

“Successes” and “Limitations” of Crony Capitalism: A Model of the Asian Currency Crisis

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This paper presents a simple model for the Asian Currency Crisis that is founded on the Nash bargaining solution and a location model, and claims that the abrupt inflow and sudden outflow of large volumes of international short-term capital destroyed monitoring mechanisms and the traditional relationship between banks and businesses based on franchise value. The model has been built on the condition that profit opportunities beyond a certain level are necessary in order to restore faith in the banking sector. The model has been used to make an appraisal of measures such as regulations on the inflow of short-term capital and high interest rate measures.

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I. Preface

The Asian Currency Crisis, which was ignited by the collapse of the Thai baht on July 2, 1997, had a catastrophic impact on East Asia. There are two points of view to consider when questioning why the countries of East Asia, whose rapid growth until that point had been touted as miraculous, were suddenly visited by a banking and currency crisis.¹

- (a) In reality, Asia was not doing all that well to start with, that is, the growth experienced during the Asian Miracle was a charade based crony capitalism and moral hazards in the banking sector. Based on this interpretation, the causes of the Asian Currency Crisis can be found in domestic factors in the countries of Asia. (Corsetti *et al.* (1998), Burnside *et al.* (1998))²
- (b) The blame does not lie in Asia; this was a self-fulfilling currency crisis that came about due to excessive transfers of international capital, particularly by hedge funds. That is, responsibility rests with foreign capital. Based on this interpretation, the fickle and dangerous nature of international financial markets is what spoiled the Asian Miracle. (Radelet and Sachs (1998), Furman and Stiglitz (1999))

These two viewpoints can also be interpreted as viewpoints that, amid the excessive short-term international capital inflow, (a) find fault with Asian countries and their **demand** for capital, and (b) place a focus on the failures of the **supply** side. Furthermore, if classified according to existing currency crisis models, viewpoint (a) represents an exogenous policy model (Krugman (1979), Froot and Garber (1984)) based on the deterioration of fundamentals, and viewpoint (b) is a model for a liquidity crisis brought about as a result of speculative attacks that has been founded on a second generation currency crisis model (endogenous policy model, Obstfeld (1984)) for a self-fulfilling shift in parity and on the Diamond bank run model.

Of course, both models are based on overly generalized logic. Therefore, as theoretical models each naturally has their own advantages and disadvantages, and there are problems with applying each directly to the Asian Currency Crisis in their current state. First of all, in the model in viewpoint (a) there is a heavy focus on the moral hazard of banks brought about by the governments' tacit guarantee of debts. However, more or less tacit guarantees such as these are not unheard of in most countries. That is not to say, however, that a moral hazard always exists and that a financial crisis will erupt if banks run up excessive investments. Thus, it is necessary to

¹ For a detailed background to the Asian Currency Crisis, please refer to sources such as Ministry of Finance Deliberative Council on Foreign Exchange (1998), Ito (1999), and Kasube and Horimoto (1999).

² Burnside *et al.* (1998) and Corsetti *et al.* (1999), as with Krugman (1998), focus on the trend of favoring Risky Projects as a result of the private sector moral hazard brought about by the government's tacit loan guarantee. In short, if a banking crisis occurs, based on Dynamic Inconsistency the government has no choice but to rescue banks. As a result, even if fiscal deficits and inflation are not present prior to a crisis, for example, after a banking crisis fiscal deficits and monetary easing become necessary for the government to rescue banks, and the value of the currency will plummet.

give consideration to the problem of what sparked the *crisis*. On the other hand, if it is accepted that the culprit is international capital transfers, as in the model in viewpoint (b), this explanation also says that the crisis could have occurred in any country, which cannot explain why the Asian Currency Crisis occurred at the time it did.

Of course, many scholars hedge their explanations of the situation with provisos, and although the matter is never discussed as simply as in (a) and (b) above, no model has yet been drawn up that fills the chasm between those two diametrically opposite viewpoints. Furthermore, the author believes that it is also necessary to explain the following points in order to unravel the Asian Currency Crisis.

First of all, it is necessary to clarify what the connection is between these two models and the widespread analyses that explain the Asian *success* (World Bank (1993), Aoki Edition (1997)). The major issue is the role that indirect finance, primarily by banks, played in Asia's growth.

Secondly, it is necessary to assess the **effect of policy** taken with respect to the Asian Currency Crisis. Many scholars have already severely criticized the fiscal constraint and interest rate hikes counseled by the IMF as effectively bankrupting the Asian economy. Moreover, more than a few regard the **restrictions on short-term capital inflows** imposed by Malaysia as achieving a certain level of success. Nevertheless, no model has yet been made that succinctly explains how to interpret these results that contradict standardized theories. At any rate, there are many that vaguely state that it is necessary to restore *faith* in the nation as a whole and in the financial sector overall.³

The third point is the relationship between **prudential regulations** in the banking sector and international capital movements. Although many point out the necessity of prudential regulations before capital liberalization in developing countries, in the absence of a clear model analysis, consideration needs to be given to a response to the question of why prudential regulations are necessary, and to the question of why miraculous growth was possible even without prudential regulations in the past. For that matter, it should also be possible to sufficiently understand the superficial and absurd-sounding notion that because prudential regulations are difficult to implement these countries have remained developing countries.

