

Different Regulatory Capital Regimes and Systemic Stability

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Abstract

Arbitrage opportunities arising from different regulatory capital requirement applied to different kinds of financial sectors may drive the risk transfer. And the shifting of risk may increase systemic instability and reduce the efficiency of the allocation of risk. This paper aims to identify the differences between capital requirements of bank and insurance company in Korea, and to show the seriousness of regulation arbitrage leading to the systemic instability.

To achieve those goals, we explore different regulatory capital regimes between banks and insurance companies and study the pros and cons for applying the different capital regime to banks and insurance company respectively. We especially compare the regulatory capital regimes for insurance company in major countries, and introduce Korean regulatory system in detail.

The issue of comparing capital requirements in different financial sectors and exploring the possibility of RCA through securitization has been emphasized. Notably, we find that the role of insurance company in triggering systemic risk has been an important concern recently, since insurance companies actively participate in the securitization market. Different regulatory capital regime between banks and insurance company and the induced RCA chances through securitization raise a big concern on the stability issue.

We also explore the issue of financial conglomeration and integrated regulation. Overall effect on the risk held by the conglomerate can be measured effectively through the consolidated financial statements. However, the different risk measurement system among subsidiaries makes the integrated risk measurement very difficult. We agree that the risk measurement and management of the financial conglomerate would be

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important task in near future. We find that in response to the integration in the markets, there has been a substantial shift from the traditional sector-by-sector approach to supervision toward integrated financial supervision.

Finally, we provide some numerical comparison between two different regimes' capital requirements. We find some significant differences and hence show the chances for RCA possibilities in Korea. In terms of securitization and risk transfer, significant regulatory capital reduction is found in the case of bank as an originator and insurance company as an investor. Therefore, there may exist the strong incentive for the RCA through securitization in Korea.

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Risk Based Capital

1. Introduction

The current regulatory capital regime in Korea is, de facto, based on single business line or their financial institution classified as bank, insurance company and securities firms. The Basel Accord in the bank industry deals with capital requirements mainly to the credit and trading activities. The regulations by the minimum solvency margin system deal with the provision and capital requirements for underwriting activities in insurance company. Keeping the net operating capital ratio at the proper level is currently required of securities companies.

The approaches to capital regulation for banks, insurance companies, and securities companies have evolved from different starting points, under different statutory regimes, accounting conventions, time horizons, intervention triggers, and policy objectives. However, this approach to capital adequacy (hereinafter, called 'silo' approach) raises a number of issues.

One of the main problems of the current regulations is inconsistency of treatment of similar risk types, which depend on where the risk is booked.³ Inconsistent treatment provides the potential for regulatory arbitrage. It may encourage institutions to take risk, which face the lightest regulations, irrespective of their ability to manage or sustain the level of risk. Another problem of the current regulations is the failure of accountancies for the risk concentrations and diversification across different institutions.⁴ In this case, the concentration (or diversification) of risk cannot be identified under the current regulations. Also, there is a concern of incompleteness that no regulation is given to a conglomeration holding company which realizes the concentration and diversification across business lines and needs additional capital. Ignoring the capital requirements of unlicensed institutions is another concern of incompleteness. The limitations of the current silo approach will be exacerbated by industry consolidation and product innovation. If the regulatory structure fails to keep pace with these developments, the whole purpose of rule-based capital requirements may prove to be self-defeating (Kuritzkes, Schuermann and Weiner; 2003).

³ For example, capital requirement of a credit exposure in a bank is 8% of outstanding. Bond in a insurance company investment portfolio hold as the same credit exposure (treated as investment, asset risk or credit insurance risk) was provided different capital requirement of outstanding.

⁴ For example, the level of credit risk in a bank has high concentration if the credit risk to the same counterparty is in the insurance investment portfolio.

From 2007 in Korea, risk in banks would be measured newly under the new Basel Accord, and also the insurer's risk would be measured under the new Risk-Based Capital (RBC) system. We have not found any evidence to prove that these two different regulations have been properly integrated. Different measurement methodologies over different sector may jeopardize the systemic stability. Arbitrage opportunities arising from different regulatory capital requirement applied to different kinds of financial firms may drive the risk transfer, where typically an insurance company buys risk from a bank since it faces a lower regulatory requirement. It may increase the ability of the financial system to absorb risk and improve the efficiency of risk allocation. The shifting of risk may however increase systemic instability and reduce the efficiency of the allocation of risk, since risk may be shifted to institutions with inferior expertise in risk evaluation or lacking incentive to monitor. Also, there could be conflicts of interest among different entities within a financial conglomerate with respect to risk bearing.

This paper aims to identify the differences between capital requirements of bank and insurance company in Korea, to prove the severeness of regulation arbitrage leading to the systemic instability. To achieve those goals, section 2 introduces the different capital regimes among the financial institutions, where we would study the capital regulation for the insurance company in detail. Section 3 asserts that the different capital regimes may induce the risk transfer among the financial institutions, and furthermore the risk transfer may lead to the systemic instability. Section 4 deals with the capital regulation issues of the financial conglomeration. We would explore the need for the integrated regulation. Section 5 provides the numerical comparison between the new Basel Accord and the insurer's RBC in terms of regulatory capital calculation. Also, we investigate the capital requirements changes of two different institutions when the risk in banks is transferred to the insurance companies. Section 6 provides the summary and remarks.

2. Different Regulatory Capital Regimes between Banks and Insurance Companies

It is difficult to compare different types of financial institutions when they use different terminology and conceptual framework for determining capital. The bank's regulatory capital system is currently subject to the well-known Basel Accord (Basel I), which would develop to the new Basel Accord (Basel II) from 2007 in Korea.

Capital requirements for securities firms vary by jurisdiction. In countries with a universal banking heritage,⁵ the requirements for securities firms fall similarly under bank capital guidelines. In the United States, the requirements for securities firms fall under different rules set by a separate authority. In Japan and the United Kingdom, through their Financial Services Authorities (FSA), regulation of all three sectors has been placed under one roof, although without a harmonized approach to capital adequacy (Kuritzkes, Schuermann and Weiner; 2003). Capital requirements of the securities companies in Korea use the system of the net operating capital ratio.

The largest risk facing insurance companies is insurance risk, i.e. miscalculating technical provisions.⁶ For the non-life insurer, although technical provisions form the main category of liabilities, they represent a lower proportion of liabilities than for a life insurer. Capital makes up between one-fifth and two-fifths of liabilities for a non-life company compared with only a few percent for a life insurer. But both life and non-life companies, like banks, also face credit, market, interest and operational risks (Keefe, 2002).

The life insurance regulatory capital system is often compared unfavorably with that used in banks. A longer-term nature in life insurance's asset and liability and the fact that the liabilities in an insurance company do not have observable market values induce the different model construction from bank's (Booth, 2002). The current risk measurement in insurance companies in Korea follows the minimum solvency margin system, ensuring that the assets are sufficient to meet the liabilities given assumption about the returns the assets will earn and the expected liabilities. Korean FSS (2004) suggests more sophisticated techniques to determine economic capital in the insurance companies, and now prepares to move to the risk based capital (RBC) system from 2007.

The RBC system takes account of the ranges of risks to which insurers are exposed. Intervention limits are defined so that, as an insurance company's actual capital falls below a given multiple of the risk-based capital, the regulator would intervene. The RBC system aims to ensure that insurer have sufficient capital to limit the expected policyholder's deficit to an acceptable level. This is however different from VaR

⁵ such as Germany and the Netherlands,

⁶ The amount of premium and investment income needed to cover future payouts. It represents funds the insurers expect to pay out to claimants rather than funds reserved against future losses (Keefe, 2002).

framework that concentrates on the probability of failure rather than on the expected value of loss (Booth, 2002).

This paper deals with the differences only between banks and insurance company. With the Capital Market Consolidated Act of 2006, the Korean securities companies would be structurally changed in near future. Regulatory capital regulation would also experience the quantum jump changes. At this stage, it is meaningless to compare the current regulatory system of securities companies with other sectors.

Is it right to apply the different capital regime to banks and insurance company respectively, rather than to integrate regimes under the single one roof? Banks has been specially regulated because of the fear of contagion⁷ and systemic risk⁸, whereas insurance companies are regulated for consumer protection reasons and because of the fear of asymmetric information. Booth (2002) therefore asserts that regulators should treat risks differently in each institution rather than applying the same capital standard to both forms of institution. If VaR type modeling were to underlie insurance company capital, the difference in the perceived systemic nature may lead regulators to require different confidence level. The illiquid nature of insurance company liabilities may require a longer modeling time horizon.

