

# **Pacific Basin Working Paper Series**

## **KOREAN BANKS' RESPONSES TO THE STRENGTHENING OF CAPITAL ADEQUACY REQUIREMENTS**

**Inwon Song**

Deputy Director, Supervision Policy Department  
Office of Bank Supervision  
Bank of Korea

and

Visiting Scholar  
Center for Pacific Basin  
Monetary and Economic Studies  
Federal Reserve Bank of San Francisco

Working Paper No. PB98-01

**Center for Pacific Basin Monetary and Economic Studies  
Economic Research Department  
Federal Reserve Bank of San Francisco**

**Korean Banks' Responses to the Strengthening of Capital Adequacy Requirements**

**Inwon Song  
Deputy Director, Supervision Policy Department  
Office of Bank Supervision  
The Bank of Korea**

**and**

**Visiting Scholar  
Center for Pacific Basin  
Monetary and Economic Studies**

**March 1998**

**Center for Pacific Basin Monetary and Economic Studies  
Economic Research Department  
Federal Reserve Bank of San Francisco  
101 Market Street  
San Francisco, CA 94105  
Tel: (415) 974-3184  
Fax: (415) 974-2168**

**KOREAN BANKS' RESPONSES TO THE STRENGTHENING OF  
CAPITAL ADEQUACY REQUIREMENTS**

**Inwon Song**  
**Deputy Director, Supervision Policy Department**  
**Office of Bank Supervision**  
**Bank of Korea**

**and**

**Visiting Scholar**  
**Center for Pacific Basin**  
**Monetary and Economic Studies**  
**Federal Reserve Bank of San Francisco**

**March 1998**

I would like to thank Reuven Glick, Frederick Furlong, Ramon Moreno, Mark Spiegel, Kenneth Kasa, and Chan Huh for their helpful comments and suggestions on an earlier version of this paper. The views expressed in this paper are those of the author alone and do not necessarily reflect either the position of the Federal Reserve Bank of San Francisco, the Board of Governors of the Federal Reserve System, or that of the Bank of Korea.

## **Abstract**

The purpose of this paper is to examine Korean banks' responses to the Basle risk-weighted capital adequacy requirements implemented in 1993. The analysis indicates that while some cosmetic adjustments might have been made by partial recognition of unrealized stock losses and expected loan losses, efforts to increase capital in ways that effectively reduced risk exposure seemed to dominate the response to strengthened capital requirements. The analysis also suggests the advisability of supplementing risk-based capital requirements with leverage restrictions. The analysis also raises the question of whether the 8 percent minimum ratio of the Basle capital accord is sufficient for banks in developing countries.

## **1. Introduction**

In the course of financial liberalization, banks may encounter greater competition and incur greater exposure to various risks. Many countries have experienced significant problems following financial liberalization, particularly where prudential supervision failed to adequately deal with increased risks. Thus, the timely implementation of prudential supervision is essential to maintain the systemic health of the financial industry as well as the sound management of individual financial institutions. Prudential policies can limit the risk exposure of the financial industry, by making sure that individual institutions are managed properly. Controlling credit risk through implementation of a minimum capital adequacy standard has been a key prudential supervisory measure.

In July 1992, Korea adopted the capital adequacy standards set by the Basle Committee of the Bank for International Settlements (BIS) in 1988 in order to strengthen domestic prudential regulation. Analysis of how Korean banks have responded to the risk-based capital adequacy requirements during the past several years is very crucial to determining future bank supervision policies in Korea. The purpose of this paper is to review and examine Korean banks' responses to the risk-based capital adequacy requirement. The analysis makes use of data for 25 Korean commercial banks, including 15 nation-wide city banks and 10 regional banks.

The analysis finds that Korean banks generally did not much utilize "cosmetic" adjustments to increase their capital ratios. That is, they did not intentionally increase their risky exposure or utilize off-balance-sheet transactions. Nor did they resort much to using capital gains, revaluation reserves, or securities revaluation gains to boost capital ratios. However, some cosmetic adjustments might have been made by partially recognizing unrealized stock losses and

expected loan losses and by including provisions for loan losses covering bad loans in supplementary capital.

In contrast, Korean banks appear to have made significant efforts to increase their effective capital in response to the strengthened capital requirement, as banks increased their total capital by 11.3 percent during the period. Bank capital was increased by issuing new shares, subordinated debt, and depository receipts.

If banks are able to rely heavily on cosmetic responses to capital requirements, the effectiveness of the BIS capital adequacy guidelines is limited, especially in developing countries where macroeconomic conditions are very volatile and accounting conventions can be more easily manipulated. In this regard, an alternative approach to imposing higher minimum standards may be necessary if banks continue to exhibit too much risk exposure. In addition, it may be appropriate to employ leverage restrictions along with risk-based capital requirements.

The remainder of this paper is organized into as follows. Section 2 briefly reviews the U.S. experience and related research on banks' responses to capital adequacy requirements. Section 3 describes financial liberalization and supervision in Korea. Section 4 discusses how new capital adequacy regulations have been applied in Korea. Section 5 examines Korean banks' responses to these requirements. Section 6 summarizes and concludes the paper.

## **2. U.S. Experience and Literature Survey**

There has been much research on the responses of banks' portfolios to changes in bank capital in the United States. According to Wall and Peterson (1996), banks can generally respond in one of two ways. A bank may increase its capital ratio without reducing the probability that it

will fail. This response may be referred to as a “cosmetic” change in the capital ratio. A second response would be to increase measured capital ratio in a way that reduces the probability of failure. This response may be referred to as an “effective” change in the capital ratio.

## 2.1. Cosmetic Changes in Capital

Cosmetic changes in bank capital ratios are possible because measures of both capital and risk are imperfect proxies for the economically relevant variables. Banks may effectively offset an increase in required capital ratios by increasing their risk exposure, as long as bank managers have private information that is unobservable to the regulators. Such a situation can also arise if capital requirements do not adequately reflect the relative riskiness of assets.

Empirical evidence is mixed about the hypothesis that higher capital leads to an increase in risk. Kahane (1977), Koehn and Santomero (1980), and Kim and Santomero (1988) argued that a higher required capital ratio increases asset risk and may lead to a higher probability of failure. Furlong and Keeley (1989) argued that, given initial restrictions on asset risk and leverage, a value-maximizing bank will not increase its asset risk under more stringent capital requirements. Gennotte and Pyle (1991) showed that banks increased their asset risk and reduced their scale when capital requirements were increased. Calem and Rob (1996) argued that a severely undercapitalized bank takes more risk in an attempt to acquire adequate capital. Banks with minimally adequate capital reduce their risk exposure to reduce the risk that losses will cause them to be undercapitalized, while well-capitalized banks increase their risk exposure to offset the increase in risk.

According to empirical research by Hancock, Liang, and Wilcox (1995), banks typically took several quarters, and in many instances a few years, to completely adjust their portfolios following required increases to their capital holdings. Banks' credit responses to such capital requirement "shocks" generally were longer at banks with capital shortfalls and at smaller banks than at larger banks.

The other way of making cosmetic changes is to exploit differences between capital as measured for regulatory purposes and the banks' true economic capital. Regulatory accounting generally records assets at historical costs rather than at their current market value. Thus, regulatory measures of capital may differ substantially from the economic capital available to support the long-term viability of a bank. A bank may exploit these differences to increase its capital as measured by regulatory accounting criteria. Thus, a seemingly low-cost way for a bank to maintain or increase its regulatory capital ratio is to avoid recognizing losses on depreciated assets and accelerate recognition of gains on assets that have appreciated in value. Banks can also utilize securities gains or losses to adjust their capital ratios.

The evidence suggests that banks may have increased their regulatory capital by selling appreciated assets and delaying the recognition of losses. For example, during the mid-1980s, a number of large banks in the United States experienced a significant reduction in the value of their Latin American loan portfolios, but many of the largest banks did not fully recognize these losses until the late 1980s. Although securities markets quickly incorporated the implications of moratoriums and reschedulings into stock returns, banks took longer to recognize the reduction in their book values as measured by GAAP accounting standards.<sup>1</sup>

---

<sup>1</sup>Wall and Peterson(1996, p.9)

In the case of gains trading in securities, empirical studies have shown that gains trading is done to boost current earnings or smooth earnings. Relatively few banks appear to engage in gains trading to boost their capital account.<sup>2</sup> Generally, the market sees through these accounting gimmicks, interpreting them as signs of likely weakness in future earnings, and accordingly reduces bank stock values.

