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„Chinese, Japanese, and South Korean Banking Sectors
and Bank Performances: All the Same or Different?
A Qualitative and Quantitative Analysis from 2011-2016“

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Abbreviations

ABC	Agricultural Bank of China
AFC	Asian Financial Crisis
ASBJ	Accounting Standards Board of Japan
ASEAN	Association of Southeast Asian Nations
BaFin	German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht)
BBC	British Broadcasting Corporation
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BOC	Bank of China
BOJ	Bank of Japan
BOK	Bank of Korea
BVD	Bureau van Dijk
CAS	Chinese Accounting Standards
CBRC	China Banking Regulatory Commission
CCB	China Construction Bank
CFA Institute	Chartered Financial Analyst Institute
CFO	Chief Financial Officer
CIA	Central Intelligence Agency
CIR	Cost-income ratio
CPI	Consumer Price Index
EA	Equity to assets
EBA	European Banking Authority
ECB	European Central Bank
EU	European Union
EVA	Economic value added
FC	Funding cost
FRA	Financial ratio analysis
FSA	Financial Services Agency of Japan
FSC	Financial Services Commission of South Korea
FSS	Financial Supervisory Service of South Korea
G20	Group of Twenty
GAAP	Generally Accepted Accounting Principles
GDP	Gross domestic product
GFC	Global financial crisis

GMAC	Graduate Management Admission Council
GNP	Gross national product
HSBC	Hongkong and Shanghai Banking Corporation
ICBC	Industrial and Commercial Bank of China
ID	Income diversification
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
JGAAP	Japanese Generally Accepted Accounting Principles
JMIS	Japan's Modified International Standards
K-IFRS	Korean IFRS
LATA	Liquid assets to total assets
LCR	Liquidity coverage ratio
LDR	Loan-deposit ratio
NBER	National Bureau of Economic Research
NIM	Net interest margin
NLDST	Net loans to deposit and borrowing
NLTA	Net loans to total assets
NPL	Non-performing loans
OBF	Orbis Bank Focus
OECD	Organisation for Economic Co-operation and Development
OPEX	Operating expenses
OTC	Over the counter
P&L	Profit and loss statement
PBOC	People's Bank of China
PRC	People's Republic of China
ROA	Return on assets
ROC	Republic of China (Taiwan)
ROE	Return on equity
SME	Small- and medium-sized enterprises
UNDP	United Nations Development Programme
US	United States
US GAAP	United States Generally Accepted Accounting Principles
USD	United States Dollar
VC	Venture capitalist
WHO	World Health Organization

1 Introduction

1.1 Topic and Research Question

Be it the Asian financial crisis (AFC) at the end of the last millennium (Yap & Dormido, 2017) or the global financial crisis (GFC) of 2007-2008 (Carvalho, 2017), history has shown the uncontested impact of the banking industry, not only on the public sector and businesses of all sizes but also on individuals (Calcagnini & Favaretto, 2011, p. xvii; Greenglass, et al., 2014, p. 11; Kokaliari, 2016, p. 8; Lindström & Giordano, 2016, p. 76).

As well as the adverse effects financial crises have on public spending for health care, education, or social welfare (Nordstrand Berg, Pinheiro, Geschwind, & Vrangbæk, 2017, p. 3; Karanikolos, et al., 2013, pp. 1323-1327), financial crises confront corporations with hardships such as subsiding firm values and credit crunch conditions, which result in limited to no access to funding for their business endeavors as they typically rely on banks for access to the capital markets (Calcagnini & Favaretto, 2011, p. xvii; Hyun, 2017, p. 3; Baek, Kang, & Park, 2004, p. 310). Causes for such credit crunch conditions stem from a lack of liquidity, meaning banks are unable to fulfill their financial obligations on time (Cabral, 2013, p. 108). For the GFC, this illiquidity and the subsequent default of banks was triggered by a premonitory urge to increase the values on their balance sheets and secure high profits by taking on leverage and thereby higher risk (Cabral, 2013, pp. 103-108).

Individuals, ultimately, face both economic and national insecurity (Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009, pp. 315-316). The effects of financial crises on individuals range from reduced social services, caused by national budget cuts (e.g., for health and mental care or family support), to increased unemployment, to higher prices for goods and services as a result of inflation (Appleby, Helderman, & Gregory, 2015, p. 3; Firtescu, 2012, p. 489; Fukuda-Parr, 2008; Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009, p. 316). Economic crises also show positive correlations with “premature deaths from intentional violence” (Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009, p. 322). The GFC – which is estimated to have resulted in global losses of United States Dollar (USD) 15 trillion (Yoon, 2012) – caused a surge of 4.7 percent in suicide rates in the male European and American population from 2008 to 2009 (Chang, Stuckler, Yip, & Gunnell, 2013). This thorough individual entanglement with the banking industry is clearly represented by the fact that, in 2014, 62 percent of the world’s adult population owned a bank account (Demirgüç-Kunt A., Klapper, Singer, & Van Oudheusden, 2015). The World Bank (2017) was ambitious to raise this level of financial inclusion to 100 percent by 2020¹.

Theissen (2013), who analyzed the regulation and supervision of banking institutions, gives an apt summary of the role banks play and the necessity to keep them healthy and functioning:

[Banks] provide a variety of services, including safekeeping of deposits and of financial instruments, they fund investments of private persons and companies in homes and machines, and provide back office services in the financial markets. If a bank fails when it no longer has assets left to pay its creditors, many clients will lose their savings or assets. In addition, as

¹ Whether that goal was actually achieved has not yet been announced by the World Bank (n.d. a) as of February 2021.

banks are interlinked through financial lending, investments and other transactions that may not yet be settled (paid or delivered), the failure of a bank might lead to perceived or real risks to other entities, including other banks. If the market thinks another related or similar entity is at risk when one bank fails, individual market participants will try to limit their exposure to the related or similar banks. Such flight away from real or perceived risk can cause market fears to transform into a self-fulfilling prophecy, with ever-wider contagion risks. (Theissen, 2013, pp. 1-2)

Combining the above with the sentiment that banks were “too big and complex” (Collins, 2014), observing, analyzing, and understanding the financial services sector in general and the banking landscapes of countries in particular intrigues various stakeholders. These include bankers (Dowd, 1994) as well as academics (e.g., Barth, Lin, Ma, Seade, & Song (2013), Demirgüç-Kunt & Huizinga (2013), Mergaerts & Vander Vennet (2016)), and range from international organizations (Asian Development Bank, 2006) to regulatory institutions (Apătăchioaea, 2015, p. 36; ECB, 2010), to professional services firms (McKinsey & Company, 2012). As bank failures vigorously impact economies and societies, studying risk- and regulation-related effects as well as bank performance – performance as a measure of value generation, profitability, and efficiency (Apătăchioaea, 2015, p. 36) – are key research interests in the field of economic sciences (see, for example, Casu, Deng, & Ferrari (2016), Laeven & Levine (2009), and Rachdi & Bouheni (2016)).

One commonly used measure to identify the pivotal players in the industry is the amount of assets² a bank holds (Mulder & Westerhuis, 2015, p. 127). Upon closer inspection of the asset distribution of the world’s largest banks using the year-end values of 2016, Asia is the leading continent regarding asset concentration (Relbanks, 2017). This dominance of Asian banks is demonstrated in *Figure 1*.

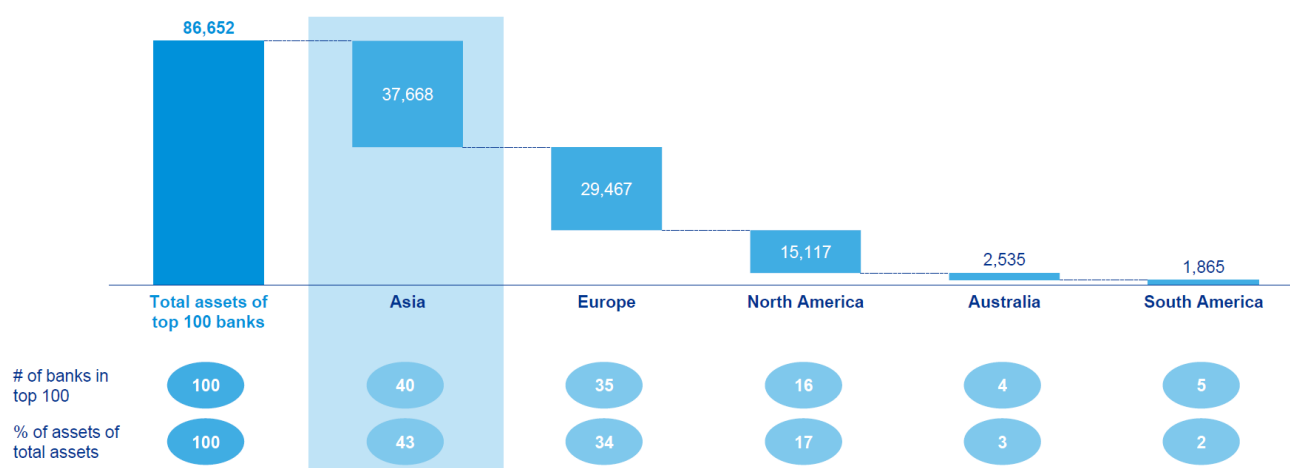


Figure 1: Overview of asset distribution of the top 100 banks by continent as of December 31, 2016 in USD billions³

As shown above, Asia is leading with 40 banks covering 43 percent of the more than USD 86 trillion in assets that these 100 leading banks reported in total. Performing a drill-down within Asia (see

² Total assets as reported in the bottom-line of the balance sheet in the financial statement (OBF, 2017).

³ Based on data from Relbanks (2017), own calculations and visualization.

Figure 2), the People's Republic of China (PRC)⁴, Japan and South Korea⁵ are the top-ranking countries of the continent (Relbanks, 2017). China not only leads in Asia but globally too, contributing one-fifth of the top banks and capturing 27 percent of the assets (Relbanks, 2017). The top five ranks are secured solely by China and Japan, with the PRC securing ranks one to four, and Japan rounding off the list, together generating a total of almost USD 15 trillion in assets (Relbanks, 2017). Combined, China, Japan, and Korea place 35 banks within the leading 100 institutions (Relbanks, 2017). Figure 3 gives an overview of the top three banks of these three leading Asian countries, further highlighting the dominance of Asian banks in the global banking industry. *Appendix B: List of Top 100 Banks in Terms of Assets* and *Appendix C: Country Distribution of Top 100 Banks in Terms of Assets* provide a full list of the world's top 100 banks.

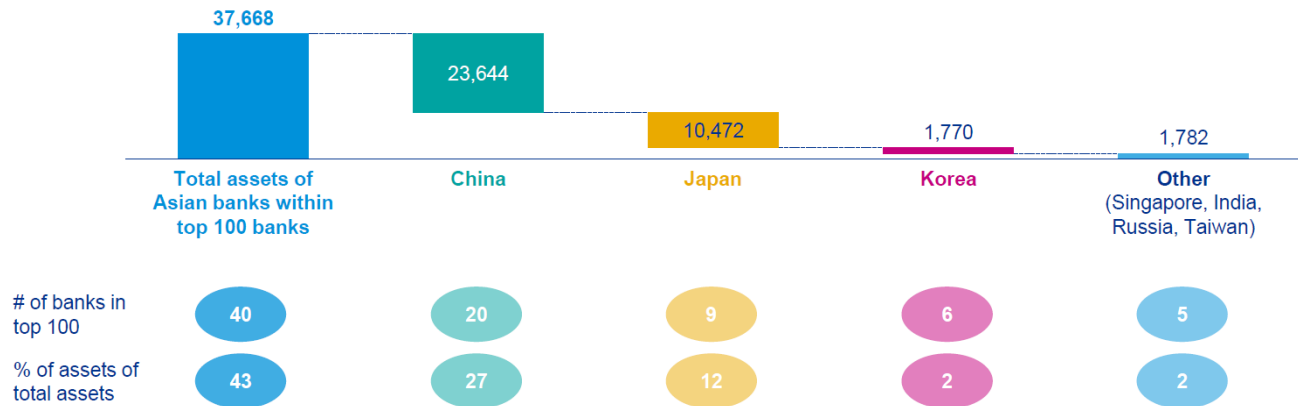


Figure 2: Overview of asset distribution of the top 100 banks within Asia as of December 31, 2016, in USD billions⁶

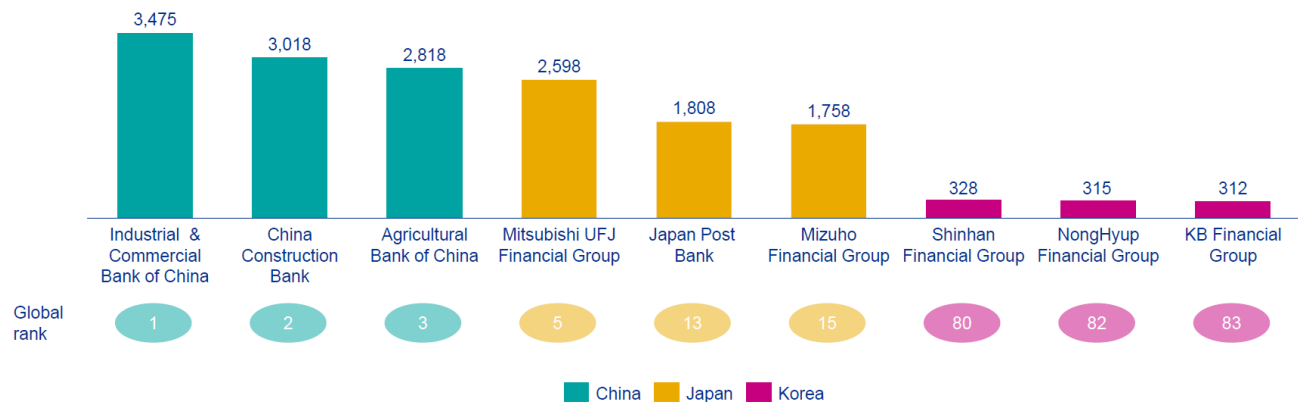


Figure 3: Largest Chinese, Japanese, and Korean banks by total assets as of December 31, 2016, in USD billions⁷

Deduced in general from the importance banks have on public, business, and individual interests and specifically from the above data, this master's thesis aims to analyze the banking landscapes and

⁴ The term "China" is used interchangeably with "PRC". The "Republic of China" (i.e., "Taiwan") is not considered in this thesis. See also 2.5 Definitions.

⁵ The focus of this work is on the "Republic of Korea", known as "South Korea" or "Korea". As the "Democratic People's Republic of Korea" (i.e., "North Korea") is not within the scope of this thesis, the term "Korea" is used interchangeably with "South Korea". See also 2.5 Definitions.

⁶ Based on data from Relbanks (2017), own calculations and visualization.

⁷ Based on data from Relbanks (2017), own calculations and visualization.

performances of China, Japan, and South Korea. Using a twofold analysis on country level and a subsequent cross-country comparison, the underlying research question is:

“What are the similarities and differences of the banking environments and the banking sector performances of China, Japan, and South Korea after the global financial crisis, covering the period from 2011 to 2016?”

In order to answer this research question, an eclectic framework is employed. Each of the countries is assessed with two different analyses:

- (A) Analysis of the macroeconomic and regulatory environment based on the research of Casu, Deng, & Ferrari (2016) and Noman, Gee, & Isa (2017)
- (B) Analysis of the performance of the banking sector using a financial ratio analysis (FRA) based on the research of Ghosh S. (2016), Kumbirai & Webb (2010), and Mergaerts & Vander Vennet (2016)

The former analysis aims to scrutinize the environment banks face using country-level data. The FRA allows for insights into the performance of banks operating in the three respective countries on the basis of aggregated data relating to 479 individual banks (OBF, 2017). Thus, an investigation of bank performance from three essential perspectives is possible – profitability, liquidity, and risk and stability (Berríos, 2013; Bordeleau & Graham, 2010). Subsequently, the results of (A) and (B) are used as the foundation for the interpretation and discussion of the analyses’ results for China, Japan, and South Korea.

I conclude this introductory chapter by highlighting the *1.2 Relevance* of the research topic. The subsequent chapter, *2 Methodology*, focuses first and foremost on the state of the art for banking sector and bank performance analyses. This is followed by the deduction of the eclectic analytical framework. Moreover, I touch upon the limitations of and necessary definitions for this master’s thesis. As for chapter *3 Analysis*, the results for both (A) the macroeconomic and regulatory environments and (B) the FRA are presented on a country level. In *4 Interpretation and Discussion of Findings* the individual results of the analyses per country are assessed, before a cross-country comparison is used to discourse the research question. Finally, the *5 Conclusion* sums up these results and opens up the path for future research.

1.2 Relevance

Regarding the relevance of the research question, it is important to highlight the following three arguments.

First, there is the global and future-oriented importance China, Japan, and South Korea represent. These countries have an undisputed reach and influence on the global stage by actively contributing to shaping worldwide developments and trends (Desjardins, 2018; McClory, 2018, pp. 41-42, 70-83; US News and World Report, 2018). That includes, but is not limited to, advances in technology, innovations, and business ventures (Fensom, 2016; McKinsey & Company, 2016; Soo, 2018). Their contributions are reflected by the continued progression in living standards and individuals’ spending

powers (UNDP, 2018). Hence, the China-Japan-South Korea triangle is considered one of the most “important and dynamic” (Dent, 2013, p. 963) economic regions in the world, playing a pivotal role globally. This is also reflected in the countries’ gross domestic product (GDP), which makes up almost a quarter of the global GDP (Harding, Wildau, & Jung-a, 2018; Muhui, 2016, pp. 309-312; 320-325; World Bank, 2019a). As a consequence, there was a further shift in the focus of international companies on (East) Asian⁸ consumer interests, alongside an increased trust in Asian companies (Kawase, 2016; Poon & Amper, 2019; Russell, 2019). This confidence is underlined by the continuous growth of venture capital investments in the region (Poon & Amper, 2019). In essence, for the past two decades, the global hotspot has shifted away from North America and Europe towards Asian countries (Nougayrède, 2017) and it can be expected to remain there as “Asia is seen maintaining its position as the fastest-growing region, with China and India leading the charge” (Fensom, 2017).

Asia accounts for almost 60 percent of the world’s population – and by 2040, there will be an additional billion people there (Rosling, Rosling, & Rosling Rönnlund, 2018, pp. 77-89 & appendix charts), requiring access to health care, daily necessities and consumer goods, as well as banking services. On a business level, this is supported by the small- and large-scale banking environments in China, Japan, and Korea, which have established a breeding ground for ongoing economic progress (Pham, 2018a). In contrast to Western countries, where capital borrowed from banks finances only about 40 percent of business ventures, the rate in these three countries reaches up to 70 percent, making these economies reliant on financial services networks (Doliente, 2005, p. 53; Mohanty & Turner, 2010, pp. 10-12; Pham, 2018a). Highlighting both the importance and the progressiveness of the advances Asia has made in the banking industry, Dahl, Ng, & Sengupta (2020) put it, bluntly, as follows:

The West has led much of the development of the world’s modern banking industry across all dimensions – from size, to growth, to business models, and innovation. In recent years, however, Asia has tilted the scale, delivering game-changing growth and innovations in banking services. This reflects not only the increasingly central role of diverse Asian economies in global trade and economic growth, but also Asia’s renewed leadership in scaling innovative technologies and new business models. (Dahl, Ng, & Sengupta, 2020)

The current Asian banking trends, which the world is looking at, can be exemplified by WeChat’s and Alipay’s dominance in cashless payments (McKinsey & Company, 2016). For instance, in 2017, China’s “value of mobile payments [...] overtook the worldwide totals of both Visa and Mastercard” (Yang, 2018). Another example is that of the Korean Kakao Bank, a digital-only bank launched in 2017, which built on the strong customer base from Kakao Corporation’s initial, successful app, Kakao Talk, an app similar to WeChat and “famous for its cute cartoons” (Fast Company, 2018). Kakao Bank went all-in and provided not only cashless payment, but also lending services – within the first day, the bank had over 300,000 customers and after two weeks on the market it had nearly

⁸ I follow the definition of Dent (2013, p. 963) concerning the definition of the geographical region of East Asia, which includes besides the three research subjects China, Japan, and South Korea also Mongolia, North Korea, Taiwan, and the two Chinese special administrative regions Hong Kong and Macau.

USD 1 billion in deposits and a credit volume of almost USD three-quarters of a billion (Bellens, 2018). As of September 2020, Kakao Bank's market value was over USD 41 billion, a "figure [...] far higher than the combined market capitalization of the four major financial groups [in South Korea]" (Ye-eun, 2020).

Subsequently, in terms of being able to stay on top of global developments, it is advisable to take a sincere and close look at the nations shaping them. As banks provide stimulus to a region's or a country's economic engine, it is important to draw closer attention to Chinese, Japanese, and Korean progress within the banking industry.

Second, the damage that financial turmoil can inflict on nations, on corporations, and on individuals' lives cannot be neglected (European Commission, 2009; McKee & Stuckler, 2020, p. 640) and, considering the weight China, Japan, and South Korea have on the global banking market (see also *1.1 Topic and Research Question*) (Relbanks, 2017), these three countries play a considerable role in the stability of the industry (Gunning, Yoshizawa, Chugh, Hu, & Chaplin, 2018, p. 9). In relation to the GFC, a World Bank report by Ötker-Robe & Podpiera (2013) stated that "[c]ountries that have been hardest hit by the global financial crisis lost more than a decade of economic development" (p. 25). It is essential for any region or country that has the ability to help foster financial wellbeing, or to trigger destabilization, that meaningful analyses and interpretations be provided, either to gain insight from historical data or with the aim of depicting the present situation and providing a future outlook. China, Japan, and Korea are fitting examples since the total assets of banks in these countries grew 20-, 15-, and 13-fold respectively from 1980 to 2010, with banks there drastically increasing their ability to lend money to businesses and consumers (Pham, 2018b).

It is, however, striking that while numerous studies focus on the United States (US) and the European Union (EU) (see, for example, Barth, Prabha, & Swagel (2012), Lardic & Terraza (2019, pp. 22, 35), Rachdi & Bouheni (2016), or, for more detail *2.2 State of the Art*) – regions that can have an equally large impact on the stability of the global banking market –, only primarily niche-research⁹ is available which scrutinizes China, Japan, and Korea specifically (Park & Hugh, 2013, pp. XII-XIII). Saona & Azad (2018) had the same understanding and began their study of bank performance in 11 Asian countries by stating that "previous literature is mainly focused on the analysis of [the] US and European banking industry, with much less discussion and insight on the Asian banking industry" (p. 429). In the face of potential arguments that these countries are not relevant enough for scholarly involvement, two observations paint a rather different picture. One is that the low research interest stands in stark contrast to other fields of economic and business studies in which the three countries are frequently the core research interest (for example, research on trends in leadership and innovation (Ulrich, 2019), economic challenges and integration (Bloom, et al., 2018; Wirth, 2015), or overall performance and efficiency (Park, Yoo, Lee, Kim, & Kim, 2015)). Furthermore, in banking-specific studies, China, Japan, and South Korea are readily included within comprehensive cross-

⁹ An example of said niche-research provide Miao & Jayakar (2016, p. 182), who analyzed the similarities and differences of mobile payments business models. Alternatively, Tsuchiya (2016, pp. 96-111) focused on the needed awareness of cyber security in the financial sectors of the three countries.

country comparisons in which double-digit numbers of countries are analyzed (see, for example, Anginer, Demirgüç-Kunt, & Mare (2018, p. 99), Ghosh A. (2016, p. 69), or Fu, Lin, & Molyneux (2013, p. 64)). This demonstrates that these countries are considered relevant in the country selection. It is therefore essential to provide insight and transparency regarding China's, Japan's, and South Korea's banking industries. Considering their influence and power within East Asia as well as globally (Baker, 2018; US News and World Report, 2018), it is crucial to understand the rationale behind and developments in their banking industries.

Finally, on a more positive note, shifting the attention to these three countries may also afford insights, such as leading practice examples or alternative business ideas – not least shaped through advances in technology as well as data and analytics (Doyle & Quigley, 2014, p. 2) – with implications for banks in more traditional settings (Chen, Li, Wu, & Luo, 2017, pp. 1-5). While the research behind this thesis is rooted in the basics of the banking sector and in bank performance analyses, it also provides a foundation for further, more in-depth research, namely into banks disrupting the industry, challenging traditional banking models, or providing greater returns, to name a few (OECD, 2020, pp. 7-10).

Analyzing Chinese, Japanese, and South Korean banking environments is therefore relevant in terms of business, economic, and scholarly viewpoints. Moreover, with continuing advances in Asia generally, it is also advisable to keep a close eye on the changes and developments within the key areas of banking as they provide essential financing to developments on every level of society (Bellens & Hwa, 2015, pp. 16-22; Mohanty & Turner, 2010, pp. 10-12; Pham, 2018b).

2 Methodology

2.1 Introduction

Before presenting the analytical framework of this master's thesis, the current view on financial sector and bank performance analyses is laid out in 2.2 *State of the Art*. The deduction and structure of the 2.3 *Analytical Framework* is then presented, focusing on how the framework was developed and its underlying analyses, variables, and data sources. Moreover, this chapter includes discourses concerning 2.4 *Limitations* of and 2.5 *Definitions* relevant to this thesis.

2.2 State of the Art

To assess the status quo of academic work for the research question, it is adjuvant to distinguish between 2.2.1 *Financial Sector Analyses*, 2.2.2 *Bank Performance Analyses*, and 2.2.3 *Cross-Country East Asia-Specific Research* with relations to both former analysis types. Typically, financial sector analyses take a closer look at external variables (i.e., macroeconomic determinants such as regulatory and legal environments or monetary measures such as GDP) defining a bank's surroundings, while bank performance analyses focus on "[i]nternal determinants [...] related to bank management" (Alper & Anbar, 2011, p. 140). It is worth noting that financial sector and bank performance analyses are not always mutually exclusive as research at times incorporates both analyses; nonetheless, following this structure provides a useful sequencing for this state of the art.

2.2.1 Financial Sector Analyses

Concerning financial sector analyses, a variety of frameworks generally consist of using quantitative variables to analyze banking landscapes (Fu, Lin, & Molyneux, 2013, pp. 65-66; Levin, 1974, p. 103). Unlike studies focusing on individual banks, as shown in 2.2.2 *Bank Performance Analyses*, financial sector analyses focus on the entire industry and its environment (Casu, Deng, & Ferrari, 2016, p. 11). Said research takes into consideration measures ranging from household deposits, to a region's or country's total bank loans, to indicators in the fields of policymaking, supervision, and regulation (Bijlsma & Zwart, 2013, p. 4; Casu, Deng, & Ferrari, 2016, p. 11; Nasir & Du, 2017, p. 2).

Bijlsma & Zwart (2013), who have established one key framework of financial sector analyses, interestingly, claim about the financial sector that "[t]he empirical and theoretical literature on the relationship between market structure, growth and stability is still in its infancy" (p. 3). This falls in line with Rachdi & Bouheni (2016, p. 25), who state that previous macroeconomic and regulatory development studies have led to varying results. Bijlsma & Zwart (2013, p. 23) used this finding to design a holistic framework encompassing channels for financial intermediation, consumer finance, and the banking sector's overall structure, thereby building on existing research (e.g., Allen, Bartiloro, & Kowalewski (2005), Allen, Chui, & Maddaloni (2004), or Black & Gilson (1998)). They created a set of 23 variables and applied their framework to the US, to EU countries, and to Japan (Bijlsma & Zwart, 2013, pp. 2, 23). Focusing on the divide between market-based conditions (i.e., financing primarily runs directly between investor and investee) and bank-based conditions (i.e., banks serve as primary

sources of funding), they found that market-based economies such as the US and parts of Europe have a larger share of venture capital financing and absorption of foreign capital coupled with larger banking sectors in proportion to GDP (Bijlsma & Zwart, 2013, p. 2). Additionally, these market-based economies generate substantial income from non-interest-bearing ventures and products (Bijlsma & Zwart, 2013, p. 34). By contrast, bank-based economies in Eastern Europe and Japan, for instance, exhibit a greater share of household deposits, while, especially in Eastern Europe, manifesting smaller banking sectors and financial markets (Bijlsma & Zwart, 2013, p. 34).

Vanguards in the area of financial sector analyses include Barth, Caprio Jr., & Levine (2001; 2013) and Demirgüç-Kunt (World Bank, n.d. b). With a clear focus on regulatory and supervisory aspects, the trio of Barth, Caprio Jr., & Levine (2013, pp. 111-112) developed a questionnaire for a comprehensive database in collaboration with the World Bank (2019b), comprising bank and country data for up to 160 nations. They have so far published five updates to the database, covering the years 2001, 2003, 2007, 2011, and 2016 (World Bank, 2019b). The 2016 database, published in mid-2019, contains 255 quantitative and qualitative data points covering 15 categories, ranging from ownership to capital, and from asset classification to supervision and Islamic banking (Mare, Cull, Demirgüç-Kunt, & Zhou, 2019). The database is widely cited and regarded by other scholars, as it provides relevant in-depth and comprehensive cross-country regulatory data, as the subsequent examples show. Barth, Lin, Ma, Seade & Song (2013, p. 2890), for one, found that higher restrictions of the regulatory environment result in a decrease in banking efficiency, unless the restrictions are capital-based, where efficiency increases. In another study, Rachdi & Bouheni (2016, p. 27) used the 2001-database for selected European countries to show that the better a banking sector operates, the more it makes sector-wide efforts to reduce risk-taking and bad practices. They concluded that such behavior ultimately triggers profitability and performance, so that “good practices of banking governance have to lead to stronger banks” (Rachdi & Bouheni, 2016, p. 27). Other researchers building upon the World Bank database include Casu, Deng, & Ferrari (2016, p. 2), Laeven & Levine (2009, pp. 262-263), Köster & Pelster (2017, p. 59), and Noman, Gee, & Isa (2017, pp. 11-12).

