日本における銀行行動に関する実証研究

Essays on empirical analyses of the Japanese banking behavior

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（要　　旨）

ABSTRACT

The global financial crisis (2008-2009) alerts the importance of banks' financial soundness as their financial health connects to financial stability deeply. It also highlights the pro-cyclicality phenomenon. Pro-cyclicality is an amplification of the business cycle. The unfavorable effects caused by the banks on the economy through their drastic reduction in lending and fire-sale externalities have led to adverse impacts on the financial system. These bank behaviors interact with the real sectors and amplify the business cycle, known as the pro-cyclicality problem, causing economic stagnation, prolongation of financial recovery, and, eventually, financial instability in the long term.

These happenings raise doubtfulness about the effectiveness of bank regulation in ensuring the financial soundness of banks. Bank capital requirements, referring to Basel I, II, and III, were implemented to promote a sufficient bank capital adequacy level for maintaining financial soundness. Banks mandate by law to fulfill at least the capital adequacy minimum of the capital requirement. Basel I was introduced in 1988 by the Basel Committee on Banking Supervision. Basel II was later developed and implemented in 2007 to supersede the Basel I accord. An ample capital buffer is an absorbent of losses in the real economy, especially during an economic downturn. Unfortunately, the global financial crisis prompted public skepticism about the efficiency of capital requirements in guiding banks to strengthen their capital to maintain banks' resilience, especially in emergencies. This doubtfulness has led to many debates over the "pro-cyclical nature" of Basel II guidelines. The main argument is that the regulation itself, namely Basel II, carries the features of "pro-cyclical" as it increases the sensitivity of bank evaluation on credit, further exacerbating the pro-cyclicality effect. In academia, works of literature attempting to draw conclusions and responses to the pro-cyclicality issues to provide some insights for designing more comprehensive capital regulations (Ayuso et al., 2004; Jokipii & Milne, 2008; Stolz & Wedow, 2011; Shim, 2012; Chen et al., 2014; Huang & Xiong, 2015).

Relating to pro-cyclicality, recent literature shows that economic policy uncertainty (EPU) has caused unfavorable effects, such as reduced bank lending and delays in projects and investments amid high economic policy uncertainty. These will hinder the operation of the real economy (Baker et al., 2016; Gulen & Ion, 2016; Berger et al., 2018; Gu & Hong, 2019). Economic policy uncertainty serves as an indicator of future outlooks and guides banks in their financial management. Moreover, the recent economic policy uncertainty-related literatures, even though still limited, show that economic policy uncertainties constrain bank credit and bring unfavorable economic effects. If the conditions go serious, it could undermine the economy. So, given the background mentioned above, it is not surprising that economic policy uncertainties will influence the direction of banks and bank behaviors.

Moreover, like firms, as the leading players in the economy, it is predictable that banks are also affected by the effects of economic policy uncertainties. In conjunction with the pro-cyclicality problem, revealed right after the global financial crisis, economic policy uncertainty is considered one of the new external factors that influence bank behaviors, subsequently affecting the real economy and stability of the financial system. Thus, we need to take this into concerns.

Since the global financial crisis, the public is also doubting the monitoring effectiveness of bank governance in limiting the over-risk-taking behavior of banks. Moreover, the public accused poor bank governance of failing to hold down aggressive risk-taking behavior and causing the global financial crisis. According to G30 Report, 2012, financial institutions' governance was insensitive to the dangers of risk-taking and failed to protect financial institutions, customers, shareholders, and society. Considered that ineffective bank governance is a more severe issue than corporate governance, as banks' behaviors are connected to the real economy closely. So, it is foreseeable that poor bank governance accompanied by monitoring failure will cause instability in the financial system. A considerable amount of banking literature provides evidence that the governance mechanism significantly influences bank risk-taking. In addition, the literature offered valuable insights regarding various channels of moral hazard problems that banks encounter. (Caprio & Levine, 2002; Pathan, 2009; Beltratti & Stulz, 2012; Gropp & Kohler, 2010; Berger & Bouwman, 2013). Looking at the context of Japan, with many personnel rotations and unclear definitions of the

execution and monitoring functions of boards, the criticism regarding the lagging of the Japanese governance system behind the international standard is infamous. Moreover, Japan is notorious for lacking independence in its governance system.

