DISCUSSION PAPER

Report No. DRD106

CAPITAL MARKET STRUCTURE AND BARRIERS TO
FINANCIAL LIBERALIZATION

Yoon Je Cho

September 1984

Development Research Department
Economics and Research Staff
World Bank

The World Bank does not accept responsibility for the views expressed herein which are those of the author(s) and should not be attributed to the World Bank or to its affiliated organizations. The findings, interpretations, and conclusions are the results of research supported by the Bank; they do not necessarily represent official policy of the Bank. The designations employed, the presentation of material, and any maps used in this document are solely for the convenience of the reader and do not imply the expression of any opinion whatsoever on the part of the World Bank or its affiliates concerning the legal status of any country, territory, city, area, or of its authorities, or concerning the delimitations of its boundaries, or national affiliation.
Abstract

The objective of the present paper is to study financial liberalization policy in an economy where there is no well developed securities market. I wish to emphasize the role of securities markets, especially the equity market, in a financially liberalized economy. It is important not only for efficient allocation of capital but also for risk sharing and absorbing external shock in a world of uncertainty. Thus, in the absence of a well developed equity market, or of reforms which allow or promote the establishment of one, financial liberalization, which emphasize the elimination of interest rate ceilings and the establishment of free competition among banks, may not be efficient, adequate, or sustainable. Until a country has a substantial development of equity market, government may have to maintain some control over the banking system, while it keeps the interest rate ceilings close to market equilibrium rate.
I. INTRODUCTION

Since the seminal works by McKinnon (1973) and Shaw (1973), there has been active research into the workings of financially repressed economies and the beneficial effects of financial liberalization (e.g. Fry (1980, 1982, 1983), Galbis (1977), Gonzalez-Vega (1975), Jao (1976), Kapur (1978), Krugman (1978), and McKinnon (1976, 1981, 1982)). They claim that liberalization of financial sector from interest rate ceilings and other restrictions facilitates economic development and growth as higher interest rates lead to both increased savings and greater efficiency of capital allocation. Today, the idea that financial activity should not be repressed has become the new orthodoxy in academia as well as in the major international institutions that provide policy guidelines for developing countries.

The financial liberalization argument, however, is not yet complete. The literature on financial liberalization has placed emphasis on the elimination of interest rate ceilings and free competition among banks. It has largely overlooked the possibility that endogenous constraints in the credit market, such as imperfect information, could be significant barriers to efficient credit allocation even if banks are freed from interest rate ceilings. The literature has emphasized the role of the banking sector, which is correctly perceived as the only organized capital market in most developing countries. It has neglected the potential role of equity market which will be important for efficient capital allocation and risk sharing when the financial market is liberalized.

In spite of the alleged benefits of financial liberalization, many developing countries still hesitate to liberalize their financial system, or have regressed back to financial repression after short-lived liberalization
attempts. Even industrialized economies such as Japan have hesitated to fully liberalize their financial market until very recently. Perhaps there are good reasons why these countries still resort to repressive financial policies, although the economics profession has no explanation for this. Chronic fiscal deficits may not be the only reason that governments depend on repressive financial policies. 

More fundamentally, poor development of securities market and preponderance of bank loans in corporate financing may have made financial liberalization attempts difficult.

To analyze these issues, it is necessary to go beyond the questions regarding the average level of interest rates and whether or not a liberalized financial system is more desirable than a repressed one. What is needed is a deeper understanding of the structural problems and various imperfections of the developing country's capital market and how these constraints have limited financial policies.

The purpose of this paper is to identify potential barriers to efficient financial liberalization policy in developing countries where the structure of the capital market is oriented towards the banking system rather than towards equity markets. The current financial liberalization literature tends to argue for liberalizing the banking sector from interest rate ceilings and various other restrictions, while assuming that the structure of capital markets in developing countries is fixed. This paper raises the important question: would full scale liberalization of the banking sector be beneficial

1/ McKinnon (1982) emphasized fiscal control as a necessary condition for financial liberalization.

2/ We will elaborate this point later.
and sustainable given the current structure of capital markets in developing countries? The analysis of this paper leads to the conclusion that without substantial development of equity markets, full scale financial liberalization need not be either adequate or sustainable since there will be strong incentives for the government to intervene in the credit market. Therefore, substantial development of an equity market is suggested as a necessary condition for successful financial liberalization. Until a country has an active equity market, it may have to settle for a second-best approach to financial liberalization in which some government intervention in the credit market is maintained, contrary to the presumption in the current literature.