Based on the above points, the objective of this research is to explain both the *success* and *failure* of Asia, and to develop a model that assesses the policy measures implemented thereafter. The main focus will be on the **franchise value of banks** and the **close relationships between banks and companies (relational banking)**. (For a recent analysis, refer to Hellmann *et al* (1997).) It is possible to use the existence of the close relationship between banks and companies to explain the process of the growth referred to as the *Asian Miracle* and closely watched by, among others, the World Bank. Next, based on the notion that these close relationships were smashed by colossal international capital movements, it is possible to simultaneously develop answers to the questions of the currency crisis and why the subsequent structural reforms were so urgently implemented.⁴

³ Of course there have been efforts to create partial models (Furman and Stiglitz (1999)), however, it cannot be said that these have been organized clearly.

⁴ There are also significant differences between the massive Asian banking sector and Latin America, which has been shown to have a low dependence on banks. In Asia, the amount of credit extended to industry from the banking sector exceeds 60% of GDP, however, in Latin American countries excluding

That is, a third viewpoint, which falls between viewpoints (a) and (b) given at the outset of this paper, will be proposed.

- (c) A financial intermediation model will be presented based on the viewpoint that growth will be successful if it is on a small scale, however, over a certain level, growth has limitations. In short, the model considers the notion that there are limitations in the ability of Asia's traditional financial intermediation mechanisms to cover large capital inflows, and that international capital movements contributed indirectly to the large-scale moral hazards faced by Asian countries.

What is the theoretical framework of the model? In this paper the following three elements form the basis for development of as simple a model as possible.

- a. Monopolistic competition structures based on location models and franchise value of banks
- b. Bilateral financing based on bargaining between banks and companies
- c. Monitoring and loan continuity by banks dependent on present discounted value of revenue.

To intuitively and briefly sum up the explanation of the Asian Currency Crisis using this model, the sudden inflow and sudden outflow of large amounts of capital shattered monitoring mechanisms based on traditional bilateral financing based on franchise value. In other words, the problem with short-term inflows of international capital is that they indirectly destroy the chummy bank–enterprise relationships. For that reason, it is considered that a certain degree of profit opportunity is necessary in order to restore faith in the banking sector. The very existence of this traditional monitoring mechanism based on bilateral financing is the Missing Link that has been omitted from analyses thus far, and this is the essence of this *faith*. In this paper, a location model is used for modeling of these conditions, and the critical point at which these traditional mechanisms collapse is determined depending on the discount rate through heavy use in repeated games and reputation analyses.⁵

Structural reform was advocated because moral hazards occurred often, but in this model moral hazards occur endogenously in accordance with economic downturns; consequently a certain degree of economic upswing is necessary in order to avoid the occurrence of moral hazards. This notion explains why the policy measures of the IMF failed.

The structure of this paper is as follows. Section II discusses a partial equilibrium model, Section III discusses a general equilibrium model, and Section IV discusses the various theories

Chile, this amount is approximately 30% of GDP. Chile is an exception among Latin American countries and the amount is approximately 60% of GDP.

⁵ The model in this paper can be said to intuitively use a location model and labor bargaining model to reconstruct the moral hazard-style efficiency wage model popularized by, among others, Shapiro and Stiglitz (1984). There is a series of research, such as efficiency wage models, aimed at avoiding moral hazards based on the assignment of rent in a world of asymmetrical information. The model in this paper applies this concept to a banking crisis.

surrounding the Asian Currency Crisis.⁶

II. Model

Features of the Model

As put forth in the Preface, this model has the following three features centering on the relationships between banks and companies.

- a. Precise formulation of franchise value of monopolistic competition structures and banks using location models

Firstly, a significant feature of this model is that it uses a circular location model (Salop (1979), Kim (1988)) for monopolistic competition structures. The close relationship between banks and companies is considered to be the core of crony capitalist practices such as localism and nepotism. However, this point will be discussed last of all.

- b. Bargaining based on bilateral financing

Modeling of the sharing of rent by banks and companies as a result of the Nash bargaining solution is the second feature of this model. In this model it is assumed that (1) where there is a Disagreement Point in cases where there is a breakdown in negotiations with the closest bank, companies will (2) do business with the second closest bank (adjacent opportunity (neighbor) in location models). This feature shows a clear formulation of the situation interest rates for companies differ in accordance with their proximity to the bank. It should be noted that the nature of this model differs from the standard Hotelling and Salop location model with regards to this disparity in interest rates.⁷

Next, as the third feature of the model, consideration is given to the limitations of bilateral financing. The limitation here is that banks carry out diligent screening, and continue loans.

⁶ This paper gives consideration to many aspects of the Asian Currency Crisis, however, it of course does not explain everything. There are three levels onto which the Asian Currency Crisis is generally broken down.

(i) Excessive inflows of short-term capital

(ii) The loss of faith in Asian economies

(iii) The progression of the crisis from Thailand to other Asian countries.

