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Restructuring of Corporate Debts after the Asian Currency Crisis: Implications of Agency-Cost Analysis

I. Introduction

In the present chapter, corporate debt restructuring will be examined by using agency-cost analysis.¹ The uniqueness of such an analysis is that as the starting point, the unintended, unexpected changes that occurred in capital structure as a result of the Asian currency crisis were observed and it was postulated that the accompanying increase of agency cost was shouldered by creditors and shareholders, whereas in the conventional argument, it is generally assumed that the borrower usually shoulders the agency cost. In addition, the concepts developed here were also represented by geometric diagrams to give the readers the opportunity to visualize them and facilitate the understanding of the different conclusions stemming from changing conditions. In the first half of the chapter, the model will be introduced, followed by its implications in the last half, but first an outline of the agency-cost approach will be presented.

In the Modigliani-Miller Theorem (hereafter MM Theorem),² which can be taken as the starting point for addressing this problem, capital structure and corporate decision-making about investment, production, etc. are not considered to mutually influence one another, but rather to be independent aspects of enterprises. Therefore, capital structure is not considered to be a major problem. However, the MM Theorem can only be applied to an ideal economy free of the various kinds of “frictions,” while in a real economy, capital structure

and corporate decision-making do not exist independently of one another.

In the real world, any enterprise's managers (or controlling shareholders), general stockholders, and creditors have different interests, which tend to conflict; and due to information asymmetry, the enterprise's management does not always act as the loyal agent of the general stockholders and creditors who have provided it with capital. This is because changes in capital structure may alter the decision-making process in an enterprise and exert an influence on the enterprise behavior, enterprise value, and the like.

For example, general stockholders are interested in maximizing enterprise value, while managers (or controlling shareholders) could very well decide not to maximize that value but be rather motivated by personal interest. There is always the danger of "empire building" on the part of managers for their own satisfaction, resulting in such aspects unrelated to enterprise profitability as construction of luxurious office buildings and leisure facilities as well as acquisition of huge expense accounts. Whenever information shared by general stockholders and managers is asymmetric (which occurs more often than not), either it becomes easier for such a non-maximizing behavior to occur, or additional funds will have to be expended on monitoring managers to prevent such behavior. Here lies the cause of agency costs of external financing through stock issuance.

Agency costs (hereafter AC) can also be encountered in the issuance of debentures and borrowing from banks. We can equate these two forms of fund raising in the present analysis since the objective of both contracts is to pay *fixed* amounts of cash in the future in return for present cash. Generally speaking, when borrowers cannot repay, creditors are limited in terms of the amounts they will be able to recover, since debt contracts are based on the principle of limited liability. Creditors can take steps to seize the assets of such borrowers, but cannot seize the private property of enterprise managers, nor request that stockholders pay the difference.

Due to such a feature, what is important from the standpoint of creditors is not necessarily the maximization of enterprise value, but rather that the value does not drop below the amount required to pay back the contracted principle and interest. The rise of opposing incentives with managers and stockholders can also occur.³ From the latter's standpoint, high-risk, high-return ventures are desirable, and in extreme cases, it is possible to select a high-risk venture over a safer one with less expected return. This is because in ventures financed by loans, all the extra income over and above the debt payment belongs to managers and stockholders if successful, whereas creditors will bear the burden for failure. Therefore, when there is information asymmetry between managers and creditors, the issuance of debt also incurs AC.

Now since fund-raising through stock issuance and debt issuance both incur AC, the wisest choice is to use a combination of the two so as to minimize the total amount of AC. The optimum combination of stock and debt for such a purpose will result in an optimum capital structure; and here it is important to distinguish between additional and total AC. Hereafter, we will refer to additional AC resulting from a unit change in the amounts of debt and stock as “marginal AC,” while total AC will be referred to simply as “AC.”

To repeat, there are two sources of AC: those incurred due to the behavior on the part of agents that is harmful to the interests of their principals, and those incurred for the purpose of preventing such behavior. The latter can be further divided into bonding and monitoring costs, to determine who incurs the AC, the former being directly incurred by the agent (enterprise), the latter by the principals (stockholders and creditors).⁴ However, according to the conventional argument, in either case, it is always the enterprise that ends up bearing the cost, because even in the case of monitoring, stock and debt instruments will be issued at prices reduced by the amount of AC; therefore, stockholders and creditors are able to shift the cost burden onto enterprises. A unique feature of the analysis that follows is a departure from the conventional argument in this respect. Since the worsening of corporate finance brought about by the Asian currency crisis was an unexpected change, it will be postulated here that the resultant increases in AC were borne by the providers of capital.

Unless it is possible to raise interests rates after the fact, creditors cannot transfer the burden of increasing debt-related AC to debtors. However, in almost all cases, it is difficult to change contract stipulations after the fact. By the same token, stockholders cannot transfer the unexpected increase of AC after the fact. Therefore, in the examination of the crisis presented here, increased AC after the fact will be assumed to have been borne by stockholders and creditors.

Also, the costs of bankruptcy will be included in debt-related AC.⁵ Here, since the incidence of bankruptcy stems from the issuance of debt, additional costs will accompany the costs involved in debt issuance itself. However, bankruptcy does not always occur. Therefore, more accurately, the cost of bankruptcy is the probability that bankruptcy occurs as a result of debt issuance multiplied by the costs expected in the case of failure. What should be noted here, however, is the fact that bankruptcy in itself is not a cost, for even when it occurs, additional costs can be eliminated by smooth and efficient bankruptcy procedures. Actually, though, such cost-free procedures are seldom carried out.

For example, due to information asymmetry and negotiation costs among

the interested parties, costs may rise from inappropriate bankruptcy procedures. Appropriate procedures involve a comparison between the value of an enterprise as a going concern and the value of liquidation, action being taken on the basis of which predominate. Otherwise, more economic value than is actually necessary will be lost. For the same reason, unnecessary delays in bankruptcy procedures can also result in the loss of economic value. The more time it takes to carry out bankruptcy, the more financial distress will occur, like talented human resources and excellent customers being taken by rival enterprises, resulting in unnecessary losses in the value of a going concern and that of liquidation.

What follows is an explanation of the methodology to be used via both a basic model and diagrams in Section II, followed by an analysis of the Asian currency crisis in Section III. Finally, in Section IV, the results of the model analysis will be summed up and implications will be pointed out.

II. Model and Diagrammatic Methodology

First, let us define our variables and symbols:

V : Total enterprise value,

B : Total value of debt,

S_T : The total market value of stock,

S_i : A part of S_T held by enterprise managers and controlling shareholders, and

S : The share of S_T held by general stockholders.

The relationship among the variables can be expressed by the following equations.

$$V = S_T + B, \quad (6.1)$$

$$S_T = S_i + S. \quad (6.2)$$

Next AC can be expressed generally by the following functions with many variables.

Debt-related AC: $AC_B(B, S, S_i, V, \dots)$,

Stock-related AC: $AC_S(S, B, S_i, V, \dots)$.