That being said, Demirgüç-Kunt – a chief economist for Europe and Central Asia at the World Bank (2019b) – entertains a broader research area in the context of banking sector analysis. To name just a few, Demirgüç-Kunt and her research colleagues have contributed to:

- The development of the world’s largest database on financial inclusion, thereby providing “comparable indicators showing how people around the world save, borrow, make payments, and manage risks” (Demirgüç-Kunt A., Klapper, Singer, & Van Oudheusden, 2015, p. VI)
- An analysis of the bailout potential of countries regarding their most important banks, finding that “many banks have grown too large, potentially because they have become too big to save” (Demirgüç-Kunt & Huizinga, 2013, pp. 875, 893)
- The enhancement of guidance for bank capital requirements to reduce systemic institutional risk (Anginer, Demirgüç-Kunt, & Mare, 2018, p. 104)

Barth, Prabha, & Swagel (2012) tackled a key question, reiterated in the world's newspapers since the GFC, namely: "Just how big is the too-big-to-fail problem?" (p. 265) Labelling some banks as "too big to fail" (Barth, Prabha, & Swagel, 2012, p. 265) is a mindset that existed for decades prior to the GFC, but has become a popular consideration in the aftermath of 2007-2008. Using banks' total assets as a measure of size, Barth, Prabha, & Swagel (2012, pp. 266-283) looked at US banks, as well as the largest banks globally, to draw conclusions for future policy recommendations. Using historic knowledge and quantitative analysis, the researchers deducted three measures taken by regulators, which proved successful for strengthening the banking landscape (Barth, Prabha, & Swagel, 2012, p. 279). The first effective measure is the incorporation of tighter liquidity and capital requirements, paralleled with the second measure, which sees constraints on "financial institutions' activities and size" (Barth, Prabha, & Swagel, 2012, p. 279). As an ultimate measure, the researchers found that specifically designed frameworks – ideally implemented internationally – helped prevent banks from failing (Barth, Prabha, & Swagel, 2012, p. 279).

Before focusing on 2.2.2 *Bank Performance Analyses* below, some studies combining elements of both financial sector and bank performance analyses are noteworthy. There is scientific justification to combine environmental and bank-level indicators for an improved picture (Saona & Azad, 2018, p. 441). Drake, Hall, & Simper (2005, p. 16) have made a strong case for the incorporation of external factors in bank performance analyses. Building upon previous scholarly insights, they analyzed the Hong Kong banking sector by applying three different tests for performance analyses and found that "the failure to account for the impact of external factors can have a marked impact on relative efficiency scores and ranks and on trends in the efficiency levels over time" (Drake, Hall, & Simper, 2005, p. 17).

One considerable approach is that of Ghosh A. (2016, pp. 61-62), who studied the globalization process of banking sectors in 169 countries by investigating, among other factors, capitalization, industry size and structure, liquidity and market risks, financial and economic development, inflation, and interest rates. Ghosh A. (2016, pp. 61-62) then contrasted these banking sector results with bank performance data. The study found that an influx of foreign banks increased competition and profits, making emerging economies prone to such developments, while low-income economies still needed to attenuate informational asymmetries to increase bank performance and, ultimately, stability to attract foreign equity (Ghosh A., 2016, p. 69). Similarly, Nasir & Du (2017, pp. 5-6, 20) employed a complex framework enabling various stock market data to "interact simultaneously" (p. 5), finding that the post-GFC financial markets of developed countries (e.g., US and Germany) diminished in importance, while those of emerging nations (e.g., China and India) stepped up their game.

Furthermore, Köster & Pelster (2017) contributed to the mixed environmental and performance banking studies. They conducted research on the impact of financial penalties for banks, thereby analyzing 68 banks worldwide (Köster & Pelster, 2017, pp. 57-59). Their study also included the world's most relevant banks, the so-called "global systematically important banks" (Financial Stability Board, 2016, p. 1). They used, first, a newly created database comprising data on financial penalties and, second, accounting data such as stock performance and profitability insights (Köster & Pelster,

2017, p. 59). A key finding was that imposed penalties have a significant negative impact on profitability before tax; however, legislation regularly allows for a certain degree of leeway to circumvent these penalties, resulting in less drastic incisions on profitability (Köster & Pelster, 2017, p. 70). Additionally, penalties have a positive effect on stock price development, as investors seem to interpret penalties as an impetus for better management in the future and express relief when “penalties are smaller than the profit generated by misconduct” (Köster & Pelster, 2017, p. 70).

2.2.2 Bank Performance Analyses

Shifting focus to bank performance analyses, it can be said that numerous models have been developed for bank-level research (Bikker & Bos, 2008, p. 3; Scott & Arias, 2011, p. 209). Thereby, two schools of bank performance analysis can be distinguished, one concerned with “accounting methods” (Kumbirai & Webb, 2010, p. 35) and another which uses alternative analysis models. Research regarding the former school usually relies on benchmarks, the use of financial ratios, or a combination of both (Avkiran, 1994, pp. 10-18), and is often termed financial ratio analysis (FRA). Examples of FRA can be found in the work of Tarawneh (2006) or Kumbirai & Webb (2010), who compared commercial banks in Oman and South Africa respectively. Alternative research frameworks include employing stochastic frontier models (such as the “X-efficiency” (Berger, Hunter, & Timme, 1993, pp. 245-246) model assessed by Berger, Hunter, & Timme (1993)), data envelopment analysis (e.g., Grigorian & Manole (2005, p. 5) or Kou, Peng & Wang (2014, p. 7)), or other, more complex methods (Bikker & Bos, 2008, pp. 31-44).

In light of the above, one might expect the more sophisticated econometric models to deliver more accurate results than the simpler FRA. Interestingly, Bikker & Bos (2008, pp. 59-115) thoroughly evaluated nine commonly used econometric models and contrasted them with a “basic framework” (p. 14), consisting of accounting approach variables, and found no indication that they were more accurate than the alternative models. Their main conclusion was that these nine bank performance evaluation models – including famed models such as those developed by Bresnahan, Panzar-Rosse, or Cournot (Bikker & Bos, 2008, pp. 59-115; Fu, Lin, & Molyneux, 2013, p. 66) – “all focus on a single variable instead of a set of variables as theory prescribes” (Bikker & Bos, 2008, p. 117), hence potentially triggering biased or one-sided results.

Amel & Rhoades (1988, pp. 686, 689) pioneered work in the field of FRA by using a clustering algorithm containing a set of 15 balance sheet variables to identify strategic groups within 16 different banking markets. The results showed that the banking sector comprises six major groups which are not based on the institutions’ size but rather their portfolio compositions regarding “specialization in time deposits, commercial and industrial loans, real estate loans, and US securities” (Amel & Rhoades, 1988, p. 689). This finding goes hand in hand with Porter’s (1979) theory of strategic groups saying “that important differences exist in the structural features that explain profit levels for differently situated firms in an industry” (p. 226). Intriguingly, Amel’s & Rhoades’ study (1988, p. 689) also found that no nexus exists between a bank’s retail or corporate orientation when it comes to allocation within a strategic group.

Mergaerts & Vander Vennet (2016) more recently analyzed the bank performances of European institutions based on their business models – a rising trend in banking analyses – to explain the banks' varying levels of success (pp. 57, 74). The framework they developed consists of “a number of strategic variables that reflect the long-term choices of bank management with respect to assets, funding, capitalization and diversification” (Mergaerts & Vander Vennet, 2016, p. 58). In contrast to Amel's & Rhoades' (1988) results, this analysis showed that banks that were more retail-oriented were more sustainable, with both a higher profitability and a lower probability of default (Mergaerts & Vander Vennet, 2016, pp. 58, 74). Despite the fact that performance also relies on non-financial aspects, such as customer portfolio quality or distribution channels, they chose to employ an FRA, arguing that any business directions chosen by management will ultimately be reflected in the bank's financial data, namely its financial statement, profit and loss (P&L) statement, and balance sheet (Mergaerts & Vander Vennet, 2016, p. 58).

Two other studies, also centered on Europe, focus on Germany and are relevant to this state of the art. Lardic & Terraza (2019, pp. 22, 35) used a panel data model to zero in on profitability, liquidity, and solvency variables, such as return on assets (ROA) and equity (ROE), respectively, on equity to assets and net loans, and on loans to customer deposits. Their study employed a dataset of over 1,600 banks from 2000 to 2014 and found that “German savings and cooperative banks managed to remain relatively stable and profitable during the crisis years” (Lardic & Terraza, 2019, p. 33). They attributed this stability to the strict diversification of German banks between savings, cooperative, commercial, and private banks (Lardic & Terraza, 2019, pp. 23-28, 33). However, commercial banks took on risks during the crisis years, yielding profits, but at the same time making the German and international financial network weaker as this venturesome behavior also included the country's largest institutions (Lardic & Terraza, 2019, p. 33). Merkl & Stolz (2009, p. 2013) used a similar research methodology, focused on German banks' regulatory capital, to test the so-called “bank capital channel theory” (p. 2014). It assumes changes in the loan activity of banks when monetary actions are imposed; that is, when – from the bank's point of view – the threshold of capital requirements is harder to be maintained (Merkl & Stolz, 2009, p. 2014). One way to overcome potential monetary changes is for banks to hold additional capital and/or “asset buffers, i.e., short-term risk-weighted assets” (Merkl & Stolz, 2009, p. 2014), which can easily be used or liquidated to maintain capital limits. Merkl & Stolz (2009) subsequently found that “[b]anks with lower asset and lower capital buffers [...] react more restrictively to a monetary tightening than their average peers” (p. 2022), which means they reduce their lending activities and potentially facilitate credit crunch conditions.

Demirgüç-Kunt (World Bank, n.d. b) and her research partners not only focused on banking environment analyses, as highlighted in *2.2.1 Financial Sector Analyses*, they also conducted research using bank-level data to deduct viable insights for bank performance research. In a 1999 study, Demirgüç-Kunt & Huizinga (1999, p. 379) investigated the intersection of commercial banks' interest margins and profitability using single bank data from 80 countries. Employing a complex framework to analyze both variables across countries and banks (Demirgüç-Kunt & Huizinga, 1999,

pp. 380-381), they extrapolated several significant findings, which in many regards hold true, even 30 years later:

- Better market capitalization is generally also signalled by higher profitability (Demirgüç-Kunt & Huizinga, 1999, p. 405).
- Lower profitability is seen in banks with a high degree of non-interest-bearing assets or those that depend on customer deposits (Demirgüç-Kunt & Huizinga, 1999, p. 405).
- Having an international parent company tends to generate higher profitability, presumably through technological or administrative advantages, especially in lesser developed countries (Demirgüç-Kunt & Huizinga, 1999, p. 405).
- Higher competition in a country's banking market negatively affects profitability (Demirgüç-Kunt & Huizinga, 1999, pp. 405-406).

Bertay, Demirgüç-Kunt, & Huizinga (2015, p. 339) investigated the similarities and differences in lending practices between private and state banks in an even more extensive analysis involving 111 countries. They found that the lending behavior of private banks is more procyclical, while state banks are more countercyclical (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 339). Governmental support during recession is additionally bolstered through increases in overall lending volume (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 339). Interestingly though, during times of economic upswing, state banks have higher rates of loan defaults, while private banks have comparatively constant rates of non-performing loans (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 339).

Many scholars scrutinize one or two countries instead of focusing on larger groups, such as Lardic & Terraza (2019) and Merkl & Stolz (2009) above. Almazari (2014) is another such scholar. He used an FRA to investigate the profitability of Saudi Arabian and Jordanian banks, employing ratios such as ROA, liquidity risk, cost to income, and bank size (Almazari, 2014, pp. 125, 130). The results showed that Saudi Arabian banks are not only more profitable but also more efficient than Jordanian banks, which mainly stems from a more favorable investment in assets and a lower risk of running into liquidity issues (Almazari, 2014, p. 138). Moreover, the negative effect of bank size on profitability suggests that “diseconomies of scale [...] exist from a level of size upwards” (Almazari, 2014, p. 138). The negative impact of bank size on profitability is the result of poorly managed increases in bureaucracy and the accordingly necessary surveillance (Almazari, 2014, p. 134). Alper & Anbar (2011, p. 149), who studied the Turkish banking sector, took internal and external variables for performance into account and found the opposite to be true for Turkey. There, larger asset size positively correlates with returns on assets and equity ratios, and the balanced diversification of products makes larger banks more profitable (Alper & Anbar, 2011, p. 149).

Scholars interested in bank performance analyses have also investigated China, Japan, and South Korea. Heffernan & Fu (2010, p. 1585) used an FRA to analyze the performance of Chinese banks from 1999 to 2006. The underlying idea was to detect whether it was possible to measure the country's financial opening and subsequent financial reforms from 1978 – when then-leader Deng Xiaoping announced his vision for an economically open China (Fang, Garnaut, & Song, 2018, pp.

5-6) – onwards (Heffernan & Fu, 2010, p. 1585). Of four performance measures used to analyze 76 Chinese banks (ROA, ROE, economic value added (EVA), an net interest margin (NIM)), EVA and NIM proved the most reliable (Heffernan & Fu, 2010, pp. 1590-1591, 1597). One of the study's key findings was that, in terms of profitability, rural commercial banks outstripped “the big four”¹⁰ (Heffernan & Fu, 2010, p. 1598), other large or international banks, and city-centered banks. The explanation for this is that these banks were well-established within local communities and typically did not have to strive to acquire customers as they were the only financial intermediaries available in their respective regions (Heffernan & Fu, 2010, p. 1598). Finally, the study also found that listing these institutions on the stock exchange and accepting foreign equity investments had no effect on bank performance, while GDP growth and high employment rates did (Heffernan & Fu, 2010, pp. 1597-1598). However, this last finding is not supported by Cheng, Zhao, & Lin (2017, pp. 387, 401), who measured the performance effects of privatization and foreign strategic investments in China. Foreign investments and going public “improves bank profitability, operating efficiency, and prudential behavior, and reduces credit risk” (Cheng, Zhao, & Lin, 2017, p. 401). Additionally, He, Chen, & Liu (2017, p. 3995) came to similar conclusions despite being critical of most research into the Chinese banking sector using data prior to 2005, when large scale banking reforms were implemented. They, too, found that privatizing and attracting strategic foreign investments showed positive results for overall Chinese bank performance (He, Chen, & Liu, 2017, p. 4008). Using an array of performance variables to scrutinize Chinese banks, they, moreover, argued that profitability and stability improved country-wide in recent years, albeit with associated losses in efficiency (He, Chen, & Liu, 2017, pp. 4003-4008).

Lui & Wilson (2010, p. 1858) similarly assessed the performance of Japanese banks by scrutinizing NIM, ROA, and ROE across 685 banks. Using data from 2000 to 2007, profits were consistently maintained, with the so-called “shinkin banks”¹¹ (Liu & Wilson, 2010, p. 1864) exhibiting the best performance due to their restricted sphere of action, both geographically and in terms of product range. Shinkin banks also support corporate and individual customers in that they actively manage and lower their net interest margins – NIM is the relation of net interest income to total assets (Alper & Anbar, 2011, p. 146) –, hence lowering NIM means changing the relation of interest received versus interest paid for the customers' sake (Liu & Wilson, 2010, p. 1864). They also found that banks that were able to diversify and generate substantial income from non-interest-bearing services (e.g., private banking, asset management) showed better profits as they could counter loan activities, which are typically weak due to Japan's low interest rate environment (Liu & Wilson, 2010, pp. 1853-1854, 1864).

Fukuyama, Färe, & Weber (2018) pursued a different research angle by focusing on decision making in Japanese banks as an alternative measure of value in terms of profitability and performance. They

¹⁰ See also *Appendix B: List of Top 100 Banks in Terms of Assets*, the “big four” (Heffernan & Fu, 2010, p. 1598) banks in China are Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Agricultural Bank of China (ABC), and Bank of China (BOC).

¹¹ Shinkin banks are cooperative banks serving only a very small geographical area (Assaf, Barros, & Matousek, 2011, p. 332).

claimed that financial ratios as standalone measures “ignore inefficiencies due to less than adept managers or due to production occurring outside the socially desirable range of constant returns to scale” (Fukuyama, Färe, & Weber, 2018, p. 2030). The data period was from 2014 to 2016 and the sample included Japan’s three largest banks, Tokyo Mitsubishi UFJ, Japan Post Bank (privatized in 2015), and Mizuho Bank (still in the post-merger integration phase after its 2013 merger), alongside almost 100 other Japanese banks (Fukuyama, Färe, & Weber, 2018, pp. 2022, 2025). Their rationale regarding the chosen period was underpinned by an interest in analyzing value developments for Japan Post Bank and Mizuho Bank after their recent and substantial changes in market appearance (Fukuyama, Färe, & Weber, 2018, p. 2025). Calling on capital, loan, securities, and employee data, Fukuyama, Färe, & Weber (2018, pp. 2022, 2026, 2029, 2031) created a data envelopment analysis and found that the two behemoths – ranked among the largest banks globally in terms of asset size – saw an 11 and 41 percent respective reduction in value. With an 11 percent decline, Japan Post Bank managed its privatization efforts relatively well compared with the other top ranked banks, which, on average, lost 14 percent of their value from 2014 to 2016, while for Mizuho Bank the aftermath of the merger put significant pressure on its valuation (Fukuyama, Färe, & Weber, 2018, p. 2029).

Sufian (2011, p. 47) took a broader perspective and analyzed the performance of South Korean banks from 1992 to 2003, looking at over two dozen banks. Using a model of 16 variables – nine of which were performance measures, the remainder being external factors such as GDP or inflation, thus incorporating both a financial sector and a bank performance analysis – the study found the following to be significant (Sufian, 2011, p. 53). First, bank profits diminished in the years following the AFC, which prevented banks from charging customers the interest rates they needed (Sufian, 2011, pp. 66-67). Second, in line with the above studies of China and Japan, product and service diversification had a positive effect on profitability (Sufian, 2011, p. 66). Lastly, and surprisingly, positive profitability values were detected for banks with relatively low levels of liquidity (Sufian, 2011, p. 66). Lee & Kim (2013, pp. 84-89) authored a similar study focused on banking in South Korea from 2003 to 2010 using an FRA paired with macroeconomic variables. The first of their three main findings is that despite the ongoing consolidation of the South Korea banking sector, there is no evidence of economies of scale from these mergers and acquisitions (Lee & Kim, 2013, p. 92). In fact, the study “suggests that the creation of the so-called mega bank is more likely to face diseconomies rather than economies of scale” (Lee & Kim, 2013, p. 92). Second, they propose that the privatization of Korean banks should be pursued, as government-controlled banks score negatively in terms of bank profitability (Lee & Kim, 2013, p. 92). Last, foreign investors, though viewed critically, play an important role in increasing the bank performance of the institutions in which they invest (Lee & Kim, 2013, p. 92).

Thibeault, Defrancq, & Vantieghem (2012) authored another single-country in the form of a report on the Belgian banking sector, in cooperation with the Vlerick Center for Financial Services and the auditing and advisory firm KPMG (KPMG, n.d.; Vlerick Business School, n.d.). While not a traditional piece of research with a purely academic interest, the study is relevant for two reasons. It provides an exemplary overview of how bank performance analysis can be conducted if the aim is to examine several angles within one study (Thibeault, Defrancq, & Vantieghem, 2012). In their case, that was

(i) a value chain analysis scrutinizing both the income and expense sides of the banks' income statements, followed by (ii) an FRA using six variables to measure financial performance. These were combined with (iii) the exploration of the risk-and-return overlap between the banks they examined (Thibeault, Defrancq, & Vantieghem, 2012, pp. 1, 7, 19, 51-78). While such a holistic approach focuses less on in-depth interpretations, they do provide valuable insights for an enhanced understanding and interpretation of analytical results. The second reason, as touched upon in *1.1 Topic and Research Question*, is that the banking industry is of fundamental interest to governments and businesses alike as it is a core pillar of economic development (Eichler, Grass, Torti, & Künnemann, 2013, p. 84). Research focused on the banking industry therefore extends beyond the academic sphere as there is ample unbiased research to shed light on the industry's many players, such as, for example, consulting firms such as Ernst & Young (2016), KPMG (2016; 2017), and McKinsey & Company (2012; 2016). That being said, the key results in Thibeault's, Defrancq's, & Vantieghem's (2012, pp. 51-78) report show that private banks outperform universal and investment banks when it comes to operating income in relation to total assets. This is also true in terms of operating expenses to total assets (Thibeault, Defrancq, & Vantieghem, 2012, p. 43). However, the tables are turned, with private banks showing values of up to 4 percent while other banks score 1 percent and less (Thibeault, Defrancq, & Vantieghem, 2012, pp. 43, 83). Moreover, in accordance with Almazari's (2014, p. 134) research, this study also finds that the larger a bank becomes, the more frictional losses have to be borne in terms of efficiency and profitability (Thibeault, Defrancq, & Vantieghem, 2012, p. 83).

With regards to non-FRA research methodologies, Grigorian & Manole (2005, pp. 4-5) investigated Bahrainian banks and contrasted them with key players in the Gulf region and Singapore. Using data envelopment analysis, the researchers used Bankscope's¹² data to model a so-called "efficiency frontier" (Grigorian & Manole, 2005, p. 4), which is the search for the best benchmark within a bank sample for defined variables (e.g., loan origination, provisions, liquidity measures) against which all other banks and hence their performance is measured. Besides finding that Bahrain holds a leading position within the Gulf region, although it is outperformed by Singaporean banks, the study reveals that all countries showed increases in efficiency through the use of information and new banking technology (Grigorian & Manole, 2005, p. 9). These improvements were not least triggered by "country-specific policies and developments (such as larger marginal impacts of capital account and financial sector liberalization [...])" (Grigorian & Manole, 2005, p. 9).

Gropper, Jahera Jr., & Park (2015, pp. 76, 91) took a more political angle and studied bank performances in US states using both economic freedom and the institutions' ties to politicians as input variables. The reasoning behind this analysis was that "[t]he link between firm performance and political connections [...] is particularly important for firms in more highly regulated industries where a simple change in either law or regulatory policy can result in significant costs, or open new profitable opportunities" (Gropper, Jahera Jr., & Park, 2015, p. 76). They found that, on the one hand, a higher

¹² Bankscope used to be the largest database for quantitative data on banks globally but was discontinued in 2016 (BVD, 2017b). Its successor is the OBF (BVD, 2017b), the database also underlying this thesis (for more information on the OBF see 2.3.3.3 *Data, Data Sources, and Results Presentation*).

degree of economic freedom granted by state laws resulted in banks reporting higher returns on assets (Gropper, Jahera Jr., & Park, 2015, p. 91). ROA was even higher when a senator or other high-ranking politician from the same state as the bank's headquarter chaired the bank's supervisory board, which, additionally, yielded higher returns for investors (Gropper, Jahera Jr., & Park, 2015, p. 91). On the other hand, though, such chairmanships showed diminishing effects the higher the level of economic freedom in a state, hence nurturing close ties with politicians is only advisable when economic freedom is comparatively low (Gropper, Jahera Jr., & Park, 2015, p. 91). Similarly, the researchers found in an earlier study that the performance benefits of local politicians in board positions were especially effective when the respective politicians were experienced, well connected, and attuned with other politicians (Gropper, Jahera Jr., & Park, 2013, p. 98). These findings are not limited to the US, as demonstrated by Faccio, Masulis, & McConnell (2006, pp. 2597, 2628), who analyzed the bailouts of 450 distressed companies in 35 countries and found "that political connections lead to preferential corporate bailouts" (2006, p. 2628).

2.2.3 Cross-Country East Asia-Specific Research

For the third and final part of this state of the art, it is essential to address analyses with a specific focus on cross-country research in East Asian countries. While the literature is highly concerned with and concentrated on the EU (examples include Ferreira C. (2016) or García-Kuhnert, Marchica & Mura (2015)), on comparisons between US states (Goetz, Laeven & Levine (2016) or Gropper, Jahera Jr., & Park (2013)), or between countries globally (see, among others, Gorener & Choi (2013), Kou, Peng, & Wang (2014), Laeven & Levine (2009), and Köster & Pelster (2017)), the number of works dealing with (East) Asia or China, Japan, and Korea, in particular, is comparatively low. This observation is not least shown by the fact that literature reviews or states of the art in scholarly articles concerned with Asian countries merely cite studies with contextual, not geographical, proximity to the research subject. The work of Casu, Deng, & Ferrari (2016, pp. 2-4) or Natalia, Kurniawan, & Firsty (2016, p. 33) are examples of such contextual framing. Interestingly though, there is great interest in country-specific, specialized analyses in the sphere of banking analyses such as China's shadow banking¹³ (e.g., Li, Hsu, & Qin (2014) or Sun (2019)), the Bank of Japan's (BOJ) monetary policy of quantitative easing¹⁴ (see Fujiki & Tomura (2017) or Matsuki, Sugimoto, & Satoma (2015)), or the bank performance in South Korea during the Asian financial crisis (see Hyun (2017) or Jeon & Miller (2005)).

Noman, Gee, & Isa (2017, p. 1) focused on Asian cross-country data and analyzed the impact of competition on the stability of the financial sectors of countries belonging to the Association of Southeast Asian Nations (ASEAN). Thoroughly investigating the ASEAN-5¹⁵ countries' commercial banks by using indicators on country- and bank-level from 1994 to 2014, the key result was that high

¹³ Shadow banking is the practice of running bank-related businesses without proper legitimation (Li, Hsu, & Qin, 2014, p. 119).

¹⁴ Quantitative easing is a measure by which the central bank buys government-issued securities such as bonds or other forms of securities in order to push the amount of money available within an economy to ultimately increase spending power within that economy (Matsuki, Sugimoto, & Satoma, 2015, p. 113).

¹⁵ ASEAN-5 countries are Indonesia, Malaysia, Philippines, Singapore, and Thailand (IMF, 2016).

competition paired with small market power fosters stability in the banking industry (Noman, Gee, & Isa, 2017, pp. 13, 16, 21-22). The trio summarized their research as demonstrative of a push to implement the ASEAN Banking Integration Framework (Noman, Gee, & Isa, 2017, pp. 21-22). It aimed to support ASEAN's plan to reach a high degree of economic and financial inclusion by 2020 (Financial Management Association, 2017). Other scholarly works focusing on ASEAN countries include Nguyen, Skully, & Perera (2012) and Ovi, Perera, & Colombage (2014), with the former concluding that banks with strong market power in interest-bearing products do not diversify much into non-interest products, while the opposite is true for banks with lesser market power (Nguyen, Skully, & Perera, 2012, p. 698). Ovi, Perera, & Colombage (2014, pp. 412-413), comparatively, analyzed market power from a different angle and found that credit risk is typically higher in banks with more power and allows them to "earn a higher share of income from fee-based and commission-based banking products" (p. 413).

Fu, Lin & Molyneux (2013, p. 64) focused on analyzing the intersection of financial stability and competition in their investigation of 13 Asian countries (China, Japan, and Korea were among them) and Australia. This study was the first to measure bank fragility in the region using market- and accounting-data on the single bank level (Fu, Lin, & Molyneux, 2013, p. 72). Interestingly, they found the nexus of stability and competition to be neutral, "indicating that the competition-stability and competition-fragility theories can simultaneously apply to Asia Pacific banking markets" (Fu, Lin, & Molyneux, 2013, p. 72). In terms of instability, the study showed that Singaporean, Malaysian, and Hong Kong banks showed the lowest risk values, while Japanese, Taiwanese, and Korean banks turned out to have the highest risk values (Fu, Lin, & Molyneux, 2013, p. 70).

Using ASEAN-5, plus China, Japan, and South Korea as sample countries, Natalia, Kurniawan, & Firsty (2016, pp. 32-42) dove into the topic of income diversification (defined as the percentage of non-interest income in relation to a bank's operating revenue (He, Chen, & Liu, 2017, p. 4000)), assessing 54 banks and diversifications' impact on both risk and firm value. The main implication was that "a bank [...] can increase its value for investors and reduce its volatility (total risk, systematic risk, and idiosyncratic risk) by diversifying of income (sic) with non-interest income, especially through fee income and other non-interest income" (Natalia, Kurniawan, & Firsty, 2016, p. 42). Lee, Yang & Chang (2014, p. 48) obtained more complex results after they, similarly, analyzed risk and profitability across 22 Asian nations, encompassing almost 1,000 banks. When only looking at the results of the entire sample, they suggest that non-interest activities reduce risk without affecting profitability (Lee, Yang, & Chang, 2014, p. 66). However, when taking into account (i) bank specialization and (ii) the individual countries' income situations, the results differ greatly (Lee, Yang, & Chang, 2014, p. 66). Concerning (i), savings banks do not profit from engaging in non-interest activities, while investment, corporate, and cooperative banks benefit either from increased profits or reduced risk (Lee, Yang, & Chang, 2014, p. 66). Additionally, banks in (ii) countries with higher income levels take on higher risks when diversifying their portfolios and banks doing so in lower income countries can thereby tackle profitability or risk (Lee, Yang, & Chang, 2014, p. 66).

The aforementioned study conducted by Casu, Deng, & Ferrari (2016, pp. 12, 23) measures the effects of deregulation and reregulation on the technological advances and cost structure of eight Asian countries using a stochastic frontier model, taking into consideration both variables for banking sector and bank performance analyses. Overall, deregulating policies, such as allowing foreign banks to enter the market, have positive effects on bank performance and technological improvements (Casu, Deng, & Ferrari, 2016, pp. 23-24). The opposite is true for reregulation activities (Casu, Deng, & Ferrari, 2016, pp. 23-24). In general, the research has shown a positive regulation balance in the analyzed countries within the observed period from 2001 to 2010 (Casu, Deng, & Ferrari, 2016, pp. 23-24). Additionally, the study found that the pioneers of technological developments are located in China and Japan; however, these efforts are mostly visible in private banks and foreign subsidiaries, with cooperative or state-owned banks typically lagging behind (Casu, Deng, & Ferrari, 2016, pp. 23-24).

Miao & Jayakar (2016) and Tsuchiya (2016) authored studies with a sole focus on China, Japan, and South Korea. The former studied the developments of the mobile payments market, based on the rationale that technological progress in one country with a similar culture to another is likely to trigger competitiveness and faster innovation (Miao & Jayakar, 2016, p. 182). Studying the history and development of mobile payments, they found that while China is not as developed in terms of overall market penetration, there is the emergence of payment platforms such as WeChat (Miao & Jayakar, 2016, p. 194). These platforms are segregated from traditional banks and phone providers, allowing them to circumvent regulations all while spreading the use of mobile payments (Miao & Jayakar, 2016, p. 194). Japan and South Korea, by contrast, were already more advanced in terms of technology and the services they provided, with the backbone of mobile payments being banks and telecommunications companies (Miao & Jayakar, 2016, pp. 193-194). They concluded that the increase in competition led to a stimulus for innovation and a broader range of products and services catering to the needs of consumers (Miao & Jayakar, 2016, p. 193).