The impacts of the global financial crisis are far-reaching. Regulators and policymakers are constantly revising the regulation, specifically the Basel III implementation comprising a counter-cyclical buffer, stricter capital definitions, and higher quality capital maintenance to promote better bank resilience. Several financial crises have shown us how vulnerable the economy is and the breakout triggered by irresponsible bank risk-taking behavior of banks. Despite the revision of the regulations, aiming for financial soundness and better control over risk-taking behaviors, surprisingly, the increment number of fraud cases of banks is still continuously rising in Japan. For example, *Higashi-Nippon* Bank, under the Concordia Financial Group, was engaged in improper lending by charging inappropriate commitment fees. Around 1,000 cases with falsification charges, approximating 400 million Japanese yen, were detected. Regardless, *Michinoku* Bank in *Aomori* prefecture experienced receiving the business improvement order and still committed document falsification again. *Suruga* Bank in *Shizouka* prefecture also committed to the fraudulence of mortgage loans. These cases hinted to us that the aggressive risk-taking behavior of banks may still sprout, and this aggressive risk-taking behavior might lead to another financial crisis shortly.

This dissertation draws on practical implications by exploring the factors influencing bank behaviors, especially in capital management practice. It also contributes to different strands of research in bank behaviors, bank governance, and banking regulations by employing various methodological approaches to understand better the factors that influence bank behavior on capital management. Finally, this dissertation comprises factors like the business cycle, economic policy uncertainty, bank governance, and banking regulations and compiles them into four chapters (Chapter 2 to Chapter 5).

The second chapter, "The cyclical patterns of capital Buffers: evidence from Japanese banks," focuses on analyzing the cyclical patterns of capital buffers under prevailing macroeconomic conditions. Specifically, this chapter investigates bank capital management practices. Previous evidence on capital management practices is mixed and cannot draw conclusive proof. Therefore, this chapter fills the gap by analyzing Japanese banks' capital management practices, aiming to provide empirical evidence.

Moreover, the divergence of capital requirements setting (dual standards) and a long period of economic stagnation in Japan's economy offered the exploration of bank capital management practices in such unique settings.

Capital buffers are the difference between the bank's actual capital adequacy ratio and the level stipulated by the capital requirements. I use capital buffers in the analysis as the independent variable to control the divergence between domestic and internationally active banks. The main research aim of this chapter is to investigate the cyclical behavior of capital buffers, also known as the capital management practice.

There are two main cyclical behaviors. First, if capital buffers are negatively associated with a business cycle proxy, the real Japanese gross domestic product growth rate (GDP) in the analysis exhibits pro-cyclical behaviors. Such cyclical behavior implies that banks need to take the initiative to increase their capital buffers during economic upturns to encounter the higher risk taken. Moreover, raising capital during economic upturns is more cost-efficient than the downturn. Therefore, if banks employ such myopic behaviors, they may face difficulties during economic downturns, whereby credit risks are likely to increase. In addition, banks face challenges as they must write off bad debts, which will erode their capital. Raising capital is incredibly costly during an economic downturn; banks may dramatically reduce their asset sides by reducing the credit supply. These behaviors further link to the pro-cyclicality problem. Some studies find that capital buffers behave pro-cyclically (Ayuso et at., 2004; Jokipii & Milne, 2008; Stolz & Wedow, 2011; Huang & Xiong, 2015).

Second, if a capital buffer is positively associated with a business cycle proxy, GDP, the capital buffer exhibits counter-cyclical behaviors. Such behavior is considered favorable cyclical behavior. Such cyclical behavior implies that banks are aware of their risk level during economic expansions and increase the sufficient amount of capital buffers to cover the potential future losses or, in other words, meet their risk level. Additionally, raising capital during economic upturns is much easier and cheaper. Such cyclical behaviors are considered forward-looking. Some studies find that capital buffers behave counter-cyclically (Jokipii & Milne, 2008; Gursoy & Atici,2012; Kontbay-Busun & Kasman, 2015).

Taking into account the unique features of Japan's sample, referring to long stagnation and diverse capital adequacy standards,

I analyze the data of Japanese commercial banks from 2002 to 2012. I employ the partial adjustment model, widely used in previous research (Estrella, 2004; Jokipii & Milne, 2008; Francis & Osborne, 2010), considering that capital buffers adjust through a dynamic form, which means the adjustment of the capital buffer is not instantaneous. However, the partial adjustment model creates a potential endogeneity problem as we must include the lagged independent variable in the model. The lagged capital buffer in the right-hand side of the equation may correlate to disturbance terms and lead to biased estimations. Following previous research, I employed a 2-step system, Generalized Method of Moments (GMM) estimators, to deal with this endogeneity problem, as proposed by Blundell and Bond (1998), and correct the standard error, as offered by Windmeijer (2005) in the estimations.