However, here they will be simplified to the single variable functions,

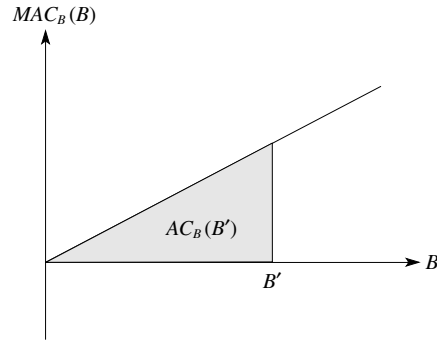
$AC_B(B)$: AC for cost accompanying debt issuance and

$AC_S(S)$: AC for cost accompanying stock issuance.

They will be expanded to two variables in the following section.

Marginal AC will be expressed as functions $MAC_B(B)$ for debt and $MAC_S(S)$ for stock and $MAC_B(B) = \partial AC_B(B) / \partial B$, $MAC_S(S) = \partial AC_S(S) / \partial S$.

Fig. 6-1. Debt-Related AC



1. Debt-Related AC Diagram

Figure 6-1 is composed of a horizontal axis representing the amount of debt and a vertical axis representing the debt-related marginal AC. Here we assume that marginal AC is increasing linearly along a fixed slope.⁶ Linearity is assumed only for the purpose of simplicity in drawing the diagram. From an analytical point of view, we only need a marginal AC function for an increasing function of B . That is,

$$\frac{\partial MAC_B(B)}{\partial B} > 0. \quad (6.3)$$

When total debt is at B' , AC is denoted by the shaded triangular area in the diagram, which can be expressed as

$$AC_B(B') = \int_0^{B'} MAC_B(B) dB. \quad (6.4)$$

2. Stock-Related AC Diagram

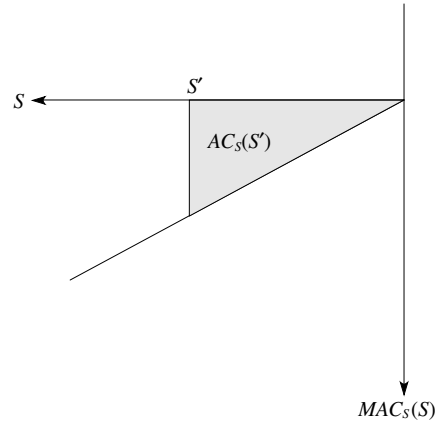
In the same manner, stock-related AC can be expressed like in Figure 6-2. Only the coordinates have been reversed, in order to match them with debt-related AC in one diagram presented later.

The horizontal axis corresponds to the total stock held by general stockholders and the vertical axis to the stock-related marginal AC. The same assumptions can be applied as in the case of debt-related AC, giving the expression

$$\frac{\partial MAC_S(S)}{\partial S} > 0. \quad (6.5)$$

Again stock-related AC at S' is denoted by the shaded triangle, expressed as

Fig. 6-2. Stock-Related AC



$$AC_S(S') = \int_0^{S'} MAC_S(S) dS. \tag{6.6}$$

3. *Diagram Combining Debt- and Stock-Related AC*

Figure 6-3 is a combination of Figures 6-1 and 6-2. The distance $O_B O_S$ along the horizontal axis expresses the total amount of external fund-raising, the distance between a point on the horizontal axis and O_B , the amount of debt financing and the distance between a point on the horizontal axis and O_S , the amount of stock financing. We use the notation OF to express total external financing, that is,

$$OF = B + S. \tag{6.7}$$

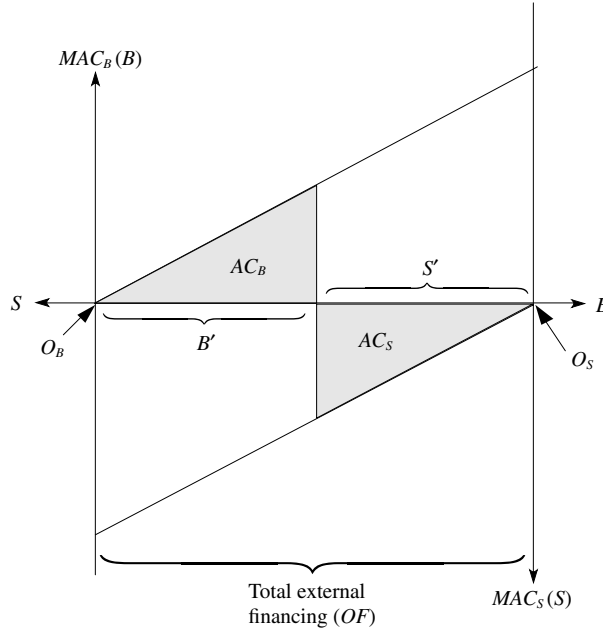
In the diagram, at the given amounts of $B = B'$, $S = S'$, total AC is indicated by the total area of the two shaded triangles. Therefore, when the amount of financing is fixed, the process of searching for the combination of B and S that will result in minimum total AC is the same as that of minimizing the combined area of the two shaded triangles, which occurs when their heights along the vertical axis are equal.

Here is a constrained minimization problem that will lead to the same conclusion:

$$\begin{aligned} & \min_{B,S} (AC_B(B) + AC_S(S)), \\ & s.t. \quad B + S = OF. \end{aligned} \tag{6.8}$$

By substituting the constraint and searching for necessary and sufficient conditions, the first order (necessary) condition is,

Fig. 6-3. Combination of Fig. 6-1 and Fig. 6-2



$$\begin{aligned}
 \frac{d(AC_B(B) + AC_S(OF - B))}{dB} &= MAC_B(B) - MAC_S(OF - B) \\
 &= MAC_B(B) - MAC_S(S) \\
 &= 0;
 \end{aligned} \tag{6.9}$$

and the second order (sufficient) condition is

$$\begin{aligned}
 \frac{d^2(AC_B(B) + AC_S(OF - B))}{dB^2} &= \frac{dMAC_B(B)}{dB} + \frac{dMAC_S(S)}{dS} \\
 &> 0.
 \end{aligned} \tag{6.10}$$

From the first-order condition, we understand that the minimization of total AC is obtained at the point where debt-related marginal AC is equal to stock-related marginal AC. From assumptions (6.3) and (6.5), the second order condition is satisfied. However, both assumptions are too strict. For example, even if either one of the marginal ACs may not increase, but remains fixed, the second-order condition would be satisfied. (Example: even if $\frac{dMAC_B(B)}{dB} > 0$, $\frac{dMAC_S(S)}{dS} = 0$, the condition is satisfied.)

Although the above amount of OF is given, generally it is also an endogenous variable determined by one condition or another. (Please refer to Appendix 6-1 to this chapter explaining how the amount of external capital to be procured, i.e., optimum enterprise scale, is determined.)