On the contrary, Keefe (2002) insists the integrated and unified approach to the regulatory capital regimes. Representatively, supervisors at the UK's Financial Services Authority harmonize the regulation of banks, investment firms and insurance companies under a single, risk-sensitive regime, which is based on the principles adopted in the new Basel Accord.⁹ For the purpose of the successful integrated system, the regulation of insurance companies now lags far behind that of banks. The aim of the new approach is to accurately measure the assets and liabilities of insurance companies as they actually are, and to move away from the concept of 'implicit prudence' that characterizes traditional methods of regulation.

Large (2003) points out the challenges of increasingly integrated financial sector. One

⁷ Contagion is defined as a significant increase in co-movement after an (initially) idiosyncratic shock.

⁸ Systemic risk denotes the significant and negative effect on the economy that shocks to some institution induces via negative externalities.

⁹ Some in the financial services industry have already dubbed the process "the road to Basel III"

example he suggest is the growth of the credit risk transfer market, and another is the emergence of large multifunctional financial group. The systemic risk is lo longer confined to banks since the process of securitization has changed all that. Growing inter-linkage between banks and insurance gives rise to the need for a further rethink. One challenge, hence he identified, for the next stage beyond the new Basel Accord is to give thought to whether analogous agreement would be appropriate in securities and insurance.

<Table 1> Current Regulatory Capital Regime in Korea

	Insurance company	Bank	Securities company
risk measurement ratio	solvency margin ratio	BIS ratio	net operating capital ratio
how to calculate	actual solvency margin / statutory solvency margin	capital / risk weighted asset	net operating capital / total risk amount
reflected risk	insurance risk, asset risk	credit risk, market risk	market risk, counterparty risk, etc
regulation	If ratio < 100%, Prompt Corrective Action	If ratio < 8%, Prompt Corrective Action	If ratio < 150% Prompt Corrective Action
when introduced	1999	1993 (2002 revised)	1997 (2001 revised)

Source: Lee, S. (2005)

2-1. Joint Forum Report on the Different Regulatory Regimes

The Joint Forum of banking, securities, and insurance supervisors¹⁰ (2001) find that there are significant differences in the core business activities among sectors and the risk management tools that are applied to these activities. There are also significant differences in the regulatory capital frameworks, in many cases reflecting differences in

¹⁰ It was formed in 1993 by the Basel Committee for Banking Supervision, the International Organization of Securities Commissions, and the International Association of Insurance Supervisors.

the underlying businesses and in supervisory approaches. We summarize their finding in short.

The primary risks of banks are credit risks from lending activities and liquidity risk related to the structure of balance sheets. The primary risks of securities firms are market and liquidity risks associated with the price movements of proprietary securities positions and of the collateral they have obtained or provided. The dominant risks for a life insurance company are whether its calculations of the necessary technical provisions would be adequate and whether the investment portfolio will generate sufficient returns to support the necessary provisions. For a non-life insurer, the key difference is that, although technical provisions represent the main category of liabilities, they represent a lower proportion of liabilities, while capital makes up bigger position as opposed to only a small for life insurers. It reflects the greater uncertainty of non-life claims.

Approaches to capital regulation reflect underlying differences in the time horizons appropriate to the risks in each sector, as well as differences in supervisory objectives and emphasis. An important issue is the different emphasis on capital relative to provisions or reserves across the three sectors, which largely reflects underlying differences in the businesses. Technical provisions for insurance companies perform the role of providing an estimate of foreseeable claims. Securities firms, on the other hand, generally do not maintain reserves because assets and contractual obligations can be valued on a mark-to-market basis, and there should be no expected losses if market prices fully reflect current information. Capital therefore serves as the primary cushion against losses in the securities sector. Banks hold both loan loss reserves to cover foreseeable losses and capital to cover unanticipated credit losses.

The capital regulation regimes are distinct. For banks, the dominant approach is based on the Basel Accord. There are two main approaches for securities firms: (1) the Net Capital approach,¹¹ and (2) the EU Capital Adequacy Directive, based on the Basel Accord Amendment for market risks. There are also two primary frameworks for insurance companies: (1) the Risk Based Capital (RBC) framework,¹² and (2) the index based solvency regime.¹³

¹¹ used in the United States, Canada, Japan, and other non-EU jurisdictions

¹² used in the United States, Canada Japan, Australia and other countries,

¹³ Used throughout the EU but also in a number of other jurisdictions.

The different requirements of accounting conventions make it difficult to undertake clear comparisons between regulatory capital frameworks.¹⁴ Differences in the relative roles of capital and provisions across the sectors also make it difficult to compare capital adequacy on each sector. There may be also significant differences across the sectors in the typical relationship between the actual capital and the minimum capital requirements.¹⁵ To the extent that differences in the ratio of actual to required capital embed a different relationship between minimum requirements and what is expected by the market participants in each sector, it may mislead to focus solely on the level of minimum requirements in comparing specific elements of each framework. For all of these reasons, comparisons of individual elements of the different capital frameworks are potentially inappropriate and misleading. Moreover, adjustments to establish an equivalent basis for comparison would be difficult and involve a variety of subjective assumptions.

In regard to cross-sectoral risk transfers, differences in the frameworks may imply different marginal capital requirements for specific types of instruments. Regulatory capital requirements can create incentives to transfer risks outside their sector. Cross-sectoral risk transfer can occur when the transferor and the transferee are separate legal entities of the same conglomerate firm. The potential for different regulatory capital treatment may create an incentive to book transactions in one vehicle rather than in another. In those senses, the Joint Forum emphasizes the need for supervisors to evaluate sectoral capital regulations in light of the degree of convergence between the sectors.

2-2. Regulatory Capital Regime for the Insurance Company

The Basel Accord governing banking industry has been well known relatively, compared to insurance industry. Therefore, this paper would explore the regulatory capital regime of insurance sector more in detail here.

¹⁴ such as the requirement that assets be marked-to-market (typically in securities company) as compared to the historical cost approach typically applied for banks and the variety of different approaches applied by insurance firms

¹⁵ Almost universal for large insurance companies to operate with actual capital amounts several times the minimum required level, while large banks and securities firms usually hold no more than 150% of their capital requirement.

There has been some concern that insurers are undercapitalized for the risks they face with banks, and that risk management skills of insurance executives are below standards seen in banks (GRR, January 2004). As the reasons, Bomhard (2005) suggests that there were insufficient incentives for setting meaningful risk and capital management in insurance sector. Another reason is the parallel universes of traditional actuarial thinking in insurance companies and the financial economic thinking in bank. Many subjects such as interest rates risk or value have a different color in actuarial or financial science.

Regulation of insurance companies comes in two primary frameworks: the risk-based capital approach¹⁶ and the index-based insolvency regime.¹⁷ Traditional approaches generally involve crude and unscientific overestimations of liabilities and undervaluation of assets. Hence, they create a false sense of security (Keefe, 2002). Risk management within insurance companies must be brought into line with best practice elsewhere in the financial services industry. Insurance industry accounting practices, which differ around the globe and are sometimes quaintly archaic, must also be reformed and unified.

However, insurance company cannot simply follow the same path as the banks have done, although banks are widely viewed as beating the insurance companies at the business of risk management. Ingram (2003) asserts that there are many significant differences in the products, investments, regulatory environment, and markets. Time frames are different. Insurance risks cannot be easily hedged in the liquid market. Risk taking is fundamental to the purpose of an insurance enterprise, while it is incidental to a bank. EU Insurance Solvency Sub-Committee (2001) also asserts that Solvency II¹⁸ for insurance company should be different from Basel II for banks, since their actual objectives differ. Whereas the Basel Accord is to reinforce the soundness and stability of the banking system, the prudential supervision in the insurance sector is to protect policyholders against the risk of bankruptcy.

Nonetheless, as long as the universe of risks that a bank undertakes is a subset of the universe that an insurance company undertakes,¹⁹ the best practices developed by

¹⁶ used in the US, Canada, Japan and Australia, for instance

¹⁷ used in the European Union and Korea

¹⁸ the new regulation framework for insurance sector in EU. To be explained in detail later.

¹⁹ such as market and credit risk

banks can be used as a guide for insurance companies. Bomhard (2005) agrees that insurance company can learn from the banking world and that some of the methods and paradigms, firmly rooted in financial economics, can be adapted and adopted by insurers. Value at Risk became commonly accepted as a risk measure whereas on the liability side regulators favor conditional VaR (or expected shortfall) measures. Fair value accounting has been emphasized to enhance the level of risk management in the insurance company.

2-3. International Comparison on the Regulatory Capital Regimes for Insurance Company

There is no comparable organization to the Basel Committee in the world of insurance and therefore regulation in this area is highly incongruent. We here compare different regulatory systems on the insurance sector over countries.