## 2.2. Effective Changes in Capital Ratios

There are other ways banks can increase their capital ratios. One way is to reduce the volume of loan assets. Most analyses of reductions in bank lending have focused on the period between the late 1980s and early 1990s, when there was an apparent slowdown in credit growth in a number of countries, which appears to have lengthened or worsened cyclical downturns. It may have been the case that this slowdown was the direct result of the impact of the 1988 Basle capital standards. Banks might have responded to the new capital requirements by reducing the volume of credit extended or by increasing their interest margins to build up their capital. However, it is difficult to fully substantiate whether the capital constraints contributed to the credit slowdown. The evidence is mixed, and capital requirement shocks appear to have played

---

<sup>2</sup>Scholes, Wilson, and Wolfson (1990) examined the recognition of securities gains and losses for a sample of mostly very large banks. They found evidence that banks with lower capital ratios are likely to have smaller recognized losses or larger recognized gains than banks with higher capital ratios. Carey (1994) examined securities sales from investment portfolios, and gains trading for a sample of more than 6,000 commercial banks. He found that most gains trading is done to boost earnings or to smooth earnings. Relatively few banks appear to engage in gains trading to boost their capital account.

only a partial role in the decline in lending.<sup>3</sup>

The imposition of risk-based capital standards could lead banks to reallocate their portfolios from loans to securities because the risk-based capital standards focused on credit risk, imposing full capital charges on most types of lending to private firms and individuals but smaller charges (in some cases no charge) for many types of securities.

Banks also can effectively increase their regulatory capital by increasing their retained earnings or issuing new securities. It is costly for banks to issue equity to increase their capital, because equity holders are generally less protected from bank insolvencies than other creditors. Thus they typically demand a higher rate of return than depositors or bond holders.<sup>4</sup> However, according to Dahl and Shrieves (1990), undercapitalized banks issue equity more often than would be predicted for similar yet adequately capitalized banks. According to Dahl and Spivey (1995), there appears to be only a limited capacity for unhealthy banks to correct undercapitalized positions by growth limitations or dividend restrictions. Equity infusions are the primary mechanism by which banks can recapitalize quickly.

---

<sup>3</sup>According to an empirical test done for New England banks, banks subject to formal regulatory orders sought to increase their capital ratios by reducing their loan portfolio significantly faster than banks that were not under a formal order (Peek and Rosengren, 1995). The Bank of England (1991) concluded that the U.K. credit slowdown resulted from decreasing borrowing capacity and bank responses to tightened standards and improved profitability, not from problems in meeting the international capital adequacy standard. Fairlamb (1994) suggested that in Japan, capital was a constraint on lending. Shinagawa (1993) presented evidence that the Japanese banks' reduction in credit was mainly demand driven.

<sup>4</sup>Goldstein (1997, p. 30)

### **3. Financial Liberalization and Prudential Supervision in Korea**

#### **3.1. Financial Liberalization in Korea**

In undertaking ambitious development plans beginning in the early 1960s, the Korean government intervened extensively in raising and allocating financial resources. Policy-based lending, facilitated mainly by expansion of the monetary base, was implemented to support strategic industries, while interest rates were regulated at levels well below market rates to provide funds at low costs to selected industries.

At the early stage of economic development, this government-led development strategy seemed to be effective in channeling financial resources into priority sectors of the economy and thus supporting high economic growth. As a result of the accommodating monetary stance and financial repression, however, chronic inflation was generated and the development of the financial sector was seriously retarded, thus weakening the long-term growth potential of the economy.

Meanwhile, commercial banks became easy-going in their business discipline, due to the government's safety-net and wide-ranging government intervention in credit allocation. As a consequence, commercial banks became burdened with an overhang of bad loans, mainly reflecting the inefficient allocation of funds that resulted from their handling of a substantial volume of policy-based loans.

All these problems in the financial industry were not explicitly exposed until the second oil crisis in the late 1970s. It then became evident that, as the economy grew larger and more complex, a government-led development strategy was no longer viable or efficient.

With recognition of the inefficiency of government intervention, a series of economic reforms and structural adjustments were undertaken and extended to the financial sector beginning in the early 1980s. Through the 1980s, Korea sought to liberalize its market through privatization of state-owned banks, interest rate deregulation, and the introduction of new financial instruments.

First of all, the government privatized commercial banks and reduced regulations governing their internal management and operations in order to enhance their autonomy and promote financial competition. In addition, entry barriers to the financial sector were lowered, thus allowing the establishment of new financial institutions. Also, some preferentially low interest lending rates were abolished and a few deposit money market rates were liberalized. Although the various measures taken throughout the 1980s did help to create a more competitive environment, they were not as effective as had been hoped because they had been undertaken on a piecemeal basis and lacked an overall vision of the financial system to be created.

Greater momentum and coordination were given to the whole financial reform process following the announcement of a financial reform program in August 1991. The deregulation of interest rates was implemented first, leading to the determination of all lending and deposit rates by financial institutions themselves. Moreover, to promote financial intermediaries' autonomous operation, policy-based loans to specific sectors such as the export industry and small and medium-sized enterprises were phased out.

The managerial autonomy of financial institutions has progressed substantially in the 1990s. Examples include introducing a committee system for the recommendation of each bank's chief executive officer, permitting banks to increase their paid-in capital and set dividends at their

own discretion, and allowing expansion of domestic business in line with their business judgement. Besides these measures, regulations on entry barriers and business scope have been steadily eased. Furthermore, the legal and institutional environment has been improved with a view to encouraging merger activity among financial institutions.

Hand in hand with the liberalization of its domestic financial market, Korea has progressively pursued foreign exchange and capital account liberalization, and granted foreign financial institutions greater access to the domestic financial market.

### 3.2 Financial Liberalization and Prudential Supervision

In recent years, many countries like Korea have implemented programs of financial liberalization, as a part of a broad strategy of economic stabilization and financial market opening. Financial liberalization undeniably offers a number of advantages. It strengthens competition in financial markets, thus exerting a disciplinary effect on the policies pursued by market participants, borrowers and lenders alike. Secondly, it enhances the efficiency of the price mechanism. Ideally financial asset prices adjust in response to publicly available information and thus optimally reflect the relative scarcity of capital. Thirdly, financial liberalization contributes to allocative efficiency, by allowing capital to be allocated more efficiently. Through the price mechanism and competition, it also stimulates financial innovation. The resultant broader and more diversified supply of financial products and services helps borrowers to obtain funds more efficiently and at lower cost.<sup>5</sup>

However, financial liberalization has a darker side as well. The process of financial

---

<sup>5</sup>Duisenberg (1995, p. 2)

liberalization can increase the fragility of financial firms and of the financial system as a whole. To the extent greater competition depresses the profit margins of financial firms, their vulnerability to large adverse shocks is increased since shocks to individual firms can be propagated more rapidly and more extensively throughout the financial system, and if liberalization fosters a higher degree of concentration and integration, it can lead to increased systemic risk as well. In addition, deregulation and liberalization may induce banks to incur increased exposure to credit, foreign exchange, and interest rate risk if they lack the necessary risk management skills.

Since radical changes in banks' operating environment can be expected to increase banking risks and affect banking soundness, liberalization should be accompanied by measures to strengthen the oversight framework. Although there is no direct connection between financial liberalization and financial crises, the banking systems in many countries have experienced significant problems following liberalization, particularly where adequate internal controls had not been developed and prudential regulation and supervision failed to contain the increased risk of new or expanded activities.<sup>6</sup>

As a result, it is now well recognized that timely implementation of prudential and bank restructuring policies is essential to avoid economic instability while undertaking financial liberalization. Prudential policies can limit risk and make sure that risk is managed properly. Policies restricting insider trading, monitoring foreign exchange exposure, or averting maturity mismatch all help to limit credit, exchange rate, and interest rate risk.

---

<sup>6</sup>According to Goldstein (1997, p.14), one of the causes of banking crises in developing countries is inadequate preparation for financial liberalization. Kaminsky and Reinhart (1995) report that the financial sector had been liberalized sometime during the previous five years in 18 of the 25 banking crises in their study.

The most important initiative to control credit risk in recent years has been the widespread implementation of minimum capital adequacy standards. In 1988, the Basle Committee of the BIS agreed to require large internationally active banks to hold capital equal to at least 8 percent of risk-weighted assets, thus preventing banks from unduly increasing credit risk through greater leverage.<sup>7</sup> Recently, the focus on credit risk of the 1988 Basle Capital Accord has come to be viewed by supervisors as too narrow to deal with the market, liquidity, and operational risks inherent in the growth of banks' trading and derivative books. In response to this development, the European Union introduced the Capital Adequacy Directive in March 1993, and the Basle Committee introduced a proposals for a revised framework for the supervisory treatment of market risk in April 1993. This new proposal was implemented at the end of 1997.<sup>8</sup>

Because of its heavily regulated development finance system, Korea has provided financial institutions with an implicit safety net by its continued policy stance of not allowing any financial institution to fail. As a result, until late 1997 Korea had not experienced the failure of any of its financial institutions, including small mutual savings and finance companies.<sup>9</sup> In this environment, prudential supervision measures were long seen as not very important.