III. Analysis of the Asian Currency Crisis

A. Characteristics of the Changes Accompanying the Crisis

To begin with, as the first step in analyzing the Asian currency crisis in terms of our AC framework, it is necessary to determine what changes were brought about by the crisis, resulting in a discussion different from the standard discourse.

Plummeting foreign exchange rates during the crisis were accompanied by swelling amounts of existing foreign-currency-denominated debt expressed in domestic currency. The point is that debt ratios expanded unexpectedly and that changes in the capital structure occurred after capital was procured.

Here let us formulate a set of assumptions or preconditions for our analysis, beginning with the assumption that the enterprise value did not change. That is,

$$dV = 0. \quad (6.12)$$

From the fact that the crisis slowed the economies of Asia down, reductions in the enterprise value may have actually occurred. However, here we want to consider only the effect that declining foreign exchange rates exerted on corporate balance sheets. It is a fairly conservative assumption, since it can be expected that the resulting main conclusions will be strengthened, when the enterprise value decreases.

Next, the value of debt increased, but we will assume that the extent of the increase did not go beyond the total market value of stock prior to the crisis. That is,

$$dB > 0, \quad (6.13)$$

$$S_T > dB. \quad (6.14)$$

Assumption (6.13) should be obvious enough, but Assumption (6.14) deserves some additional explanation. According to assumption (6.14), after the crisis, enterprises involved did not experience capital deficits. Since if capital deficits did occur, other problems beside AC would arise,⁷ We will limit the investigation to enterprises whose debt ratio sharply rose, but who did not experience capital deficits.

Based on the above assumptions, we know that

$$dS_T + dB = 0. \quad (6.15)$$

(Totally differentiating equation (6.1) for V and substituting $dV = 0$.)

Since we assume $dB > 0$,

$$dS_T < 0. \quad (6.16)$$

and equation (6.2) corresponds to $dS_T = dS_I + dS$ (total differential), it follows that

$$dS_I + dS < 0. \quad (6.17)$$

On the other hand, since when the value of the stock drops, that of both general and controlling shareholders is influenced equally in proportion, it follows that

$$\frac{dS}{S} = \frac{dS_I}{S_I}. \quad (6.18)$$

Combined with (6.17), we know that

$$dS_I < 0 \quad \text{and} \quad (6.19)$$

$$dS < 0. \quad (6.20)$$

Now let us expand the functions of AC and marginal AC to two variables. As indicated previously, the most general assumptions are

$$AC_B(B, S, S_I, V, \dots),$$

$$AC_S(S, B, S_I, V, \dots),$$

allowing us to consider functions with many variables. However, first we will ignore the enterprise value item, because in the analysis here we have assumed that V did not change (assumption [6.12]). In order to simplify further, we will assume that AC_B is not influenced by S , nor is AC_S influenced by B (i.e., we ignore any cross effects). As a result, we can consider that AC_B is a function of B, S_I and that AC_S is a function of S, S_I .

Furthermore, we assume the functional forms,

$$AC_B\left(\frac{B}{S_I}\right),$$

$$AC_S\left(\frac{S}{S_I}\right)$$

and assume that AC_B and AC_S are increasing functions. This simplification was made in order to obtain results with analytical significance. (The appropriateness of such simplification will be discussed at the end of this chapter.)

Also, the functional forms of marginal AC are

$$MAC_B\left(\frac{B}{S_I}\right),$$

$$MAC_S\left(\frac{S}{S_I}\right)$$

and are assumed to be increasing functions.

B. Analysis of the Influence of AC on the Currency Crisis

What we want to determine here is what changes occurred in debt- and stock-related AC and marginal AC. Let us begin with the stock-related analysis.

Change in AC_S

It is clear that $dAC_S = 0$, since

$$d\left(\frac{S}{S_I}\right) = \frac{S}{S_I} \left(\frac{dS}{S} - \frac{dS_I}{S_I}\right)$$

$$= 0.$$

(The expression in parenthesis on the right is zero from assumption (6.18).)

Change in MAC_S

Although $dAC_S = 0$ as shown above, $dMAC_S = 0$ is not true. Because

$$MAC_S = \partial AC_S / \partial S,$$

$$MAC_S = \frac{\partial AC_S}{\partial(S/S_I)} \cdot \frac{1}{S_I}.$$

When we totally differentiate both sides of this equation, we obtain

$$dMAC_S = \frac{\partial^2 AC_S}{\partial(S/S_I)^2} \cdot \frac{dS}{S_I^2} - \left[\frac{\partial^2 AC_S}{\partial(S/S_I)^2} \cdot \frac{S}{S_I^3} + \frac{\partial AC_S}{\partial(S/S_I)} \cdot \frac{1}{S_I^2} \right] dS_I$$

$$= \frac{\partial^2 AC_S}{\partial(S/S_I)^2} \cdot \frac{dS}{S_I^2} \cdot \left(\frac{dS}{S} - \frac{dS_I}{S_I}\right) - \frac{\partial AC_S}{\partial(S/S_I)} \cdot \frac{dS_I}{S_I^2}$$

$$= -\frac{\partial AC_S}{\partial(S/S_I)} \cdot \frac{dS_I}{S_I^2}$$

$$= -MAC_S \cdot \frac{dS_I}{S_I^2}$$

$$> 0.$$

(We have used equation (6.18) for transforming the second line to the third.)

At first glance, although it may appear strange that stock-related marginal AC is increasing while AC remains unchanged, the following explanation may be given. First, the value of the stock decreased due to the currency crisis, but since the relative size (proportion) of the shares held by general and controlling shareholders did not change, the relationship between them remained the same. Therefore, total AC will not change. On the other hand, despite the absence of change in their share of stock, controlling shareholders will experience a reduction in the absolute value of that share, S_I , which causes a problem encountered at the time of new stock issuance to the public. Suppose that the company raises a certain amount of money by public issuance of new stocks, this will dilute the share of S_I much more when the absolute value of S_I is smaller, implying an increase in the additional (marginal) AC at the time of new stock issuance.

Change in AC_B

$$dAC_B = \frac{\partial AC_B}{\partial B} \cdot dB + \frac{\partial AC_B}{\partial S_I} \cdot dS_I > 0.$$

Looking at the right side, $\partial AC_B / \partial B$ is MAC_B and is positive; dB is positive given inequality (6.13); $\partial AC_B / \partial S_I$ is negative, since AC_B is an increasing function of (B/S_I) ; and dS_I is negative, given inequality (6.19). Therefore, the first item on the right side corresponds to the multiplication of two positive values and the second item to the multiplication of two negative values; therefore both are positive and will produce a positive sum.

