Total net capital inflow	2.0	4.1
Change in reserves	0.4	1.9
Total saving	24.0	28.0
Total investment	25.9	30.7
Latin America²		
Real GDP	3.1	3.5
Consumer prices	193.7	222.9
Money growth	200.5	258.1
Private consumption	64.4	68.0
Private saving	18.6	13.5
Fiscal balance	-5.6	0.1
Current account balance	-0.9	-2.4
Real effective exchange rate	0.8	4.3
Total net capital inflow	-1.7	1.4
Change in reserves	0.3	1.2
Total saving	19.2	18.6
Total investment	20.1	20.9

¹. India, Indonesia, Korea, Malaysia, the Philippines, and Thailand

². Argentina, Brazil, Chile, Columbia, Mexico, and Peru

II. Asian Growth and Setbacks

Cities in Asian capitals remind me of the benefit of growth by whatever reasons. Paul Krugman (1994) criticized that Asian growth is primarily due to increasing input without increase in the total factor productivity. In spite of his criticism, growth with increased output would be an extremely envious situation for policy makers in Africa and CIS countries that suffer from massive unemployment. Grand views of the sky scrapers in Jakarta, Bangkok and other Asian cities illustrate the speed of and the benefit from the

growth process before the crisis, but the unfinished parts of sky scrapers visualize the consequences of the expectations that were betrayed. All the efforts based on the optimistic views on the future economic conditions encountered setbacks because their forecasts had not materialized.

In most of crisis countries, the balance of current account was a source of worry, that is, the concern in the flow dimension. Many countries such as Malaysia, Korea, and particularly Thailand, had suffered from a large deficit. On the other hand, the government budget was a serious concern for some countries like Thailand and Korea, but not for other countries. In Indonesia, the current account was not in a serious situation at all.

At the time of crisis, however, a sudden, huge reversal of capital flow (Radelet and Sachs, 1998) took place without exception. That can be interpreted as a shift of portfolio preference from the asset denominated in the currency of an Asian country to the asset denominated in the US dollar. Indeed, when we consider the economic mechanism of a currency crisis, we have to consider both the flow aspect and the stock aspect of the critical process. But, as the critical force that drives the dramatic course of financial crises, one can probably say that the dislocation of stock demand plays an immediate and crucial role than the erosion in flow relationship. For example, Indonesia's current account deficit was not as serious as that of Thailand or Malaysia, but the currency depreciation was most precipitous in Indonesia. The Philippines experienced large current account deficits but escaped to be one of crisis countries.³ What made the Indonesian case nearly catastrophic was the sudden shift of asset preference ignited by the loss of confidence in political and economic stability.

III. The Portfolio Approach to the Exchange-Rate Determination

In economics, the relationship between stock equilibrium and flow equilibrium has been discussed for long. The flow relationship indicates how active we engage in economic activities during a given period, like savings, investment, GDP and the balance of payments.⁴ Those flow variables affect the speed of asset accumulation in a national economy and its international credit as well as debt position. The flow dimension variables determine the speed of changes in the stock variables. The imbalances in

³ It is interesting to see why the Philippines were not affected so much by the Asian Crisis. Consumer oriented attitudes of the nation may (see the gigantic shopping mall in Manila!) have prevented a large investment-savings gap. Like an airplane that was slowly climbing, the nation might have found it easier to resist an air pocket. Also the Philippines were already disturbed by malfunctioning of financial sectors. Therefore, the measles effect (to be explained below) was not there.

⁴ Those flow variables affect the speed of asset accumulation in a national economy and its international credit as well as debt position. The flow dimension variables determine the speed of changes in the stock variables.

government deficits and the current account deficits are imbalance in flow dimensions. On the other hand, the asset balance is the equilibrium in stock dimensions in such a way outstanding assets --- here we emphasize the distinction of assets denominated in various currencies --- are exactly held at the ongoing economic variables. From this point of view, the IMF policy recommendation to balance the government budget or the current account balance is an attempt to remedy the flow side of the problem and its recommendation to adjust the asset market by a high interest rate policy is an attempt to remedy the stock side of the problem.

There are many explanations to the causes of Asian currency crisis. And the following causes would probably also apply to Latin American currency crises: The fundamentals of monetary policy and external balances, the speculative international bank runs based on conjectural expectations among speculators, the moral hazard in lending to developing countries due to the explicit or implicit assurance by the governments, mismatching of short and long term demand and supply in the credit market, and myopic, herding behavior of investors. These factors are certainly relevant in many crises, and, like the case of concurrent derailment, multiple factors reinforce the precipitating course of events.

Whatever the causes may be, however, the common resulting phenomenon was a sudden dislocation of asset preference. Radelet and Sachs refer it as the sudden and huge reversal of capital flow. Thus, as a phenomenon, the stock rather than the flow aspect becomes extremely important. Regardless whether or not disequilibria exist in the flow market such as the current account deficits and the government deficit, the occurrence of a sudden dislocation of asset demands the *sine qua non* to a serious Asian currency crisis. One may even say that flow imbalances are important primarily because they are linked to stock problems.

This conceptual framework I rely on today is nothing but the portfolio (or asset) approach to the determination of exchange rates. Pentti Kouri (1979), William Branson and Dale Henderson (1984), studied the dynamics of the exchange rate resulting from the combination of the stabilizing flow equation and the destabilizing stock equation.

Alternative versions exist for the formulations of the portfolio approach to the exchange rate determination. The model can vary depending on alternative assumptions, for example, whether the agents have rational expectations, whether residents have own currency biases in asset choices, and whether agents in each country hold other countries' assets in a cross-country way. I will present here a simplest version of the model similar to Kouri (1979) taking the currency of Indonesia, Rupiah as the example.

Suppose that Indonesians hold only the asset denominated in Rupiah, but that residents in the rest of the world hold the assets denominated in Rupiah and those denominated in Dollar. This is a strong simplifying assumption to keep our analysis intuitive, but the qualitative nature of the results will hold intact even if Indonesians hold dollar dominated assets provided that each nation has the home currency bias in currency holding. The

home currency bias implies that other things equal Indonesians hold more proportion of their portfolio in terms of Rupiah than the rest of the world.