The paper proceeds as follows. In the next section, we analyze the efficiency of capital allocation through a free, competitive credit market under imperfect information. This is then compared to the case where capital is allocated through an equity market. We show that for a given degree of imperfect information, capital would flow more efficiently through an equity market. Section III analyzes the degree of risk sharing in an economy where the capital market consists primarily of a commercial banking system, so that debt is the major source of corporate financing. As will be shown, the government plays an important role, because the financial market does not provide adequate risk sharing schemes. It enables the corporate and household sectors to share risk and thus reduces macroeconomic disruptions caused by exogenous shocks. Section IV concludes the paper.
II. IMPERFECT INFORMATION AND EFFICIENCY OF CREDIT ALLOCATION

There are two possible constraints on free differential interest rate setting according to borrowers’ characteristics: exogenous and endogenous constraints. The first one is often referred to as a legal or institutional constraint on perfectly differentiated interest rate settings. The second constraint, the endogenous one, arises because of the costs (especially information costs) of distinguishing between different customers and their risk characteristics, and/or the bank’s imperfect ability to screen customers for a more complicated and detailed rate system. That is, it is impossible, or prohibitively costly, to distinguish sufficiently between the risk characteristics of customers, at least in the case of "new customers". Even if the financial system is liberalized by eliminating interest rate ceilings and securing free competition among banks, the improvement of the efficiency of allocation is by no means secured if these information constraints are very strong.

While the financial liberalization literature has placed emphasis on the elimination of the exogenous constraints in order to acquire higher efficiency of capital allocation, it has largely neglected the effect of the endogenous constraint. But, as we will see later, endogenous constraints will be a significant barrier to efficient credit allocation even though the exogenous constraints, i.e., interest rate ceilings, are eliminated. This is especially true when a country’s capital is allocated only through the bank credit market as is the case in most developing countries.

Recently, some credit rationing literature has modeled the endogenous constraints to explain why there is rationing in the competitive credit market. (For example, see Jaffee and Russell, 1976; Keeton, 1979; Stiglitz
and Weiss, 1981 and 1983.) The primary concern of these studies is to investigate credit rationing as an equilibrium or efficient outcome of the rational behavior of lenders and borrowers. That is, even though there is excess demand for loans at a given interest rate, it is more profitable for the lender not to respond to it by increasing the price. However, in most of this literature, the issue is to explain why there is rationing in the loan market and the problem of efficiency of credit allocation has not been a major concern. The exceptions are the papers by Stiglitz and Weiss (1981) and Ordover and Weiss (1981) where they suggest the possibility that there can be several groups of observationally distinguishable borrowers, and under imperfect information some groups can be totally excluded from credit market, since there can be no interest rate at which they would get loans. This can take place even though the expected returns of the excluded groups of borrowers are higher than those who get credit. Here we further investigate the presumption they suggested and extend the results to see their implications regarding the effect of financial liberalization on the efficiency of credit allocation. 1/ We present a model whose main idea is drawn from Stiglitz and Weiss (1981). We modify and extend it in order to make it better fit to explain the issue of allocational efficiency in economies which go through a

---

1/ Here, we define efficiency of capital allocation in terms of production efficiency. In developing countries, bank loans are mostly limited to productive business investment, and borrowing for consumption or financial investment is not of major importance. Thus, allocational efficiency is said to be improved if an economy can expect more output with given amount of investment. This definition is independent of the degree of uncertainty of the returns from investment. This definition takes the position that society could be risk neutral, or at least it faces only a small systematic risk because it could well diversify among various investment projects. See Arrow and Lind (1970) for several positions of this issue.
financial liberalization process. Our model explicitly shows why some borrowers who are more productive cannot find financing even when financial system is liberalized from interest rate ceilings if bank credit is the only source of firm financing. It also will be shown that the development of an equity market will resolve this problem partially, at least. This has not been well discussed in the previous literature.

A Model

The following notations and definitions will be used:

\( \ell \) : Size of loan

\( X(\ell) \) : Total return of the project by investing loan of amount \( \ell \). \( X \) is a random variable realized in period two.

\( x(\ell) = \frac{X(\ell)}{\ell} \) : One plus rate of return of per unit loan.

\( f(x) \) : Probability density function of \( x \). Assume \( f(x) \) is uniformly distributed.

\( v(\ell) \) : The spread of a particular distribution of \( x \).

Under distribution of \( v \), \( x \) has a maximum value of \( R + v \) and a minimum value of \( R - v \).

\( R \) : The mean of distribution of \( x \).

\( R = \int_{R-v}^{R+v} x f(x) \, dx \)

\( t \) : Per unit loan transaction cost.

\( C \) : Collateral size.

\( c \) : Collateral ratio \( = \frac{C}{\ell} \)

\( h \) : Deposit interest factor \( = 1 + \) deposit rate

\( r \) : Loan interest factor \( = 1 + \) loan rate
\( \psi(h) \): Saving function. Assume \( \psi_h > 0 \).

\( E_w \): Expected return to the bank of a unit loan, Net profit to the bank will be \( E_w - h \).

\( E_\phi \): Net expected return per unit loan to the borrower after repaying loan liability \( r \).