Change in MAC_B

$$MAC_B = \frac{\partial AC_B}{\partial (B/S_I)} \cdot \frac{1}{S_I},$$

and when totally differentiating both sides, we obtain

$$\begin{aligned} dMAC_B &= \frac{\partial^2 AC_B}{\partial (B/S_I)^2} \cdot \frac{dB}{S_I^2} - \left[\frac{\partial^2 AC_B}{\partial (B/S_I)^2} \cdot \frac{B}{S_I^3} + \frac{\partial AC_B}{\partial (B/S_I)} \cdot \frac{1}{S_I^2} \right] dS_I \\ &= \frac{\partial^2 AC_B}{\partial (B/S_I)^2} \cdot \frac{B}{S_I^2} \cdot \left(\frac{dB}{B} - \frac{dS_I}{S_I} \right) - \frac{\partial AC_B}{\partial (B/S_I)} \cdot \frac{dS_I}{S_I^2} \\ &= \frac{\partial^2 AC_B}{\partial (B/S_I)^2} \cdot \frac{B}{S_I^2} \cdot \left(\frac{-V}{B} \cdot \frac{dS_I}{S_I} \right) - \frac{\partial AC_B}{\partial (B/S_I)} \cdot \frac{dS_I}{S_I^2} \\ &= -\frac{\partial^2 AC_B}{\partial (B/S_I)^2} \cdot \frac{V}{S_I^2} \cdot \frac{dS_I}{S_I} - MAC_B \cdot \frac{dS_I}{S_I} \end{aligned}$$

$$\begin{aligned}
&= -\frac{\partial MAC_B}{\partial B} \cdot V \cdot \frac{dS_I}{S_I} - MAC_B \cdot \frac{dS_I}{S_I} \\
&= -\left(\frac{\partial MAC_B}{\partial B} \cdot V + MAC_B\right) \cdot \frac{dS_I}{S_I} \\
&> 0.
\end{aligned}$$

(Note that in the transformation from the second to third lines, we have used the equations 6.12–6.18 for dB , dS , and dS_I .)

Comparison of the Values of $dMAC_S$ and $dMAC_B$

Here it will be shown that the value of $dMAC_B$ is higher than that of $dMAC_S$, indicating that after the changes of the two marginal ACs brought about by the currency crises, debt-related marginal AC should increase.

$$\begin{aligned}
dMAC_B - dMAC_S &= -\left(\frac{\partial MAC_B}{\partial B} \cdot V + MAC_B\right) \cdot \frac{dS_I}{S_I} - \left(-MAC_S \cdot \frac{dS_I}{S_I}\right) \\
&= -\left(\frac{\partial MAC_B}{\partial B} \cdot V + MAC_B - MAC_S\right) \cdot \frac{dS_I}{S_I} \\
&= -\frac{\partial MAC_B}{\partial B} \cdot V \cdot \frac{dS_I}{S_I} \\
&> 0.
\end{aligned}$$

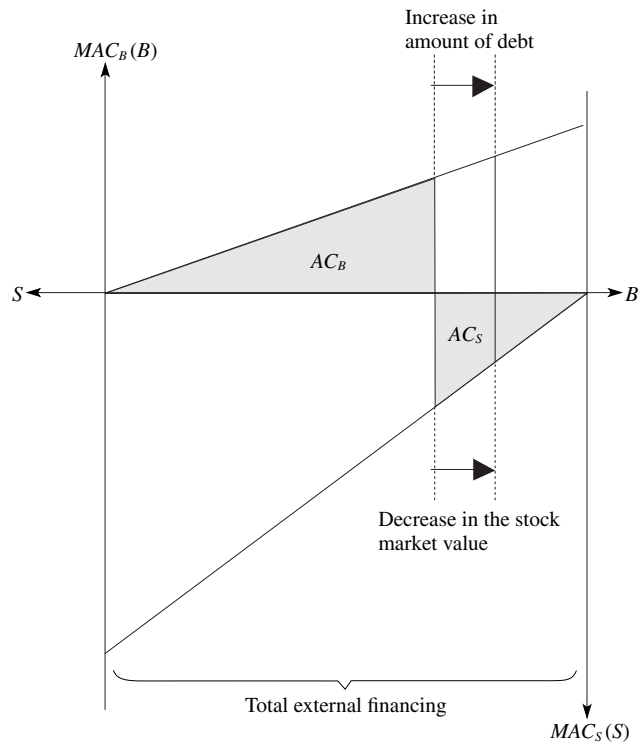
(Note that in the transformation from line two to three, we have used the fact that $MAC_B = MAC_S$ was the initial situation just before the crisis.)

C. Results in Diagrammatic Form

First, let us look at Figure 6-4. It is not yet an accurate illustration of the results, but it merely corresponds to Figure 6-3 in the previous section with some additional comments. The changes brought about by the crisis led first to an increase in the amount of debt ($dB > 0$), which promoted a decrease in stock prices.

The reason why the diagram is not accurate is because the changes that occurred in total and marginal AC were not reflected. (They are reflected in Figure 6-5, however.) First, debt- and stock-related marginal AC both increased for any given argument, i.e., their curves shifted. Secondly, debt-related total AC increased, while stock-related AC remained unchanged. (Note that the lack of change of stock-related AC is not sufficiently illustrated in the diagram.) Finally, the relationship between the two marginal AC figures after the changes showed that the debt-related marginal AC was higher ($MAC_B^{new} > MAC_S^{new}$ in the diagram). This last result indicates that after the

Fig. 6-4. Crisis Inflates the Share of Debt in the Corporate Financial Structure

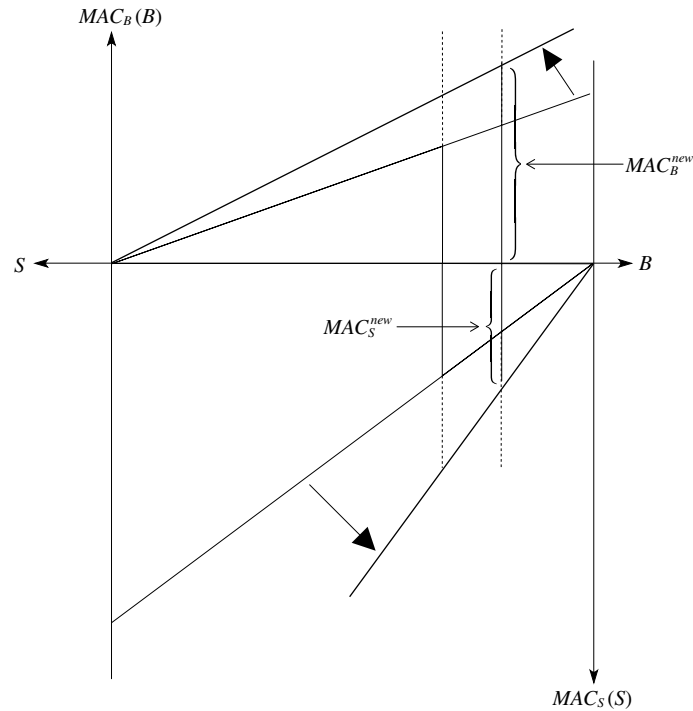


changes, since the capital structure was not at the optimum level, in order to restore that optimum, it would be necessary to increase the share of stock financing and reduce debt-financing. Several measures could be taken to help restore the optimum balance, and these will be outlined in the following section.

