

Banks' Financial Intermediation Role in Korea

Jong-Ku Kang

During the recent period of recession, Korean banks' loans to SMEs have decreased greatly. Banks' weakened financial intermediation role could impair the effectiveness of monetary policy as well as that of resource allocation. This paper identifies factors affecting Korean banks' recent weak financial intermediation role, through theoretical and empirical analyses. From these analyses, it derives policy measures for strengthening Korean banks' financial intermediation role.

The results of the empirical analysis show that the weakening of Korean banks' financial intermediation role has been mainly caused by structural changes in the banking industry. Firstly, in the course of financial consolidation among banks in Korea, the cost to banks of lending to SMEs has increased. As banks have attached more importance to short-term profits, they have reduced their long-term credits. Loans to firms have declined as foreign and domestic banks prefer to lend to households. On top of this, Korean commercial banks have reduced their riskier assets such as SME loans and long-term loans, out of a preference for safer asset holdings. In order to improve banks' financial intermediation role, the Korean financial authorities need to take the following policy measures: strengthening local banks' business capabilities, heightening corporate governance structures and accounting systems, increasing the allocation to internal reserves of banks' profits, and enlarging the number of instruments available for sharing the risks of bank lending.

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I. Introduction

In the course of providing credit to companies, banks exercise their distinctive intermediation functions of producing information about them and monitoring them which are difficult for non-banking financial institutions or financial markets to perform. When these intermediation functions of banks are strengthened, they can extend loans to sectors characterized by high information asymmetries between borrowers and banks and high risks. In this case, the shares of corporate lending, credit loans, long-term loans will increase while those of household loans, secured loans, and short-term loans will decline.

Recently, banks in Korea have managed their assets in such a way that household loans, short-term loans, secured loans and investment in safe bonds have increased while corporate lending, credit loans, and long-term loans have declined. This appears to show that a weakening of the distinctive financial intermediation role of banks on the basis of their production of information about borrowing companies and monitoring of them in Korea.

If their financial intermediation role is weakened, the effectiveness of monetary policy will be diminished and the efficiency of resource allocation will be reduced. If the ratio of corporate lending in total assets is low because of their weakened financial intermediation role, an expansionary monetary policy is likely to cause banks to hold more bonds, such as government and public bonds, than to expand corporate lending so the effect of monetary policy through the credit channel will decrease. As the intermediation role weakens, moreover, the supply of funds to innovative SMEs that promise in future to combine high profitability and growth potential will not be carried out seamlessly, meaning that resources will not be efficiently allocated. In order to expand the foundation for long-term growth, therefore, it is imperative to strengthen banks' financial intermediation role by reinforcing the effectiveness of monetary policy and increasing the efficiency of resource allocation.

In this paper, I analyze the causes of the weakening of banks' financial intermediation role and try to identify policy options to strengthen it. For the purpose of the analysis, I divide the causes of weakening of the role into structural and cyclical factors and analyze them theoretically and empirically. Among some of the structural factors underlying the weakening of bank's financial intermediation, we may find the trend toward banks' expansion of scale and a universal banking system in the financial industry after the financial crisis in Korea, an emphasis on short-term profitability and stability, and the

comparative advantage of foreign banks in terms of household loans.

The structure of this paper is as follows. In Section II, I analyze the relationship between banks' distinctive financial intermediation roles and their portfolio composition and investigate from a theoretical standpoint the effect of a strengthening of banks' financial intermediation roles on resource allocation and monetary policy. In Section III, I examine trend of banks' portfolio composition to explore whether their financial intermediation role in Korea has in fact weakened. In Section IV, I divide the causes of weakening of the roles into structural and cyclical factors, examine theoretically them and analyze empirically the effect of each factor on banks' financial intermediation role. Lastly in Section V, on the basis of analysis in this paper, I seek to draw out some policy proposals for strengthening banks' financial intermediation role.

II. Theoretical Discussion of Banks' Financial Intermediation Role

1. Banks' intermediation role and changes in banks' portfolio composition

A financial intermediation role in a broad sense means to sell financial products to economic agents in surplus and to provide credit for economic agents in deficit. Among the financial institutions that perform this intermediation role broadly defined are banks and it is widely accepted that they have unique functions that differ from those of other institutions in terms of financial intermediation. Fama(1985) argues that banks can impose higher interest rates than CP interest rates on companies because they can generate information about the companies through monitoring, which is not accessible in the financial market.¹⁾ Similarly, because banks have a comparative advantage in producing information in comparison to the market, James(1987), Mikkelson and Partch(1986) found that when companies borrow from banks, their stock prices increase but if they finance in the market by issuing bonds, then stock prices do not go up.

1) Generally banks can obtain more information about a borrowing company through participation in its board of directors, supervision of its decision making process, and access to data on its financial transactions. This contrasts to the situation in the market where other financial institutions mostly rely on financial statements of the companies.

Therefore, banks' financial intermediation role can be defined as follows; they receive funds from non-specific depositors and, on the basis of their information production and monitoring, provide funds to entities that need it (Fama(1985), Bossone(2001), Gorton and Winton(2002), and Ham(2004)).²⁾ On the other hand, simple financial intermediation which does not involve information production and monitoring between fund suppliers and users is not regarded as a distinct function of banks because it can be conducted in the financial market. Apart from this, there are other distinct functions that only banks exercise in the financial market. These include, for example, the provision of payment and settlement services, the creation of money, consumption smoothing, and so forth(Gorton and Winton(2002)).

If banks' role of information production about borrowers and monitoring them is strengthened, the cost of information production and monitoring will be lowered and the incentives to extend loans to sectors that have relatively higher risks will become larger.³⁾ In general, higher risk is involved in corporate lending rather than household loans, in loans to SMEs among corporate lending, and in relationship lending⁴⁾ rather than transaction lending. The longer the maturity and the smaller the collateral, the higher the lending risks are. In this context, if the banks' distinct financial intermediation role is strengthened, the ratio of loans to SMEs, corporate lending, credit loans and relationship lending will all increase while those of household loans, collateralized loans, and investment in government and public bonds will decline. Furthermore, the maturity of debts is likely to become longer(Berger and Udell(1996), Gorton and Winton(2002)).

2. Effect of strengthening of banks' financial intermediation role on resource allocation and monetary policy

The strengthening of banks' financial intermediation role is expected to bring about positive externalities such as the promotion of long-term economic growth through improvement of the efficiency of resource allocation, the heightened effectiveness of monetary policy, the development of the primary financial

2) See <Appendix 1> for definitions and roles of information production and monitoring.

3) Banks in which the roles of information production and monitoring are strengthened through participation in boards of directors of borrowing companies, special agreements on credit business, and long-term relationships incur lower costs in producing information about borrowers or monitoring them than other banks.