However, as a result of financial repression and the protection of financial institutions,

---

<sup>7</sup>Existing capital requirements in the 1980s were ill-suited to handle the changes in banking exposure arising from the growing complexity of transactions and the expansion of off-balance sheet business, particularly in the form of derivatives.

<sup>8</sup>*International Capital Markets Development, Prospect, and Policy Issues* (IMF, 1995, p. 18).

<sup>9</sup>In December 1997, when terms of the IMF's bailout of Korea were agreed upon, fourteen troubled merchant banks, two securities companies, and one investment trust company in Korea were suspended from all business operations due to their inability to meet obligations and mounting non-performing loans.

several problems have emerged as potential threats to the soundness of Korea's banking system, making prudential supervision more important. First, substantial non-performing loans were built up during the era of development finance. Banks relied on an implicit guarantee by the government, which had involved itself heavily in resource allocation, picking target sectors to support. Consequently, when sectors or industries favored by the government's past industrial policy lost competitiveness and performed poorly, banks accumulated large amounts of non-performing loans. Second, the heavy government intervention in banks' internal management produced a corporate culture where a sense of managerial responsibility was lacking, and the governance of banks was viewed as a matter for the state. As a result, Korean banks' managerial efficiency and profitability declined, particularly compared with their foreign counterparts. Lastly, the belief that financial institutions were protected by the government brought about the problem of moral hazard, which added to management risks. Due to these problems, market discipline failed to develop because depositors had no incentive to monitor financial institutions' management.

In addition to the problems caused by government regulation and protection, as financial liberalization and market opening have progressed in Korea, they have exerted new destabilizing effects on the overall financial system. First, there has come a rise in banks' risks associated with increased investment in high-yield but high-risk assets under the more intense competition prevailing among financial institutions. Second, the market risks facing financial institutions have increased in line with the greater volatility of exchange and interest rates.

Consequently, since the early 1990s, Korea has strengthened prudential regulation to maintain the health of the financial industry as financial liberalization proceeds. One of the most

important measures was the adoption of the Basle Capital Accord. In July 1992, Korea introduced risk-weighted capital adequacy standards in order to bolster the soundness of Korean commercial banks, to raise Korean banks' credit standing in the international financial markets, and to work toward international regulatory convergence.

In addition to the strengthening of capital adequacy requirements, Korean authorities reinforced various prudential supervisory measures. They reinforced guidelines for loan loss provisions and induced charge-offs of existing bad loans by simplifying procedures for the writing-off of bad loans. There has been a parallel effort to adopt a more comprehensive approach to risk management of Korean banks, stressing the importance of internal governance and the role of market discipline. Banks must institute appropriate internal control procedures, and managers must be more knowledgeable about and involved in the risk assessment process. Internal control procedures and risk management guidelines for derivative transactions were reinforced in line with the Basle recommendations. In order to strengthen the market discipline function, the Korean bank supervision authority expanded the mandatory disclosure of management performance in 1994 so that the general public, especially depositors and shareholders, are in a better position to monitor bank behavior.

#### **4. Capital Adequacy Regulation in Korea**

When the Office of Bank Supervision in Korea first introduced capital adequacy requirements in 1981, it set numerical capital-to-deposit guidelines at 10 percent for all banks. In 1988, in line with ongoing financial liberalization, the guideline was changed from the capital-to-deposit ratio to the capital-to-total asset ratio in order to limit increased financial leveraging by

banks. The minimum required ratio was set at 6 percent for nationwide city banks and 8 percent for the regional banks. In December 1990, the minimum ratios were raised to 8 percent for nation-wide city banks and 9 percent for local banks.

In July 1992, the Office of Bank Supervision introduced the risk-weighted capital standards recommended by the Basle Committee as a further prudential measure to ensure capital adequacy. The Office recognized that convergence with the Basle Capital Accord guidelines was necessary both to ensure the capital adequacy of Korean banks and to ensure that they stood on a competitive footing with international banks in global financial markets.<sup>10</sup> The capital adequacy standards were applied to all commercial banks, including local banks and foreign bank branches. Local banks were included because they were expected to become more active in international business, as financial globalization proceeded.

Korea implemented the Basle guidelines over a three year period. Korean commercial banks were required to maintain a capital ratio of at least 7.25 percent at the end of 1993, and to meet the full 8 percent standard by the end of 1995. This longer transitional period was prompted by the difficulties domestic banks had in increasing capital at that time due to the sluggishness of the Korean stock market after 1990. It was also felt that the banks needed time to prepare for the new standards.

If capital requirements are not met, the supervisory authority can require the bank to take

---

<sup>10</sup>Gjerde and Semmen (1995) argued that with unconstrained equity and suboptimal risk weights, risk-based capital regulation is inferior to traditional leverage restrictions. When equity is constrained, it may be appropriate to supplement leverage restrictions with a risk based capital plan. The risk-based capital plan is the superior mechanism only when equity is constrained and risk weights are optimal. Therefore, regulatory agencies must be very accurate in their estimation of bank asset risk to justify dropping leverage restrictions in favor of risk-based capital requirements only.

the actions needed for improving its management. These might involve limits on fixed asset investment and dividends, the disposal of risky assets, and so on. The bank supervision authority is now preparing to adopt the new BIS capital adequacy regulations concerning market risk.

In drawing up the capital standards, Korean bank supervision authority incorporated the Basle framework as far as possible so that in effect there is little difference between Korean capital adequacy standards and the Basle Capital Accord. Capital ratios are calculated on a consolidated basis; capital includes both core capital (tier 1) and supplementary capital (tier 2); assets are weighted item by item to reflect credit risk. Off-balance-sheet engagements are also included in risk-weighted assets after conversion using credit conversion factors.

The Basle Capital Accord allows national supervisory authorities a certain degree of discretion in fixing the extent of supplementary capital and the magnitude of risk weights for assets. In Korea, supplementary capital is made up of revaluation reserves, gains on securities valuation, and general provisions for loan losses, within the limits set in the Basle framework, and subordinated term debts. Gains on securities valuation may be included up to a maximum of 45 percent, and general provisions for loan losses are limited to a maximum of 1.25 percent (1.5 percent before the end of 1995) of risk-weighted assets. Total supplementary capital may not exceed the total of core capital.

Risk weightings are largely determined by the asset transaction counterpart, i.e., 0 percent for central government and central banks; 10 percent for domestic public-sector entities; and 20 percent for banks. A 50 percent weight is assigned to loans secured by mortgage on residential property, and 100 percent for other claims.

The bank supervision authority in Korea is now preparing to adopt the new capital accord

incorporating market risk by the Basle Committee in response to the increased volatility of the exchange rate and interest rates as restrictions on capital flows are removed. However, for various reasons it is expected that this new capital adequacy regulation will be adopted gradually. In order to calculate capital charges based on specific risk and general market risk for debt securities having different maturities and risk weights, banks need sophisticated computer software. Developing such software is likely to take considerable time. In measuring market risk, the Basle Committee permits two approaches. One is a standardized method proposed by the Basle Committee. The other is the banks' own internal risk management model. Because Korean banks have little experience in measuring market risk, it will take considerable time to develop their own internal risk management models or to apply borrowed models.

In addition to the risk-weighted capital adequacy requirement, there are other legal capital requirements. The minimum paid-in capital requirements are 100 billion won in the case of a nationwide commercial bank, and 25 billion won in the case of a regional bank. The minimum paid-in capital requirements are set at 3 billion won in the case of a branch of a foreign bank.

Aside from the obligatory minimum capital requirements, all banks in Korea, including foreign bank branches, are obliged to maintain a prescribed solvency position under the provisions of the General Banking Act. A bank must always maintain an aggregate amount of equity capital equivalent to at least one twentieth of its outstanding liabilities arising from guarantees or other contingent liabilities. Equity capital is defined as the sum of paid-in capital, reserves, and any surplus carried over from the previous term. Another requirement is that in its allocation of the net profit earned in a fiscal term a bank should credit at least 10 percent of this to a legal reserve until such time as the reserve equals the amount of its total paid-in capital.