IV. Summary of Results and Implications

A. Summary

The rise in the value of debt denominated in foreign currency caused by a currency crisis (1) decreased the value of stock, (2) increased the total AC of existing debt, while stock-related AC remained unchanged (under a given assumption), (3) increased both debt- and stock-related marginal AC (i.e., increased the costs incurred by new capital procurement), and (4) the rise in

Fig. 6-5. Decrease in S_f Causing Outward Shifts in MAC Curves

debt-related marginal AC should be higher than the rise in stock-related marginal AC.

Result (1) is in accordance with intuition and actual development after the Asian currency crisis. Result (2) means that the management of existing debt became costly. For example, creditors had to pay a great deal of attention to monitor borrowers whose incentives decreased and who became much more inclined to act against creditor's interest.

On the other hand, the conclusion that stock-related AC should not change in result (2) may seem puzzling, but it is caused by the fact that the proportion of stock held by controlling shareholders and corporate managers should not change compared to that held by general stockholders, though its value decreased. That is to say, the balance of power between the two groups remained unchanged. It is for this reason that total AC did not change. However, result (3) implies that if attempts were made to procure new capital through public offering of new shares, investors would not respond unless stock prices decreased.

Result (4) means that although the cost of both stock and debt finance increased, stock issuance was the better alternative, if necessary. That is to say, even when enterprises resumed capital procurement after a crisis, at the time when the economy was beginning to recover, they may prefer to issue stock than borrow funds. And if so, any recovery in bank lending is likely to lag behind that of the whole economy, as it actually happened in many countries affected by the Asian currency crisis.⁸

B. Who Bore the Burden of AC and Enthusiasm for Reform

What are the implications of many enterprises that prefer to procure new funds by means different from those incurring debt? For example, enterprises may probably not be very enthusiastic about institutional reform that would help reduce debt-related AC (both total and marginal), because they have no plans to do so in the near future. However, from the standpoint of creditors, such reform is extremely important, because unexpected rises in AC after the fact will, unlike new debt issuance, be borne by creditors instead of the debtors (enterprises). It is only natural that those who have to bear such costs should become enthusiastic about reforms that will help reduce their burdens.

Let us take, for example, the reform of accounting standards. Since enterprises compile and publicly disclose financial statements as one method of bonding, improvements in accounting standards may result in a higher reliability and probably lead to a reduction in debt-related AC. However, for enterprises that are not considering incurring new debts in the near future, such an issue will lack any urgency. On the other hand, from the standpoint of creditors, accounting reform would support their monitoring activities and neutralize any increases in AC, except for enterprises that are not appreciably affected by a currency crisis. The potential of such enterprises to procure capital via debt remains the same as that before the crisis, and they would undoubtedly be enthusiastic about any reform that would reduce debt-related AC.

A prevalent opinion about the relationship between economic crises and economic reform implies that economic recovery always cools the enthusiasm for structural reform necessitated by a crisis. However, based on the situation considered above, there was no such tradeoff between recovery and reform. This is because upon recovery, the larger the number of enterprises who need to raise capital via debt, the greater the enthusiasm for reform that would reduce debt-related AC.

In addition, while this is not directly related to reform, we can probably cite the occurrence of “strategic default”⁹ in post-crisis Thailand as an interesting

example of how rises in AC after the fact affected corporate behavior. The phenomenon of defaulting, despite the ability to repay both the principal and interest, defies the normal situation in which enterprises that consider procuring capital via debt would not in their right minds dare damage their relations with creditors in such a way. In other words, those who default strategically must be indifferent to debt-financing, at least for the time being. This fact is in agreement with our model's conclusion according to which debt-related marginal AC increases more rapidly than stock-related marginal AC, which discourages new debt financing by firms. Obviously, it should also be pointed out that Thailand's legal system at the time (with a weak mechanism for enforcing contract performance) made such behavior possible.

Regarding institutional frameworks such as good accounting standards and efficient bankruptcy laws, the countries affected by the Asian currency crisis have been blamed for not implementing these measures after the crisis, although such a problem was scarcely referred to before the crisis. Their laxity in this area became a major issue only after the crisis struck, and the viewpoint of AC can be very helpful in explaining such a discontinuity. To begin with, even if a government decided to adopt such an institutional framework, it would be costly in terms of both political decision-making and administration of the system. If so, it would be possible under precrisis conditions that the marginal cost of setting up such a system might have outweighed its marginal benefits. Therefore, although everyone pointed to institutional deficiencies after the crisis, not taking steps to invest time and money for setting up such a system before the crisis could have been a rational decision.

Bureaucrats and civil servants in some countries cannot be considered to be highly talented in the jobs they do. Due to such a human resource problem, the design of new institutions and their implementation may be more costly than otherwise. In addition to such high administrative costs, in some environments, due to a rent-seeking behavior, objective and rational decision-making may be very difficult, resulting in the increase of the decision-making costs of system building.

On the other hand, we cannot conclude that, since governments were negligent in the past about setting up such institutions, they will remain so in the future. If governments realize that rising AC caused by the crisis is now sufficiently high and understand what that means, there is a high probability that efforts will be made to correct the situation institutionally, despite the political and administrative costs involved. As an example, countries like Indonesia and Thailand, which had failed to set up bankruptcy laws, took the opportunity of the crisis to make provisions for that aspect in their legal systems.

C. Policy Evaluation

Agency-cost analysis can also be effective in a more practical way in creating effective policy. With AC analysis it becomes possible to consider the advantages and drawbacks of a policy. (For proof of the following statements, see Appendix 6-2 to this chapter.)

To begin with, let us look at the promotion of debt-equity conversion (DEC), which is a very effective policy for changing capital structure directly. Debt-equity conversion has also been considered to be a beneficial trump card for maintaining a healthy capital structure, and some countries rely on this measure as their main corporate restructuring policy. However, as shown in Appendix 6-2, the effects of DEC are limited. Although DEC changes the relative shares of debt and stock in external finances, it does not change the shape of marginal AC curves. On the other hand, rescheduling and debt forgiveness are superior to DEC in lowering marginal AC curves across the board. However, since these measures involved transfer of income between interested parties, they are seldom implemented spontaneously.

Compared to them, policies geared to directly reducing debt- and stock-related ACs are more effective. They include setting up a legal structure to decrease the cost of bankruptcy and strengthening accounting standards to decrease bonding costs. If through such policies marginal ACs can be sufficiently reduced, the effects will spread throughout the economy and ACs related to both existing and new capital procurement will decrease.

Now let us look examine which is more effective, a policy for reducing mainly debt-related AC or that geared to lowering stock-related AC. The answer is that both are associated with advantages and disadvantages. Immediate results can be obtained by measures geared to reducing stock-related AC. As seen previously, after a crisis, many enterprises strongly tend to delay debt instrument issuance, and prefer issuing stock when procuring capital. Under such circumstances, it will not be possible to make new capital procurement via debt unless marginal AC decreases significantly. Therefore, reducing stock-related AC will result in the immediate increase of new corporate investment.