Covering an extended period or an entire cycle of economics may lead to fruitful implications. However, with the introduction of a new regime of Basel III, I limit the estimations period until 2012 (2002-2012). The new regime of Basel III, with a different definition of capital adequacy ratios definitions and some core items in the capital adequacy ratios, may need extra clarification in the interpretation of the analysis results. Moreover, the estimation period only covered part of the cycle, so it is hard to justify whether the cyclical behavior of capital buffers remains robust in the more protracted prolonged economic downturn of stagnation. Massive mergers and acquisitions (M&A) activities occurred between 2002 and 2004 in the Japanese banking industry. Thus, I recode and rerun the analysis estimations for robustness. Furthermore, the estimation period covered two significant crises: the non-performance loans and global financial crises. Therefore, I include two crisis dummies in the estimations. The first crisis dummy is a dummy equal to one for high-level non-performing loans (CRISIS DUMMY 1), and the second is a dummy equal to one for the global financial crisis (CRISIS DUMMY 2).

The main empirical results are as follows. First, there is no significant relationship between the capital buffers and the business cycle proxy (GDP) overall. I then find a negative and significant relationship between capital buffers and GDP by including an internationally active banks dummy. In other words, this result implies that the capital buffers of Japanese commercial banks behave pro-cyclically. Such a pattern is a negative myopic behavior. Second, I find a positive and significant relationship between

capital buffers and the cross-term of internationally active banks and GDP, implying that capital buffers of internationally active banks behave counter-cyclically. Third, the positive signs of the cross-term between internationally active banks and GDP became negative during the crisis periods. This result implies that despite the capital buffers of internationally active banks behaving counter-cyclically, they lose their resiliency during crises.

The third chapter, entitled "Economic policy uncertainty and banks' target capital buffers," focuses on analyzing the impact of economic policy uncertainties on Japanese banks' target capital. Economic policy uncertainty (EPU) is an overall index developed by Baker et al. (2016) by applying text-mining techniques, extracting policy-related terms articles from prominent newspapers. This index has been widely used in the research area recently, and studies show that when EPU increases, causing unfavorable effects on the economy (Berger et al., 2020; Berger et al., 2020; Gulen & Ion, 2016; Hu & Gong, 2019).

Recent studies empirically show that EPU affects bank behaviors (Berger et al., 2020; Hu & Gong, 2019). Chi and Li (2017) show that an increase in EPU will increase loan loss provisions as banks perceive the increment of credit risk in China. Ng et al. (2020) show that banks in the United States respond to increasing EPU by increasing loan loss provisions. These studies show that banks adjust their response to EPU. Capital level generally reflects its durability against unexpected events and increases the probability of survival in a financial crisis (Heid, 2007; Thakor, 2014).

Capital adjustment issues are one of the essential topics in the banking industry. However, except for Tran, Nguyen, and Hoang (2021), the empirical research on the effect of EPU on capital adjustment still needs to be explored. In corresponding to the recent evidence that economic policy uncertainties caused unfavorable economic outcomes, this chapter provides some valuable insights on the impact of economic policy uncertainties on bank capital buffer, aiming to contribute to the related banking literature.

Taking this as motivation, in chapter 3, I empirically analyze the impact of EPU on Japanese banks' target capital and the adjustment speed. Moreover, the effect of the varied contents in economic policy uncertainties on bank capital buffers is tested, for instance, fiscal, monetary, trade, and currency exchange. For extension analysis, I explore the impact of EPU on portfolio adjustments. I employ a partial adjustment model used in research (Estrella, 2004; Jokipii & Milne, 2008; Francis & Osborne,

2010) for the estimation. To test the effect of EPU on the target capital buffer, I define the target capital buffer by including EPU as the influence factor in estimating the target capital buffer level. I also consider that the adjustment speed may vary at different speeds depending on bank attributes and external environmental conditions rather than just constant. Thus, following De Young et al.,2018; Öztekin and Flannery, 2012, I define bank-specific, time-varying adjustment speed in the analysis. To alleviate the endogeneity problem in the partial adjustment model, I employ a 2-step system, Generalized Method of Moments (GMM) estimators (Blundell and Bond 1998,) and standard error correction (Windmeijer, 2005). I use the estimations of Japanese commercial banks from 2002 to 2012. I limit the sample period until 2012 due to the implementation of Basel III, which is taking a stepwise implementation, considering the coverage of Basel III with a substantial change in the definition and calculation may lead to confusion in the interpretation of analysis results. For banks undergoing mergers and acquisitions (M&A), I recode them and treat them as new banks. For extension analyses to test the impact of EPU on portfolio adjustments, I employ the period from 2002 to 2018.