## 5. Korean Banks' Responses to the Strengthening of Capital Adequacy Requirements

The average risk-adjusted capital ratio of the 25 Korean commercial banks in the data sample declined from 10.34 percent at the end of 1993 to 9.14 percent at the end of 1996 (Table 1).<sup>11</sup> This decline was due to the fact that equities increased by 11.3 percent on a yearly average basis, while risk-weighted assets registered an increase of 17.0 percent (Table 2). Korean commercial banks had some difficulties in raising equity capital from the stock market which began to deteriorate in 1994.<sup>12</sup> On the other hand, Korean banks' assets registered rapid growth because they did not strengthen their credit evaluation criteria, despite the adoption of risk-weighted capital adequacy requirements, and simply followed the traditional stance of supporting the growth of the Korean real sector.<sup>13</sup>

### 5.1 Cosmetic Responses to Capital Requirements

As discussed in Section 2, banks can make major cosmetic changes in their capital adequacy ratios that actually increase their risk exposure. In order to find out whether Korean banks made these kinds of change, we look at changes in the composition of risky assets.

---

<sup>11</sup>Because Korean banks were required to maintain minimum risk-weighted capital ratios since 1993, the analysis extends from the end of 1993 to the end of 1996, for 25 commercial banks. (15 nationwide city banks and 10 regional banks)

<sup>12</sup>The annual average stock price index in Korea was 965.7 in 1994. The index declined to 934.7 in 1995 and 833.4 in 1996. (The index declined by 3.2 percent in 1995 and 11 percent in 1996.)

<sup>13</sup>M2 increased by 18.6 percent in 1993 on an yearly average basis compared to the previous year and 15.6 percent, 15.5 percent, and 16.2 percent in 1994, 1995, and 1996 respectively. GDP growth rate in 1994 recorded 8.6 percent, and 8.9 percent and 7.1 percent in 1995 and 1996 respectively.

From 1994 to 1996, the ratio of risk-weighted assets increased by less than that of total assets. Risk-weighted assets increased by 17.0 percent on a yearly basis, while total assets increased by 20.2 percent during the same period. This suggests that Korean banks tried to limit the increase in their risk-weighted assets below that of total assets (Table 2).

The composition ratio of risk-weighted assets of 25 Korean banks changed little from the period of 1994 to 1996. The composition ratio of risky assets with 100 percent risk weight to total risky assets was 89.9 percent at the end of 1993 and 90.0 percent at the end of 1996. On the other hand, the composition ratio of less-risky assets increased slightly. The ratio of risky assets with 50 percent risk weight to total risky assets increased from 3.2 percent to 3.7 percent during the same period (Table 3).<sup>14</sup> This suggests that Korean banks did not intentionally increase their risky assets with 100 percent risk weights in order to make cosmetic changes in their capital adequacy ratios.

However, changes in risky assets showed different patterns in the case of regional banks which are much smaller than nation-wide city banks.<sup>15</sup> In the case of nation-wide city banks, risk-weighted assets increased by less than did total assets. While total assets increased by 19.7 percent, risk-weighted assets registered only a 15.7 percent increase on a yearly average basis from 1994 to 1996. On the other hand, in the case of regional banks, the rate of risk-weighted assets surpassed that of total assets during the same period. Risk-weighted assets increased by

---

<sup>14</sup>Loans to merchants banks are classified as loans to which a 20 percent risk-weight is applied. The ratio of risky assets with 20 percent risk weights to total risky assets decreased from 6.2 percent to 5.5 percent during the same period. This fact implied that loans to merchant banks did not play an important role in risky asset portfolios.

<sup>15</sup>The average asset size of regional banks was about one fourth that of nationwide city banks in 1996.

24.8 percent on a yearly average basis, while total assets increased by 23.7 percent during the same period.

The composition ratio of risky assets exhibited the same pattern. In the case of nationwide city banks, the composition ratio of risky assets with 100 percent risk weight was 90.7 percent as of the end of 1993, little changed from the level of 90.6 percent at the end of 1996. However, in the case of regional banks the composition ratio of risky asset with 100 percent risk weight increased from 85.1 percent in 1993 to 86.3 percent in 1996 (Table 3).

These facts also show that small banks in Korea increased their risk exposure somewhat from 1994 to 1996. However, it is not certain whether small regional banks tried to make cosmetic changes in their capital ratios by increasing risk exposure intentionally. Because the initial level of capital ratios of regional banks were much higher than the minimum level of 8 percent at the end of 1993, regional banks might not have paid as much attention to their risk exposure as did nationwide city banks.

The average capital ratio of regional banks at the end of 1993 was 14.86 percent compared to 9.71 percent for nation-wide city banks. From 1994 to 1996, the risk-weighted assets of regional banks increased by 24.8 percent on an average yearly basis, while those of nation-wide city banks grew by 15.7. As a result, the average capital ratio of regional banks declined from 14.86 percent in 1993 to 10.15 percent in 1996, while that of nation-wide city banks showed a small decline from 9.71 percent to 8.97 percent during the same period (Table 1).

These facts also imply that Korean banks in general did not make much effort to reduce risky asset holdings or to adjust their risky asset positions, despite introduction of the risk-weighted capital adequacy requirements. As explained in Section 4, minimum capital to total

asset ratio requirements were already in place prior to the introduction of risk-weighted capital adequacy requirements in 1993. If these minimum capital to total-asset ratio requirements had been maintained even after the risk-weighted capital adequacy requirements were introduced, the capital positions of Korean banks might have been better. As Gjerde and Semmen (1995) argued, it may be appropriate to supplement risk based capital requirements with leverage restrictions when equity is constrained.

Off-balance-sheet items are relevant to the issue of how banks responded to higher capital levels, because risk-weighted capital standards incorporate off-balance-sheet items. A popular explanation for the remarkable growth in banks' off-balance-sheet activities is the avoidance of capital adequacy requirements. Results of empirical studies related to this issue are mixed.<sup>16</sup>

In the case of Korean banks, on-balance sheet risk-weighted assets increased by 19.5 percent from 1994 to 1996 on a yearly average basis. On the other hand, off-balance-sheet risk-weighted assets recorded a meager increase of 9.6 percent during the same period. The meager increase in the off-balance-sheet activities was partly due to a decline in the increasing rate of issuing letters of credit related to the trade and bidding activities of Korean corporations (Table 4). These facts imply that Korean banks did not utilize off-balance-sheet activities intentionally in order to make cosmetic adjustment of capital ratios.

On the other hand, there were some changes in the composition of off-balance-sheet

---

<sup>16</sup>Pavel and Phillis (1987) and Baer and Pavel (1987) suggest that banks engage in loan securitization and standby letters of credits in order to reduce regulatory taxes, such as capital adequacy requirements. Benveniste and Berger (1987) and Koppenhaver (1989) find that capital constraints are not an important factor in banks' off-balance-sheet activities. Julapa Jagtiani, Anthony Saunders, and Gregory Udell (1995) found that changes in the capital requirements for banks have no consistent impact on the diffusion of off-balance-sheet activities.

activities. The composition ratio of off-balance-sheet activities to which a 100 percent conversion rate<sup>17</sup> is applied to total off-balance-sheet activities declined from 68.9 percent at the end of 1993 to 62.2 percent at the end of 1996 (Table 5). This trend can be interpreted as implying that Korean banks tried to reduce their off-balance-sheet transactions with higher conversion rates in order to maintain their capital adequacy ratios.

Banks may make cosmetic adjustments by exploiting accounting system standards. They may sell assets that have appreciated in value or refuse to recognize substantial reductions in the market value of assets. Banks can also utilize securities gains to adjust their capital ratios.

In Korea, if banks earn capital gains by selling property or real estate assets, they must record these gains as non-operating revenue (in the case of securities, these gains are recorded as securities gains). The amount of non-operating revenue of Korean commercial banks amounted to 426 billion won during the fiscal year of 1994, but declined to 321 billion won during 1996 (a decline of 24.6 percent). The ratio of non-operating revenue to total revenue declined from 2.4 percent in 1994 to 1.2 percent in 1996. The ratio of non-operating revenue to total operating income declined from 9.1 percent to 7.3 percent during the same period. Thus Korean banks did not resort much to using capital gains to increase their capital ratios (Table 6).

Banks can utilize securities gains to adjust their capital ratios, because capital gains increase the total operating income of banks. In the case of Korean banks, trading gains in stocks declined sharply from 1994 to 1996. In 1994, they recorded 1,175.3 billion won as stock trading gains, comprising 25.1 percent of total operating income. However, stock trading gains declined

---

<sup>17</sup>Off-balance-sheet items are included in risk-weighted assets after conversion using credit conversion factors.

to 462.4 billion won in 1995 and to 114.2 billion won in 1996. The ratio to total operating income also declined, from 11.0 percent in 1995 to 2.5 percent in 1996. Because the annual average stock price index declined by 3.2 percent during 1995 and by 11.0 percent during 1996, banks could not resort much to utilizing stock trading gains. Although banks can utilize stock trading gains as a method for increasing their operating income, it is difficult for banks to boost their capital ratios consistently in this manner because of variability in stock market returns. Therefore, gains trading have been used to boost current earnings or smooth earnings rather than to boost capital ratios (Table 7).

