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ADB Institute Discussion Paper No. 44

Financial Reforms: Benefits and Inherent Risks

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I. Introduction: Financial reforms are beneficial when carefully implemented

Many countries have repeatedly undertaken financial reform measures. Some have pursued them consistently over a long period of time, while others have pursued them intermittently, often in haste over a relatively short period of time. These reform efforts have one thing in common; they seek to enhance the efficiency and to strengthen the stability, of the financial system.

Japan is an interesting case. Undoubtedly Japan is quite advanced. Yet, the nation has been suffering from financial market distress since the late 1980s. Most people take the 'inefficient' Japanese financial system as the culprit that has brought long run stagnation. Note that the problems got serious at the time when Japan began to actively integrate the national financial market with the global market. After suffering for about 20 years, Japan seems to have finally put the financial system in order. Perhaps it is not a coincidence that the Japanese economy is reviving now. See, for example, Bergsten, Ito, and Noland (2001).

Singapore and Hong Kong have grown rapidly with a concurrent development of financial markets. Both are high-income economies and both boast world-class financial centers. Taipei, China and Malaysia have also grown rapidly, though their financial sector development lags slightly behind those of the real sector. Note that in these countries financial sectors have never been tightly controlled and they remained open to international players from early on. As a result they have been able to grow in tandem with the real sectors. None of them have experienced financial crises.

Indonesia, South Korea, and Thailand had grown rapidly, too, but their financial sector developments had remained very retarded, mainly because they had been tightly controlled and protected. Then almost suddenly these countries began to open up their financial markets in the early 1990s. However, their retarded financial markets were apparently not strong enough to successfully compete in the new environments. Their economies failed miserably in 1997.¹ Philippines, which had a retarded financial market as well as a lackluster development record, failed, too, in 1997.

¹ Indonesia's financial markets were subject to considerable reform and liberalization in the 1980s. But the rapid liberalization, undertaken under conditions of weak regulation, made the financial system very vulnerable to sudden shocks. The centralized systems of regulation were weakened, but nothing much

The People's Republic of China (henceforth PRC) is an interesting case in that the economy has been growing very rapidly, though financial sector development has lagged far behind that of the real sector. Yet, so far she has avoided financial crises. Note that Chinese financial system is not yet fully liberalized and is under a rather strong central regulatory system.

Cambodia, Laos, Mongolia, Myanmar, North Korea, and Viet Nam have underdeveloped economies, financial as well as real. Though these countries have avoided serious financial crises, their economies are very poor.

When a country's financial sector grows in tandem with its real sector, the country tends to have good economic prospects. Though the evolutionary forces of markets can promote financial sector development, it is essential to continuously exert purposeful reform effort and provided that appropriate precautionary measures are taken, opening financial markets to international players is a good way to promote development. Singapore, Hong Kong, Taipei, China, and Malaysia appear to be good examples.

When one country's financial sector development lags far behind its real sector development for too long, the country is very likely to experience a serious financial crisis. It would be especially so when hitherto regulated and protected markets are suddenly exposed to freer competition. South Korea, Thailand, Indonesia, Mexico, and Russia had problems when they opened their financial markets very rapidly. Japan, Sweden, and USA had problems when they lifted important elements of regulation without taking sufficient precautionary measures.²

How about PRC? It has so far avoided financial crises, though its real sector has been growing very rapidly in the face of an apparently very retarded financial sector. The fact that PRC has successfully avoided having crises in the last 25 years may make her somewhat too confident. However, recall that South Korea, for example, had been growing rapidly for over 30 years without experiencing serious financial crises: Yet

was put in place to regulate the new forms of market behavior.

² According to Bordo & Eichengreen (2002) during 1973-97, there were 47 crises in developed countries and 95 in emerging markets with average output losses of 6.25% and 9.21% of GDPs respectively.

South Korea was totally helpless when one hit the country in 1997. PRC may be different, but still, it would be prudent for the country to begin to undertake financial reform measures before it gets too late.³

Cambodia, Laos, Myanmar, Mongolia, North Korea, Philippines, and Viet Nam do not yet have efficiently working financial sectors. When these countries begin to grow, they have to create financial sectors almost anew. In doing so, they should be able to have the most suitable system for each of them. It is imperative for them not to experience financial crises. However, it is almost certain that, sooner or later, one or more of these countries will face a crisis. They have to get ready for a crisis and have some plans in place for coping with such a situation.

As with any reform efforts financial reforms tend to produce good outcomes in the long run. However, they often produce dismal outcomes in the short run. Are there ways to avoid these pitfalls? That is, is it possible to make financial reforms less costly but more beneficial? And can financial reforms serve poverty alleviation more directly? Can a financial system fit all countries, or does each need a different system depending on its stage of development? What can international donor agencies do to help poor countries in their attempt to undertake financial reform measures? This paper attempts to answer these questions.

Our approach is to construct a theoretical model of economic development, in which financial intermediation plays an essential role. In our model financial reforms are understood as policy induced changes in financial intermediation technologies. We then study the outcomes of various financial reform efforts. From this exercise we get the following results.

First, the outcomes of financial reforms crucially depend on how well they are planned and implemented. When carefully planned and cautiously implemented, they tend to produce good outcomes. But when badly planned and too hastily implemented, they tend to produce bad outcomes.

³ China's monetary authorities are clearly aware of these problems. See, for example, the home page of the People's Bank of China at <http://www.pbc.gov.cn>.

Second, even the richest countries should keep on upgrading their financial systems, if they want to remain competitive. Though evolutionary forces of markets play important roles for the improvement of financial systems, conscientious efforts by stakeholders are needed, too.

Third, for poor countries, adopting a too advanced system could be a mistake: They could easily end up worse off. This would be the case when the adopted system turns out to be too 'expensive' for a poor country. It would be much better for a poor country to have a system suitable for its stage of development. It is unwise for a country with a per capita income of less than \$1,000 to go for a financial system suitable for a country with a per capita income of over \$30,000.⁴

Fourth, assistance from international donor institutions can alleviate some of the dilemma that poor countries have in adopting financial reforms. Frequently poor countries cannot afford to implement desirable but costly financial reforms. Financial aid and technical assistance from donors can help poor countries to introduce 'decent' financial reforms.

Fifth, there exist various financial practices that may cost little but have fairly large benefits. Poor countries can easily adopt them. Mutual savings and loan clubs, an export financing scheme, trade credit, micro-finance, extended family financing, and perhaps the town and village enterprise financing schemes, are a few such examples.

Sixth, financial practices can serve specific objectives and needs. For example, they can be used to help technological development, to promote small-scale enterprises, and to help human resources accumulation. More importantly, they can be a useful means for poverty alleviation. When the targets have external effects, the characteristics of public goods, or are subject to market imperfections, targeted financing could be justified.

Seventh, though countries are strongly tempted to use policy-led credit allocation schemes, we would advise them not to do so. When policies are closely aligned to market signals, such practices may produce desirable results. But policies are usually

⁴ The point should not be used as an excuse for not initiating any reform plans.

not closely aligned to market signals, and as such policy-led credit allocation schemes tend to produce very bad outcomes.

In section II we spell out our key points in non-technical terms. Most of the points are based on the more formal approach taken in section III. There we construct a theoretical model of financial reforms. The model is a variation of the neoclassical growth model. One crucial difference is the inclusion in the model of financial intermediation process. In section IV, we attempt to shed further lights by reviewing financial development records of South Korea through the framework of the proposed model. Section V concludes the paper.

II. A common sense approach

A fundamental and universal fact of life is that there is no such thing as a free lunch. In order to have something valuable, we must pay for it. Any action that brings benefits always carries costs. This is true for policy changes of many kinds, too. Of course it is equally true for financial reform. For example, reform efforts to reduce the costs of financial intermediation are costly, too.

We take various actions to reform the financial sector, presumably because doing so would yield benefits. Indeed financial reform efforts do yield substantial benefits. They tend to enhance the efficiency of the system, and when thoughtfully implemented, they tend to strengthen the stability of the system. However, even here we have to remember that implementing financial reform measures is not costless. In fact they often carry substantial costs.

