A Survey of the Literature on Banking in Korea:
A Decade on from the Global Financial Crisis

Dohan Kim
University of Pennsylvania

Wook Sohn*
KDI School of Public Policy and Management

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Abstract
This paper reviews recent studies on banking in Korea by classifying a substantial body of literature into three categories – the role of banks in the real economy, the efficiency and performance of the banking industry, and regulatory and policy issues. This paper differs from previous survey literature in that it offers a comprehensive systematic literature review of banking studies in Korea in a decade on from the global financial crisis and presents statistics of research articles on various topics in banking published in major economics and finance journals. We find the rising trend of banking research across all subjects, and in particular, dramatic increases around the global financial crisis. This paper also reveals a lack of studies on several topics such as distributed ledger technologies and central bank digital currency, recommending future research on these topics.

Keywords
Literature survey, Banking research, Korea, Global financial crisis, Banks and the economy, Banking industry, Bank regulation

JEL classification
G21, G28, G01

* Corresponding Author: wooksohn@kdischool.ac.kr, Tel: +82-44-550-1062
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I. Introduction

It has been more than a decade since the global financial crisis, and many important issues have emerged in the banking literature, as the crisis underlines the importance of banks to the economy. In particular, banks were placed in a very different environment than they were in the precrisis period due to dramatic changes in regulations and new technology developments such as fintech. Following these changes, a substantial body of literature has sprung up in banking. In this paper, we review studies on banking in Korea. This paper differs from previous survey literature in that it introduces the most recent papers, specifically those published after the global financial crisis, in the field of banking and regulation in Korea. We also provide statistics on recent trends in research themes that are explored in the banking literature.

The share of research on banking in leading journals has gradually increased over the last few decades, and the amount of banking research seems larger for those countries that have experienced severe financial crises during the period. Interestingly, the share in Korean journals increased substantially immediately after the two financial crises of 1997 and 2008. We also calculate how the share of research focusing on each subject in global journals and Korean journals has changed for the period from 1991 to 2020. The figure supports the rising trend of banking research across all subjects, and in particular, dramatic increases are observed around the global financial crisis. In the case of Korean journals, substantial increases also took place for many subjects around the 1997 financial crisis.

We classify studies into three categories: (1) the roles of banks and the real economy; (2) the banking industry; and (3) regulatory and policy-related issues. In the first part, we introduce studies on relationship banking and the effects of banks on the real economy. Banks, in fact, play many important roles in the economy, and relationship banking is one of the key roles that banks perform for the economy to mitigate the information asymmetry problem by repeatedly dealing with the same borrower over
time. The benefits and costs of relationship banking are a long-standing question in the banking literature, and studies in Korea seem to suggest that the net benefits of relationship banking are somewhat negative due to problems such as the hold-up problem and conflicts of interest. Interconnections between banks and the real economy are brought into focus, especially during crisis periods. While many studies before the crisis focus mainly on whether banks stimulate economic growth, studies after the crisis also deal with how banks contribute to economic fluctuations and inequality.

In the second part, we review research on the efficiency and performance of the banking industry and the effect of technological change and financial innovation. Measuring the efficiency of the financial system and the performance and risk management of banks, as well as identifying those factors affecting them have been popular research topics. In particular, many studies in Korea focus on the effect of bank size on the efficiency and performance of banks, as the banking industry in Korea has been consolidated and concentrated since the 1997 financial crisis. For technological changes and financial innovations, we introduce studies on the effect of P2P lending platforms, online banking, and internet-only banks on the banking industry. While much of the recent interest in technological progress is driven by distributed ledger technologies such as blockchain, we do not discuss this issue in this paper, as related studies are still scant.

In the last part, we review studies on regulatory and policy-related issues. This section covers many interesting topics that sprung up immediately after the global financial crisis. We first introduce studies on systemic risk. Since the global financial crisis, there has been enormous interest in measuring and managing systemic risk in the financial system, and various ways of measuring systemic risk have been proposed by leading global researchers. Following this trend, many researchers in Korea have tried to measure systemic risk in the Korean banking sector by modifying and improving them in various ways. We then focus on studies regarding Basel regulation and its impact and macroprudential policy. As bank regulations tightened globally and several
new policy tools and regulations were proposed as a result of regulatory efforts to improve the stability of the banking system, many related studies have emerged. In particular, the potential value of macroprudential policies is brought into focus by many researchers as well as policy-makers and regulators. The global financial crisis also led central banks to focus more on financial stability. Thus, we also cover studies on the transmission of monetary policy and the role of central banks in financial stability. Finally, studies on deposit insurance and market discipline are reviewed. Although deposit insurance is essential to ensure depositor confidence in the banking system, it may generate unintended consequences such as excessive risk-taking due to moral hazard problems and deterioration in market discipline. Many studies in Korea focus on such issues related to savings banks due to the savings bank crisis in 2011.

The rest of this paper is organized as follows. Section 2 provides the recent trends in banking research and research themes that are explored in the banking literature. Section 3 discusses the role of banks and the real economy. Section 4 covers research on the efficiency, performance, and risk management of the banking industry and the effect of technological changes and financial innovations on the banking industry. In Section 5, we review studies on regulatory and policy-related issues such as systemic risk, Basel regulation and macroprudential policy, central banking, and deposit insurance and market discipline. Finally, Section 6 concludes the paper.

II. Recent Trends of Banking Research

Before we begin our review of the research, we briefly present several interesting statistics on the recent trends in research themes that are explored in the banking literature. Figure 1 shows how the amount of research focusing on banking is associated with GDP and population. Although other important factors, such as data availability and language, must also affect it, we observe a positive relationship between the amount
of research conducted on a country and its GDP. One noticeable pattern is that the amount of banking research seems larger for countries that have experienced severe financial crises during the period than other countries. For example, when we classify countries into two groups depending on whether their share of research is above the predicted value based on GDP, countries such as Korea, Thailand, Malaysia, Singapore, Hong Kong, Spain, Italy, Greece, Portugal and Ireland, which were at the center of...
the Asian financial crisis and the European sovereign debt crisis, fall into the group whose share of research is above the predicted value.

The share of research on banking in leading journals has gradually increased over the last few decades. Figure 2 displays the trend of the share of articles focusing on banks in selected journals for the period from 1991 to 2020. Interestingly, the share in Korean journals increased substantially immediately after the two financial crises of 1997 and 2008. This trend seems attributed to the fact that the banking sector is at the center of crises, and many important research issues naturally arise to identify the cause of the crisis and develop new policy tools and regulatory frameworks to reduce the frequency and costs of future financial crises. Table 1 reveals that the rising trend can be observed in the top 5 economics journals as well as the leading finance journals. Similarly, Table 2 confirms this rising trend in leading Korean journals.1) One may
interpret this as the rising importance of banking research.

We now turn to the statistics on the trends of the share of banking research by subject: (1) relationship banking; (2) banks and real effects; (3) efficiency, performance, and risk management; (4) technological change and financial innovation; (5) systemic risk; (6) Basel regulation and macroprudential policy; (7) central banking; and (8) deposit insurance and market discipline. Using the data from the EconLit and KISS databases, we counted the number of articles in each category using selected keywords. Specifically, we find banking research by assuming that articles on banks are those that have "bank" or "banks" or "banking" in the main subject registered on the EconLit database.