We assume the following:

(a) When the project fails, the outcome plus collateral could fall short of the amount of the loan liability. That is, if \( x + c < r \), the firm (borrower) defaults in the second period.

(b) Investment opportunities are specific to the borrowers and they cannot be undertaken unless the borrowers are able to borrow a fixed amount of funds \( Z \). In other words, the quantity of loan as a decision variable is assumed away.

(c) There are \( N \) groups of potential borrowers.

(d) \( R_i = \bar{R}_i \) for all \( i \in N \) and \( R_i < R_j \) for \( i < j \). That is, the expected productivity of each borrower within the same group is equal, but different among different groups.

(e) However, the riskiness of each borrower is different although they are in the same group. The bank's subjective distribution of the riskiness of borrowers is defined by
\[
\max_{v_i} g_i(v), \quad \text{where } \int_{v_i}^{\max} g_i(v) \cdot dv = 1.
\]

The variance of \( v \) in group \( i \) is less than that of group \( j \) for \( i < j \).

(f) \( c_i \) (collateral ratio) = \( \bar{c}_i \) for all \( i \in N \), and \( c_i > c_j \) for \( i < j \).

(g) \( t_i = \bar{t}_i \) (transaction cost) for all \( i \in N \), and \( t_i < t_j \) for \( i < j \).

(h) We assume the banks have imperfect information in the sense that although they can distinguish among different groups of borrowers they cannot distinguish among the borrowers within the same group.

(i) Assume for the sake of simplicity, banks are risk neutral.

The economic meaning of the above assumptions can be explained as follows. There are observationally distinguishable groups of firms depending on their size, the industry they belong to, their history of customer relationship with banks, etc. The banks can roughly estimate the expected productivity of firms belonging to each group which are very similar if they belong to the same group. However, they are still heterogeneous in the sense that their riskiness differs depending on managerial skills, marketing ability, etc., which are not easily observable. That is, even among the seemingly same kind of borrowers (for example, newly established personal
computer producers with similar size), there are different probabilities of success. 1/ All the other variables such as collateral and transaction costs are observable.

Let us think of the economy which has been newly liberalized from its long-repressed financial system. Under financial repression, banks tend to concentrate their loans on a small number of large firms and have established customer relations with them, but usually have little information on the rest of the firms. 2/ Among these rationed-out small firms, there can exist firms with potentially high productivity and good creditworthiness. Banks, however, cannot easily identify them from others with potentially bad creditworthiness due to their lack of information on this group (j) of borrowers. What they have is their subjective estimate of the probability distribution of these borrowers' riskiness. The variance in the distribution of riskiness of this group (j) is supposed to be larger either because of the characteristics of the projects they take or because of the banks' poor screening ability on this group of borrowers, or both. For example, for the first group of borrowers, who are old customers, the bank has already prescreened their quality. But for the second group, the creditworthiness of borrowers is yet to be proven. Therefore, the bank's subjective estimate of the variance for the second group should be larger since they know they could end up with a pool of loan applicants with more spread of creditworthiness (risk of default). Note that

1/ The reason why we put this heterogeneity in the same group is to explore the effect of imperfect information.

2/ See the second chapter of my dissertation for detailed discussions.
assumptions (f) and (g) are not crucial for our result, but they will strengthen it.

The Borrower's Behavior

Here, we are analyzing the response of borrowers with different riskiness but the same productivity to the change of interest rate the bank charges to them. The expected profit of a specific borrower (k) in a certain group (i) will be written as follows:

\[
E_{k}^{i} = -c \int_{r-c}^{R-c} f(x) \, dx + \int_{r-c}^{R} (x-r) \, f(x) \, dx
\]

\[
= \frac{c^2 - 2cr - 2cv + 2cR - 2vr - 2Rr + 2vR - r^2 + R^2 + v^2}{4v}
\]

The first term tells us that when the investment turns out to have a bad outcome \(x < r-c\), the borrower defaults and loses the collateral. The second term means he can keep any excess of outcome over loan liability \((x - r)\) when the investment turns out to be a success \((x > r-c)\).

By partially differentiating (1) with respect to \(v\), we can see the effect of a change of riskiness on the borrowers' expected profit when other things are constant.

\[
\frac{\partial E_{k}}{\partial v} = \frac{(+) - (-)}{4v} 
\]

\[
\Rightarrow 0
\]

We can conclude from (2) that among borrowers with the same expected return and collateral size, the borrowers with higher riskiness of projects

---

1/ Superscript \(k\) is omitted in \(v\) and subscript \(i\) is omitted in all variables on the right hand side. The same holds in the following equations.
can get a higher expected profit at a given interest rate. Therefore, as the bank increases the loan rate to this group, those who drop out will be the safer borrowers since their \( \hat{E}_\phi \) turn out to be negative first. Let us define the riskiness of the borrower in group \( i \) whose expected profit becomes zero when the bank charges him \( r_i \) as \( \hat{v}^\text{min}_i (r_i) \). 