We cannot justify an action simply because it is an attempt to reform something: It can be justified only when the benefits of doing so exceeds the costs in appropriate senses. This implies most of all that before we undertake any reform measure, we should carefully weigh its benefits and costs. A reform measure, however beneficial it may be, should not be undertaken, if its expected costs outweigh its benefits.

One important characteristic of the benefits stemming from any reform measure is that they are non-rival: The fact that I enjoy the benefits does not reduce the amount you

can enjoy. In fact there is a strong indication that the total amount of benefits stemming from a reform measure tend to increase as the volume of affected economic activities get larger. However, the costs of a reform measure do not have their public good aspect. Of course, total costs of a reform measure increase, as the magnitude of its target gets bigger. Still its average costs may fall for some range of activities.

This fact has an important implication. In most case we should weigh the total benefits of a reform measure against its costs relative to total activities affected. This means that it would be much easier in general for a rich country to implement a reform. A rich country can more easily bear the costs. On the other hand, it also means that it could be very difficult for a poor country to implement the same reform measure. It would be simply too costly for it.

Another important characteristic of a reform activity is that its benefits tend to accrue mostly over the very long run, but its costs tend to accrue mostly in the short run. Still another important characteristic of a reform activity is that invariably it carries a substantial amount of uncertainty and risk. Therefore, what we should weigh is in fact the expected discounted present value of benefits and costs.

If capital markets were perfect, the above-mentioned two characteristics would not pose great difficulties for any country. However, capital markets are in general imperfect. This creates additional difficulties for poor countries. Even when the expected present value of benefits far outweighs the expected present value of costs, a poor country faced with a serious financing constraint cannot easily undertake a reform measure. If we interpret this slightly more generally, being poor does not only mean being poor in a material sense, but it also means being poor in ability or capacity. Thus here we conclude that in undertaking reform measures wealthy and capable agents, be they a country, a firm, a household, or an individual, have advantages over poor and less capable agents.

Is there some ways for a poor country to overcome those difficulties? There seem to be two alternatives.

One is to take more gradual and pragmatic approaches. So far we have lumped everything under the rubric of financial reform measures. However, there is a quite diverse range of activities, each of which has different benefits and costs characteristics. There are, for example, reform measures that may yield small benefits, but are not that costly to implement. And there are reform measures that yield great benefits, but are very costly. Poor countries can begin with less costly reform measures. These can put poor countries on a steady development path and as they become wealthier, they can move up to a more costly reform measure that has larger benefits. In this way a poor country can eventually transform her into a wealthy country.

The other is to rely on outside assistance. Here the assistance from international aid agencies or donor countries can have a useful impact. The latter can assist poor countries with financial aid or technical assistance. In doing so, it would be wise for them to begin with reform measures that are less costly, though they might yield small benefits. And it would be better to encourage the poor countries to build up their own capacities.

The idea that we must pay for what we want to have can be translated into 'incurring fixed costs in return for a reduction in marginal costs.' Here the present value of marginal costs reduced in every period stands for benefits and the present value of the fixed costs incurred stands for the costs of reform. Put in this way, an action can be justified when the present value of marginal costs reduced outweighs the present value of fixed costs.

In section III we capture this idea in the cost function of financial intermediation. There we will consider a variety of financial intermediation technologies that have different cost characteristics. Adopting a better intermediation technology would be viewed as a financial reform activity. Here an intermediation technology having different cost characteristics means that its fixed costs-marginal costs features are different from those of other intermediation technologies. In general a technology that greatly reduces marginal costs tends to have large fixed costs: That is, a more 'efficient' technology is in general costlier to adopt.

This brings us back to our earlier discussion. Because of the existence of fixed costs, a poor country may not afford to have a very efficient financial technology. But for a wealthy country the burden of the fixed costs would not be that heavy, since average fixed costs would become smaller as a country gets wealthier. This is exactly what we argued above. It is easier for a wealthy country to undertake a financial reform measure, and the wealthier one country gets, the better technology it can afford. It also means that if a poor country tries to adopt too 'expensive' a technology, it may end up poorer as a result.

The fact that there are a variety of financial technologies with different cost structures gives hope for poor countries. A poor country should aim for adopting a technology that is not too expensive, though its benefits may not be large. Once a poor country is on a steady growth path, it can gradually move up to better technologies. This will reinforce its growth capacities, and as it gets wealthier, it can move up to even better technologies.

There may also be some technologies that are efficient, but are not too costly. Of course, if there were such technologies, it would be likely that they would have already been taken up. But the real world does not always work so efficiently, and there may still be important practices to be utilized. Presumably identifying such practices and transferring the knowledge to poor countries is what international aid agencies should do. In that regard, we consider a few such examples in what follows.

In considering some practices actually implemented, we bear in mind that a technology that carries a small fixed cost, but entails a large reduction in marginal costs, is ideal. Of course such a technology is hard to come by, and we may have to satisfy with lesser technologies.

The 'Kye', a traditional means of savings-loan arrangement among households, was widely used in South Korea in earlier periods, when commercial financing for households was virtually non-existent.⁵ Usually twelve households form a 'Kye', eleven of which pay monthly dues the sum of which is given to the remaining member. Each member takes turns and depending on when you get the money, the monthly

⁵ In fact similar arrangements were widely used in many countries. For example, Indonesia's 'Arisan' is very similar to South Korea's 'Kye.'

installment total will vary accordingly. The practice, though of limited economy wide importance, did serve important functions: It filled a gap and through it housewives learned the significance of thrift. They also learned that mutual trust was essential for finance.

Micro-finance activities are another instance that fills the void left by more organized formal financial institutions. It is widely practiced in many Asian countries, and it has helped many, especially women, to engage in some fruitful micro-enterprise activities. There is growing evidence that micro-finance directly helps the poor. For this consult the growing list of publications and activities of ADBI.⁶

Trade credits have been extensively used as an important means of financing among firms. Trade credits are credits extended by firms to other firms, and they are based on close relationships among the firms built up over a long period. For example, in Japan and South Korea the trading houses used to extend trade credits to their subsidiaries and suppliers.⁷ Large manufacturing firms also routinely extend trade credits to their subsidiaries, suppliers, and wholesale and retail houses of their products. Though used by all countries regardless of their level of developments, they serve important functions when the country's financial industry is not yet well developed. The trading houses or the 'mother' companies know much more about the creditworthiness of those with whom they deal than do financial institutions. In that sense, they may be particularly important for developing countries.⁸

Chinese businessmen extensively use practices similar in spirit to trade credits. For example, in Chinese business communities in Taipei,China, Hong Kong,China Singapore, Malaysia, Indonesia, and Thailand, financial arrangements among 'extended family' members have served them well. Another example is the financial arrangements adopted by the town and village enterprises in many Chinese communities.

⁶ See, for example, a paper by Weiss and Montgomery (2005), and Montgomery (2005).

⁷ See Miwa and Ramseyer (2005) for Japanese experience. For South Korean experiences, see section IV below.

⁸ Needless to say, superior information and monitoring power that the mother firms have are key elements of these arrangements.

Offering joint products has also proved in many cases fruitful. For example, countries routinely use postal services as financial institutions. It may be a good way of reducing the burden of costs: Space and manpower savings are immediate. The benefits from utilizing the postal service's information communication facilities can also be great. Similarly countries routinely use co-operatives as financial institutions. Credit unions are other instances for relying on joint products. Of course, as we see in the case of the Japanese attempt to privatize the postal services, mixing financial and non-financial activities together can have serious down sides, too.

There are other practices that we would like to evaluate, also. Export financing schemes and directed credit allocations are two such examples. These we will consider in detail in section IV when we discuss South Korean experience. Also another very important and relevant issue is concerned with the wisdom of opening up a country's financial market to outsiders. We will consider the issue in detail, too, in section IV.

Finally, we want to point out that there are financial practices that directly promote technological advance. For example, supporting R & D activities or more generally higher educational institutions with subsidized financing can yield substantial benefits. As these activities have public goods aspects, the public sector should play a role here. The venture capital market plays an important role, too.