Data Source: EconLit

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\[\text{Table 1} \] Statistics for global journals

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Data Source: EconLit

Among well-known Korean journals, we include journals that we can have access to the journal database through either EconLit or KISS.
or “banks” or “banking” in the main subject registered on the EconLit database or those that have keywords such as “bank” or “banking” or “lending” or “loan” or “deposit” or “monetary” or “credit” or “payment” or “interest rate” or “finance” or “financing” or “funding” or “debt” or “systemic risk” or “capital” in the title or keywords or abstract registered on the KISS database. Then, we list keywords in each subject and consider articles that have at least one such keyword in the abstracts as studies focusing on the corresponding subject. While this method has its limitations in that it may overestimate or underestimate the number of articles in each category depending on the choice of

### Table 2: Statistics for Korean journals

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Note: Each number represents the number and fraction in percentage (in parentheses) of articles on banks in each journal. ARFR: Asia Review of Financial Research, JMF: Journal of Money & Finance, KJFM: The Korean Journal of Financial Management, KJFS: Korean Journal of Financial Studies, KER: The Korean Economic Review, KKY: Kukje Kyungje Yongu, JKEA: Journal of Korean Economic Analysis, SJE: Seoul Journal of Economics, APFM: Asia-Pacific Journal of Financial Studies. Articles on banks are those that have “bank” or “banks” or “banking” in the main subject registered on the EconLit database (SJE and APFM) or those that have keywords such as “bank” or “banking” or “lending” or “loan” or “deposit” or “monetary” or “credit” or “payment” or “interest rate” or “finance” or “financing” or “funding” or “debt” or “systemic risk” or “capital” in the title or keywords or abstract registered on the KISS database (APFR, JME, KJFM, KJFS, KER, KKY, and JKEA). Note that KJFS is available only for the period from 2009 to 2017 through the KISS database.

Data Source: EconLit and KISS
keywords, it is useful to capture general trends because it has been consistently applied over the years.  

Keywords in each category are as follows: (1) relationship banking: "relationship bank", "bank relationship", "conflicts of interest", "information asymmetry", "asymmetric information", "hold-up", and "agency theory"; (2) banks and real effects: "economic growth", "real economy", "employment", "real effects", and "cycles"; (3) efficiency, performance, and risk management: "efficiency", "performance", "profitability", and "risk management"; (4) technological change and financial innovations: "fintech", "fin tech", "financial innovation", "internet", "online", "mobile", "lending platform", "blockchain", and "cryptocurrency"; (5) systemic risk: "systemic risk" and "early warning"; (6) Basel regulation and macroprudential policy: "BIS", "Basel", "capital regulation", "capital
Figure 3 shows how the share of research focusing on each subject in global journals and Korean journals changed for the period from 1991 to 2020. The figure supports the rising trend of banking research across all subjects. In particular, dramatic increases

### Table 3 Statistics by journal and subject (1991–2020)

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are observed around the global financial crisis. In the case of Korean journals, substantial increases are also pronounced for many subjects around the 1997 financial crisis.

Finally, Table 3 presents statistics for each Korean journal by subject. The overall share of banking research in selected Korean journals is 17.2%. JMF has the largest number of bank–related articles and the highest share, followed by APFR. For the statistics on specific topics, “efficiency, performance, and risk management” is the subject that has the largest share. In contrast, relatively recent research themes such as “technological change and financial innovations” and “systemic risk” are still scant.

Ⅲ. The Roles of Banks and the Real Economy

1. Relationship Banking

One of the key roles that banks perform in the economy is to ameliorate the information asymmetry problem by repeatedly dealing with the same borrower over time, which is termed relationship banking in the literature. According to Freixas and Rochet (2008), relationship banking can emerge when two conditions are met: (1) the bank offers services to its customer at more favorable terms than its competitors; and (2) contingent long–term contracts are not feasible. Yoon and Park (2014) summarize the theoretical discussions as well as the empirical studies on the costs and benefits of relationship banking. In particular, Yoon and Park (2014) conclude that the net effects of relationship banking in Korea seem somewhat negative because the Korean banking sector is consolidated and alternative financing opportunities are quite limited. Recent studies address issues related to relationship banking in various contexts and environments. Here, we introduce some of them.

Oh and Kim (2012) summarize and empirically test various capital structure theories and hypotheses, such as trade–off theory, agency theory, pecking order theory, market
timing theory, and the hold-up hypothesis, to examine which one best explains the capital structure choices of Korean listed manufacturing firms. Their panel analysis using a sample of 601 manufacturing companies for the period from 2001 to 2010 reveal a statistically negative relationship between growth opportunities and bank loans, which supports the hold-up hypothesis: bank loans are less preferred by firms with more growth opportunities because they are concerned about the monopolization of firm-specific information by banks.

The hold-up problem has been highlighted as one of the key factors that reduces the net benefit of relationship banking. Lee and Hwang (2013) and Hwang and Lee (2014) also suggest empirical evidence supporting the existence of the hold-up problem for small and opaque firms, Lee and Hwang (2013) argue that there is a hold-up problem for small firms with a single banking relationship and fast-growing opportunities due to high information asymmetry and switching costs. An empirical analysis using a dataset of 18,805 nonfinancial firms between 2006 and 2011 shows that information transparency and the quality of firms are positively associated with the probability of changing primary banks. They also find that firms change their main banks for growing credit needs, but only large firms with multiple banking relationships show an improvement in their performance after switching. Hwang and Lee (2014) show that a firm strategically concentrates its borrowing on one main bank while maintaining multiple banking relationships; this is considered the optimal financing structure in the sense that it can overcome both the hold-up problem and the possible failure of coordination among banks to some degree. They show that firms that are smaller, less transparent, more profitable, less risky and have a larger liquidation value of assets tend to show a higher level of creditor concentration, and this tendency becomes more pronounced when economic conditions are good and the level of competition in the loan market is high.

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3) The hold-up problem in the literature refers to a situation in which a relationship bank monopolizes firm-specific information and extracts rents (see Allen, Carletti, and Gu, 2019).
4) Maintaining multiple banking relationships helps reduce the hold-up problem (Von Thadden, 1992) but it may result in the failure of coordination among those banks in negotiations for loan renewals (Bolton and Scharfstein, 1996).
The above results are consistent with Lee (2009), who empirically investigates the effect of firm characteristics on firm–bank relationships using a dataset of 4,503 listed Korean firms between 2004 and 2006. The study reveals that firms with higher information asymmetries, worse performance, riskier status, higher growth and investment, and stronger financial conditions tend to rely more on the main bank. While these results can be interpreted as evidence supporting the existence of the hold-up problem for small and opaque firms, the author also suggests that banks play an important intermediary role in alleviating information asymmetry in the loan market.

Dong and Kim (2014) and Jun and Yang (2013) explore whether firms benefit from relationship banking using a micro dataset of individual loans in a certain Korean bank. Dong and Kim (2014) examine the effect of relationship banking on loan delinquency and find that relationship banking has a positive effect in that it reduces the incidence of loan delinquency even in difficult economic times and that the effect is stronger for smaller firms. Therefore, the result supports the idea that firms benefit from a strong relationship with a bank because it alleviates information asymmetry. Jun and Yang (2013), on the other hand, investigate the effect of relationship banking on the loan maturity and interest rate of small- and medium-sized enterprises (SMEs) and find that the effect differs depending on credit ratings and business periods. While SMEs with decent credit ratings and business periods of more than 6 years benefited from relationship banking, SMEs with low credit ratings and business periods of less than 6 years did not.

Kim, Lee, and Lee (2010) empirically test whether Korean banks produce meaningful information about firms for investors, which is a critical part of relationship banking. Specifically, they use a dataset of 164 public announcements of long-term bank loans by KOSDAQ firms during the period between October 2004 and March 2006 to test whether bank borrowings are considered positive signals about firms in the stock market. They suggest that the role of Korean banks in producing valuable information is quite limited, considering that they do not find any abnormal stock returns from bank loan disclosures.
Lee and Han (2013) report different behaviors in the interest rate of the consumer finance market in Korea and Japan. They argue that Korean financial consumers face lending rates that are highly concentrated at a level near the interest ceiling imposed by the government and show a smaller range of interest rates than the Japanese consumer financial market that stems from high information asymmetry in the loan market. They theoretically show that establishing information infrastructure is helpful to resolve the information asymmetry problem, thereby improving social welfare by allowing differentiated lending rates based on consumer credit.