In this paper (ii) is analyzed based on the existence of (i); (iii) is outside the scope of the paper. Also, as with many other models, rather than attempting to explain as rational behavior why foreign investors suddenly made large investments and equally suddenly withdrew them, this paper explains these behaviors as a precondition. Nevertheless, this model clarifies many aspects of the Asian Currency Crisis. Of course, as mentioned above, the so-called contagion that triggered the plunge in the currencies of Asia is discussed. In order to analyze this contagion, it is necessary to expand the analysis to include the link structure of intermediary goods and the dollar-peg systems of Asia. It is also necessary to consider the behavior of dealers and other market participants, which should have been a wake-up call.

⁷ In normal location models, businesses located in a circle carry out transactions with consumers that have come from afar at the same prices as with those who have come from nearby. However, in this model, prices differ in order to share rent.

c. Loan continuity following monitoring by banks that is dependent on discounted present value of revenue

In order to hypothesize that loan continuity by banks is dependent on discounted present value of revenue, a new constraint, which will be called the loan continuation condition, has been added. Cases where this limitation is valid are those where there is a possibility that the size of the discount rate represents a moral hazard and where there is a close relationship. Based on the results of this, analysis is made of whether or not a moral hazard of the bank will occur endogenously.⁸ In other words, with respect to whether or not a moral hazard will occur, it will be easy to understand the following analysis if it is considered that, based on repeated games and the state of reputation, moral hazards will not occur under the condition of future orientation based on a fixed discount rate.

With respect to the above modeling, there is a variety of earlier research as samples. For example, the research of Bester (1989) and others on models combining Disagreement Points and neighbors, and research by Espinosa (1992a,b) and others on models combining Salop-style location models and repeated games. Also, Economides, Hubbard and Darius (1996) conducted an experimental study by formulating branch regulations and franchise value for banks based on Salop's circular city model based on Economides (1996). Furthermore, Espinosa and Rhee investigate the combination of repeated games and labor negotiations based on the formulation of labor negotiations.⁹ However, as no framework has been presented that enables summation and analysis of the three researchers' findings, the model presented in this paper represents a theoretically new approach.

Bank Location: Circular Monopolistic Competition General Equilibrium Model

⁸ Espinosa (1992a,b) made an analysis based on a circular model of monopolistic competition, however, due to the Salop-style pricing the results are extremely confusing.

⁹ Espinosa and Rhee (1988) derived results indicating that by solving the problem of labor bargaining, in case where the discount rate δ is 0 a monopolistic consortium model that maximizes interest rates is generated, however, as δ approaches 1, the results of bargaining approach an efficient contract model.

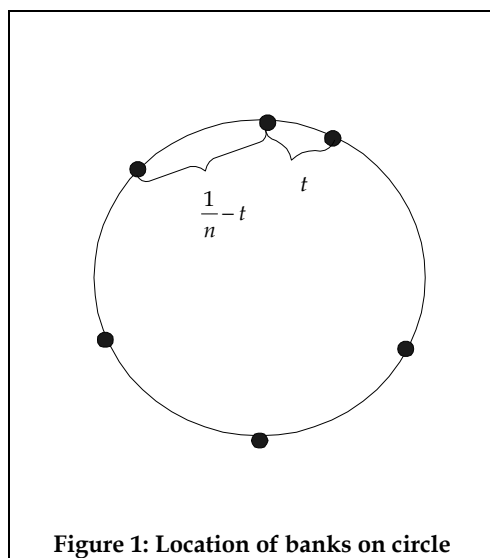
Firstly, it is necessary to explain the relationship between bank locations and companies. Homogeneous companies selling products are situated with a density of N on the perimeter of a circle with a length of 1, and the density is growing at a growth rate of g . Thus, $N_t = Ng^t$. It is assumed that each company is funded solely by borrowings from banks, and that the product market is perfectly competitive. On the other hand, n number of banks are located evenly spaced along the perimeter of the circle. Thus, the distance between each bank is $1/n$. As long as there are no specific objections, n is considered to be exogenously fixed. As a result of entry restrictions and barriers, banks are, in a manner of speaking, in a situation where they are subject to restrictions. The relationship with the short-term international capital inflows that were central to the Asian Currency Crisis will be discussed later.

Borrowings from banks involve transaction costs C which are borne by companies, however, these transaction costs are a function of the distance t between the bank and the company. Specifically, in proportion to the distance between banks and companies, these costs can be formulated as:

$$C(t) = t K(t) \tag{1}$$

These transaction costs change in proportion to the distance t between the banks and companies on the perimeter of the circle and the amount of borrowings K .

The gross revenue R of banks in each accounting period is the sum of interest revenue from all



transacting companies and is expressed as follows.

$$R = 2N \int_{t=0}^D (r(t) - r^e) K(t) DT \tag{2}$$

Here, $D(=1/2n)$ is the largest value for the distance between banks and companies.

Negotiations between Banks and Companies

Next, each bank negotiates with companies under the Nash bargaining solution, and shares rents. The point to consider here is that rent is included in the interest rate on loans, however, that rent varies depending on the distance between the bank and the company. Given the combination of banks and companies, negotiations between banks and companies are considered below as a partial equilibrium model based on an asymmetrical Nash bargaining solution.

$$\max_{\{r,K\}} \beta \log \{\pi(t) - \pi^e(t)\} + (1-\beta) \log \{(r(t) - r^e)K(t)\}. \quad (3)$$

Where β is the bargaining power of a business, $\pi = [PX(t) - r(t)K(t) - tK(t)]$ is the business's profit, P is the market price, $r(t)$ is the interest rate including the rent outlined below, $K(t)$ is capital stock, and items displayed with the superscript e attached are disagreement point variables. The only production function specified is capital $K(t)$, which is specified in the Cobb-Douglas style as a production factor. ($1/2 < a < 1$)

$$X = K^a \quad (4)$$

As explained below, π , π^e , r , and K are all functions of t and vary according to the distance t between banks and companies.