Let us denote the exchange rate of the Rupiah in terms of the Dollar as e , in such a way that $e = 1/8,000$, meaning a Rupiah is worth 1/8,000 dollar. (Note that this is the reverse of the usual exchange rate expressed in such a way that the Dollar is expressed as 8,000 Rupiah per Dollar. Let the total asset that the rest of the world possesses be Z Rupiah. Then the balance of payments of Indonesia is a function of the exchange rate e , and the amount of indebtedness Z . The balance of payments is a decreasing function of the exchange rate e and an increasing function of the indebtedness Z . In terms of the increase in Z , that is, the negative of the balance of payments of Indonesia, one obtains,

$$(1) \quad dZ/dt = f(Z, e),$$

where $f_Z < 0$, and $f_e > 0$.

The portfolio balance equation express the relationship that people in the rest of the world holds a higher proportion of the Indonesian asset in their portfolio if the expected rate of appreciation of the value of the Indonesian currency is higher. That is, denoting the expectation by operator E ,

$$(2) \quad (eZ)/(W + eZ) = g(\pi), \quad \text{where } \pi = E[(de/dt)/e], \text{ and } g'(\cdot) > 0.$$

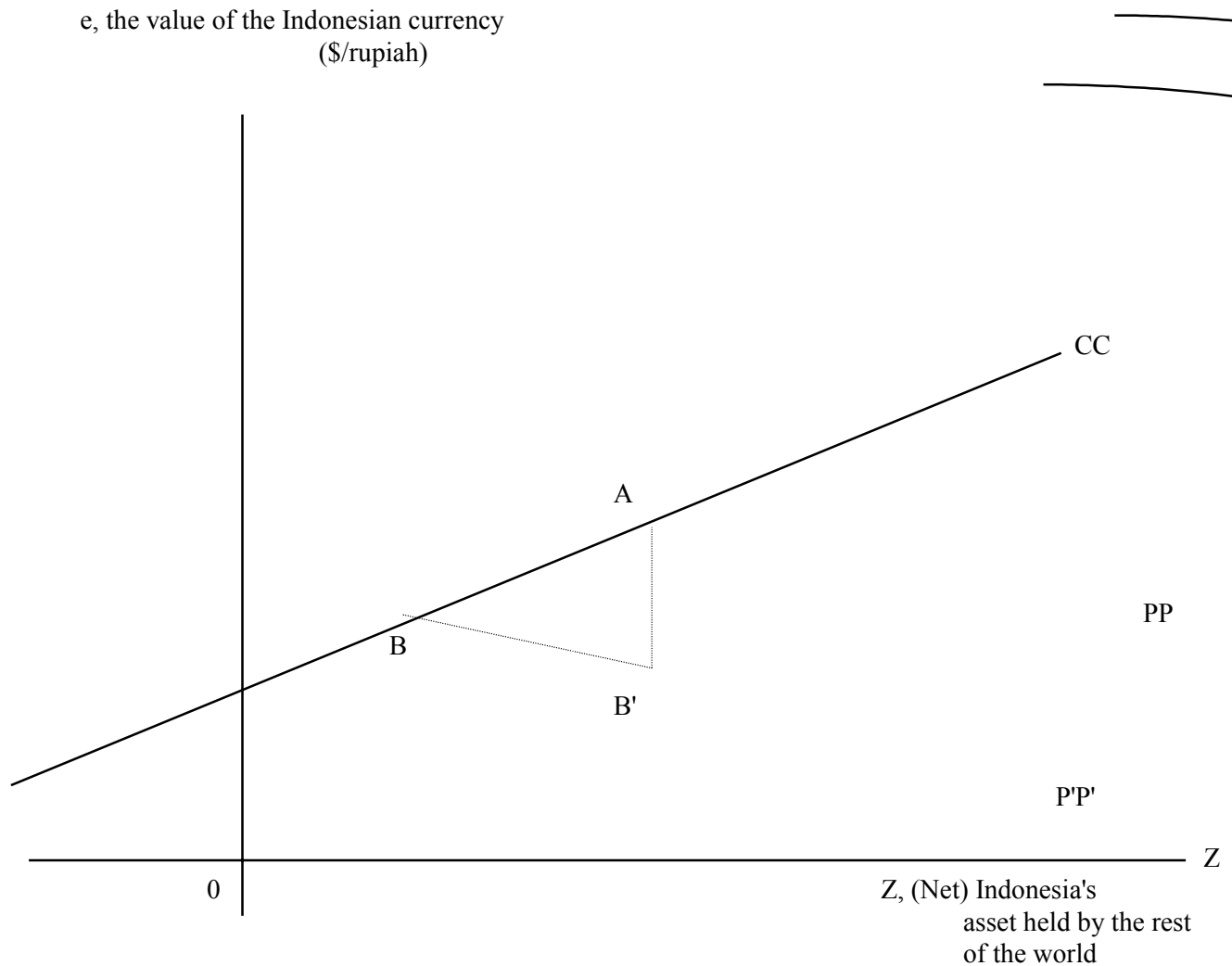
If we impose the assumption of rational expectations such that $E[(de/dt)/e] = (de/dt)/e$, we obtain from equation (2), the following

$$(3) \quad de/dt = h(Z, e),$$

where $h_Z > 0$, $h_e > 0$.

Strictly speaking, the portfolio balance is meaningful for the nominal exchange rate e , and the current account balance is meaningful for the real exchange rate because the current account is considered to respond to the real exchange rate. At this stage, this aspect is not taken into consideration, though further development of the portfolio approach should certainly do so.

Figure 1: The Portfolio Approach to the Exchange Rate



In *Figure 1*, the phase diagram of the simultaneous equation system, (1) and (3) is drawn as *CC*, and *PP*.