III. A theory of financial intermediation and growth

The basic model

Let us consider the following model of economic growth.

$$Y = AK \tag{1}$$

$$\dot{K} = I - \delta K \tag{2}$$

$$S = sY \tag{3}$$

$$I = S - C(S; \phi) \tag{4}$$

Equation (1) is the AK type aggregate production function suggested by Rebelo (1991). The level of technology or knowledge A is regarded as exogenous. The capital stock K

stands for all sorts of capital, including at least physical and human capital. It is well known that when the economy's aggregate production function is of the AK type, persistent growth is possible.

Equation (2) shows that capital accumulation is determined by investment minus depreciation and equation (3) indicates that households in this economy save a fixed proportion s out of their income Y . These equations are common components of Solow-type growth models (Solow, 1956). Here we take the case of a constant savings rate for convenience of exposition. It will not alter our results even if we allow households to optimally choose savings rates.

Equation (4) is a new ingredient of the model. Unlike the usual growth models, here the amount invested is not equal to the amount saved. Rather it is equal to savings minus intermediation cost. This is because mobilizing and allocating financial resources entails real resource costs. In equation (4) $C(S:\phi)$ represents the cost of intermediation. Of course, if intermediation is costless, then $C(S:\phi)$ is zero and $I = S$. Here ϕ indicates how efficient the financial system is. In this paper we treat it as parameter that policy makers can choose. Note that previously there has been no attempt to put a wedge between investment and savings in Solow type growth models, as we do here.

We should note in passing how total output is used in this economy. In each period, it is used for consumption, investment, and intermediation services. That is, the portion of output that is not consumed is used for intermediation services and investment. That is why in our model the amount of investment is smaller than the amount of savings. Of course, in practice the financial sector creates values, too. We can capture this through an investment function as, $I = G(S:\phi) - C(S:\phi)$, where $G(S:\phi)$ stands for the real amount of resources created by the financial sector with a degree of efficiency ϕ utilizing the 'input' S . Depending on $G(S:\phi)$ and $C(S:\phi)$, the volume of investment I can now be greater than the volume of household savings S .⁹ For simplicity of

⁹ In national income accounting savings always equal to investment, because savings made by the financial sector is also included as a part of the total savings.

exposition, we just consider the case that $G(S:\phi) = S$ and leave the more general cases for future research.

The cost of financial intermediation

We model the cost of financial intermediation $C(S:\phi)$ as a function of the volume of resources being intermediated¹⁰ S and the degree of efficiency in intermediation ϕ . We assume $C(S:\phi)$ to be an increasing function of S . As the volume of resources being intermediated increases, so does the cost. Because fixed costs are incurred to set up a financial system (institutions, intermediaries, and markets), the average cost of financial intermediation would first decrease and then increase in S . That is, the AC curve is U-shaped. So is the MC curve in general. Sometimes, however, the MC curve can be represented with a horizontal line, a case of constant marginal cost. This is the case we first study in this section.

The parameter ϕ captures the degree of efficiency in financial intermediation. We assume that a higher ϕ represents more efficient intermediation. Now it would normally cost more to set up a more efficient intermediation system or to improve the efficiency of an existing system. In this respect $C(S:\phi)$ would be increasing in ϕ . However, a more efficient intermediation should imply, almost by definition, a substantial reduction in cost. In this sense $C(S:\phi)$ should be decreasing in ϕ . How can we reconcile this conflict? We resolve the conflict by making the fixed cost component (in terms of S) of $C(S:\phi)$ to be increasing in ϕ , but the marginal cost component (again in terms of S) of $C(S:\phi)$ to be decreasing in ϕ .

Reflecting these arguments we write the cost function as follows:¹¹

$$C = c_0 + c_1\phi + \frac{c_2S}{\phi} \quad (5)$$

¹⁰ Of course, the volume of intermediation is several times as large as the amount of savings. The saved resources usually turn hands several times before they reach the final borrowers. Here we are assuming that the resources turn hand only once during the entire inter-mediation process.

¹¹ Here we start with constant MC for simplicity and deal with the case of increasing MC below.

In terms of S the equation (5) is a linear function with $c_0 + c_1\phi$ as intercept and c_2/ϕ as slope. The cost function as a whole increasing in S .

The intercept $c_0 + c_1\phi$ can be interpreted as fixed costs to set up and to maintain financial systems, institutions, and markets of a variety with a degree of efficiency ϕ . These costs are fixed when viewed as function of the volume of resources being intermediated. But they are increasing in the degree of intermediation efficiency ϕ : In order to 'buy' a financial system that is more efficient, you have to pay a higher price.

The fixed costs need some clarification. In order to have a well functioning financial system with a degree of efficiency ϕ , we have to incur two kinds of costs: the setup costs and the maintenance costs. You have to pay the setup cost only once, but the maintenance costs every year. The fixed costs here then should be interpreted as the sum of the amortized setup costs and the maintenance costs.

The slope c_2/ϕ represents the marginal cost of intermediation. As we have a cost function linear in S , the marginal cost is constant when viewed as a function of S . However, it is a decreasing function of ϕ . That is the marginal cost of intermediation goes down as the efficiency of intermediation improves. (This is what we usually mean by intermediation efficiency.)

When viewed as a function ϕ for a given S , the cost function given in (5) is skewed U-shaped. It falls first and then rises in ϕ . Therefore, there exists for each S a corresponding value of ϕ that minimizes intermediation costs. This means that improving the efficiency of financial intermediation beyond a certain level may be harmful to the economy. Note that the threshold level of efficiency is determined as a function of the volume of financial transactions S .

The growth rates implied by the model

The equations (1) – (5) imply the following law of motion.

$$\dot{K} = [sAK - \delta K] - [c_0 + c_1\phi + \frac{c_2sAK}{\phi}] \quad (6)$$

The right hand side of the equation (6) consists of two parts. The first part corresponds to the expression commonly found in Solow type growth models. The second part is a new element of our model. It represents the fact that in the presence of intermediation costs the amount of capital accumulation is the society's savings minus not only the usual depreciation, but also the resources used up for financial intermediation. Evidently there is no free lunch. The society has to bear the costs of financial intermediation.

In order to make the equation (5) comparable to the law of motion usually found in a Solow type model, let us rewrite it as follows:

$$\dot{K} = sAK - [c_0 + c_1\phi + (\delta + \frac{c_2sA}{\phi})K] \quad (7)$$

This can be graphed as [Figure 1]. The first part of (7) is a straight line passing through the origin. Its slope is sA . The second part is also a straight line, with an intercept of $c_0 + c_1\phi$ and a slope of $(\delta + c_2sA/\phi)$. These two straight lines intersect at K^* . There the rate of capital accumulation becomes zero. Therefore, K^* is a stationary state. It is, however, very unstable. The economy would grow indefinitely whenever the actual level of capital stock is larger than K^* . And the economy would experience negative growth whenever the actual level of capital stock is smaller than K^* . In this sense we can call K^* a threshold level of capital stock.

The threshold K^* is calculated as solution for K in (7) with $\dot{K} = 0$ as follows:

$$K^* = \frac{c_0 + c_1\phi}{(1 - \frac{c_2}{\phi})sA - \delta} \quad (8)$$

As we want to rule out negative values for K^* , we assume that $\phi > (c_2 s A) / (s A - \delta)$ holds. This can be interpreted as providing a lower bound $\underline{\phi}$ for the degree of financial efficiency given below. The lower bound is the minimum level of financial efficiency that an economy must achieve if it wants to grow.

$$\underline{\phi} = \frac{c_2 s A}{s A - \delta} \quad (9)$$

Of course it is only for expositional purposes that we have interpreted the above inequality as providing a lower bound for ϕ . In fact the inequality simply requires that the values of the parameters ϕ, c_2, s, A, δ should be such that they should jointly satisfy the inequality.