UK

Financial Services and Market Act (FSMA) of 2000 adopts the interim prudential sourcebook, which divide the industry into 5 sectors (bank, investment, insurance, etc.) and allows different prudential criteria. From 2007, however, FSMA would require all the financial institutions to adopt the integrated prudential sourcebook, which divide financial risks into credit, market, insurance, liquidity, operational and etc. and apply the same prudential criteria no matter what the industry be.

EU

Since 2004, Solvency I has been applied for the EU insurance companies. It emphasizes the role of solvency margin, which is 16~18% of premium (non-life), 4% of technical provisions (life). It is simple, robust, easy to understand and use and furthermore inexpensive to administer. However, Solvency I is volume-based, not explicitly risk-based, hence it is not proper for the rigorous risk management purpose.

Solvency II is the European Commission's project devoted to revising and extending Solvency I and it is expected to come into effect in 2009. Solvency II is to the insurance industry as the new Basel Accord was for the banking sector in terms that it takes into account recent trends in the insurance sector to emphasize a more risk-sensitive

approach and the provision of incentives for prudent risk management.

General principles of Solvency II are summarized, mostly following Embrechts (2004);

- risk-oriented assessment of overall solvency
- encourage insurers to measure and manage their risks
- consistency between financial sectors (banking & insurance)
- efficient supervision of insurance groups and financial conglomerates
- increased harmonization of supervisory methods between legislations
- compatible with international developments (IAIS, IAA, IASB)
- market-based (financial) valuation methods – stochastic cashflows and discounting

Asset: marking-to-market or marking-to-model

Liability: risk-neutral expectation of future cash flows discounted with risk free interest rate

- Basel II type 3 pillar structure as starting point

Solvency II: 3 pillars

- Pillar 1: capital requirements

Technical provisions (policy liabilities)

- Appropriate assets supporting those obligations

- Capital requirements: two levels

– Minimum capital level (safety net): simple, no internal model,
court actions

– Target capital: risk-based, internal models allowed

- Pillar 2: supervisory review process

– Internal control and risk management, ALM rules, reinsurance

– Harmonization at EU level

– Minimum criteria for on-site inspections

– Peer reviews of supervisory practice by national authorities

- Pillar 3: market transparency and disclosure

– Co-ordination of reporting requirements

In short, Solvency II project intends to create a regulatory framework for insurance companies in the spirit of the Basel Committee and be seen in conjunction with the initiatives of the IASB on fair value accounting.

Swiss

The Swiss Solvency Test (SST) aims to develop a flexible, EU Solvency II-compatible solvency framework for specifying the standard framework for non-life, life and health insurance. SST working groups are in cooperation with major Swiss insurers, re-insurers, Swiss Actuarial Association and Swiss Insurance Association.

Requirements for SST are as follows (Embrechts, 2004);

- risk-based
- consistency in asset and liability valuations
- compatibility with EU Solvency II
- compatibility with regulatory demands on other market players (Basel II)
- principles-based
- Aims:
 - regulatory density should remain reasonable
 - cooperation with SST project should add value to companies
 - SST should enable companies to better assess and manage risks
 - SST should give incentive for use of internal models

USA and Canada

In the United States, statutory capital requirements for insurer follows risk based capital (RBC) system, which was promulgated by the National Association of Insurance Commissioners (NAIC). Classification of risks of life insurance is C-1(risk of loss of asset values), C-2(pricing or insurance risk), C-3(disintermediation or asset/liability mismatch risk) and C-4(business or operational risk). Each classification has its own sub-classification. With covariance adjustment, risk based capital is finally calculated under the following rule;

$$C0 + \sqrt{(C1o + C3a)^2 + (C1cs)^2 + (C2)^2 + (C3b)^2 + (C4b)^2} + C4a$$

Canadian system is similar as USA. Minimum Continuing Capital and Surplus Requirement (MCCSR) is required by the Office of the Superintendent of Financial Institutions (OSFI). Table 2 compares the regulatory capital regime for USA and Canada and the new Basel Accord.

<Table 2> RBC in USA and Canada and the new Basel Accord

classification			factors (risk coefficient)		
			USA RBC	Canada MCCSR	Basel II
C-1	Asset Risk ²⁰	long-term bond	range from 0.0040 for asset class 1 to 0.23 for class 5 and 0.30 for class 6	range from 0.0025 for AAA to 0.08 for B and 0.16 for lower than B	(corporate) range from 0.016 for AAA & AA to 0.20 below BB-
		Mortgages	insured 0.0014, other residential 0.0068, other commercial 0.0260, farm 0.0260	residential (first) 0.02, commercial 0.04	residential 0.028, commercial 0.08
		Common equity	30% adjusted for weighted average	15%	8%
C-2	Insurance Risk	mortality ²¹		Reductions for participating business in Canada	
		morbidity	extensive health business calculation, Underwriting risk (active lives), Claim reserves, Generally, stronger treatment for disability income	simplified, mostly disability income focus	
		persistence	no component.	provision in case lapse rates deteriorate, Policies are divided in two groups based on whether an increase or decrease in lapse rates is more unfavorable, Capital requirement is the difference between two liability calculations.	
C-2	Insurance Risk	interest	no component	generally 0.005 of policy liabilities	
		expense	Not covered in either MCCSR or RBC		

²⁰ RBC modifications: 1) Concentration: double requirement on holdings of ten largest exposures of debt; five largest common equity holdings, 2) Diversification: adjust bond requirement for number of issuers, 3) Mortgage quality: adjust requirements for farm and commercial mortgages by experience adjustment factor.

²¹ Charge based on net amount at risk. Charge varies by length of premium guarantee period, Adjustment to reflect portfolio size (law of large numbers).

C-3	AL Mismatch Risk	Traditional products ²²	charge depends upon whether reserves were cash flow tested for asset adequacy	also charge for assets with no prepayment penalties	
		Variable annuities and segregated funds	Stochastic approach to provide for guarantees that depend upon economic scenario. Total balance sheet approach, integrating reserving and capital requirements. First use of internal models for regulatory capital		
C-4	Business (Op) Risk ²³		C-4a based on premium income, annuity considerations and separate account liabilities Component is designed to account to a company's exposure to guaranty fund assessments C-4b based on health ASO/ASO administrative expenses	No explicit component for C-4 risk Instead, the minimum capital requirement for C-4 is set at an additional 20% of the total of C-1, C-2 and C-3 requirements.	
Treatment of Subsidiaries			C-0 consists of subsidiaries' RBC (divided by 0.65) or the value of the investment in other subsidiaries	Calculated on a fully consolidated basis with investment in non-insurance subsidiaries shaved from capital	
Covariance			The covariance formula produces a significant reduction in RBC If the RBC approach is used to allocate capital internally, an important question is the treatment of the covariance saving		
Capital Ratio			available capital / required capital		regulatory capital / risk weighted asset

Source: Brender (2004)

Japan

RBC system has been applied since New Insurance Law of April 1996. Similarly to USA, classification of risks in the life insurance company is C1 (risk of loss of asset values),

²² Charges based upon policy liability. Varies with length of premium or interest guarantee and with policyholder's withdrawal rights

²³ This area is most in need of future development in considering insurance required capital. The emphasis will be different from that in banking, since the insurance business is not as transaction based as is banking.

C2 (pricing or insurance risk), C3 (interest rate risk) and C4 (business or operational risk). For the details on the RBC coefficient in each category, see Ryu (2006). With covariance adjustment, the statutory capital requirement is calculated under the following rule.

$$\frac{\sqrt{(C2)^2 + (C1 + C3)^2} + C4}{2}$$

USA tends to be more forward looking than Japan in terms of risk coefficient estimation. When the risk coefficient cannot be properly estimated using the observed data, USA may adopt the subjective judgment based upon experience, but Japan sticks to use the estimation result using the past data (Ryu, 2006).

2-4. Regulatory Capital Regime for Insurance Company in Korea

The current regulatory capital requirement in insurance companies in Korea follows the minimum solvency margin system, ensuring that the assets are sufficient to meet the liabilities given assumption about the returns the assets will earn and the expected liabilities. It has been criticized in terms that it does not properly reflect risk in insurance company. It reflects only the liability side risk, especially insurance risk, but does not reflect the asset side risk. Even when the insurance risk is calculated, the current system depends only upon the past data, rather than forward looking.

Korean FSS now prepares to move to the risk based capital (RBC) system from 2007. The RBC systems take account of the ranges of risks to which insurers are exposed. Credit and market risk in the asset side would be explicitly considered, which is missed in the current system. And the business risk (operating risk in Basel terms) would be also added. Regulator's intervention limits are defined so that, as an insurance company's actual capital falls below a given multiple of the risk-based capital, the regulator would intervene. The RBC system aims to ensure that insurer have sufficient capital to limit the expected policyholder's deficit to an acceptable level. This movement follows the global trend. RBC has been adopted 1993 in USA and 1996 in Japan. EU also prepares now to move to Solvency II, newly adopting the basic concepts of the new Basel Accord and RBC.