Tsuchiya (2016, p. 96) studied the threats posed by the shift in all three countries from classical branch banking to digital services, such as mobile payments and Internet banking. He argues that the East Asian region is one of the most affected by cyber-attacks as “it is the most dynamically developing area of the Internet” (Tsuchiya, 2016, p. 97) with China, Japan and Korea experiencing 700, 100, and 40 million attacks respectively in 2013 alone. Concerning the financial services sector, the degree of manual execution of transactions has dropped dramatically as computers manage them in milliseconds, or even microseconds (Tsuchiya, 2016, p. 103). At the same time, this digitalization of payment systems has made them vulnerable to failures and attacks that result in monetary and/or reputational losses (Tsuchiya, 2016, pp. 103-104). Attacks on banks are daily occurrences in the three countries, ranging from illicit stock orders to fake payments and software attacks (Tsuchiya, 2016, p. 97). In China especially, attacks originate both from domestic sources as well as from abroad (Tsuchiya, 2016, pp. 103-106).

In conclusion, this chapter highlights that there exists ample current research in the fields of financial sector and bank performance analyses. It also shows there is a wide variety of research focuses,

with an emphasis on Western countries. When it comes to East Asia, and China, Japan, and Korea in particular, some research has been conducted, but not to the same extent as for other geographical regions. This result for financial sector and bank performance analyses is further manifested by the fact that cross-country Asia-specific research, especially focusing on the three countries, is, in comparison with the geographical West, not yet fully developed.

2.3 Analytical Framework

2.3.1 Introduction

As discussed in 2.2 *State of the Art*, there are numerous approaches to analyzing single countries or groups of countries with regards to their banking sectors (i.e., regulatory and macroeconomic environments) as well as the performance of banks. Moreover, approaches for research on both the single bank level and the aggregated level find sound justification. As a consequence, this master's thesis benefits from a broad selection of potential analytical frameworks.

Before deducing and presenting the analytical framework, I want to briefly touch upon why I decided to use a two-layered research question scrutinizing the overall countries' banking industries as well as their banks' performance. Adding to the fact that combining both research angles is not uncommon in scholarly works (examples also presented under 2.2 *State of the Art* include Köster & Pelster (2017), Nasir & Du (2017), and Saona & Azad (2018)), I find it essential to provide not only the framing (in this thesis' case an analysis of the country-level banking environment), but to also delve into a more detailed, directly banking sector-related analysis.

Academics are aligned in the view that both an individual bank's and an entire sector's performance are dependent on their surroundings (Drake, Hall, & Simper, 2005, pp. 16-17; Lozano-Vivas, Pastor, & Pastor, 2002, pp. 59-60). Lozano-Vivas, Pastor, & Pastor (2002, pp. 72-73) even argue further that the mere analysis of bank performance provides little validity. Hence, merely conducting a performance analysis would not yield insights into how the environment supports or hinders a region's or a nation's banking industry (Almazari, 2014, p. 126). The pivotal role of the banking industry on society and regional and/or global stability is a given (Theissen, 2013, pp. 1-2), which in my opinion should not be neglected in any research aiming at investigating banks – whether that is from a political, regulatory, governance, performance, or other viewpoint. Even analyses focused predominately on bank level are complemented by measures such as GDP growth as independent variables or proportionality measures (e.g., Alper & Anbar (2011, pp. 145-146), Bertay, Demirgüç-Kunt, & Huizinga (2015, p. 329), and Mergaerts & Vander Venet (2016, pp. 71-72)). Moreover, even when there is no inclusion of such country-level variables in bank performance studies, the introductory chapters often provide context and/or the literature review references to research that is concerned with the geographical area in question (see, among others, Cheng, Zhao, & Lin (2017, pp. 389-393), Ghosh S. (2016, pp. 372-373), or Miao & Jayakar (2016, pp. 186-184)).

Besides the observation that there is a strong case for bank performance analyses to incorporate analyses of the surrounding environment, I hold the general view that a master's thesis comes with

certain additional requirements not necessarily expected of scholarly articles. Not only do methodological and structural competence have to be presented in greater depth, more emphasis also needs to be put on the analytical framework and development throughout the thesis to show subject matter expertise. Furthermore, and in a somewhat contradictory sense, certain types of analyses (for example, in the case of complex statistical models) can only be performed to a limited extent or cannot be executed at all due to the lack of specific instruments or capabilities. Finally, thesis authors need to convince the reader that they are capable of working academically, while published scholars have already been vetted by the journals publishing them, hence they have the advantage of matter-of-factly presenting their methodological approaches without long discourses on the derivation of their framework.

Taking into consideration the above arguments, I followed three guiding principles for the development of this research's analytical framework:

- First, my intention is to provide a sound analysis of the Chinese, Japanese, and Korean banking industry. The picture would be incomplete if the focus were limited to bank performance without the environmental context or vice versa. Using both a banking landscape and bank performance analysis is an approach I can also confirm from my work as a management consultant with numerous banks in Austria and Europe, where any market-oriented analysis provided to my clients does include both regulatory and macroeconomic viewpoints to complement bank-specific analyses.
- Second, I aim to provide a substantial analytical model, which not only provides a solid overview but also yields graspable insights into the landscapes and banking sector performances of those three East Asian countries.
- Last, I need to be wary of data availability, my capability to perform certain analyses, and overall suitability.

My study of previous banking sector and bank performance analyses has shown there is no framework with direct applicability for this thesis (see 2.2 *State of the Art*). The various reasons include, among others, a sole focus on either banking environment or bank performance, very specific research angles not suited for a master's thesis (for example, the work of Busch & Memmel (2016) who parsed, in an in-depth manner, the individual components of a single bank performance measure), scrutiny of circumstances not prevailing in China, Japan, and Korea (e.g., EU-specific regulation (Rachdi & Bouheni, 2016)), or use of models/statistical methods that are not replicable.

As a consequence, despite taking existing frameworks in the fields of banking sector and bank performance analyses into account, I developed the research framework eclectically. The framework used under 3 *Analysis* comprises two parts:

- (A) Country-level macroeconomic and regulatory analysis to represent the banking environments of China, Japan, and South Korea
- (B) Bank-level FRA to evaluate the bank performance in China, Japan, and South Korea

Analyses (A) and (B) are performed individually for each of the three countries. Based on these results, *4 Interpretation and Discussion of Findings* discusses the results of these analyses – first on a single country level and then in a full cross-country comparison, with the aim of providing answers to the research question, allowing for an overarching comparison of similarities and differences between China, Japan, and South Korea concerning banking environment and bank performance. This interpretation and discussion of findings provides not only the synopsis of analyses (A) and (B), it also allows one to build on it to establish a combined understanding of the results. *Figure 4* provides a high-level overview of the analytical framework and the subsequent *4 Interpretation and Discussion of Findings*.

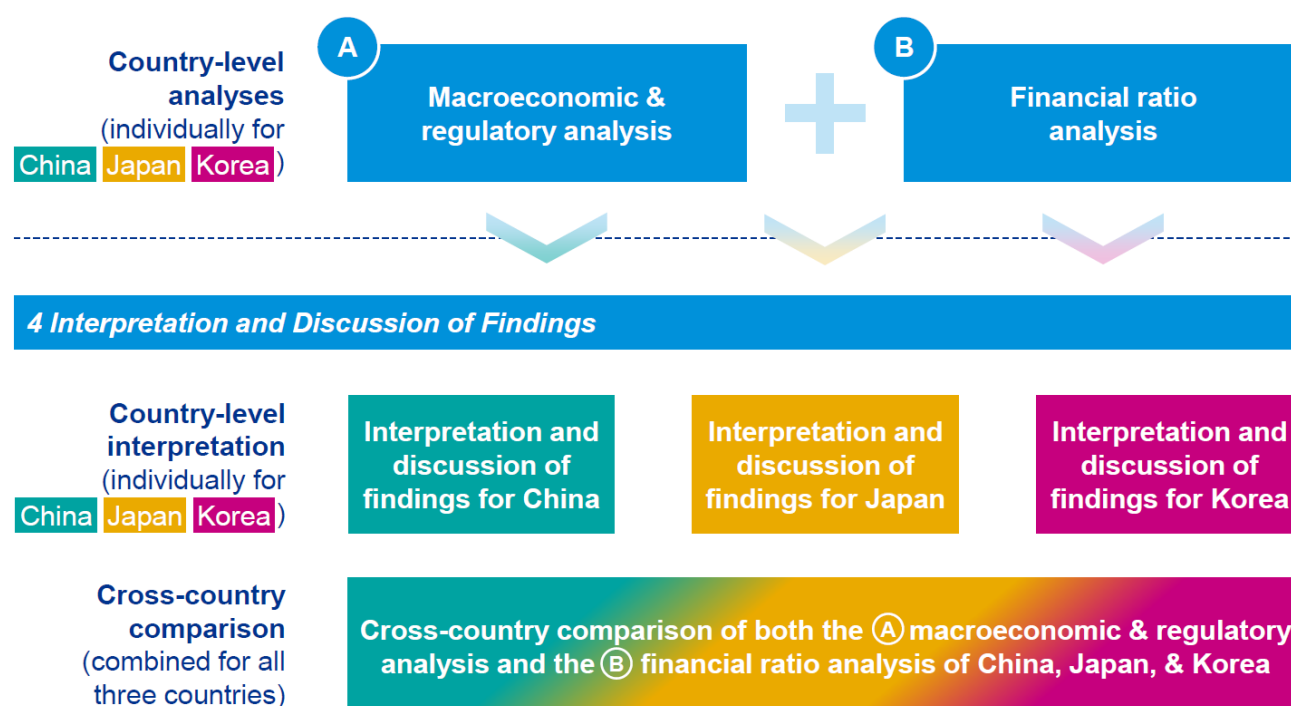


Figure 4: High-level overview of the two parts of the analytical framework and interpretation of the results and discussion

Concerning (A) the banking sector analysis, the review of existing research has put forward the common practice of using variables from two areas especially, macroeconomics and regulation (e.g., Casu, Deng, & Ferrari (2016, p. 11), García-Kuhnert, Marchica, & Mura (2015, pp. 612-613), Köster & Pelster (2017, p. 60), or Noman, Gee, & Isa (2017, p. 6)). GDP growth and inflation rate (Becchetti, Ciciretti, & Paolantonio, 2016, p. 228) are key variables pertaining to the former. Additionally, particularly since the rise of financial turmoil, variables surrounding “concomitant prudential regulation initiatives” (Casu, Deng, & Ferrari, 2016, p. 1) have been added to banking sector analyses or are even the center of the research, as, for example, demonstrated in the scholarly articles of Apătăchioaea (2015, pp. 35-42), Gorener & Choi (2013, p. 128), Hyun (2017, p. 705), Noman, Gee, & Isa (2017, pp. 5-6), or Rachdi & Bouheni (2016, p. 27). As a consequence, and within the limits of this thesis, the framework used for (A) the banking sector analysis is focused on macroeconomic and regulatory events in China, Japan, and South Korea.

The variables used follow the frameworks of Casu, Deng, & Ferrari (2016) and Noman, Gee, & Isa (2017). These two studies came to focus as both research trios performed banking sector analyses of Asian countries with additional bank performance analyses, thus displaying strong parallels to the scope of this thesis (Casu, Deng, & Ferrari, 2016, p. 9; Noman, Gee, & Isa, 2017, p. 5). The geographical proximity of these two studies, however, was not decisive in their selection as a foundation for the framework established here – other studies simply had to be discarded as they were not suitable for the scope or this thesis' research question (for instance, Barth, Prabha, & Swagel (2012, pp. 270-279) tried to determine which US and global banks were potentially on the verge of a breakdown; or Ferreira C. (2016, pp. 180, 192-193) and Drake, Hall, & Simper (2005, pp. 4, 16) used data envelopment analysis to study the connection between economic growth and efficiency in the EU and the impact of environmental factors on the earnings of Hong Kong banks respectively). Casu, Deng, & Ferrari (2016, p. 12) used seven variables measuring de- and reregulation alongside GDP as a control variable. Noman, Gee, & Isa (2017, pp. 6, 13), on the other hand, employed two regulatory measures together with two macroeconomic measures.

As well as Casu, Deng, & Ferrari (2016) and Noman, Gee, & Isa (2017), other scholars also use measures of GDP development (examples include Ghosh A. (2016, p. 62) and Köster & Pelster (2017, p. 60)), as it captures economic activity and a country's growth rate, allowing for comparison with other countries (Amadeo, 2019a). Noman, Gee, & Isa (2017, p. 6) complemented GDP growth with inflation rate. These two variables, GDP growth and inflation rate, also constitute the two quantitative measures used to capture the macroeconomics of analysis (A).

A qualitative analysis of changes to the regulatory environment will also be performed. The reasons for doing so are threefold. First, as demonstrated in core research by Casu, Deng, & Ferrari (2016, pp. 9-15) and Noman, Gee, & Isa (2017, pp. 5-6), both involve complex statistical models to derive comparatively specific results. As my aim is to provide a solid overview of recent changes in the regulatory framework, using a descriptive approach is more sensible. The topic of regulation is such a broad field of research in itself – ranging from policymaking to the effectiveness of supervisory institutions to measures of its impact on both the economy as a whole and the business side of regulated banks (Agoraki, Delis, & Pasiouras, 2011, p. 38; Anginer, Demirgüç-Kunt, & Mare, 2018, p. 97; Ferreira C., 2016, p. 174; Gregoriou, Kontonikas, MacDonald, & Montagnoli, 2009, p. 401) –, approaching it from a quantitative angle cannot be done in a serious manner within the scope of this thesis. Rather, a solid picture of the regulatory environment and main events throughout the research period (as well as some more historical developments) are to complement the quantitative macroeconomic part. Other scholars analyzing financial services often have recourse to a qualitative description of country and regulatory environments as well¹⁶. Key studies include Barth, Prabha, & Swagel (2012, pp. 279-282), Cheng, Zhao, & Lin (2017, pp. 389-392), He, Chen, & Liu (2017, pp. 397-399), and Fukuyama, Färe, & Weber (2018, p. 2022).

¹⁶ Also Casu, Deng, & Ferrari (2016, pp. 1-9) and Noman, Gee, & Isa (2017, pp. 1-5) provide lengthy qualitative discourses on the banking environment, comprising 38 and 23 percent respectively of total pages of their studies.

Second, adding a qualitative component within the banking sector analysis enables one to provide a more inclusive picture of the respective country and its overall developments since regulatory changes are usually the result of certain events – be it nationally, internationally, or industry-specific. Allowing for this broader view, moreover, affords the opportunity to highlight and nuance the three countries in question further, while quantitative measures lack the necessary context.

Finally, the guiding works of Casu, Deng, & Ferrari (2016, pp. 13, 28) and Noman, Gee, & Isa (2017, pp. 11-12) make use of the World Bank's database on regulation and supervision as initially designed by Barth, Caprio Jr., & Levine (2001; 2013) (see also my discourse of the database under 2.2 *State of the Art*)¹⁷. The two most recent updates to the database provide insight into the regulatory environment in 2011 and 2016 (World Bank, 2019b)¹⁸, which are both within the time span under consideration in this thesis. While the survey's design does not provide the type of information relevant to the regulatory analysis (due to the closed question format of the survey, as well as the topics themselves) (World Bank, 2019b), I am still using the database for cross-checks.

Chapter 3 *Analysis* presents a summary of the changes in the regulatory environment in China, Japan, and Korea, based on recent literature on the subject, allowing for the direct incorporation of quantitative, regulation-centered research results to be directly incorporated into this thesis.

In conclusion, (A) the macroeconomic and regulatory analysis comprises three components – two are of a quantitative nature and with a focus on macroeconomics, the third entails a qualitative assessment of the respective regulatory environments. *Table 1* shows the variables used.

Analysis	Variable	Origination
(A) — Macroeconomic & regulatory analysis	1 GDP growth	Casu, Deng, & Ferrari; Noman, Gee, & Isa
	2 Inflation rate	Noman, Gee, & Isa
	3 Changes in the regulatory environment	Adapted from Casu, Deng, & Ferrari; Noman, Gee, & Isa: Qualitative analysis of change in regulatory requirements

*Table 1: Variables underlying (A) the macroeconomic and regulatory analysis*¹⁹

Coming to (B) the bank-level analysis, in which the performance development on an aggregated bank level is in focus, the basic framework is based on an FRA. While there are other methods used by academics as well, such as stochastic frontier models (e.g., Berger, Hunter, & Timme (1993, pp. 245-246)) or data envelopment analysis (e.g., Grigorian & Manole (2005, p. 5) or Kou, Peng & Wang (2014, p. 7)), using a comparatively simpler, accounting data-based FRA is justified for three reasons. First, following my guiding principles, the complexity of certain models as well as, second, the data availability for such models, make it difficult to employ them. Moreover, Bikker & Bos (2008, p. 117) found that FRA are not less accurate, they are even advantageous in that they usually include a broad range of variables, rather than focusing on a single variable as other models often do. As such,

¹⁷ Casu, Deng, & Ferrari (2016, pp. 11-15) used a meta-frontier model with seven regulatory and 16 market and profitability data points to derive at their conclusions. Noman, Gee, & Isa (2017, p. 11) incorporated the volumes of deposit insurance and imposed restrictions in activities of banks as regulatory variables.

¹⁸ The latest update of the World Bank's (2019b) survey follows the questionnaire developed by Barth, Caprio Jr., & Levine (2001); however, the authors of the survey have changed to Mare, Cull, Demirgüç-Kunt, & Zhou (2019).

¹⁹ Based on research by Casu, Deng, & Ferrari (2016, p. 12) and Noman, Gee, & Isa (2017, p. 13), own visualization.

FRA provide an overall snapshot of a bank's performance if the set of variables is well curated (Bikker & Bos, 2008, p. 117). The concept of FRA is additionally one that I regularly employ in my work with my bank clients, so I can contribute my professional knowledge to this type of analysis.

As with any data-centered analysis, I approached the search for a suitable FRA model from the point of view of data availability. As the literature shows, FRA typically include large samples of individual banks in their scope, gaining thousands of data points per analysis – Bertay's, Demirgüç-Kunt's, & Huizinga's (2015, p. 326) sample includes 1,633 banks in 111 countries, while Gropper, Jahera Jr., & Park (2015, p. 1988) looked at 505 banks in the US alone. This demonstrates that collecting each bank's data manually is not feasible, not least due to the increased risk of incorrectly inputting data. Many scholars conducting performance analyses, such as Bertay, Demirgüç-Kunt, & Huizinga (2015, p. 327), Heffernan & Fu (2010, p. 1591), and Laeven & Levine (2009, p. 262), relied on the Bankscope database, which specialized in compiling balance sheet and P&L data on banks globally (BVD, 2017b). Unfortunately, Bankscope was discontinued in 2016 (BVD, 2017b). Its successor is Bureau van Dijk's (BVD) database Orbis Bank Focus (OBF), which is the source of all accounting-level data in this thesis (for more information on the OBF see 2.3.3.3 *Data, Data Sources, and Results Presentation*). With solid data quality and availability²⁰ secured, the search and development for the fitting FRA framework was predominantly a question pertaining to the research angle.

Like with the reason for including (A) the macroeconomic and regulatory analysis to provide a comprehensive picture of the banking environment, the same creed led to the FRA being eclectically built upon the studies of Kumbirai & Webb (2010), Ghosh S. (2016), and Mergaerts & Vander Venet (2016), of which the former provides the basis framework.

Kumbirai & Webb (2010, pp. 30, 39-40) employed a model comprised of seven variables to measure the performance of South African banks. The variable set encompasses the viable performance triangle of profitability, liquidity, and risk and stability (Berríos, 2013; Bordeleau & Graham, 2010; Kumbirai & Webb, 2010, pp. 39-40). This trichotomy is the core foundation of the FRA model used for this thesis. As there is a broad spectrum of FRA methodologies used by researchers (see also the discourse under 2.2 *State of the Art*), Kumbirai's & Webb's (2010) rather holistic, integrated approach using a research methodology that combines variables from all three areas of the performance triangle is what made it relevant for this thesis. Basing a framework on these three areas allows for a performance analysis from different viewpoints of banks' fundamental elements. In comparison, other research often has a more in-depth analysis of one of the aspects in focus – for instance, Alper & Anbar (2011, pp. 143-146) immersed themselves in the profitability spectrum, while Laeven & Levine (2009, p. 259) focused mainly on risk and stability. As the very nature of this thesis is to examine the performance of Chinese, Japanese, and South Korean banks adequately, applying a broader perspective is essential.

²⁰ The migration from Bankscope to the OBF resulted in viable data for banks in China, Japan, and Korea to only be available from 2011 onwards, as not all data was being transferred to the new platform (OBF, 2017). This is part of the reason why the research timeframe for this thesis starts with the year 2011 (more on selection of the timeframe from 2011 to 2016 can be found below).

Despite their holistic tendency, Kumbirai & Webb (2010, pp. 39-40) put greater emphasis on profitability and liquidity aspects, and only explored risk measures to a lesser extent. The performance triangle is where the reputable works of Ghosh S. (2016) and Mergaerts & Vander Vennet (2016) come into play, as they both affirm the variables established by Kumbirai & Webb (2010) while also supplementing additional variables to ensure a solid balance is maintained between the three building blocks. This means that additional variables from Ghosh S. (2016) and Mergaerts & Vander Vennet (2016) have eclectically enhanced the FRA framework. Including them follows a twofold rationale. For one, Mergaerts & Vander Vennet (2016, pp. 57-59) studied both risk and profitability of several hundred European banks using an FRA, “containing both bank-specific and macroeconomic variables with an annual frequency” (p. 59), thereby generating results applicable for internal decision making within banks and bank business models. Secondly, Ghosh S. (2016, pp. 372-374) used an FRA model to analyze the impact of political transition – in particular, that of the Arab Spring – on bank performance, thus focusing on external factors. The two works not only allow for cross-reference and refinement of the analytical framework, they also encompass additional viewpoints that are useful for the analysis.

Combining the three FRA frameworks and conducting additional cross-checks with established other works in the field of FRA (Amel & Rhoades (1988), Demirgüç-Kunt & Huizinga (1999), Heffernan & Fu (2010), or Laeven & Levine (2009), for example) shaped a profound and balanced set of 11 variables that equally highlight profitability, liquidity, and risk and stability. The derived analytical framework for (B) the FRA is shown in *Table 2*.

Contrary to (A) the macroeconomic and regulatory analysis, it was not sensible to use East Asia-focused or even China-, Japan-, and Korea-centered works to build the FRA framework. One reason is the relative lack of extensive FRA research for the region, as has also been discussed in 2.2 *State of the Art*. Additionally, among research that focused on it, there was not enough compatibility to fully include these works, but they proved fruitful nonetheless for cross-checks throughout the development of the framework. For instance, Cheng, Zhao, & Lin (2017, p. 393) use a set of 16 variables, some of which are also presented in *Table 2*; unfortunately, they focus on the attraction of foreign investors as a form of strategic development, hence their framework’s orientation is not a fit for the requirements defined herein. Moreover, the analysis focuses solely on China (Cheng, Zhao, & Lin, 2017, p. 388), as do He, Chen, & Liu (2017, p. 3995) and Heffernan & Fu (2010, p. 1585). As for Japan and South Korea, financial ratios and more complex analyses exist, which were helpful in the process of developing the FRA for both cross-reference and country-specific inputs, but they lack the element of international comparison (e.g., Liu & Wilson (2010) for Japan or Lee & Kim (2013) for Korea). Among the potential cross-country methodologies, Fu, Lin, & Molyneux (2013, p. 67) also used variables that were not replicable with the given data, such as the Lerner index or the Z-score (see more about these variables under 2.4 *Limitations*). Lee, Yang, & Chang (2014, pp. 48, 54) employed many of the variables in *Table 2*; however, they are concerned mainly with non-interest income and its contribution to overall risk and profitability with hardly any focus on interest income, thereby neglecting the prime source of banks’ income.

Analysis	Dimension	Variable	Origination
(B) — Financial ratio analysis	Profitability	1 Return on assets	Ghosh S.; Kumbirai & Webb; Mergaerts & Vander Vennet
		2 Return on equity	Kumbirai & Webb; Mergaerts & Vander Vennet
		3 Net interest margin	Ghosh S.; Mergaerts & Vander Vennet
		4 Cost-income ratio	Kumbirai & Webb; Mergaerts & Vander Vennet
	Liquidity	5 Funding cost	Ghosh S.
		6 Liquid assets to total assets	Ghosh S.
		7 Net loans to total assets	Ghosh S.; Kumbirai & Webb
		8 Net loans to deposit and borrowing	Kumbirai & Webb
	Risk & stability	9 Equity to assets	Ghosh S.; Mergaerts & Vander Vennet
		10 Income diversification	Mergaerts & Vander Vennet
		11 Non-performing loans	Ghosh S.; (Kumbirai & Webb; Mergaerts & Vander Vennet ²¹)

Table 2: Variables underlying (B) the financial ratio analysis²²

While both (A) the macroeconomic and regulatory analysis and (B) the FRA are performed for each of the three countries individually and sequentially, the subsequent interpretation and discussion of results allows for the combined view on the banking landscapes and the performance results of China, Japan, and Korea. The 4 *Interpretation and Discussion of Findings* is descriptive in nature and is laid out in two phases. The results of (A) and (B) are merged for country-level interpretation and then assessed from a greater perspective to provide the element of international comparison. Where relevant or necessary, additional literature has been used to corroborate the interpretation. Figure 5 provides an illustration of the complete, eclectically developed framework and the interpretation of the analyses.

For all analyses, the time period spans from 2011 to 2016, using data points on a yearly basis. The justification for this comparatively short timeframe – six years – is twofold. By 2011, the effects and aftereffects of the GFC had partially subsided inasmuch as there was a shift from the key turmoil being located primarily in the banking sector towards public institutions and countries being downgraded by rating agencies (Elliott, 2011; London & Lund, 2018). Stark irregularities spanning the entire bank data sample as a result of the GFC were therefore not a necessary consideration.

²¹ Both Kumbirai & Webb (2010, p. 40) and Mergaerts & Vander Vennet (2016, p. 61) used similar variables – loan loss provisions/reserves to total loans –, which are often used as proxy for NPL (for more details see *Non-Performing Loans*).

²² Based on research by Ghosh S. (2016, p. 375), Mergaerts & Vander Vennet (2016, p. 62), and Kumbirai & Webb (2010, pp. 39-40), own visualization.

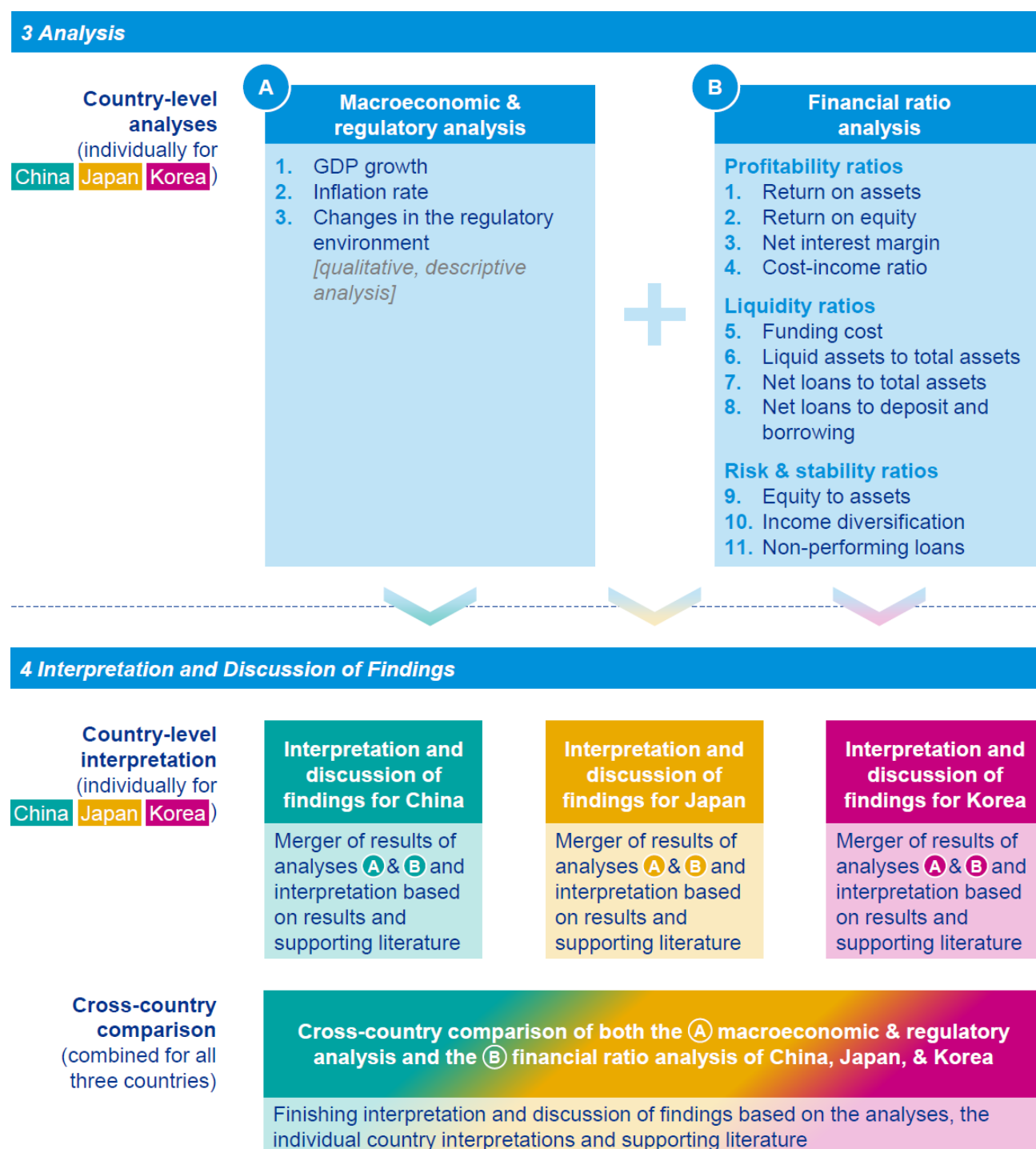


Figure 5: Illustration of eclectic analytical framework and the structure for the interpretation of the results and discussion²³

In addition, the data available from the OBF only starts to have a substantial number of Chinese, Japanese, and Korean banks from 2011 onwards (BVD, 2017b). This has largely to do with data migrating from the previous database, Bankscope, to the OBF (BVD, 2017b). This happened despite BVD being the host for both databases (the old Bankscope and the new OBF); however, the

²³ Based on research by Casu, Deng, & Ferrari (2016), Ghosh S. (2016), Kumbirai & Webb (2010), Mergaerts & Vander Vennet (2016), and Noman, Gee, & Isa (2017), own visualization.

underlying investors changed from rating agency Fitch to Moody's Analytics, another rating agency's affiliate (BVD, 2017b; Moody's, n.d.). The relaunch as the OBF in early 2017 led to the global financial institutions' historical data not being migrated in its entirety, instead the database only promised to provide at least the most recent three years with the complete data (BVD, 2017b; Vienna University of Economics and Business, n.d.). To gain a useful amount of data points for Chinese, Japanese, and Korean banks, 2011 proved to be the first viable starting point of the dataset (OBF, 2017). Rachdi & Bouheni (2016, p. 27) are an example of research focused on an equally short time period. They looked at European banks from 2005 to 2011, starting in 2005 due to a change in reporting standards. Nonetheless, their analysis provided sound and new results in the field of European banking sector governance (Rachdi & Bouheni, 2016, p. 32). In total, the sample for (B) the FRA contains 479 banks in China, Japan, and Korea (OBF, 2017).