4) Relationship lending refers to lending on the basis of private information obtained through a long-term relationship with companies and, in the case of relationship lending, banks can enter into differentiated lending agreements with companies for more efficient monitoring. In contrast, transaction lending means lending through a standardized lending agreement based on published information such as financial statements, and loans made by transaction lending can be traded easily in the secondary market.

market and so on. If banks strengthen their information production functions, SMEs that have high growth potential but find it hard to finance in the market can gain access to external financing and thus the efficiency of resource allocation will improve (Petersen and Rajan (1994)). Similarly, Schumpeter (1952) and King and Levine (1993a) argue that a strengthening banks' role of financial intermediation can promote technological innovation because banks can screen promising companies and provide loans to them. Moreover, they argue that companies would use financial resources more efficiently by avoiding investment involving high risks because banks would strengthen their monitoring of them through differentiated loan agreements.

If the ratios of loans to SMEs or corporate lending are high as a result of a strengthening banks' financial intermediation role, an expansionary monetary policy is likely to induce banks to increase corporate lending rather than household loans or holdings of government and public bonds. On the other hand, when the ratio of holdings of safe bonds such as government and public bonds accounts for a high portion of assets, an expansionary monetary policy is likely to lead banks to hold more government and public bonds. Therefore, the interest rates on government and public bonds will decline substantially while those on corporate lending will not decrease as much. As a result, the effectiveness of monetary policy will be reduced.

Furthermore, non-bank financial institutions, on the basis of information produced by banks, can efficiently implement direct financing such as the underwriting and intermediation of securities. For example, loans to a specific company by a bank may be accepted in the market as a signal that the company's credit rating is high (Fama (1985)). In addition, if banks provide funds to companies on a long-term basis, then the companies' growth can be promoted and their creditworthiness increased so that they can finance themselves through the market later. Therefore, by strengthening banks' distinct financial intermediation role, we can also expect the development of non-bank financial institutions and the advance of the direct financing market.

III. Banks' Financial Intermediation Role in Korea

We can examine changes in banks' financial intermediation role by examining changes in their asset portfolio composition because the role can be assessed by their function of producing information about borrowers and monitoring them. I

look at changes in the portfolio composition of Korean banks and it appears that banks' intermediation role has recently weakened overall. I examine changes in banks' portfolio composition by investigating the various ratios of investment in corporate lending, credit loans, collateralized lending, long-term lending, and safe assets such as government and public bonds. First, since 1999, the ratios of corporate lending and corporate facilities lending in total assets have gradually declined while that of household loans has substantially increased (See [Figure 1]).⁵⁾

Figure 1 Ratios of lending by type in total financial assets held by deposit money banks

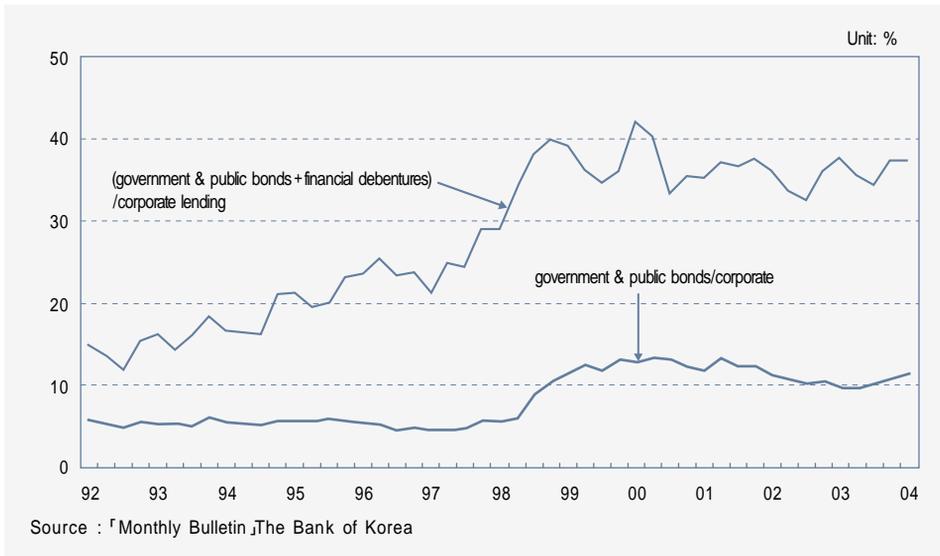


5) Although bill default ratios, which show changes in companies' credit risks, have marked a downward trend since 2000, the ratio of corporate lending by banks has declined and it appears highly likely that the supply of funds by banks to companies has weakened.

Trend of nationwide bill default ratios (based on amount)

'94~'96	'97~'99	2000	2001	2002	2003	2004
0.18	0.50	0.40	0.39	0.11	0.17	0.18

Figure 2 Ratios of safe bonds against corporate lending by deposit money banks



I compare the size of safe assets(government and public bonds) held by deposit money banks with that of corporate lending and find that ratios of safe assets surged after the financial crisis and were subsequently maintained at a high level(See [Figure 2]).

[Table 1] shows the ratios of lending by types of collateral. It may be that, since 2000, the ratios of collateralized lending, particularly lending against real estate collateral, have increased while those of credit lending have declined.

Table 1 Commercial banks' lending ratios by type of collateral

	unit: %									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
collateralized loans	49.75	47.83	42.79	47.61	45.86	46.20	44.96	49.32	52.41	52.87
loans collateralized by real estate	41.45	38.10	34.32	37.60	38.21	38.28	36.72	42.28	47.21	46.94
credit loans	43.18	44.24	49.45	42.34	39.85	41.22	43.73	39.55	38.02	36.98

Source : Bank Management Information, Financial Supervisory Service

Figure 3

Loans to SMEs by deposit money banks

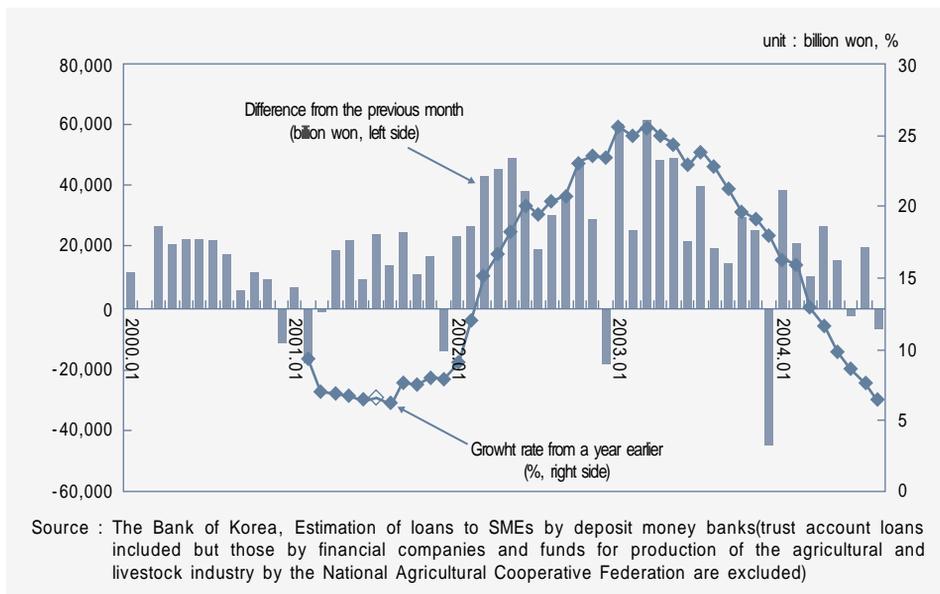


Table 2

Index of status of funds of companies

	2003.01 (A)	2003.04	2003.07	2003.10	2004.01	2004.04	2004.07 (B)	B-A
Large corporations	100	94	87	95	99	94	92	-8
Small & medium sized enterprises	86	80	74	79	81	78	76	-10
Exporting companies	84	87	76	84	87	85	82	-2
Domestic-oriented companies	92	83	79	84	86	82	81	-11
All industry	88	83	78	83	86	84	81	-7

Notes : The lower the index of status of fund, the worse the status of fund has become in comparison to a previous period as perceived by companies.