CC indicates the combination of *e* and *Z* that keep the current account of Indonesia in balance, or that maintain the value of Indonesian asset held by the rest of the world constant. This is an intrinsically stable relationship and the value of *Z* increases in the left side of *CC*, and decreases in the right. *PP* indicates the combination of *e* and *Z* that keep the portfolio balance of the rest of the world. This is an intrinsically *unstable* relationship so that *e* increases above *PP* and decreases below *PP*. The combination of these two balances create a phase diagram around the intersection of *CC* and *PP*, point *A*, of the well-known saddle point nature. Under changes in exogenous factors, exchange rate *e*

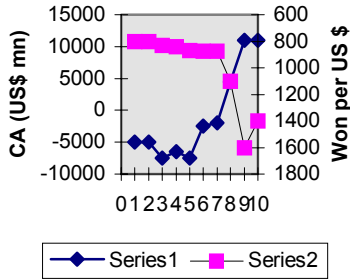
jumps to the saddle stable path and the balance of payment adjusts gradually to the new equilibrium.

Before the crisis, the prospect of the Indonesian economy was so bright that Indonesians were willing to invest even more than their high savings, or to borrow from abroad. At that time this perception was shared by the lenders as well. Both were dancing tango under the mistaken notion. The rest of the world was willing to hold a large amount of Indonesian debt. Indonesia's future appeared bright and the country risk was considered small. Thus portfolio balance PP was located in the right. (Then the equilibrium was at a point like *A*, where Indonesian debt was large and the value of Indonesian Rupiah was high. Then, all of a sudden, the asset demand for the asset in Rupiah declined precipitously, and the new equilibrium is now shifted to a point like *B*. Since *Z* can move only slowly, only *e* jumps and the path of variables takes the trajectory like *A* through *B'* to *B*. As will be shown below, a similar situation occurred in many countries such as Thailand, and South Korea.

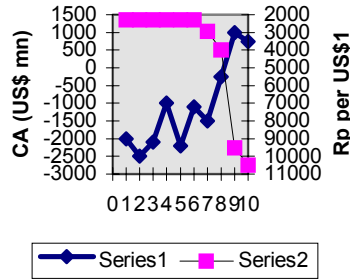
The model thus predicts first the sudden overshooting depreciation in a Asian currency by the dislocation of demand for the currency and then the process by which the current account of the Asian country gradually improves. The prediction of this model surprisingly applies well to the experiences of Asian countries, and perhaps to those of Latin American countries. *Figure 2* shows the changes in exchange rates after the dislocation of currency demand and the following slow adjustment in current accounts. In most countries (except Mexico) shown in the *Figure*, one can detect jumps in exchange rates and the reversal of the current account from deficit to surplus.

Figure 2

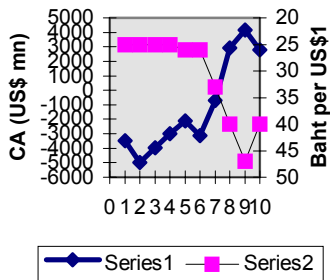
South Korea



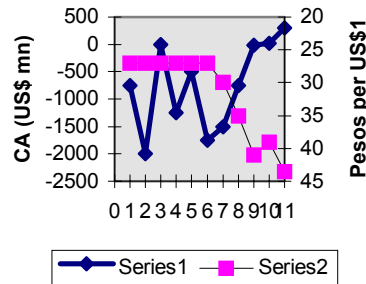
Indonesia



Thailand



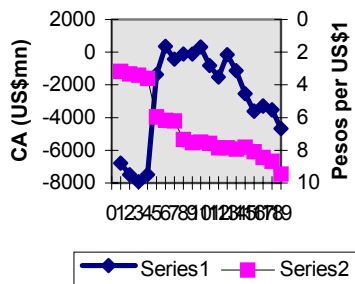
Philippines



1=1996Q1 5=1997Q1 9=1998Q1
2=1996Q2 6=1997Q2 10=1998Q2
3=1996Q3 7=1997Q3
4=1996Q4 8=1997Q4

Series 1 = Current Account
Series 2 = Exchange Rate

Mexico



1=1994Q1 5=1995Q1 9=1996Q1 13=1997Q1 17=1998Q1
2=1994Q2 6=1995Q2 10=1996Q2 14=1997Q2 18=1998Q2
3=1994Q3 7=1995Q3 11=1996Q3 15=1997Q3 19=1998Q3
4=1994Q4 8=1995Q4 12=1996Q4 16=1997Q4

Series 1 = Current Account

Technically, this model of stock-flow interactions can be analyzed more rigorously. Merton (1969) and Samuelson (1969) showed that under the specification of constant relative risk-aversion utility the consumption decision in the flow dimension and the wealth holding decision in the stock dimension can be separately analyzed. Using this formulation, Branson and Henderson (1985) derive optimal wealth composition of foreign currency in the international portfolio.⁵ The portfolio depends on the deviation from the interest parity, the variance of exchange rate, and the covariance between the future exchange rate and the future price level. The last term reflects the fact that the exchange rate works as the insurance against inflation.

In our context we can interpret this as follows. When market participants suddenly realize that they have been overoptimistic about a country's future income, then the flow relation, equation (1), *CC* in *Figure 1* shifts to the left because participants do not regard the progress of borrowing as reasonable. Moreover, the stock relation, equation (3), *PP* in *Figure 1* shifts drastically downward. Thus the analysis also indicates the precipitating fall of the exchange rate.

This model analyzes a floating exchange rate regime where the exchange rate is determined freely. This regime is what the IMF often prefers to recommend to ailing nations. The IMF might have implicitly endorsed the fixed exchange-rate practice before the onset of a crisis, but after the crisis in Asia it recommended the flexible exchange rate regime with the recommendation of fiscal and monetary austerity that may respectively help the national economy shift *CC* and *PP* above and sustain its exchange rate. The economy will return to a new, less extravagant, equilibrium position. Residents living in any economy that is distinct from the classical, money-neutral economy would suffer from this sudden change in the exchange rate and the following adjustment process.

It is well known that one cannot sustain the impossible trilogy: the fixed exchange rate, free capital mobility and autonomy of monetary policy. The flexible exchange rate regime just analyzed gives up the first of the three. This is, however, not the only possible regime. The other regimes are possible and in practice experimented as well: The Capital Control Regime and the Currency Board Regime.

The capital control changes the slope of portfolio relationship and also the speed of adjustment. The proportionate Tobin tax by rate τ on all the capital transactions will substitute $g((1 - \tau)\pi)$ for $g(\pi)$. It is easy to see the arrows of movements in the phase diagram becomes steeper (*Figure 3*). In this portfolio asset model, capital transaction taxation will *increase* rather than decrease the volatility of exchange rates.⁶ On the other hand, control and deterrent to capital outflow as was imposed in Malaysia, then the portfolio relation *PP* will be shifted to the right and the equilibrium exchange rate for the

⁵ Branson and Henderson (1985), Equation (3.19), p.787.