A conflict of interest is also a crucial issue in relationship banking. Sohn and Choi (2011) and Sohn (2010) address issues regarding a conflict of interest that arises when banks acquire failed banks. Sohn and Choi (2011) find empirical evidence that a firm’s preexisting relationship increases the probability of the continuation of the relationship after banks acquire loans from failed banks. The result suggests that acquiring banks face a conflict of interest due to the preexisting lending relationship. This finding is consistent with results suggested by Sohn (2010), who examines how the market value of firms changes after banks borrowed from are forced to close and their loans are transferred to surviving banks. The study shows that the market value of those firms increases when their outstanding loans are transferred to financially sound banks because loan renewal to them can be seen as a good signal. This is because investors are aware that acquiring banks do not face the conflict of interest that stems from preexisting relationships when they decide whether to renew loans.

Kang (2012), Baek and Lim (2010), Kim, Park, and Jung (2013), and Park, Choi, and Lee (2011) explore the conflict of interest issues in investment banking. Kang (2012) develops a game-theoretic model and shows that social welfare is always lower when investment banks are affiliated with nonfinancial conglomerates because they are more likely to produce distorted information due to potential conflicts of interest. Baek and Lim (2010) investigate the effect of corporate bond underwriting activities on firm value measured by the spread between the benchmark rate and the bond issuing rate. The
empirical analysis using a sample of bond issuing activities between 2000 and 2003 shows that bonds issued through security firms affiliated with commercial banks tend to exhibit lower spreads than bonds issued through other security firms. Kim, Park, and Jung (2013) find that investment banks show opportunistic behaviors in overnight block trades in that they tend to pursue their own profit maximization at the expense of sellers’ best interest. Finally, Park, Choi, and Lee (2011) show that a conflict of interest arises in IPO (Initial Public Offering) underwriting and asset management activities when an IPO underwriter sells a fund managed by its affiliate asset management company. Overall, studies support the “conflict-of-interest view” in the Korean financial system.

2. Banks and Real Effects

This section reviews studies on the effects of banks on the real economy. Interconnections between banks and the real economy are brought into focus, especially during crisis periods. Berger, Molyneux, and Wilson (2020) review research on this topic, focusing mainly on the U.S. and Europe and conclude that studies generally suggest that banks have positive effects on the real economy. We introduce studies in Korea on three aspects of this issue: economic growth, economic fluctuations, and inequality.

Economic Growth

Whether banks benefit, or hinder, real economic growth has been the subject of considerable debate. While many studies support the finance–growth nexus view that banks stimulate economic growth (see, e.g., King and Levine, 1993; Levine, 2005; Berger et al., 2004; Demirgüç–Kunt and Maksimovic, 1998, 2002), some researchers argue that there is a nonlinear relationship between them and that too much finance may hinder economic growth due to problems such as the misallocation of resources and more frequent financial crises (Rajan, 2005; Arcand et al., 2015; Sahay et al., 2015).
Yoon and Park (2014) survey studies in Korea and concluded that the effects of banks on the real economy in Korea are insignificant or even negative. They conjecture that this result may stem from the fact that banks have superior negotiating power over borrowers in Korea, that the government has a significant influence on bank behavior, and, simply, that the data used by many studies include the 1997 financial crisis. Lee and Ha (2012), on the other hand, argue that financial development has stimulated economic growth in Korea through investment channels. However, they also point out that value-added services such as information production, monitoring, and risk management that lead to technological innovations and productivity improvement are insufficiently developed.

Park, Park, Park, and Park (2018) focus on the disparity between finance and growth in Korea and examine the factors causing it. Analyses using industry-level panel data suggest that inefficient resource allocation of finance, increasing household lending, firms’ risk aversion tendency, and structural weakness of the financial system contributed to the observed disparity. In particular, they argue that economic growth based on further financial deepening is unlikely to take place in Korea.

Some studies focus on whether banks stimulate firm growth and productivity. Song and Kim (2016) explore the heterogeneous effect of financial development on firm growth using data from 1,619 manufacturing firms for the period from 2001 to 2013. They show that financial development is more beneficial for large and old firms than for young and small ones. On the other hand, Jang and Kim (2017) find that the positive productivity effect of bank lending is stronger for small and younger firms than for large and older firms using a dynamic panel model for 50,959 micro firm–year panel data of Korean Venture SMEs from 2006 to 2014. They also suggest that the positive productivity effect is stronger in periods of financial crisis due to tighter financial constraints.
Economic Fluctuations

The global financial crisis led to a surge in research aimed at understanding the causes and consequences of the financial crisis, and the role of banks in economic fluctuations is brought into focus. In particular, banks’ procyclical behavior of providing too much credit during booms and too little credit during downturns to the real economy is blamed for amplifying economic fluctuations (see, e.g., Adrian and Shin, 2010; Adrian and Shin, 2014). Several studies in Korea focus on this issue and explore factors generating the procyclical behavior of banks.

Yoon and Park (2009) study procyclicality in banks’ funding and lending under informational asymmetry. Informational asymmetry emerges in their model because only the bank can observe the true profitability of loan applicants. When investors are assumed to use the PiT (point-in-time) method to evaluate a loan portfolio, it gives rise to the procyclicality of the bank loan supply. For example, during the downturn from the top of a business cycle, investors overvalue loan portfolios. As a result, equity financing becomes cheaper, and banks prefer equity financing. Then, banks end up providing too much credit to the economy by issuing less profitable loans. Likewise, banks provide too little credit to the economy during the upturn from the bottom of a business cycle. Finally, they argue that this procyclicality can be mitigated significantly when investors use the TTC (through-the-cycle) method instead of the PiT method. They posit that the internal ratings-based (IRB) approach in Basel II is associated with the TTC method.

Hahm, Cho, and Kwon (2015) find that the backward-looking nature of the credit scoring system can contribute to the procyclicality of household debt over the business cycle by using micro-credit bureau data. Then, they build a macroeconomic adjusted credit scoring model in which the credit score is adjusted over the business cycle. They show that the model substantially mitigates the procyclicality problem.

Seoh (2011) argues that herding behavior resulting from collective intelligence that leads banks to adopt a similar business model for self-preservation was one of the
driving forces behind a sharp increase in household lending in Korea since the 1997
financial crisis. The author also points out a structural decrease in funding demand
from the corporate sector following the 1997 financial crisis and the distortionary effects
of Basel II risk weighting in which risk weights are much lower for mortgage loans
than for corporate loans induced banks to turn their attention to household lending.

**Inequality**

Finance can play a critical role in reducing income and wealth inequality but may
contribute to greater inequality depending on how the financial system is managed
(Čihák and Sahay, 2020). In this regard, it is important to understand whether the
current financial system reduces inequality. However, there are few studies on this
topic in Korea.

Jung and Lee (2012) propose a lending market model and test the model using data
from international commercial microfinance institutions to study lenders’ behavior for
low-income and less creditworthy individuals. They find that market inefficiency due
to imperfect information is not the principal factor that prevents low-income borrowers
from accessing finance because the average loan loss rate (1.5–2.5%) and ROA (over
1%) are viewed as reasonable levels. Instead, they show that operating cost is the main
factor that drives up the lending rate and that high operating costs are attributed
to the small size of loans and the low number of outstanding loans.

Kim and Won (2016) examine the effect of household financial debt on the income
distribution using a dataset of the income and debt of 500,000 individuals provided
by the Korea Credit Bureau (KCB) for the period between 2008 and 2014. The result
shows that a household with a higher nonbank debt-to-income ratio tends to move
down to lower-income groups. They argue that it is important for policy-makers to
pay attention to the trend of nonbank debts and policies that expand high-cost credits
to households to reduce income inequality, which may, in fact, exacerbate it.
IV. Banking Industry

1. Efficiency, Performance, and Risk Management

Measuring the efficiency of the financial system and the performance and risk management of financial institutions, as well as understanding the factors affecting them, have been popular research topics. Bank performance and efficiency depend on various factors, such as legal and regulatory environments and economic development. Many studies have also focused on how bank size is associated with bank performance and risk management. In particular, the effect of bank size on the efficiency and performance of banks has been an important issue in Korea because the Korean banking industry has been consolidated and become more concentrated since the 1997 financial crisis.