Source : Business Survey, The Bank of Korea

Loans to SMEs showed a relatively high increase during 2002 but their growth has slowed down substantially since 2003(See [Figure 3]). It is, however, possible that the reduction in the growth of loans to SMEs resulted from a decrease in the demand for corporate lending not from a decrease in its supply. Therefore, I examine whether the supply of loanable funds has declined using

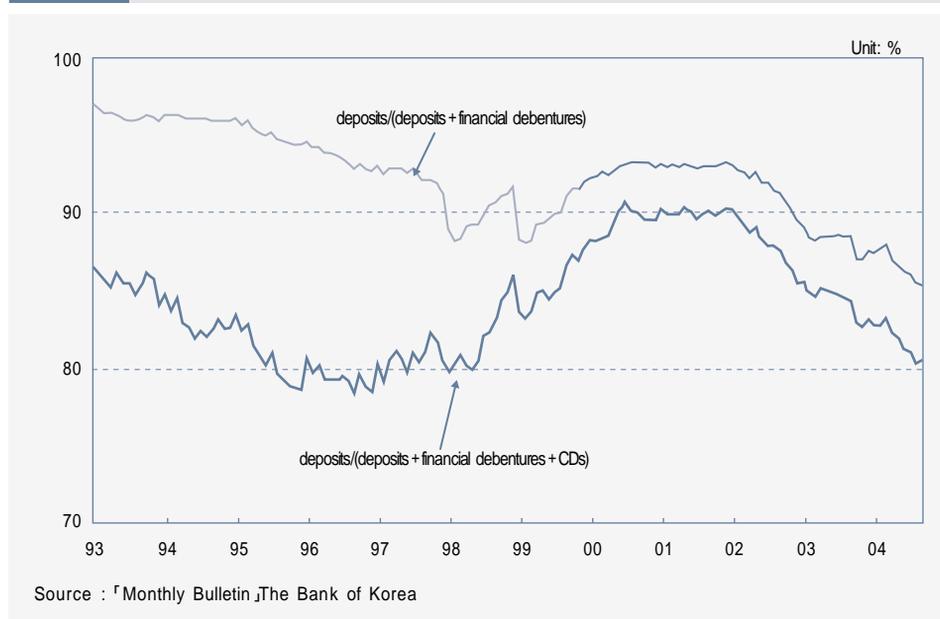
indexes of companies' status of fund. [Table 2] shows the trend of indexes of companies' status of fund, computed on the basis of surveys. It emerges that companies' status of funds deteriorated, particularly for SMEs and domestic-oriented companies and it appears that the reduction in loans to companies stems from a decrease in fund supply by banks.

Changes in the portfolio composition of banks are examined through several indexes and it turns out that the ratios of corporate lending and credit loans, particularly to SMEs, have reduced while those of safe assets such as household loans, collateralized loans, and government and public bonds have increased as have those of short-term loans and short-term securities. It appears that banks' financial intermediation role has generally weakened in recent years.

[Figure 4] shows since 2002 that the ratio of deposits in total funds raised by banks has declined while that of financial debentures has increased. It appears that banks' financial intermediation role has weakened in terms of financing as well as asset management.

Figure 4

Ratios of deposits in total funds raised by deposit money banks



IV. Causes of Weakening of Korean Banks' Financial Intermediation Role in Recent Years

1. Structural factors

A. Banks' expansion of scale and scope in the Korean banking industry

From 1998 to 2002, there were 14 instances of mergers and acquisitions within the Korean banking industry⁶⁾ which suggests that banks' expansion of scale has made rapid progress in the Korean banking industry. In general, it is known that the cost of inspecting and supervising loan officers (agency cost, Berger and Udell(2002)) increases as the size of banks expands. Given that agency cost increases as banks enlarge the size and scope of their business, large banks attempt to reduce it by applying standardized screening methods to companies.⁷⁾ Thus, screening methods based on public information such as financial statements may strengthen while banks' ability to produce information about companies may weaken. Since a large proportion of loans to SMEs are generally based upon the reputation of the owners of the companies, a weakening of banks' ability to produce information may lead to a contraction of the supply of funds for SMEs. In addition, in the process of mergers among banks, information about SMEs can be reduced as loan officers are dismissed and this may result in a decrease in loans to SMEs.

Several overseas empirical analyses show that the bigger(the smaller) the banks are, the lower(the higher) the ratios of loans to SMEs(Strahan and Weston(1996)) and the higher the degree of banks' concentration, the lower the ratio of relationship lending(Elsas (2004)). Furthermore, Carter and McNulty(2005) proved that large banks have greater comparative advantage in small loans and credit card loans while small and medium sized banks have a comparative advantage in loans extended on the basis of information to which they are privy that is not made public in the market. From this, we can surmise that banks' financial intermediation role has weakened in Korea since their

6) Number of M&As among banks in Korea is as follows: seven in 1998, three in 1999, one in 2000, two in 2001 and one in 2002.

7) Once a standardized loan screening method on the basis of objective materials such as financial statements is introduced, the cost of inspecting and supervising loans officers will be lowered because of their reduced discretionary power. Currently, commercial banks in Korea employ a Credit Scoring System(CSS) for corporate lending.

expansion of scale proceeded rapidly through mergers and acquisition after the financial crisis. Korean banks have witnessed an increase in agency cost and a loss of information about SMEs so they have reduced relationship lending and incentives for information production and monitoring have been lowered. However, for a more precise analysis, empirical research on it will be required.

After the financial crisis in Korea, adoption of a universal banking system has sped up rapidly, as shown by business alliances among financial institutions, the establishment of financial holding companies, the introduction of bankasurance and so forth. Generally, banks' CEOs are likely to reduce relationship lending which incurs relatively high management costs, when the handling of a wide range of business brought about by the expansion of universal banking causes administration costs to rise.(Berger and Udell(1996)). Moreover, banks are likely to expand the input of human and physical resources into more profitable non-banking businesses such as the underwriting of securities, the intermediation of M&A, and sales of insurance policies rather than traditional loans-and-deposits businesses. Therefore, it is highly likely that lending to SMEs will decline. Similarly, as banks have expanded the scope of their business, managerial diseconomies have increased and sources of profit making other than loan businesses have widened and it appears that this has resulted in a reduction of loans to SMEs.