3 Analysis
3.1 Introduction
3.2 Analysis (A): Macroeconomic and Regulatory Analysis
China
1. GDP growth 2. Inflation rate 3. Changes in the regulatory environment
Japan
1. GDP growth 2. Inflation rate 3. Changes in the regulatory environment
South Korea
1. GDP growth 2. Inflation rate 3. Changes in the regulatory environment
3.3 Analysis (B): Financial Ratio Analysis
China
1. Return on assets 5. Funding cost 9. Equity to assets 2. Return on equity 6. Liquid assets to total assets 10. Income diversification 3. Net interest margin 7. Net loans to total assets 11. Non-performing loans 4. Cost-income ratio 8. Net loans to deposit and borrowing
Japan
1. Return on assets 5. Funding cost 9. Equity to assets 2. Return on equity 6. Liquid assets to total assets 10. Income diversification 3. Net interest margin 7. Net loans to total assets 11. Non-performing loans 4. Cost-income ratio 8. Net loans to deposit and borrowing
South Korea
1. Return on assets 5. Funding cost 9. Equity to assets 2. Return on equity 6. Liquid assets to total assets 10. Income diversification 3. Net interest margin 7. Net loans to total assets 11. Non-performing loans 4. Cost-income ratio 8. Net loans to deposit and borrowing
4 Interpretation and Discussion of Findings
4.1 Introduction
4.2 China [based on analyses (A) & (B) and supporting literature]
4.3 Japan [based on analyses (A) & (B) and supporting literature]
4.4 South Korea [based on analyses (A) & (B) and supporting literature]
4.5 Cross-country Comparison [based on analyses (A) & (B), country-level interpretation, and supporting literature]
5 Conclusion

Figure 6: Structure of chapters 3 Analysis, 4 Interpretation and Discussion of Findings, and 5 Conclusion

The structure of analyses (A) and (B) presented under 3 Analysis follows the structure and the terminology of the analytical framework presented here and, subsequently, below in more detail. All analyses are conducted individually, per country, and in alphabetical order, so China before Japan,

and Japan before South Korea. The final chapters 4 *Interpretation and Discussion of Findings* and 5 *Conclusion* build on these results. Figure 6 illustrates the structure of these chapters.

Subsequently, I will provide a deep dive into the variables, the needed data and its sources, as well as the style and format of the presentation of the results under 3 *Analysis* for the two components of the analytical framework (see 2.3.2 *Analysis (A): Macroeconomic and Regulatory Analysis* and 2.3.3 *Analysis (B): Financial Ratio Analysis*). For the quantitative variables, I will add approximate reference benchmarks to provide a first placement of the later analytical results. It is important to mention that I refrain from providing too much data related to China, Japan, or South Korea, as this would be a lookahead to the analysis itself; rather, I aim to first provide guidance as to the range of values in which results might possibly be found (for example, by showing benchmark values from other Asian countries or the EU). Moreover, I would like to add a closing remark on the topic of accounting standards. The variables used in (B) the FRA are based on balance sheet and P&L data of the respective banks. As accounting standards vary across institutions and locations, a discourse *Excursion: Accounting Standards* on the legitimacy of comparing China, Japan, and South Korea, has been added under 2.3.3.3 *Data, Data Sources, and Results Presentation*. Since the 4 *Interpretation and Discussion of Findings* is based on the results of 3 *Analysis*, which is mainly of a quantitative nature, I deem it important to provide a brief outlook on the style and presentation of results, hence the additional 2.3.4 *Interpretation and Discussion of Findings* section.

2.3.2 Analysis (A): Macroeconomic and Regulatory Analysis

2.3.2.1 Introduction

The first part of the analytical framework comprises (A) the macroeconomic and regulatory analysis, which is founded in the studies of Casu, Deng, & Ferrari (2016) and Noman, Gee, & Isa (2017). As has already been derived above in the 2.3.1 *Introduction* of the analytical framework, this analysis includes three variables. Two of them are of a quantitative nature – GDP growth and inflation rate –, while the third – changes in the regulatory environment – is qualitative. For the sake of completeness, Figure 7 shows the variables of (A) the macroeconomic and regulatory analysis.

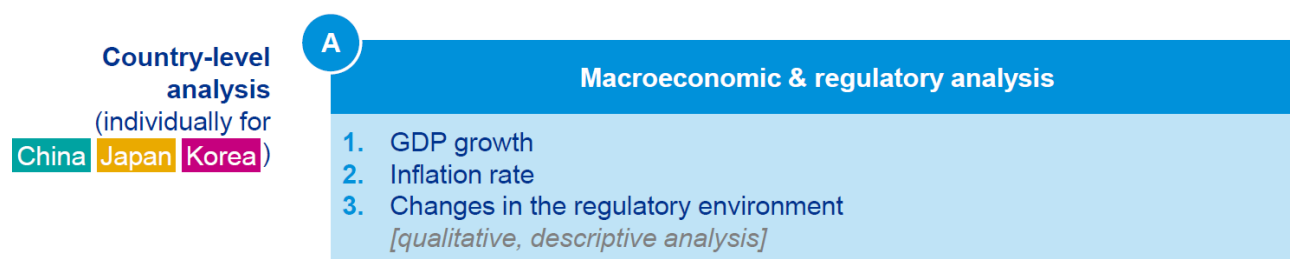


Figure 7: Overview of variables underlying (A) the macroeconomic and regulatory analysis²⁴

To avoid repetition, anything already provided in the 2.3.1 *Introduction* to the analytical framework and analysis (A) will not be restated here, but the focus of the following two sections 2.3.2.2 *Variables*

²⁴ Based on research by Casu, Deng, & Ferrari (2016, p. 12) and Noman, Gee, & Isa (2017, p. 13), own visualization.

and 2.3.2.3 *Data, Data Sources, and Results Presentation* is to provide information pertaining to the data, its sources, and a subsequent presentation of the results of the analysis.

2.3.2.2 Variables

GDP Growth

A country's GDP reflects the total output it generates – typically within a year – in terms of products and services (Amadeo, 2019a; Fernando, 2020) or as Gita Gopinath, currently the International Monetary Fund's (IMF) chief economist (Harvard University, 2020), put it: "GDP is a function of capital, labour and how productively you use both" (Sikarwar & Pandey, 2013). GDP is thus an important indicator of a country's economic progress (Fernando, 2020). Absolute GDP values only allow for comparison within a country, indicating whether the GDP rose or fell in comparison to the previous measurement (UN Economic Commission for Europe, 2020), or, alternatively, GDP can be used to contrast economies regarding their absolute size (Amadeo, 2020). The growth rate is a more suitable measure as it can be used for cross-country comparisons irrespective of size and indicates "how fast an economy is growing" (Fernando, 2020). The growth of a country's GDP reflects the change of real GDP²⁵ in percent compared to the previous measurement (Köster & Pelster, 2017, p. 72). GDP growth represents the most prominent measure to express economic growth or slowdown (Amadeo, 2019a). Another variable to express economic growth, for example, is GDP per capita (Ghosh A., 2016, p. 65; Rachdi & Bouheni, 2016, p. 39).

With regards to banking environments, GDP growth can be seen as a proxy variable to show "fluctuations in economic activity" (Agoraki, Delis, & Pasiouras, 2011, p. 43), thus signaling potential relevant developments in the banking landscape of the country under scrutiny (Casu, Deng, & Ferrari, 2016, p. 11). "It is expected to have an impact on numerous factors related to the demand and supply for banks deposits and loans" (Alper & Anbar, 2011, p. 145). Typically, higher levels of economic growth reflect a reduced likelihood of individuals or businesses defaulting on their loans as the overall economic power is increasing (Ghosh A., 2016, p. 62). Moreover, real GDP growth generally affects bank profitability and efficiency positively, while at the same time reducing risk-taking behavior (Ghosh A., 2016, pp. 64-66; Noman, Gee, & Isa, 2017, p. 21).

Providing first reference values of GDP growth in other countries, Köster & Pelster (2017, pp. 57, 61) assessed 68 nations from 2007 to 2014 and demonstrated an average GDP growth of 3.1 percent, with the maximum value reaching 14.2 percent, while the minimum value showed a contraction of 5.6 percent. Casu, Deng & Ferrari (2016, p. 12) found GDP growth rates between 0.7 and 10.9 percent over a 10-year span, from 2001 to 2010, in the eight Asian nations they analyzed.

Inflation Rate

Another commonly used macroeconomic measure in general, and for banking sector analyses in particular, is the inflation rate (see, for example, the works of Alper & Anbar (2011, p. 145), Anginer, Demirgüç-Kunt, & Mare (2018, p. 99), or Ghosh A. (2016, p. 63)). This measure denominates "the

²⁵ Real GDP characterizes GDP values that have been adjusted for effects caused by inflation (Amadeo, 2019a).

increase [or decrease] in the prices of goods and services over time” (Amadeo, 2019b), thus defining the purchasing ability of individuals and businesses alike in a specific country or region.

While there are several ways to measure inflation (or its opposite, deflation), the most common one, the change in consumer price index (CPI), is used in this thesis (Nishizaki, Sekine, & Ueno, 2014, p. 21; Shah, 2018). The consumer price thereby reflects the price paid for a defined basket of goods and services by an individual in urban surroundings (Bureau of Labor Statistics, n.d.). The change in CPI is expressed as a percentage relative to the previous measurement (Shah, 2018). Employing CPI change as a means of measuring inflation falls in line with supporting literature using inflation rates in bank performance analyses (examples include Noman, Gee, & Isa (2017, p. 10) or Rachdi & Bouheni (2016, p. 39)).

Contrary to GDP growth, inflation has a “fragility effect” (Noman, Gee, & Isa, 2017, p. 21), that is, increases in inflation lead to an amplified likelihood of individuals, businesses, and banks to take (more) risks. Also, as Bordeleau & Graham (2010, p. 12) demonstrate, banks may experience negative effects through inflation as the yield they generate from their lending business does not counter increased interest rates for short-term credits. However, Ghosh A. (2016, p. 62) argues that when banks correctly anticipate changes in the inflation rate, they can profit from these alterations if they are able to reduce costs while adapting interest rates for loans and deposits. Furthermore, “[i]nflation is generally associated with higher profitability as it implies additional earnings from float, which tend to compensate for the higher labor costs” (Ghosh A., 2016, p. 62).

To provide some graspable values of inflation rate as measured by CPI change, I draw on Noman’s, Gee’s & Isa’s (2017, pp. 13-14) study, in which the ASEAN-5 countries were analyzed from 1990 to 2014. The average inflation rate over those years stood at 6.6 percent (with Indonesia having the highest individual average with 10.7 percent and Singapore the lowest with 2.0 percent), the maximum value recorded was 58.3 percent and the lowest was a deflation of 0.8 percent (2017, p. 13). On a global level, inflation was up at 4.8 percent at the beginning of the research period in 2011 and had declined to 1.5 percent by 2016 (World Bank, 2019d).

Changes in the Regulatory Environment

Unlike with the first two variables, GDP growth and inflation rate, I will not employ a single quantitative measure for changes in the regulatory environment. Instead, I chose to follow a qualitative approach for this variable by making use of a literature review (for details see above 2.3.1 *Introduction*).

Taking the regulatory environment and its recent developments into consideration is relevant for a banking performance analysis, especially with economic turmoil and the constantly increasing interconnectedness of banks with individuals, private businesses, and public organizations (Calcagnini & Favaretto, 2011, p. xvii; Greenglass, et al., 2014, p. 11; Kokaliari, 2016, p. 8; Lindström & Giordano, 2016, p. 76). Regulation in the banking sector is defined as the conception and launching of sets of guidelines and rules to be followed by banks under local (domestic or national) and oftentimes also under international law (Nasdaq, n.d.). Such recommendations are issued and implemented by governments, typically in close accord with international agencies such as the IMF, the Bank for International Settlements (BIS), the Basel Committee on Banking Supervision (BCBS),

the World Bank, or the European Central Bank (ECB) (Barth, Caprio Jr., & Levine, 2012, p. 2; ECB, n.d.; Levine, 2005; Nasdaq, n.d.). This issuance and the ongoing enforcement of the adherence to the ruleset is called supervision and “is the part of government involvement that is primarily focused on maintaining the financial health (also known as the solidity) of individual banks” (Theissen, 2013, p. 1). The German Federal Financial Supervisory Authority, commonly abbreviated as BaFin²⁶, describes its supervisory duties as follows: “These are to work to prevent irregularities in the banking system which endanger the safety of the assets entrusted to institutions; adversely affect the orderly execution of banking transactions; or may substantially prejudice the economy as a whole” (BaFin, 2014). Supervisory activities start with the setup and licensing of banks and range from the fulfilment of requirements to the eventual liquidation of ill-functioning banks (Theissen, 2013, p. 2).

Regulatory rulesets typically consist of quantitative and qualitative requirements and, additionally, reporting obligations (Theissen, 2013, p. 8). Quantitative requirements, for example, can include minimum capital requirements (a certain percentage of capital a bank has to hold in order to withstand market turbulences) or maximum targets for troubled loans (Barth, Caprio Jr., & Levine, 2012, pp. 10, 12; Theissen, 2013, p. 9). Moreover, liquidity or risk requirements may have to be met (Theissen, 2013, p. 9). Examples for qualitative requirements include governance requirements (e.g., setup of the organizational chart and its reporting functions) as well as organizational requirements (e.g., proper controlling instruments or apt board members and employees) (Theissen, 2013, pp. 9, 11). Additionally, banks need to provide insights into their business, typically through regular reporting on the ruleset variables as well as disclosing bank information to supervisors (Theissen, 2013, pp. 11-12). Interestingly, research has shown adverse effects of banking regulation, as this observation of Barth, Caprio Jr., & Levine (2012) shows: “[I]n fact, increased supervision was found to be negatively related to the development of the banking sector and the integrity of the system (in other words, positively related to corruption in banking)”²⁷ (pp. 3-4). Nonetheless, markets and individuals alike demand financial regulation and its oversight, especially since the shocks of the GFC (Wolf, 2019).

While the regulation of financial institutions is no recent phenomenon (the US, for example, traces the roots of its banking regulation efforts back to the late 18th century), using and building upon international comparisons and leading practices only began in the last decade of the 20th century (Markham, 2010, pp. 221-222). Defining advances come from the research database established by Barth, Caprio Jr., & Levine (2013, pp. 111-112) (also touched upon in 2.2 *State of the Art*), which for the first time allowed cross-country regulation and supervision analyses (Levine, 2005, pp. 9-11). One of Levine’s (2005) key findings, which can be seen as a relevant impetus and perspective for this thesis’ regulatory analysis, was:

Consistent with research on the political economy of banking policies, the patterns we observe in the data suggest that countries do not choose individual regulations in isolation; rather,

²⁶ BaFin comes from the German long form of the authority’s name “Bundesanstalt für Finanzdienstleistungsaufsicht” (BaFin, n.d.).

²⁷ There are several theories on and studies into the correlation of the tightening of supervision and increases in corruption (Beck, Demirgüç-Kunt, & Levine, 2006, pp. 2131-2133). As more regulation inevitably leads to increased administrative and reporting costs as well as potentially reduced revenue, there is incentive for banks, corporations, and politicians to play the financial system (Beck, Demirgüç-Kunt, & Levine, 2006, pp. 2131-2133).

individual choices reflect broad approaches to the role of government in the economy. Some governments choose an active, hands-on approach, where the government owns much of the banking industry, restricts banks from engaging in non-lending activities such as securities underwriting, insurance, real estate, and non-financial services, limits the entry of new banks, and creates a powerful supervisory agency that directly oversees and disciplines banks. Other countries rely substantially less on direct government control of banks. These countries place comparatively greater emphasis on forcing banks to disclose accurate information to the public as a mechanism for facilitating private sector governance of banks. (p. 9)

Building on the above, the literature review in 3 *Analysis* for the regulatory environments will provide an overview of the key regulatory developments and changes throughout the research period. Even though regulation often builds upon international guidance, the environment in a country is still specific and influenced by national characteristics. Employing this regulatory view will contribute to a sound overview of China's, Japan's, and South Korea's banking landscape and allow for an increased understanding of potential developments observed in (B) the FRA.

2.3.2.3 Data, Data Sources, and Results Presentation

The results for all three variables are presented for each country individually, using the same order that was used to present them above. Data for both GDP growth and inflation rates are retrieved from the World Bank's database on world development indicators on a yearly basis from 2011 to 2016 (World Bank, 2019c; World Bank, 2019d). This is also the source used for these macroeconomic variables in the supporting literature (Casu, Deng, & Ferrari, 2016, p. 28; Ghosh A., 2016, p. 63; Köster & Pelster, 2017, p. 59; Noman, Gee, & Isa, 2017, p. 12; Rachdi & Bouheni, 2016, p. 39).

To put developments in China, Japan, and South Korea in greater context, I will also show data prior to the thesis' research period. Data is thus presented from 1990 onwards but is not core of the analysis itself. The year 1990 has been chosen, for one, as it includes possible visible developments of both the AFC and the GFC. Moreover, this timeline still allows for a lucid presentation of the data. As well as showing and discoursing the World Bank (2019c; 2019d) data on GDP growth and inflation, I touch upon current research on the results and its causes in the respective countries, where deemed essential. Chinese data does not include values for its two special administrative regions, Hong Kong and Macau (see also 2.5 *Definitions*).

With regards to GDP values, slight differences in the trend of the growth values, in percent versus absolute values, stem from the fact that the GDP growth rate values are calculated based on local currency, while the total GDP values are provided in USD (World Bank, 2019e). In order to compute cross-country and global comparisons, I refrain from using GDP values in local currency. Deviations in the overall GDP trend for a country caused by this effect are marked in the analysis.

Figure 8 depicts an example result presentation for GDP growth as well as the inflation rates. For increased commensurability, global values have been added to the charts.

As for the regulatory environment, I am using current research on regulation in China, Japan, and Korea. While the period from 2011 to 2016 is in focus, relevant insights into developments preceding 2011 are to some extent included for increased context. The results for all three measures of the

macroeconomic and regulatory embedding are presented per country in alphabetical order in *3.2 Analysis (A): Macroeconomic and Regulatory Analysis*. Each country is given a separate sub-chapter, in which the results for GDP growth and inflation rate are shown as charts and discussed. Then follows the literature review of the changes in the regulatory environment.

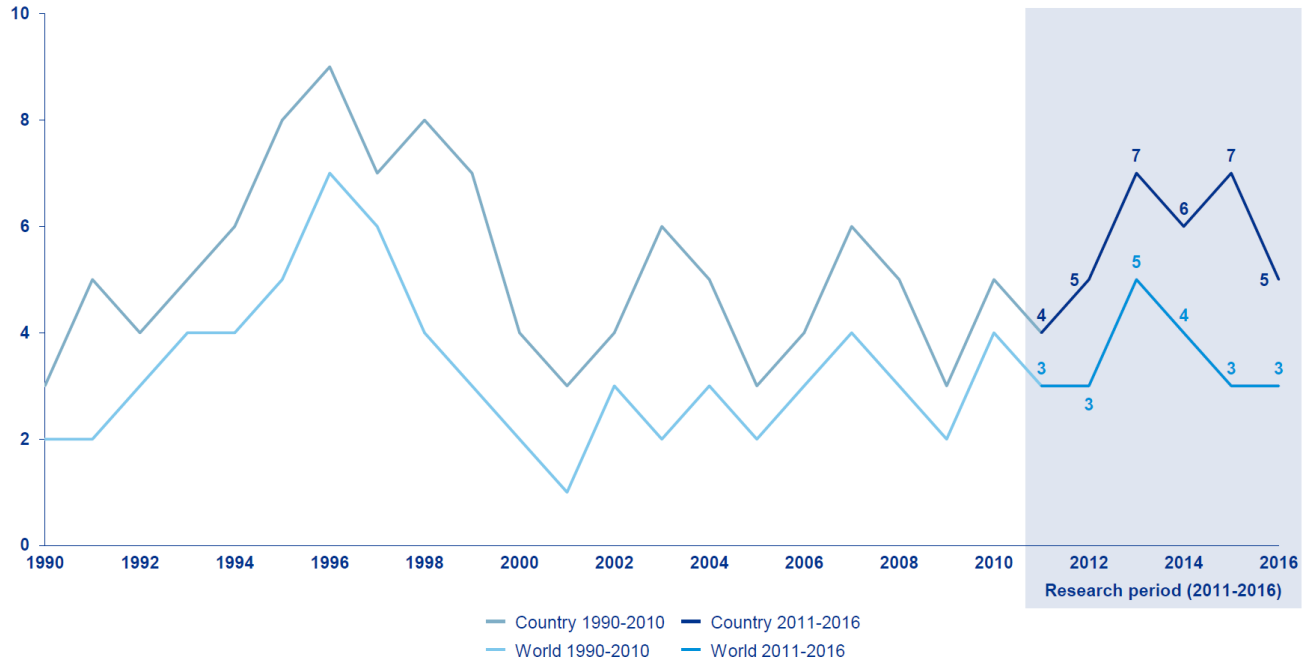


Figure 8: Example result presentation for GDP growth and inflation rate in percent

2.3.3 Analysis (B): Financial Ratio Analysis

2.3.3.1 Introduction

The second part of the analytical framework, (B) the FRA, has been eclectically built upon the studies of Kumbirai & Webb (2010), Ghosh S. (2016), and Mergaerts & Vander Vennet (2016). The FRA is performed individually on 479 banks in China, Japan, and Korea on an annual basis (i.e., for each year within the time period of 2011 to 2016), before being weighted by the banks' total assets and aggregated on a country level. The underlying dataset has been obtained from the OBF (2017) database, which specializes in compiling data on banks globally (BVD, 2017a). More context to the OBF and its vast pool of data can be found in section 2.3.3.3 *Data, Data Sources, and Results Presentation*.

The deduction of the variable set under the premise of maintaining a stable balance between the triad of profitability, liquidity, and risk and stability (Berríos, 2013; Bordeleau & Graham, 2010) has adequately been presented above in 2.3.1 *Introduction* of the analytical framework. All variables used for the FRA are ratios, meaning that (i) they represent divisions and (ii) the relevant values will be the divisions' results, indicated as percentage values (GMAC, 2017, pp. 106-107). The words "ratio" and "variable" are used interchangeably. The summary of the total 11 variables can be found in Figure 9.

Country-level analysis (individually for China Japan Korea)	B Financial ratio analysis		
	Profitability ratios	Liquidity ratios	Risk & stability ratios
	1. Return on assets	5. Funding cost	9. Equity to assets
	2. Return on equity	6. Liquid assets to total assets	10. Income diversification
	3. Net interest margin	5. Net loans to total assets	11. Non-performing loans
	4. Cost-income ratio	6. Net loans to deposit and borrowing	

Figure 9: Overview of variables underlying (B) the financial ratio analysis²⁸

For enhanced readability, the variable names are not given the add-on “ratio” (with the exception of “cost-income ratio” due to the popularity of this denomination both in scholarly and business contexts). Unfortunately, there is not one, stringent terminology for ratios (e.g., usage of hyphens between words), which is why I use the denominations of Kumbirai & Webb (2010), Ghosh S. (2016), and Mergaerts & Vander Vennet (2016). This naming is presented in *Table 3*, together with the abbreviations used. Other sources might use different labels for the same variables. For all these values, only the OBF (2017) classifications have been used, for clarity’s sake.

Dimension	Variable	Abbreviation
Profitability	1 Return on assets	ROA
	2 Return on equity	ROE
	3 Net interest margin	NIM
	4 Cost-income ratio	CIR
Liquidity	5 Funding cost	FC
	6 Liquid assets to total assets	LATA
	7 Net loans to total assets	NLTA
	8 Net loans to deposit and borrowing	NLDST
Risk & stability	9 Equity to assets	EA
	10 Income diversification	ID
	11 Non-performing loans	NPL

Table 3: Overview of abbreviations for the variables of (B) the financial ratio analysis

There are five variables employed by one of the underlying studies, but were excluded from this FRA:

- (i) Z-score
- (ii) Loans to earning assets
- (iii) Other income
- (iv) Loan rate
- (v) Net stable funding ratio

²⁸ Based on research by Ghosh S. (2016, p. 375), Mergaerts & Vander Vennet (2016, p. 62), and Kumbirai & Webb (2010, pp. 39-40), own visualization.

Addressing (i), the Z-score is a measure to determine a bank's probability of defaulting (García-Kuhnert, Marchica, & Mura, 2015, p. 604). Developed by Roy (1952, pp. 433-446) and highly popular among researchers (e.g., Ghosh S. (2016, p. 375), Laeven & Levine (2009, p. 262), or Mergaerts & Vander Vennet (2016, p. 62)), this variable has been excluded due to the fact that it is calculated over three to five consecutive accounting periods (García-Kuhnert, Marchica, & Mura, 2015, p. 612), something that is not possible given the timeframe for this thesis.

Furthermore, (ii) loans to earning assets, as suggested by Mergaerts' & Vander Vennet's (2016, p. 62) framework, is another excluded variable, due to its similarity to NLTA, part of the base framework from Kumbirai & Webb (2010, p. 40). Building on that rationale, (iii) other income was not incorporated in the FRA framework either, since ID makes for an appropriate alternative (Mergaerts & Vander Vennet, 2016, p. 62).

Similarly, (iv) loan rate is one of two measures employed by Ghosh S. (2016, pp. 375, 437) to analyze banks' credit portfolios and their potential yield. The variable was discarded due to the varying interest rate regimes and real interest rates in the countries under analysis (Harding, 2017; Wells, 2017; Wildau & Wells, 2017; World Bank, 2016). The second variable, FC, on the other hand, allows for sufficient analysis of the loan portfolio, especially in combination with NLTA and NLDST (Ghosh S., 2016, p. 374; Kumbirai & Webb, 2010, p. 40).

Moreover, (v) the net stable funding ratio, a regulatory measure within the Basel III agreement²⁹, was discarded because, despite being officially incorporated in 2010 and having been amended since, it only became effective in 2018 (BIS, 2014; Rogers, 2017). While banks needed to actively increase their stable funding until 2018 in order to achieve the compulsory minimum target (BIS, 2014; Liao, n.d.), results for the 2011 to 2016 period are not anticipated to provide relevant insight. Furthermore, many banks did not publish this ratio prior to 2018 (Wildau, 2016a).

The 11 variables shown in *Figure 9* and their calculations are presented and discussed in detail below (under 2.3.3.2 *Variables*). Then 2.3.3.3 *Data, Data Sources, and Results Presentation* focuses on data and sample creation, showing how the list of 479 banks has been compiled (OBF, 2017) and how data has been processed (this relates to technicalities, such as conversions into a single currency or varying accounting standards) to guarantee a solid analysis across countries and years. Finally, the result presentation is discussed.

2.3.3.2 Variables

Return on Assets

Return on assets (ROA) constitutes the first variable pertaining to profitability measurements. Employed in all three articles used for the FRA framework (Ghosh S., 2016, p. 375; Kumbirai & Webb, 2010, p. 39; Mergaerts & Vander Vennet, 2016, p. 62), ROA indicates how much post-tax profit a company generates with its assets (Kennon, 2016). "It measures the profit earned per Euro [or any

²⁹ Basel III denotes an international regulatory framework aiming at increasing the minimum capital requirement of banks "to strengthen the regulation, supervision and risk management of the banking sector" (BIS, n.d.) and has been signed off by the G20 leaders in Seoul in 2010 (HSBC, 2015).

other currency] of assets and reflects how well bank management uses the banks' real investment resources to generate profits" (Lardic & Terraza, 2019, p. 23).

Return on assets is calculated as follows (Kumbirai & Webb, 2010, p. 39):

$$ROA = \frac{Net\ income}{Total\ assets}$$

Net income, often also referred to as net profit, is a company's profit or loss after income tax and adjusted for profits or losses made from discontinuing certain operations (Ghosh S., 2016, p. 375; Kumbirai & Webb, 2010, p. 39; OBF, 2017). Total assets, on the other hand, represent the entirety of assets as shown on the balance sheet, including predominantly cash, loans to customers and other financial institutions, property, securities and derivatives, and investments in joint ventures or associated companies (OBF, 2017; Wagner, 2007, p. 122).