Banks can also record revaluation gains by adjusting upward the historical book value of real estate they own, if the market price exceeds the book value. These revaluation gains can be included as revaluation reserves in supplementary capital. The ratio of revaluation reserves to total supplementary capital was 15.2 percent as of the end of 1993, but declined to 8.7 percent at the end of 1996. This implies that Korean banks did not utilize revaluation reserves to increase their capital ratios (Table 8).

Banks can also record revaluation gains in securities holdings. According to the Basle capital standard, up to 45 percent of securities revaluation gains can be included in supplementary capital. Korean banks' securities revaluation gains declined rapidly from 1994 to 1996 due to the sluggish stock market. Because revaluation gains decreased during the period of 1994 to 1996, banks' capital was affected adversely. Banks could not manipulate securities revaluation gains to boost capital ratios because they were affected by the stock market situation directly.

If banks refuse or delay recognizing reductions in the value of assets, they can make cosmetic adjustments in capital ratios. For example, if a bank intentionally delays writing off its

bad loans or delays the recognition of securities revaluation losses, it can maintain its earnings and prevent its capital ratio from deteriorating.

In the case of Korean banks, they speeded up writing-off of bad loans from 1993 to 1996. The amounts written off increased from 633 billion won in 1993 to 1,379 billion won in 1996. The ratio of credits written off to total credits stood at 0.39 percent in 1993, but increased to 0.48 percent in 1996. This fact implies that Korean banks did not resort to cosmetic adjustments of their capital ratios by delaying the writing off of bad loans (Table 9).

The level of provisions for loan losses can also affect the capital ratio of a bank. Periodic additions to loan loss reserves, by means of loan loss provisioning, are charged against current earnings. If a bank sets up loan loss provisions, its net income declines and, as a result, retained earnings also decrease. The level of retained earnings affects the capital ratio of a bank directly. Under risk-based capital regulation, loan loss reserves are not counted as Tier 1 capital, but are counted only as Tier 2 capital up to 1.25 percent of the bank's weighted risk assets. Hence, from the perspective of meeting regulatory capital requirements, it is much more effective to allocate income to retained earnings, which are counted as Tier 1 capital than to allocate it to loan loss reserves.<sup>18</sup> If a bank fails to set up loan loss provisions sufficient to cover the expected decline in real economic value of credits, the result is equivalent to a cosmetic adjustment in its capital ratio.

Under regulations issued by the Office of Bank Supervision of the Bank of Korea, each bank must set up provisions for loan losses at the end of each fiscal year, consisting of 0.5% of normal credits, 1% of precautionary credits, 20% of substandard credits, 75% of doubtful credits, and 100% of estimated loss credits, in line with the five-fold classification of the status of loan

---

<sup>18</sup>Kwan (1997, FRBSF Economic Letter, No. 97-21)

assets made by the bank themselves. However, consideration has been given to those banks with an overhang of bad loans, allowing them up to five years (1994-1998) to comply. Those banks which can not cover 100 percent of their expected loan losses are permitted to make cosmetic adjustments to their capital adequacy ratios.<sup>19</sup>

According to Goldstein (1997), in many developing countries accounting standards are not rigorous enough to prevent banks from concealing the true size of the non-performing loan portfolio. If loan classification is dependent only on the loan's payment status, without regard to the borrower's creditworthiness or to the market value of collateral, then the delay in recognizing bad loans can be considerable. And if non-performing loans are systematically understated, loan-loss provisions are apt to be too low, and bank net income and capital will be systematically overstated.

Goldstein and Turner calculated the provisioning-coverage ratio (i.e., the ratio of loan-loss reserves to non-performing loans) for a sample of developing countries in the early 1990s (see Table 10). In the case of Korea, the provisioning-coverage ratio was 1.5 percent, which is relatively higher than in other Asian countries (for example, for Indonesia it was 0.2%; for Thailand, 0.2%; Taiwan, 0.4%; Japan, 0.3%; and Hong Kong, 0.7%). This implies that Korean banks did not rely much on cosmetic adjustments of loan loss provisions in comparison to other Asian countries.

However, several considerations should be taken into account in judging the extent of cosmetic adjustment through loan loss provisions. According to the Basle capital adequacy

---

<sup>19</sup>The average ratio of provisions for loan losses to total expected loan losses of 25 Korean banks stood at 86.4 percent as of the end of 1996.

guidelines, where provisions have been created against identified losses or an identified deterioration in the value of any assets, they should not be included as supplementary capital because they are not freely available to meet unidentified losses.

In the case of Korean commercial banks, loan loss provisions are included as supplementary capital up to 1.25 percent of weighted risk assets.<sup>20</sup> Loan loss provisions for doubtful and expected loss credits are provisions created against an identified deterioration in the value of particular assets although they are not allocated to these assets. To the extent that these provisions are not excluded from supplementary capital, and some banks could not set up 100 percent of expected loan losses as reserves, partial cosmetic adjustments can be made in the capital ratios through loan loss provisions.

The recognition of stock revaluation losses decreases the net income of a bank, and thus has an adverse impact on its capital ratio. Therefore, it is desirable for banks to fully recognize stock revaluation losses for the accurate calculation of net income and the capital ratio. Partial recognition of such revaluation losses would inflate the amount of net income and raise the capital ratio. Delaying the recognition of substantial falls in value of stocks held by a bank can be a possible method of cosmetically adjusting capital ratios.

Korean banks were allowed to partially recognize revaluation losses in 1995 and 1996 by up to 30 percent of the total. Stock revaluation losses of Korean banks amounted to 2,157 billion won and 4,962 billion won in 1995 and 1996, respectively. The discrepancy between full recognition and partial recognition of stock revaluation losses amounted to 1,501 billion won to

---

<sup>20</sup>In 1996, among the total outstanding of provisions for loan losses of Korean banks, only 85.9 percent of provisions could be recognized as supplementary capital. The remaining portion exceeded 1.25 percent of total risk-weighted assets (Table 11).

(35.8 percent of total operating income) in 1995, and 3,473 billion won (79.0 percent of total operating income) in 1996 (Table 12).<sup>21</sup>

These facts imply that cosmetic adjustments were made to capital ratios by means of partial recognition of stock revaluation losses in Korean banks in these years. It is estimated that the capital ratios of Korean banks were increased by 0.23% and 0.84% in 1995 and 1996, respectively, through this kind of cosmetic adjustment. If the mark-to-market accounting principles had been applied to stock valuation, this kind of cosmetic adjustment for capital ratios could not have been made.<sup>22</sup>

## 5.2 Effective Increases in Capital

The most direct way for a bank to raise its capital adequacy ratio is to increase its capital. The total capital of Korean banks grew by 11.3 percent on a yearly average basis from 1993 to 1996. However, the increase in capital was less than that of risky assets which exhibited an increase of 17.0 percent during the same period. Among total capital, core capital increased by 9.3 percent on a yearly average basis, while supplementary capital rose by 21.3 percent.

---

<sup>21</sup>Banks in Korea are allowed to record the value of stocks at historical prices.

<sup>22</sup>In principle, regulators could eliminate all cosmetic changes to equity by requiring mark-to-market accounting. However, Berger, King, and O'Brien (1991) pointed out that market value is an ambiguous concept and some of the more relevant definitions of market value are not subject to perfect measurement. Carey (1995) argued that a partial version of market value accounting in which only securities are marked to market has the same potential for misvaluing bank capital as historical cost accounting for liabilities. (In its Statement Number 115, the FASB 1993 has chosen to implement a partial version of market value accounting that affects only securities.) There are conceptual and practical problems with full market value accounting for banks in which all assets and liabilities would be marked to market. Market prices do not exist for many bank assets and liabilities, so "market" values would have to be approximated by rules of thumb, with attendant distortions and effects on incentives.

Due to the sluggish stock market since 1995, Korean banks had difficulty in raising paid-in capital from domestic stock issues. In 1996, Korean banks started to issue depository receipts in major international financial markets to increase core capital. However, due to the strong dollar against the Korean won and the continued sluggish stock market in Korea, Korean banks encountered difficulty in issuing large amount of depository receipts.