B. Banks' focus on short-term profits

In general, it is relatively difficult for banks' external shareholders to obtain internal information about the banks and they are more likely to rely on information in the public domain such as financial statements. Therefore, they tend to appraise CEOs' performance on the basis of short-term profits instead of long-term growth potential.⁸⁾ After the financial crisis in Korea, the conditions for the exercise of minority shareholders' rights were relaxed and the influence of external shareholders on banks' management strengthened. Therefore, banks' managers have come to put greater emphasis on short-term profits. Additionally, market principles have been stressed in the banking industry in order to achieve its trouble-free restructuring after the financial crisis in Korea and this has also led banks' management to prioritize short-term profits among their goals.

If banks' management regards short-term profits as the priority, they are

8) In general, in the US and UK, where management is evaluated on the basis of short-term profits and returns to shareholders are emphasized, it is likely to focus on short-term performance. In contrast, in Germany and Japan, where returns to all stakeholders including such as shareholders, creditors and workers are all seen as important, management is likely to emphasize on long-term performance.

unwilling to supply funds to companies whose credit ratings have temporarily declined even though their long-term profitability and growth potential are very high. Moreover, banks are reluctant to produce information about companies,⁹⁾ which can be thought of as long-term investment, and this makes harder for them to supply stable and long-term loans. Since the financial crisis in Korea, banks' governance structure has changed so that returns for shareholders are more strongly emphasized, and banks' managers are inclined to attach greater importance to short-term business results and become reluctant to long-term and stable businesses with companies. Therefore, it seems that banks' distinct role in producing information and monitoring has weakened in Korea.

C. Foreign banks' comparative advantage in financial services concerning households

Since 2000, the entry of foreign capital into the Korean banking industry has increased substantially and the ratios of assets managed by foreigners in total assets held by all banks (commercial, special banks and overseas branches are included) increased from 7.4% at the end of 1997 to 19.8% at the end of September in 2004. In general, it is widely recognized that management costs are relatively high in the case of foreign banks because of their more expensive screening costs, resulting from a lack of information about the Korean economic situation and business practices, and their organizational complexity resulting from their customary provision of global financial services (Berger and Udell (1996)). In these circumstances, foreign banks have preferred to make use of standardized screening techniques using financial statements with the aim of cost reduction and have reduced relationship lending. Therefore, it seems that the role of information production and monitoring by banks has weakened. Furthermore, on the platform provided by their advanced screening techniques and know-how concerning household loans, foreign banks tend to extend household loans and strengthen Private banking services.¹⁰⁾ As the weight of foreign banks has substantially increased in Korea since the financial crisis, corporate lending has declined and household loans have expanded, which results in a weakening of banks' financial intermediation role.

9) Banks' private information about companies cannot be traded in the market but it can be thought of as a long term investment from the banks' point view because it can be made good use of later to improve returns on long-term investment.

10) In the Korean stock market, foreign investors have the highest returns on investment, followed by domestic institutional investors, private investors. Citibank strengthened its PB business after it acquired Mexican and Polish banks.

D. Banks' emphasis on stability

Before the financial crisis, the stability of Korean banks was implicitly guaranteed and, although there were cases of banks becoming troubled, the risk of insolvency was not large. After the financial crisis, however, the policy authorities abolished implicit payment guarantees and had ailing banks forced to exit under market principles. Therefore, in the banking industry, market discipline has been dramatically strengthened and depositors' sensitivity to banks' risks has increased so prior insolvency risk has dramatically increased.

Generally when default risk is expected to increase, banks are inclined to reduce relationship lending because they can lower default risks and improve their values by making transaction lending instead of relationship lending. Through an increase in transaction lending, banks can maintain the stability of their assets even when the economy is unstable because they are able to reduce credit to potential insolvent corporations and can easily sell their assets in the financial market.¹¹⁾ In contrast, if banks increase relationship lending so that there is an increase in the number of companies, whose profitability has declined temporarily because of economic recession but which have long-term growth potential, the financial market (depositors included) will perceive that the default risks of banks has become higher.¹²⁾ This will lead to an increase in cost of financing and probability of default of banks.¹³⁾ Therefore, when the stability of banks is reduced because of an increase in economic uncertainty, a decrease in their credit ratings and the heightened sensitivity of depositors to their risks, banks can act to improve expected revenues and reduce default risks by decreasing the weight of relationship lending.

To sum up, after the financial crisis in Korea, due to an increase in economic uncertainty, the strengthening of market discipline in the banking industry, and the heightened sensitivity of depositors to banks' risks, banks' prior default risks have increased and banks have been reluctant to become involved in relationship lending in order to avoid jeopardizing their stability. As a result, their role in financial intermediation has been weakened.¹⁴⁾

11) Since loan officers screen loan applications on the basis of information made public in the market, the value of asset for loan which is evaluated by banks is the same as that measured in the financial market (depositors are included).

12) In the case of relationship lending, loans are screened on the basis of private information which is not made public in the market so the financial markets tend to overestimate the riskiness of the assets held by banks.

13) The possibility of a bank's becoming insolvent is expected to turn out differently, depending upon the degree of macroeconomic stability, its credit ratings, information asymmetries between the bank and the financial market, and the sensitivity of financial markets to the risks of banks.

14) The stability of banks can be evaluated through capital adequacy ratio, the ratio of their non-performing loans, return on assets and so on.

E. Instability of household income

Recently, the stability of household earnings and the revenues of the self-employed appear to have worsened because of the wider fluctuations of company profitability, an increase in the unemployment rate, sluggish domestic demand and an increase in household debts.¹⁵⁾ As the income stability of households worsens, in order to smooth future consumption, they tend to prefer deposits in banks which have lower default risks to those in banks which have higher default risks(See [Appendix 2]). In response to changes in households' behavior, banks extend the weight of their safe assets such as government and public bonds, and collateralized loans and reduce their holdings of more risky assets such as loans to SMEs in order to improve asset soundness.

In a nutshell, as a tendency to prefer safer banks became more apparent because of the widened instability of household income in recent years, banks have reduced the size of loans to SMEs in the process of strengthening their asset soundness.¹⁶⁾

F. Decreased demand for loans by corporations

Recently, a decrease in the debt ratios of companies, a decline of market interest rates and a reduction of facilities investment reveal that corporate demand for funds has been falling. When corporate demand for funds lessens, then excess demand in the loan market clears, banks' dominance in the relationship between banks and companies is weakened and the cost of producing information about companies and monitoring them rises(Hellmann et al. (1997)).¹⁷⁾ In particular, the demand for funds by companies that have good credit ratings is likely to be more steeply reduced and, among loan customers, the weight of companies with lower credit ratings increases and the cost of information production and monitoring by banks will rise further.¹⁸⁾ Therefore, as

15) Households' leverage will be increased by the expansion of their debts and then fluctuations in net income flow will widen and the bankruptcy ratio of households will consequently rise.