Basic principles in the newly introduced RBC system are as follows; ① accurately and rationally reflect risks in insurance company, ② meet the global trend, including the

recommendation from IAIS on the financial prudence of insurance company and the experience of the developed countries, ③ consider both the domestic insurance industry environment and the risk management capability of the existing insurance companies, ④ motivate insurance company in Korea to enhance the risk management ability (Ryu, 2006).

RBC ratio is calculated by dividing available capital by required capital. Depending upon the RBC ratio, each different regulatory action would be expected. Available capital is sum of the primary and supplementary capital. Required capital reflects main risks in insurance company, e.g. insurance, market, credit, ALM and operating risk, and importantly the correlation among them. Each risk capital equals risk exposure multiplied by the risk coefficient which is estimated based upon the statistical and scenario analysis, etc.

RBC is the only part of the new regulatory system for the Korean insurance company. FSS announced “Master Plan on the Risk Based Supervision on Insurance Company” in March 2003, where Risk Assessment and Application System (RAAS) was introduced as the new supervision concept. RAAS suggests the proper supervision based upon the more scientific risk assessment, risk tolerance and the related internal control in insurance company. With RAAS, FSS hopes to evaluate risks in insurance company by the forward looking criteria, rather than relying on the past financial statements data. And also the supervision on insurance company in Korea would follow the 3 Pillars system similarly to the new Basel Accord, as shown in Table 3.

<Table 3> Risk Based Supervision on Insurance Company in Korea

supervision	current	⇒	future	Pillar
	ex-post concept		ex-ante concept preventive and preemptive	
regulatory capital	minimum solvency margin	⇒	RBC	Pillar 1
prudence evaluation	CAEL	⇒	RAAS	Pillar 2
disclosure	management performance	⇒	risk disclosure	Pillar 3

	disclosure			
regulation type	direct	⇒	indirect	

3. Risk Transfer and Systemic Stability

3-1. Regulatory Capital Arbitrage and Risk Transfer

Häusler (2003) declares that “the increasing blurring of the boundaries between insurance and other financial institutions, especially in the OTC derivatives markets, implies a heightened importance of the insurance industry for systemic financial stability and calls for a stronger supervisory focus on financial risks”.

Regulatory Capital Arbitrage (hereinafter RCA) is driven by large divergences that frequently arise between underlying economic risks and the notions and measures of risk embodied in regulatory capital ratios (Jones, 2000). Due to RCA, regulatory capital ratios could mask deteriorations in the true financial conditions of financial institutions. Hence, RCA tends to erode regulatory capital standards, and impair regulatory discipline that is needed to limit systemic risk within the banking system. Moral hazard associated with the bank safety net is also an important concern, because RCA may encourage institutions to take risk, which face the lightest regulations, irrespective of their ability to manage or sustain the level of risk. Also, by cherry-picking²⁴ in securitization, RCA may tend to reduce the average credit quality of the remaining (unsecuritized) assets. The positive side of RCA however is that it could permit financial institution to compete effectively in low-risk businesses they would otherwise be forced to exit owing to unreasonably high regulatory capital requirements.

Jones (2000) asserts that incentives to undertake RCA are related negatively to the associated structuring costs, and positively to the amount of “freed up” regulatory capital. He also suggests three guiding principles of RCA: 1) concentrate credit risk and cherry pick,²⁵ 2) remote-origination, and 3) indirect credit enhancements.

²⁴ securitize their highest quality assets

²⁵ Although little risk is actually transferred to investors, RCA through securitizations nevertheless can reduce the

RCA is an important factor encouraging risk transfer and securitization, although by no means the only factor. Karaoglu (2005) lists possible motivations for banks to transfer loans (using securitization). First, banks have a comparative advantage in different aspects of lending; origination of loans, servicing, and managing the ownership of cash flows from the loans. These activities can be separated by loan transfers and performed by their most efficient producers (in line with Hess and Smith, 1988, Pennacchi, 1988). Second, banks may transfer loans for financing, risk management, regulatory capital management, and earnings management purposes.²⁶ Third, securitization can provide a cheaper form of external financing than equity or unsecured debt by reducing informational costs, since the collateral is a pool of loans (in line with Minton et al, 1997). Fourth, loan transfers may be used to manage interest rate risk and credit risk. Funding through securitization can match the duration of the expected loan receipts, hedging away the interest rate risk. Securitization is also useful for managing credit risk, since banks can diversify concentrations of risks by loan transfers (in line with Demsetz, 2000; Pavel and Phillis, 1987). Fifth, banks can increase their capital by selling or securitizing loans and capitalizing expected future earnings. Loan transfers can have a large effect on the income statement, because the present value of all earnings from a loan pool is recognized in a single period.

Acharya (2001) shows that depending on the capital requirements imposed on banks, they may find it attractive to increase correlation risk, due to moral hazard. One way of

institution's capital requirement dramatically. Jones (2000) asserts that RCA through securitization with retained recourse is most cost-effective when the underlying loan pool is of sufficiently high quality that most of the credit risk can be concentrated into a subordinated tranche. Discretionary gains or losses from loan transfers result from the historical cost accounting for loans.

²⁶ Bank managers can use discretion in three aspects of loan transfers: timing, selection of loans, and valuation of retained interests if the loans are securitized. However, as Karaoglu(2005) insists, securitization has mainly a timing effect on the regulatory capital ratio, since any estimation errors in the valuation of retained interests will be reversed over the life of the loans. In this case, motivations for loan transfers may result from the failure of the Modigliani-Miller's capital structure irrelevance theorem due to information asymmetry in capital markets, agency problems arising from bondholder-shareholder conflicts, and frictions such as taxes and regulation. For further study, see Moyer (1990), Beatty, Chamberlain, and Magliolo (1995), Collins, Shackelford, and Wahlen (1995), Kim and Kross (1998) Ahmed, Takeda, and Thomas (1999). Pavel and Phillis (1987), Jagtiani et al. (1995).

achieving increased correlation risk is through securitizing assets. The new Basel Accord does not however properly address the correlation risk.

Overall, risk transfers may be desirable if they improve the diversification of risk. Or they may be undesirable if they increase the risk of financial crises. In that sense, the issue of comparing capital requirements in different financial sectors and exploring the possibility of RCA through securitization has come into sharper focus, which has been amplified by recent innovations in credit risk transfer market.

Risk transfer should not be artificially encouraged or discouraged by regulation (Booth, 2002). The current Basel Accord treats credit protection in the same way as a guarantee. Purchasing credit protection from another bank replaces the credit risk capital with the counter-party risk capital. However, a protection contract purchased from an insurance company would yield no capital reduction for the bank. On the contrary, under the new Basel Accord, it would be possible to reduce capital required in the financial system as a whole through the process of credit insurance.

Overall banks are net buyers of risk protection and insurance companies are net sellers in the markets for credit risk transfer (British Bankers Association, 2002 and Fitch Ratings, 2003). Therefore, if there were sudden build up of credit risk within insurance sector to the extent that the insurance sector posed systemic risks, then this could be a matter for concern in the banking sector, too (Booth, 2002).

3-2. Systemic Stability

The results of the existing studies on the stability aspects of risk transfer seem mixed. Greenbaum and Thakor (1987) assert that credit securitization allows a bank to reduce its risk exposure, and to increase diversification in the economy. Duffie and Gârleanu (2001) states that securitizations improve liquidity and induce a positive overall market value effect. Wagner and Marsh (2004) also assert that the transfer of risk out of a relatively fragile banking sector leads to an improvement in stability.

On the contrary, Duffie and Zhou (2001) show that credit risk transfer can cause the collapse of risk sharing mechanisms and this can result in a reduction in welfare, Allen and Gale (2004) argue that, for incomplete markets, credit risk transfer may increase risk concentration rather than risk diversification, thereby raising overall systemic risk. Wagner

(2005a) shows that although credit risk transfer might improve the liquidity of bank assets, this can also increase the probability of crises by increasing the risks that banks are prepared to take. Wagner (2005b) shows that the increased portfolio diversification possibilities introduced by credit risk transfer can increase the probability of liquidity-based crises. Allen and Carletti (2006) shows that credit risk transfer can be beneficial because it improves risk sharing, but it can also induce contagion and lead to a Pareto reduction in welfare. They continue that although credit risk transfer may not pose a systemic problem at the moment, it may do in the future as it continues to grow in importance. Krahnen and Wilde (2006) insist that securitization will increase bank's systemic exposure, which contributes to an increase in the probability of banking crises. The source of systemic risk here is not contagion, but the impact of a common macroeconomic factor in the return generating process. Hence, securitizations lead to increased systematic and systemic risk together.