The critical level of capital stock K^* is an increasing function of c_0, c_1, c_2 , and δ , and a decreasing function of s and A . Thus when the fixed cost or the marginal cost of financial intermediation increases, so would K^* . Likewise K^* would go up as the depreciation rate δ increases. When these happen, economies hitherto having enjoyed positive growth may well begin to experience negative growth. Therefore, when either the costs of financial intermediation or the depreciation rates increase, some economies that have been growing relatively slowly would stop growing and a few of them may even experience negative growth. On the other hand, the fact that K^* is a decreasing function of s or A means that when the savings rate or the level of technology goes up, then some economies that have been experiencing negative growth may start to grow positively.

Finally, K^* may increase or decrease in ϕ . Increasing ϕ would entail additional fixed costs, and thereby exerts a negative influence on growth. At the same time, increasing ϕ would lower marginal costs of intermediation, and thereby exert a positive influence on growth. This means that countries clustered around K^* should be very careful in undertaking financial reform efforts. If they are able to improve financial efficiency without incurring large fixed costs, they may well enjoy positive growth. However, if

they have to pay large fixed costs in return for a small reduction in marginal costs, then they would suffer from financial improvements.

Characteristics of the growth rate

The growth rate of the economy described by the model is given as follows:

$$g(K) = \left[\left(1 - \frac{c_2}{\phi}\right) sA - \delta \right] - \frac{c_0 + c_1 \phi}{K} \quad (10)$$

The growth rate has the following characteristics.

First, we see that the growth rate is an increasing function of K . As the economy develops, its growth rate would go up. By the same token, when an economy is very poor, it may well grow negatively. An underdeveloped economy might not be able to bear even the fixed costs of maintaining a financial system and thus experiences negative growth. For a growing economy, its long run growth rate would eventually settle down to the following asymptote:

$$\overline{g(K)} = (1 - c_2 / \phi) sA - \delta \quad (11)$$

Second, the critical level of capital stock beyond which an economy would experience positive growth is identical to the stationary state capital stock K^* . Thus growth rate would be positive when $K > K^*$ and would be negative when $K < K^*$. Of course, when $K = K^*$ holds, then $g(K) = 0$ holds, too. These points are shown in [Figure 2].

Third, the growth rate $g(K)$ is increasing in s and A , and decreasing in c_0, c_1, c_2 , and δ . A rise in the savings rate or an improvement in technology would raise the growth rate of the overall economy. However, if financial intermediation becomes costlier or if the capital stock depreciates more rapidly, then the growth rate would decrease.

Fourth, with respect to the efficiency parameter ϕ , growth rates have the following relationship:

$$\frac{\partial g}{\partial \phi} = \frac{c_2 s A}{\phi^2} - \frac{c_1}{K} \quad \begin{array}{l} < \\ = 0 \\ > \end{array} \quad (12)$$

This shows that $\partial g / \partial \phi$ could either be positive or negative. Therefore, improving financial efficiency does not guarantee an increase in the growth rate. Sometimes it may reduce growth rates. It is interesting to note that as the economy develops, the probability for financial reforms to contribute positively to economic growth would grow, too.

The equation (12) suggests a critical level of capital stock K^{**} that constitutes a borderline between $\partial g / \partial \phi > 0$ and $\partial g / \partial \phi < 0$. It is given by the following:

$$K^{**} = \frac{c_1 \phi^2}{c_2 s A} \quad (13)$$

Thus when the actual level of capital stock K is larger than the critical level K^{**} , efforts to improve financial efficiency would raise the growth rates of the economy. However, when K falls short of K^{**} , efforts to improve financial efficiency would decrease growth rates. Since the actual level of K has a one to one correspondence with the level of economic development, this means that underdeveloped economies may well experience a retardation in growth rates when they embark on financial reforms. An economy must be developed beyond a certain level, if it hopes to benefit from financial reforms that are costly to undertake. Therefore, an underdeveloped economy should resist the temptation to hurriedly reform the financial sector. It is especially so if the country plans to reform the financial sector using only its own resources.

An optimal policy

Since we do not consider welfare explicitly in our model, the policy that maximizes the economic growth rate is the optimal policy. Following this interpretation, we can easily find out what should be the growth rate maximizing level of intermediation efficiency by studying equation (12). It is rewritten here for convenience.

$$\frac{\partial g}{\partial \phi} = \frac{c_2 s A}{\phi^2} - \frac{c_1}{K} \quad (12)$$

The value of ϕ that makes the right hand side of equation (12) equal to zero is the answer that we seek. It is given by the following:

$$\phi^* = \sqrt{\frac{c_2 s A K}{c_1}} \quad (14)$$

As can be seen from equation (14) ϕ^* is an increasing function of the level of development K . What is the meaning of this? It means that if a country wants to maintain the maximum possible economic growth rate, it has to continuously improve the efficiency of financial intermediation in tandem with the growth of income. If a country neglects this, it would end up growing less rapidly than its full potential would allow.

The optimal level of intermediation efficiency ϕ^* is an increasing function of c_2 , s , and A , and a decreasing function of c_1 . Therefore, if the fixed cost of improving the efficiency of financial intermediation rises, it would be optimal to maintain a lower level of efficiency. On the other hand, if the marginal cost of intermediation rises as c_2 increases, it would pay to keep c_2 / ϕ low by raising ϕ . Finally, the optimal response of ϕ to changes in s or A is the same as the optimal response to a change in K studied in the above.

Several extensions of the basic model

There are several directions along which we can extend the model. Let us take a look at a few of them.

First, we can allow individuals to optimally choose the savings rate that we have treated as a parameter. Except for the fact that the resulting savings rate (hence the economic growth rate) would depend, in addition to the parameters we have introduced in the above, on preference parameters such as time discount rate and the elasticity of substitution, nothing new, especially about the role of the financial sector, comes out of this extension. Besides there are innumerable studies that have already gone in this direction.

Second, rather than treating it as a parameter, we can study how the level of technology A is determined through, for example, research and development activities. It is entirely possible for financial activities to positively affect the rate of technological progress. If this happens, it would provide an important additional channel through which financial activities enhance the growth potential of an economy. This extension we pursue in this paper.

Third, we can extend the model by incorporating, in addition to physical capital, human capital or social capital into the model. Numerous studies have gone in this direction, though without explicitly considering the financial sector. Yet, if the accumulation of financial capital does favorably affect the accumulation of human capital or social capital, then it would be another important channel through which financial development can positively contribute toward economic growth. Clearly there is a need to extend the model in this direction.

Fourth, we can let the model determine the degree of efficiency ϕ of financial intermediation. In general ϕ would be determined as a result of profit maximizing behavior on the part of financial institutions. In order to extend the model along this direction, we have to study individual banks' profit maximizing choices, the resulting market equilibrium, and finally the implied degree of financial efficiency from all these. The task is beyond this paper.

Fifth, we can extend the model by suitably generalizing the intermediation cost function. This can be done relatively easily and the new results from this extension would offer a good comparisons with our results. This is another extension we pursue in this paper.

Sixth, we can extend the model by generalizing the benefit side of the financial intermediation process. We have so far confined ourselves to $I = S - C(S : \phi)$, whereas in a more general setting we should have $I = G(S : \phi) - C(S : \phi)$, where $G(S : \phi)$ stands for the total resources 'created' by the financial sector. In general $G(S : \phi)$ is an increasing function of S for a given ϕ and it is increasing in ϕ for all S . Once we do this, it is easy to incorporate a risk factor σ into the benefit function, too. A benefit function $G(S : \phi, \sigma)$ is such an example, where a financial system is now characterized by risk as well as efficiency parameters. Then we can trace out important aspects of finance by carefully linking the risk parameter σ to the efficiency parameter ϕ . We leave this case as our next research topic.