Disagreement Points and Incentive Limitations of Lender Banks

For banks, the interest rate on deposits is r^e , and the interest rate on loans is $r(t)$; the difference between those two is profit. Here, as shown below, banks introduce the **loan continuity condition** to the relationship with companies.

$$2N \frac{\delta + g}{1 - \delta - g} \int_{t=0}^D (r(t) - r^e) K(t) DT - m \geq 2N \int_{t=0}^D (r^e - r(t)) K(t) DT \quad (5)$$

Rearranging the above formula gives:

$$2N \int_{t=0}^D \left[\frac{r(t) - r^e}{1 - \delta - g} K(t) \right] dt \geq m \quad (5')$$

Here, r^e is the external opportunity interest rate for the bank, and is not a function of t . In other words, it is assumed that the external opportunity of banks is set regardless of the type of and distance to companies. As indicated above, r^e also functions as the interest rate on deposits in this

model, and the external opportunity for banks and the interest rate on deposits are assumed to be the same as a result of arbitrage. m is the lump sum present value of monitoring costs per bank. δ is the discount factor, and for banks for which this is large and close to 1, the incentive to continue loans is strong. The density of companies is considered to grow at the growth rate g . Banks carry out monitoring by applying a restriction formula such as (5) in repeated games and reputation analysis, and by continuing loans, they are able to earn excess revenue $(r(t)-r^e)K(t)$ in excess of the external opportunity $r^e K(t)$ from each company. Thus, the left side of Formula (5) is the discounted present value of future gains earned by the bank in and after the next accounting period in cases where loans to the company are continued. In cases where there is a deviation from the tacit agreement to continue loans, the loan will be terminated and the external opportunity r^e will be achieved once only. Thus, the right side of the equation represents the gain in the case of capital investment in external opportunity profit in cases where agreement with respect to loan continuity between the bank and the company has collapsed.¹⁰

Solving the Model

The following Lagrangian is formulated using the above settings.

$$(1-\beta)\log(\pi(t)-\pi^e)+\beta\log\{(r(t)-r^e)K(t)\}+\lambda\left[2N\int_{t=0}^D\left[\frac{r(t)-r^e}{1-\delta-g}K(t)\right]dt-m\right] \quad (6)$$

A level one condition of this optimization problem is:

$$r: \quad -(1-\beta)\frac{K(t)}{\pi(t)-\pi^e} + \frac{\beta}{r(t)-r^e} + \lambda\frac{K(t)}{1-\delta-g} = 0, \quad (7)$$

$$K: \quad (1-\beta)\frac{PMPK-r(t)-t}{\pi(t)-\pi^e} + \frac{\beta}{K(t)} + \lambda\frac{r^e-r(t)}{1-\delta-g} = 0, \quad (8)$$

which is the restriction formula (5).

Case 1: $\lambda=0$

First of all, as a benchmark, a case where the loan continuity condition is not valid ($\lambda=0$) is considered.

Firstly, if Formula (8) is replaced and the rent sharing condition is derived, it can be confirmed

¹⁰ This assumption does not determine whether or not banks will continue loans with respect to each firm; it simultaneously determines whether or not the bank will exercise loan continuity for all firms. This assumption is not necessarily substantive, however, it is a necessary assumption in order to proceed with a clear analysis later.

that the interest rate is equal to the weighted average of average productivity and marginal productivity minus distance t .

$$r(t) = \frac{\beta}{1-\beta} \frac{\pi(t) - \pi^e}{K(t)} + PMPK - t \quad (9)$$

Next, based on the level one condition Formula (7) and Formula (8) we get,

$$PMPK (= PaK^{a-1}) = r^e + t \quad (10)$$

and it can be seen that marginal productivity PaK^{a-1} is equal to the external opportunity interest rate r^e plus distance t . In this case, the problem is represented using the Nash bargaining solution with perfect information. Therefore, it can be confirmed that Pareto optimum production is realized.

If Formula (10) is replaced, we get:

$$K(t) = \left[\frac{Pa}{r^e + t} \right]^{1/(1-a)} \quad (11)$$

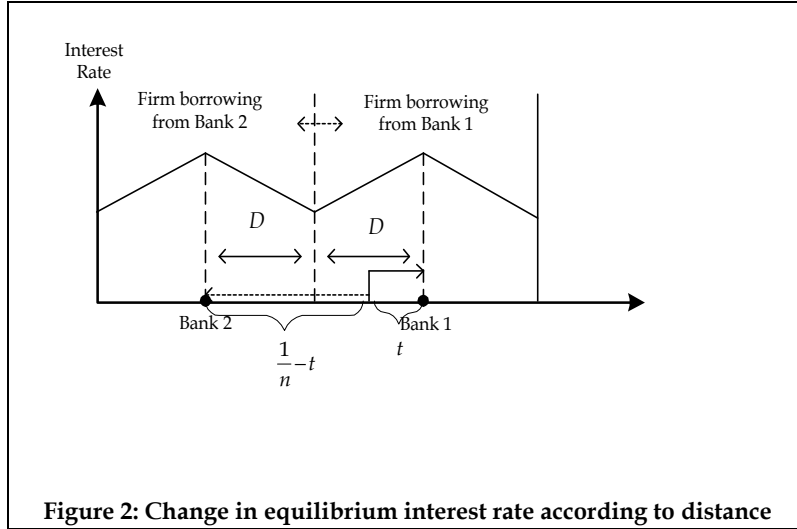
and it can be seen that capital stock decreases in proportion to the distance t from the bank. If capital is represented as K^e in cases where a loan is taken from the second closest bank:

$$K^e(t) = \left[Pa / \left[r^e + \left(\frac{1}{n} - t \right) \right] \right]^{1/(1-a)} \quad (12)$$

Therefore, here π and π^e can be calculated as:

$$\pi(t) = P(K(t))^a - r(t)K(t) - tK(t) = \frac{1-a}{a} (Pa)^{1/(1-a)} [r^e + t]^{a/(a-1)} \quad (13)$$

$$\pi^e(t) = (K^e(t))^a - r^e(t)K^e(t) - \left(\frac{1}{n} - t \right) K^e(t) = \frac{1-a}{a} (Pa)^{1/(1-a)} \left[r^e + \left(\frac{1}{n} - t \right) \right]^{a/(a-1)} \quad (14)$$



Thus, the interest rate $r(t)$ can be calculated as:

$$r(t) = r^e + \frac{\beta}{1-\beta} \frac{1-a}{a} \left(1 - [r^e + t]^{1/(1-a)} \left[r^e + \left(\frac{1}{n} - t \right) \right]^{a/(a-1)} \right) \quad (15)$$

In cases where the firm is located at the midpoint between two banks it can be seen that

$$(t=(1/n)-t), r(t) = r^e + \frac{\beta}{1-\beta} \frac{1-a}{a} (1 - r^e - (1/2n)).$$

Next, the total capital TK of a firm based on loans from an individual bank is calculated as follows.

$$TK = 2N \int_{t=0}^D \left[\frac{Pa}{r^e + t} \right]^{1/(1-a)} dt = 2N(1-a)P(Pa)^{a/(1-a)} \left([r^e]^{-a/(1-a)} - [r^e + D]^{-a/(1-a)} \right) \quad (16)$$

This case illustrates that the larger the number of banks $n(=1/2D)$, the larger TK and total production become.

However, the above analysis is simply a benchmark. For the Asian Currency Crisis and bank restrictions, a case (Case 2) where the following restrictive condition is valid must be considered.

Case 2: $\lambda > 0$

As a second case, consideration is given to a case where the restriction is a more significant bank loan continuity condition. In this case, too, Formulae (9) and (10) have been simplified to get

$$PaK(t)^{a-1} = r^e + t, \text{ and } K(t) = \left[\frac{aP}{r^e + t} \right]^{1/(1-a)}.$$

Here, based on free entry and exit of firms at the equilibrium, the zero profit condition $\pi(t) = P(K(t))^a - r(t)K(t) - tK(t) = 0$ is worked out.¹¹ Thus:

¹¹ For this purpose the number of firms is determined endogenously, as opposed to the number of banks,

$$r(t)=PK^{a-1}-t = \frac{1}{a}(r^e+(1-a)t) \quad (17)$$

Substituting Formula (11) and Formula (17) for the loan continuity condition

$2N \int_{t=0}^D \left[\frac{r(t)-r^e}{1-\delta-g} K(t) \right] dt \geq m$, we find that:

$$2N \int_{t=0}^D \left[\frac{r(t)-r^e}{1-\delta-g} K(t) \right] dt = \frac{2N(1-a)^2}{(1-\delta-g)(1-2a)} (Pa)^{a/(1-a)} \left((r^e+D)^{(1-2a)} - (r^e)^{(1-2a)} \right) \geq m \quad (18)$$

If the smallest δ , which guarantees the maintenance of loans for the firm, is written as δ^* , and the above Formula is replaced, we get:

$$\delta^* \geq 1-g - \frac{2N(1-a)^2}{m(1-2a)} (Pa)^{a/(1-a)} \left((r^e+D)^{(1-2a)} - (r^e)^{(1-2a)} \right) \quad (19)$$

In short, in cases where δ^* is larger than the right side of Formula (19), loans will be continued. The following is primarily an analysis of Formula (19).

Comparative Statics

Next, consideration is given to the effect of changes in exogenous variables on δ^* . In short, the bank's discount factor is exogenous, and size of the factor is not specified. However, in cases where this exogenous discount factor is larger than the smallest discount factor for which the bank's loan continuity is possible δ^* , the loan will be maintained, but in cases where it is smaller, the loan will not be maintained. Thus, the probability of loan continuity is influenced depending on what conditions influence δ^* . Consequently, the following analyses are all based on δ^* .