The role of insurance company in triggering systemic risk has been an important concern recently, since insurance companies actively participate in the securitization market. Different regulatory capital regime between banks and insurance company and the induced RCA chances through securitization could give rise to this suspicion. As noted earlier in this paper, RCA runs some risk of masking potential weaknesses at banks. Distortions to reported regulatory capital ratios may compromise market discipline. Without addressing these underlying factors, supervisors may have little practical scope for limiting RCA other than by imposing arbitrary restrictions on banks' use of risk unbundling and repackaging technologies, including securitization and credit derivatives (Jones, 2000). In that sense, the unfortunate combination of improper regulation and RCA through securitization might trigger systemic risk significantly.

Allen and Carletti (2006) assert that financial innovations shift portfolios in a way as to make contagion across different sectors more likely. Because asset sides of the balance sheet of the insurance and banking sectors become more similar through securitization,²⁷ a severe shock in one sector may force large asset sales that will affect prices and thus the balance sheet of the other sector as well. In this case, contagion shortly leads to systemic instability. Moreover, defaults on credit guarantees can leave banks with substantial losses for which there are no capital provisions.

²⁷ Minderhoud (2003) finds that there is significant extreme interdependence between the banking and the insurance sector that cannot be explained by macroeconomic shocks.

However, Santos (2006) insists that a shift in the asset portfolios of insurance companies has been driven not by the introduction of credit risk transfer instruments, but by more fundamental and traditional forces: i.e. 1) insurance companies are given added flexibility to design new products. This has led insurance companies to consider broader asset classes for their investments than traditional ones. 2) insurance companies have been forced to change their asset allocation towards securities with higher yields (including credit risk instruments) in order to meet their fixed rate liabilities, since the yields on overall asset have dropped dramatically. In short, Santos (2006) argues that insurer's participation in the credit risk market is a only consequence of the same primary forces driving increased participation in other markets, i.e. even though credit derivatives had not come along, the balance sheets of banks and insurance companies would have become more closely correlated anyway.

As shown in earlier literature survey, a lot of the activities of insurance companies in risk transfer and securitization markets are driven by regulatory arbitrage and induce the systemic risk. Integrated regulation over banks and insurance, e.g. Solvency II, may eliminate these activities by effectively increasing the cost of activities. For regulators, risk shifting between banks and capital markets is relevant since it may affect the required capital base of individual banks and, even more importantly, it may affect the exposure of the banking system at large vis-à-vis macroeconomic risks (Andersen et al, 2004).

4. Financial Conglomeration and Integrated Regulation

Financial conglomeration²⁸ has been a global trend. Economies of scale and scope strengthen this trend. Increasing industry consolidation, financial deregulation, and globalization are also fueling rapid growth in the scope of large, multi-line financial conglomerates. The universal banking tradition made that trend settled earlier in Europe than in U.S. and Japan of specialization tradition. FSA in U.K. launched in 1998 as the integrated supervisory body over bank, securities and insurance altogether.

²⁸ The Joint Forum of the Bank for International Settlements (BIS) defines a financial conglomerate as “any group of companies under common control whose exclusive or predominant activities consist of providing significant services in at least two different financial sectors (banking, securities, insurance).”

Barclay, Lloyds TSB, RBC, HSBC are major conglomerates. Germany and Switzerland also have tradition of universal banking, and hence keep loose regulation of equity holdings in the financial institutions. USB and CSFB are major conglomerates in Switzerland.

On the other side, in the United States, the Gramm-Leach-Bliley Act of 1999 recently triggered financial conglomeration in earnest, unburdening specialized banking system supported by the traditional federalism and Glass-Steagall law. In Japan, the financial Big Bang of 1996 was a crucial point toward the conglomeration. Holding company system was adopted mainly to solve NPL. Mizuho Group and Tokyo-Mitsubishi Group are representative. For further details on this issue, see Song (2006).

1997 Currency Crisis was the turning point for the financial conglomeration in Korea and four conglomerates has been built up at the point of July 2006. Table 4 shows the major financial conglomerates in Korea.

<Table 4> Major Financial Conglomerates in Korea

Classification	Financial Sector	Business Network	Weight
Woori Financial Holdings Co.	Bank	Woori Bank, Kyongnam Bank, Kwangju Bank	94.7%
	Securities	Woori Investment & Securities, Woori Asset Management, Woori Futures	5.3%
	Insurance	—	—
Shinhan Financial Holdings Co.	Bank	Shinhan Bank, Jeju Bank	94.3%
	Securities	Good Morning Shinhan Securities, Shinhan BNP Paribas ITM	2.3%
	Insurance	Shinhan Life Insurance, SH&C Life Insurance	3.4%
Hana Financial Group Inc.	Bank	Hana Bank	95.7%
	Securities	Hana Securities, Daehan Investment & Securities, Daehan Investment Trust Management Co.	3.8%
	Insurance	Hana Life Insurance	0.5%
Kookmin Bank	Bank	Kookmin Bank	99.8%

Kookmin Bank	Securities	KB Asset Management, KB Futures	0.1%
	Insurance	KB Life Insurance	0.2%

1) As of the end of Sep. 2005, based on the total asset

2) Securities includes securities, asset management and futures

source: Financial Supervisory Service, Park (2006)

4-1. Risk of Conglomeration

The effect of the conglomeration on the financial risk is open question. Diversification gets rid of the unsystematic risk and leads to the positive effect of risk reduction in the conglomerate. Lown, Osler, Strahan, and Sufi (2000), using pro forma analysis of potential combinations of banks with securities firms, life insurers, or P&C insurers, find that the merger of a bank with a life insurer results in the best risk-return benefit, largely because of economies of scope and anticipated risk reduction, rather than economies of scale. Estrella (2001), based on options pricing and the arbitrage pricing theory, finds potential diversification gains from virtually all combinations of banking and insurance.

On the contrary, diseconomy, too-big-to-die or too-complex-to-fail phenomenon, oligopoly issues might unfortunately raise risk. Contagion among subsidiaries is another concern for risk increase. Worse is the systemic risk. Interdependency among subsidiaries due to internal transaction in the conglomerate is one important pass of the contagion and systemic risk.²⁹ Risk in conglomerate may also increase because monitoring declines through either the bank monitoring its counterparties or the bank being monitored less by others such as rating agencies. Cumming and Hirtle (2001) argue that the risk of the whole may be greater than that of the sum of its parts, largely due to spillover effects from reputational risk.

Overall effect on the risk held by the conglomerate can be measured effectively through

²⁹ For example, bancassurance can bring systemic benefits by exploiting the correlation of risks between banks and insurance companies. But the complexity of managing large conglomerates can in itself bring new risks; e.g. concerns about an insurance subsidiary can spill to the banking branch of the conglomerate, increasing systemic risk (Santos, 2006).

the consolidated financial statements. However, the different risk measurement system among subsidiaries makes the integrated risk measurement very difficult. Things which cannot be accurately measured cannot be properly managed. The risk measurement and management of the financial conglomerate would be another important task in near future.

4-2. Integrated Risk Measurement in Financial Conglomerate

Economic capital is often used as common currency for risk measurement, irrespective of where the risk is incurred. This allows for consistent measurement of risk factors across both banking and insurance lines. It also addresses risk aggregation at successive levels in an organization (Kuritzkes, Schuermann and Weiner, 2003). Risk aggregation is composed of three levels; (Level I) within a single risk factor,³⁰ (Level II) across different risk factors within a single business,³¹ (Level III) across different business lines.³² Although Kuritzkes, Schuermann and Weiner (2003) show that level III diversification effects are relatively small, they insist that this finding does not support the deconsolidation approach taken in the new Basel Accord, where capital at the holding company level is simply the sum of the parts. It is because regulatory measures assumes an average level of correlation within a single risk factor and ignores cross-risk factor diversification at the business line level.

Accurate treatment of correlation effect at each level of conglomerate is still a big concern. Both of the present and the new Basel Accord treat credit and market risks on a stand-alone basis and simply add together, ignoring cross-risk factor diversification. Capital regulation at level III can be no more accurate than the stand-alone measures on which it is based. Given the inherent limitations at levels I and II, a better approach to capital regulation for conglomerates would be to adopt a more supervision-intensive approach, e.g. Basel Second Pillar. Conglomerates should develop their own customized models, which are the only real hope of capturing the complexity of diversification at all levels within a conglomerate (Kuritzkes, Schuermann and Weiner, 2003).

The developments of integrated risk and capital frameworks for evaluating capital

³⁰ for example, credit risk in a commercial loan portfolio.

³¹ for example, combining the asset, liability, and operating risks in property and casualty or life insurance.