Empirical studies using a dataset of banks across countries support the existence of economies of scale in the banking industry; they also show, however, that inefficiencies may result if bank size expands excessively. Park, Suh, and Hahm (2010) use a Bankscope dataset of 8,404 banks across countries from 1991 to 2008 and find positive effects of bank asset size expansion on bank profitability and earnings stability. However, they show that the positive effects decrease and even become negative as assets increase immoderately. Kim and Choi (2013) argue that there are both positive and negative effects of the expansion of bank asset size on the banking industry based on empirical analyses using a Bankscope dataset of 2,153 banks in 43 countries for the period from 1997 to 2012. The study reveals that bank profitability measured by ROA and its capital adequacy ratio decrease in asset size, but asset soundness and the liquidity ratio increase with asset size. However, they find that the effects of bank size on the bank risk differ depending on the systemic size of the bank. In particular, asset expansion of systemically large banks turns out to be associated with increased risks. Park, Suh, and Park (2013) also find that excessive loan growth reduces bank profitability but
increases bank risk using Bankscope panel data across 19 countries covering the period from 1999 to 2007. Overall, the above studies imply that an optimal bank size may exist depending on the characteristics of the banking industry and the economic development of each country.

According to Hughes, Mester, and Moon (2001), studies that explore the effect of banks’ economies of scale need to incorporate endogenous risk-taking behaviors into the analysis because better diversification achieved by economies of scale may lead to higher levels of risk-taking. Motivated by this argument, Hahm (2012) studies the effects of bank consolidation and conglomeration since the 1997 financial crisis on the risk and cost efficiency of Korean banks using a sample of 19 Korean banks from 1999 to 2009. The empirical analysis shows that the economies of scale effects become weaker or even disappear once risk factors such as equity capital, nonperforming loan ratio, and liquidity ratio are considered in the cost function. The author claims that banks need to strengthen internal control and risk management capacities at the individual bank level as well as at the level of the financial conglomerate.

One of the main concerns with the consolidation of the banking system is that it may lower competition and increase risk in the banking industry. Shin and Kim (2013) address this issue and find evidence to the contrary. They examine the degree of bank consolidation and competitiveness in the Korean banking industry for two time periods: 1992-1996 and 1999-2007. While the result supports the existence of monopolistic competition in the market, they also find that competitiveness in the banking industry has improved due to increased market concentration.

In a recent study, Kang and Lee (2020) argue that the Korean banking industry has become less efficient since 2006 and that an expansion in asset size does not improve efficiency. The efficiency in this study is measured based on DEA (data envelopment analysis) using the number of employees, fixed assets, and interest expenses as input variables and outstanding loans and net profits as output variables. They suggest that an increase in the number of employees and improvement in profitability and soundness
may contribute to improving efficiency.

Along with the consolidation in the banking industry, understanding how economies of scale through diversification of business activities affects the banking industry was important as the Korean government enforces the Financial Investment Services and Capital Markets Act in 2009 to promote innovation and competition in the financial sector. Lee, Kwak, Park, and Park (2009) focus on this issue. Specifically, they examine the effects of income diversification through increasing non-interest income on bank performance and risk by using a Bankscope data set of 3,220 banks from 66 countries for the period from 1993 to 2007. They find that increasing non-interest income improves bank’s performance and capital adequacy but increases default risk and the volatility of earnings. In particular, it may deteriorate the asset quality because banks have less incentives to manage the quality of assets than they rely more heavily on the interest income.

Other than economies of scale, many factors affect bank efficiency and performance. For example, some studies examine the effect of bank managers on efficiency and performance. Kang and Bae (2018) empirically find a positive relationship between the terms in office of executive officers and the performance of banks. The result may be driven by the possibility that short terms induce short-sighted decision-making. Jeon and Sonu (2012) provide empirical evidence that stock options granted to CEOs increase banks’ efficiency and value using the stock options data of 10 large Korean banks from 2000 to 2009.

Risk management is one of the key activities for banks, and researchers, in general, support the idea that strong risk management is associated with improvement in the efficiency and performance of banks. For example, Cho (2016) studies how risk management affects the risk and performance of Korean banks during the period between 2000 and 2013. The author argues that strong risk management can restrain banks’ risk-taking behavior. Regarding performance, strong risk management lowers ROA during normal periods but enhances it during recessions, Han (2020) also provides
empirical evidence for the positive effect of interest rate risk management on profitability based on analyses covering 33 commercial banks and financial holding companies listed on the Korea Exchange from 1995 to 2017. In particular, the positive effects turn out to be stronger for banks with more growth opportunities and during periods of contraction and higher interest rate volatility.

The stock returns of banks may capture the efficiency and performance of those banks. In this regard, it is meaningful to investigate factors that affect the rate of stock return of banks. Nah and Baek (2018) find that the yield ratio of the KOSPI has the largest impact on the rate of stock returns of domestic banks and four major financial holding companies and that fluctuations in the exchange rate lower the rate of stock returns. In addition, while the variation of interest rate affects the volatility of the rate of stock return, the interest rate itself does not have a significant impact. A revised GARCH-M model is employed for the period from 2003 to 2017. Baek, Baek, and Cha (2011) use Fama–French’s three-factor model to examine common risk factors in Korean bank stocks from 2000 to 2010. The analysis suggests that the market beta is a key risk factor that explains the stock returns of Korean banks, but the size factor has little explanatory power. Kim (2018) finds that bank managers smooth income through provisioning and adjust loan loss provisions (LLPs) to manage the capital ratio. In particular, the study shows that stock prices fall in response to increases in bank managers’ discretionary provisioning because investors interpret this as a deterioration in the quality of assets.

Finally, we introduce some studies focusing on the performance of savings banks. Kim, Park, and Oh (2019) empirically find that savings banks are more likely to go bankrupt when they have a more concentrated loan portfolio and mega loans, defined as loans above 1 billion won. Sohn and Sim (2014) show that high loan growth rates and the post-examination actions taken by supervisory authorities increase the probability of the Prompt Corrective Action (PCA) of supervisory authorities, which typically leads banks to default. Jung and Lee (2016) find a financial synchronization
phenomenon within the savings bank group and argue that it is important to consider affiliated entities of a savings bank group as a single financial institution when evaluating their performance and associated risks. Park and Jung (2015) empirically show that the risk of savings banks is positively associated with the share of controlling shareholders.

2. Technological change and financial innovation

Technological changes and financial innovations have affected the nature of banking over the last few decades. Before the global financial crisis, the main focus was on innovations in banking products and processes, such as asset securitization, online banking, the growth of debit and prepaid cards, and risk management tools. Recent changes, however, are influenced by the development of fintech and involve new organizational forms such as internet-only banks and P2P lending platforms. While the literature is still scant, we introduce some studies focusing on P2P lending platforms, online banking, and internet-only banks.

P2P Lending Platforms

Lee (2018) and Park and Ryu (2020) theoretically analyze the impact of the introduction of P2P lending platforms on the loan market. Lee (2018) examines whether P2P lending platforms can substitute and/or complement the intermediary financial role of traditional banks. The study shows that P2P lending platforms can substitute bank loans and complement the role of banks in the loan market by offering loans to borrowers rationed by banks. This theoretical result stems from the assumption that P2P lending platforms can generate profits from direct intermediation between investors and borrowers without assuming borrowers’ credit risk. Park and Ryu (2020) focus on reverse factoring5) services offered by P2P lending platforms. In particular, they compare the discount rates of

5) Reverse factoring is a type of supply chain finance service that allows companies to exchange accounts receivable for discounted cash.
reverse factoring services provided by banks and P2P platforms. According to their model, the financier that can offer a lower discount rate differs depending on market conditions. Specifically, P2P platforms can offer a lower discount rate in situations where market conditions are less favorable for retailers, the retailer's liquidity preference is lower, P2P investors are less risk averse, and P2P investors can estimate credit risk more accurately. They conclude that the fact that P2P platforms offer services at a higher discount rate than banks in 2019 may suggest that P2P investors overestimate credit risk due to inherent information asymmetry in the P2P lending market. Therefore, policies that mitigate information asymmetry in the P2P lending market are required to develop P2P financing as alternative financing for small businesses with financial constraints, thereby promoting the growth of the e-commerce market.