While for non-financial sector companies, it can be said that the higher the ROA the better; higher ROA for banks typically also correlates with higher risk-taking by the management, which in turn weakens the stability of an institution (Kennon, 2016; Laeven & Levine, 2009, p. 71). Adding to that, Alper & Anbar (2011, pp. 147-148) found in their profitability study of the Turkish banking sector that banks with larger asset sizes typically also have a higher ROA – their sample reaching levels of up to 24 percent, while the sample average stood at 1.9 percent. Typically, though, the ROA for banks is in lower, single-digit percentages, with negative values not uncommon (ECB, 2019). Another reference point, for example, is the average EU banking institution's ROA, which was -0.03 percent in 2011 and 0.2 percent in 2016 (ECB, 2019).

Return on Equity

The next essential variable in the profitability spectrum is return on equity or ROE. This variable is very popular among investors "as their primary measure of bank performance as [ROE] focuses on return to the shareholders of a bank" (Lardic & Terraza, 2019, p. 33).

Used by both Kumbirai & Webb (2010, p. 39), as well as Mergaerts & Vander Vennet (2016, p. 58), ROE is a key indicator to define the cost of a bank's equity (Dong, Firth, Hou, & Yang, 2016, p. 281). Kumbirai & Webb (2010) even argue that return on equity is "the most important indicator of a bank's profitability and growth potential" (p. 39).

ROE is calculated as follows (ECB, 2010, p. 9):

$$ROE = \frac{Net\ income}{Total\ equity} = \frac{Net\ income}{(Shareholder\ equity + non-controlling\ interests)}$$

Net income presents the same input variable as defined for *Return on Assets* above. Total equity is defined as the sum of shareholder equity and non-controlling interests (OBF, 2017). Shareholder equity refers to a bank's total assets as reported on the balance sheet, minus all liabilities, and represents "a corporation's owners' residual claim after debts have been paid" (Hayes, 2019a). Shareholder equity can be both positive and negative (Hayes, 2019a). If it is positive, it means that a bank has the ability to repay all debts, while sustained negative shareholder equity "is considered balance sheet insolvency" (Hayes, 2019a). Non-controlling interests are the value of minority

interests – that is, interests of less than 50 percent – that others have in the bank’s subsidiaries and which the bank fully consolidates in its annual reports (Hayes, 2019b; Kenton, 2019a; Lopes, Lourenço, & Soliman, 2012, p. 26; Neue Zürcher Zeitung, 2013). Non-controlling interests can only apply to consolidated statements. Unconsolidated statements, as the name suggests, cannot include any non-controlling interest items on their balance sheets (Neue Zürcher Zeitung, 2013).

Critics of ROE argue that it can be an insufficient measure due to its volatile nature – especially in turbulent times, since it allows for strategic adjustments by a bank’s senior management (e.g., by forming or liquidating provisions) (Dong, Firth, Hou, & Yang, 2016, p. 281; ECB, 2010, p. 5). Notwithstanding, return on equity is the most widely used indicator of bank performance (ECB, 2010, p. 5) – not least as it can easily be retrieved from banks’ financial statements.

In terms of reference values for ROE, the ECB (2010, p. 5) conducted an in-depth analysis of return on equity. When looking at major universal and investment banks globally, they found that pre-GFC values for ROE averaged between 17 to 22 percent in the early 2000s, benefitting from a huge upswing followed by an immediate crash in 2007 and 2008, and finally bouncing back up to over 10 percent by 2010 (ECB, 2010, pp. 15-16). Investment banks therefore proved to be more volatile in their ROE developments than universal banks (ECB, 2010, pp. 15-16). At the end of the research period, the average global ROE (182 countries) was 14.18 percent (Global Economy, 2017)³⁰. Regarding this thesis’ focus on East Asia, the Chinese big four banks predominantly showed ROE values similar to the ECB (2010, pp. 15-16) study, while Japanese banks showed figures in the one-digit range (Huang, Wang, Wang, & Lin, 2013, p. 67; Lincoln, 2013, p. 212). Finally, the ECB (2010) warns that levels of ROE that are too elevated should be considered with caution, stating bluntly: “Following the spectacular losses in the financial crisis and the massive government intervention, there is little support for banks returning ROE ratios of well above 20%, as these have mostly proved to be unsustainable” (p. 5).

Net Interest Margin

The net interest margin (NIM), also known as “bank spread” (Doliente, 2005, p. 53), is a commonly used variable in FRA – for example, Heffernan & Fu (2010) and Lui & Wilson (2010) employed NIM in their FRA – since it measures “the difference between interest income and interest expense as a percentage of total assets” (Alper & Anbar, 2011, p. 143). Busch & Memmel (2016) even state: “For most banks, the net interest margin is by far the most important source of income” (p. 371).

This is how the equation for the NIM is defined (Alper & Anbar, 2011, p. 146; Brock & Suarez, 2000, p. 132):

$$NIM = \frac{\text{Net interest income}}{\text{Total assets}} = \frac{(\text{Total interest received} - \text{total interest paid})}{\text{Total assets}}$$

In sum, the NIM measures the price for financial intermediation, “[t]hat is [...] the wedge between what borrowers have to pay for their loans and what the ultimate lenders actually receive” (Busch &

³⁰ The underlying data of Global Economy (2017) comes from Bankscope, a database discontinued as of 2016 (BVD, 2017b), which is why the secondary source had to be used for the provided benchmark.

Memmel, 2016, p. 372). This means that the NIM is a useful determinant of a bank's management of its interest-related activities and generation of interest income exceeding its interest expenses (Alper & Anbar, 2011, p. 145; Mergaerts & Vander Vennet, 2016, p. 61). Consequently, the NIM is also an efficiency variable (Alper & Anbar, 2011, p. 145), determining a bank's "ability [...] to tap into various funding sources and transform those funds into assets with attractive yields" (Mergaerts & Vander Vennet, 2016, p. 61).

With regards to the measure's components, total interest received is the sum of income generated by a bank through interest paid by its customers for granted loans as well as interest generated through the management of bank deposits, cash, and balances with central banks (OBF, 2017). Total interest paid exemplifies the opposite – all expenses incurred from interest-bearing activities a bank engages in; for example, when the bank itself takes out loans and when it pays interest to its customers for deposits made with the bank (OBF, 2017). After deduction of the interest expenses from the interest income, the result is the so-called "net interest income" (OBF, 2017).

The equation's numerator is divided by total assets (for details on total assets refer to *Return on Assets*). Doing so allows for comparisons to be drawn with other banks (OBF, 2017; Wagner, 2007, p. 122). While some research employs total interest-bearing assets instead of total assets (e.g., Brock & Suarez (2000, pp. 121, 132), Doliente (2005, p. 54) or Saona & Azad (2018, p. 433)) – that is, a reduction of total assets by assets not generating any interest income – the majority of the research reviewed uses total assets (see, for example, Alper & Anbar (2011, p. 143), Busch & Memmel (2016, p. 376), or World Bank researchers Demirgüç-Kunt & Huizinga (1999, p. 386)). To stay in line with the work of Ghosh S. (2016, pp. 374-375)³¹, I, too, use total assets as the divisor.

There is no consensus as to whether a higher or lower NIM is desirable as there are many factors influencing the variable (e.g., regulatory and capital requirements, loan loss provisions, changes in interest rates), and, additionally, there are variations across regions and countries (Doliente, 2005, p. 53). Changes in NIM can be triggered by all three NIM determinants: interest income, interest payments, and totals assets (Demirgüç-Kunt & Huizinga, 1999, p. 381). Thus, say, a reduction in NIM of 1 percent can be a positive trigger (e.g., through a reduction of payable taxes for the bank, thus higher interest income) or a negative trigger (e.g., through a higher rate of defaulted loans, thus reduced interest income) (Demirgüç-Kunt & Huizinga, 1999, p. 381). Furthermore, changes in assets held change the numerator – increases in assets reduce NIM, while a reduction of total assets creates a higher NIM.

Deducting from the above, the development of NIM from 2011 to 2016 and the forces triggering these developments are what is under scrutiny, rather than just comparing NIM values against hard values. Nonetheless, to give an indicator of NIM values, in 2015, the global NIM was at 3.56 percent, following

³¹ Mergaerts & Vander Vennet (2016, p. 61) also use NIM as one of their variables. However, they lacked sufficient granular data for a straightforward calculation, which is why their method for calculating it is not considered for this thesis (Mergaerts & Vander Vennet, 2016, p. 61). The OBF (2017) calculates NIM using interest-bearing assets, which is why NIM for this thesis is calculated manually.

a decline from 4.67 percent in 2007 (Datamarket, n.d.)³². Saona & Azad (2018, pp. 428, 441), who analyzed the performance of banks in 11 Asian countries, found an average NIM of 2.45 percent for the region.

Cost-Income Ratio

While the previous ratios were a mix of variables from both the balance sheet and the profit and loss statement, the cost-income ratio, abbreviated as CIR, only relies on inputs from the P&L (Richter & Gischer, 2019, p. 356). A highly popular measure to quickly identify how well a bank is using its funds to generate revenue, the ratio is calculated as follows (OBF, 2017):

$$CIR = \frac{\text{Total operating expenses}}{\text{Operating revenue}}$$

The result reveals the quantity of expenses created for any revenue generated (Kenton, 2019b). For example, if a bank has a CIR of 70 percent, it means that for USD 100 revenue generated through its products and services, it has costs of USD 70 and a remaining income of USD 30.

Following the definition of the OBF (2017), total operating expenses (OPEX) are defined as the sum of costs incurred through “normal business activities” (Kenton, 2019b), including both personnel and material expenses (Richter & Gischer, 2019, p. 360). For banks, the majority of such expenses are those related to its employees as well as administrative expenses and other expenses, such as rent (OBF, 2017; Richter & Gischer, 2019, p. 360). This means, OPEX only include running expenses, as business-related expenses (e.g., interest expenses, trading losses) are part of the net interest and non-interest income, which are included in the operating revenue (Mergaerts & Vander Vennet, 2016, p. 62; OBF, 2017). Thus, by contrast, operating revenue is the sum of net interest income (the dividend of the variable NIM, as discussed under *Net Interest Margin*), income or losses from fees, trading activities, insurances, real estate, and any other type of income, also including that of Islamic banking³³ activities (OBF, 2017).

Drawing from my own experience as a management consultant for banks, I can state that the calculation methods for CIR vary among institutions – often with the aim of whitewashing the result for internal communication or towards investors. Hence, CIR values stated in annual reports can vary from results using the above formula. However, given that accounting standards define total operating expenses and operating revenue clearly, using CIR as defined here delivers comparable results for all banks in the sample (for a discourse on accounting standards and the legitimacy of comparing China, Japan, and Korea based on balance sheets and P&L data, see *Excursion: Accounting Standards* below under 2.3.3.3 *Data, Data Sources, and Results Presentation*). Admittedly, CIR is a measure that subsumes differing sources of income and expenses, but it is a

³² Datamarket uses World Bank and BVD data to provide aggregated data visualizations, the latter of which is also the database underlying this thesis’ FRA (for details on the dataset see 2.3.3.3 *Data, Data Sources, and Results Presentation*) (Datamarket, n.d.).

³³ Islamic banking is a banking practice that follows the Sharia (Tarver, 2019). “Two fundamental principles are the sharing of profit and loss, and the prohibition of the collection and payment of interest by lenders or investors” (Tarver, 2019).

highly popular measurement tool among board members, members of supervisory boards, as well as external investors, thus its importance for any FRA (Richter & Gischer, 2019, p. 354).

CIR measures the efficiency of a bank in terms of expenses and its value can vary greatly among institutions (Richter & Gischer, 2019, p. 361). Richter & Gischer (2019, pp. 372-373) analyzed the CIR of banks within Europe and found that across countries, from 2000 to 2014, the average CIR was between just over 50 and 75 percent per country. The average CIR of the Austrian banking market, for example, from 2017 to mid-2019, was at roughly 66 percent (Statista, 2019). A global analysis found that Europe is in the less efficient group, while Asia reaches country average lows of 32 percent and highs of 64 percent (Ledonne & Garrido, 2019). Results at the lower end of the spectrum denote highly efficient banks. Featuring at the top of the list typically encourages banks to start projects geared towards reducing their OPEX. A CIR value of more than 100 percent is possible, but it would mean that the bank spends more money than it is actually makes.

Funding Cost

The first ratio in the liquidity dimension denotes that of funding cost (also known as “cost of funds” (Kagan, 2019a)), abbreviated as FC throughout this thesis. “The cost of funds is a reference to the interest paid by financial institutions for the funds that they use in their business” (Kagan, 2019a). Ghosh S. (2016, p. 375) defines this variable thus³⁴:

$$FC = \frac{\text{Total interest paid}}{(\text{Deposits} + \text{short-term borrowing})}$$

The numerator of the equation, total interest paid, has already been touched upon in detail regarding the *Net Interest Margin* above. In the literature, there is some ambiguity regarding the definition of the denominator’s two general components: deposits and short-term borrowing (sometimes also referred to as “short-term funds” (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 328)). In this context, Babihuga & Spaltro (2014) thus denote “the overall cost of funding achieved by a bank is quite complex and difficult to get at” (p. 5). Concerning deposits, for example, Bikker & Bos (2008, p. 66) explicitly express that they only use customer deposits (that is, all deposits from regular retail and corporate customers of a bank, be that demand deposits, savings deposits, time deposits, or other forms of deposits, but no interbank deposits (OBF, 2017)). However, for this thesis, and in line with Ghosh S. (2016) as well as the ECB (2016a, p. 26), deposits here also include bank and wholesale deposits. Such deposits are typically from other banks, institutional investors, or mutual and pension funds (OBF, 2017). Using a broader definition of deposits is especially sensible as the bank sample includes a variety of bank types with varying business models, not just banks primarily engaged in retail and corporate banking (for more details see 2.3.3.3 *Data, Data Sources, and Results Presentation*) (ECB, 2016a; OBF, 2017). The second part of the denominator, short-term borrowing, includes all additional funds available to the bank (Ganti, 2020). Short-term implies that these funds are held by the bank for at most one year (Ganti, 2020). Citing the OBF (2017), short-term borrowing consists of all of the following: short-term debt securities and securities loaned (e.g., corporate or

³⁴ Verbally, Ghosh S. (2016) speaks of “interest expenses” (p. 375), which, in the OBF terminology, is “total interest paid” (OBF, 2017).

government bonds, but also the infamous collateralized debt obligations and mortgage-backed securities that fueled the first shock wave of the GFC, the subprime mortgage crisis (Amadeo, 2019c; Chen J., 2019)), repurchase agreements, and cash collaterals.

The above equation and the breakdown of its composition focus on easily accessible funds that can be transferred into loans issued to customers. Other scholars, such as Bertay, Demirgüç-Kunt, & Huizinga (2015), consider an even broader range of sources eligible when it comes to assessing credit growth potential and also include, for example, “non-deposit liabilities, [...] long-term liabilities, and equity” (p. 328). Including additional sources for alternative calculations stems from a stability-centered viewpoint (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 328), which for this thesis is covered through *Income Diversification*, *Equity to Assets*, and *Non-Performing Loans* below.

Kagan (2019a) explains that FC “is one of the most important input costs for a financial institution since a lower cost will end up generating better returns when the funds are used for short-term and long-term loans to borrowers” (Kagan, 2019a). Consequentially, funding cost is not only an essential variable with regards to liquidity, it also has a close link to the NIM performance variable, given that the smaller the interest expenses, the better the potential margin on a bank’s interest-bearing activities (Kagan, 2019a).

Due to the great variety of how FC is composed, no reference values can be given. Rather, the analysis across the sample and the countries of China, Japan, and Korea are the core for interpretation.

Liquid Assets to Total Assets

The second liquidity ratio is liquid assets to total assets (LATA), defined simply, as indicated by its name, as (Ghosh S., 2016, p. 375):

$$LATA = \frac{\text{Liquid assets}}{\text{Total assets}}$$

LATA is used by the IMF (2006) as one of two liability measures in its “financial soundness” (2006, p. 2) check. The IMF (2006) denotes of the variable – also known as “liquid asset ratio” (Vodová & Stavárek, 2017, p. 161) – when analyzing the entire banking sector of a country that it “indicates how much balance sheet shrinkage the sector could absorb before being forced to sell illiquid assets” (p. 157). On the level of individual banks, LATA is defined as the amount of easily accessible funds for a bank to cover in case of a sudden and significant withdrawal of deposits or sudden repayment requirements (Vodová & Stavárek, 2017, p. 161). Bunda & Desquilbet (2008) call the ratio an “absolute” (p. 365) one to measure liquidity, since it contrasts one part of the balance sheet with the balance sheet’s total.

Higher rates of LATA indicate that a bank has a higher level of liquidity (Alper & Anbar, 2011, p. 144). At the same time, this comes with opportunity costs as liquid assets are not used as a means to generate interest income (Alper & Anbar, 2011, p. 144). While, on the one hand, higher liquidity provides strength during shock periods, on the other hand, it prevents income generation – finding the right balance of prudence is essential for bank stability (Alper & Anbar, 2011, p. 144). In the

literature, there is a certain degree of ambiguity as to whether securing higher levels of liquidity through holding liquid assets has a positive or negative impact (Alper & Anbar, 2011, p. 144; Ghosh S., 2016, p. 377). The negative argument is “that a bank’s capacity to absorb unforeseen losses influences its overall performance” (Goddard, Molyneux, & Wilson, 2004, p. 1073). However, Bourke (1989) (to date, often cited in the context of liquidity ratios and other financial ratio analyses, among others, see Ghosh S. (2016, p. 377)) sees “liquidity ratios [...] as being positively related to profitability” (p. 79). In either case, it is indisputable that liquidity is to analyze, and which result is deemed better or worse is also a question of context and depends not least on a certain country’s liquidity requirements as imposed by the regulating authority.

The OBF (2017) defines the following as liquid assets: cash and balances with central banks, traded financial assets held at fair value through profit and loss, net loans and advances to banks, reverse repurchase agreements, securities borrowed, and cash collaterals. From the sum of these assets, mandatory reserve deposits with central banks, i.e., the regulatory requirement to hold certain minimum deposits with the relevant central bank, have to be subtracted (OBF, 2017). The second part, total assets, has already been defined above under *Return on Assets*.

Bertay’s, Demirgüç-Kunt’s, & Huizinga’s (2015, pp. 327-329) research is a good starting point when it comes to referencing values for later analysis, because they managed to compute an international LATA, so to speak, by examining the financials of over 1,600 banks in more than 100 countries in the first decade of the new millennium (thus already including the impetus of balance sheet developments triggered by the GFC). They found this international LATA to average 23.9 percent (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 329). Also drawing international comparisons, Arora & Kohli (2018, p. 26) saw LATA values of between 5 and 21 percent in the mid-2010s. Meanwhile, the Turkish banking sector was further elevated with close to 32 percent between 2002 and 2010 (Alper & Anbar, 2011, p. 147). Eastern European countries saw pre-GFC values of 25 percent to up to 40 percent, and post-GFC values of between 7 and 34 percent in 2014 (Vodová & Stavárek, 2017, p. 161).

Net Loans to Total Assets

Up next in the liquidity spectrum is the net loans to total assets (NLTA) ratio, “[indicating] what percentage of the assets of the bank are tied up in loans” (Bunda & Desquilbet, 2008, p. 365). The formula for this ratio is shown below (Kumbirai & Webb, 2010, p. 40):

$$NLTA = \frac{Net\ loans}{Total\ assets}$$

NLTA reverse-defines how liquid a bank is – the higher the ratio, the less potential liquidity the bank has (Bunda & Desquilbet, 2008, p. 365). Lardic & Terraza (2019) put it this way:

This ratio does not directly measure liquidity; it gives an indication of how much of the bank assets are tied into illiquid loans. The higher this ratio the less liquid the bank will be and the more risk a bank may be to higher defaults. This ratio can be interpreted as well as a measure of the risk of liquidity as the credit risk. An increased exposure to credit risk is normally

associated with decreased bank profitability and, hence, we expect a negative relationship between ROAA³⁵ and the NLTA ratio. (Lardic & Terraza, 2019, pp. 23-24)

In line with the above, the flipside of having a small NLTA is that interest income is leveled down as the bank has a lower percentage of outstanding loan volume. This means, banks showing lower NLTA need to rely more on non-interest income to be profitable.

The total assets input variable has already been touched upon under *Return on Assets* above; however, the formula's numerator, net loans, needs some further comment. Net loans equal total loans (that is, the entirety of credit a bank has disbursed from consumer loans to mortgages to investment credits to cash advances) less the loan loss reserve (OBF, 2017; Wang, Jiang, & Liu, 2016, p. 527)³⁶. The loan loss reserve (also called loan loss allowance) is a contra position on the asset side of the balance sheet that factors in potential credit defaults (Kagan, 2019b; Walter, 1991, pp. 22, 29). While the allowance for loan losses provides insights into whether a bank is following risky lending practices, and is thus in itself a key stability measure (Berríos, 2013, p. 110), using the net value instead of total loans – as Ghosh S. (2016, p. 375) does – provides a more distinct picture of a bank's confinement to loans. Using the formula, as presented above, is further supported by the works of FRA pioneers such as Bertay, Demirgüç-Kunt, & Huizinga (2015, p. 338).

For reference, the following should provide guidance for section 3 *Analysis*. Qamruzzaman (2014, p. 175) elaborated an FRA of the Bangladeshi banking sector and found an industry average of around 66 to 73 percent from 2008 to 2012. Kumbirai & Webb (2010, p. 43) found slightly higher values for South African banks with industry averages between 73 and 76 percent from 2005 to 2009. Lardic & Terraza (2019, pp. 22, 36-37) obtained lower results after assessing German banks from 2000 to 2014 and found the average NLTA to range from 55 to 62 percent. Cheng, Zhao, & Lin (2017, p. 393) analyzed 82 Chinese commercial banks from 2000 to 2013, where NLTA ranged between 18 and 83 percent, with an average of 53 percent.

Net Loans to Deposit and Borrowing

Net loans to deposit and borrowing (NLDST³⁷) is a liquidity ratio, considering the percentage of a bank's deposits and short-term funds corded in loans with its customers (Haile, Getacher, & Tesfay, 2015, p. 257). The formula for NLDST is as follows (Kumbirai & Webb, 2010, p. 40):

$$NLDST = \frac{\text{Net loans}}{(\text{Deposits} + \text{short-term borrowing})}$$

Unlike the aforementioned *Net Loans to Total Assets* that considers the balance sheet total, NLDST contrasts assets and liabilities. NLDST “compares illiquid assets to their own financial source” (Lardic & Terraza, 2019, p. 24) as banks use deposits and liabilities to fund loans they have granted.

³⁵ ROAA stands for return on average assets and denotes a variation of the here used variable return on assets (Lardic & Terraza, 2019, p. 23).

³⁶ Not included in NLTA are loans and advances to banks as interbank lending usually has a very short maturity, often as brief as a single day (Kenton, 2019c; OBF, 2017; Qamruzzaman, 2014, p. 174).

³⁷ While the abbreviation NLDST might not seem too comprehensible, it is, however, the abbreviation used by academics and I do not find it reasonable to veer off for this thesis. The “ST” presumably stands for short-term since the type of funding applied in the ratio is short-term borrowing.

Given that the ratio's components, net loans and deposits, and short-term borrowing, have been explained above under *Funding Cost* and *Net Loans to Total Assets* respectively, there is no need for more details.

Further mention, however, is required regarding the fact that there are different takes on loan to deposit ratios. Lardic & Terraza (2019, pp. 24, 27) use a narrower definition for the bottom part of the equation, where they only include customer deposits – bank or wholesale deposits and short-term borrowing are left out. While the authors give no reasoning for their choice, it can be presumed that they did so as they were analyzing universal banks in Germany, which naturally have a strong customer focus, and not so much, say, on the interbank market (Lardic & Terraza, 2019, p. 22). For the sample at hand for this thesis, this constraint will not be applied, for the heterogeneity in the sample may lead to misanalysis. A slightly simpler approach to NLDST is the loan-deposit ratio (LDR), which looks, as the name suggests, at total loans to total deposits (Murphy, 2019). There are two distinctions from NLDST; first, total loans also include loan loss reserves and, second, short-term borrowing is not included. All these slightly different takes on loans with deposit comparisons follow the same aim, namely, to identify “a bank’s ability to cover loan losses and withdrawals by its customers” (Murphy, 2019). The reason why NLDST is the measure chosen for this liquidity analysis is because it is also the variable employed in Kumbirai’s & Webb’s (2010, p. 40) base framework.

While a single NLDST calculation already provides valuable insights, looking at it over a period of time also reveals whether a bank has managed to attract new customers, which in turn leads to new deposits that can be transferred into loans that generate interest income (Murphy, 2019). Qamruzzaman (2014, p. 175), who applied NLDST to Bangladeshi banks, found results between 73 percent and 89 percent. The result in South Africa was similar, where the industry averaged between mid-70 percent and mid-90 percent (Kumbirai & Webb, 2010, p. 44). The Ethiopian banking sector was lower than that with values of 46 to 55 percent in the early 2010s (Haile, Getacher, & Tesfay, 2015, p. 271). Chinese banks in the first 13 years of the new millennium showed NLDST of just under 70 percent (Cheng, Zhao, & Lin, 2017, p. 373). NLDST beyond 100 percent comes with associated risks as it means the bank needed to incur debt to carry out its lending activities (Lardic & Terraza, 2019, p. 24; Murphy, 2019).

Equity to Assets

The first variable in the final third of the FRA framework – risk and stability – is the equity to assets “capital ratio” (Mergaerts & Vander Vennet, 2016, p. 62), or EA for short. The calculation of EA makes use of two components described above, *Return on Assets* and *Return on Equity* respectively (Ghosh S., 2016, p. 375)³⁸:

$$EA = \frac{\text{Total equity}}{\text{Total assets}}$$

³⁸ While it may seem counterintuitive that the ratio is not referred to as total equity to total assets – as, for example, LATA und NLTA do –, literature uses a variety of abbreviations; the shorter name for the ratio is in place with the main underlying literature of Ghosh S. (2016) and Mergaerts & Vander Vennet (2016), similarly to ROE and ROA.

“The result [of the equation] represents the amount of the assets on which shareholders have a residual claim” (Kenton, 2020). Or, expressed the other way around, it shows the degree to which a bank funds its assets with equity rather than with debt, which has been found to be especially helpful during financial turmoil as banks that do this show better strength in difficult times (Kenton, 2020; Mergaerts & Vander Vennet, 2016, p. 68; Toader, 2014, pp. 426-427). As has been discoursed above under *Liquid Assets to Total Assets*, liquid assets provide banks with stability during periods of turmoil. Similarly, total equity supports stability and is thus in many countries regulated with minimum capital adequacy requirements³⁹ (Gong, Hu, & Lighthart, 2015, p. 200; Toader, 2014, pp. 426-427). While it might seem logical to assume that higher capital adequacy does not imply more liquid assets, since one element for stability has been covered (Vodová & Stavárek, 2017, p. 163), Bunda & Desquilbet (2008, p. 373) found “that a higher ratio of equity to assets [...] is concomitant with higher asset liquidity.”

Looking at EA as a leverage indicator is furthermore of great relevance. Reversing the numerator and denominator gives the multiple of liabilities exceeding equity (Hayes, 2020). Looking at this so-called “equity multiplier” (Hayes, 2020) is of interest when assessing a bank’s risk-bearing ability. If a bank is liquidated, all the assets are sold off and used to repay the incurred debt; the residual is forwarded to the shareholders (Kenton, 2020). Thus, higher EA increases the likelihood of receiving repayment as a shareholder in cases of liquidation (Kenton, 2020).

Mergaerts’ & Vander Vennet’s (2016, p. 68) research found that banks with higher EA also showed higher results for ROA and NIM, but it had a negative effect on ROE since holding equity is more expensive than holding debt (Toader, 2014, p. 411). Broad, international analysis of EA found that the average EA of over 1,600 banks in 111 countries from 1999 to 2010 was 10.6 percent (Bertay, Demirgüç-Kunt, & Huizinga, 2015, pp. 327-328). Above that were the results of the analysis of the Jordanian and Saudi Arabian banking sectors, which revealed EA of between 12 and 14 percent from 2005 to 2011 (Almazari, 2014, p. 132). With an average of 11.43 percent, Turkish banks showed a similar trend (Alper & Anbar, 2011, p. 147). Cheng, Zhao, & Lin (2017, p. 393) found lower results for 82 Chinese commercial banks from 2000 to 2013, namely 5.2 percent.

Income Diversification

Returning to a ratio that is purely derived from a bank’s P&L, income diversification (ID) denotes the percentage of non-interest income in relation to operating revenue, that is (He, Chen, & Liu, 2017, p. 4000):

$$ID = \frac{\text{Non-interest income}}{\text{Operating revenue}}$$

³⁹ There is a variety of capital adequacy requirements and related indicators – for example, under the ECB the capital adequacy minimum requirement is 10.6 percent for Common Equity Tier 1 (ECB, 2020). The calculation here is a subset of a bank’s equity over its risk-weighted assets, that is, assets being accounted for the assumed risk they bear (ECB, 2020). As capital requirements are a key focus of regulators, especially since the aftermath of the GFC, many different ways to compute and measure capital adequacy are in place (BIS, 2017; ECB, 2020). The calculation used for this thesis is a comparatively simple one that does not differentiate between varying types of capital nor factor in country-specific legislation. At the same time, computing EA this way allows for a comparable picture across countries.

The definition of both non-interest income and operating revenue has already been given above under *Cost-Income Ratio*. While Mergaerts & Vander Venet (2016, p. 1859) eliminated data points of negative non-interest income as they argued it is hard to construe the business sense behind it, I am in favor of including them in the results. The reasoning behind this is the fact that I am predominantly looking at aggregated country-level values that would be whitewashed if negative results were not included in the analysis (this extends to negative operating revenue).

Diversification can be defined in two ways. First, diversification can be that of the portfolio mix that a broker defines and executes with the bank (Ferreira, Zanini, & Alves, 2019, p. 93; Markowitz, 1952, p. 77; Mergaerts & Vander Venet, 2016, p. 62). That is diversification in the narrower sense, and it does have an impact on the value of ID, as non-interest income and losses already reflect it. Diversification defined in a broader sense, one that applies here, concerns the diversification of the asset side of the balance sheet (in simplified terms: loans versus securities, derivatives, and investments) and the subsequent revenue generated with these business choices (Ferreira, Zanini, & Alves, 2019, pp. 93-94; Sufian, 2011, p. 66)⁴⁰. The aim of analyzing the proportion with which a bank generates revenue, aside from loans and deposits, is to evaluate both potential performance and stability (Mergaerts & Vander Venet, 2016, p. 68). The theoretical idea is that a more diversified income structure leads to both an increased profitability and risk mitigation, as market turbulence would not affect a diversified bank as much as one that is specialized in a certain income area (Lardic & Terraza, 2019, p. 27; Mergaerts & Vander Venet, 2016, p. 68; Sufian, 2011, p. 49). Interestingly, ID is a somewhat controversial measure among researchers, as this theoretical profitability-stability nexus can also reverse itself and make banks more risk-prone (Ferreira, Zanini, & Alves, 2019, pp. 94-95).