⁶ That may be the reason that in the countries where capital is controlled, the exchange rates In this sense, Indonesia has some similarity to Latin American cases. are controlled or highly managed.

local currency will appreciate for the time being. Whether this increase is offset by the reluctance of potential investors to invest in the country because of the unexpected imposition of control remains to be seen. In case of the Chile type of control, this effect of unexpected control does not exist, but general discouragement against capital inflow remains. Naturally, the control tends to reduce the value of the home currency.

The fixed exchange rate including the Currency Board System makes exchange rate a policy variable. It changes the nature of the differential equations. The exchange rate is no longer endogenous, forward-looking variables, but a policy variable once to be fixed by the monetary authorities. Accordingly, exchange rates are no longer jumping variables, either. Instead money supply is no longer a policy variable. The flow equation CC and the stock relation PP are forced to intersect at the intersection for a determined value of the exchange rate. In order to do that, domestic price levels and the domestic interest rate will vary a great deal. Thus, the main cost to the country that takes Currency Board System is the high interest rate that comes from the speculative attack. A speculative attack could occur as long as the credibility of fixed parity of the currency is less than perfect. It draws the reserves from the system rapidly enough to make the domestic interest rate extremely high. In Hong Kong, and Argentina, this is coped with technical devices of broadening the money base. The cost of fixing exchange rate by the Currency Board System has thus put the burden of high rates of interest for the country.

Depending on the regime, the adjustment mechanism thus differ. So does the seriousness of adjustment cost to crisis countries. In other words, adjustment costs to employment, price stability and income distribution are hidden behind equations (1) and (2). Once the dislocation of the asset demand has come, some adjustment costs are inevitable. We have to cultivate an open minded view on the relative cost and benefit of adjustment mechanisms. Rather than arguing for or against the IMF scheme, we have to compare several alternatives such as the Currency Board System, the Tobin tax, and capital controls of Chilean or Malaysian way by the criterion how these systems economize the adjustment costs that is anyway needed after the dislocation of capital demand.

With this general theoretical preparation, let us proceed to a bird's eye view of the country experiences across the Pacific, in Asia and in Latin America. Rather than discussing the average values of economic variables as IMF did in its *World Economic Outlook* cited above, I will trace the time paths of each countries in turn.

Table 2
Economic Indicators of Selected Asian Economies

	1994	1995	1996	1997	1998
Thailand					
Real GDP Growth (%)	8.6	8.8	5.5	-0.4	-9.4
CPI Inflation (%)	5.1	5.8	5.9	5.6	8.1
Money Supply Growth (%)	12.9	17.0	12.6	16.5	15.4
Saving/GDP (%)	34.9	34.3	33.1	31.8e	

Fiscal Balance/GDP (%)	2.0	2.6	1.6	-0.4	
Current Account Balance/GDP (%)	-5.6	-7.9	-7.9	-2.2	12.5
Official Reserve (billion US\$)	29.3	36.0	37.7	26.2	28.8
External Debt/GDP (%)	45.8	49.7	49.3	n.a.	
Share of Short-term External Debt (%)	44.5	49.4	41.4	n.a.	

Indonesia

Real GDP Growth (%)	7.2	8.0	7.4	5.5	-13.7
CPI Inflation (%)	8.5	9.4	7.9	6.6	60.7
Money Supply Growth (%)	20.0	27.2	27.2	23.2	
Saving/GDP (%)	29.2	29.0	28.8	27.3e	
Fiscal Balance/GDP (%)	0.0	0.8	1.4	2.0e	
Current Account Balance/GDP (%)	-1.7	-3.3	-3.3	-26	4.5
Official Reserve (billion US\$)	12.1	13.7	18.3	16.6	22.7
External Debt/GDP (%)	61.0	61.5	56.7	n.a.	
Share of Short-term External Debt (%)	18.0	20.9	25.0	n.a.	

Malaysia

Real GDP Growth (%)	9.3	9.4	8.6	7.7	-7.5
CPI Inflation (%)	3.7	3.4	3.5	2.7	5.3
Money Supply Growth (%)	14.7	24.0	20.9	22.6	16.1
Saving/GDP (%)	32.7	33.5	36.7	37.0e	
Fiscal Balance/GDP (%)	2.5	3.8	4.2	1.6e	
Current Account Balance/GDP (%)	-7.8	-10.0	-4.9	-4.8	-0.5p
Official Reserve (billion US\$)	25.4	23.8	27.0	21.7	23.0
External Debt/GDP (%)	40.4	39.3	40.1	n.a.	
Share of Short-term External Debt (%)	21.1	21.2	27.8	n.a.	

South Korea

Real GDP Growth (%)	8.6	8.9	7.1	5.5	-5.8p
CPI Inflation (%)	6.3	4.5	4.9	4.5	7.8
Money Supply Growth (%)	18.7	15.6	15.8	21.5	13.3
Saving/GDP (%)	34.6	35.1	33.3	32.9e	
Fiscal Balance/GDP (%)	1.0	0.0	0.0	0.0e	
Current Account Balance/GDP (%)	-1.2	-2.0	-4.9	-2.0	5.5p
Official Reserve (billion US\$)	25.6	32.7	34.0	21.1	52.0
External Debt/GDP (%)	14.9	17.2	21.6	n.a.	
Share of Short-term External Debt (%)	n.a.	n.a.	58.3	42.4	

Hong Kong

Real GDP Growth (%)	5.4	3.9	4.9	5.3	-5.1p
CPI Inflation (%)	8.1	8.7	5.2	6.5	4.8 _{Mar.}
Money Supply Growth (%)	11.7	10.6	12.5	8.4	4.0 _{Feb.}
Saving/GDP (%)	33.1	30.4	30.6	30.8e	
Fiscal Balance/GDP (%)	1.3	-0.3	2.2	4.2e	

Current Account Balance/GDP (%)	1.6	-3.9	-1.3	-1.5	-0.4p
Official Reserve (billion US\$)	49.3	55.4	63.8	92.8	88.6 _{10Oct.}
External Debt/GDP (%)	15.6	n.a.	n.a.	n.a.	
Share of Short-term External Debt (%)	n.a.	n.a.	n.a.	n.a.	