That is,

\[
\hat{E}_\phi (\hat{v}^\text{min}_i, r_i, \bar{r}_i, \bar{c}_i, \bar{\epsilon}_i) = 0
\] (3)

At \( r_i \), the borrowers with their riskiness higher than \( \hat{v}^\text{min}_i \) still would want to borrow while those with their riskiness lower than \( \hat{v}^\text{min}_i \) would not. We can easily show that when \( r_i \) goes up \( \hat{v}^\text{min}_i \) also goes up by totally differentiating (3).

\[
d\hat{E}_\phi = \frac{3\hat{E}_\phi}{3\hat{v}^\text{min}_i} \cdot d\hat{v}^\text{min}_i + \frac{3\hat{E}_\phi}{3r} \cdot dr
\]

\[
= - \frac{\left[ r-((R-\hat{v}^\text{min}_i)+c) \right] \left[ r-((R+\hat{v}^\text{min}_i)+c) \right]}{4(\hat{v}^\text{min}_i)^2} \cdot d\hat{v}^\text{min}_i + \frac{\left[ r-((R+\hat{v}^\text{min}_i)+c) \right]}{2\hat{v}^\text{min}_i} \cdot dr
\]

\[= 0 \quad (4)\]

---

1/ \( \hat{v}^\text{min}_i \) is distinguished from \( v^\text{min}_i \) which is the riskiness of the safest borrower in group \( i \).
From (4), we get,

$$
\frac{dv_{i}^{\min}}{dr_{i}} = \frac{2v_{i}^{\min}}{r-(R-v_{i}^{\min})+c} > 0 \quad (5)
$$

When the bank charges $r_{i}$ to group $i$ borrowers, the average riskiness of the pool of borrowers who apply for loans at this interest rate can be defined as:

$$
\theta_{i}(r_{i}) = \frac{\int_{v_{i}^{\min}(r_{i})}^{v_{i}^{\max}} v_{i} \cdot g_{i}(v) \cdot dv}{1 - G_{i}(v_{i}^{\min}(r_{i}))} \quad (6)
$$

where

$$
G_{i}(v_{i}^{\min}(r_{i})) = \int_{v_{i}^{\min}}^{v_{i}^{\max}} g_{i}(v) \cdot dv
$$

To see the change of the average riskiness $\theta_{i}$ of the potential borrowers of group $i$ as the loan rate to this group $r_{i}$ changes, we get

---

1/ $\theta_{i}$ is distinguished from $\bar{v}_{i}$ in the sense that it is the average riskiness of potential borrowers at loan rate $r_{i}$, not the average riskiness of the total pool of group $i$ borrowers.
Therefore, a higher interest rate has the adverse selection effect since it makes the average riskiness of the potential borrowers worse. The larger are \( \theta_i - \nu_\text{min}(r_i) \) and \( \nu_\text{min} / \partial r_i \), the larger the effect will be.

The Bank's Behavior

The expected return (per unit loan) to the bank from lending to the \( k^{th} \) borrower in group \( i \) (\( E_{w_i}^k \)) can be written in the following implicit form.

\[
E_{w_i}^k = \int_{r-v}^{r-c} (x+c) \cdot f(x) \cdot dx + r \cdot \int_{r-c}^{R+v} f(x) \cdot dx
\]

\(^{1/}\) An incentive effect (or moral hazard) could also result if borrowers have a choice of projects with different degrees of riskiness because a higher interest rate would lead them to choose a riskier project (see Stiglitz and Weiss (1981)). But we assume away this effect since the project is given by our assumption.
The first term shows that when the project outcome plus collateral \((x+c)\) falls short of the borrower's liability \((r)\), he defaults and the bank assumes all the loss \([r - (x+c)]\). The second term shows that when the project outcome plus collateral exceeds the loan liability, the bank gets only the principal plus interest rate \((r)\) whatever the excess may be. When it charges \(r_i\) to this group, its average expected return \(\left(\bar{E}_{r_i}\right)\) per borrower would be

\[
\bar{E}_{r_i} = \frac{\int_{v_{i}^{\min}}^{v_{i}^{\max}} q(v_i, r_i, \bar{R}_i, \bar{c}_i, \bar{t}_i) \cdot g_i(v) \cdot dv}{1 - G(v_{i}^{\min}(r_i))}
\]