A case of increasing marginal costs

Let us study the following extended cost function that incorporates increasing marginal costs in the simplest possible way.

$$C = c_0 + c_1\phi + \frac{c_2sA}{\phi}K + \frac{c_3sA}{\phi}K^2 \quad (15)$$

When the cost function is give by (15), the law of motion for the economy would also change as follows:

$$\dot{K} = [sA - \delta]K - [c_0 + c_1\phi + \frac{c_2sA}{\phi}K + \frac{c_3sA}{\phi}K^2] \quad (16)$$

[Figure 3], which depicts the equation (16), shows that there exist two stationary states K_1^* and K_2^* when the cost function is quadratic. (We assume here the coefficients are

such that there exist two real roots.) The stationary state K_1^* is unstable, but the stationary state K_2^* is stable. Thus whenever the initial capital stock is smaller than K_1^* , the economy would decay to the zero income level. Of course, if the capital stock exceeds K_1^* , then the economy would steadily grow to the income level associated with K_2^* .

In this case the economic growth rate is determined as follows:

$$g(K) = \left[\left(1 - \frac{c_2}{\phi}\right) sA - \delta - \frac{c_3}{\phi} sAK \right] - \frac{c_0 + c_1\phi}{K} \quad (17)$$

[Figure 4] shows in a graph the economic growth rates implied by the equation (17). It shows that economic growth rates would be positive only when the capital stock remains in between K_1^* and K_2^* . Thus when the capital stock is either too big or too small, the economy would experience negative growth. It is understandable that a country with a very low level of capital stock might experience negative growth. However, it may appear strange that a country with a very high level of capital stock might experience negative growth, too. This happens because the marginal cost becomes prohibitively large when its marginal cost is an increasing function of the volume of resources being intermediated.

The assumption of a continuously increasing marginal cost function implies that there is a limit to the income level that a country can reach through capital accumulation, while the assumption of a constant marginal cost function implies that there is no such limit. Which is more plausible? We can settle the question only through empirical investigation.

When the marginal cost of intermediation is constant, the world would consist broadly of four groups of countries. The first group contains countries that are already very poor. The second group contains countries that are becoming poorer. The third group contains countries that are clustered around the stationary level K^* . The fourth group contains countries on their positive growth path who will grow indefinitely. Of course, as

time passes, the world will be divided between a group of countries that are extremely poor and a group of countries that are becoming richer and richer.

When marginal cost is increasing, the world would consist again of four groups in the short run. The first two are similar to what we have described for the case of constant marginal cost. The difference lies in the third and fourth groups. Now, they will grow only up to the higher stationary level K_2^* . In the long run the world will be divided again into two groups. One is a group of countries that remain very poor. The other is a group of countries that are very rich but with no further income growth.¹²

Implications for growth

What are the effects of financial development on economic growth when the marginal cost is increasing? If we capture financial development by an increase in ϕ as before, we can get answers to the question by investigating the growth rate function (17). The following is an answer:

$$\frac{\partial g}{\partial \phi} = \frac{1}{\phi^2} (c_2 s A + c_3 s A K) - \frac{c_1}{K} \quad (18)$$

We can see from the equation (18) that an improvement in the efficiency of financial intermediation would contribute positively toward economic growth, provided that K is not too small. When K is very small, efforts to improve financial efficiency might decrease economic growth rates. This would surely happen when the fixed cost of intermediation is large. Finally, we can see from the equation (18) that the positive effects of an increase in ϕ on growth rates g is an increasing function of K . Therefore, the richer a country is, the larger benefits it would get from the efforts to improve financial efficiency.

A case when better finance helps technological progress

¹² Technological progress, as we demonstrate below, can insure a country to grow persistently.

Better financial services can enhance growth capacity of the economy when the former exerts a favorable impact on the process of technological progress. A good example is the role played by venture capitalists behind the rapid rise of the Silicon Valley. In order to capture this aspect of finance, let us now make the level of technology as a function of the efficiency of financial intermediation as $A = A(\phi)$ with $A'(\phi) > 0$. Then the law of motion of the economy becomes as follows:¹³

$$\dot{K} = sA(\phi)K - [c_0 + c_1\phi + (\delta + \frac{c_2 sA(\phi)}{\phi})K] \quad (19)$$

Note that this is identical to (7) except for the fact that now A is an increasing function of ϕ . Let us rewrite (19) into a more useful form as follows:

$$\dot{K} = [1 - \frac{c_2}{\phi}]sA(\phi)K - [c_0 + c_1\phi + \delta K] \quad (20)$$

The growth rate of the economy is now given by the following:

$$g(K) = [(1 - \frac{c_2}{\phi})sA(\phi) - \delta] - \frac{c_0 + c_1\phi}{K} \quad (21)$$

Finally the threshold level of capital stock is now given by the following:

$$K^* = \frac{c_0 + c_1\phi}{sA(\phi) - \delta} \quad (22)$$

They are again almost identical to (10) and (8) respectively except, of course, for the fact that now A is an increasing function of ϕ .

The three key equations of the extended model are almost identical to those of the basic model, and therefore, no gains seemed to have been made by this extension. However, this appearance can be deceptive.

¹³ Here we revert to the constant marginal cost setup for simplicity.

In the basic model efficiency gains made in the financial sector exerted an influence on growth through their effects on the cost of financial intermediation. There we saw that financial development would promote more rapid economic growth, when the former resulted in a reduction in intermediation costs. It is costly to improve financial efficiency, but improved efficiency makes intermediation less costly. Thus when the reduction in intermediation costs thanks to a more efficient intermediation is greater than the cost incurred to make intermediation more efficient, efforts to improve financial efficiency would promote more rapid growth. Otherwise, such efforts may well have adverse impacts on growth.

In the extended model, however, efforts to make intermediation more efficient are more likely to promote more rapid growth. This is because more efficient intermediation makes the level of technology higher, too. This effect is in addition to the aforementioned effect acting through the cost reduction channel. As can be seen easily from (21), an increase in ϕ (an improvement in intermediation efficiency) makes the first term in the right hand side, which is the net marginal productivity of financial services, bigger. Though to improve ϕ is costly (this is captured by an increase in $c_1\phi$), the additional cost can now be more easily offset by the increase in the net marginal productivity.

In the extended model, therefore, underdeveloped countries can begin to enjoy benefits from financial sector reforms at earlier stages of development. This is so because its positive impacts on technology make financial development more conducive for growth. We can see the point more clearly by examining the threshold capital given in (22). There, because the denominator increases more than before with an increase in ϕ , it is more likely for an increase in ϕ to make K^* smaller than before. As the threshold capital decreases, more underdeveloped countries can benefit from financial sector reforms.

Of course, for countries already beyond certain stages of development, efforts to make financial services more efficient will always help promote their economic growth. Moreover, the asymptotic rate of growth, to which all growing countries will eventually converge, will become unambiguously higher with an improvement in financial

efficiency. That is, the same amount of effort to make finance more efficient now makes the asymptotic growth rate higher than before.

Note that these growth-enhancing effects of making finance more efficient are the stronger, the larger is the positive impact on technology.¹⁴

IV. An understanding South Korean financial history using the Model

In the process of the persistent rise and the precipitous fall of the Korean economy during the last 40 years, its financial sector has played pivotal roles. Has it contributed toward the rise? If so, how? Has it also caused the fall? If so, again, how? In this section we seek answers to these questions. We do this by critically evaluating the financial policies implemented during the period in the light of the implications of the model we have proposed.

The policy of borrowing from abroad

When Korea embarked on an economic development path in the early 1960s, it was too poor to domestically mobilize all the resources needed for investment. Korea filled the resource gap with funds borrowed from abroad. (Korea did not encourage foreign direct investment and its capital markets were not sufficiently developed for foreigners to make portfolio investment.) With the borrowed funds, Korea imported capital goods, raw materials and parts, and technologies. And to them she applied her ample supply of labor to produce export goods. The export earnings then were used to repay the foreign debts and to finance a slow but steady increase in domestic savings.

This policy can be viewed as a strategy to circumvent the resource constraint (4). The constraint shows that the amount of investment is equal to the society's net savings minus resources used up in the intermediation process. As the ultimate source for the growth of the economy is investment, the economy can grow only when either its citizens save more than enough to cover the depreciation and the intermediation costs or the economy can keep depreciation and intermediation costs to a very low level. Borrowing from abroad allows the economy to bypass this constraint. First, it

¹⁴ Of course, underdeveloped countries that lack human capital may not benefit from this.

supplements domestic savings with foreign savings. Second, it can be a means to reduce the intermediation costs, if it is less costly to intermediate foreign savings than to intermediate domestic savings.