Firstly, if we consider the exogenous change in distance $D(=1/2n)$,

$$\frac{\partial \delta^*}{\partial D} = -\frac{1-a}{m} 2NP \left(\frac{aP}{D+r} \right)^{1/(1-a)} < 0, \quad (20)$$

it can be seen that there is a negative effect on δ^* . That is, the larger the distance to the neighbor bank $D(=1/2n)$, δ^* will be smaller and the greater will be the probability of establishing a condition for loan continuity. That is, it can be seen that the smaller the number of banks, the more effective prudential regulations such as barrier restrictions will be.

Next, looking at prices, it can be seen that increases in prices have a negative effect on δ^* , and increase the probability of establishing a condition for loan continuity.

which is not.

$$\frac{\partial \delta^*}{\partial P} = -\frac{2N(1-a)}{m(2a-1)}(aP)^{a/(1-a)} \left[r^{(1-2a)/(1-a)} - (D+r)^{(1-2a)/(1-a)} \right] < 0 \quad (21)$$

There is also a link between this point and exchange rate pegs, however, this will be discussed later.

If similar consideration is given to changes in external interest rates r^e , and the fixed monitoring costs of banks m , we get:

$$\frac{\partial \delta^*}{\partial r^e} = \frac{1-a}{m} 2NP(aP)^{a/(1-a)} \left[r^{-a/(1-a)} - (D+r)^{-a/(1-a)} \right] > 0 \quad (22)$$

$$\frac{\partial \delta^*}{\partial m} = \frac{2N(1-a)^2}{m^2(2a-1)} P(aP)^{a/(1-a)} \left[r^{(1-2a)/(1-a)} - (D+r)^{(1-2a)/(1-a)} \right] > 0 \quad (23)$$

If the external interest rate r^e increases, δ^* gets larger and the probability of establishing a condition for loan continuity decreases. In the same manner, the higher monitoring costs m become, the larger δ^* and the lower the probability of establishing a condition for loan continuity. It should be noted that the bargaining power of the firm β has no relationship to δ^* .

$$\frac{\partial \delta^*}{\partial \beta} = 0 \quad (24)$$

This is because in this case, irrespective of the bargaining power of banks, loan continuity conditions are a restricting condition, and it is necessary to secure a certain level of profit.

III. The Model and Theories Surrounding the Asian Currency Crisis

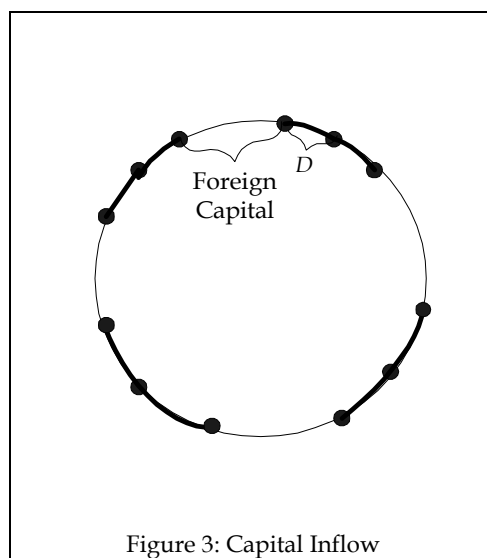
As indicated in the Preface, this chapter will discuss the relationship between the various theories surrounding the Asian Currency Crisis and this model.

Policy Issue 1. Why criticize international capital movements of mostly short-term capital?
[Bhagwati (1998)]

Bhagwati and many other scholars place a large emphasis on the role of short-term capital inflows, and point out that the rapid inflow and subsequent removal of that capital were the trigger for the Asian Currency Crisis. There are data available to confirm this point. For instance, in the case of Thailand between 1991 and 1996, the average current account deficit was 4.5%, whereas the net inflow of capital reached 8% of GDP, and this was mostly due to the size of short-term capital

inflows¹². Malaysia's subsequent imposition of restrictions on short-term capital became a point of controversy. Also, although there were few calls of support for the long-term continuation of the capital movement restrictions, many considered the restrictions to have been effective in the short-term.

However, it is not clear as to the type of theoretical models on which this criticism by Bhagwati *et al* and the Malaysian experiment are based. Generally, under the concept of “free markets”, the decision of how much to lend and how much to withdraw is a free one. Also, there is no denying that it is impossible to ignore the merits of free capital movement¹³. On the contrary, this emphasizes the adverse effects of speculation; even in cases where a self-fulfilling currency crisis is considered, restrictions must be in place at all times as a currency crisis could occur at any time.



Following is a consideration along the lines of the model developed in this paper of the effect of the inflow of short-term capital from overseas. In the case of Thailand it is understood that investment other than direct investment was directed towards the real estate market via Thai banks and non-bank financial institutions, and in the case of Korea, this was directed towards capital investment in *zaibatsu*-type manufacturing industries¹⁴. As foreign capital was lent directly to companies without passing through local banks that enforce rent sharing, it is thought that bank franchise value was eroded.

So, using Formula (10), the threshold for bank franchises D must satisfy

¹² Developing countries with fiscal deficits of 3-4% of GDP are not uncommon.

¹³ As general reasons for why capital movements are not desirable, (1) they strain trade, (2) taxation structures differ, and (3) there is asymmetry of information.