16) As more households prefer safe assets, non-banking institutions reduce their supply of funds while banks increase theirs so the scale of assets held by banks increases. However, an increase in the size of assets held by banks does not necessarily mean an increase in the weights of their risky assets. It is generally recognized that banks increase the weight of safe assets as they expand in scale through an increase in asset size. For example, an increase in asset size by small and medium-sized banks in the US led to an improvement of banks' stability and an increase in the weight of loans to SMEs because the banks with enlarged assets could provide credit to various sectors(Strahan and Weston (1996)).

17) Elsas(2004), using the data of Housebank in Germany, proved empirically that banks tend to extend more relationship lending as they obtain greater negotiation power over borrowers.

18) In dealing with companies with lower credit ratings, banks have more problems in terms of information asymmetry and conflict of interests compared with businesses with companies with good credit ratings. Therefore, generally, banks incur higher cost in information production about companies with low credit ratings

the cost of information production and monitoring increases because of the weakened corporate demand for funds, the incentives to expand relationship lending are reduced, resulting in a weakening of banks' financial intermediation role.

2. Business cyclical factors

A. Pro-cyclicality of default risks of SMEs

When the economy is in a recession phase, capital flight resulting from a decrease in the return on assets in the domestic market causes its own currency to depreciate. In this case, the extent of the decrease in profitability of domestic-based companies is higher than that of exporting companies. In general, large corporations that have international competitiveness are more likely to be exporting companies than small and medium-sized firms.¹⁹⁾ Since SMEs are more likely to sell in the domestic market, the decrease in their profitability is bigger than that of large corporations during an economic recession. Similarly, the default risks of SMEs are larger than those of large corporations in a time of economic recession and banks further cut back their lending to SMEs, which has already been reduced.

Furthermore, SMEs' governance and accounting systems are not as transparent as those of large corporations and, if profit margins are squeezed because of the economic recession, then there is a strong chance that without repaying their borrowings company owners will simply make use of their funds, contrary to lenders' interest. In this case, banks' loan losses will be augmented. Therefore, they will cut back lending to SMEs on a relatively larger scale than that to large corporations and loans to SMEs will be substantially reduced during the economic recession.

B. Pro-cyclicality of banks' profitability

As the scale of non-performing loans increases, supervisory authorities strengthen their supervision of banks' soundness through prompt corrective actions. Banks expand the weight of their investment in safe assets such as government and public bonds to improve asset soundness and reduce the weight of their investment in risky sectors such as SMEs.

and monitoring them.

19) As of the end of the year 2003, the ratio of exporting companies (companies with larger revenues in overseas markets than in the domestic market) among large corporations was 32.1% while that for SMEs was 11.62% (Korea Investor Service, Inc. database).

Banks will increase loan loss reserves as the size of their non-performing loans grows during an economic recession, which will cause their capital adequacy ratios to fall. In order to strengthen their capital adequacy ratios,²⁰⁾ banks will reduce risky lending rather than increase their capital. This is because the cost of raising capital through the issue of stocks and subordinated debt is expensive. Therefore, loans to SMEs, which carry relatively higher risks from banks' perspective, will be reduced.

3 Empirical study of causes of weakening of financial intermediation role

A. Effect of structural factors in the banking industry on financial intermediation role

We estimate using banks' annual panel data in order to test empirically whether structural changes in the Korean banking industry have weakened banks' financial intermediation role.²¹⁾ The estimation period ranges from 1999 to 2003 in consideration of the fact that there were a lot of structural changes in banking industry after the financial crisis. Specialized banks are excluded from the analysis because their operational behavior is different from that of commercial banks in that the latter pursue profitability and the maximization of stability.

If explanatory variables in banks' panel estimation equations explain most of the changes in dependent variables, it is expected that the correlations between the residuals of estimation equations for each bank will not be significant. In this case, residuals in each bank's estimation equation can be regarded as white noise.²²⁾ However, if factors²³⁾ other than explanatory variables greatly affect the fluctuations of dependent variables, it is possible that the residuals of the estimation equation for each bank will have higher correlations. For example, in case a certain factor increases the ratios of corporate lending of both A and B banks but that factor is not included in the estimation result as an explanatory variable, then the residuals of the estimation equations for both banks will turn out to change in the same direction and the correlations between the two of them

20) If a bank increases loan loss reserves, a corresponding amount is deducted from their capital stock and assets so its capital adequacy ratio will subsequently decline.

21) Structural changes in the Korean banking industry include banks' expansion of scale and scope, their focus on short-term profits, the growing entry of foreign capital into the Korean banking industry, and banks' emphasis on stability.

22) When residuals have the characteristics of white noise, regardless of time, the expected values are zero, variances are constant and they have no correlations with other variables.

23) For example, the herding behavior of banks and the contagion effect among them.

will be significant. If it is assumed that there is no correlation between the residuals for each bank even though there is a significant correlation between residuals among banks, the variance of estimations will not turn out correctly and significance is liable to be lower or higher than it actually is. In this paper, we employ Seemingly Unrelated Regression(SUR) to take into consideration the fact that it is highly likely that the residuals of the estimation equations for each bank have significant correlations. In SUR, it is assumed that there are correlations between the residuals of estimation equations for each bank at the same time point. Therefore, we will be able to catch the effect of factors other than explanatory variables in the estimation equations on dependent variables for each bank.

Furthermore, when the time points of dependent variables and explanatory variables are the same, the impact of dependent variables on independent variables will be reflected in the calculation of estimation coefficients. The accuracy of estimation coefficients will then be lowered and statistical significance will turn out to be overstated. Thus, explanatory variables and dependent variables have a one-year time interval in their estimation and the estimation function is set up as follows.

$$Y_{i,t} = \sum_{j=1}^n X_{j,i,t-1} + \epsilon_{i,t} \quad (1)$$

$$E[\epsilon_{i,t} \epsilon_{j,t+k}] = 0, \text{ if } k \neq 0 \text{ and } E[\epsilon_{i,t} \epsilon_{j,t+k}] = \sigma_{i,j}, \text{ if } k = 0$$

If it is assumed that there is no correlation between the residuals of each bank, then $E[\epsilon_{i,t} \epsilon_{j,t}] = 0$ holds but in this paper we assume that there is a correlation between them and that $E[\epsilon_{i,t} \epsilon_{j,t}] \neq 0$ holds. However, it is assumed that there is no time-series correlation between residuals. In equation (1), $Y_{i,t}$ is a dependent variable of the bank i and $X_{j,i,t-1}$ is j^{th} explanatory variable of the bank i , with a one year time lag of the dependent variable. For dependent variables, which show changes in banks' financial intermediation role, I employ the ratio of corporate lending(corporate lending/total credit), the ratio of loans to SMEs(loans to SMEs/total credit), the ratio of loans for facilities investment(loans for facilities investment/total credit), the ratio of investment in safe assets(government and public bonds/total bonds). For explanatory variables, proxy variables are used to represent structural changes in the banking industry(banks' expansion of their scale and scope, banks' focus on short-term profitability, the entry of foreign capital, and banks' emphasis on stability). More specifically, the capital adequacy ratio, the return on assets, and the ratio of non-performing loans are employed as proxy variables for the stability of