Leaven & Levine (2009, pp. 260, 273), for example, found that ownership structure has a significant effect on ID and associated risks as banks with minority or majority shareholders are pressurized to diversify into higher earning but also riskier activities. Ferreira, Zanini, & Alves (2019) argue further that diversifying and taking on larger risks “can benefit managers with the power and prestige of a large company” (p. 93). The trio found a positive relationship between diversification and profitability in the Brazilian banking market, but could not confirm reduced risk (Ferreira, Zanini, & Alves, 2019, p. 105). Furthermore, increased levels of ID can have a positive relationship with other variables such as ROA and ROE, but this reduces NIM (Liu & Wilson, 2010, p. 1862; Mergaerts & Vander Venet, 2016, pp. 67-68). Logically, ID is a variable that shows a high degree of correlation with other variables – analyses that cannot be provided for this thesis as they venture beyond its scope. Nonetheless, the overall ID results for the three countries do allow one to draw a picture on developments throughout the research period as well as across countries. Despite ID being flawed, researchers continue to use it in their analyses as it sheds light on banks’ business strategies.

⁴⁰ Another variable to measure income diversification is that of the Herfindahl Hirschmann index (see, for example, Bijlsma & Zwart (2013, p. 30) or Ferreira, Zanini, & Alves (2019, p. 96)). This index, however, lacks to “specifically analyze the impact of separate income” (Ferreira, Zanini, & Alves, 2019, p. 96), while ID, as defined above, does show that effect, especially when results are contrasted with profitability and/or stability measures over time.

Empirical ID results range from an average of 5 percent in Japanese banks (with regional banks having an average of 11 percent and city banks 30 percent) (Liu & Wilson, 2010, p. 1859), to a country average of 15 percent based on gross revenue in China (He, Chen, & Liu, 2017, p. 4003), to an average of 27 percent in Brazil (Ferreira, Zanini, & Alves, 2019, p. 101), and up to 32 percent among European banks (Mergaerts & Vander Vennet, 2016, p. 62).

Non-Performing Loans

The last FRA framework variable is the non-performing loans ratio (NPL), which signifies the relation between a bank's credit portfolio's non-performing loans and its total loans (Ghosh S., 2016, p. 375):

$$NPL = \frac{\text{Non-performing loans}}{\text{Total loans}}$$

Analyzing the quality of a bank's loan portfolio is an essential step to better understand the potential risk and conversely the stability of that institution (Almazari, 2014, p. 133). NPL defines the percentage of loans that defaulted during the period of investigation (Segal, 2020). NPL is, like the other variables in this FRA framework, an ex post variable as it indicates losses already materialized (Cheng, Zhao, & Lin, 2017, p. 395). Some researchers use other ratios, loan loss reserves or provisions to total loans, to analyze the credit portfolio – for example, Almazari (2014, p. 133), Demirgüç-Kunt & Huizinga (1999, p. 381), Hamid (2013, p. 47), and Sufian (2011, p. 49) as well as Kumbirai & Webb (2010, p. 40) and Mergaerts & Vander Vennet (2016, p. 61). However, these are “forward-looking measure[s] of loan quality” (Mergaerts & Vander Vennet, 2016, p. 61), since loan loss reserves and loan loss provisions are a bank's assessment of future defaults and give an indication towards the current portfolio's risk status as per cutoff dates (Kumbirai & Webb, 2010, p. 40; Mergaerts & Vander Vennet, 2016, p. 61). Kumbirai & Webb (2010) state that NPL “is not available for all banks” (p. 40) in their research, which is why they use loan loss reserves to total loans as a proxy. It is true that not all banks report their NPL data; for the sample in this research though, the number of banks providing relevant information is relatively high, hence NPL is the main variable for credit quality analysis (OBF, 2017). Cheng, Zhao & Lin (2017, p. 393), who analyzed banks in China, faced a similar situation, where part of their sample did not have NPL data, but they still decided the share of those that did is large enough to use the ratio. Thus, given that it remains in line with the other variables of the FRA framework, which take an ex post perspective and provide sounder results, NPL is the ratio of choice.

The ECB (2016b) defines non-performing loans as follows: “A bank loan is considered non-performing when more than 90 days pass without paying the agreed instalments or interest. Non-performing loans are also called “bad debt”” (ECB, 2016b)⁴¹. While there are varying standards outside the EU as to when exactly a loan is considered bad debt – for example, depending on whether it is corporate or consumer credit – on a country level though, the reporting standards allow comparability (Segal, 2020). Moreover, the fact that NPL is widely used in scholarly analyses (e.g.,

⁴¹ Technically, there are slightly varying definitions for non-performing, defaulted, and impaired loans, but even the ECB (2017) acknowledges that the differences are, first, similar, and, second, “for most exposures the three concepts are aligned” (p. 48). Hence, the terms are used interchangeably throughout this thesis.

Bertay, Demirgüç-Kunt, & Huizinga (2015, p. 329), Gropper, Jahera Jr., & Park (2013, p. 81), or He, Chen, & Liu (2017, p. 4003)) further supports the ratio's use. Total loans, as described above under *Net Loans to Total Assets*, are the sum of all disbursed loans to customers as well as the loan loss reserves set aside for future defaults (OBF, 2017; Wang, Jiang, & Liu, 2016, p. 527).

The study of the Chinese banking sector from 2000 to 2013 conducted by Cheng, Zhao & Lin (2017, p. 393) found that the average NPL for those years stood at 4.2 percent (excluding savings banks). When differentiating between banks that were public and private, public banks had a lower percentage of impaired loans (NPL of 2.9 percent) than those run privately (NPL of 4.5 percent), all the while boasting greater profitability as measured using ROA (Cheng, Zhao, & Lin, 2017, p. 394). This means that increasing risk from the bank's point of view can trigger an increase in losses and subsequently have a negative effect on profitability (Almazari, 2014, p. 133). "Therefore, the relationship between credit risk and bank profit is expected to be negative" (Almazari, 2014, p. 133). A study of NPL in the EU found that, in 2017, the average NPL stood at 3.72 percent and at 3.20 percent in the Euro nations (Ciukaj & Kil, 2020, p. 29). Crisis-ridden countries, however, can have double-digit NPL as the cases of Cyprus and Greece show, displaying averages between 40 to 50 percent and 30 to 45 percent respectively between 2013 and 2017 (Ciukaj & Kil, 2020, p. 29). Globally, the average NPL ratio was 6.01 percent in 2011 (based on 123 countries) and 7.42 percent in 2016 (based on 137 countries) (World Bank, 2020a). The European Banking Authority (EBA) (2018, p. 4) defines a bank to be high risk when 5 percent NPL is exceeded.

2.3.3.3 Data, Data Sources, and Results Presentation

Introduction

Analysis (B), the FRA, is conducted, first, at bank level for each of the 11 variables discussed above, before, second, being weighted by total assets and aggregated at a country level. Finally, the aggregated data for each year from 2011 to 2016 is presented per variable and country under 3 Analysis. The underlying dataset of Chinese, Japanese, and Korean banks is from the OBF (2017), a global database for data from financial statements, regulators, and additional information (BVD, 2017a). The OBF is compiled by BVD) a Dutch company owned by Moody's Analytics, an affiliate of rating agency Moody's (n.d.)), which specializes in distributing "financial information and private company datasets of 220 million companies" (Reuters, 2017). As of August 2017, the OBF contained data of 42,000 banks worldwide with a minimum of three years history (BVD, 2017a).

Before explaining how the data sample has been researched and generated, *Figure 10* provides an overview of the sample. As can be seen below, the sample consists of 479 banks in total, of which 218 are Chinese⁴², 194 are Japanese, and 67 are South Korean. Additional information is shown with regards to the banks' specializations (OBF, 2017).

⁴² Chinese banks do not include banks headquartered in either of the two special administrative regions Hong Kong and Macau (see also 2.5 Definitions).

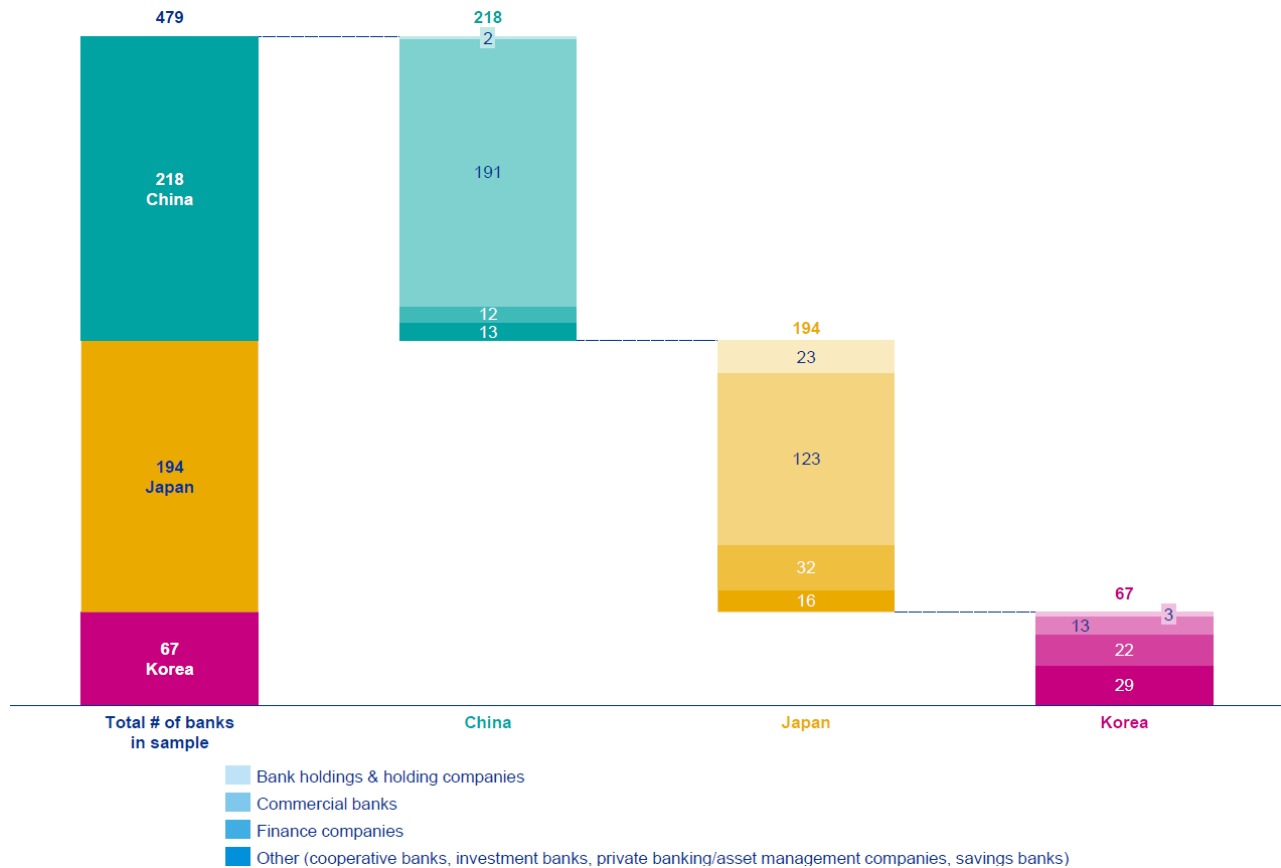


Figure 10: Overview of total bank data sample for (B) the financial ratio analysis, split by country and bank specialization⁴³

In order to guarantee both a solid analysis within the three countries, certain adjustments were made to the initial data retrieved from the OBF (2017) – which originally consisted of 1,089 financial institutions. These adjustments are addressed below under *Sample Size Adaptions*.

As financial data is typically stated in local currencies (in this case, Chinese Renminbi, Japanese Yen, and Korean Won (OBF, 2017)), these values were translated into USD. USD was selected as the main currency simply because it is the common standard currency for cross-country bank analyses (e.g., Chen X. (2012, p. 418), Gong, Hu, & Lighthart (2015, p. 202), Köster & Pelster (2017, p. 62), and Relbanks (2017)). In order to have solid and single-sourced exchange rate information, data from the website Oanda (2017) – “an online trading platform” (Masry, Aloud, Tsang, Dupuis, & Olsen, 2010, p. 2) that also provides exchange rate information – has been used. For all conversions, the exchange rate from the originating currency to USD per financial statement reference date has been applied. To give an example, a financial statement dated March 31, 2015, would be converted with the corresponding exchange rate from the originating currency into USD for March 31, 2015.

Lastly, note should be given to the generation of cohesive years within the data sample, since there are several 12-month periods that corporations use as their fiscal year, that is, their “annual period within which starts and ends a cycle of accounting transactions” (Francois, 2014, p. 123). As the FRA relies on data retrieved from annual reports and financial statements prepared under varying fiscal

⁴³ Based on data from the OBF (2017), own calculations for sample size amendments and own visualization.

years and among the individual banks, a definition for what “a year” means for this thesis had to be created. While over 80 percent of major Japanese companies chose for their fiscal years to run from April 1 to March 31 (Matsui, 2011, p. 3735), Chinese and Korean companies typically report within the calendar year, so from January 1 to December 31 (CIA, 2017; Francois, 2014, p. 123; Rho, 2007, p. 90). Following this, all fiscal years ending anytime between April 1 and March 31 are considered as within the same year, despite deviating from the calendar year. For example:

Company A had its fiscal period from January 1, 2015, to December 31, 2015. Company B started its fiscal year April 1, 2015 and ended it March 31, 2016. Company C published its annual report for the period October 1, 2014, until September 31, 2015.

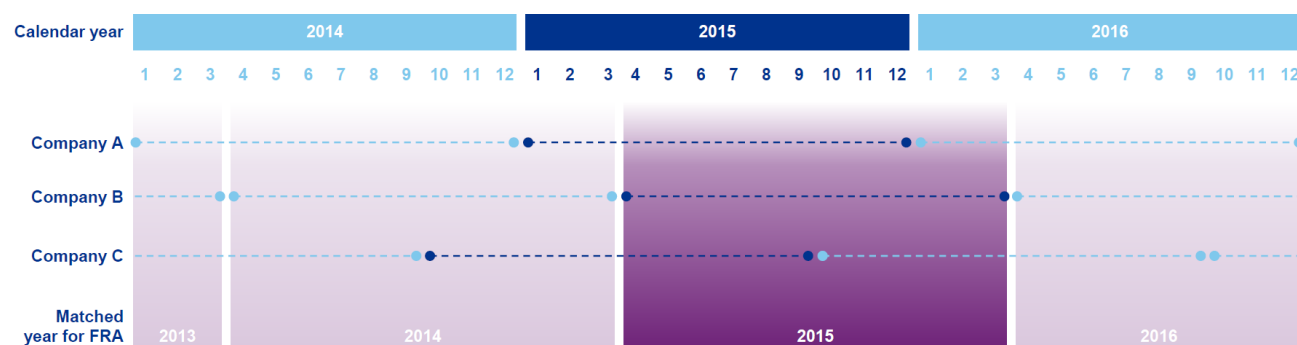


Figure 11: Matching varying fiscal years to “one year” for this master’s thesis along example of companies A, B, and C

Figure 11 depicts how the above example would apply for the FRA. For all analyses concerning the FRA in section 3 *Analysis*, all fiscal year end dates between April 1 and March 31 are matched to the same year. The rationale behind this is that a company ending its fiscal year on March 30 still has three-quarters of its fiscal year accounting for the preceding calendar year⁴⁴. Accordingly, the above examples of companies A, B, and C would all be assigned to the year 2015 (highlighted in Figure 11). Hereinafter, for simplification purposes, all matched data points will be referred to as “year 2011”, “year 2012”, and so on, while the underlying individual fiscal years can vary in between the range defined here. Consequently, this thesis relies on data ranging from April 1, 2011 until March 30, 2017.

To conclude the above, the FRA has an underlying sample of 479 banks in China, Japan, and Korea, which are analyzed for the years from 2011 to 2016. For thorough comparison, all financial data points for the entire period have been converted to USD and a definition for the mapping of said data to year values has been made. In addition, sample size adaptations were necessary to increase the analysis’ comparability and quality (see *Sample Size Adaptions* below).

Sample Size Adaptions

Of the initial total of 1,089 financial institutions available in the OBF (2017) when filtering for active Chinese, Japanese, and Korean banks, exclusions had to be made in order to generate a comparable and plausible data sample. In doing so, I follow Mulder & Westerhuis (2015, p. 150), who analyzed

⁴⁴ Globally, fiscal years running either with the calendar year or from April 1 to March 31 account for 84 percent of typically employed fiscal years among 148 countries and the majority of their companies (CIA, n.d.). China, Japan, and South Korea fall within that 84 percent (CIA, n.d.).

global banking internationalization for almost three decades by comprising all active, profit oriented banks. Amendments to the original sample size retrieved from the OBF (2017) in August 2017 were triggered by one of the following reasons:

- (i) Cases of non-banks
- (ii) Cases of non-profit oriented banks
- (iii) Cases of Japanese cooperative banks
- (iv) Data quality issues
- (v) Irrelevance of time period
- (vi) Unusual or incompatible accounting standards

With respect to sample adaptation (i), the OBF (2017) includes financial institutions, which are not banks in the narrower sense of the term (i.e., with focus on loan disbursement and intake of deposits (Gong, Hu, & Lighthart, 2015, p. 198)), such as securities firms, which are “[m]ainly active in securities trading/arbitrage activities/securities brokerage/derivatives” (OBF, 2017). Investment and trust corporations are other examples, as they focus on trusteeships, private equity activities, or bond issuances (OBF, 2017). Consequently, these financial services providers have been excluded from the sample.

Moreover, the total sample also includes (ii) banks without a clear for-profit orientation, such as central banks, specialized governmental credit institutions, multilateral governmental institutions, or microfinancing institutions (Migliardo & Forgione, 2018, p. 524; Schwarz, Karakitsos, Merriman, & Studener, 2014, p. 16). A business-oriented view, however, is imperative for a conclusive performance analysis (Mergaerts & Vander Vennet, 2016, p. 57), which is why those institutions were also removed from the sample.

After adaptations (i) and (ii), the sample only includes banks with one of the following bank-related, profit oriented OBF (2017) classifications:

- Commercial banks⁴⁵
- Savings banks
- Cooperative banks
- Investment banks
- Private banking and asset management companies
- Finance companies
- Bank holdings and holding companies

⁴⁵ Commercial banks include retail banks – banks predominantly focused on individuals and/or small- to medium-sized (SME) enterprises –, but also universal banks that span the entire spectrum from individual, to SME, to corporate and institutional banking, and potentially even to investment banking.

An overview of the specialization types and definitions from the OBF (2017) can be found in *Appendix D: Orbis Bank Focus Specialization Definitions*.

Excluding (i) financial institutions with non-banking business models and (ii) non-profit oriented banks is standard practice among researchers, as the works of de Haas & van Lelyveld (2006, p. 1933), Gong, Hu, & Ligthart (2015, p. 198), or Gorener & Choi (2013, p. 129) show⁴⁶. These two amendments create the foundation for all further amendments, providing a desirable core set of banks. Consequently, adaptations (iii) and (vi) focus on increasing data quality and comparability.

While cooperative banks are within the set of banks to be analyzed, special consideration had to be given to the so-called “shinkin banks” (Liu & Wilson, 2010, p. 1851), former Japanese credit associations (Assaf, Barros, & Matousek, 2011, pp. 331-332; Kano & Tsutsui, 2003, p. 158). While shinkin banks, which tend to be even smaller “than city or regional banks and focus on local communities” (Assaf, Barros, & Matousek, 2011, p. 332), follow the same regulation as larger banks, they come with several restrictions which undermine profit orientation (Casu, Deng, & Ferrari, 2016, pp. 11, 24). Examples of such restrictions include policies that solely grant one loan per customer, limit membership to the geographical proximity of loan-seeking businesses, or prescribe quotas on the number of a company’s employees who are allowed to be members of the bank (Assaf, Barros, & Matousek, 2011, p. 332). Similarly to Casu, Deng, & Ferrari (2016, pp. 11, 24), I have excluded the 428 shinkin banks – which, despite their large total number, accounted for less than 10 percent of total assets for all financial institutions in the Japan sample (OBF, 2017).

Naturally, I performed (iv) data quality tests with the remaining sample, which resulted in the elimination of a handful of banks which, for example, lacked information regarding currency or accounting standards (OBF, 2017). Moreover, the sample included several banks where (v) data recordings stopped prior to 2011, the first year of analysis in this thesis, or data was not provided for a sequence of consecutive years or more than one year (OBF, 2017). Furthermore, there was no data available at all in the cases of some banks (OBF, 2017).

Lastly, (vi) banks not following defined accounting standards had to be excluded, as a comparison between banks and countries would otherwise have made the analysis prone to erroneous results (KPMG, 2016). As varying accounting standards across firms and countries are of high importance, an insight has subsequently been provided under *Excursion: Accounting Standards* to discuss the selection and the comparability of accounting standards selected in this thesis.

Taking into consideration amendments (i) to (iv), from the initial sample of 1,089 financial institutions, 479 contribute to the FRA. Despite reducing the sample size by more than 50 percent, the remaining sample has thereby been made comparable both within China, Japan, and Korea and across these nations and the quality of the data has also been enhanced for all banks involved. An overview of the

⁴⁶ As a side note, following Köhler (2015, p. 197), no differentiation, has been made between whether banks are listed or unlisted, which contributes to a larger sample size.

banks included in the sample can be found in *Appendix E: Banks of Financial Ratio Analysis Data Sample from Orbis Bank Focus*.

Excursion: Accounting Standards

This excursion into accounting standards is relevant, as they can vary greatly. For example, the US accounting standard, commonly referred to as US generally accepted accounting principles (US GAAP), is hardly comparable with the standard of the majority of banks in this thesis' sample (KPMG, 2016; OBF, 2017). Hence, providing an argument that explains why some standards have been chosen and how they are comparable appears crucial⁴⁷ as it speaks to the FRA's reliability.

Similarly to Mergaerts & Vander Venet (2016, p. 59), all financial data is employed as reported in the OBF (2017) (besides the above-mentioned conversion into USD). Considering or disregarding certain accounting standards is highly important, as these guidelines on creating a company's financial and income statements can lead to varying results, which make an analysis prone to incomparable or simply erroneous results if the reporting standards' underlying methods vary greatly (KPMG, 2016). Subsequently, of the six reporting standards of the initial total data sample with 1,089 banks (OBF, 2017), only four have been retained for the FRA:

- (i) International Financial Reporting Standards (IFRS)
- (ii) Chinese Accounting Standards (CAS)
- (iii) Two Japanese variations
 - Japanese Generally Accepted Accounting Principles (JGAAP)
 - Japan's Modified International Standards (JMIS)
- (iv) Korean IFRS (K-IFRS)

While (i) is an international standard, (ii) to (iv) are local accounting standards, often coined as "local GAAP" (Chao & Horng, 2020, p. 94). Before detailing the approved standards, *Figure 12* gives a summary of the split between accounting standards within the data sample (OBF, 2017).

First, and most importantly, (i) the IFRS encompass a globally recognized "single set of high-quality, understandable, enforceable [...] accounting standards" (IFRS, n.d.). As of 2016, 89 percent of all countries⁴⁸ had either stipulated or admitted listed companies to use IFRS as their primary accounting standard (PricewaterhouseCoopers, 2017), making it the most commonly used reporting standard globally "across developed, emerging and developing countries" (IFRS, 2017a). As shown in *Figure 12*, all but one of the Korean banks use IFRS, while 14 of the Chinese banks use it, and in Japan Local GAAP are at the forefront (OBF, 2017).

⁴⁷ The reviewed literature barely assesses discrepancies in accounting standards (Heffernan & Fu (2010, p. 1591), Laeven & Levine (2009, p. 261), and Mergaerts & Vander Venet (2016, pp. 59-60) being exceptions). Assessing and potentially eliminating some accounting standards is necessary to avoid skewing results (Chao & Horng, 2020, p. 73). Accounting principles are a highly complex matter and it would be presumptuous to ignore distinctions in the standards. This aspect is of particular significance to me, as I have encountered issues with accounting standards in my professional experience analyzing banks in Austria and Europe.

⁴⁸ Includes all countries with active stock exchanges, 131 in 2016 (PricewaterhouseCoopers, 2017).

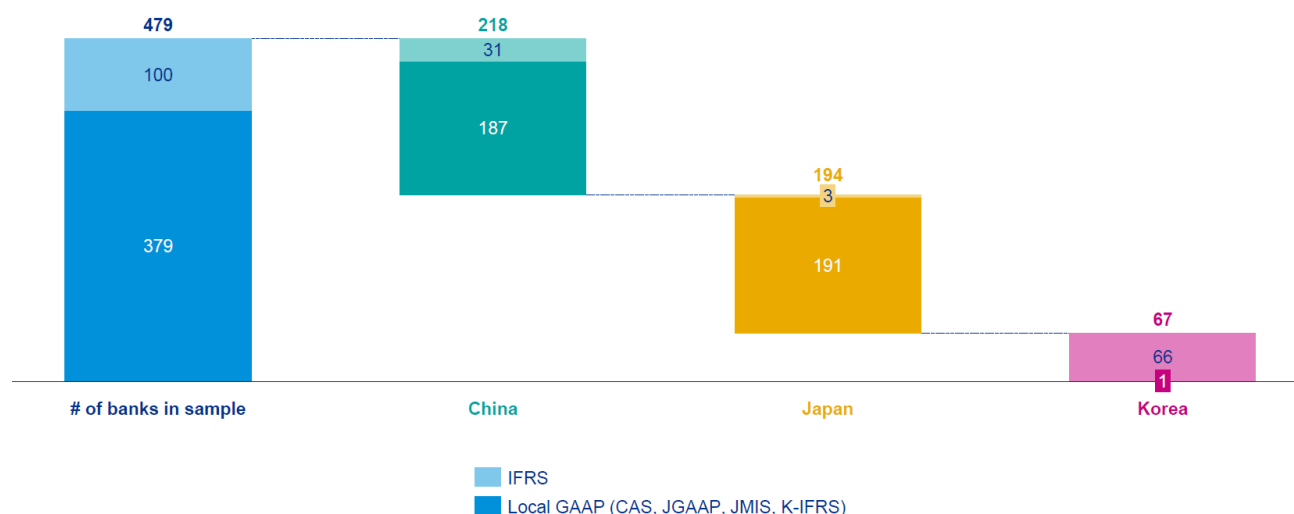


Figure 12: Distribution of accounting standards of bank sample for (B) the financial ratio analysis⁴⁹

Besides banks reporting under IFRS, Chinese banks follow (ii) the CAS, issued by the Ministry of Finance in 2006 (Deloitte, 2017a; PricewaterhouseCoopers, 2017, p. 158). Since its adoption, CAS has rapidly and “substantially converged with IFRS” (PricewaterhouseCoopers, 2017, p. 158), leading to CAS becoming based on IFRS with just a few exceptions (Ramanna, 2012, p. 15). Despite minor deviations from IFRS, researchers frequently use data from Bankscope and similar databases⁵⁰ (for example, Hsiao, Shen, & Bian (2015, p. 74) or Mergaerts & Vander Vennet (2016, pp. 59, 71)), especially since “a user of financial statements prepared under different accounting standards will no longer have enough information to make specific adjustments required to achieve comparability” (CFA Institute, 2016, p. 131).

Similarly, Japan uses (iii) both JGAAP and JMIS (ASBJ, 2017a). Japan is gradually moving from its specific accounting standards towards the global standards and is thus following a plan to convert to IFRS (ASBJ, 2017b; Ernst & Young, 2016, p. 2; PricewaterhouseCoopers, 2017, p. 169). While a full conversion of JGAAP has not yet been performed (ASBJ, 2017a), researchers do not hesitate to compare IFRS-reporting and JGAAP-reporting banks – Becchetti, Ciciretti, & Paolantonio (2016), Delke & Lee (2015), Gong, Hu, & Ligthart (2015), or Laeven & Levine (2009), for example – arguing that “[u]nfortunately, we cannot restate balance sheets and income statements to a common standard” (Beltratti & Stulz, 2012, p. 6). Financial institutions following JMIS essentially report under IFRS with two limited modifications related to goodwill and other comprehensive income (ASBJ, 2017b; PricewaterhouseCoopers, 2017, p. 169).

Lastly, Korea, with the ulterior motive of improving the standing of Korean companies to domestic and foreign investors, adopted (iv) K-IFRS in 2011 (with early adoption starting in 2009) (Song & Chung, 2016, pp. i, 1). This resulted in the complete acceptance of global IFRS standards in Korea, becoming a requirement for all listed enterprises and financial services providers (Deloitte, 2017b;

⁴⁹ Based on data from the OBF (2017), own visualization.

⁵⁰ The OBF (2017) was only launched in 2017 (BVD, 2017a). Its predecessor, Bankscope, however, has been a prime source for researchers (e.g., Rachdi & Bouheni (2016)) (BVD, 2017b). For reference, the usage of Bankscope is considered a proxy for this thesis’ usage of the OBF.

IFRS, 2017b; PricewaterhouseCoopers, 2017, p. 175). The only deviations are “timing differences for newly published IFRS and some additional disclosure requirements” (Deloitte, 2017b), which have no effect on the analysis conducted in this thesis.

Banks that either report under US GAAP – which is particularly the case in Japan, even though it is becoming less popular (KPMG, 2017) – and specialty IFRS standards (OBF, 2017), were excluded from the initial bank sample.

In conclusion, while the comparability of varying accounting standards is a sensitive matter, it has been shown that for the FRA, the standards employed by the banks within the sample are comparable to an extent that it is either standard practice among researchers or local standards are closely related to international accounting standards.