On the other hand, in 1996 banks were allowed to increase their supplementary capital by issuing or borrowing subordinated debts. During 1996, Korean banks issued subordinated bonds in foreign currencies amounting to 709 billion won (2.7 % of total capital) and borrowed subordinated debt amounting to 772 billion won (3.0% of total capital). For subordinated bonds in foreign currencies, the interest rates were roughly 30 basis points above those on floating rate notes. After bankruptcies of several large corporations in Korea in the first half of 1997, spreads of subordinated bonds were widened due to the deteriorating creditworthiness of Korean banks. Consequently, Korean banks had difficulties in issuing bonds subordinated abroad.<sup>23</sup> Thus, in 1997 Korean banks tried to issue subordinated bonds in the domestic bond market, although the long-term bond market is not well developed in Korea.

In terms of composition of capital, the ratio of core capital to total capital was 80.2 percent at the end of 1996, which was slightly less than the 84.6 percent level at the end of 1993. The ratio of core capital to total capital in the case of Korean banks exceeds that of Japanese banks, which for Japanese city banks was 50.6 percent as of the end of March 1996. Korean banks have more room to increase their supplementary capital by issuing more subordinated

---

<sup>23</sup>Banks are also exposed to exchange rate risk when issuing subordinated bonds in foreign currencies.

debts. For Korean banks, subordinated debt comprised only 5.8 percent of total capital as of the end of 1996, while for Japanese city banks' it comprised 32.9 percent as of the end of March, 1996.

Banks can also increase their capital ratios by reducing their volume of loans. For example, they can sell off loans or convert loans to securities which have a lower risk-weight in calculating capital ratios. In the case of Korean banks, loans did not decline between 1994 and 1996. To the contrary, total loans increased by 23.9 percent on a yearly average basis (Table 13). Loans with a 100 percent risk-weight increased by 17.3 percent on a yearly basis. Loans with a 50 percent risk-weight also rose by 20.2 percent, and loans extended to other domestic financial institutions for which 20 percent risk-weight is applied increased by 28.5 percent during the same period. Loan growth exceeded that of total capital, which rose at a 11.3 percent rate.

In Korea, it is not easy for banks to reduce their loan portfolio by selling off existing loans because the loan sale market is not well developed. Because market interest rates are usually higher than the lending rates of commercial banks, banks have considerable difficulty in finding buyers of loans. It is also difficult for Korean commercial banks to reduce their loan levels by curbing credit to corporations because commercial banks play an important role as financial intermediaries in the Korean financial market. This explains why Korean banks did not reduce loan portfolios in order to increase capital ratios.

Banks can also effectively increase capital ratios by increasing securities investments, which have lower risk-weight. Investments in securities by Korean banks increased by 35.5 percent on a yearly basis from 1994 to 1996. This increase surpassed that of loans, which rose 23.9 percent annually during the same period (Table 14). This implies that Korean banks

converted some of their asset portfolios from loans to securities.

However, this fact does not necessarily mean that banks reduced risk exposure by increasing security investments, because the risk-weights applied to securities vary depending on the type of securities. For example, in the case of stocks, a risk-weight of 100 percent is applied, while government, municipal, and monetary stabilization bonds have no risk weight. Among the total securities held by Korean banks, the ratio of government, municipal, and monetary stabilization bonds to total securities has declined. The ratio stood at 28.2 percent at the end of 1993, but fell to 18.6 percent at the end of 1996. On the other hand, the ratio of other securities such as stocks or corporate bonds to which 100 percent risk-weight is applied increased from 71.8 percent in 1993 to 81.4 percent in 1996 (Table 15). This indicates that the increase in securities investment did not improve capital ratios during the past three years.

If we look at the composition of total risky assets we can understand the changes in loans and securities more clearly. The composition ratio of loans with a 100 percent risk-weight to total risky assets decreased from 62.5 percent at the end of 1993 to 58.9 percent at the end of 1996. On the other hand, the composition ratio of securities with 100 percent risk weight increased from 8.1 percent of total risky assets at the end of 1993 to 9.1 percent at the end of 1996 (Table 16). Fiercer competition among banks following financial liberalization might have induced banks to increase their securities investment in order to earn higher returns. However, these increasing investments in securities did not help raise capital ratios, because securities investments tended to be concentrated in securities which had 100 percent risk-weight such as loans rather than in securities with no risk-weight.

## 6. Summary and Conclusion

Inadequate preparation for financial liberalization can contribute greatly to banking crises in developing countries. Timely implementation of prudential supervision is essential to maintain the systemic health of the financial industry as well as the sound management of individual institutions. Among various prudential supervisory measures, the most important initiative to control credit risk has been the implementation of minimum capital adequacy standards.

The direction, size, and composition of banks' portfolios or capital in response to binding capital requirements are crucial in formulating prudential supervision policies and promoting macroeconomic stability. In this paper, Korean banks' responses to the strengthening of capital adequacy requirements were analyzed from the viewpoint of distinguishing between cosmetic and effective responses.

The data suggest that Korean banks on the whole did not much utilize cosmetic adjustments to increase capital ratios during the 1994-1996 period. They did not intentionally increase their risky assets with 100 percent risk-weight, utilize off-balance-sheet activities, or resort much to capital gains from selling properties, real estate, or securities to increase their capital ratios. They also did not much utilize revaluation reserves to boost capital ratios, in part because a sluggish stock market limited their ability to manipulate securities revaluation gains.

Because Korean banks speeded up the writing-off of bad loans and because regulations on provisions of loan losses were strengthened during the period, it is also not evident that Korean banks made substantial cosmetic adjustments in their capital ratios by delaying the set-up of loan loss provisions or postponing the writing off of bad loans. The fact that the provisioning-coverage ratio was relatively higher in Korean banks than banks in other Asian countries implied

that Korean banks did not generally make cosmetic adjustments to capital ratios by minimizing loan loss provisions. However, the fact that some Korean banks with an overhang of bad loans could not set up provisions for loan losses up to 100 percent of expected loan losses and some Korean banks included provisions for loan losses created against doubtful and estimated loss credits as part of their supplementary capital implied that cosmetic adjustments were made in some cases. In addition, in 1995 and 1996, when Korean banks were allowed to recognize only up to 30 percent of their revaluation losses on stocks held, it can be said that cosmetic adjustments were made in capital ratios by means of partial recognition of stock revaluation losses.

However, the fact that Korean banks increased their total capital by 11.3 percent from 1993 to 1996 showed that they tried to increase their capital effectively. Due to the sluggish stock market, Korean banks encountered some difficulty in raising equities in the domestic stock market. Therefore, they started to issue depository receipts in major international financial markets in 1996. They also intensified their efforts to borrow subordinated debts to increase supplementary capital which was considerably less than core capital.

Although in principle banks can increase capital ratios by shrinking their loan portfolios, Korean banks were limited in their ability to do so because the domestic loan sale market was not well developed. Moreover, loan increases continued because banks did not strengthen their credit evaluation criteria and chose to follow the traditional stance of supporting the expansion of business corporations. If they could have reduced loans through tougher credit criteria, they might have effectively improved their capital ratios and maintained better international credit-worthiness.

In conclusion, Korean banks' response to the strengthened capital requirement generally involved efforts to increase effective capital, although some cosmetic adjustment might have been undertaken. The interpretation of these findings has some limitations because of the relatively short observation period. Therefore, further empirical analysis using a longer observation period is desirable.

Although regulators cannot prevent all cosmetic changes to capital ratios, they should be able to adjust regulatory requirements to prevent banks from gaining material benefits through cosmetic changes. In the case of Korean banks, cosmetic changes to equity can be partially eliminated by requiring mark-to-market accounting for securities. In addition, loan loss provisions created for credits of doubtful or estimated losses should be excluded from supplementary capital if they reflect an identified deterioration in asset values, and loan loss provisions should reflect declines in the economic value of Korean banks' assets. Strengthening prudential supervision by preventing cosmetic changes and enhancing effective ways of increasing capital ratios seems to be essential for the sound management of Korean banks and for restructuring of Korea's financial system.

In addition, Korean experience raises questions of whether it might be advisable for Korean bank supervision authorities to impose leverage restrictions as well as the risk-based capital requirements considering that Korean banks did not adjust their risk asset portfolios much in response to the risk-based capital adequacy requirements alone. If minimum capital to total asset ratio requirements were imposed along with the risk-weighted capital adequacy requirements, better capital positions might have been maintained by Korean banks.