³² for example, banking and insurance.

adequacy in a conglomerate context are being driven by a number of factors: (a) introduction of risk measurement methodologies and analytical tools for risk and capital management as well as performance measurement, (b) evolution of enterprise risk management as a key function of the corporate center, (c) blurring of product boundaries through financial innovation and the potential for regulatory capital arbitrage, (d) increased reliance by rating agencies on enterprise-wide capital models for evaluating the ratings of financial conglomerates, and (e) pressure from some regulators for a consolidated view of risk and capital at the holding company level (Kuritzkes, Schuermann and Weiner, 2003).

The new Basel Accord requires the internationally active bank to calculate the regulatory capital on the consolidated basis, in addition to the stand-alone basis.³³ The aggregation of the regulatory capital in financial conglomerate must consider the issues of double gearing, excessive leverage and the existence of unregulated subsidiary, and also keep consistency in the time horizon and confidence level. Joint Forum (2001b) suggests three different approaches to calculate the regulatory capital of conglomerate; (a) building block approach, (b) risk based aggregation approach, and (c) risk based deduction approach.

4-3. Integrated Regulation

(1) Problems of Silo Approach

The evolution of new risk and the possible increase of the existing risk in financial conglomeration should be important challenge for the regulator. The importance of the macro-prudential supervision and the sound risk management cannot be overemphasized, concerning the threat from the contagion and the systemic risk. However, unfortunately, the risk supervision on the conglomerate would be difficult issue since the integrated risk measurement is still beyond our ability. Failure for the regulator to properly supervise might lead to the regulation arbitrage and possibly increase the systemic risk. It is possible when each financial institution meets the regulation in the each belonging industry, exploiting the different regulatory capital regimes, but would transfer risk into the less-regulated sector. Then, the economic risk

³³ See Song (2006) for details.

has not been changed at all, but only the regulatory capital decreases.³⁴

Should supervisors extend the safety net beyond just the bank in order to help prevent failure of a non-bank affiliate for which such safety net may not be appropriate? If so, this would induce the moral hazard problem that we mentioned earlier,³⁵ and would inhibit market discipline by reducing the incentive to monitor the financial institution and increase the risk of contagion across the pieces of the holding company (Kuritzkes, Schuermann and Weiner, 2003, Čihák and Podpiera, 2006).

In order to mitigate the adverse effect of silo approach, Kuritzkes, Schuermann and Weiner (2003) suggest another Pillar for conglomerate in addition to the new Basel Accord Three Pillars. The Fourth Pillar—legal firewalls—is a response to contagion of risks, where (a) non-financial subsidiaries should be separately capitalized and (b) it must prevent inter-company funding of the subsidiary and cross-company guarantees. Although this is not sufficient to fully mitigate against reputational risk, but they could limit financial contagion. On the contrary, Čihák and Podpiera (2006) insist that while supervisors try to make companies create firewalls among their different businesses, the effectiveness of such firewalls could be low in case of financial problems and they certainly do not protect against all forms of regulatory arbitrage.

(2) Road to the Integrated Regulation

Largely in response to the integration in the markets, there has been a substantial shift from the traditional sector-by-sector approach to supervision toward integrated

³⁴ Capital Market Consolidated Act of 2006 in Korea could be another triggering event for the conglomeration and market competition. Hence, the regulators should do their best in risk supervision to prevent the contagion and the increase of the systemic risk.

³⁵ If safety net extends to the non-bank institutions, financial conglomerate might pursue riskier business than specialized, non-conglomerated institution, via risk transfer among subsidiaries.

financial supervision³⁶ (Čihák and Podpiera, 2006). Financial conglomerates cover a range of financial services for which supervision has been typically fragmented. And this has raised concerns about the ability of supervisors to assess the overall risk the conglomerate is taking. Especially in crisis management, supervisors should respond on a conglomerate-wide basis even though initial problems affect only one part of the conglomerate.

Integrated regulation seems a global trend. Under the new Basel Accord, holding companies must capture risks within the whole banking group including securities and insurance subsidiaries on a fully consolidated basis. EU Directive on the Supervision of Financial Conglomerates in 2002 also aims to (a) ensure that the conglomerate is adequately capitalized, (b) introduce methods for calculating a financial conglomerate's overall solvency position, (c) deal with issues of intra-group transactions, group-level risk exposure, and internal risk management and control processes. Gramm-Leach-Bliley law of 1999 in the United States subjected financial holding companies to limited forms of consolidated supervision by the Federal Reserve. In addition, Joint Forum aims to identify and provide solutions for problems that financial conglomerates pose for supervisors, in the sense that supervision of financial conglomerates cannot be effective if individual components of a group are supervised on a purely silo basis.

Korean FSS does not yet provide the integrated regulation. They plan not to apply the new Basel Accord to the financial conglomerate in near future. Even though regulation on banks via Basel Accord and regulation on insurance company via RBC share the common concepts in many aspects, that is not enough to say that the supervision is being integrated effectively and efficiently. This is very surprising if we think of the justification FSS suggested when it was born; integrated supervision was the main justification. If sectoral supervisors are simply put under one roof, without substantial organizational changes and changes in the regulation of individual sectors, the synergies will be likely small.

³⁶ Čihák and Podpiera (2006) define a (fully) integrated supervisory agency as an agency that is in charge of (micro) prudential supervision of at least the three main segments of most financial sectors—banking, insurance, and securities markets. Such agency may or may not be in charge of consumer protection. Financial sector regulation and supervision framework consists of macro-prudential surveillance, micro-prudential supervision, consumer protection, and competition policy. Mostly, macro-prudential surveillance is carried out by a central bank, and competition issues are handled by a separate agency regulating competition in general.

The integrated risk supervision preserves the consistency and completeness of supervision, hence could successfully protect the financial consumer (or user) and keep the market stability. Song (2006) lists the needs for the integrated supervision as follows; (a) protect financial market from contagion, (b) prevent double gearing,³⁷ (c) mitigate adverse reaction of the existence of unlicensed subsidiaries and RCA, (d) fix the system fragileness due to the blurring boundaries in the financial sectors. Čihák and Podpiera (2006) also list the environment changes for integration of supervision as follows; (a) financial conglomeration, (b) central bank involvement,³⁸ (c) size of the economic system,³⁹ (d) recent financial sector crisis,⁴⁰ and (e) legal factors.⁴¹ They also summarize the pros and cons of integrating financial sector supervision as in Table 5. They empirically find that full integration is associated with higher quality of supervision and greater consistency of supervision across sectors.

<Table 5> Summary of Pros and Cons of Integrating Financial Sector Supervision

Potential Pros	Potential Cons
Easier to achieve efficiency in supervising financial conglomerates.	If objectives not clearly specified, may be less effective than sectoral supervisors
Possible economies of scale	Possible diseconomies of scale if too large an organization that is difficult to manage
Possibly improved accountability	If objectives not clearly communicated, possibility to extend moral hazard problems across the whole financial sector
Easier to eliminate duplicities, turf wars	Process of integration may lead to politically or special interest motivated changes in supervisory framework
Easier to ensure level playing field across market segments	Process of integration, if not managed properly, may lead to loss of key staff or to other problems.

source: Čihák and Podpiera (2006)

The issues of contagion, double gearing, RCA through risk transfer cannot be properly

³⁷ It is also called double leverage. Used to describe situations where multiple companies are using shared capital to buffer against risk occurring in separate entities without the proper documentation of exposure (www.investopedia.com).

³⁸ If a unified agency is created, it is more likely that the agency will be separate from the central bank

³⁹ The lower the overall economic size is, the higher is the probability of integration.

⁴⁰ The creation of integrated supervisors was prompted by a recent financial sector crisis.

⁴¹ Countries with a “Civil Law root,” have a higher probability of integrating their supervisory system.

handled under the current silo-based regulatory framework. Also, in order to risk-sensitively measure regulatory capital of the financial conglomerate, we need to develop the methodology to aggregate each different risk among sectors, and need to build the integrated regulatory framework. This would, in hope, mitigate the adverse impact that the RCA through securitization and contagion lead to the systemic instability.

5. Numerical Comparison between the Two Different Regimes Capital Requirements

This comparison is only intended to be illustrative, rather than exhaustive. Since the details of the Korean RBC has not been set up completely and opened publicly yet, we here provide several alternatives, including Japan, Australia and US RBCs and some academic results on the Korean RBC in order to compare with the Basel Accord in terms of calculating the regulatory capital.

5-1. RCA Possibilities

As we mentioned earlier, the silo approach leads to inconsistent treatment with different originations. For example, consider a credit exposure to an ‘A’ rated counterparty. As shown in <Table 6>, regulatory capital becomes 8% under Basel 1 when the exposure was treated as commercial loan. However, RBC becomes 0.16% under EU non-life insurance regulation when the exposure was booked in a P&C insurance company as credit insurance transaction, paying premium 1% per annum. EU solvency capital requires 16% of premiums (EU Non-life insurance Solvency Directive, 2002). On the contrary, RBC becomes 3% under EU life insurance regulation when the exposure was booked in a life insurance company as an investment (EU Life insurance Solvency Directive, 2002). Consequently, the inconsistent treatment across sectors may lead institutions to book business in those subsidiaries that face the lightest regulation regardless of the ability of risk management.