The main empirical results are as follows. First, banks respond to the increase of EPU by increasing their capital buffers. This result supports the notion that when EPU increases, banks are aware of their exposure to uncertainty risk. Thus, under the precautionary motive, banks increase capital buffers against any potential unexpected event. Second, when EPU increases, it also raises the capital adjustment speed. This result implies that banks are adjusting their capital buffers level towards the target capital buffers faster to maintain their soundness earlier. Third, fiscal, trade, and currency exchange policy uncertainties are the driving factors that increase the capital buffer level. Therefore, banks are working on enhancing their soundness by increasing their capital buffer level to alleviate the impacts of policy uncertainties. Lastly, results in extension analyses, which analyze the effects of EPU on portfolio adjustments, show that banks tend to hold more government bonds but lesser stock holdings in response to the increase of EPU. In the amid of high EPU, banks adjust their portfolio by shifting from high-risk assets, for example, stocks that carry a risk weight of 100%, to Japanese government bonds with zero risk weight to improve banks' financial soundness.

However, there is a potential endogeneity problem in the analysis. For instance, EPU may capture other uncertainties that do

not belong to EPU and creates measurement error bias in the selection. Therefore, I need to employ instrument variables related to EPU that do not directly or indirectly affect the capital buffer. Following the previous works of literature, Gulen and Ion (2016), I employ the residual policy uncertainty by regressing the Japanese EPU on the United States EPU as an instrumental variable for EPU. Alternatively, I also use a policy-related variable, the opposition party support rate developed by Ito (2016) serves as an instrumental variable to alleviate the endogeneity problem. The results reveal qualitatively robust.

The fourth chapter, entitled "Bank capital and bank governance," focuses on analyzing the relationship between banks' capital ratio and governance which comprises ownership structure and board characteristics. The global financial crisis has raised the question and skepticism on the effectiveness of monitoring roles by bank governance. As we know, banks are in the business of risk-taking, and as one of the market's leading players, accounting for the majority of bank funding and capital. The failure of bank governance by providing effective monitoring to hold down the excessive risk-taking behavior of banks will lead to massive societal costs. Regulators and policymakers are aware of the critical role of bank governance in monitoring (G30 Report,2012, Basel Committee, 2010).

In academia, vast banking literature provides evidence regarding the governance mechanism in risk-taking behaviors and provides some insights into these areas (Pathan, 2009; Beltratti & Stulz, 2012). Unfortunately, the evidence is mixed and inconclusive. Although the works of literature on the impact of bank governance on bank capital are still limited, some related literature provides valuable insights. For instance, Berger and Bouwman (2013) show that under the control of ownership, capital increases the probability of survival of small banks in the event of a crisis. In addition, Shehzad, Haan, and Scholtens (2010), under a better shareholder protection right, concentrated ownership enhances the capital adequacy ratio.

In response to the debates on the monitoring effectiveness of bank governance, this chapter provides supporting empirical evidence and draws some policy implications for engaging in a better bank board. Understanding how bank governance mechanisms affect the capital ratio is vital for regulators in capital requirement setting. I empirically analyze the data of Japanese commercial banks from 2006 to 2013. The data comprises of bank governance comprises of ownership structure and board

characteristics. Considering the long history of cross-shareholdings in Japan and its impact on the capital adequacy ratio through the link of the calculation of unrealized profits and losses, I include cross-shareholding as one of the factors that may influence the capital ratio. Board characteristics comprise board size and board composition. I limited the sample period until 2013 due to the introduction of "Abenomics" in December 2012, which consists of monetary easing, fiscal stimulus, and structural reforms. However, data until 2013 was employed as it covered most of the information from 2012 for both groups.

The main results are as follows. First, ownership structure, referring to institutional and foreign ownership, is positively correlated with capital ratio. This result implies that shareholders tend to enhance the level of capital ratio. In terms of theory and works of literature, shareholders are more risk-taker compared to managers. Moreover, with the outbreak of the global financial crisis, under the pressure of public noise, shareholders need to improve their capital ratios to fulfill their risk appetite. Second, no significant relationship between cross-shareholdings and capital ratios. This result may be due to the temporary relief program implemented by the Japanese Financial Services Agency on the exemption of the calculation of unrealized losses for some items and, therefore, netting off the effects. Third, there is a positive relationship between outside and independent directors and the capital ratio. This result may be because outside or independent directors are concerned about regulatory compliance by enhancing the capital ratio level to align with the business nature of banks in risk-taking.