Result Presentation

Each of the 11 variables in the FRA framework, as presented under 2.3.3.2 *Variables* above, will be analyzed individually by country. For this analysis, the variables’ components (i.e., for CIR, operating expenses and operating revenue) are weighted by total assets before being aggregated into a single value for this variable. Weighting is a common method (compare, for example, Calice & Zhou (2018, p. 8) and Bordeleau & Graham (2010, p. 6)) to provide a realistic picture of that specific variable, as, for instance, some banks boast balance sheet totals of several USD 100 billion, while others have just a few USD billion or less. Without a redistribution of weight that each bank contributes to the final figure, the result would be the average of all banks without accounting for varying sizes and the different degree of influence on the country’s banking sector. As shown in *Figure 3* in the *1 Introduction*, China, Japan, and South Korea all have banks of a magnitude that is palpable on the global stage (Relbanks, 2017); accordingly, this needs to be factored in.

For every variable, the following will be done under 3 *Analysis*:

- Calculation and presentation of the average value for each year, from 2011 to 2016
- Calculation and presentation of the median value for each year, from 2011 to 2016
- Calculation and presentation of additional data for each year, from 2011 to 2016, namely
 - Number of banks in the sample included in the average and median values
 - Average value of the variable’s numerator in USD million
 - Average value of the variable’s denominator in USD million
 - Highest and lowest value of single banks within the sample
- Description of the data as well as provision of additional information

All numerical information has been retrieved from the OBF (2017) data sample, upon which I have performed all necessary calculations. Visualizations based on these results provide an overview at a glance – *Figure 13* showcases a dummy chart.

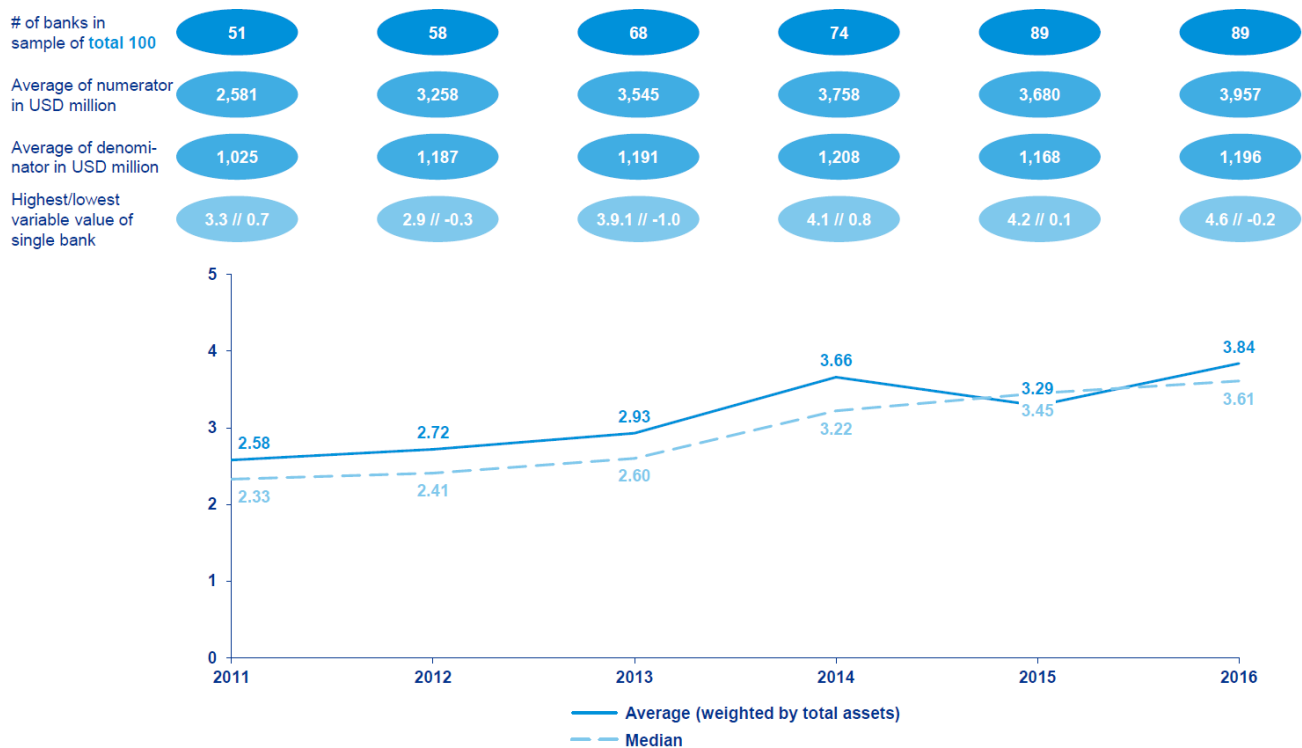


Figure 13: Example result presentation for variables of (B) the financial ratio analysis in percent

As the number of banks in the sample varies for each year (because some bank data is only available from a certain year onwards or because of data quality issues (OBF, 2017)), I provide the information of the number of banks in the respective year contributing to the overall variable value. Presenting the numerator and denominator values provides an understanding of the sizes underlying the FRA variable calculations. A similar rationale follows providing the highest and lowest results of individual banks as it shows the spread of results within the sample.

The main result, however, is the line chart, which displays both the average weighted and median values for the variable. Adding the median – that is, “the middle number in a sorted [...] list of numbers” (Ganti, 2019) – provides additional insight as it neglects potential outliers (the high and low values discussed above) in the sample. The line chart visualizes the development of the respective FRA variable’s six-year timeframe.

Moreover, I also include a descriptive explanation of the variable chart and its results, both enriched with additional information from scholarly articles and other relevant sources. Furthermore, individual banks with outstanding specifics (e.g., outlier values) are presented and an explanation for those specifics given. An interpretation and/or comparison with other variables and/or countries is not included in 3 *Analysis* but in 4 *Interpretation and Discussion of Findings*.

2.3.4 Interpretation and Discussion of Findings

2.3.4.1 Introduction

Despite following on from 3 *Analysis*, it is nonetheless important to briefly touch upon chapter 4 *Interpretation and Discussion of Findings* as it is where the analyses' results are brought into context to answer the research question. This chapter thus builds the junction of the results from (A) the macroeconomic and regulatory and (B) the FRA. No longer plainly analytical, it rather builds upon and condenses the results of the analyses and allows for their interpretation and discussion.

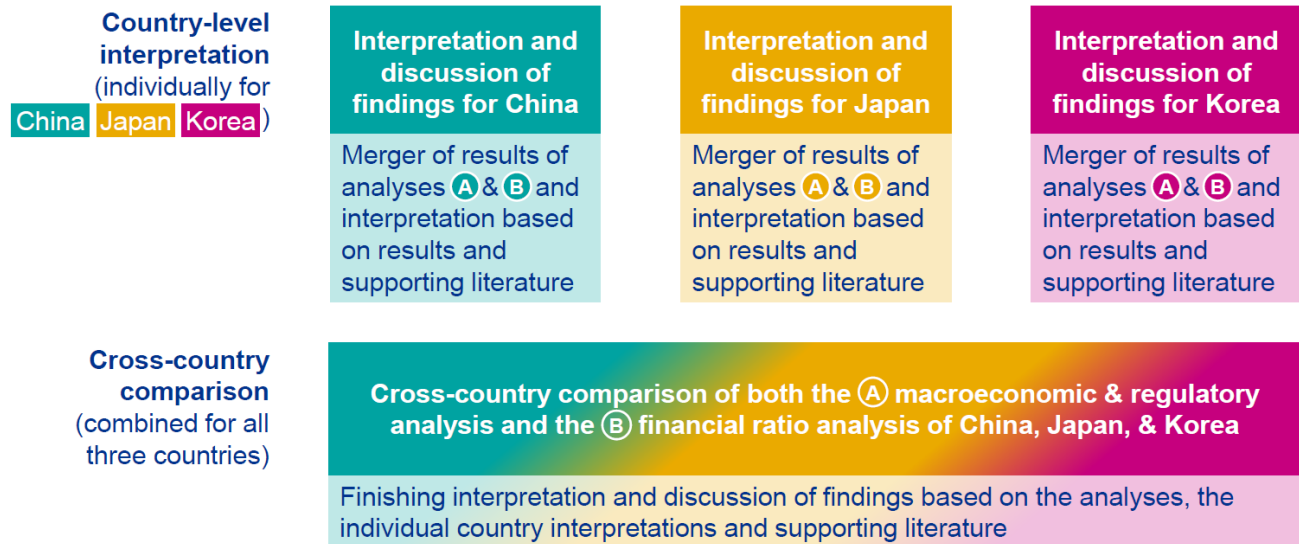


Figure 14: Structure of chapter 4 Interpretation and Discussion of Findings

The interpretation and discussion are presented in two steps. First, as all variables for (A) and (B) have been shown individually under 3 *Analysis*, the country-specific results are combined into a country-level interpretation. Second, the cross-country comparison is the qualitative discourse of the individual countries' macroeconomic and regulatory environments as well as their banking industries' performances over the course of the six years, from 2011 to 2016. The prime input sources provide analyses (A) and (B); however, for the deduction and/or corroboration of elementary findings, supporting literature is used. An overview of the structure of the discourse on the findings is provided in Figure 14.

2.3.4.2 Data, Data Sources, and Results Presentation

All data used for the country-level interpretation and cross-country comparison stem from the two analyses, (A) the macroeconomic and regulatory analysis and (B) the FRA. For the former, the country-level interpretation, the countries' primary, individual results for all variables are shown in an aggregated country profile (Figure 15).

As depicted below, I summarize all results from the 3 *Analysis*, thereby inserting the percentage values retrieved for all variables (for the FRA, the weighted average values are shown). The regulatory changes are one exception, for which a summary of the key findings from the literature review is added. From 2012 onwards, there is an additional trend marker, showing each variable's

development in relation to the previous year. Adding trends helps to visualize and understand the development of the variables for year-on-year interpretation. There are five levels, ranging from a (strong) upward trend, to no change, to a (strong) downward trend. As it is not sensible to define a threshold separating a strong from a regular upward trend (e.g., a 10 percent threshold might be too small for one variable and unlikely to be exceeded for another), the differentiation is made variable by variable, and synoptically across countries. Using five instead of three levels allows for a more detailed trend evaluation. The use of supporting literature is made where necessary.



Figure 15: Example result presentation for the country-level interpretation based on analyses (A) and (B) in percent

For the subsequent cross-country comparison, the individual country profiles are the main input. The cross-country comparison is descriptive in nature and supported by relevant literature. The supporting chart visualizes both the cross-country comparison and the comparison against international benchmark values throughout all quantitative variables. The discourse on the similarities and differences between China, Japan, and South Korea represents the thorough finale of the thesis. When necessary, I add scholarly input.

2.4 Limitations

The scope of this thesis is limited in six ways.

First, this thesis is an attempt to shed light on the banking industries of China, Japan, and Korea, which is done in all scientific conscience; however, it is also clear that these analyses only provide a

limited and timeboxed insight into these multifaceted countries and that both macroeconomic and industry developments are steered by a gargantuan number of factors. Conclusions from the analyses performed in this thesis are thus limited to the confines of the analytical framework, which only looks at a selection of factors shaping the countries and their banks. This means that the interpretation of results is rooted in the data and information compiled in the analyses and lays out a foundation for an informed discussion regarding the causes underpinning certain developments in China, Japan, and Korea; but it is also a limited vehicle to do so.

Second, the thesis' chronological scope – six years – does not allow for long-term observations. As discoursed in the *2.3.1 Introduction* to the *2.3 Analytical Framework*, there are two main reasons for this comparatively short timeframe – one, that the database providing the bank sample for the FRA does not provide substantial data prior to 2011 (OBF, 2017), and, two, that, by 2011, the aftermath of the GFC has been absorbed and somewhat stable business activity can be assumed going forward (Elliott, 2011; London & Lund, 2018).

In addition, the FRA framework was eclectically developed within the confines of analytical and statistical means as well as data availability. Both to reduce complexity and make best use of the limited time span, certain potential variables were not considered. For example, the popular bank risk measure “Z-score” (García-Kuhnert, Marchica, & Mura, 2015, p. 612; Mergaerts & Vander Vennet, 2016, p. 61) was excluded as it demands three (sometimes five) years of revolving data for a single calculation. Also, the Lerner index, which “[measures] the markup of price over marginal cost” (He, Chen, & Liu, 2017, p. 4000), was removed, since the individual price markup data for all banks in the sample is simply not feasible to collect.

In some large sample research projects, outlier results are sometimes eliminated from the dataset (Lardic & Terraza, 2019, p. 23). For this research – besides eliminations made as presented under *Sample Size Adaptions* – this has not been done as outlier positions still reflect an observed development in either the banking sector or a single bank. Simply because it is an extreme value does not mean that it is less relevant, quite the opposite, in all probability. Such exclusions would consequently also mean eliminating some of these larger banks from the sample. However, since these few behemoth banks (see also *Figure 3* in *1.1 Topic and Research Question*) make up a significant share of the samples' total assets (OBF, 2017; Relbanks, 2017), their developments also shape the variables' results to some extent. If a bank that constitutes 2 percent of the entire country sample has a bad year and reports losses, that bad year shapes 1/50th of the country's overall result. Since the aim is to evaluate the bank performance of the entire country, it is relevant to retain all banks, no matter their size, in the sample.

Furthermore, dependencies among variables are initially not addressed in the FRA. For example, net income is a position in the FRA variables that is included in both ROA and ROE and is also partially included in the net interest income used for NIM and the total interest paid of FC. Hence, stark developments in income positions are reflected in not only one but four variables. The subsequent synopsis counters this effect and allows for the set of variables to be seen as a whole system of to some extent communicating vessels.

The final limitation is that this thesis does not differentiate between different types of banking – such as retail banking, corporate banking, private banking, or investment banking. While, as discoursed in 2.3.3.3 *Data, Data Sources, and Results Presentation*, the data sample for the FRA has been sanitized for bank data not material to the research question (such as data for central banks or highly specialized securities firms), the FRA looks at the data on an aggregated level, without explicit differentiation of the eligible bank types included in the bank sample.

2.5 Definitions

This sub-chapter aims to provide a brief description, and thus definition, of the relevant terms used throughout this thesis.

It is necessary to distinguish between banks and financial institutions. While every bank is a financial institution, not every financial institution is a bank. The major difference between banks and non-bank financial institutions lies in their business models (Gong, Hu, & Ligthart, 2015, p. 198). While the role of commercial (customers include both individuals and corporations) and retail banks (customers are mainly individuals; retail banks include savings and cooperative banks) is to accept deposits and issue loans (Gong, Hu, & Ligthart, 2015, p. 198), investment banks focus on mergers and acquisitions, underwriting and trading securities, and asset management (Financial Times, n.d.; Gong, Hu, & Ligthart, 2015, p. 198). Private banking and asset management firms administer the wealth of high net-worth individuals and families, or corporations (Faust, 2019). On the contrary, non-bank financial institutions do not hold a full banking license and are thus not allowed to secure deposits (World Bank, n.d. c). Furthermore, these types of financial institutions typically serve a specialized purpose (World Bank, n.d. c). Examples of non-bank financial institutions include insurance companies, governmental credit institutions and pension funds, investment and trust corporations, and securities firms (Miller & Petranov, 2000, p. 364; OBF, 2017). In order to increase comparability within and across countries – and also based on previous academic research in the field of banking sector analyses (e.g., Avdjiev, Aysun, & Hepp (2019, p. 59) or Gorener & Choi (2013, p. 129)) – only banks as described above have been considered (see also *Sample Size Adaptions*).

Furthermore, it is important to touch upon the term performance, especially in the context of bank performance analysis. Taken alone, the word performance simply describes someone's or something's ability or disability to fulfill a certain task (Cambridge Dictionary, n.d.). In the context of banking, performance has traditionally been associated with economic theory (Bikker & Bos, 2008, p. 7) “from the point of view of shareholders of a bank [which] is obtaining profit by maximizing the revenue and minimizing the cost” (Apătăchioaea, 2015, p. 37). This traditional view implies considering profitability as synonymous with performance. There are, however, certain elements that affect a bank's ability to reach a desired level of profitability, such as “competition, concentration, efficiency, [or] productivity” (Bikker & Bos, 2008, p. 3). Furthermore, regulation, especially in the years since the GFC, has proved to have an additional impact on banks' P&L statements (Bordeleau & Graham, 2010, p. 4), which is why a more inclusive and varied definition for bank performance is necessary. Performance is herein defined as the interplay of three pillars – profitability, liquidity, and

risk and stability (Berríos, 2013; Bordeleau & Graham, 2010). In line with the traditional view, profitability describes how well a bank manages its income in relation to its expenses (Apăvăchioaea, 2015, p. 37). The ECB (2010) even says “[p]rofitability is a bank’s first line of defense” (p. 8) as profits are used both to counter unexpected events and to finance investments to secure future profitability. Liquidity coins a bank’s ability to fulfil financial obligations and invest in new assets without time delay or substantial losses (BIS, 2008; Bordeleau & Graham, 2010, p. 4). Liquidity is a core aspect regulators are keen on as “[v]irtually every financial transaction or commitment has implications for a bank’s liquidity” (BIS, 2008). Lastly, risk and stability define a bank’s strength to withstand or recover from unexpected events and eventually losses (Apăvăchioaea, 2015, p. 37).

A brief note shall be made with regards to China and Korea. First, concerning China, all data used for the analysis solely takes data that concerns the People’s Republic of China (PRC) into consideration. The two special administrative regions of Hong Kong and Macau, as well as the Republic of China (ROC), commonly referred to as “Taiwan”, are excluded from the analyzed scope – particularly because of data availability issues (e.g., macroeconomic data is usually prepared separately, hence variables such as inflation rate do not come as one single measure (World Bank, 2019d)). Second, the thesis only focuses on the Republic of Korea, also known as South Korea. Its neighbor North Korea, officially the Democratic People’s Republic of Korea, is not considered. For simplicity in writing for both the PRC and South Korea, the terms “China” and “Korea” are used with the described research areas in mind.

3 Analysis

3.1 Introduction

The analysis invigorates the analytical framework as presented in 2 *Methodology* above, with the aim to provide the analytical foundation for answers to the research question. Following the layout of the framework, first, analysis (A) focusing on the countries' banking sectors in terms of their macroeconomic and regulatory environment is conducted. This is followed by (B) the FRA, which scrutinizes the performance indicators of 479 Chinese, Japanese, and Korean banks (OBF, 2017). Analyses (A) and (B) are both conducted on a country level and in alphabetical order. The 4 *Interpretation and Discussion of Findings*, which also includes the cross-country comparison, is presented in the next chapter.

3.2 Analysis (A): Macroeconomic and Regulatory Analysis

3.2.1 China

3.2.1.1 GDP Growth

Historically, GDP as a measure of economic growth was not part of the Chinese regimes (Liu, 2018, pp. 67-68). It was only in 1979 that Deng Xiaoping – “chief architect of China’s reform and opening-up” (Liu, 2018, p. 69) – introduced gross national/domestic product (GNP/GDP) as a target measure for the country, not least as the country aimed at reducing its poverty levels and overcoming the developmental shortcomings of the previous decades (Liu, 2018, pp. 67-69). Deng’s vision was that “China’s total output should quadruple, with GNP per capita reaching US\$800-1000” (Liu, 2018, p. 69) until 2000, a vision accomplished in 1997 prematurely (World Bank, 2019f). Crucial for achieving it was the meticulous planning and targeting on city and province level (Liu, 2018, p. 69).

Figure 16 below shows the development of Chinese GDP from 1990 to 2016. As can be seen, during the research period, the growth rate slowed, from 9.5 percent in 2011 to just 6.7 percent in 2016 (World Bank, 2019c). The chart also shows that China’s GDP grew at a rate exceeding 10 percent in the years prior to the looming of the AFC as well as the GFC (World Bank, 2019c). After the sudden slump from over 14 percent in 2007, despite a brief moment of relief in 2010, previous growth values have remained unmatched (World Bank, 2019c).

While Chinese and Western media have anticipated that this slowdown in economic growth shows the weakening of the second largest world economy, its ruling Communist party head, Xi Jinping, who came to power as party and state chief in 2012, frames the economic development as reaching a proclaimed “new normal” (Holbig, 2018, p. 342; Yao, 2019). This new normal ideology reflects the changes Chinese society and its economy underwent in previous decades – the country no longer represents a mere low-cost production area for foreign companies, but instead drives its own initiatives and innovations, increases the prosperity of its population, and attempts to reach sustainable rather than short-term growth (Zhang & Laiming, 2017, pp. 1-2). In 2012, the growth rate

fell below the 8-percent mark, a threshold “long regarded as the growth rate necessary to absorb the growing workforce, keep the export-oriented economic machine rattling and maintain social stability” (Zheng, Hu, & Bigsten (2012, pp. 212-221) as cited in Holbig (2018, p. 343)). The values of between 7.9 and 6.7 percent from 2012 onwards (World Bank, 2019c), nonetheless, manage to match the annual target growth rate “to meet the ruling Communist Party’s longstanding goal of doubling gross domestic product and incomes in the decade to 2020, to turn China into a “modestly prosperous nation” (Yao, 2019). From an ideological and mathematical point of view, the delivered GDP rates are in line with the Chinese government’s plans and expectations. Main cause for this comparatively slow growth is, for one, the general and global economic downturn (Holbig, 2018, p. 347). Moreover, it is also seen as a chance within China to allow for an overall, system-wide reboot to redesign the Chinese economy (Holbig, 2018, p. 347).

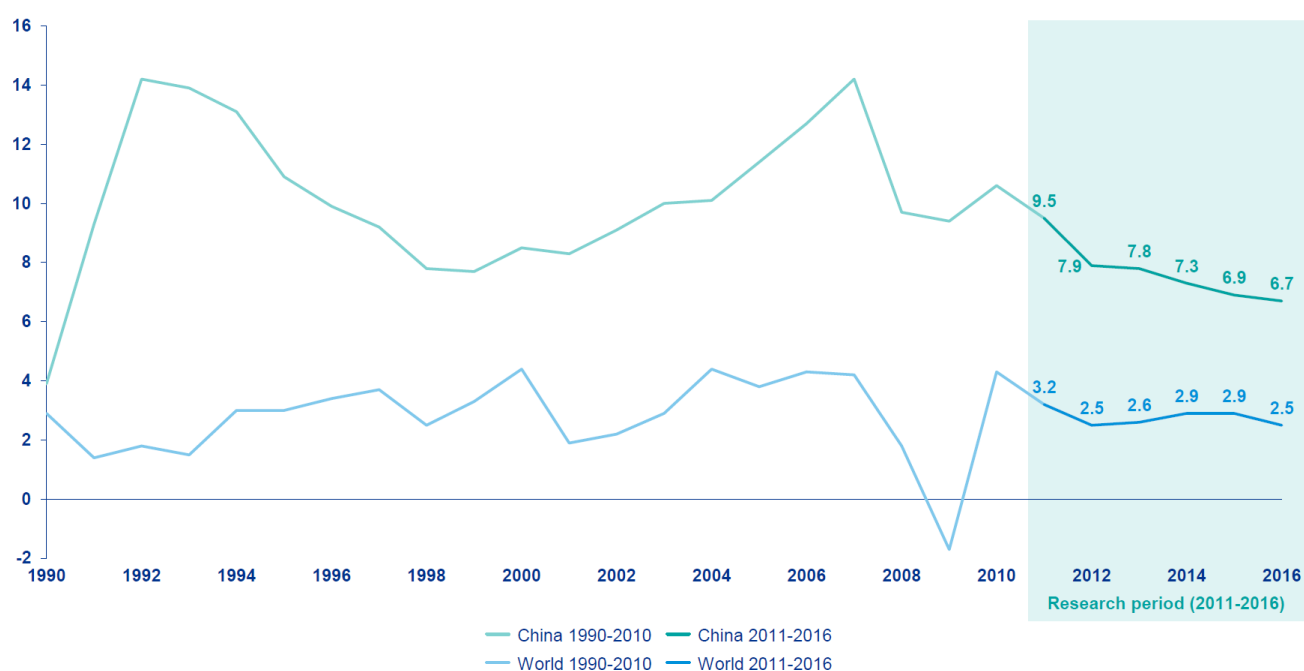


Figure 16: Development of Chinese GDP growth from 1990 to 2016 in percent⁵¹

Regarding global economic development, *Figure 16* shows that global GDP growth from 2011 to 2016 is lower than China’s, with a rather stagnant development, concentrating at around 2.5 percent, with the last peak in 2011 reaching 3.2 percent (World Bank, 2019c). During the GFC, the world’s growth rate turned negative, reaching a low of -1.7 percent in 2009, while China reported a growth rate of 9.4 percent (World Bank, 2019c).

In terms of absolute values, China’s GDP for 2011 stood at USD 7.5 trillion, contributing 10.3 percent to the global GDP of over USD 73 trillion (World Bank, 2019c). By 2016, China’s GDP even accounted for almost 15 percent of the world’s GDP, with USD 11.1 trillion, while global GDP was USD 76 trillion (World Bank, 2019c). In the research period, China increased its GDP by USD 3.6 trillion, while the total global value increased by USD 2.6 trillion, China thus exceeded the global GDP growth by USD

⁵¹ Based on data from World Bank (2019c), own visualization.

1 trillion (World Bank, 2019c). China is thereby the second-largest economy in terms of GDP, second only to the US' GDP of USD 18.7 trillion for 2016 (World Bank, 2019c).

3.2.1.2 Inflation Rate

With regards to China's inflation rate, *Figure 17* shows its development, contrasted with the global inflation rate for 1990 to 2016. Chinese inflation values have had a rather jumpy past, with values as high as 24.3 percent in 1994 and as low as -1.4 percent in 1999 (Kojima, Nakamura, & Ohyama, 2005, p. 2; World Bank, 2019d). A trigger for the 1994 hyperinflation was the lifting of prescribed pricing as a market liberalization measure paired with high expenditures for state-owned enterprises and local governments (Kojima, Nakamura, & Ohyama, 2005, p. 6). Deflation, on the other hand, occurred four times after 1990, which research attributes to "a negative demand shock" (Kojima, Nakamura, & Ohyama, 2005, p. 2). This shock was triggered by (i) banks being reluctant to lend money as they were forced to restructure their loan portfolios in order to reduce the number of defaulting loans and (ii) household budgets becoming tighter due to the government's ongoing reform of state-owned enterprises (Kojima, Nakamura, & Ohyama, 2005, pp. 2, 9). During the research period, though, the inflation rate became more stable, starting from 5.6 percent in 2011 and descending to 2.0 percent in 2016 (World Bank, 2019d).

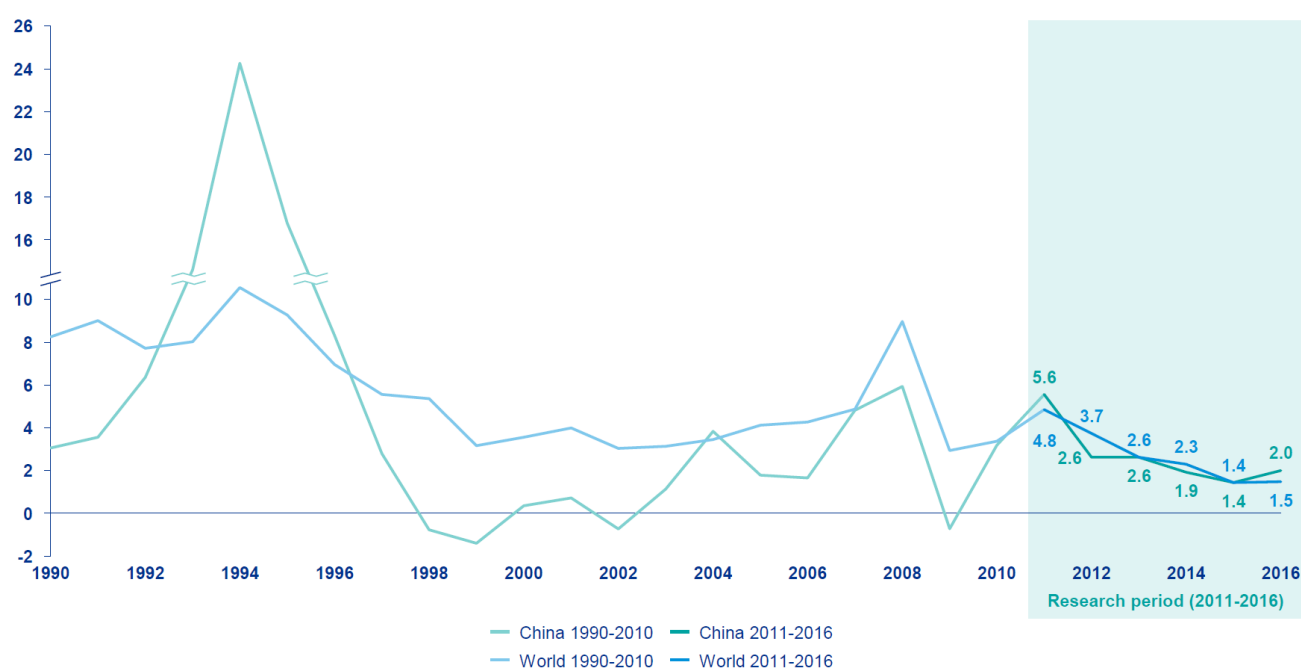


Figure 17: Development of Chinese inflation rate from 1990 to 2016 in percent⁵²

Maintaining levels of around 3 percent is a policy priority for the Chinese government, which actively manages inflation, for example, by raising the central bank interest rate or issuing "price control guidelines" (Lin & Wang, 2013, p. 3049). As well as showing adverse effects for Chinese consumers and businesses, high inflation in China is also a threat for countries heavily engaged in trade with China, such as South Korea, which made more than one fifth of its imports and a quarter of its exports

⁵² Based on data from World Bank (2019d), own visualization.

with China in 2017 and previous years (Lin & Wang, 2013, p. 3049; Observatory of Economic Complexity, n.d.).