By differentiating (9) with respect to \(r_i\), we get

\[
\frac{\partial \bar{E}_{r_i}}{\partial r_i} = -g_i(v_{i}^{\min}) \cdot \left[ q(v_{i}^{\min}(r_i), r_i, \bar{R}_i, \bar{c}_i, \bar{t}_i) - \bar{E}_{r_i} \right] \cdot \frac{dv_i}{dr_i}
\]

\[
+ \int_{v_{i}^{\min}}^{v_{i}^{\max}} \frac{\partial}{\partial r_i} q(v_i, r_i, \bar{R}_i, \bar{c}_i, \bar{t}_i) \cdot g_i(v) \cdot dv
\]

\[
\frac{\partial}{\partial r_i} \left(1 - G(v_{i}^{\min}(r_i))\right)
\]

\[
= \frac{\partial}{\partial r_i} q(v_i, r_i, \bar{R}_i, \bar{c}_i, \bar{t}_i) \cdot g_i(v) \cdot dv
\]

\[
\frac{\partial}{\partial r_i} \left(1 - G(v_{i}^{\min}(r_i))\right)
\]

The first term is negative (representing the change in the average riskiness of borrowers) since \(q(v_{i}^{\min}, r_i, \bar{R}_i, \bar{c}_i, \bar{t}_i) = \bar{R}_i - \bar{E}_{r_i}(v_{i}^{\min}, r_i) (=0)

\[
\bar{E}_{r_i} = \frac{\left(\frac{r_i - \bar{c}_i}{4v_i^2} + \frac{\bar{R}_i^2}{4v_i^2} + \frac{s_i^2}{4v_i^2} + \frac{\bar{c}_i \cdot \bar{R}_i}{4v_i^2} + \frac{\bar{c}_i}{4v_i^2} + \frac{r_i \bar{R}_i}{2v_i^2} + \frac{r_i}{2v_i^2} + \frac{r_i}{2v_i^2}\right)}{4v_i}
\]

\[
1/ \text{ The explicit form of equation (8) is}
\]
= \bar{E}_{\pi_i} > 0\) and \(\frac{d\pi_{i}}{dr_{i}} > 0\), while the second term is positive (the effect of increase in returns from raising the loan rate \(r_{i}\), holding the borrowers mix fixed). The first term is large, in absolute value, if \(\frac{d\pi_{i}}{dr_{i}}\) and/or \(g_{i}(v_{i}^{\text{min}})\) are large.

Therefore, it is possible that \(\hat{E}_{\pi_{i}}\) is not monotonically increasing with respect to \(r_{i}\) and there is an optimal value of \(r_{i}^{*}(=r_{i}^{**})\) at which \(\hat{E}_{\pi_{i}}\) obtains a local maximum value \((\hat{E}_{\pi_{i}}^{**})\).

\[\text{Figure 1}\]

Hence a bank's maximum possible return from group i lending is obtained when it charges \(r_{i}^{*}\) to this group. However, whether the banks would actually charge \(r_{i}^{*}\) to each group or not will be determined by competition among banks and the total demand for and supply of loans, as will be seen later.

\[\text{1/ At this } r_{i}, \text{ there may be excess demand for loans, but banks do not respond to it by increasing } r_{i}. \text{ Instead, they do credit rationing at } r_{i}. \text{ See Stiglitz and Weiss (1981) for a detailed discussion.}\]
The Equilibrium and Efficiency

By assumption, we have N groups of potential borrowers with different productivities in the economy. The bank's maximum expected return (per unit loan) from each group will be

\[ E_{\text{max}}^{*} = \frac{\int_{v_{i}^*}^{v_{i}^\text{min}} q(r_{i}^*, \bar{R}_{i}, \bar{C}_{i}, \bar{c}_{i}, r_{i}) \cdot g_{i}(v) \cdot dv}{1 - G_{i}(v_{i}^\text{min}(r_{i}^*))} \]

\[ \equiv \pi(g_{i}(v), r_{i}^*, \bar{R}_{i}, \bar{C}_{i}, \bar{c}_{i}, \bar{r}_{i}), i = 1 \ldots N. \]  \hspace{1cm} (11)

Let us define \( d_{i} \) such that, for \( i = 1 \ldots N, \)

\[ d_{i} = q_{i}(v_{i}^\text{min}(r_{i}^*), r_{i}^*, \bar{R}_{i}, \bar{C}_{i}, \bar{c}_{i}, \bar{r}_{i}) - E_{\text{max}}^{*} = \bar{R}_{i} - E_{\text{max}}^{*} \]  \hspace{1cm} (12)

The variance of \( v \) in group \( j \) is supposed to be higher than that of group \( i \) in such a way that, at \( r_{i}^* \), the bank would end up with more heterogeneous borrowers (in the sense that the spread of borrower's riskiness is larger) with group \( j \) than with group \( i \). This can hold either because of the special characteristics of the borrowers who belong to group \( j \) in a very competitive product market or because of the banks' insufficient information base which leads them to poor screening among this group. The \( d \) will be a function of

\[ \theta(r_{i}^*, \bar{v}_{i}^\text{min}(r_{i}^*)) \text{ so that } \partial d/\partial[\theta(r^*) - \bar{v}_{i}^\text{min}(r^*)] > 0. \text{ Thus, } d_{i} < d_{j}. \]

---

1/ This is obvious since higher riskiness of individual borrowers will lower the expected return to the bank at given interest rate (which is \( r \) in our case).
Therefore, the bank's maximum expected return from lending to group \( j \) (\( E_{Wj}^* \)) can be lower than that of group \( i \) (\( E_{Wi}^* \)) although group \( j \) borrowers' projects are more productive, i.e., \( R_j^* < R_i^* \).