However, like most governance studies, it encounters the endogeneity problem. For example, the reverse causality problem or the board characteristics that I investigate may correlate to other variables that I cannot account for, causing endogeneity. So, of course, an instrumental variable intrinsically related to governance variables but not correlated or related to the capital ratio is urgently needed to alleviate the endogeneity problem. Thus, the result serves as ancillary evidence to support the interpretation.

The fifth chapter, entitled “Business improvement order and bank governance,” focuses on the business improvement order issued against banks to demonstrate whether bank governance, specifically ownership structure and board characteristics, effectively prevents the commission of non-compliance. In response to the surging number of fraud cases after the global financial crisis, this chapter attempts to fill the gaps to analyze the board characteristics that can effectively reduce banks’ non-compliance

in the view of providing supporting evidence of having effective monitoring bank boards.

After the global financial crisis, regulators acknowledged the vital role of bank boards in preventing any misconduct or breaching, putting "heightened expectations" on bank boards for safe and sound operation (Office of the Comptroller of the Currency, 2014; Financial Stability Board, 2014). In Japan, the revised governance codes and the amended Companies Act in 2015 encourage banks to allocate more outside directors to increase board independence for effective monitoring to reduce non-compliance. Another highlight is that megabanks are taking the initiative to minimize cross-shareholdings in their banks' directions. Additionally, foreign shareholdings have risen sharply for the past decade and emerged as the largest investor group in some regional banks. Therefore, foreign investors can be effective monitors. Under the amended act for promoting board independence, reducing cross-shareholdings for better governance, and revising stricter capital regulations for promoting banks' financial soundness, we shall expect these steps to lead to effective monitoring to deal with fraud, breaching, or non-compliance in the banking industry. However, surprisingly, misconduct cases and fraudulent cases are still increasing. These conflicting contentions trigger continuing debates, and the effectiveness of the approaches or amendments is still a moot point.

The primary research motivation in this chapter is whether governance mechanisms, particularly ownership structure and board characteristics, matter in preventing banks' non-compliance and, if so, what governance variables matter. This chapter studies regulatory enforcement actions, specifically business improvement orders, issued against Japanese commercial banks from 2004-2013 to present whether governance effectively prevents or alleviates banks' non-compliance. Empirically analyzing non-compliance is challenging in academia. Generally, non-compliance can only be observed once it is detected. However, because the detection is imperfect, even in the absence of the issuing of business improvement orders against banks, banks may still commit non-compliance. To alleviate this problem, I employ a bivariate probit model following Nguyen, Hagendroff, &Eshraghi (2016) and Wang (2013). Theoretically, the probability of non-compliance commission increases with the expected benefit and decreases with the expected cost of detection and penalization. Thus, the process of non-compliance undergoes two processes; the first is a commission of non-compliance, and the second is detection. Under the bivariate probit model, allow us to consider

the two latent probabilities of interest, the probability of non-compliance commission and the probability of the detection of non-compliance, from the observed probabilities of detected non-compliance. This model gives a clearer picture regarding the commissioning of non-compliance and offers a precise understanding of the economics of non-compliance to deter non-compliance better.

The main results are as follows. First, a larger board size is associated with fewer cases of non-compliance detection and a lower likelihood of non-compliance detection. In other words, it helps in reducing the commission of non-compliance. This result implies that banks are in the high complexity sector due to the business nature of banks; thus, a giant board pool of expertise is beneficial to banks by providing expert advice, which in turn prevents banks from non-compliance commitment. Second, board composition, for instance, a higher percentage of outside directors with bank working experience and executive directors is associated with fewer non-compliance detection. This result implies that only outside directors backed up with bank working experience or executive directors considered better informed can timely prevent any potential breaching from alleviating the non-compliance.

I employ a bivariate probit model to understand non-compliance precisely. The evidence highlights that the bank board is essential in reducing non-compliance. However, like most governance-related studies, the analysis encounters potential endogeneity problems. Although I have included most of the relevant board characteristics variables, there may still be unobservable board characteristics related to non-compliance that I need to account for in future research. Furthermore, identifying the reverse causality problem between governance variables and bank non-compliance is problematic. Thus, I need to make this one of the essential topics in future research.