<Table 6> Treatment of Credit Exposure with Different Originations (*)

type	Basel 2	EU Regulation (P&C)	EU Regulation (L&H)	NAIC Regulation
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Credit Exposure to an 'A' rated counterparty	RBC	4%	0.16%	3.00%	0.30%
	Treatment	Commercial Loan	Credit insurance with 1% premium	Investment	Credit Risk

(*) Revised by authors based on Kuritzkes, Schuermann and Weiner (2003)

5-2. Differences between the new Basel Accord and RBC Regulations

Different regulatory capital for cash and debt obligation of commonwealth government or territory government are compared in the <Table 7>. We would compare the new Basel Accord's standard approach with the insurer's RBCs, because IRB approaches totally depend on the internal estimates of PD (and LGD for AIRB) which are not publicly available.

<Table 7> RBC for Cash and Debt Obligation of Commonwealth Government or Territory government

type	the new Basel Accord				
	Standard	FIRB	AIRB		
Cash and Debt Obligation of: Commonwealth Government or Territory government	0%~12% with 6 different grades	0% ~ (lower bound for PD: 0.03% ~)	0% ~ (lower bound for PD: 0.03% ~)		
type	RBC				
	RBC1	RBC2	RBC3	RBC4	RBC5
Cash and Debt Obligation of: Commonwealth Government or Territory government	Bond: 0% Cash and Deposit: 0% ~ 3.8%	Debt obligation of government or territory government; 1.91%	0%; For the Deposit, RBC varies (0%~30%)	0.50% with grade 1 counterparty rating	0%

	(L&H)	(P&C)	with 4 different Grades		
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RBC1 is based on the Korean L&H experience results of Ryu et al. (2002)

RBC2 is based on the Korean P&C experience results of Lee et al. (2005)

RBC3 indicates RBC in Japan

RBC4 indicates RBC in Australia GGN 110.4-9 (2002)

RBC5 is based on the NAIC's RBC reported by American Academy of Actuaries (2002)

Regulatory capitals for an unaffiliated common stock are shown in the <Table 8>. Under the new Basel Accord, there are 3 different ways to handle the investment. Internal models depend on the institutions' own estimates of VaR or PD. Hence, direct comparison may not be possible since regulatory capital is quite sensitive to the volatility as well as the credit quality of individual assets in a portfolio. Table 8 shows that RBC requirements in Japan, Australia and US are smaller than the new Basel requirements. We could not tell the differences in Korean cases, since ranges of the proposed RBC requirements in Korean experiences (RBC1 and RBC2) are large.

<Table 8> RBC for Invested Common Stock

type		the new Basel Accord				
		Simple	Internal Model	PD/LGD approach		
Common Stocks (unaffiliated)	A (listed)	24.0%	99%VaR (16% ~)	Internal PD with LGD=90% and M=5years 16%~ for listed 24%~ for not listed		
	B (not-listed)	32.0%	99%VaR (24% ~)			
type		RBC				
		RBC1	RBC2	RBC3	RBC4	RBC5
Common Stocks (unaffiliated)	A (listed)	29% ~ 40.5%	13.92% (P&C)	10.0%	8%	P&C 15% L&H 20%

	B (not-listed)	(L&H)			10%	
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RBC1 is based on the Korean L&H experience results of Ryu et al.(2002)

RBC2 is based on the Korean P&C experience results of Lee et al. (2005)

RBC3 indicates RBC in Japan (2002)

RBC4 indicates RBC in Australia GGN 110.4-9 (2002)

RBC5 is based on the NAIC's RBC reported by American Academy of Actuaries (2002)

Different regulations for invested bonds is shown in the <Table 9>. Under the new Basel Accord, there are 3 different ways to handle the investment, Standard, FIRB and AIRB. For comparison with the insurer's RBC, the standard approach under the Basel Accord is chosen. Table 9 shows that RBC requirements in Japan, Australia and US (RBC3, RBC4 and RBC5) are smaller in case of high credit quality. RBC requirement of Grade4 in Japan and of Grade5 and 6 in US are, however, bigger than any other type of regulation. The proposed RBC requirements in Korean P&C company (RBC2) is about 8%, indicating the Grade3 (BB-~BBB+) under the new Basel regulation.

<Table 9> RBC for Invested Bonds

type	the new Basel Accord				
	Standard		FIRB		AIRB
Bonds (*)	Grade1: 1.6% Grade2: 4% Grade3: 8% Grade4: 12%		> 0% (Internal estimate of PD)		> 0% (internal estimate of PD and LGD)
type	RBC				
	RBC1	RBC2	RBC3	RBC4	RBC5
Bonds (*)	0% (L&H)	8.28% (P&C)	Grade2: 1% Grade3: 4% Grade4: 30%	Grade1&2: 1%~2% Grade3: 4%, Grade4: 6% Grade5: 8%	US Govt. : 0% Grade1: 0.3% Grade2: 1.0% Grade3: 2.0% Grade4: 4.5% Grade5: 10% Grade6: 30%

(*) Some adjustments are applied for the short-term and long-term bonds.

RBC1 is based on the Korean L&H experience results of Ryu et al. (2002)

RBC2 is based on the Korean P&C experience results of Lee et al. (2005)

RBC3 indicates RBC in Japan (2002)

RBC4 indicates RBC in Australia GGN 110.4-9 (2002)

RBC5 is based on the NAIC's RBC reported by American Academy of Actuaries (2002)

Different regulations for real estate is shown in the <Table 10>. For simple comparison, the standard approach under the new Basel Accord is chosen. Table 10 shows that RBC requirements in Japan, Australia and U.S. (RBC3, RBC4 and RBC5) are bigger than the Basel requirements. The proposed RBC requirements in Korean L&H and P&C (RBC1 and RBC2) show the mixed results in terms of magnitude comparison.

<Table 10> RBC for Real Estate

type	the new Basel Accord				
	Standard	FIRB	AIRB		
Real Estate (Residential)	2.80%	Not Applicable for Retail	Formula is given based on the internal estimates(PD and LGD), one-factor model with 99.9% VaR		
Real Estate (Commercial)	8%				
type	RBC				
	RBC1	RBC2	RBC3	RBC4	RBC5
Real Estate (Residential)	14.8% ~ 15.8% (L&H)	3.97% (P&C)	5%	10%	5% (P&C)
Real Estate (Commercial)					10% (P&C)

Note: RBC1, 2, 3 and 4 are based on the direct holdings of real estate.

RBC1 is based on the Korean L&H experience results of Ryu et al. (2002)

RBC2 is based on the Korean P&C experience results of Lee et al. (2005)

RBC3 indicates RBC in Japan (2002)

RBC4 indicates RBC in Australia GGN 110.4-9 (2002)

RBC5 is based on the NAIC's RBC reported by American Academy of Actuaries (2002)

Different regulations for operation risk are also shown in the <Table 11>. It is, however, difficult to compare two different systems.

<Table 11> RBC for Operation Risk

	the new Basel Accord			RBC	
	BIA	SA	AMA	RBC3	RBC5
Operation Risk	Gross Income X 15%	For 8 different business units; Gross Income X 12% ~ 18%	Based on the internal estimates	(Asset Risks + Insurance Risks) X 2% ~ 3%	Average of 3 month Premiums X 2%