Analyses of Korean bank response to strengthened capital adequacy requirements suggests the following implications for other emerging countries capital ratios:

Management of banks in developing countries are more inclined to use cosmetic adjustments to capital ratios because accounting principles, loan classification standards, and disclosure requirements are not strict. This is particularly the case for banks carrying assets of questionable quality and for which insufficient provisions have been made. Such banks may try to reduce the amounts diverted to loan loss reserves by way of loan restructuring or other sorts of devices. If capital ratios are adjusted for under-provisioning, they are much lower than they look.<sup>24</sup>

In this regard, the question of whether the 8 percent minimum ratio of the Basle capital accord is sufficient for banks in emerging or developing countries can be raised. Dziobez, Frecaut, and Nieto (1995) argue that applying the Basle 8 percent rule without adequate provisioning distorts the information value of the capital ratio. Worse than that, compliance with the 8 percent capital rule without adequate reserves for loans of doubtful quality renders the ratio meaningless as banks may boost capital ratios at the expense of provisioning.

In this regard, the setting and monitoring of international banking standards help reduce the opportunities for cosmetic adjustments in capital ratios in developing countries. Under the new international banking standards, participants would agree to set out clearly the criteria and rules/practices they employ to classify loans, provision for loan losses, and suspend accrual for overdue interest. Participants would also pledge to discourage and monitor accounting devices that facilitate the evergreening of bad loans. Through these measures, many cosmetic adjustments

---

<sup>24</sup>*Asian Wall Street Journal* "Asian Banks Need Flexible Capital Ratios" (Jan. 10, 1997).

can be prevented. For this purpose, the “Core Principles for Effective Banking Supervision” proposed by the Basle Committee in April 1997 would be an important landmark for future international banking standards.

In addition, imposing even higher minimum risk-weighted capital standards should be considered by countries where the operating environments are relatively volatile and there are uncertainties regarding asset qualities of banks or other adverse characteristics of banking conditions.<sup>25</sup>

Central banks from several emerging countries, especially in Latin America, have recently accepted the idea of imposing higher standards than those required by the Basle Accord. They hope that this will compensate for greater economic volatility, as well as providing extra insurance against accounting inaccuracies. Argentina and Columbia have already raised their capital requirements to 12 percent and 9 percent respectively (Table 17). This might be a good reference for appropriate capitalization levels for other developing countries.

---

<sup>25</sup>Refer to Goldstein (1997) for the argument of higher capital requirement where the operating environment of banks is relatively volatile.

**Table 1. Risk- Weighted Capital Ratios of Korean Commercial Banks**  
(End-of-period figures)

(Unit: percent)

	1993	1994	1995	1996
Banks as a whole	10.34	10.15	9.33	9.14
(15 nationwide city banks)	(9.71)	(9.70)	(8.97)	(8.97)
(10 regional banks)	(14.86)	(13.11)	(11.44)	(10.15)

**Table 2. Changes in Capital and Risk-Weighted Assets**

(Unit: percent)

	1994	1995	1996	Average
Total capital	14.5	5.4	14.1	11.3
(Core capital)	(14.4)	(6.9)	(6.7)	(9.3)
(Supplementary capital)	(15.1)	(-1.1)	(56.8)	(21.3)
Risk-weighted assets	18.7	16.0	16.4	17.0
(On balance assets)	(20.9)	(17.9)	(19.6)	(19.5)
(Off-balance assets)	(12.7)	(10.6)	(5.6)	(9.6)
Total assets	23.6	20.1	17.0	20.2
(On-balance assets)	(21.9)	(16.8)	(20.8)	(19.8)
(Off-balance assets)	(26.1)	(24.6)	(11.7)	(20.8)

Note: Rates of change compared with the previous year.

**Table 3**      **Composition of risk-weighted assets of on-balance-sheet items**  
**(End-of-period figures)**

**(Unit: percent)**

	Banks as a whole		Nation-wide city banks		Regional bank	
	1993	1996	1993	1996	1993	1996
Total risk-assets	100	100	100	100	100	100
(100% risk-weight)	(89.9)	(90.0)	(90.7)	(90.6)	(85.1)	(86.3)
(50% risk-weight)	(3.2)	(3.7)	(2.2)	(3.3)	(8.6)	(6.6)
(20% risk-weight)	(6.2)	(5.5)	(6.4)	(5.4)	(5.1)	(6.1)
(10% risk-weight)	(0.7)	(0.8)	(0.7)	(0.8)	(1.2)	(1.1)

**Table 4. Changes in on-balance-sheet activities and off-balance-sheet activities****(Unit: percent)**

	1994	1995	1996	Average
On-balance-sheet activities	20.9	17.9	19.6	19.5
Off-balance-sheet activities	12.7	10.6	5.6	9.6

Note: Rate of change compared to the previous year.

**Table 5. Changes in the composition ratio of off-balance-sheet activities****(End-of-period figures)****(Unit: percent)**

	1993	1996
Off-balance-sheet activities to which conversion rate of 100% is applied	68.9	62.2
" to which conversion rate of 50% is applied	24.1	30.0
" 20% is applied	6.9	7.2
others	0.1	0.6
total	100.0	100.0

**Table 6. Non-operating revenues and ratio to total revenue****(Unit: billion won, percent)**

	1994	1995	1996
Non-operating revenue	426.0	334.8	320.8
Ratio of non-operating revenue to total revenue	2.4	1.4	1.2
Ratio of non-operating revenue to total operating income	9.1	8.0	7.3

**Table 7. Ratio of stock trading gains to total operating income****(Unit: billion won, %)**

	1994	1995	1996
Stock trading gains (A)	1,175.3	462.4	114.2
Total operating income (B)	4,667.6	4,195.1	4,396.2
Ratio (A/B)	25.1	11.0	2.5

**Table 8.      Composition of Supplementary Capital**  
**(End-of-period figures)**

**(Unit: percent)**

	1993	1996
Provisions for loan losses	76.8	62.2
Revaluation reserves	15.2	8.7
Revaluation profits from securities	7.7	0.0
Subordinated debts	-	28.4
Others	0.3	0.7
Total supplementary capital	100.0	100.0

**Table 9.      Credits written-off and ratios of written-off credits to total credits**

**(Unit: billion won, percent)**

	1993	1994	1995	1996
Credits written-off	633	1,695	950	1,379
Ratio of written-off credits to total credits	0.39	0.87	0.39	0.48

**Table 10. Provisioning coverage for non-performing loans**

Country	Loan loss reserves (A) (percentage of total loans, average 1990-94)	Non-performing loans (B) (percentage of total loans, average 1994-95)	Coverage ratio (A/B)
Hong Kong	2.2*	3.1	0.7
India	-	19.5**	-
Indonesia	2.6	11.2	0.2
Korea	1.5	1.0	1.5
Malaysia	9.6	8.2	1.2
Singapore	-	-	1.2
Taiwan	1.1	2.6	0.4
Thailand	1.7	7.6	0.2
Argentina	10.2*	10.5	1.0
Brazil	1.6	5.9	0.3
Chile	3.5	1.0	3.5
Columbia	1.9	2.5	0.8
Mexico	3.1***	14.8	0.2
Venezuela	7.0	17.7	0.4
Japan	1.0	3.3	0.3
United States	2.7	1.6	1.7

Note: These figures may not be strictly comparable.

\* Average 1994-95

\*\*Relates only to public sector banks

\*\*\* Average 1992-94

Source: Goldstein (1997)

**Table 11. Provisions for loan losses in 1996****(Unit: billion won, percent)**

Outstanding provisions for loan losses (A)	3,835.7
Provisions for loan losses allowed to be part of supplementary capital (B)	3,295.4
Ratio (B/A)	85.9

\* Consolidated basis

**Table 12. Stock revaluation losses****(Unit: billion won, percent)**

	1994	1995	1996
Total operating income (A)	4,667.6	4,195.1	4,396.2
Total stock revaluation losses	-	2,157.3	4,962.1
Discrepancy between full recognition and partial recognition (B)	-	1,510.1	3,473.4
Ratio(B/A)	-	35.8	79.0

**Table 13. Changes of total loan outstanding****(Unit: percent)**

1994	1995	1996	Average
24.2	27.8	19.9	23.9

Note: Rate of change compared to the previous year

**Table 14. Changes of securities investment outstanding of Korean banks****(Unit: percent)**

1994	1995	1996	Average
40.2	45.0	21.5	35.5

Note: Rate of change compared to the previous year

**Table 15. Composition of securities holdings****(Unit: percent)**

	1993	1994	1995	1996
Gov. bond, municipal bond, Monetary Stabilization bond	28.2	23.3	21.9	18.6
Other securities (stocks)	71.8(10.4)	76.7(12.8)	78.1(10.9)	81.4(9.0)
total	100	100	100	100

**Table 16. Composition of assets among total risky assets**  
**(End-of-period figures)**

**(Unit: percent)**

	1993	1996
loans	62.5	58.9
securities	8.1	9.1
fixed assets	8.5	6.9
assets with 100% risk-weight	89.9	90.0
assets with 50% risk-weight	10.1	10.0
total risky assets	100.0	100.0

**Table 17. Required and actual bank capital ratios (percentages), 1995**

Country	Capital adequacy ratio (national requirements)	Actual risk-based capital ratio
Hong Kong	8(a)	17.5(b)
India	8	9.5(c)
Indonesia	8	11.9
Korea	8	9.3
Malaysia	8	11.3
Singapore	12 (d)	18.7(d)
Taiwan	8	12.2
Thailand	8(e)	9.3
Argentina	12	18.5
Brazil	8(e)	12.9
Chile	8(f)	10.7
Colombia	9	13.5
Mexico	8	11.3
Israel	8	10.5(g)
South Africa	8(h)	10.1
Japan	8	9.1
United States	8	12.8

Note: Several European countries have significantly higher capital ratios. Definitions sometimes differ from those applied by the Basle Committee.