Kim, Park, Lee, and Choi (2013) and Seon and Han (2020) empirically examine factors explaining investment decisions and loan repayment in P2P lending platforms. Kim, Park, Lee, and Choi (2013) explore factors affecting P2P lending repayment using a dataset of 542 loans from a leading crowdfunding company in Korea for the period between June 2008 and November 2010, and find three interesting empirical results. First, there is a positive relationship between borrowers' personal bankruptcy experience and the probability of loan repayment. They find that this stems from the fact that people with poor credit have an incentive to repay loans because they can improve their credit ratings through online P2P lending platforms. Second, the success of loan repayment increases when people borrow for essential living expenses such as housing and medical expenses. Finally, active social interaction between borrowers and lenders is positively associated with the success of loan repayment because it can help reduce information asymmetry and establish trust between borrowers and lenders. Seon and Han (2020), on the other hand, study the effect of investment information on investment decisions in P2P lending platforms by comparing four P2P lending platforms in the United States, the United Kingdom, and Korea from 2007 to 2017. They find evidence that supports the importance of offering reliable borrower information to investors.
to mitigate asymmetric information problems. They argue that the government should lead domestic P2P lending platforms to provide reliable credit-related information about borrowers to develop a small business P2P lending market in Korea.

The above studies emphasize the importance of mitigating asymmetric information problems to developing P2P lending platforms. This argument is also supported by Ju, Lee, Yang, and Ryu (2016) who evaluate the current status of the Korean fintech industry by comparing it to foreign cases such as the United States, the United Kingdom, and China. They also address institutional issues and policy challenges in the Korean fintech industry in detail and provide various policy recommendations.

**Online Banking and Internet–Only Banks**

Studies related to online banking tend to focus on the determinants of bank adoption and its impact on bank performance. For example, Kim and Chun (2016) studied the effect of the internet and mobile banking on the profitability of banks by using data from 17 banks from 2001 to 2014. The results show that the widespread use of the internet or mobile banking has had no meaningful impacts on the profitability of banks. According to Kim and Chun (2016), related studies in Korea are scarce due to the lack of data, while there are many international studies. A comprehensive literature review of international studies can be found in Kim and Chun (2016).

Jun and Yeo (2015) and Song and Yang (2020) address issues regarding the introduction of internet–only banks. Jun and Yeo (2015) theoretically analyze the effect of the introduction of internet banking on the domestic banking industry by using industrial–organizational approaches. They consider the effects of consumer switching costs and network externalities on competition and consumer welfare. They find that whether consumer welfare increases or decreases depends on the degree of substitution of cross–products. For example, consumers using only some individual services may be worse off due to the high burden of costs. Song and Yang (2020) theoretically analyze how deregulation of the separation of banking and commerce in response to the emergence...
of internet banking affects competition and soundness in the banking industry. In particular, they focus on the adverse selection problem over the quality of prospective participants following deregulation. They argue that a combination of strengthening credit exposure constraints and relaxing the shareholding limit improves social welfare.

Han, Jun, and Kang (2017) theoretically examine the effect of fintech prepaid services on competition and stability in the banking sector. They show the importance of an asymmetric competitive environment to financial stability. According to the model, financial stability improves only when fintech prepaid services are introduced in both deposit and loan markets because it ensures asymmetric competition in both markets.

V. Regulatory and Policy Related Issues

1. Systemic Risk

Since the global financial crisis, there has been enormous interest in measuring and managing systemic risk in the financial system. The global financial crisis has highlighted that the spreading of distress caused by interconnectedness and spillovers across financial institutions gives rise to systemic risk. Although systemic risk is an abstract concept that is difficult to define or measure accurately, developing a reliable measure is necessary to mitigate the risks and costs of systemic crises.

Due to its inherent importance, various ways of measuring systemic risk have been proposed by leading researchers. For example, Adrian and Brunnermeier (2016) developed conditional value at risk (CoVaR) as a measure of systemic risk, which captures a statistical tail dependency between a financial institution and the whole financial system. Specifically, it computes the contribution of a particular financial institution to systemic risk based on the variation in the value at risk of the financial system under the assumption that the institution is in distress. On the other hand, Acharya et al. (2017) and Brownlees...
and Engle (2017) adopt different methodologies. Acharya et al. (2017) measure the contribution of each financial institution to systemic risk based on its systemic expected shortfall (SES), which is defined as its propensity to be undercapitalized when the whole financial system is undercapitalized. Brownlees and Engle (2017) introduce SRISK, defined as the expected capital shortfall of a financial institution conditional on an intense market decline. Researchers in Korea have tried to apply those concepts to measuring systemic risk in the Korean banking sector by modifying and improving them in various ways. Kim (2013) surveys a variety of systemic risk measures proposed in the literature in detail. We introduce some of them here.

Lee (2011) and Lee, Lee, and Lee (2013) focus on capturing interdependence among financial institutions by computing the conditional probability of default or the joint probability of distress. Specifically, Lee (2011) proposes the conditional probability of default (CoPD), defined as the probability of default of a bank when other banks go bankrupt, as a measure of systemic risk. Lee (2011) uses Monte Carlo experiments to show that CoPD can overcome possible measurement errors on tail dependence with CoVaR. Lee, Lee, and Lee (2013) estimate systemic risk using the Vine Copula method. They compute the joint probability distribution of default in the banking sector using the Vine Copula and then calculate the Joint Probability of Distress (JPD) and the Banking Stability Index (BSI) from the joint probability distribution. They show that the Vine Copula method considers that interdependence among financial institutions may vary over time.

Yi (2017), similar to the above two studies, measured systemic risk by various variables, such as the joint probability of default (JPoD) and the marginal expected shortfall (MES). Suh (2011), on the other hand, measures the systemic risk of the Korean banking sector based on option pricing methods to capture banks’ asset return dynamics and their correlations. Under the framework, systemic risk is measured with the ratio of the number of default banks to all banks and the share of the debt amount of default banks to all banks,
Some studies propose an indicator that can be interpreted as a measure of systemic risk. For example, Kim, Choi, and Hyung (2013) developed a spillover index model based on the index proposed by Diebold and Yilmaz (2009) to understand the spillover effect of credit risk between financial institutions. They show that the spillover index rises dramatically during the global financial crisis. Interestingly, they find that credit risk spillover within the banking system as well as between S&L and the banking sector is not high. Kim, Kim, and Ahn (2017) construct an implied pseudoleverage measure for six domestic systemically important banks (D-SIBs) in Korea between 2006 and 2013 using a structural credit risk modeling approach. The implied pseudoleverage driven from stock and credit default swap (CDS) market information can be interpreted as a systemic risk indicator. Lee, Um, and Mok (2020) develop a financial stability index and empirically examined how the increase in financial instability contributes to macroeconomic downside risks. The noise-to-signal-ratio comparison shows that the financial stability index based on the two-step dynamic factor model estimation excluding the real economy and credit blocks performs the best as an early warning indicator among various indices. The multiquantile regression result shows that macroeconomic downside risks increase in response to the increase in financial risks.