Let S_f be foreign savings, i.e., the amount borrowed from abroad, C_f be the cost of intermediating S_f . Then the resources constraint (4) can be rewritten as follows:

$$I = S + S_f - C(S : \phi) - C_f(S_f : \phi_f) \quad (23)$$

This shows that foreign savings can contribute to economic growth first by supplementing domestic savings S and second through a possible savings in intermediation costs. The latter would result when the intermediation of foreign savings, i.e., the intermediation by foreign financial institutions, can be done at lower costs than its domestic counterpart.

Now if the entire processes of mobilizing and allocating foreign savings are done following financial practices established in advanced countries, the probability of C_f lower than C could be non-negligible. In this instance an underdeveloped country can begin to grow positively by relying on intermediation services provided by foreign financial institutions.

In order to understand these points better, let us go back to the equation (13). The equation shows that unless the actual level of capital stock surpasses the critical level K^{**} , any effort to improve financial efficiency would result in a retardation of growth. Now if those countries can borrow from abroad then they can increase the total available capital stock from K to $K + K_f$. When this can be done in such a way as to make $K + K_f$ exceed K^{**} , then even underdeveloped countries can safely undertake financial reforms.

Needless to say, borrowing from abroad is not a panacea. For one thing, the borrowing country must pay back what it has borrowed. It must, therefore, plan for a timely paying back of the borrowed funds out of the benefits it produces utilizing the borrowed funds.

The payback would only be possible when investment made with the borrowed funds yields sufficiently high profits.

Second, costs of intermediating the borrowed funds often turn out to be very high. This would be the case when those in power exert undue influence on the allocation processes. History is replete with instances where dictators and their cronies stashed the borrowed or aid funds away in foreign countries for their personal gain. When this happens, borrowing from abroad would in the end make the country poorer.

The export financing system

For about 20 years since the early 1960s Korea has used an allocation mechanism (of financial resources) called the export financing system.¹⁵ This was a system where a bank would automatically buy valid letters of credit (L/C) brought in by the exporters. Of course a bank's buying the L/C was an act of granting loans. Therefore, as long as banks kept on buying L/C's, financial resources automatically flowed to the export sector. The process was pretty much automatic and impartial, and it was done frequently at subsidized interest rates. The export financing system had several features that are especially relevant for the model we have developed.

First, the system incurred low intermediation costs because it was rather simple and easy to set up and operate the system. In terms of the intermediation cost function (5), this probably meant that the system had small c_0 , c_1 , and c_2 . In that case, a larger portion of saved resources would have been used for investments, thereby contributing to economic growth.

Second and more importantly, it seems to have been a very efficient intermediation system. Here efficiency might be gauged by how well the funds get allocated to the 'right' borrowers. For the case of the export financing system, funds were automatically channeled to the exporters. Since most exporters in these instances were those who had succeeded in international competition, channeling funds to them had the effect of channeling funds to the actual and potential winners in the market. In terms of our

¹⁵ Financing export and import business is now a part of ordinary banking activities, and they are not as important as they once were.

model this can be interpreted as the export financing system having a rather large efficiency parameter ϕ .

In sum, we may well interpret the export financing system as an intermediation mechanism that has successfully kept both the fixed and marginal cost of intermediation small. That is, in terms of our model we may regard it as a system with a small c_0 , c_1 , c_2 , and a large ϕ . As can be seen from equations (8) and (10), this would have made the critical level of capital accumulation K^* smaller and the growth rate $g(K)$ larger. This way the system might have contributed toward more rapid growth of the Korean economy.

*Directed credit allocation policies*¹⁶

From the mid-1970's to mid-1980's Korea had very strongly pursued the so-called heavy and chemical industrialization (henceforth HCI) drive. This was a set of policies to help setup and promote industries to produce steel, automobiles, ships, electronics, machinery, arms, and petroleum-chemical products. It was pursued under the double catchphrases of building up the foundations for an advanced economy and of achieving self-sufficiency in arms supply.

As the HCI drive was a policy that required a huge sum of resources over many years, there were virtually no private sector firms that could join in the efforts. That was why the government stepped in. It chose a handful of larger firms and encouraged them to enter into the designated industries with a promise to confer subsidized financial resources over an extended period of time.

The firms that had joined in the HCI drive were mostly those who grew bigger as the main beneficiaries of the export financing system. A few existing and newly established state-owned companies also participated. These firms became the main players of the HCI drive almost by default. Altogether slightly fewer than twenty firms had participated and many of them eventually evolved into Chaebols.

¹⁶ For a related discussion, see Lee (1998).

Among the firms who joined the HCI drive, quite a few had become successful in producing world-class products by the mid-1980's. Examples were automobiles by Hyundai Motor, memory chips by Samsung Electronics, ships by Hyundai Heavy Industry, and steel products by POSCO. There had been, however, a large number of failures, too. Examples were firms who entered into the production of specialty steel products, machinery, arms, airplanes, and petroleum products. So-called success cases like ships, including Hyundai Heavy Industry, had become successful only after a long period of heavily subsidized financial supports. Many firms that were engaged in the so-called successful industries later turned into failures. Examples were automobiles by Daewoo and memory chips by Hyundai Electronics.

How should we view the HCI drive in the light of the model we have proposed here? Given the fact that there had been a large number of failures and many successful ones had become so only after a prolonged period of support, the HCI drive must have been a rather inefficient intermediation mechanism. This means, in terms of our model, that the HCI drive had been an intermediation mechanism with large c_1 and c_2 coupled with a small ϕ . If that were the case, then the parameter values of $c_1\phi$ and c_2/ϕ in equation (5) must have been large making the overall intermediation costs very high. Of course, high intermediation costs would surely have had adverse effects on the long run economic growth.

Note here one crucial difference between the export financing system and the HCI drive. Whereas the export financing system tended to support those firms that were successful on open international markets, the HCI drive tended to support those activities that the government believed to be important. That is, in the allocation of resources, the export financing system relied more on market signals, but the HCI drive relied more on governmental decision-making processes. That the HCI drive had a very high price tag was no coincidence. Whereas politically motivated discretionary allocations are highly likely to fail, market based allocations are highly likely to succeed. This is the sense why we regard, as an intermediation mechanism, the export financing system efficient and the HCI drive not so efficient.

Financial policies that favored larger firms

The industrial policy measures that the Korean government had actively pursued from the early 1960s had helped the formation of business conglomerates commonly known as Chaebols. Chaebols grew out of the general trading companies (GTC), which were setup in the mid-1960's under government's encouragements. The policy goal was to use the GTCs as main vehicles for export promotion by making them engage in the business of exporting not only their own products, but also products made by other companies. In return for these services, the GTCs had enjoyed a privileged access to bank loans. They had become the main beneficiaries of the export financing system. When other firms were having a hard time securing loans from the banks, having easy accesses to subsidized funds was a golden opportunity for GTCs to grow rapidly. For some the growth was such a financial boon as to allow them to form business conglomerates by acquiring existing firms or establishing new ones.¹⁷

It was the HCI drive launched in the 1970's that had transformed the GTCs into Chaebols. In order to undertake the investment projects envisioned under the HCI drive, huge sums of money were needed over many years. Because of this, the companies that had grown through their GTCs were the only private sector partners that could join hands with the government in the HCI drive. The GTC related companies had quickly become the main players in the HCI drive and they began to receive huge sums of subsidized loans for many years. This continued financial support provided golden opportunities for the GTC related companies to once more expand their business empires. The end result was the birth of Chaebols. The Chaebols, though they were mostly progenies of the industrial policies, had by mid-1980's become so powerful as to exert influence on policy-making. There were several reasons why they could become so influential.