China

Real GDP Growth (%)	12.6	10.5	9.69	8.8	7.8
CPI Inflation (%)	24.3	16.7	8.4	2.8	-0.8
Money Supply Growth (%)	35.1	29.5	25.3	17.3	14.6
Saving/GDP (%)	42.6	41.0	42.9	40.8e	
Fiscal Balance/GDP (%)	-1.6	-1.7	-1.5	1.5e	
Current Account Balance/GDP (%)	1.4	0.2	0.9	2.4	2.1p
Official Reserve (billion US\$)	52.9	75.4	107.0	142.8	140.6
External Debt/GDP (%)	18.6	16.9	15.8	n.a.	
Share of Short-term External Debt (%)	17.4	18.9	19.7	n.a.	

Philippines

Real GDP Growth (%)	4.4	4.7	5.8	5.2	-0.5
CPI Inflation (%)	9.1	8.1	8.4	6.0	9.7
Money Supply Growth (%)	24.4	24.2	23.2	26.1	
Saving/GDP (%)	19.4	17.8	19.7	21.0e	
Fiscal Balance/GDP (%)	-1.6	-1.4	-0.4	-0.9e	
Current Account Balance/GDP (%)	-4.6	-4.4	-4.7	-5.4	-3.2p
Official Reserve (billion US\$)	6.0	6.4	10.0	7.3	9.2
External Debt/GDP (%)	62.4	53.2	49.2	n.a.	
Share of Short-term External Debt (%)	14.3	13.4	19.3	n.a.	

Singapore

Real GDP Growth (%)	10.5	8.8	6.9	7.8	3.5p
CPI Inflation (%)	3.1	1.7	1.4	2.0	1.0 _{Mar.}
Money Supply Growth (%)	14.4	8.5	9.8	10.3	11.1
Saving/GDP (%)	49.8	50.0	50.1	50.0e	
Fiscal Balance/GDP (%)	13.7	12.0	8.4	8.3e	
Current Account Balance/GDP (%)	17.1	16.8	15.8	15.2	14.3p
Official Reserve (billion US\$)	58.2	68.7	76.8	71.4	74.9 _{Nov.}
External Debt/GDP (%)	11.1	n.a.	n.a.	n.a.	
Share of Short-term External Debt (%)	n.a.	n.a.	n.a.	n.a.	

Taiwan

Real GDP Growth (%)	6.5	6.0	5.7	6.9	5.0p
CPI Inflation (%)	4.0	3.7	3.1	1.1	2.6 _{Mar.}
Money Supply Growth (%)	15.2	9.6	4.7	8.0	8.1 _{Mar.}
Saving/GDP (%)	27.1	28.0	28.0	27.9e	
Fiscal Balance/GDP (%)	0.2	0.4	0.2	0.2e	
Current Account Balance/GDP (%)	2.6	2.1	4.0	2.3	2.5p

Official Reserve (billion US\$)	13.0	10.5	10.3	8.8	9.0
External Debt/GDP (%)	10.7	10.3	n.a.	n.a.	
Share of Short-term External Debt (%)	76.9	72.5	n.a.	n.a.	

IV. Experiences Under Flexible Exchange Rates

The following are the countries that adopted more or less the floating exchange rate policy under the recommendation of the IMF.

(1) Thailand

The sign of crisis was already latent from March of 1997, but the crisis became open in July 1997. On July 27, 1997, Thailand requested the assistance from the IMF.

Thailand is considered to be the country that triggered the Asian crisis. The fiscal balance was in order during the years preceding the crisis, and price levels were under control. The only serious feature in macroeconomic conditions was the deficit in the current account. And this amount of borrowing was probably within the limit to which a healthy growing economy could borrow from abroad. Thus the flow dimension had a symptom in the balance of payments to which the first generation approach to the causes of the currency crisis might apply. See *Table 2*. The fact that the baht was pegged to a currency basket in which the US dollar was over-represented by made the situation difficult. The yen depreciated about 50 per cent against the US dollar, cutting the edge in the competitiveness of trade sector in Thailand.

The Baht declined 36%, and the recovery process was already traced by *Figure 2*. Asian cases indicated that currency crises could occur in even the economies that controlled inflation and that are equipped with sound fiscal and monetary policies. This is certainly a market failure rather than government failure. The total amount of external debt at the end of 1996 was \$90.6 billion and about 50 per cent of Thailand's GDP. 81.3 percent of the total debt was owed by the private sector. 41 per cent of the total debt was with the short term maturity.

As of May 1998, the IMF extended a rescue package of approximate \$4.0 billion of standby loan facilities, to be effective for 34 months, that was equivalent to 505 percent of Thailand's IMF quota. This facility amounted about to 2.2 per cent of the GDP.*

(2) Indonesia,

Indonesia was, like Thailand and South Korea, a high saving country. Though the price level was rising more than these countries, the economic fundamentals in Indonesia appeared quite sound in 1997 (*Table 2*). Fiscal balance was in surplus and current account deficits are within the permissible range. Therefore, one would suspect that not fundamentals but speculative attacks in the asset market triggered the currency crisis in

Indonesia. The contagion element worked through the PP balance. One month after Thailand's outburst of crisis, Indonesia floated its currency, Rupiah on August 4, 1997, and in early October Indonesia started negotiations with the IMF. ,

Unfortunately, political instability fueled the speculative pressure, and the Rupiah precipitated as the political rumors of government's vulnerability spread. Thus this country fits the schematic picture of *Figure 2, and Table 2*. The Rupiah exchange rate fell from 2,500 rupiah per US dollar to less than 15,000 rupiah per US dollar (600 per cent!) once, and now back around 7,000 to 8,000 rupiah to US dollar. The recovery process was slow, painful, and people are hoping that the economic stability follow the possible political stability after the election. Indonesian cases indicated that currency crises could occur in even the economies that have fairly sound fundamentals if the economy is seriously attacked by speculators. The shift of the asset balance (The downward shift of PP in *Figure 1*) was unfortunately aggravated by the loss of the public confidence in Rupiah because of political turmoil.