banks(soundness and profitability). The higher the capital adequacy ratio and the lower the ratio of non-performing loans, the more stable banks usually are. Moreover, a high return on assets means that banks have strong management efficiency and can be regarded as safe banks from a long-term perspective. The ratio of foreigners' shareholdings, the number of outside directors and dividend policy (dividend/net income) are used as proxy variables to represent banks' governance and management. The greater the share of equity held by foreigners, the greater the influence they have on banks' management as well as on portfolio management. The larger number of outside directors can be seen as part of banks' endeavors to improve the transparency of their governance. Lastly, dividend policies demonstrate the degree to which profits are paid out instead of being retained and reinvested and show whether the banks' business goals are focused on the short-term or the long-term. The ratio of net interest revenue($(\text{interest revenue} - \text{non-interest revenue})/\text{total assets}$) and size of assets(transformed in log form) are used as proxy variables for banks' industry structure. The more universal the bank is, the higher its ratio of non-interest revenue(such as fees and commissions) is likely to be and the lower its ratio($(\text{interest revenues} - \text{non-interest revenues})/\text{total assets}$). The size of assets is used as a proxy variable for banks' expansion of scale because their size becomes larger as their business expands.

The effect of changes in the explanatory variables on the dependent variable, banks' financial intermediation role, is expected to be as follows. First, if the safety of banks' investment improves, banks' financial intermediation role will strengthen because their default risks will be lowered. Second, the increased share of the equity held by foreigners will weaken banks' financial intermediation role because participation by foreigners in management will increase their screening cost for companies and they will step up lending to households. Third, higher dividend payout policies are expected to reduce banks' financial intermediation role because they demonstrate that banks' management is focused on short-term performance. Fourth, a higher proportion of outside directors is forecast to strengthen banks' financial intermediation role because it means that banks' governance is more likely to be sound and management to be more transparent. Fifth, bigger banks with assets on a larger scale are expected to lessen their financial intermediation role because they are more likely to prefer standardized screening methods. Sixth, a higher ratio of non-interest revenue is forecast to reduce banks' financial intermediation role because higher ratios mean that banks are more universal in scope.

[Table 3] shows that banks have strengthened their financial intermediation

roles through enhancement of profitability and soundness because banks with a higher capital adequacy ratio, stronger profitability and a lower ratio of non-performing loans show higher corporate lending, loans to SMEs, and loans for facilities investment.²⁴⁾ Moreover, the increased inflows of foreign capital and the trend to a management focus on short-term performance have weakened banks' financial intermediation role because banks with a higher ratios of equity held by foreigners and higher dividend payout ratios show lower corporate lending, loans to SMEs and loans for facilities investment. Instead of the variable of ratio of foreigners' shareholdings, we set 1 for banks (Cheil, KEB, KorAm banks) in which foreigners exercise their management rights and 0 for other banks. Using the dummy variables, we show that banks in which foreigners exercise management rights have a lower ratio of corporate lending and a higher ratio of investment in safe bonds. Therefore, it appears that participation in management by foreigners is likely lead to a weakening of banks' financial intermediation role. Moreover, banks with a higher proportion of outside directors show a higher weight of lending to SMEs and for facilities investment. It appears that improvement of banks' governance and management transparency strengthens their financial intermediation role through enhancement of their creditworthiness. Apart from this, banks with larger assets and non-interest revenues have lower ratios of corporate lending and loans to SMEs, so it appears that banks' expansion of scale and scope may have a negative influence on their financial intermediation role.²⁵⁾

To sum up, it is expected that banks' financial intermediation role is likely to be reduced when the profitability and soundness of banks worsens, the ratio of foreigners' shareholding increases, their governance structure is weakened or their expansion in scale and scope progresses.²⁶⁾

24) In the estimation of the panel equation, although macroeconomic variables (GDP growth rate or bill default ratio) are included in it, the estimation result does not show a big difference.

25) The empirical results show that the bigger the size of banks, the lower the ratio of loans to SMEs but this should not be taken to mean that banks' expansion of scale necessarily causes a decrease in the weight of loans to SMEs. Although banks expand in scale, if small banks take advantage of niche markets and smoothly supply funds to SMEs, then the ratio of loans of total financial institutions will not decline.

26) When multi-collinearity exists among explanatory variables, significance of estimation coefficients may be lower than otherwise. In this paper, most estimation coefficients turn out to be significant and it seems that the problem of multi-collinearity is not significant.

Table 3 Estimation Result of Panel Data

Explanatory Variable	Dependent Variable	Weight of Corporate Lending	Weight of Loans to SMEs	Weight of Loans for Facilities Investment	Weight of Investment in Safe Bonds
	Profitability & Soundness	Return on Assets	6.61(0.34)*	8.11(0.34)*	1.78(0.34)*
Ratio of Non-Performing loans		-0.37(0.05)*	-0.62(0.05)*	-0.17(0.05)*	0.95(0.05)*
Capital Adequacy ratio		1.25(0.17)*	-0.08(0.17)	-0.29(0.17)	1.92(0.17)*
Governance Structure	Ratio of shares held by foreigners	-0.62(0.03)*	-0.65(0.02)*	-0.14(0.02)*	0.05(0.02)*
	Number of outside directors	0.72(0.07)*	1.23(0.07)*	0.30(0.07)*	0.12(0.07)
	Dividend payout ratio	-0.28(0.02)*	-0.42(0.02)*	-0.12(0.02)*	-0.03(0.02)
Banking Industry Structure	Asset size	-2.49(0.36)*	-3.35(0.36)*	0.69(0.36)	-3.61(0.36)*
	Ratio of interest-related revenue	4.95(0.26)*	5.97(0.26)*	1.45(0.26)*	-0.11(0.26)
\bar{R}^2		0.47	0.55	0.09	0.20

Notes : 1) () indicates standard deviations.

2) * denotes significance at less than the 5 % level.

B. Effect of business structural factors on banks' financial intermediation role

In this paper, we use data of commercial banks from the first quarter of 1999 to the second quarter of 2004, to examine empirically whether banks' financial intermediation role is affected by business structural factors such as companies' default risks. We can not find cointegrated relationship between level variables so we use first-differentiated log variables for the estimation.²⁷⁾

The ratio of corporate lending (corporate lending/total assets), the ratio of loans to SMEs (loans to SMEs/total assets) and the ratio of loans for facilities investment (facilities investment loans/total assets) are used as dependent variables to consider changes in banks' financial intermediation role. For explanatory variables, a proxy variable (bill default ratio) is used to represent the default risks of SMEs and a proxy variable (banks' retained earnings) to take banks' profitability into account. The estimation function is set up in the following manner.

27) It turns out that the first-differentiated variable does not have a unit root.

$$CL_t = \alpha_0 + \alpha_1 DR_{t-1} + \alpha_2 ESP_{t-1} + \alpha_3 CL_{t-1} + \epsilon_t \quad (2)$$

CL_t is a dependent variable, DR_t a default ratio and ESP_t banks' retained earning. It is expected that increased default ratios will weaken banks' financial intermediation role because banks will reduce their supply of loans to SMEs. Secondly, it is forecasted that reduced banks' retained earnings will also weaken their financial intermediation role because banks lower loans to SMEs in order to improve their asset soundness.