¹⁴ FDI is only about 2% of GDP.

$$r^e + D \geq r^e + f \quad (25)$$

Here, f is the interest rate spread demanded by foreign financial institutions in external financial markets. The more the interest rate spread f contracts as foreign capital flows in, the lower the franchise D of domestic banks. Thus, it can be seen that the probability of banks establishing a condition for loan continuity falls. Even if $r^e + D \geq r^e + f$ is interpreted in the model in Chapter II as an explicit restriction, no correction will be made to the analysis and conclusion as D is determined by exogenous restrictions. This has been explained here solely to avoid confusion for the reader.

Thinking in this way, in this model it is easy to understand the reason that the Malaysian short-term capital restrictions were to a degree successful. This is because, inhibiting the inflow of capital protects the franchise value of banks and concentrates capital in investment in production.

In short, international capital movements erode the long-standing relationships between banks and firms, and explain the triggering of the breakdown in banks' monitoring of companies and loan continuity. In other words, this is because the problem with the foreign capital is that it attempted to gain a free ride on the long-standing relationship between banks and companies. In a manner of speaking, at a time when the poor and needy came in good faith, money was lent in large sums, then suddenly removed, thereby crushing local financial institutions.

Policy Issue 2. Why did the conditionality (high interest rate policy measures and exchange rate maintenance measures based on fiscal austerity and monetary tightening) of the IMF fail? Or rather, why is it criticized? [Feldstein (1998), Radelet and Sachs (1998), Furman and Stiglitz (1999)]

The IMF demanded

- fiscal tightening
- bank closures and structural improvements through the abandonment of nepotistic practices.

However, many scholars were united in their criticism of these measures. Opinions are divided over

- the high interest rate policy implemented to prevent the outflow of funds.

Sachs *et al* contend that it would have been possible to achieve a soft landing by lowering exchange rates.

To sum up the IMF's conventional diagnosis of the currency crisis, as the economies in the countries in which the crisis occurred were overheating, imports had increased excessively and exports dropped off resulting in a trade deficit that gave rise to the currency crisis. The IMF's prescription for the situation was to tighten fiscal and monetary policy and that it was necessary to cool the economy. On the other hand, due to stable exchange rates, the high interest rate would bring about an expansion of exports and a recovery of capital inflows, which would lead to an early stabilization of the economy. Nevertheless, although such policy was implemented in Asia, and did result in an inflow of foreign capital, exports did not expand.

In this model, as shown in Formula (22), increases in interest rates make it difficult to establish a condition for loan continuity. Furthermore, increases in the projected growth factor for company density g cause the circle on which banks are located to become gradually thicker. Therefore, as shown below, as g increases δ^* becomes smaller, and the probability of establishing a condition for loan continuity becomes higher.

$$\frac{\partial \delta^*}{\partial g} < 0 \quad (26)$$

In short, the monitoring of moral hazards and the probability of establishment of a system that and guarantees loan continuity are correlated with economic conditions.

The following analysis is not necessarily a complete model, however, it will be explained here to show that the considerations of this model are not always contradictory.

Extension 1: Why are prudential regulations for banks necessary?

As with international capital movements, the effect of domestic deregulation can also be considered. For instance, as a result of deregulation in Thailand there has been an expansion in the number of finance companies similar to the housing loan corporations that are commonplace in Japan. These finance companies were jostling banks out of the market but many went bankrupt as a result of failed real estate loans. In the model presented in this paper, the scope of a bank's franchise is important for determining δ^* , and if entry becomes easier as a result of deregulation, the scope of the franchise will shrink, competition will increase, and it will become difficult to establish a system to guarantee loan continuity. However, in this model, it is necessary to construct an additional model to explain why excessive entry of banks will occur.

Extension 2: Dynamics of the Banking Crisis

The model developed thus far has fundamentally been a static model. However, if the total value of non-performing loans are expressed as B and the right side of Formula (5') from Chapter II, the condition for bank loan continuity, is revised as $2N \int_{t=0}^D \left[\frac{r(t) - r^e}{1 - \delta - g} K(t) \right] dt \geq m + B$, it is also possible

to consider dynamics. In short, the higher the total value of non-performing loans climbs, the more difficult it will be to establish a condition for loan continuity and the lower δ will become.

And, in the process of recovery from a currency crisis, it can be seen that increases in B have a negative effect on the recovery of loans and that falls in r^e have a positive effect. Thus, if the value of land, which is important for collateral value, falls for example, it can be seen that there is both a positive and negative impact in that the total value of non-performing loans increases while the external rate of return will fall.

Extension 3: Function of dollar peg exchange rates

It has been pointed out that the dollar peg system was behind the rapid inflow of capital to East Asia. Dollar interest rates in the 1990s averaged around 5%, however, baht interest rates for example were 13–14%, which is an enormous interest rate spread. It is considered that the rapid inflow of short-term funds was because there was little exchange rate risk due to the pegged exchange rate.

If the nominal exchange rate is ϵ , imported materials prices are expressed as P^* , and we consider that exchange rates are established as the relative price of tradable goods, we get $\epsilon = (P/P^*)$

So, if the demand for goods conforms to the demand factor $X = (P/P^*)^{-\eta}$ and imported goods prices P^* are standardized as 1, $P = \epsilon$. Thus, it can be said that exogenous increases in the nominal exchange rate ϵ based on the dollar peg system have the same effect as increases in prices P . (i) decreases in δ^* will have a direct effect, whereas (ii) there will be a larger indirect effect whereby the scope of franchises D will be caused to decrease, thus causing an increase in δ^* .