The total amount of external debt of Indonesia at the end of 1996 was \$129 billion and about 57 per cent of Indonesia's GDP. Unlike other Asian countries, a large portion of the national debt was owned by the public sector. 46 percent of the total debt was owed by the private sector.⁷ 75 per cent of the total debt was with the long term maturity.

As of May 1998, the IMF extended a rescue package of approximately \$10.0 billion of standby loan facilities, to be effective for 3 years, that was equivalent to 494 percent of Indonesia's IMF quota. This facility amounted about to 4.4 per cent of the GDP. The IMF did not agree to the plan of adopting the Currency Board System. In my opinion, the value of Rupiah the Indonesian government was unreasonably high. And in the light of the difficulties of the Currency Board System when it is attacked by speculators, as will be discussed in Section VI), the recommendation against the Currency Board System was more than justified.

(3) South Korea,

South Korea was a most active growth engine in the East Asia. People saved a high proportion of income, and investment was vigorous. Price levels were stable, and the government budget of South Korea was more or less balanced. The current account of the balance of payments showed a deficit of 4.9 per cent of GDP in 1996, but that amount of deficits are what many countries could afford to bear for a year. (*Table 3*). Thus, fundamentals seemed to have been all right. When contagious waves of speculative attacks came to invade, however, not only speculators but short term investors like Japanese withdrew funds from South Korea. South Korea became thus again the victim of an asset market initiated currency crisis. The rigid industrial and financial structure, which was often associated to the role of chaebol, added the burden for reformers.

⁷ In this sense, Indonesia has some similarity to Latin American cases.

South Korea started its crisis in November 1997, and requested financial relief from the IMF on November 19. The Won exchange rate fell about 37 per cent from the peak to the bottom. The rehabilitation process was painful because of the high interest policy recommended by the IMF. The IMF tried to shift up *PP* schedule in *Figure 1*. Now, however, the recovery process is about to end. The trough was the cycle was deep but fortunately the rebound came soon.

The total amount of external debt of South Korea at the end of 1996 was \$158 billion and about 33 per cent of South Korea's GDP. They are predominantly owned by the private sector. 98.5 per cent was owned by the private sector and 76 per cent was by the private financial sector. Also, the debt with short-term maturity was more than a half, 63 per cent. Indeed it might have been the unfavorable side effect of the nationalist policy to restrict foreign direct investment.

As of May 1998, the IMF extended a rescue package of approximately \$21.0 billion of standby loan facilities, to be effective for 3 years, that was equivalent to 1,939 percent of South Korea's IMF quota. This facility amounted about to 4.3 per cent of the GDP.

Incidentally, the following are recent Latin American Experiences:

(4) Mexico

In many senses, Mexico was a forerunner of the Asian type of currency crises. Anticipating the Thai case, the Mexican economy was running current account deficits amounting to 7.7% of GDP in 1994. Capital market liberalization went ahead of trade liberalization. The deficit was more or less funded by capital inflow until 1993, but in 1994 the funding became difficult. Like Thailand, the flow fundamentals were in difficulty. Unlike Thailand, national savings are not very high, and the government continued a series of high government deficit. In fact, the accumulation of Tesobonos, dollar denominated short debt, was the major trigger of Mexican crisis. An element of human errors, myopia and the cognitive dissonance must have worked as well.

After the middle of 1993, the value of Mexican peso went down drastically, international reserves depleted, and in December 1994, the peso was under flexible exchange rates. It was devalued into a half in 1996. The sudden dislocation of stock demand occurred as the withdrawal of foreign investors from investment in the government obligation, notably from Tesobonos. The level of US\$21 billion in December 1994 became two thirds in April and one third in September in 1995. (Griffith-Jones, 1996) On the other hand, conforming to our framework above, the current account in 1996 reached almost the equilibrium. (From the deficit of US\$29,418 million in 1994 to US\$654 million in 1995.) Here one can observe the robustness of the portfolio approach, This adjustment was achieved again by a sudden decline in GDP of about 6.2%.

Griffith-Jones records opinions that, in comparison to Chile, the Mexican case may indicate the danger of premature opening of the capital market. As she carefully observes, the merit of capital control should be weighed against the disruption of resource allocation function of capital market.

(5) Brazil

Partly by its own initiative, and partly in order to cope with the Mexican Crisis, Brazil devalued its Real drastically by the end of 1994. The current account was in surplus until the 3rd quarter of 1994. After that, the pattern does not seem to conform to the paradigm of the portfolio approach.

Brazil was another case of government rather than market failure. The economy kept struggling inflation. Between the four years between the Real and September 1998, the economy succeeded to wrench inflation down from rates in excess of 2700% a year to under 3%. This is a remarkable achievement that was helped by fiscal discipline, structural reform in many sectors including. The Asian crisis created another wave of financial difficulties, but the Brazilian economy seems to be managing all right.

The IMF rescue package of US\$ 41 billion was released in November 1998.18.1 would be provided by the IMF stand-by arrangement, and the World Bank, the Inter-American Development Bank and other government. The amount of rescue by IMF is about 2.3% of Brazils GDP --- 1996 figure). Even counting other forms of help, the relative magnitude of rescues are not necessarily larger than in most Asian countries.

V. Capital Control Measures Across the Pacific.

One can find interesting differences between the practice of capital control in Malaysia and in Chile.

(1) Malaysia

Malaysia experienced similar difficulties as Thailand, Indonesia and South Korea. Premier Mahathir Mohamad, however, did not appeal to the IMF relief. He was critical of the behavior of international speculators and was reluctant to conform to the IMF conditionality that reflects the principle of free capital market. Instead, he adopted the policy of capital control. In September, 1998, the government prohibited the repatriation of foreign capital that had a maturity of less than a year. In February, 1999, this embargo was relaxed but a tax is imported to the capital repatriation of the duration of less than year, depending on the length of the duration of investment in Malaysia.