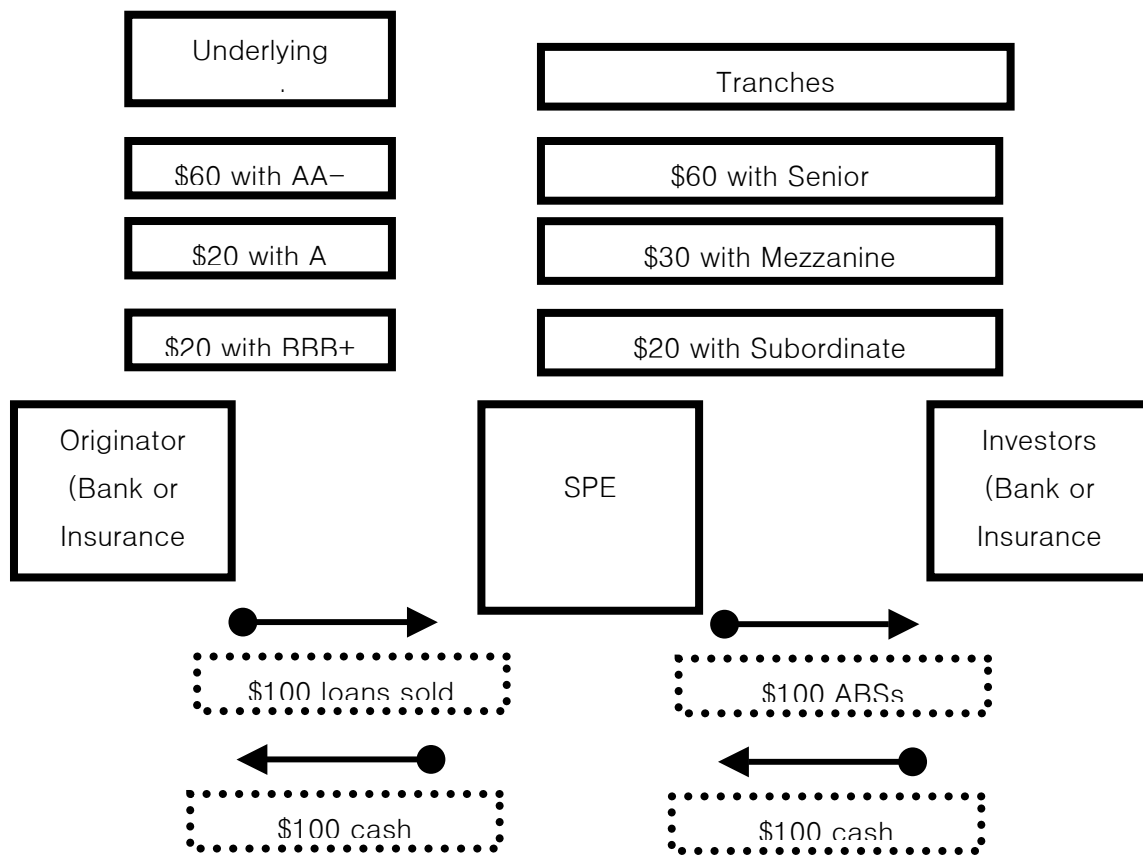
RBC3 indicates RBC in Japan (2002)

RBC5 is based on the NAIC's RBC reported by American Academy of Actuaries (2002)

5-3. Securitization and Risk Transfer

Suppose that an institution securitizes US\$ 100 of loans from its balance sheet by selling the assets to a SPE. The SPE funds this purchase by issuing US\$ 100 of ABS to third party investors. This securitization without retained risk results in the bank transferring all the credit risk of the securitized loans to the third party investors. Diagram 1 shows the basic structure of this deal.

<Diagram 1> Basic Structure of Deal



In the case of bank as an originator and insurance company as an investor, significant regulatory capital reduction (\$3.36 → \$0.57) is found. Therefore, there exists the strong incentive for the RCA with securitization. On the contrary, in the case of insurance company as an originator and bank as an investor, regulatory capital increases significantly (\$0.57 → \$42.02).

<Table 12> Results of Risk Transfer with Securitization

Originator	Underlying Assets	Ratings	Capital Requirements
Bank (*)	\$60	AA-	\$0.96
	\$20	A	\$0.80
	\$20	BBB+	\$1.60
	Total		\$3.36
Insurance Company (**)	\$60	AA-	\$0.18
	\$20	A	\$0.18
	\$20	BBB+	\$0.20

	Total		\$0.56
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Investors	Exposure	Tranches	Capital Requirements
Bank (*)	\$60	Senior	\$2.02
	\$30	Mezzanine	\$30.00
	\$10	Subordinate	\$10.00
	Total		\$42.02
Insurance Company (**)	\$60	Senior	\$0.18
	\$30	Mezzanine	\$0.19
	\$10	Subordinate	\$0.20
	Total		\$0.57

(*) the new Basel Standard Approaches are applied, assuming no rating for tranches

(**) NAIC's RBC with bond rating is applied to calculate RBC

6. Summary and Concluding Remarks

Arbitrage opportunities arising from different regulatory capital requirement applied to different kinds of financial sectors may drive the risk transfer. And the shifting of risk may increase systemic instability and reduce the efficiency of the allocation of risk. This paper aims to identify the differences between capital requirements of bank and insurance company in Korea, and to show the seriousness of regulation arbitrage leading to the systemic instability.

To achieve those goals, section 2 explores different regulatory capital regimes between banks and insurance companies. We omit the securities companies because, with the Capital Market Consolidated Act of 2006, their regulatory capital regimes would experience the quantum jump changes soon. We study the pros and cons for applying the different capital regime to banks and insurance company respectively. We find that many differences in requirements of accounting conventions, the relative roles of capital and provisions, and the relationship between the actual capital and the minimum capital requirements across the sectors. Those differences would make it difficult to undertake clear comparisons between regulatory capital frameworks across the sectors. Hence, we assert, it may mislead to focus solely on the level of minimum capital requirements in comparing the regulatory regimes across the sectors.

Since the Basel Accord governing banking industry has been relatively-well known, this paper concentrate to explore the regulatory capital regime of insurance sector. We find lots of reasons why insurance company cannot simply follow the same path as the banks have done, although banks are widely viewed as beating the insurance companies at the business of risk management. Nonetheless, we conclude, as long as the universe of risks that a bank undertakes is a subset of the universe that an insurance company undertakes, the best practices developed by banks can be used as a guide for insurance companies.

We compare the regulatory capital regimes for insurance company in major countries, and introduce Korean regulatory system in detail, which currently follows the minimum solvency margin system and prepares to move to the risk based capital (RBC) system from 2007.

Section 3 deals with the issue of risk transfer and systemic stability. Risk transfers may be desirable if they improve the diversification of risk. Or they may be undesirable if they increase the risk of financial crises. In that sense, the issue of comparing capital requirements in different financial sectors and exploring the possibility of RCA through securitization has been emphasized. We find that the results of the existing studies on the stability aspects of risk transfer seem mixed. Notably, we find that the role of insurance company in triggering systemic risk has been an important concern recently, since insurance companies actively participate in the securitization market. In short, different regulatory capital regime between banks and insurance company and the induced RCA chances through securitization raise a big concern on the stability issue. The unfortunate combination of improper regulation and RCA through securitization might trigger systemic risk significantly.

Section 4 explores the issue of financial conglomeration and integrated regulation. The effect of the conglomeration on the financial risk is open question. Diversification gets rid of the unsystematic risk and leads to the positive effect of risk reduction in the conglomerate. On the contrary, diseconomy, too-big-to-die or too-complex-to-fail phenomenon and oligopoly issues might unfortunately raise risk. Contagion among subsidiaries and the induced systemic risk is another concern for risk increase.

Overall effect on the risk held by the conglomerate can be measured effectively through

the consolidated financial statements. However, the different risk measurement system among subsidiaries makes the integrated risk measurement very difficult. Things which cannot be measured cannot be managed. We agree that the risk measurement and management of the financial conglomerate would be important task in near future.

Economic capital is used as common currency for risk measurement, irrespective of where the risk is incurred. This allows for consistent measurement of risk factors across both banking and insurance lines, addressing risk aggregation at successive levels in an organization. However, accurate treatment of correlation effect at each level of conglomerate is still a big concern. The developments of integrated capital frameworks for evaluating capital adequacy in a conglomerate context are being required. Failure for the regulator to properly supervise in this regards might lead to the regulation arbitrage and possibly increase the systemic risk.

We find that in response to the integration in the markets, there has been a substantial shift from the traditional sector-by-sector approach to supervision toward integrated financial supervision. The integrated risk supervision enhances the consistency and completeness of supervision, hence could successfully keep the market stability. The issues of contagion, double gearing, RCA through risk transfer cannot be properly handled under the current silo-based regulatory framework. Integrated regulatory framework would mitigate the adverse impact that the RCA through securitization and contagion lead to the systemic instability.

Finally, section 5 provides some numerical comparison between two different regimes' capital requirements. Since the details of the Korean RBC has not been set up completely and opened publicly yet, we provide several alternatives, including other countries' RBCs and some academic results on Korean RBC in order to compare with the Basel Accord in terms of calculating the regulatory capital. We find some significant differences and hence show the chances for RCA possibilities. In terms of securitization and risk transfer, significant regulatory capital reduction is found in the case of bank as an originator and insurance company as an investor. Therefore, there may exist the strong incentive for the RCA with securitization in Korea.

This paper contributes to raise the issue that different regulatory capital regimes across sectors may induce the RCA through securitization, leading to the systemic instability in Korea. However, we could provide neither a rigorous theoretical model,

nor empirical finding based upon the past data. We provide instead the existing literature survey on the related issues and also some numerical comparison results. We hope that future studies could extend to the more rigorous one in terms of theory and empiricism.

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