IV. Remaining Issues

In this paper, a simple model for the Asian Currency Crisis based on monopolistic location competition and repeated bargaining was presented. Following is a summary of the fundamental arguments of this paper and the model.

- a. As extolled by the World Bank, why did **high growth** continue in Asia? Or rather, was it a phantom? Why did the economies of Asia, which boasted sound fundamentals, suddenly collapse?
- b. Why was there a twin crisis, and what was the role of local banks?
- c. Where did the **moral hazard** lie; with lenders or borrowers? Or, what do explanations using moral hazards lack?

a. The following summary of macroeconomic fundamentals of Asian economies

- (1) **Treasury budgets** were for the most part balanced
- (2) **Inflation** was 5–6%
- (3) The domestic **saving rate** was approximately 35% of GDP

shows that fundamentals had not deteriorated. The largest question here is, if economic fundamentals had not deteriorated, why did the currency crisis occur? In other words, the problem is, what is the difference from Latin America where currency crises occur repeatedly? With respect to this, this paper has focused on the local banking sector, where the focus has also traditionally been. The World Bank's *Asian Miracle* report is well known. In that report, the World Bank praised the Banking-oriented Financial System. On the other hand, it is also well known that

Krugman (1999) and Young (1995) *et al* discarded the growth of Asian economies as being phantom.

This paper argues that the Asian growth was more a product of a system that focused on confidence in members of the “in-group” and was based on localism and nepotism, rather than explicit ratings and information disclosure as a structure to overcome the asymmetry of information. Therefore, this paper does not argue that the growth was “phantom”.

b. Furthermore, the role of banks in the Asian Currency Crisis served to concentrate risk as they

- borrowed short-term from foreign capital but lent long-term
- borrowed in dollars but lent in local currency.

The important thing here is that if the financial intervention capabilities of local banks is not a precondition, it is not possible to understand the above transformation. Quite frankly, it is fine for foreign banks to lend to local banks in this way, however, as the local banks do not possess screening skills, such lending is not possible. For that reason, banking crises are the real danger and a model focusing on banks is necessary.

c. At the outset of the currency crisis, many fingers pointed at the crony capitalism of East Asia, which was the source of demand for capital, however, the Russian crisis occurred in 1998, just one year later, and as a result the powerful hedge fund LTCM went bankrupt. This led to increasing criticism of those supplying capital.

In the model presented in this paper, local banks directly caused a moral hazard, however, that means that foreign capital had an indirect effect. The inflow of foreign capital eroded the territory of domestic banks and as a result relationships with high quality domestic lenders were lost. Thus, the cause of the moral hazard was the breakdown of bilateral transactions; neither group was specifically to blame. As mentioned in the Preface, if arguing whether it was the demand side of the international capital inflow or the supply side that was at fault, it comes to stand that the supply side eroded the territory of local banks, and therefore the demand side banks faced a moral hazard. In short, the direct cause is the moral hazard of the banks, however, the background to that was the impact of international capital movements.

As this model is based on foreign banks lending directly to Asian firms, the increase in capital inflows itself beckoned an increase in domestic savings, and it is not considered to have been directed toward cheap finance. The direction in which that capital was channeled will be discussed separately, however, the model from this paper is better applied to Indonesia, where foreign banks lent directly to local firms, as opposed to than Korea and Thailand, where many loans were extended via local banks.

Lastly, the problems addressed in this model are not limited to the interpretation of the Asian Currency Crisis, it should be pointed out that it is also necessary to consider these in light of larger issues such as whether or not traditional local monitoring mechanisms are effective, and whether

universal appraisal systems are effective. Although there is already a vast array of research on the Asian Currency Crisis, from an assessment of so-called crony capitalism, there will be many sharp divisions of opinions as shown below. These are

- Is it desirable to have “universalism” based on ratings and qualifications derived from so-called “global standards”?

and

- is it desirable to have so-called “communalism” based on human relationships that include localism and nepotism?

The difference here is a possibility that goes beyond normal economics frameworks. For example, as put forth by Hayao Kawai (1999), there has been an assessment by a certain Filipino that Japanese, who take the approach that “It’s family so it will be OK”, are morally inferior.

However, many discussions lean heavily toward the proxy war aspect of the two standpoints indicated above, and there is a strong element of vain attempts to divide something that cannot be divided. The standpoint taken in this paper is an eclectic one, recognizing that although the arguments of both sides have their strengths and weaknesses, it is not possible to take only the good arguments of each. In this model, Asian growth is thought to be more a result of a system that focused on good faith in the in-group rather than explicit ratings and information disclosure as a structure for overcoming the asymmetry of information. Also, it shows that the breakdown of traditional mechanisms triggered the crisis. In short, although it is possible to increase the likelihood of progress if traditional mechanisms are respected, there is a limit to this. Thus, this paper does not one-sidedly argue that it is good to continue traditional mechanisms. However, on the other hand, it also does not argue that a rapid collapse of traditional mechanisms is desirable. It argues that it is necessary to give further consideration to this dilemma; and with this dilemma in mind behavior that demands an optimal combination is necessary.

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