This is the measure in the short run to shift *PP* in *Figure 1* to above by making foreigners difficult get rid of the asset denominated in the Ringgit. In the long run it may reduce

demand for foreigners to invest in Malaysia. As long as Malaysia wants to rely on Western, Chinese, and Japanese capital, this scheme cannot continue forever but should taper out gradually. The record of recovery is impressive, and, as a short term device, this measure is worth studying further.

(2) Chile

In 1991, the Chilean government introduced a system of requiring 20% of the foreign borrowing to be deposited with no interest for the period of a year. This was effectively the taxation on capital inflow with heavier burden for the short term capital flow. This device was taken because since 1989 there was a burst of capital inflow that appreciated Chilean peso and generated the current account deficit. This had an inflationary tendency. Moreover, right or wrong, as a former central banker told me, it was believed that the current account surplus was a necessary ingredient for Chile's economic development. The ratio that was required to be deposited free increased in 1992 to 30%, and the coverage of this law was increased.

This device is to push down the *PP* curve in Figure 1 downward and to prevent the occurrence of the sudden dislocation of fund demand from Chilean peso. This device made the Chilean economy enjoy prosperity and growth. Now, however, I understand that this device has become a drawback for a faster growth by discouraging capital inflow too much. Now this measure of capital control is suspended.

Chilean measures utilized precautions and have ex-ante character as compared to Malaysian measures that attempted to prevent the already invested capital from going back. Chilean measures hold down *PP* curve so that the resulting balance of payments deficit and international indebtedness be kept from growing. Malaysian measures first try to prevent *PP* from shifting downward, but *PP* will anyway shift down because foreign investors will be annoyed by the uncertainty that their investment may be captured as hostages. Chilean methods are in a sense a fair way to foretell the tax burden to investors, while Malaysian methods gave them surprise attacks. In the long run, the effect will be approximately the same, but the short run dynamics should have been disturbed more by the Malaysian way (Agosin and French-Davis, 1998).

VII. Currency Board Systems

Hong Kong and Argentina are considered to be two typical examples of Currency Board System.

(1) Hong Kong

Hong Kong had a long tradition of using the Currency Board System, first pegging with the Pound Sterling and then, after an interlude of the floating rate experience, the Hong Kong Dollar was pegged to the US Dollar by 7.8 to 1. Under the Currency Board System, the Hong Kong Dollar is issued in principle only in exchange of the US Dollar. Hong Kong thus gives up all the autonomy of monetary policy.

The classical specie-flow mechanism is supposed to work here. In the idyllic days of the gold standard, the mechanism worked slowly as the flow relationship. Over-extended domestic activities generated the balance of trade deficit, which invited the outflow of gold. This contracted the monetary base and domestic economic activities were slowed down. This process was reinforced by the rise in the domestic interest rate that attracted foreign funds back to the domestic economy.

Now the above process does not proceed so smoothly. First of all, it is not excess demand for the traded goods but the will of speculators that triggers the financial crisis. Speculators usually bet against the whole system of the Currency Board, and, if not the system, at least the existing parity. Speculative moves can drain the reserves quite rapidly and the domestic interest rate climbs very rapidly. In the fall of 1997, the stock market index fell 23% between October 20 through 23, and the overnight call rate between banks in Hong Kong went up to more than three hundred per cent. Still it would have been profitable for speculators to borrow because 10 per cent devaluation that occur within a week would have meant profit opportunity of more than 500 per cent. China expressed its will to protect the value of Hong Kong dollar.

Starting August 1998, another wave of speculative attacks came. Stock market, real estate, and hotel prices went down over 50 per cent. Hong Kong government engaged in price keeping operations in the stock market essentially using its foreign reserves, violating the principle of free market. It also took the policy measures that broadened the monetary base so that speculative attacks would affect only a part of base money. Discount Window is introduced to lend Hong Kong dollars in exchange for the Exchange Fund Bills and Notes. They are fortunately backed by the US. Dollar. In effect, they could afford, by the ample foreign reserves, to broaden the monetary base without changing the complete backing of deposit by the reserves. They could also manage to strengthen the credibility of the currency board system and, at the same time, to allow more flexibility in monetary policy and less drastic interest rate movements. The measures seems to have succeeded to lower the sensitivity of domestic interest rates to speculative attacks (Yam, 1998:Kwan, Lui, and Cheng, 1999)

Hong Kong has a high degree of openness, measured by export to GDP ratio of about 109%. This qualifies the region as a good candidate for fixed exchange rates. It may be worth mentioning, in passing, Singapore that has a higher export to GDP ratio (130%) adopts a (managed) floating regime. The political issues facing Hong Kong with respect to the Mainland China is outside the scope of this paper.

(2) Argentina

The Mexican currency crisis at the end of 1994 also created speculative waves against the Argentine peso. And depleted the reserve about 40% between December 1994 to March 1995. Interest rates soared. This seems to be a similar phenomenon to Hong Kong's.

In order to avoid his difficulty in liquidity, since December 1996, the Central Bank negotiated with foreign banks for stand-by agreements to borrow dollar whenever necessary. Dollar denominated Argentine government bonds are used as collateral. At the end of 1997, the stand-by limit went up to \$7.4 billion, about 10% of total domestic deposits, and about 2.7% of the GDP (in 1995). Hong Kong did not rely on this type of scheme primarily because Hong Kong's reserves are much more than the demand deposit. The difference in the amount of foreign reserves makes the difference between a sort of domestic funding and the external funding in Argentina.

VIII Real Exchange Rates, Prices and Output

(A section that compares the cost of adjustments will follow.)

IX Conclusions: Are there Some Stylized Patterns in Asia and Latin America?

Across the Pacific, we observe many similar patterns that exemplify the universality of economic mechanism. At the same time we observe subtle differences that reflect the difference in economic systems in countries, the differences in the objectives and instruments of economic policies, even the differences in the philosophy of economic policies. Among these differences, important is the difference in initial conditions under which each country is placed. Risking the criticisms of apparent over-simplifications and over-stylization, I dare attempt to summarize our observations and possible policy implications as follows.