Along with developing a measure of systemic risk, it is critical to identify the factors that contribute to increases in systemic risk. Several factors have been emphasized in the literature. For instance, Lee (2011) shows that the BIS capital ratio and the FX liquidity ratio are the major factors that affect systemic risk with a lead of two or three quarters. Suh (2011) argues that the common factor measured by the banking sector stock index turns out to be important in measuring systemic risk by showing that systemic risk can be underestimated when the common factor is not considered. Shin, Kim, and Kim (2016) suggest that the homogeneity in asset compositions across large banks increases the probability of systemic risk. While the above studies use the balance sheet or stock market information of banks, Yi (2017) uses a micro dataset of 500,000 household borrowers to examine the effect of loans of vulnerable households, characterized by low credit
scoring, multiple loans, and excessive loans, on systemic risk. Empirical analyses indicate that the loan balance increase in vulnerable households Granger-causes the increase of systemic risk with a time lag of four months. Among others, the danger of heavy reliance on nondeposit liabilities has been highlighted by several studies. Kim, Kim, and Ahn (2017) show that the ratio of nondeposit liabilities to total liabilities is the key determinant of systemic risk. They also find that the relationship between commercial and industrial loans and nondeposit liabilities is positive during boom periods but negative during crises, indicating the contribution of nondeposit liabilities to credit cycles. Suh, Park, and Shin (2010) also find that the risk level of a bank that relies heavily on wholesale funding is more likely to increase during a liquidity crisis.

There are also other studies that do not address systemic risk directly but are related. For example, Kang (2010) investigates factors that determine the wholesale funding ratio, which was found to be one of the main factors affecting systemic risk. The empirical analyses reveal that the wholesale funding ratio of a bank increases in its market share and GDP growth but decreases in its core capital ratio, NPL ratio, and the number of branches. Kim, Kim, and Lee (2020) find that a change in the debt affordability of households, which can be measured by the debt-to-income (DTI) ratio, is the key determinant of the delinquency probability using a borrower-level micro dataset from the Korea Credit Bureau (KCB) from 2012 to 2016. Yi (2019), on the other hand, suggests that the credit score is the most significant factor that affects household loan default, and the default probability of household borrowers increases by 0.4 percentage points in response to 3 percentage point increases in interest rates and 15 percent decreases in housing prices.

2. Basel Regulation and Macroprudential Policy

Basel Regulation

It was apparent that the existing bank regulatory framework needed to be reformed
after the global financial crisis. Regulators and policy-makers around the world have proposed various changes to bank regulations to ensure the financial stability of banking systems. In particular, Basel III, which requires enhanced quality and quantity of capital as well as sound liquidity risk management, has been endorsed internationally. Following this global trend, Korea has tightened financial regulations. For example, the phased introduction of Basel III-based capital regulations on domestic banks was initiated in 2013, and the liquidity coverage ratio (LCR) was implemented in 2015. In addition, capital conservation buffers and capital surcharges for domestic systemically important banks (D-SIBs) were imposed in 2016, and the net stable funding ratio (NSFR) and leverage ratio were implemented in 2018 (see BOK 2018).

Researchers have tried to understand the effects of introducing such regulations on the financial system as well as on real activity and report that there are corresponding costs and benefits. Oh and Choi (2009) find that BIS regulation led to improvement in the soundness of credit loans because banks put more effort into screening borrowers, but it also contributed slightly to economic stagnation due to the credit crunch. Their analysis focuses on the period between 2000q1 and 2009q1 and uses the fact that the BIS standard was strengthened in late 2002 in Korea. As a more recent study, Cha (2018), who focuses on the macroeconomic cost of strengthening bank capital regulation using a quarterly dataset from 1999 to 2017, also confirms a trade-off between economic stability and economic growth. The empirical results show that the net benefit of bank capital regulation decreases as regulations are tightened because excessive regulation has a detrimental effect on economic activity by raising the lending rate.

Some studies call attention to a potential problem that may arise when Basel III regulation or similar regulations are implemented rapidly or too tightly. Yun and Kim (2015) show that banks’ short-term deposit ratio has increased due to the prolonged low interest rates in advanced countries as well as to rising stock and housing prices. Therefore, banks’ efforts to satisfy long-term liquidity ratios in a short period of time may lead to an unexpected disruption in the financial market. On the other hand,
Binh, Kang, and Jung (2015) discuss the potential vulnerability of the reform of the NCR system implemented by the Korean Financial Authority since 2014. While they support the tightened regulation of SIFIs (Systemically Important Financial Institutions) to prevent systemic risk, they point out that it should not be used to regulate small brokerage firms whose risk contribution is small. Kim and Park (2018) empirically analyze how tightened regulations on loan classification standards and provisioning requirements for Korean savings banks that took effect gradually from April 2017 to January 2020 affect bank risk. The result shows that for almost all savings banks, tightened regulation increases risk, measured by the Z-score, due to lower returns on assets and higher nonperforming loan ratios. They recommend capitalization to manage increased risk.

Kang (2010) and Suh (2010) theoretically analyze how financial regulation affects liquidity risk and financial systemic risk. Kang (2010) shows that tightening BIS capital regulation, raising the core capital ratio, and imposing bank taxes on nondeposit liabilities can reduce liquidity risk and curb banks’ risk-taking behavior. On the other hand, strengthening leverage ratio regulations and imposing a tax on bank profits can increase liquidity risk by inducing banks’ risk-taking behavior due to the moral hazard problem. Suh (2010) asserts that regulation policies for macroeconomic stability during a severe downturn may aggravate financial stability and may lead to financial instability in the future if economic recovery is delayed.

Yu and Ryu (2020), on the other hand, focus on the effect of subordinated debt issuance on bank profitability and insolvency risk, which was one of the significant issues for policy-makers and regulators, as the introduction of the Basel III capital framework may affect banks’ incentive to issue subordinated debt. They find that the effects of subordinated bond issuance on bank profitability, measured by ROA and ROE, and insolvency risk, defined as the distance-to-insolvency Z-score, are negative because it raises interest expenses. However, the negative effects were significantly mitigated after the introduction of Basel III in 2013.
Macroprudential Policy

While financial stability was generally regarded from a microprudential perspective before the global financial crisis, it has been mainly considered from a macroprudential perspective since then. This is because the potential vulnerability of the financial system may be overlooked when it is treated as simply the sum of its parts. This recognition led to greater interest in the potential value of macroprudential policies\(^6\) that aim to curb the buildup of systemic risks and mitigate the adverse impact of financial instability by complementing microprudential regulations. In particular, macroprudential tools are designed to limit bank risk-taking, thereby reducing the probability of a financial crisis.

As a result, macroprudential policies have been widely used across countries to address financial stability concerns in recent years (see, e.g., Claessens, Ghosh, and Mihet, 2013; Akinci and Olmstead–Rumsey, 2018). However, our understanding of the effectiveness of these policies is quite limited: neither has the literature reached a clear consensus about how effective the policies are (see, e.g., Altunbas, Binich, and Gambacorta, 2018; Akinci and Olmstead–Rumsey, 2018). In fact, there are two critical challenges for implementing macroprudential policies. One key challenge is to measure the effectiveness of these policies. In particular, it is critical to understand how such policies affect bank lending and risk-taking behavior. The other challenge is to determine when such tools need to be tightened or loosened to dampen the economic cycle.

Igan and Kang (2011) find such evidence for the effectiveness of LTV and DTI limits in Korea, suggesting that LTV and DTI limits can be effective tools to curb real estate booms and the associated risks. The empirical analyses exploiting the variation across regions with different LTV/DTI limits in effect at different points in time show that transaction activity falls significantly with a lag of approximately three months and price appreciation slows down with a lag of approximately six months following the tightening of LTV and DTI limits. In particular, LTV regulation turns out to be more

\(^6\) Specifically, macroprudential policies include policies that aimed at the borrowers (e.g., limits on loan-to-value (LTV) and debt-to-income (DTI) ratios) and policies that focus directly on the banking sector (e.g., countercyclical capital buffer (CCyB), and dynamic provisioning).
effective in terms of influencing house price dynamics by curbing speculative incentives than DTI regulation. Park and Bang (2012) also support the usefulness of macroprudential policies such as LTV and DTI ratios in stabilizing house prices. They first find a significant long-run relationship between house prices and bank lending for the period from 1986 to 2010 and then use a causality test to show that they affect each other. Based on this finding, they argue that such tools can be used to curb bank lending and, thereby, housing prices.