First, they were engaged in so-called strategic industries such as steel, energy, automobiles, electronics, and shipbuilding that were regarded by many as the backbone of the economy. Second, they were employing a large number of workers. Because of these facts, punishing them for their misbehavior became rather difficult.

¹⁷ The general trading companies have also served many useful functions. For us two functions stand out: their extensive uses of trade credits and their role in information gathering and dissemination. The former had clearly filled huge gaps left by the banks by providing useful financial services for small and medium sized firms.

The fact that Chaebols had become too influential would not have had such disastrous consequences if the Korean banking sector had not become a de facto prisoner of the Chaebols. For example, timely opening up of all markets, especially those where the Chaebols were the key players, to both domestic and international competitors would have surely lessened the market power of the Chaebols.

However, the fact that most banks had loan exposure that was too concentrated towards the Chaebols had grave consequences. Thanks chiefly to their privileged access to financial resources most Chaebols had become highly indebted by the end of 1980's. This growing indebtedness of the Chaebols raised the probability of a banking crisis occurring should any one of them fail. As a result neither the financial institutions nor the government could exert appropriate restraints on the Chaebols. This had become one of the most important root causes that eventually led to the breakdown of the Korean economy in 1997.

How had this situation come about? It was an end result of the government-led development strategy adopted by the Korean government from the 1960's. It was a strategy to promote rapid economic growth by channeling subsidized financial resources into government designated 'growth' areas. The beneficiaries were first the exporting firms, then the GTCs, and finally the Chaebols. In order to channel financial resources to the 'preferred' borrowers, the government had for a long time tightly regulated the financial industry. Thus up until the mid-1980's most Korean banks had remained as mere distribution windows of financial resources according to government-set guidelines.

Even when the government began to phase out the policy of tightly controlling the finance industry, banks kept on allocating large chunks of financial resources to Chaebols. Why? It was because banks deemed the Chaebols as 'better' borrowers. Indeed, by the mid-1980's most Chaebols had grown very big and were able to generate substantial amounts of revenue. The sheer size of their assets and revenue generating capacities made most Chaebols a relatively safe bet for the banks.

On top of this, there existed an implicit understanding that the government would readily bailout a bank or a Chaebol whenever any of them got into trouble. This

'perceived' 100% insurance scheme had made the financial institutions negligent and the heavy borrowers irresponsible. There occurred a massive failure of governance of both the lenders and the borrowers. As a result the indebtedness of the corporate sector, especially that of the Chaebols, continued to grow and the vulnerability of the financial sector continued to increase in tandem with the former.

In terms of the model developed in the previous section, the financial policies that had favored large firms (or, the Chaebols) can be understood as policies that were rather inefficient.¹⁸ One way of understanding this in terms of our model is to view the policies as something that carried a high marginal cost of intermediation c_2 / ϕ without a compensating reduction in fixed cost $c_0 + c_1\phi$. If that was the case, then according to our model the policy of favoring large firms must have reduced the growth rate (see the equation (10)) and increased the critical level of capital stock K^* (see the equation (8)). As we have already seen, an increase in K^* could make hitherto positively growing countries start experiencing negative growth. That is, the growth rate may decline so much as to make the economy grow negatively.

Financial liberalization and opening up

The Korean government began to introduce policy measures to liberalize and open up the financial markets in the mid-1980's. At first the process was slow and hesitant. However, once Korea became a member of the OECD, the process gathered speed and proceeded very quickly.

Financial market liberalization and opening up would be beneficial to any country that initiates them provided that the country has a well established and properly working infrastructure for a sound financial system. When the pre-requisites are not met, financial liberalization and/or opening up carried out in haste can have detrimental effects, at least in the short run. Asymmetric information inherent to financial transactions, the convention of keeping fractional reserves, and the pro-cyclical tendency of bank lending behavior all point to a need to have a properly functioning

¹⁸ Channeling funds to Chaebols itself was not that costly. However, as numerous investment projects undertaken by Chaebols with borrowed funds went bankrupt, total intermediation cost was very large.

financial infrastructure before a full fledged liberalization and a 100% opening up are introduced.

In terms of our model, a well planned financial liberalization and opening up measures can be understood as policies that lower both the fixed cost and the marginal cost of intermediation. That liberalization and opening up would lower the marginal cost of intermediation c_2 / ϕ by increasing the degree of efficiency ϕ is easy to envision. The fixed cost $c_0 + c_1\phi$ would decrease, too, if the entry costs to financial markets c_0 can be lowered sufficiently.

However, a premature liberalization and opening up may make the workings of the financial markets less efficient, at least in the short run. Recall that according to our model when a country's wealth level is below that associated with the critical level of capital stock K^* , efforts to improve the efficiency of the financial sector could decrease the growth rate of the economy. This happens when efforts to open up and to liberalize the financial markets consume more resources than what an underdeveloped country can save for future.

When domestic financial intermediaries hitherto protected from outside competition and thus not yet strong enough to operate independently are suddenly thrust to face outside competitors, who are most likely much bigger, more knowledgeable, and powerful, it would be foolish for anyone to expect that all the domestic players can survive under the entirely new rules of the game. It would be natural for the weaker ones to succumb to competitive forces beyond their capacity to match.¹⁹

In any market winners and losers would naturally arise when environment changes. For example, when a market hitherto protected from outside players is suddenly made fully open, some of the weak players in the market would most likely be wiped out by the new entrants. In most cases this kind of reshuffling is just a manifestation of how a market mechanism works. The stakeholders of the losers would surely raise strong voices of distress in such cases. However, on the whole that kind of change should be beneficial to the economy as a whole.

¹⁹ Domestic liberalization, if pursued too hastily, could be very risky, too. Indonesia's experiences in the 1980s were clear indications of how thing might go wrong with an ill-thought-of domestic liberalization.

This may not be the case with financial liberalization, though. It is because the finance industry is a network industry that crucially depends on credit creation. Finance, which is vulnerable to large unexpected shocks, is so pervasive as to make all economic activities depend on it. Because of this pervasiveness and vulnerability, it would be disastrous to the entire economy if the finance industry experiences a systemic failure. Financial market opening up should be done in such a way as not to hurt the stability of the financial system.

Needless to say, a sudden and full opening up of the financial markets would be more harmful when most of the domestic players are heavily burdened with non-performing loans. It would be far better first to deal with these non-performing loan problems before fully exposing the heavily burdened domestic players to fierce outside competitors. Internal liberalization of the financial industry implemented together with measures to strengthen the financial supervisory framework should be a first step. These measures would force the domestic players to reform themselves. It may also be beneficial to allow some of the outside players to come into the domestic market at this stage. In the process the weakest may go out of business, the weaker may be bought up by others, and the stronger would emerge as the dominant players. When this process is accomplished to a reasonable degree and when the domestic finance industry functions efficiently, then it would be appropriate to fully open up the markets to outside players.

V. Conclusions

The key points we have made in this paper regarding financial reform efforts do in fact have wider applicability. They are applicable to all sorts of reform activities, be they may financial reforms, real sector reforms, policy reforms, political reforms, or social reforms. And they are applicable to decisions made by individuals, households, firms, groups, policy makers, and political parties.

The points we have made are especially applicable to so-called reformist zealots. They should always remember that a reform is justified only when it has positive net benefits. History is replete with incidences of bad reforms: Actions taken in the name of a reform

have frequently made things worse. They sometimes have ruined the entire society. Remember that a reform is bad when it has large costs but small benefits. Problems arise because it is not too difficult for the zealots to exaggerate the net benefits. Indeed they rarely mention the costs associated with a reform proposal. What is more, they routinely use populist tactics to stir the masses, depicting those who oppose such measures as people's enemies.

The model we studied in this paper does not have explicit reformers. Presumably all the stakeholders of the financial system participate in the reform efforts and most of what we call reform effort is nothing more than the optimal response of these stakeholders to a changing environment. In this sense they are evolutionary. Economy-wide reforms, however, have strong public good aspects, and they cannot be left entirely to markets. Here the roles played by reformers, usually policy makers, are crucial.