The incorporation of the collateral size and administrative costs will strengthen the result since \( \partial E^*/\partial c > 0 \) and \( \partial E^*/\partial t < 0 \).

Figure 2

In the diagram above, we have the expected return of banks (\( \hat{E}_m \)) from each group of borrowers corresponding to the loan rate they charge to them (\( r \)).

Suppose the government has imposed a loan rate ceiling at \( \bar{r} \). Then the bank's most preferred group of borrowers will be group 1, and the next one is group 2. When the deposit rate ceiling corresponding to \( \bar{r} \) is imposed such that \( \hat{E}_m^*(\bar{r}) < h < \hat{E}_m^*(\bar{r}) \), then only group 1 will get loans. When \( h \) is set such that \( \hat{E}_m^*(\bar{r}) < h < \hat{E}_m^*(\bar{r}) \), then both group 1 and group 2 will
get loans, but all the rest are rationed out of the credit market. In other words, when an interest rate ceiling is imposed, the rank of the bank's priority would be group 1, group 2, group 3, ..., group N. This would clearly contradict the efficiency of credit allocation since $R_1 < R_2 < R_3 < R_4 \ldots < R_N$.

When the interest rate ceiling is eliminated, the rank now becomes group 3, group 2, group 1, group 4, ... group i. This partially improves the efficiency, but it is still below the maximum efficiency that an economy can achieve at a given level of capital formation. This can happen since very productive groups (say group 4, group 5) may still be unattractive to banks, although some of the firms rationed out under financial repression, whose productivities are higher than who actually borrowed, become more attractive under a free interest rate regime. When the competitive banking system determines the deposit rate at $h_c$, then group 1, group 2 and group 3 can borrow, but all the rest are still rationed out, even though some of them have higher productivities.

The level of loan rates that each borrower pays will be determined by the shape of demand and supply functions. In equilibrium,

$$\Psi(h_c) = \sum_{i \in k} n_i l_i$$

(13)

where $n_i$ is the number of borrowers in group i, $l_i$ is size of loans to each borrower of group i, and k is the set of groups which satisfy $E_{l_i} > h_c$. The banks' returns from each group of borrowers to whom they lend should be equal in equilibrium. Otherwise, competition among banks would bid down the loan rate to the group which yields a higher expected return to the banks. As a result, at $h_c$ (which equals the return to the bank under competitive banking
system) the group 1 borrowers will get loans at \( r_1^e \), group 2 at \( r_2^e \), and group 3 at \( r_3^e \). All other groups cannot get loans at any interest rate.

Therefore, the free interest rate regime alone would not be sufficient to achieve full allocative efficiency when asymmetric information is significant. Banks would avoid financing new, innovative borrowers, who may be perceived to be risky, even though the banks are risk neutral and free from interest rate ceilings.  

Allocation Under Equity Contract

The above problem comes from a characteristic of bank loans which is the fixed fee contract in which there is conflicting interests between lenders and borrowers. Under debt contracts, borrowers keep the whole excess of outcome over their loan liabilities when the investments become successful. Lenders, however, are restricted to the lower tail of distribution where they have claims only on the principal plus interest rate specified \( (r) \), whatever the amount of successful outcome may be, while they have to take an entire loss \( (x+c-r) \) if the projects fail. This does not happen in case of equity contracts. Under equity contracts, the problem of adverse selection would not take place even though the lenders (shareholders) may have asymmetric information. This is because under pure equity contracts, the expected return to the shareholders of the \( i \)th group firms \( (E_{r_i}) \) is nothing more nor less than the expected return of the projects themselves \( (R_i) \) that the firms undertake.

Therefore, in our case, the rank of the attractiveness of groups to the lenders will be:

---

1/ We often say bankers are conservative. Here, we clearly showed that the nature of bank loan (debt finance) and the existence of imperfect information makes them conservative even though they are risk neutral.
potential shareholders will be exactly the same as the rank of expected productivities. Even though lenders (shareholders) are risk averse, highly productive borrowers, though they may be risky, could be financed to the extent that the risk is diversifiable. Thus, a financial market with equity financing will allow capital to flow more efficiently, i.e., according to firms' expected return, than that without equity financing under the given endogenous constraints of capital markets.