[Table 4] shows the estimation result and it turns out that a higher bill default ratio has a negative impact on the ratio of loans to SMEs but does not affect the ratio of corporate lending and facilities investment loans. Moreover, an increase in banks' retained earnings boosts the ratio of loans for facilities investment but does not influence the ratio of corporate lending and loans to SMEs. On the other hand, GDP growth rates and business coincidence indexes are used as explanatory variables but estimation coefficients turn out to be not significant. As a result, it appears that business cyclical factors such as an increase in companies' default risks and the deterioration of banks' profitability do not have an influence on banks' financial intermediation role.

Table 4 Estimation Result with Time-Series Data

Explanatory Variables Dependent Variables	Constant	Probability of Default	Retained Earnings	Time-lag of Dependent Variables	\bar{R}^2
Weight of Corporate Lending	-0.06 (0.33)	-0.16 (0.12)	0.61 (0.63)	0.05 (0.23)	0.05
Weight of Loans to SMEs	-0.02 (0.16)	-0.24 (0.04)*	0.17 (0.20)	0.14 (0.27)	0.52
Weight of Loans for facilities investment	-0.33 (0.25)	0.01 (0.87)	0.74 (0.32)*	0.15 (0.80)	0.83

Note : () indicates standard deviations and * denotes significance at the 5% level.

V. Policy Implications

In the foregoing empirical analysis, we found that there was a possibility that structural changes in banking industry acted to weaken banks' financial intermediary roles after the financial crisis in Korea. In this light, to strengthen banks' intermediary role, we need to study measures to minimize the side effects

that emerged in the process of the restructuring of banking industry. First, we need to look at plans to strengthen banks' financial intermediary role by widening the business bases of regional banks, given that the expansion of banks' scale through mergers and acquisitions is likely to weaken their information production and monitoring functions.²⁸⁾ In order to enlarge role of regional banks, we need to induce market entry by regional banks and actively support business alliances among regional banks so that they can jointly develop loan and deposit products, invest in computer networks and establish credit bureaus.²⁹⁾

On the other hand, bigger-size banks do not necessarily lead to a weakening of the financial intermediation role. An increase in banks' assets arising from expansion of their business scale does not always act as a factor weakening their financial intermediary roles. Furthermore, in order to improve international competitiveness in Korean banking industry, we need to foster very large banks which can compete with advanced foreign banks such as Citibank. In this regard, it seems that in order to develop the Korean banking industry very large banks and small and medium sized banks should have a different business scope and management style. In other words, the very large banks would specialize in international business and the portfolio management for the corporate sector and household while the small and medium sized banks would focus on relationship lending to small and medium sized companies.

Second, as banks expand their business scope, they are likely to reduce loans to SMEs and banks' financial intermediary role is likely to weaken. Therefore, it seems desirable to promote the financial holding company system, in which holding companies have different financial institutions as subsidiaries, rather than the direct universal banking system in which banks directly operate non-banking business. This is because, among the various types of system for the expansion of banks' business scope (total integration, universal banking³⁰⁾, subsidiaries, and holding companies), the holding company system has the advantage of lowering management costs incurred by the complexity of the expansion of business scale.

Third, as the amount of foreign capital in the Korean banking industry has

28) Since regional banks can collect information about companies based in the region, which is not shown in financial statements, they can analyze regional SMEs more easily in terms of their creditworthiness.

29) For example, the government could encourage the establishment of consultation groups among regional banks as a permanent committee and also invest in it.

30) The universal banking model is one where a single financial institution handles both commercial banking and investment banking business and it handles other types of business by the operation of separately capitalized subsidiaries as do the German Deutsche Bank, Dresdner Bank, and Commerz Bank.

increased, it is possible that banks' financial intermediary role has weakened because of information asymmetries between domestic and foreign banks. In this case, we need to reduce the information asymmetry through enhancement of domestic companies' governance structure and accounting transparency and, at the same time, we need to foster domestic private equity funds and promote mergers among banks based on domestic capital. In order to improve the transparency of corporate accounting, we should consider proposals for external audit institutions to be chosen by independent "Auditor Selection Committees" set up to include outside directors and creditors, instead of the current audit system under which the management of the inspected company picks the external audit institution (accounting firm). Meanwhile, as an alternative to lessen the side effects of participation in management by foreign capital, if, through the promotion of private equity funds, domestic capital were to acquire and operate domestic banks, there would be differences of interest between industrial capital and financial capital and it would not be desirable for industrial capital to participate in the acquisition of banks.³¹⁾

Fourth, when banks focus on short-term performance, long-term loans to corporations become problematic. Therefore, we should urge banks to lower their dividend payout ratios and support them in reinvigorating their information production and monitoring functions. The policy authorities should provide incentives for banks to reduce dividend payout ratios in a way that offers tax reductions or lessen exacting supervisory standards when banks increase retained earnings.³²⁾ It is also possible for policy authorities to devise a scheme whereby a certain ratio of tax deduction is allowed for funds that have been invested for strengthening information production and monitoring (purchase of programs for credit analysis).

Fifth, if banks' governance structure is transparent, their role as financial intermediaries will be strengthened because their creditworthiness is improved. Therefore, banks need to strengthen governance structures and management transparency through improvement of their outside director system and the introduction of incentive arrangements. In the case of outside director systems, banks need to improve the current system, in which they are appointed by the president of the bank, to a system whereby the various interested parties such as external shareholders are appointed as outside directors. It is also recommended that the term of external directors be extended. In addition, it is also possible for

31) Industry capital is growth-oriented and willing to bear short-term loss in order to expand market power while financial capital is stability-oriented and tends to avoid risky market competition situations.

32) Once banks increase their equity capital through retained earnings, their stability is improved so that financial supervisory agencies can afford to be less rigorous in their application of supervisory requirements.

the policy authorities to consider a way to give incentives to banks that have a good record on their governance structure and accounting systems.³³⁾

Sixth, as banks strive to improve their asset soundness, they tend to reduce loans to SMEs. Thus, we need to increase measures for risk sharing among banks and establish ways to extend the scope of retail loans and loans to SMEs to prevent them from being reduced in line with the introduction of Basel II (scheduled to come into force in Korea by the end of 2007). As a way of risk sharing among banks, we might also consider establishing a fund grouping regional banks, credit unions, companies, fund-raising companies, and private investors that would expand long-term credit loans and relationship lending to SMEs.³⁴⁾ Moreover, we need to galvanize the use of synthetic collateralized loan obligations (SCLO)³⁵⁾ so that special purpose companies (SPC) can shoulder some of the risks of banks' loans.

Under the country-specific discretionary clauses of Basel II, of total loans to SMEs, those below a certain amount are classified as retail loans and a relatively lower risk weight (75%) can be applied to them. Therefore, there should be an expansion of loans to SMEs that can be categorized as retail loans after the introduction of Basel II in order to avoid a contraction of lending to SMEs. Moreover, once a specific company is classified as an SME, it carries a relatively lower risk weighting than a large corporation, so that it will be desirable to widen the coverage of SMEs.