We have a dilemma; we need agents who undertake reforms, but they can easily become bad reformers. How to solve the dilemma is beyond the scope of this paper. Democracy could be an answer: A government fully accountable to people would take less disastrous actions than less than fully democratic governments. Also as Hayek forcefully argued, we should rely more on the evolutionary forces of competition even for economic reforms. Competition is fundamentally a discovery process that is far superior to our limited abilities in finding what is best. This suggests that efforts to make the evolutionary forces of market competition function better could be a priority.

We have argued that the poor countries should take more gradual and pragmatic approaches to reforms. Rather than undertaking too ambitious reform projects that may cost too much, it is better for them to begin with modest plans that are less costly. As their economies grow, they then can move up to more ambitious reform measures. Is this applicable to economies in transition? Chinese and Russian experiences are often contrasted in this regard. The key issue here is how to overcome resistance of the existing power holders. When existing power holders turn themselves into reformers, as they have in PRC, the gradual approach tends to work better. But when existing power holders become opponents of reforms, the big bang approach may turn out to be the only option.

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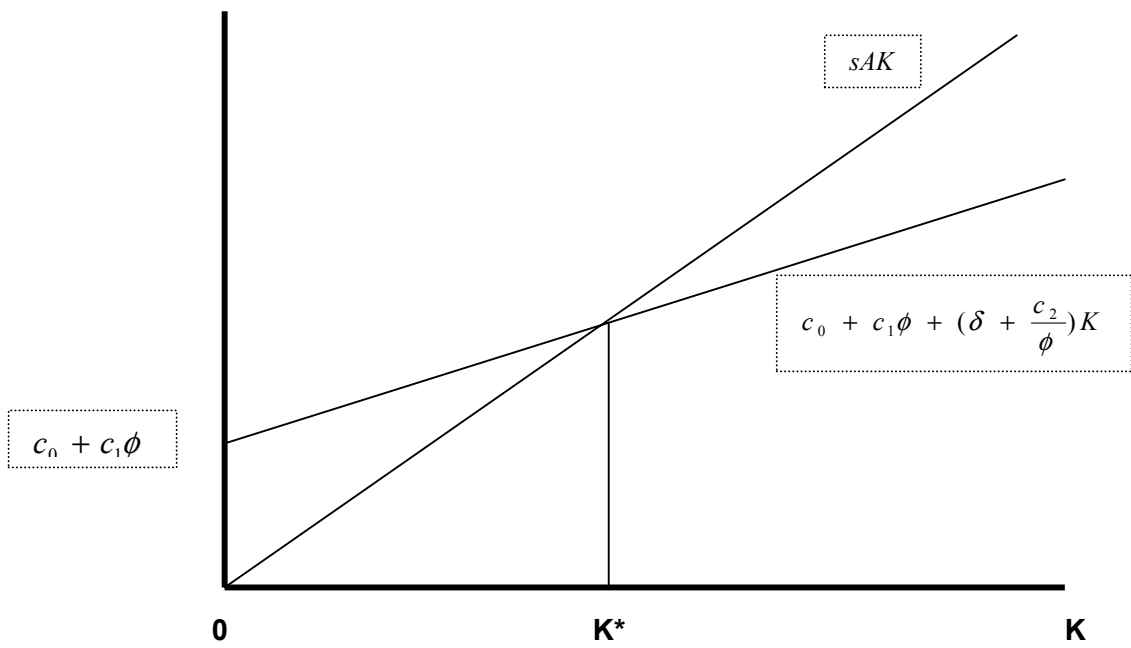
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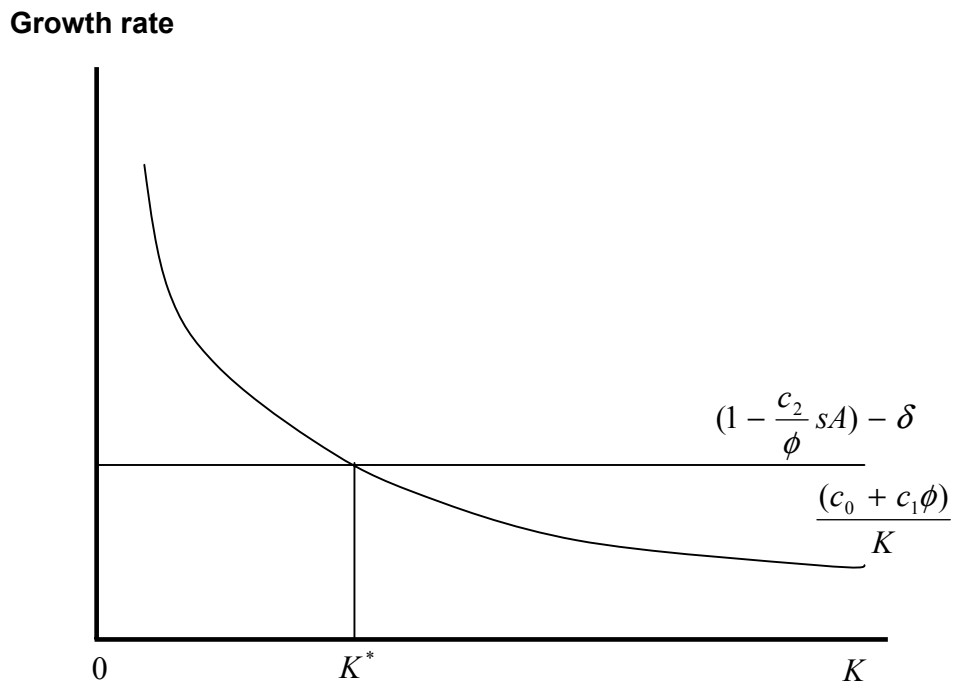
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[Figure 1] Stationary state when the MC is constant

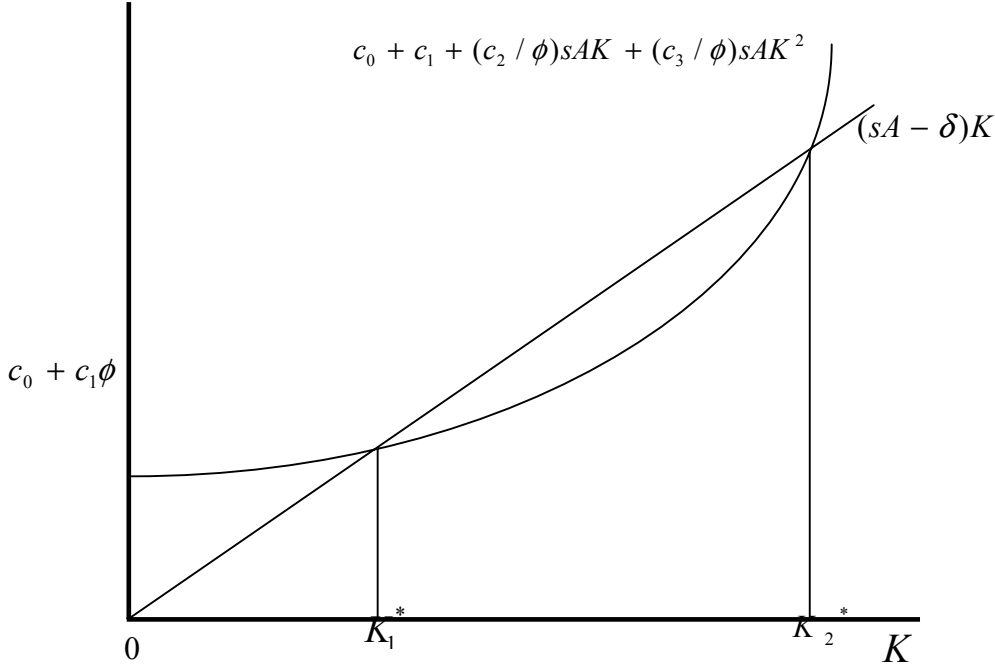
Savings and
Intermediation cost



[Figure 2] Growth rate when the MC is constant



[Figure 3] Stationary state with an increasing MC



[Figure 4] Growth rate when the MC is increasing