In a financial market with well developed equity markets, high-risk, innovative industries (e.g. groups 4 and 5) are able to find financing although they may be rationed out of bank financing. If there are no well developed equity markets, however, it may be necessary for the government to intervene in the allocation of credit and direct loans to these industries (with interest rate ceilings) to improve allocative efficiency. 1/ This may necessitate putting some interest rate ceilings on deposit and loans. 2/

1/ The social gains from this intervention may be redistributed by tax-cum-subsidy policies. Probably, those who paid the cost of this intervention are households (depositors) since the government might put ceilings on deposit rates to compensate the potential loss of the banks by pushing them to direct loans to risky groups. When investments turn out to be a success, the government may redistribute the corporate sector's gain through tax-cum-subsidy policies. An economy without well developed equity market may have to choose this second best solution rather than to leave credit allocation totally to market determination.

2/ If the government direct banks to allocate loans to some specific sector (group 5, for example) without interest rate ceilings, the bank will charge high interest rate which gives rise to adverse selection effect within this group. If the government put ceilings on loan rate, they also have to put ceilings on deposit to secure banks profitability. But the interest rate ceilings in this case should be kept close to market equilibrium level. I am not arguing for interest rate ceilings which repress the real rate of return to negative, the case often found in the financially repressed economy.
III. CAPITAL MARKET STRUCTURE AND RISK SHARING

The government's strong intervention in interest rate setting, loan policy and credit ceilings of banking institutions is not a phenomenon unique to developing countries. It is often found among industrialized countries that have their economies oriented towards debt contract as the dominant capital market. In economies where commercial banks are the dominant source of corporate financing and stock markets are poorly developed, the debt/equity ratio of the corporate sector is usually very high. This holds even in many industrialized economies, as Table 1 shows. Japan and many Continental European countries (especially the Scandinavian countries) still have financial markets oriented towards commercial banking systems; the size of their security markets is not very large. Countries such as the United States, England and Canada, however, have very well-developed capital markets. Let us call the former the Continental European style of capital market and the latter the Anglo-American style.

Since the debt finance is a fixed fee contract, which makes risk sharing difficult, the manufacturing sector of an economy with a Continental European style capital market is faced with a greater risk of bankruptcy than its counterpart in an Anglo-American style economy. When an exogenous shock (e.g., oil shock) hits the economy, the distribution of projects can be shifted such that the cumulative density of the lower tail increases. This may cause many firms to go bankrupt. Massive bankruptcies in turn, entail real resource costs on the economy, i.e., discontinuation of production, massive layoffs, unemployment, a reduced growth rate and many other undesirable macroeconomic ramifications. A continental style financial system magnifies the negative effects of exogenous shocks, if it happens to be less
Table 1: **DEBT/EQUITY RATIO (%) MANUFACTURING FIRMS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Korea</th>
<th>Germany</th>
<th>USA</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>394.2</td>
<td>174.57</td>
<td>86.04</td>
<td>402.5</td>
</tr>
<tr>
<td>1972</td>
<td>313.4</td>
<td>180.82</td>
<td>86.90</td>
<td>420.8</td>
</tr>
<tr>
<td>1973</td>
<td>272.7</td>
<td>184.19</td>
<td>87.92</td>
<td>423.5</td>
</tr>
<tr>
<td>1974</td>
<td>316.0</td>
<td>195.68</td>
<td>92.11</td>
<td>449.4</td>
</tr>
<tr>
<td>1975</td>
<td>339.5</td>
<td>210.41</td>
<td>88.31</td>
<td>458.6</td>
</tr>
<tr>
<td>1976</td>
<td>364.6</td>
<td>212.05</td>
<td>86.24</td>
<td>488.2</td>
</tr>
<tr>
<td>1977</td>
<td>350.7</td>
<td>215.10</td>
<td>85.94</td>
<td>488.2</td>
</tr>
<tr>
<td>1978</td>
<td>366.8</td>
<td>209.00</td>
<td>88.49</td>
<td>474.7</td>
</tr>
<tr>
<td>1979</td>
<td>377.1</td>
<td>211.80</td>
<td>92.90</td>
<td>446.4</td>
</tr>
<tr>
<td>1980</td>
<td>487.9</td>
<td>214.20</td>
<td>99.10</td>
<td>418.1</td>
</tr>
</tbody>
</table>

**Sources:**
- Financial Statements Analysis, Bank of Korea, 1981.
costly for private banks to declare a firm in default rather than to reschedule the loan hoping that the firm's profitability (and solvency) will be restored. Default may occur even though rescheduling may be socially more beneficial, i.e., there would be a collective benefit if massive bankruptcies could be avoided.\footnote{\textsc{Green and Shoven} (1981) discuss this issue in the multiperiod case.} Thus, this provides another justification for the government to exercise some control over the banking system.