- (1) In Latin American countries, countries that were subject to currency crisis were suffering from macroeconomic policy difficulties. Many countries were under substantial, and often severe, inflation. There were many cases of government failures. Thus the first generation model of the currency crisis that focuses on economic fundamentals will suffice to explain the causes of the crisis. On the other hand, Asian countries were mostly under stable prices and under reasonable fiscal and monetary policies. In Asia it was the market rather than the government that failed. Here, the fundamental theory should be supplemented by more sophisticated strategic or expectation oriented explanations in order to explain the cause of a currency crisis.
- (2) Asian countries were high saving, high investment countries. The only major mistake was that they, and lenders, were over-confident of the future. That led to an over appreciation of a local currency and the over-borrowing. With the optimistic future,

they over-stretched themselves like a *sumo wrestler*. When the perception of the rosy future was shaken, the collapse of a currency takes place.

- (3) The austere measure of IMF recommended theory is suitable for fundamentals triggered crisis. If a change in the prospect of asset market is the trigger of the crisis, the flow measure like balancing fiscal budget is not sufficient or even necessary. The asset market oriented measure like a high rate of interest can in principle work, but it would require a tremendous high rate of interest. The policy of changing the future prospect itself is necessary.
- (4) Except in Indonesia, the external debt in Asia was mostly owed by the private sector. Over-borrowing occurred by the match of erroneous beliefs of private lenders and private borrowers. Lenders made mistake about the capacity of the borrowers to repay for themselves or by the help of their government, or indirectly by international financial organizations. On the other hand, the external debt in Latin America was owed mostly by governments. Private lenders and public lenders considered the capacity of governments to repay either by taxing their people or by being bailed out by other nation or international financial institutions. It is a curious question which of these channels is more accommodating to moral hazard.
- (5) The Wall Street=Treasury=IMF conspiracy theory maintains that the IMF is guided by the intention of the US Treasury and Western governments, which reflect the interest of the Business Circle symbolized by the Wall Street. The analytical results using the common agency theory predict a similar tendency based on the study of incentive structure facing agents involving the rescue decision. (Dixit, 1996: Hamada 1998). A related conjecture is that the IMF rescues Latin American Countries more than Asian countries because the Latin America is closer to the Wall Street. However, we have not found sufficient quantitative support for this conjecture as far as we compare between Asia and the Latin America. the relative magnitude of the IMF and other international rescues to the scale of national economies.

The effect of Confucianism, Buddhism and Islam may be a proximate cause for high savings in Asian countries that made their growth successful and might have made the financial crisis more steep. The Philippines surprises us with their huge shopping malls. Can we say that the consumption oriented attitude of Filipinos came from the Catholic religion rather than Confucianism, for example?

Also the Asian crony capitalism, that is, the economic mechanism that depends more on already made group relationship than on individualistic economic calculations, may be one of the reasons so many lenders and borrowers made errors of forecast. Asian types of institutions are the product of historical experiences, and often can be justified as a semi-rational form of business in a closed society where the same agents engage in business repeatedly. The “crony “ components did not seem to be missing in the process of dealing with the Long-Term Capital Market Fund in the United States. Now that the economies in Asia are being open, and deregulated. Also the crisis makes a situation a

part of a repeated game, but the end game where players do not care about the next round. Then the behavior pattern that has fit to the closed and repetitive environment are to be replaced by the contingent and explicit contract patterns.

Once the errors on the prospect was made, we have to bear the cost of readjustment. It is the main message of this paper that there is no obvious way to adjust. The IMF way brings widely fluctuating exchange rates and high rates of domestic interest, though it does not impair the inter-temporal resource allocating function of the capital market. The capital control disrupts the intertemporal allocation function but restores some of monetary autonomy. The currency board system gives up monetary autonomy, and still is subject to volatile interest rate fluctuations unless guarding measures are taken.

One should compare the cost involved in each regime and adopt the best for the environment a country faces. Writing this paper, I was kept reminded of Kazushi Ohkawa, an eminent quantitative historian who could be called the Kuznets of Japan.⁸ When I once asked him a question, “Does economic theory developed in western, or Anglo-Saxon economies apply to other parts of the planet?,” his answer was simple, “Yes, it does. But, you have to emphasize a certain aspect of the theory when you analyze a certain country because conditions surrounding the economy are different from country to country.” I could conclude as follows. Economic mechanism working in currency crises is quite universal from a continent to another. But initial conditions are so different that alternative remedies will function differently. One has to assume, therefore, open minded attitude to evaluate alternative policy measures to cope with currency crises.

Epilogue

Are Jakarta and New York Isomorphic in Terms of Flow-Stock Balances?

Now at the turn of the century, in the United States, we see all the sign of prosperity: Full employment, bright prospect of the future, and notably the historic zenith of the Dow-Jones Stock Market. At the same time, we see the combination of the country's current account deficit and the large indebtedness to foreign country. Then, is New York not isomorphic to Jakarta in the exchange-rate and asset dynamics? In other words, the flow behavior of nations extravagant consumption that keeps the savings rate close to zero is supported by the asset behavior of the rest of the world.

The flow aspect is reflected in the cumulative current account deficit in the United States. On the other hand, the whole world is willing to invest in the United States and in the asset denominated in the dollar. The net debt is large as a percentage of GDP in the United States, though it is not yet as large as in the eve of Asian crises. Here we find an isomorphism between New York and Jakarta.

⁸ He liked the game of Go, and he remembered me well in the economists' tournament of Go. When I met him in academic conference, he often forgot who I was.

What happens if the asset preference for the dollar decline suddenly, by some impairment of credibility in the American economy or by the vitalization of capital markets in Asia, Latin America or in other parts on the globe. For example, Tokyo or Hong Kong market suddenly become attractive relative to the Wall Street. Then our model predicts that the Dollar and probably the Wall Street Stock market will precipitate, and that the current account balance of payments will improve gradually to achieve a less indebted equilibrium position of the United States economy toward the rest of world.

To the relief of Americans, and to be fair, I should add that the international debt to GDP ratio in the United States is approximately 15 per cent at the end of 1997, while those figures before crises ran around much higher percentages for Asian countries. My back of the envelope calculation shows, the ratios are around 36% for Thailand, 38% for Malaysia, and 45% for Indonesia at the outset of the crises. Brazil gives a similar figure of 18%. We cannot deny the structural similarity between the United States economy and other troubled crisis countries, but, quantitatively speaking, the symptom may not yet be immediately threatening for the United States.

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