On the other, stock issuance is not usually an alternative available to small and medium-scale businesses. From their standpoint, reducing stock-related AC is meaningless and reducing debt-related AC is an important part of keeping that sector of the economy afloat.

D. Significance of Bankruptcy Laws and Some Points of Caution

Among the policies discussed so far, setting up a legal structure deserves special mention. Its evaluation centers around the question of whether or not such a mechanism can actually decrease bankruptcy costs and AC. First and foremost, can such a policy guarantee expeditious bankruptcy proceedings, for speed is the key to preventing financial distress and thus the reduction of an enterprise's value as a going concern or liquidation value. Secondly, such policy must help avoid either inefficient liquidation or inefficient continuation of operations, which is another key to reducing debt-related AC. A solution to both problems is offered by the Aghion-Hart-Moore (hereafter AHM) proposal (Aghion, Hart, and Moore 1992), which suggests that it is possible to avoid both inefficient liquidations and continuations through a clever combination of DEC and granting of stock options on a priority basis. However, the implementation of such a policy requires innovative and complex procedures. In contrast, Ikeno and Seshimo (1999) argue that the practice of private-sector bankruptcy resolution based on the main-bank system in Japan would result in exactly the same effects as the AHM proposal. Here we have a very interesting case, in that this practice can be adopted both actually and on a private basis. (However, the same study showed that in recent years the rationale for the main banking system has disappeared in Japan, and that it is gradually losing its effectiveness as a means for bankruptcy proceedings.) In several countries of East Asia, bankruptcy legal reform has been implemented along the lines of the legislation in the United States. However, according to recent studies,¹⁰ among Japanese, U.S., and European practices, the American model is the most lenient toward enterprise managers in debt. Ikeno and Seshimo (1999) also pointed out that the American system gives too much discretion to the judiciary and described the damage caused. This is because setting up a legal system determines how private negotiations are carried out, in that the existence of a bankruptcy law becomes the starting point for private negotiations. For example, in Japan, judiciary discretion is considerably limited. For this reason, allocations expected in judicial decisions are easily agreed upon and negotiations with such allocations as the starting point are comparatively easily concluded. In contrast, in the United States, the result of litigation depends heavily on the discretion of the court, thus posing barriers to negotiation at the private level.

Several decisions have already been handed down under the new bankruptcy laws in Thailand and Indonesia, resulting in such strong criticism as (1) most of them favored the debtor, and (2) due to the broad judicial discretion, not much can be expected. In many cases, the governments of these countries

have been called to task, but it was somehow a consequence stemming from their American-style model. Therefore, attention should be paid to alternative models existing in Europe and Japan, and revisions be made to correct the situation.¹¹

E. Fire Sale

Agency-cost analysis also has implications when dealing with foreign stockholders and creditors, because these parties have access to less information than their domestic counterparts. Such information asymmetry is the source of conflicts of interest between concerned parties in enterprises and can also exacerbate existing conflicts. Furthermore, the cost of monitoring by foreign investors is relatively higher than that of domestic counterparts, thus increasing AC.

As previously mentioned, on the occasion of new capital procurement, when marginal AC is higher, investors will request cheaper stock and creditors higher interest rates. Therefore, when the number of potential investors decreases in the domestic economy due to a currency crisis, only foreigners requiring high ACs will be left, possibly leading to a sharper decrease in stock prices than normally necessary. Following a currency crisis, foreign enterprises become interested in acquiring domestic enterprises in the name of “fire sales.” Such a practice of foreign acquisition for less than the real enterprise value has been criticized in the past, but in my opinion, the foreigners involved are only acting in good faith, and they are merely looking for good deals, based on their own subjective ideas of AC expense. On the other, since such valuation is lower than that of domestic agents (i.e., the estimation of the enterprise value is higher by the latter), it is considered to be unreasonable. In any case, these differences in consciousness tend to make negotiations difficult and cause political problems like xenophobic public opinion.

F. Examining the Model’s Assumption

Finally, we would like to draw the attention to some of the strong assumptions that were inserted into our model in order to produce results. Among them, probably the most important is the argument concerning the AC and marginal AC functions; namely, B/S_i for debt-related and S/S_i for stock-related AC (and marginal AC). In other words, it is assumed that B and S do not overlap and mutually influence the two ACs and that S_i is not an absolute amount, but merely one relative to B or S . If these restrictions are lifted, any accurate analysis becomes difficult. Therefore, simulation or some other methods should be employed.

Although the assumptions were somehow simplified as stated above, the model predictions obtained were largely consistent with the actual development after the crisis. For example, our model predicted that the increase in stock-related marginal AC would be relatively small compared to that of debt-related marginal AC after the crisis, which implies that external fund-raising may become expensive but, relatively speaking, fund-raising through stock could be cheaper than through borrowing. Actually, in the case of East Asia, while bank lending after the crisis continued to stagnate, new capital procurement on its stock markets recovered in a relatively short time.

Appendix 6-1. Deciding on the Amount of External Financing

Here we will explain the minimization problem (8) using the Lagrangian multiplier method. Since Lagrangian L can be written as

$$L = AC_B(B) + AC_S(S) + \lambda(OF - B - S).$$

The first-order condition is

$$\begin{aligned}\partial L / \partial B &= MAC_B(B) - \lambda = 0, \\ \partial L / \partial S &= MAC_S(S) - \lambda = 0, \\ \partial L / \partial \lambda &= OF - B - S = 0.\end{aligned}$$

The Lagrangian multiplier λ corresponds to a shadow price when restrictions are loosened. It is

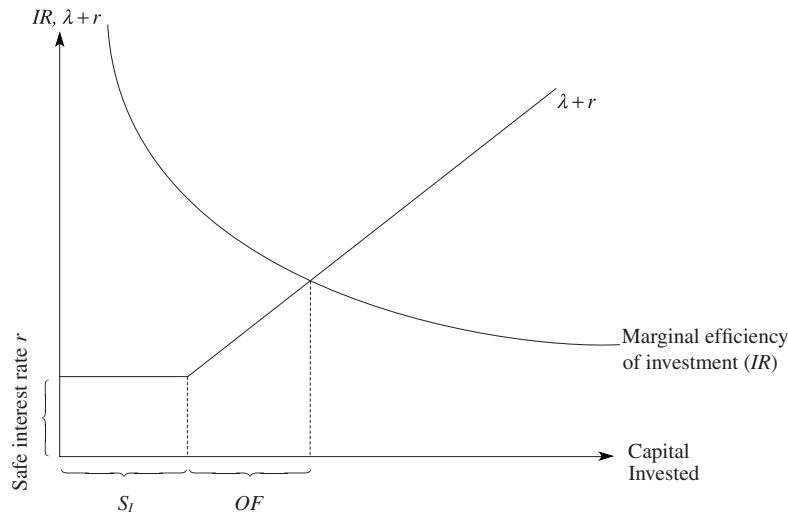
$$\lambda = MAC_B(B) = MAC_S(S).$$

On the other hand, by differentiating the first-order condition and arranging $d\lambda$ and dOF , we obtain

$$\frac{d\lambda}{dOF} = \frac{\frac{dMAC_B(B)}{dB} \cdot \frac{dMAC_S(S)}{dS}}{\frac{dMAC_B(B)}{dB} + \frac{dMAC_S(S)}{dS}}.$$

Based on the assumptions outlined in this chapter, we know that the value is positive. If we plot OF on the horizontal axis and λ on the vertical axis, the resulting curve will slope upwards to the right. Because λ is the shadow price of external financing, it can be considered to represent the marginal cost curve for changes in the amount of procured capital.