Choi and Park (2015), on the other hand, suggest the use of indirect regulatory tools such as the loan-to-income (LTI) ratio that limits the share of excessive loans because it allows banks to assess and screen borrowers with low default risk. Empirical analyses using individual data of 165,463 mortgage loans provided by Korea Housing Finance Corporation (KHFC) from June 2010 to December 2012 show that both LTV and DTI significantly affect the default rate of individual mortgage loans, but their statistical explanatory power was substantially lower than that of the credit rating of borrowers. Therefore, indirect regulatory tools that allow banks to screen borrowers effectively are recommended.

Kim and Lee (2014) empirically verify the important role of the credit-to-GDP ratio and the credit-to-GDP ratio gap as an early warning indicator by using quarterly credit data. They find that the credit-to-GDP ratio can be used for predicting currency crises and that the ratio gap is useful in banking crisis prediction. Based on these findings, they argue that these indicators can be used for central banks to implement macroprudential policies. Park and Lim (2018) assert that macroprudential policies such as dynamic loan loss provisions and Countercyclical Capital Buffers should be implemented based on the credit cycle rather than the economic cycle because the loan insolvency rate is more associated with the credit cycle than the economic cycle.

As capital control is often used to complement macroprudential policies in developing countries to stabilize capital flows, some studies focus on the effectiveness of capital controls on stabilizing capital flows. Kim, Yang, and Oh (2014) find that capital controls
and prudential measures affect capital flows with a 3– to 5-month time lag in Korea. The result supports the idea that capital controls and prudential measures can be important policy tools for developing countries to mitigate economic shocks from abroad. Hong and Hong (2015), on the other hand, study the effectiveness of such tools on mitigating the volatility of international capital flows for emerging market economies using a panel dataset of 28 countries for the 2005–2013 period. Similarly, they find that macroprudential measures and capital controls are helpful in terms of reducing capital inflows and bank lending.

3. Central Banking

The Transmission of Monetary Policy

Studies examining the effectiveness of the bank lending channel of monetary policy report that this channel has been weakened since the late 1990s. Kim and Yie (2009) argue that, since the 1997 financial crisis, firms have relied more on internal funding sources and issuing bonds than on bank loans to maintain financial soundness. They examine the period from 1991 to 2008 using a dynamic stochastic general equilibrium model with a financial sector that allows firms in the model to finance their investment through either bank loans or bond issuance. Chai (2017), on the other hand, points to the change in the monetary policy framework of the Bank of Korea (BOK) in 1998 from monetary targeting to inflation targeting. The Granger causality test shows that the BOK was able to control bank loans by adjusting the monetary base under the monetary targeting framework, but it became harder for it to affect bank loans since it adopted the inflation–targeting framework. In fact, reverse causation, from bank loans to the monetary base, is observed during the inflation–targeting period. In addition, the impulse response analysis shows that a positive shock to the policy rate does not have a meaningful impact on bank loans during the inflation–targeting period.

The risk–taking channel of monetary policy, which refers to the impact of monetary
policy on the perception and pricing of risk by economic agents, has been explored by many leading global researchers since the global financial crisis (e.g., see Borio and Zhu, 2012; Bruno and Shin 2015). Previous studies show that low interest rates can promote risk-taking by encouraging asset managers in financial institutions to search for yield (Rajan, 2005) or through valuation effects that boost collateral values and thereby lead to a higher leverage of financial institutions (Adrian and Shin, 2009). Kim (2014), Choi and Yoon (2018), and Kim and Jung (2019) find that the risk-taking channel of monetary policy is significant in Korea. Kim (2014) shows that banks are taking greater risks, measured by credit default swap (CDS) premiums, in the period of low interest rates, Choi and Yoon (2018) find a significant inverse relationship between proxy variables of monetary policy stance and bank risk. They also suggest that the balance sheet channel and bank lending channel of monetary policy may affect bank risk. Kim and Jung (2019) examine how monetary policy affects banks’ risk-taking behavior through their profit and asset structure. They show that short-term interest rates are negatively associated with the risk level of a bank, measured by the risk weight driven by its BIS capital ratio. Similarly, Lee (2010) finds that prolonged low-interest rates since 2002 contributed to a sharp increase in the supply of bank credit in the run-up to the global financial crisis by boosting bank profits and capital over time.

Yun (2011) finds asymmetric responses of commercial bank lending and deposit rates to changes in the policy rate using a linear VAR model and a threshold VAR model for the period from 1999 to 2010. The impulse response analysis shows that both lending and deposit rates are upwardly rigid in response to the change in the policy rate, but the lending rate is more rigid than the deposit rate. In particular, the deposit rate falls more than the policy rate decreases. Therefore, a rise (fall) in the policy rate narrows (widens) the lending–deposit rate spread. In sum, the analysis shows that bank lending and deposit rates respond asymmetrically to the change in the policy rate. Since this may imply an asymmetric relationship between monetary policy and
real economic activity, this asymmetric effect should be taken into account when examining the monetary policy transmission mechanism.

The role of financial stability

The global financial crisis has led central banks to focus more on financial stability. This is in sharp contrast to the prevailing view before the crisis. The standard view supports a dichotomy between monetary policy and financial stability policy. However, there is now little support for this conventional perspective on the interaction between monetary policy and financial stability, and the importance of the financial stability role of central banks has been highlighted since the global financial crisis (Mishkin, 2019).

This new view has also been widely supported by many researchers in Korea. For example, Jung, Shin, and Park (2009), Kim, Kim, Kim, Kim, and Shin (2017), Kang (2018), and Ha (2017) support the idea that strengthens the role of the Bank of Korea in contributing to financial stability. Specifically, Jung, Shin, and Park (2009) discuss how to establish a financial stability framework in Korea and suggest policy recommendations such as adding financial stability as one of the mandates of the BOK and allowing it to have more access to supervisory information on individual financial institutions. Kim, Kim, Kim, Kim, and Shin (2017) emphasize that financial stability cannot be guaranteed by monetary policy itself and that financial instability may lead to price and output instability. This idea is consistent with Kang (2018), who empirically shows that price stability and financial stability are not only complementary but also conflicting, depending on the time lag. The result indicates that monetary policy focusing only on price stability may negatively affect financial stability. Ha (2017) studies how central bank mandates affect macroeconomic performance by using theoretical models as well as empirical analyses with a dataset of 23 countries. The result reveals that central bank mandates affect macroeconomic performance through expectations channels such as pronouncement effects and that economic performance improves when financial
stability is included as one of the objectives of central banks. Kim and Ku (2019) argue that the predictability of the nominal term spread for future economic activity increased after the global financial crisis because the BOK has focused more on economic stability than price stability.

Along with empowering the financial stability role of central banks, establishing an efficient financial stability framework was considered one of the most urgent tasks in the post–global financial crisis era. Kim (2016) discusses how to design the institutional framework for macroprudential policy in Korea. The author considers various institutional realities in Korea in detail. Yoon and Jung (2010) focus on a macroprudential policy framework for systemic financial risk management. They address various sources of systemic risk and compare different types of macroprudential policy frameworks. Kim (2013) describes how credit cycles, capital inflow problems that may follow sudden stops and reversals, and external liabilities are associated with a financial stability framework. He argues that macroprudential policy is not a panacea and that financial development is necessary to support a sustainable and efficient financial stability framework.