When a banking system is strongly controlled by the government, massive bankruptcies in bad times can be avoided by immediate government intervention to reduce interest rates so as to reduce firms' debt burdens. Rescheduling loans and even increasing lending to the firms in trouble, which may often require printing money, may be necessary and desirable.\footnote{The consequent inflation would push down the bank's real loan rate, often to less than zero.} The burden of such government intervention, in turn, falls on depositors who hold savings accounts in banks because of the reduced real return on their savings. In this way, an economy with the Continental European style of capital market can share economy-wide risks. In fact, most economies in this category tend to follow such a strategy consciously or unconsciously.

The government could also absorb risk through the tax system. But the tax system alone would not suffice. Adjusting tax rates may not be as easy as intervening to adjust financial costs and may require a longer time lag, making it impractical in crisis situations. Furthermore, if the government can not readily adjust expenditure to the reduced level of tax revenue, the government would have to depend on deficit financing through the
banking system. Again, this leads to financial repression. Banking regulations and their interest rates, of course, cause distortions in many other sectors of the economy, for instance, in foreign exchange markets, capital flows, trade, etc. (see McKinnon and Mathieson, 1981; McKinnon 1973 and 1982). As a result, the economy which strongly regulates its financial system often has to regulate other markets too. But this obviously would not be a first-best outcome.

Except in unusual circumstances, economies with well-developed equity markets can absorb risk without strong government intervention in the financial system. The financial market provides the corporate sector with a risk sharing mechanism through equity contracts. Entrepreneurs and shareholders share in the firm’s profits whether it be on the upper or lower tail of the distribution. And the rate of return to each party will be exactly the same as the rate of return to the project itself in the case of pure equity financing. Therefore, the economy with substantial (even though not pure) equity contracts would be less vulnerable to exogenous shocks and business cycles. Without a substantial equity market, the risk sharing between corporate sector and household sector would have to be done through the role of government intervention in the bank intermediation.

As a result, government’s control on financial system is very common in countries where the bulk of financial intermediation is effected through commercial banks. Full scale financial liberalization may not be sustainable unless the economy has a well developed securities markets.
IV. CONCLUSIONS

The literature on financial liberalization has emphasized the desirability of market-oriented financial policy in order to raise domestic savings and improve the allocative efficiency of capital. This, in turn, increases economic growth. Within the context of a given capital market structure where the role of commercial banks is paramount, the literature recommends the elimination of interest rate ceilings and direct government allocation of credit, as well as the encouragement of competition among banks. This paper extends this literature by analyzing the potential limitations of such a policy, drawing special attention to the absence of well-developed equity markets in developing countries. It emphasizes that, given their existing financial structure, developing countries may have to choose a second-best policy in which the government maintains some controls on the banking sector until a well developed securities market is in place.

In a credit market with imperfect information, liberalization of the banking system from interest rate ceilings and other government interventions would not, by itself, be sufficient to achieve full efficiency, though it may partially improve it. This is due to the adverse selection effect (and also the moral hazard effect) that occur when debt contracts are used in the presence of asymmetric information. In this situation, the government may be justified in intervening in the credit allocation process. It can improve allocative efficiency by securing loans for particular groups which are potentially very productive but are unable to obtain loans because the problem of adverse selection is acute. Equity contracts, however, are free from the adverse selection effect and could thus overcome inefficient allocation of
capital when the same degree of imperfect information on borrowers exists as in the case of debt contracts.

In economies where corporate financing is limited to bank loans, governments also have strong incentives to control the banking system in order to absorb the risk faced by the corporate sector during economic down turns. If the financial system (banking system) is completely liberalized in the absence of well developed equity market, financial crisis and deep recessions will be recurrent as the economy becomes vulnerable to shocks. This eventually, may lead the government to resume interventionist policy and financial repression.

The foregoing analysis should not be taken as a defense for financial repression in developing countries. As McKinnon (1973) correctly argues, the nominal interest rate ceilings which often lead to negative real interest rates and abundance of direct credit controls create many distortions in the economy and hinder financial sector development and economic growth. The purpose of this paper is to describe the optimum degree of financial liberalization given the structure of capital markets, and to suggest the need for fostering equity markets as part of a comprehensive liberalization strategy.

The reason why there are well developed equity markets in some countries (such as U.S. and England) and are not in others (including such well industrialized countries as Japan and Germany) is an extremely interesting question that deserves further research. It may be that, in countries with very poor securities markets, repression of the financial system puts limits on efficient institutional innovation this in turn, exacerbates the problem of underdeveloped securities markets. In the early
stages of economic development it may be too costly to depend on the securities markets; banks have many advantages in reducing information and transaction costs. 1/ Beyond some point in the economic development process (after attaining a well developed corporate sector, etc.), however, a careful strategy for financial liberalization should strongly encourage the development of securities markets.

1/ The advantages of debt contract over equity contract in the early stages of economic development are discussed in Chapter Five of my thesis (1984) and also in Cone (1982).
REFERENCES