- (a) 12 percent for some banks, and 16 percent for some non-banks.
- (b) Relates to locally incorporated authorized institutions and is on a consolidated basis.
- (c) Relates only to public-sector banks.
- (d) Based only on Tier 1 capital.
- (e) Plus 1.5 percent on national value of swap operations.
- (f) Legislation now before Congress.
- (g) 1994.
- (h) Higher ratios for some banks.

Source: Goldstein (1997)

## References

- Asian Wall Street Journal, "Asian Banks Need Flexible Capital Ratios," Jan. 10, 1997.
- Baer, Herbert, and Christine A. Pavel, 1987, "Does Regulation Drive Innovation?" Economic Perspectives, Federal Reserve Bank of Chicago, pp. 3-16.
- Bank of England, 1991, "Is There a 'Credit Crunch?'" *Bank of England Quarterly Bulletin*, Vol. 31 (May 1991), pp. 256-59.
- Benveniste, Lawrence M., and Allen N. Berger, 1987, "Securitization with Recourse: an Instrument that Offers Uninsured Depositors Sequential Claims," *Journal of Banking and Finance* 11, pp. 403-424.
- Berger, Allen N., Kathleen Kuester King, and James M. O'Brien, 1991, "The Limitation of Market Value Accounting and a More Realistic Alternative," *Journal of Banking and Finance* 15, pp.753-83.
- Calem, Paul S., and Rafael Rob, 1996, "The Impact of Capital-based Regulation on Bank Risk-taking: a Dynamic Model," Board of Governors of the Federal Reserve System, *Finance and Economics Discussion Series*, pp. 96-12.
- Carey, Mark, 1992, "Why Do Banks Gains-Trade?" Board of Governors of the Federal Reserve System, unpublished paper.
- , 1995, "Partial Market Value Accounting, Bank Capital Volatility, and Bank Risk," *Journal of Banking and Finance* 19, pp. 607-622.
- Crockett, Andrew, 1997, *The Theory and Practice of Financial Stability*, Essays in International Finance No. 203, Princeton, Princeton University.
- Dahl, Drew, and Ronald E. Shrieves, 1990, "The Impact of Regulation on Bank Equity Infusions," *Journal of Banking and Finance* 14, pp. 1209-28.
- Dahl, Drew and Michael F. Spivey, 1995, "Prompt Corrective Action and Bank Efforts to Recover from Undercapitalization," *Journal of Banking and Finance* 19, pp. 225-43.
- Duisenberg, Wim F., 1995, "Prudential Supervision and the Stability of the Financial System," lecture manuscript at the International Symposium in commemoration of 25th Anniversary of the Bank of Korea, pp. 1-17.
- Dziobek, Claudia, 1996, "Regulatory and Tax Treatment of Loan Loss Provisions," Monetary and Exchange Affairs Department's Operational Paper, International Monetary Fund.

- Dziobek, Claudia, Olivier Frecaut, and Maria Nieto, 1995, "Non-G-10 Countries and the Basle Capital Rules: How Tough a Challenge Is It to Join the Basle Club?" *IMF paper on Policy Analysis and Assessment* No.95/5 Washington D.C., International Monetary Fund, pp. 1-19.
- Fairlamb, David, 1994, "Beyond Capital," *Institutional Investor*, Vol. XIX, No. 8 (August 1994), pp. 16-26.
- Furlong, Frederick T., and Michael C. Keeley, 1989, "Capital Regulation and Bank Risk-Taking: A Note," *Journal of Banking and Finance* 13, pp. 883-891.
- General Accounting Office, 1997, "International Financial Crises: Efforts to Anticipate, Avoid, and Resolve Sovereign Crises," Washington D.C.
- Gennotte, Gerard, and David Pyle, 1991, "Capital Controls and Bank Risk," *Journal of Banking and Finance* 15, pp. 805-824.
- Gjerde, Oystein, and Kristian Semmen, 1995, "Risk-based Capital Requirements and Bank Portfolio Risk," *Journal of Banking and Finance* 19, pp. 1159-1173.
- Goldstein, Morris, 1997, *The Case for an International Banking Standard*, Washington, D.C., Institute for International Economics
- Goldstein, Morris and Philip Turner, 1996, "Banking Crises in Emerging Economies: Origins and Policy Options," Bank for International Settlements.
- Hancock, Diana, Andrew J. Liang, and James A. Wilcox, 1995, "Bank Capital Shocks: Dynamic Effects on Securities, Loans, and Capital," *Journal of Banking and Finance* 19, pp. 661-77.
- Honohan, Patrick, 1997, "Banking System Failures in Developing and Transition Countries: Diagnosis and Prediction," Bank for International Settlements Working Papers No. 39.
- International Monetary Fund, 1995, "International Capital Markets Development, Prospect, and Policy Issues," p. 18, Washington D.C., International Monetary Fund.
- Jagtiani, Julapa, Anthony Saunders, and Gregory Udell, 1995, "The Effects of Bank Capital Requirements on Bank Off-Balance-Sheet Financial Innovations," *Journal of Banking and Finance* 19, pp. 647-58.
- Kahane, Yehuda, 1977, "Capital Adequacy and the Regulation of Financial Intermediaries," *Journal of Banking and Finance* 1, pp. 207-217.
- Kaminsky, Graciela, and Carmen Reinhart, 1995, "The Twin Crises: The Causes of Banking and Balance of Payments Problems." Manuscript, Board of Governors of Federal Reserve System and the International Monetary Fund.

- Kim, Daesik, and Anthony M. Santomero, 1988. "Risk in Banking and Capital Regulation," *Journal of Finance* 43, pp. 1219-1233.
- Kane, Edward, 1995, "Difficulties of Transferring Risk-Based Capital Requirements to Developing Countries," *Pacific Basin Finance Journal* 3, No. 2-3, pp. 193-216.
- Koehn, Michael, and Anthony M. Santomero, 1980, "Regulation of Bank Capital and Portfolio Risk," *Journal of Finance* 35, pp. 1235-1250.
- Koppenhaver, G. D., 1989, "Effects of Regulation on Bank Participation in the Guarantee Market," in G. Kaufman, ed., *Research in Financial Services: Private and Public Policy*, JAI Press, pp. 165-180.
- Kwan, Simon, 1997, "Recent Developments in Loan Loss Provisioning at U.S. Commercial Banks," Economic Letter No. 97-21, Federal Reserve Bank of San Francisco.
- Pavel, Christine, and Davis Philis, 1987, "Why Commercial Banks Sell Loans: An Empirical Analysis," *Economic Perspective* 11, Federal Reserve Bank of Chicago, pp. 3-14.
- Peek, Joe, and Eric S. Rosengren, 1995, "Bank Regulation and the Credit Crunch," *Journal of Banking and Finance* 19, pp. 679-92.
- Shinagawa, Ryoichi, 1993, "Impact of Capital Requirements on the Behavior of Banks and its Macroeconomic Implications: Japan's Experience," in Federal Reserve Bank of Chicago, *FDICIA: An Appraisal, Proceedings of the 29th Annual Conference on Bank Structure and Competition*, May 1993 (Chicago : F.R.B. of Chicago, 1993), pp. 157-70.
- Sholes, Myron. S., G. Peter Wilson, and Mark A. Wolfson, 1990, "Tax Planning, Regulatory Capital Planning, and Financial Reporting Strategy for Commercial Banks," *Review of Financial Studies* 3, No. 4. pp. 625-50.
- Wall, Larry D., and Pamela P. Peterson. 1996, "Banks' Responses to Binding Regulatory Capital Requirements," *Economic Review* March/ April, Federal Reserve Bank of Atlanta, pp. 1-17.