Appendix Fig. 6-1. Determination of Enterprise Scale



We added capital S_i contributed by controlling shareholders (but making it a given exogenous variable) and assumed a safe interest rate, r , as the opportunity cost attributed to this portion of capital, because we postulated that this portion corresponds to internal funds free of AC. After fully utilizing internal funds, external fund-raising occurred accompanied by AC as well as the opportunity cost of capital, r . Therefore we obtained a kinked cost curve for funds, $\lambda + r$ shown in Appendix Figure 6-1. Then we drew a downward sloping curve IR after ranking investment projects available to an enterprise on the basis of efficiency. The point where the two curves intersected is the optimum enterprise scale when ACs exist.

When investment opportunities expand and IR shifts to the right, the points of intersection will shift upwards and to the right, capital investment will expand and λ will rise. On the other hand, when $\lambda + r$ shifts to the right due to such conditions as an increase in exogenous variable S_i , the points of intersection with IR will shift downwards to the right, enterprise scale will increase and marginal AC will decrease. (Actually, in this case, the slope of λ will level off somewhat due to the fact that $\frac{\partial MAC_B}{\partial S_i} < 0$, $\frac{\partial MAC_S}{\partial S_i} < 0$.)

Appendix 6-2. Evaluating Policy

Debt-Equity Conversion (DEC)

It is clear that through DEC in appropriate amounts, an optimum capital structure can be achieved. However, the analysis here indicates that there are limits to the effectiveness of DEC. Given that both debt- and stock-related ACs will shift outward due to a currency crisis, as shown in Figure 6-5, even when merely changing the relative shares occupied by debt and stock, eventually total ACs will increase more than before the crisis. In order to avoid this phenomenon, it is necessary to remove the factors causing such shifts in the marginal AC curve.¹²

Increased Investment by Controlling Shareholders

The marginal AC curve shifts occurred because S_f shrank. (In our model analysis, the change $dS_f/S_f < 0$ resulted in positive signs for $dMAC_B$ and $dMAC_S$.) Therefore, policies that directly restored S_f to its precrisis level were effective.

As an example, investment on the part of controlling shareholders may increase. However, problems arise as to whether they have the wherewithal to invest, and if they do, whether they will profit from that investment. If they have been seriously hurt by a currency crisis, they probably will not have the wherewithal to invest. Also, as stated in Section I of this chapter, since the increases in AC accompanying a currency crisis are borne by existing stockholders and creditors, which is not the normal case, the benefits of lowering AC by increased investment on the part of controlling shareholders will not be reverted to them. Therefore, they have very little incentive to spend their money.

Debt Relief (Forgiveness) and Rescheduling

When creditors forgive the debts owed to them, stock prices will rise, which can also restore S_f . If debt forgiveness is carried out on the same scale as the debt amount that swelled as a result of a currency crisis, AC, can be restored to its precrisis level.

However, the problem is whether such an action will be beneficial enough to the creditors, because while the stockholders can enjoy reduced AC without any payment, that part will reduce what is reverted to the creditors. Therefore, if some means of redistributing income from stockholders to creditors is not employed, it is unlikely that creditors will be willing to forgive debts of their own accord.

In many cases, even if rescheduling does not accompany debt relief, such actions as putting aside repayment deadlines and reconsidering (lowering)

interest rates are actually similar to debt relief. Since they reduce the existing value of debt, that reduction exerts similar effects to explicit debt forgiveness.

Replacing Controlling Shareholders

One more possible step is for new or existing general stockholders to buy out and take over the enterprise. Obviously, to reduce the marginal AC curve, the share of new owners must be large enough. However, as in the case of new investment, the problem is to what extent such action will benefit new owners.

The above measures all necessarily accompany negotiations at the private level, like debt work out. Therefore, the stickiest problem common to all is the negotiation costs, which will increase in proportion to the number of concerned parties involved.

The next point to examine is the policies for decreasing AC in general. Compared to the measures taken in private negotiations, these policies can be adopted by the government to facilitate monitoring and bonding activities. Therefore, they have a clear advantage of range, by affecting the whole economy.

Decreasing Debt-Related Marginal AC

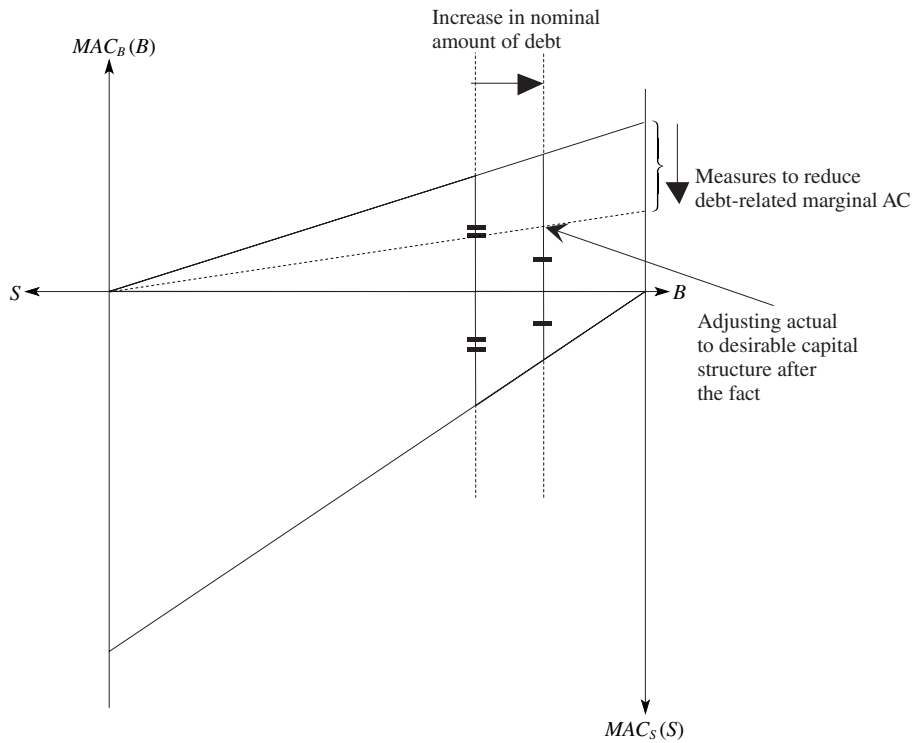
These all include measures that are effective in lowering debt-related marginal AC by increasing the creditors' ability to monitor debtors and debtors' ability to bond: for example, improvement in practices related to debt contracts (promoting desirable financial covenants, improving accounting and auditing practices), and passing bankruptcy legislation.