Seventh, we can promote the growth of SMEs by inducing banks to take capital stakes in SMEs so that banks' function of information production and monitoring to be reinvigorated.³⁶⁾ It is generally the case that where banks hold a stake in companies to which they lend they will lower the interest rates applied on such loans so as to bring about a rise in the value of their stocks while at the same time promoting their long-term growth by a stable supply of funds over a long-time period. This, meanwhile, is known to strengthen banks' function of information production and monitoring.³⁷⁾ In particular, if banks participate in the equity of innovative SMEs, that have high growth potential, the incentives for them to extend loans to these companies will increase greatly.

34) It is known that this kind of financial support partly helped Japan to recover from the long-standing recession.

35) When borrowers can not repay their debts, Special Purpose Vehicles (SPVs) enter into an agreement with banks that they will guarantee a payback of a certain portion of the debts and issue several kinds of collateralized loan obligations (CLOs) with loans as underlying assets.

36) Gorton and Schmid (2000) demonstrate that the greater a bank's participation in a company's equity, then the better that the company's performance will be.

37) If banks hold an equity stake in a company, they are able to participate in its board of directors and monitor the decision-making process so it is relatively easy for them to produce information about the company and monitor it.

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[Appendix 1] Information Production and Monitoring

- * Information Production : Refers to the capturing of information about the likelihood of borrowers' repayment of principal and interest. This includes both factors that affect a company profitability directly such as demand for its products and the degree of market competition along with other variables such as its governance structure and credit ratings.
 - Banks can gain a composite picture of a borrower's payment and settlement status as they provide payment and settlement services and so they can capture important information on their creditworthiness. (Bossone (2001)).
 - Credit rating agencies in the financial market can replace banks in terms of information production but this will be limited in its scope because of problems with the reliability and exclusivity appropriateness of their information.

- * Monitoring: After banks provide loans to borrowers, they supervise borrowers' repayment capacity, and they evaluate their liquidated value if borrowers are unable to redeem their debt at maturity but go bankrupt, and (conduct of monitoring on behalf of depositors : Diamond, 1984).
 - Banks can strengthen their capacity to monitor companies by concluding special loan agreements with borrowers and, if they do so, they prevent them from excessive risk-taking.
 - If the number of credit rating agencies responsible for the collection of debts were to increase, banks' monitoring role could be reduced. However, these specialist debt collection agencies do not have to shoulder directly the burden of the loan loss so their incentive for monitoring is relatively weaker than that of banks and they do not exercise a function of monitoring borrowers' repayment capacity.

[Appendix 2] Households Avoidance of Investment when Risk of Fluctuations in Earned Income is High owing to the Economic Situation

[Literature Review]

- * Bodie, Merton and Samuelson(1992) analyze individuals' choice of assets by dividing the analysis into two cases: where there is no uncertainty in earned income and where there is a complete correlation between earned income and risky assets. When there is no uncertainty in earned income, it can be regarded as representing a risk-free asset, so the preference for risky assets become stronger. When earned income and risky assets are completely correlated, earned income can be thought of as representing a risky asset so the preference for risk-free assets will be stronger. They did not analyze case where earned income and risky assets have only partial correlation.
- * Viceira(2001) assumes that individuals have utility function in the form of CRRA and earned income and returns on risky assets have normal distribution. According to the results, the positively (negatively) higher is the correlation between earned income and return on risky assets, the higher (lower) is the demand for risk-free assets.
- * Bodie, Detemple, Otruba and Walter(2004) argue that individuals have a utility function in the form of HARA, which is a more general structure than CRRA and they derive the optimal asset demand function after assuming that earned income and returns on risky assets have normal distribution.
- * Henderson(2005) assumes that individuals have an exponential utility function and derived an optimal asset demand function.
- * In the present paper, we do not set up assumptions about forms of demand function but assume that earned income and returns on risky assets have normal distribution. If earned income and returns on risky assets have normal distribution, consumption will have normal distribution, and the utility function will be expressed as a function of the mean and variance of consumption. However, there are some limitations to the research in that a two-period model is employed instead of a multi-period model.

[Main assumptions]

- * Stock returns and an individual's labour income have a joint normal distribution, and thus the individual's consumption has a normal distribution.
- As the individual's consumption has a normal distribution, his utility function can be expressed with mean and variance following the theory of mean-variance optimizing.
- * There are two periods: at the first period the individual makes investment decision and at the second period he consumes all of his wealth.

[Utility function and budget constraints]

$$\max U(E[C_1], V[C_1]), \frac{\partial U}{\partial E[C_1]} > 0 \text{ and } \frac{\partial U}{\partial V[C_1]} < 0$$

$$A_0 = B_0 + S_0$$

$$C_1 = (1 + r_{B,1})B_0 + (1 + r_{S,1})S_0 + y_1$$

$$(1 + r_{B,1})(A_0 - S_0) + (1 + r_{S,1})S_0 + y_1$$

$$V[C_1] = (S_0)^2 V[r_{S,1}] + V[y_1] + 2S_0 Cov[r_{S,1}, y_1]$$

* where $U(\cdot)$ is utility function, A_0 is initial asset, C_t and y_t are consumption and labour income, respectively, B_t and S_t are the amounts of risk-free asset and risky asset, respectively, $(1 + r_{B,t})$ and $(1 + r_{S,t})$ are the returns of the risk-free asset and risky asset, respectively.

[The first order condition]

$$\frac{\partial U}{\partial E[C_1]} E[r_{S,1} - r_{B,1}] + \frac{\partial U}{\partial V[C_1]} (2S_0 V[r_{S,1}] + 2S_0 Cov[r_{S,1}, y_1]) = 0$$

[Optimal asset investments]

$$\frac{\frac{\partial U}{\partial E[C_1]} E[r_{S,1} - r_{B,1}] + 2 \frac{\partial U}{\partial V[C_1]} Cov[r_{S,1}, y_1]}{-2 \frac{\partial U}{\partial V[C_1]} V[r_{S,1}]}$$

$$B_0^* = A_0 - S_0^*$$

* The above relations imply that the individual's investment on the risky asset increases (i) as the difference between the expected return on the risky asset and that on the risk-free asset ($E[r_{s,1} - r_{B,1}]$) becomes greater, (ii) as the covariance between the risky asset and labour income ($Cov[r_{s,1}, y_1]$) is smaller³⁹⁾, (iii) as the variance of the risky asset return is smaller ($V[r_{s,1}]$).

- Generally the covariance between the risky asset return and labour income has positive sign ($Cov[r_{s,1}, y_1] > 0$) as risky asset returns and labour income tend to change in a same direction with macroeconomic shocks.⁴⁰⁾ Thus, a rise in the variability of macroeconomic variables can make the value of $Cov[r_{s,1}, y_1]$ increase, the optimal risky asset holding (S_0^*) decrease and the optimal risk-free asset investment (B_0^*) increase.

39) This is because $\frac{\partial U}{\partial V[C_i]}$ has negative sign.

40) Campbell and Viceira (2002, Table 7.1) show that labour income and stock returns have positive correlation.