Policy coordination issues have also been emphasized in building a financial stability framework. Kim (2013) discusses macroprudential policy coordination issues between the BOK and Financial Supervisory Institutions in terms of systemic risk management. Based on the literature survey, the author concludes that establishing a control tower for policy coordination between two institutions is more recommended than building a new institution to manage systemic risk. The trade-off between monetary policy and macroprudential policy and the independence of the BOK are also discussed.

In the meantime, issues regarding the financial supervisory system have also been widely addressed by many researchers. For example, Yoon, Ko, Binh, Yang, Won, and Jun (2013) discuss various issues in the Korean financial supervisory system and suggest a twin-peak system that separates the financial industry supervision function from the financial industry policy function as one possible way of reforming the system. Kim (2015) derives policy implications on the financial reform debate in Korea from
experiences of other countries such as the United Kingdom and Germany. The key message is that consumer protection has little to do with a specific type of financial supervisory model in use, but rather depends on policy substance. Kim and Kim (2013) empirically examine the effect of independence, accountability, and transparency of regulatory governance of a financial supervisory agency on financial stability using a panel dataset for 55 countries and find that the financial stability effect of governance is significant for nations that have not yet established regulatory governance.

4. Deposit Insurance and Market Discipline

Deposit insurance is a widely adopted policy in many countries around the world. Although deposit insurance is considered an essential part of the financial safety net to ensure depositor confidence in the banking system, it also generates unintended consequences such as excessive risk-taking due to moral hazard problems and a deterioration in market discipline. Many studies in Korea focus on issues related to savings banks as a result of the savings bank crisis in 2011.

Kim and Kim (2019) study the effects of deposits in excess of the deposit coverage limit on management risk in Korean savings banks using data from 2014 to 2017. They show that a reverse U-shaped relationship between the share of deposits not covered by deposit insurance and management risk. While there is a negative relationship between them when the share is low, it becomes positive once the share exceeds a certain point. The result suggests that a substantial increase in the share of deposits in excess of the deposit coverage limit may lead savings banks to take excessive risk to raise the return on assets to offset the increased funding rate.

Studies in Korea appear to support the existence of market discipline by depositors for savings banks. For example, Park (2009) finds empirical evidence in favor of market discipline by depositors on mutual savings banks in Korea for the period 2003 through 2007 by showing that deposits grow faster for banks with a higher BIS ratio and lower
NPL ratio. Sim (2018) also finds empirical evidence suggesting that depositors discipline Korean savings banks’ excessive risk-taking behaviors by withdrawing uninsured deposits. The empirical analysis, using a dataset of 115 savings banks from 2010 to 2014, shows a significantly negative effect of the failure probability, estimated by using a logit model based on the actual failure records, on the quantity of uninsured deposits.

Choi (2012) and Kim (2019) also confirm the existence of market discipline for savings banks but find that the degree of market discipline effect may vary. Choi (2012) shows that the enforcement (forbearance) of Prompt Corrective Actions strengthens (weakens) market discipline and the sensitivity of the degree of market discipline is lower for quarterly disclosing savings banks than semi-annually disclosing savings banks. The results suggest that reinforcing disclosure and strong enforcement policy may strengthen market discipline, Kim (2019), on the other hand, finds that deposits in surviving (failing) savings banks decreases (increases) when they face higher management risks, indicating that failing savings banks weaken market discipline by aggressively pulling in insured deposits.

Lee, Jung, Baek, and Park (2017) and Park and Han (2017) explore the existence of market discipline in each financial sector. Lee, Jung, Baek, and Park (2017) confirm that market discipline by large depositors works overall for the period from 2004 to 2011, although the degree of significance differs depending on the type of financial institution. Park and Han (2017) also find that market discipline exists for both commercial banks and savings banks for the period between 2001 and 2009. However, they also show that moral hazard problems exist for both groups. For example, small savings banks tend to adopt a high-yield and high-risk strategy by raising deposits with high interest rates. In contrast to above two studies, Lee (2016) focuses on securities firms and finds that market discipline may work by investors with more than 200 million won who respond sensitively to capital adequacy or profitability indicators.

Choi and Sohn (2014), on the other hand, focus on the effect of the regulatory forbearance of savings banks on the market discipline of depositors for the period from 2000 to 2010. They find that regulatory forbearance reduces the sensitivity of depositors to
savings banks’ asset quality. Interestingly, they show that this forbearance effect can be found in the behavior of the depositors of other savings banks in the same business area. They argue that regulatory forbearance raises the expected costs of bank failure by inducing depositors to misjudge bank risks.

As Korea planned to adopt the risk-based deposit insurance system in 2014, related studies have also emerged on this topic. Kang, Park, Choi, and Han (2011) empirically examine whether the moving average method can be applied to mitigate the procyclical property of the risk-based deposit insurance scheme using a sample of 98 savings banks from 2000 to 2010. They first confirm that the risk-based deposit insurance scheme has a procyclical property, which is one of the concerns about this system because it imposes more burdens on financial institutions during downturns. They then show that the moving average deposit insurance scheme exhibits less procyclicality. Therefore, they recommend the application of the moving average scheme to the risk-based insurance program.

Park and Kim (2010) attempt to price systematic risk, which can be considered a negative externality, for deposit insurance using a credit risk model in a general equilibrium setting. According to the study, their model differs from the traditional option-based model in that it can be used to estimate the expected default loss and the systematic risk premium separately. They find that the systematic risk premium is larger for commercial banks than mutual savings banks in Korea because commercial banks’ assets tend to be more procyclical, while mutual savings banks have higher expected default losses. They recommend differential deposit insurance premia based on the differences in systematic risk premia. Similarly, Ahn and Chung (2017) study how systematic jump risks affect the cost of deposit insurance. They show that the correlation between the jumps in both the underlying stock and the market portfolio has a significant influence on the cost of deposit insurance because jump risk is systematic.

Kim and Kim (2011) analyze whether the implied capital forbearance threshold, estimated by using option premium formulae, can be used as an early warning indicator for the
capital soundness of financial intermediaries. They find statistically significant relations with variables that represent the capital soundness of financial intermediaries, such as the BIS capital ratio, the fixed loan rate, and the net interest margin. The result suggests that the estimated implied capital forbearance threshold performs better than the deposit insurance premium based on the constant capital forbearance threshold in terms of reflecting market information about capital soundness. They claim that it is a useful indicator for monitoring the moral hazard of executives and the capital soundness of financial intermediaries.

VI. Concluding Remarks

In this paper, we reviewed a number of studies on banking in Korea that cover three broad topics: the roles of banks in the real economy, the banking industry, and regulatory and policy-related issues. The statistics we presented show that the share of banking research in leading journals has increased gradually over the last few decades, suggesting its rising importance. One pronounced pattern is that the share of banking research rises immediately after the crisis period, which seems natural in that banks are usually at the center of financial crises. However, active research on banking even during normal periods should be appreciated because it may contribute to mitigating the risks and costs of financial crises by identifying financial imbalances and inefficiencies in the financial system in advance.

Since the global financial crisis, many important issues have emerged in the banking literature, as the crisis underscores the importance of banks to the economy and has challenged many traditional views on banking. As financial stability is now considered from both a micro- and a macroprudential perspective, the importance of measuring and managing systemic risk in the financial system and developing appropriate macroprudential policy tools have been emphasized. In addition, the interaction between
monetary policy and macroprudential policy and the financial stability role of central banks have been highlighted. Not only is the role of banks in economic growth studied, but the roles of banks in economic fluctuations and inequality are also explored. In particular, banks find themselves in a very different environment than they were in the precrisis period due to dramatic regulatory changes and new technology developments; the effects of these changes on banking and the real economy, however, are still unclear. There are many other important research themes that we did not cover because there are few studies. For example, consumer protection and financial literacy, financial inclusion, corporate governance, the sovereign–bank nexus, the emergence of cryptocurrencies with distributed ledger technologies such as blockchain, and the introduction of central bank digital currency (CBDC) and associated policy issues are also promising research topics for future research.

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