The effects of such measures are shown in Appendix Figure 6-2. They aim at narrowing the gap between debt- and stock-related marginal AC after a crisis. Although they cannot restore the conditions before the crisis, they can restore the firm's subjective optimality condition, i.e., debt-related marginal AC equated with stock-related MAC marginal AC if the magnitude of the policy effect is sufficient.

Decreasing Stock-Related Marginal AC

All of these measures attempt to enhance the general stockholders' ability to monitor and the firm's ability to bond: for example, establishing a good corporate governance system, strengthening the authority of the securities and exchange commission, and improving the standard of disclosure of securities-related information. Their effects are shown in Appendix Figure 6-3. They act in just the opposite manner to debt-related measures by widening the gap between debt- and stock-related marginal AC, and thus increase the discrep-

Appendix Fig. 6-2. Decreasing Debt-Related Marginal AC Narrows the Gap between the Two Marginal ACs



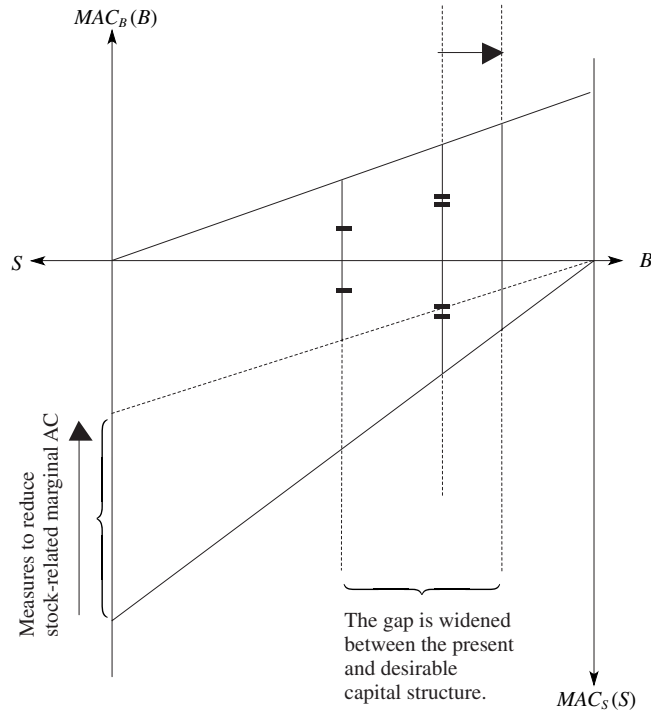
ancy between the present and desirable capital structures according to the firm's subjective point of view.

Comparing the Two Measures

While it would appear that debt-related-type measures, which narrow the gap between the present and desirable capital structures, would be called for, such is not always the case, because in a post-crisis economy, capital procurement is probably being carried out by stock issuance, in the absence of debt issuance. That is to say, decreases in debt-related marginal AC ease constraints on new capital procurement, unless the magnitude of the effect exceeds a certain amount. On the other hand, measures to reduce stock-related MAC exert an immediate effect on reducing the cost of procurement, since the stock-related MAC binds when firms refer to the fund-raising cost of new capital.

However, in some cases, debt-related measures are desirable, if their imple-

Appendix Fig. 6-3. Decreasing Stock-Related Marginal AC Widens the Gap between the Two Marginal ACs



mentation is easier than that of stock-related measures and if they are expected to reduce MAC significantly. Also, since large-scale enterprises are usually the only sector of the industrial structure with access to stock markets, debt-related measures are the key to policy geared to small and medium-sized firms. Obviously, since both are by no means mutually exclusive, they can be applied together.

Notes

The present chapter is a combination of two previously published papers (Kunimune 2000a, 2000b) with revisions added.

- 1 The framework for analyzing optimum capital from the viewpoint of agency cost is systematically developed in Jensen and Meckling (1976). This chapter basically follows that framework.
- 2 See Modigliani and Miller (1958).
- 3 In this case, the interests of managers and stockholders are identical.
- 4 Examples of stockholder monitoring include formal corporate control through stockholder meetings, incentives to managers via ownership participation such as stock options, and the appointment of independent directors. Another method of monitoring is to stipulate what kinds of expenditures will be honored, and ensuring that these limits are honored. Examples of bonding include restricting managerial discretion by clearly stipulating types of inappropriate behavior and enterprises publicly disclosing securities information. Debt-related monitoring includes the stipulation of financial limits in debt contracts and ensuring that these limits are honored, while debt-related bonding includes the issuance of financial statements and promise to submit audit reports prepared by certified public accountants.
- 5 How to define bankruptcy or failure is in fact very difficult. The most conservative definition would probably specify the two conditions of excess debt and the failure to pay it. However, the occurrence of either condition alone could also be considered to be *de facto* bankruptcy. Also, even in the case of a capital deficit, such a condition could be disguised by window-dressing accounting, and in the case of failure to repay, if creditors decide among themselves to delay payment, clear-cut bankruptcy can be prevented from occurring.
- 6 When other conditions remain fixed, increases in debt only will induce a more opportunistic behavior on the part of debtors, the probability of bankruptcy will rise, and marginal AC will increase.
- 7 For example, the problem of debt overhang discussed in Chapter 4.
- 8 According to Demirguc-Kunt, Detragiache, and Gupta (2000), in the countries affected by the crisis, the start of economic recovery did not accompany credit expansion. See also the discussion in Chapter 1 of this book concerning macro shock.
- 9 See Mieno (2000).
- 10 The United States is not only the most lenient in its bankruptcy system but also in its whole mechanism for enterprise governance. For the topic of bankruptcy, see Fukao and Morita (1997, pp. 36–37) and Fukao (1999, pp. 132–38).
- 11 During my own fieldwork in Thailand during 1999, experts there stated that they were interested in studying Japanese legal institutions in an attempt to reform the bankruptcy act, but they were faced with language problems and a lack of expert

help. In the end, they were forced to center their work around American law, which is far more easily accessible. Much more technical support from Japan is definitely needed in this area.

- 12 In addition, in the case of DEC, (1) deciding on conditions and negotiations becomes difficult and (2) creditors may not be experienced in managing stock portfolios (thus affecting AC). Both problems can be solved if the stock market is functioning properly: that is, (1) decisions and negotiations are related to stock market prices, and (2) stock can be merely sold on the market.