Lowering levels of inflation was a concern until 2012, since 2013 inflation rates were less than the target rate, with the Chinese government taking measures to stimulate domestic consumption (Hsu, 2017). Causes for the slowdown were triggered by consumers, who showed less interest in retail goods and services (Hsu, 2017). At the same time, producers' prices inflated as production costs were climbing due to wage increases and improved economic prosperity (Hsu, 2017).

Contrasted with global inflation rates, China and the world are somewhat on par (World Bank, 2019d). Such development is typical according to researchers, as "country inflation tends to revert toward the rate of global inflation" (Kearns, 2016, p. 2). Overall, the global economy started off with an elevated level of 4.8 percent in 2011, constantly lowering its values down to below 2 percent, with 2015 and 2016 showing 1.4 and 1.5 percent respectively (World Bank, 2019d). These globally low levels of inflation are still, years after the GFC, attributed to the economic shock of 2007-2008 (Irwin, 2019).

3.2.1.3 Changes in the Regulatory Environment

Banking regulation has been a key topic in China since the start of the country's opening reforms in 1978 (Fang, Garnaut, & Song, 2018, pp. 5-6; Mo, 2016, p. 90). By that time, the People's Bank of China (PBOC) was the only "formal financial institution [...] account[ing] for 93 percent of the country's total financial assets" (Huang & Wang, 2018, p. 291), functioning both as a central and a regular commercial bank. This monopoly was the result of the complete nationalization and subsequent shutdown of existing banks in 1952 under Mao Zedong following "undisciplined money supply [...] and macroeconomic instability" (Huang & Wang, 2018, p. 293). With the opening reforms of the late 1970s, the recovery of preexisting banks such as the ABC or the BOC, as well as the founding of new banks, and with it a proliferation of banking services, flourished (Huang & Wang, 2018, pp. 291-294; Mo, 2016, pp. 92-98).

Until the early 2000s, Chinese regulatory measures included, for example, the introduction of a stringent loan classification system based on international standards to better oversee and address non-performing loans or measures to improve and strengthen the capital adequacy of state-owned banks like the BOC (Mo, 2016, pp. 92-98). This was highly needed as it has been assessed that up to a quarter of the country's bank loans were defaulting in the 1980s and 1990s (He W. P., 2012, p. 368; Mo, 2016, p. 90).

The beginning of the 21st century put the further renewal of the banking sector on the Chinese Communist Party's agenda, with a focus on increased private ownership (He W. P., 2012, p. 367). Moreover, "[t]he role of the government, from being a dominant force in the market, was to be transformed into being a facilitator of the market economy" (He W. P., 2012, p. 367) as well as granting international banks the right to become minority shareholders in Chinese banks.

In 2003, the China Banking Regulatory Commission (CBRC)⁵³ was founded and it thereby provided (together with two additional regulatory commissions for securities and insurance) the regulatory and supervisory authority for the Chinese banking sector (He W. P., 2012, p. 367; Huang, Wang, Wang, & Lin, 2013, pp. 99-100). The PBOC, besides monetary central bank duties (where it has full autonomy concerning utilizing monetary instruments), additionally performs risk-mitigating activities (Huang, Wang, Wang, & Lin, 2013, p. 100). Despite the proposed freeing of the market and the accelerated economic development seen in China, the PBOC has had a strong stake in the financial markets ever since, for example, by prescribing interest rates or bands for lending, deposits, and foreign exchange (Huang & Wang, 2018, p. 295). Regulatory developments have shown varying, sometimes adverse, effects – one cause is the “dual-track strategy” (Huang & Wang, 2018, p. 296). The result is the regulator differentiating in policies and responses between state-owned and private institutions, leading, for instance, to increases in NPL or overall financial volatility despite uninterrupted economic progress (Huang & Wang, 2018, pp. 295-303).

Such inconsistencies also led to a rise in shadow banking, which is the practice of offering bank-like services such as lending by unauthorized institutions, as a result of regulation discriminating against the free market (Chen D., 2019; Huang & Wang, 2018, p. 299). Reducing issues that arise with such unlicensed lenders and peer-to-peer platforms were of primary concern in the mid-2010s for the CBRC and the PBOC (Chen D., 2019). Another concern was the promotion of debt-to-equity swaps for businesses which have a positive outlook overall but temporary cash difficulties (Chen D., 2019). Such swaps entail that companies offer equity to reduce their debt with banks and ultimately reduce the country's NPL (Chen D., 2019). Insurance companies and private equity funds are interested in debt-to-equity vehicles, as are specifically the asset companies founded by Chinese banks themselves (Chen D., 2019).

A major development to strengthen free market activities and competition on the Chinese banking market was the “interest-rate liberalization” (Chen, Qu, Tan, & Yung, 2016, p. 1) for deposits in 2015. Up until then the interest charged for deposits had a prescribed cap defined by the PBOC (Chen, Qu, Tan, & Yung, 2016, p. 1). With this change, Chinese banks are free in their pricing strategies as they can now strategically tailor their offers to their customers (i.e., through more favorable rates for highly valuable customers), which leaves banks, however, with the burden of leaving existing business models behind and transforming their customer engagement, a potentially difficult task, especially for small banks (Chen, Qu, Tan, & Yung, 2016, pp. 1-3). “The People's Bank itself called this step the riskiest move in the whole reform efforts” (Chen, Qu, Tan, & Yung, 2016, p. 1).

Despite efforts to effectively regulate China's banking sector, Huang & Wang (2018) criticized the financial reforms spanning from 1978 until 2018 bluntly:

China's financial reform and development during the past four decades have been strong on quantity, but weak on quality. China has a large number of financial institutions and huge volumes of financial assets. Yet Chinese authorities maintain serious and extensive restrictions

⁵³ In April 2018, the China Banking Regulatory Commission was merged with the China Insurance Regulatory Commission, which operates under the name of China Banking and Insurance Regulatory Commission (CBIRC, 2018; Thomson Reuters Practical Law, n.d.).

on financial markets, including on interest rates, exchange rates and funds allocation. (Huang & Wang, 2018, p. 291)

3.2.2 Japan

3.2.2.1 GDP Growth

The development of Japan's GDP since 1990 is shown below in *Figure 18* together with the respective developments on the global scale. Japan's economic growth has performed below the global values since the early 1990s and had not recovered by 2016 (World Bank, 2019c).

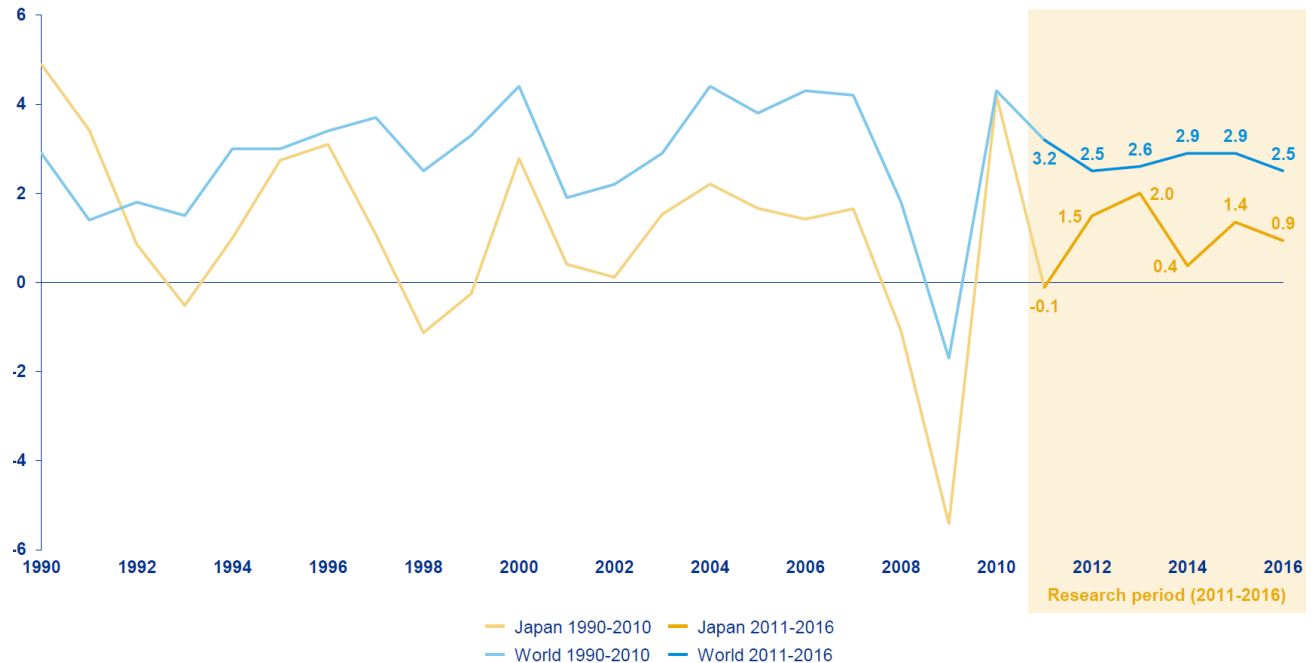


Figure 18: Development of Japanese GDP growth from 1990 to 2016 in percent⁵⁴

Prior to sinking beneath the world's GDP growth level, Japan was on a steady economic rise spurred by post-World War II economic activity and it joined the group of major economic powers globally in the 1970s (Kuepper, 2019; Lincoln, 2013, p. 146). In the late 1980s though, a stock market and real estate bubble developed due to "[r]ecord-low interest rates" (Kuepper, 2019) and subsequently burst at the beginning of the next decade (Lincoln, 2013, p. 149). In a few short years, "both the stock market and the urban real estate market tripled" (Lincoln, 2013, p. 149) and could as a consequence no longer sustain their values. In the early 1990s, economic turmoil began to become visible in Japan's GDP, the era often dubbed a "lost decade" (Kuepper, 2019; Lincoln, 2013, p. 151). The bubble's deflation was accompanied by Japan's economic downturn (or as Lincoln (2013) put it, an "underperformance of the economy" (p. 149)), resulting from deficits of the country's household budget and ever-increasing savings, and the decreasing current account balances of the Japanese population (Lincoln, 2013, pp. 146-147). Reasons for this globally known savings phenomenon range from the immediate aftereffects of the economic shock (and from the next generations continuing to

⁵⁴ Based on data from World Bank (2019c), own visualization.

hoard inherited money) to the perceived need to support an (over-)ageing population by stepping in for weak social security (Hayashi F., 1986, pp. 164-167). Moreover, there was a trend of high bonuses and tax benefits, which led recipients to either invest in interest-bearing instruments such as government bonds, or to simply accrue interest in their current accounts (Hayashi F., 1986, pp. 164-167). For banks themselves, the low, and, since 2016, negative, interest rates, have led to the disbursement of more loans to customers as well as an increase in risk-taking to counter the negative effects resulting from this monetary measure (Hong & Kandrac, 2018, p. 27).

Since the start of the recession in the early 1990s and until the shock of the GFC (bristled with the AFC and the dot-com bubble) (Nishizaki, Sekine, & Ueno, 2014, pp. 28-29), Japan has reported negative economic growth four times, hitting -5.4 percent in 2009 (World Bank, 2019c). By contrast, the global GDP in the same year reached -1.7 percent (World Bank, 2019c). After a brief relief in the following year, with a growth of 4.2 percent, Japan reported negative growth again in 2011 (World Bank, 2019c). Since then, growth has somewhat normalized in that the country reported GDP growth figures ranging from 0.4 to 2.0 percent (World Bank, 2019c).

Japan still lags behind global growth values (World Bank, 2019c). During the research period, the world's economy has stabilized after the GFC, with values approximating 3 percent or slightly below (World Bank, 2019c). In terms of absolute figures, Japan's total GDP plateaued in 2011 and 2012 at approximately USD 6.2 trillion, subsequently dropping to USD 4.9 trillion by 2016 (World Bank, 2019c)⁵⁵. As the world's total GDP rose by USD 2.7 trillion from 2011 to 2016, Japan's economy lost USD 1.2 trillion (World Bank, 2019c). In percentages, this translates to Japan accounting for 8.4 percent of the world's GDP in 2011 and almost 2 percentage points less (6.5 percent) in 2016 (World Bank, 2019c). Despite this negative trend, Japan is still the third largest economy globally, followed at some distance by Germany, reporting a GDP of USD 3.5 trillion in 2016 (World Bank, 2019c).

3.2.2.2 Inflation Rate

Figure 19 presents the development of Japan's inflation from 1990 to 2016. As can be seen, Japan has had a series of deflationary periods during this time span, consecutively reporting, for seven years from 1999 to 2005, a constant decrease in prices (Lincoln, 2013, p. 151; World Bank, 2019d). Another four years of deflation followed from 2009 to 2012 (World Bank, 2019d). Regarded as "long-lasting but mild deflation" (Nishizaki, Sekine, & Ueno, 2014, p. 20), this phenomenon is quite unique compared to other economies (Nishizaki, Sekine, & Ueno, 2014, p. 22). As of 2011, the Bank of Japan launched the unprecedented measure of quantitative easing, whereby the central bank bought back government bonds from the Japanese capital markets to inject money into the economy and drive lending as well as consumption (Berkmen, 2012, p. 3). Triggered by deflation following the GFC (see *Figure 19*), the BOJ stepped up its game, where "[o]ne key measure was an asset purchase program involving government securities as well as private assets" (Berkmen, 2012, p. 3). Whether or not quantitative easing delivered on its promise is circumstantial (Berkmen, 2012, p. 3). The IMF's

⁵⁵ There is a slight deviation in the GDP growth values that indicate a negative development for 2011 while there is a positive development in absolute USD values for the same year (World Bank, 2019c). This deviation is caused by the use of local currency to compute the GDP growth in percent (World Bank, 2019e).

Berkmen (2012) concluded that research on the topic showed “its effect on economic activity and inflation was found to be small” (Berkmen, 2012, p. 3). In addition, in the 1990s, the BOJ started the successive reduction of interest rates to give prices an extra nudge in a bid to trigger inflation (Hong & Kandrach, 2018, pp. 8-9).

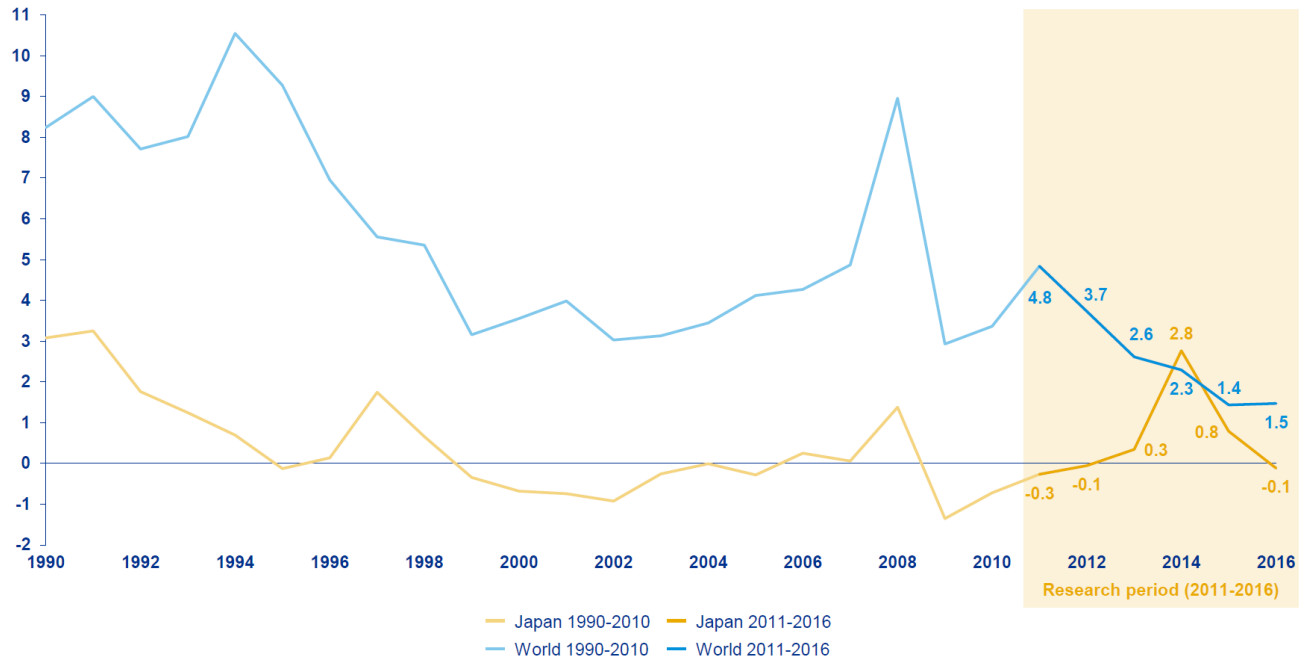


Figure 19: Development of Japanese inflation rate from 1990 to 2016 in percent⁵⁶

While it might be assumed that this “chronic deflation” (Calvo, 2016, p. 1) is closely linked to the economic downturn Japan experienced throughout the 1990s discussed in 3.2.2.1 *GDP Growth*, researchers have reasoned that unraveling this macroeconomic anomaly is more complex (Nishizaki, Sekine, & Ueno, 2014, p. 33). Nishizaki, Sekine, & Ueno (2014) summarized the result of their investigation of the Japanese deflation, stating: “[I]t is still difficult to single out one specific or dominant explanation for Japan’s prolonged period of deflation, and it may well be the case that it is the result of a combination of factors” (p. 33). Potential contributing factors include (Nishizaki, Sekine, & Ueno, 2014, pp. 24-33):

- Unfortunate overall economic development paired with interest rates falling to and below zero
- Decrease in inflation expectations by Japanese households and businesses alike
- Inability of the Japanese central bank to counteract with policy measures
- Currency fluctuations and significant price differences between Japan and other economies

During the research period, inflation showed negative values in 2011, 2012, and 2016 (World Bank, 2019d). In the years between, Japan reported price increases, peaking at 2.8 percent in 2014 (World Bank, 2019d). The 2014 value represented the highest inflation rate in almost a quarter of a century, which was welcomed by the Japanese government with a sales tax rise to 8 percent, up from 5

⁵⁶ Based on data from World Bank (2019d), own visualization.

percent (BBC, 2014). The target inflation rate for Japan was set to 2 percent by policy makers, supporting this goal by “boosting the country’s money supply” (BBC, 2014) to “force consumers and businesses to spend more money and not hold back purchases, as they may have to pay more later on” (BBC, 2014) once prices climb. Meeting the goal only in 2014, the following two years brought about a decline in consumer prices, ending with -0.1 percent in 2016 (World Bank, 2019d), “suggesting that the economy still lacks enough momentum to jump-start inflation” (Kihara, 2016). In January 2016, the BOJ also announced that it was to start a negative interest rate regime, charging banks, at the time, 0.1 percent interest on deposits made with the BOJ (Hong & Kandrac, 2018, pp. 8-9).

Contrasted with the global inflation development, Japan lagged behind global values from 1990 to 2016, with one exception in 2014, when Japan hit its 2.8 percent discordant value, when globally the inflation rate was at 2.3 percent (World Bank, 2019d).

3.2.2.3 Changes in the Regulatory Environment

For each decade from 1980 to 2010, Japan held the number one position when analyzing the locations of headquarters for the world’s 50 largest banks by total assets – owning 23, 48, and 21 percent per decade respectively – making the country a prime playing field for financial regulation and deregulation (Barth, Prabha, & Swagel, 2012, p. 277; Lincoln, 2013, p. 143). With the prospect of turning Japan into a key protagonist on the international financial market, the focus in the late 1980s and the 1990s was on shifting from a bank-based economy towards one that relies more on market forces and capital markets (Lincoln, 2013, pp. 143-144). An initial regulatory change happened in the late 1980s which “enabled large nonfinancial corporations to raise money from capital markets rather than from banks, a change that caused banks to seek other, riskier borrowers” (Lincoln, 2013, p. 153), a main contributing factor to the real estate bubble touched upon above in 3.2.2.1 *GDP Growth*. The troubles of this asset crisis climaxed in 1997, when a large number of banks either went bankrupt or needed government intervention, leading to both the consolidation of the Japanese banking market and the tightening of financial regulation (Kanaya & Woo, 2000, p. 4; Liu & Wilson, 2010, p. 1851). The IMF’s view on a decade full of crises was that the main triggers were “excessive asset expansion in periods of economic boom, liberalization without an appropriate adjustment of the regulatory environment, weak corporate governance and regulatory forbearance” (Kanaya & Woo, 2000, p. 4). For example, during these years, the Ministry of Finance published fabricated data on the state of bad debt to keep its mismanagement from the public (Lincoln, 2013, p. 154). To strengthen the Japanese banking market, three main measures were enforced in the early 2000s – forced write-downs of non-performing loans, increased capital requirements, and ongoing consolidation (Lincoln, 2013, p. 155). In addition, the Financial Services Agency (FSA)⁵⁷ was established as the main regulating and supervising body for Japanese banks (FSA, 2020a; Lincoln, 2013, p. 155). After the FSA, the Bank of Japan is the second key player pursuing the stabilization of the country’s banking sector (Yoshino, Nakabayashi, & Morgan, 2018, p. 103). Activities of the

⁵⁷ The FSA was established as part of the Prime Minister’s administrative body, but only in 2000/2001 became responsible for regulation and failed institutions (FSA, 2020b, p. 2; Yoshino, Nakabayashi, & Morgan, 2018, p. 102).

BOJ in this function include the provision of transactions, supervising and monitoring of banks, and, in worst-case scenarios, taking steps to prevent banks from failing (Yoshino, Nakabayashi, & Morgan, 2018, p. 103). Japan managed the GFC comparatively well, not least due to a more stringent regulatory framework established in the years leading up to 2007, coined the “Plan for Strengthening the Competitiveness of Japan’s Financial and Capital Markets” (Liu & Wilson, 2010, p. 1853; Tamaki, 2008, p. 2), thereby shaping the banking industry that is under scrutiny in this thesis.

As for the research period, it was predominately characterized by the easing of capital requirements from December 2008 onwards “[t]o reduce spillover effects that caused [...] the global financial crisis” (Tongurai & Vithessonthi, 2020, p. 5). Japan differentiates between banks solely operating within the country – these banks have a minimum capital requirement of 4 percent – as well as banks with overseas activities and international banks – these banks need to follow the BCBS’ Basel-requirements of 8 percent minimum capital adequacy ratio⁵⁸ (Tongurai & Vithessonthi, 2020, pp. 4-5). While the capital adequacy requirements, i.e., the 4 and 8 percent respectively, remained unaltered, the easing stemmed from a more favorable calculation method for the capital allowed into the ratio itself (Tongurai & Vithessonthi, 2020, pp. 5-6). The easing resulted in the capital adequacy ratios either staying unchanged or improving as more types of equity were now allowed for the calculation of the ratio, and a worsening of the ratio was impossible (Tongurai & Vithessonthi, 2020, pp. 5-6). This was especially beneficial for domestic Japanese banks and included, for example, that losses incurred from government and corporate bonds as well as shares no longer had to be considered for the capital adequacy ratio (Tongurai & Vithessonthi, 2020, pp. 5-6). Relaxed capital requirements allow banks to engage in more and/or riskier lending activities, since more types of equity are allowed into the calculation and as a consequence the amount of risk-weighted assets, the driver of the capital adequacy ratio, can be larger (Tuovila, 2020).

Other regulatory developments throughout the research period include the following. First, as a consequence of the GFC, the FSA offered moratoria for SMEs with difficulties meeting the instalment deadlines until 2014 and, at the same time, it allowed banks to exclude such prolonged loans in their NPL reporting (Imai, 2019, p. 15). Despite offering economic relief for companies in a liquidity crunch, “the law created the long-term problem that [...] there is likely a substantial amount of hidden non-performing loans in the balance sheets of the Japanese banks” (Imai, 2019, p. 15), repeating the incredibility of bad debt data of the 1990s touched upon above (Lincoln, 2013, p. 154). The history of bad debt absorbed by Japanese banks also led the Bank of Japan to repeatedly lower interest rates (Weistroffer, 2013, p. 4). “By lowering interest rates, the Bank of Japan tried to boost credit supply and allow banks more time in dealing with the bad loan problem” (Weistroffer, 2013, p. 4). Second, with stress testing having already been introduced to the Japanese banking sector in the last century, a renewed stress test for the entire landscape on the aggregated level was started together with the IMF in 2011/2012 (Harada, Hoshi, Imai, Koibuchi, & Yasuda, 2015, p. 55). The BOJ performs stress tests semiannually and publishes the results in its “Financial System Report” (Harada, Hoshi, Imai,

⁵⁸ The capital requirement is calculated as tier 1 and tier 2 capital in relation to risk-weighted assets – for details on the calculation and definitions refer to BCBS (2017) in general and BCBS (2017, pp. 137-138) in specific.

Koibuchi, & Yasuda, 2015, p. 56). Finally, the Group of Twenty (G20) defined that over the counter (OTC) trades of derivatives needed stronger regulation, not least due to such instruments' infamous role in the GFC (Harada, Hoshi, Imai, Koibuchi, & Yasuda, 2015, pp. 56-57). As of November 2012, Japan imposed tighter restrictions on OTC derivative purchases and sales concerning clearing and reporting (Harada, Hoshi, Imai, Koibuchi, & Yasuda, 2015, pp. 56-60).

3.2.3 South Korea

3.2.3.1 GDP Growth

Figure 20 depicts the development of South Korea's GDP from 1990 to the end of the research period. Up until the latter, the country's GDP growth was comparatively high with erratic falls, from 2011 on, however, the Korean GDP values are abreast with global values (World Bank, 2019c).

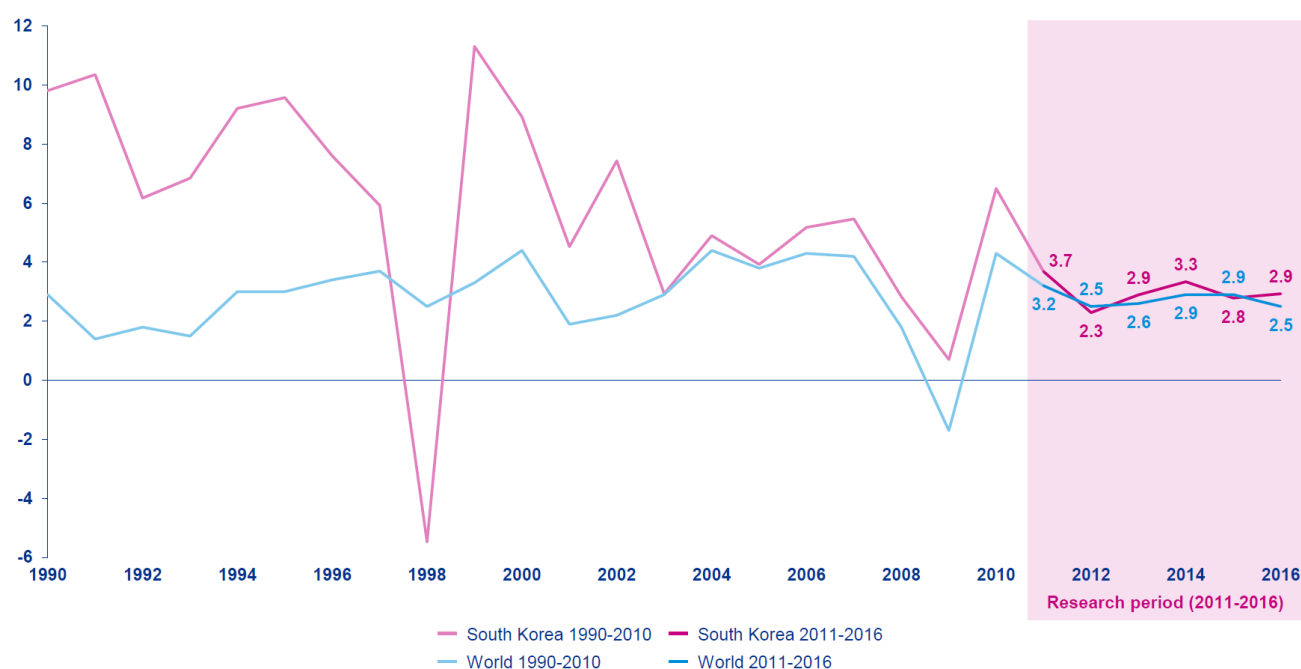


Figure 20: Development of South Korean GDP growth from 1990 to 2016 in percent⁵⁹

Korea's economic advances since the end of the Korean War in 1953 convey a remarkable transition from an agrarian, war-shattered nation to one of the world's leading economies (Johnston, 2016). This drastic progress is also referred to as the "miracle on the Han" (Johnston, 2016), a reference to the main river in Seoul. Employing a consequent series of transformative economic plans and strategically investing foreign aid money from the US, Japan, and other nations, Korea managed to join the "rich man's club" (Tran, 2011) and secured rank 11 on the GDP leaderboard (Kim & Kwon, 2012, pp. 179-180; World Bank, 2019c).

Despite this overall impressive performance, the South Korean economy was also struck with financial turmoil, the latest of which included the Asian financial crisis from 1997 to 1998, "a credit card lending boom in 2003, a real estate boom-bust in 2003-2007, a liquidity crisis in 2008, and a run

⁵⁹ Based on data from World Bank (2019c), own visualization.

on savings banks in 2011” (Park Y. C., 2013, p. 225). The former, the AFC, hit the Korean economy hardest and “with unexpected force” (Hyun, 2017, p. 3), resulting in a negative GDP growth of -5.5 percent, soaring to a record high of 11.3 percent the following year because of IMF support and increases in exports due to the weakened Korean won (World Bank, 2019c). The GFC, a decade later, did comparatively little harm to the country, with contracted but nonetheless positive growth of 2.8 and 0.7 percent in 2008 and 2009 respectively (World Bank, 2019c).

In 2010, the economy picked up speed again, reporting GDP growth of 6.5 percent (World Bank, 2019c). However, in the following years, the research period, the Korean economy leveled off at around 3 percent, reporting values of between 2.3 and 3.7 percent (World Bank, 2019c). This stability was also unaffected by the 2011 bank scandal, which caused around two dozen insufficiently funded savings banks to be shut down (Cha, 2012). This was caused by profitability issues due to increases in loan defaults in the real estate sector as a lagging aftereffect of the GFC (Cha, 2012). As a questionable solution, these banks started offering “subordinated bonds that had low priority for repayment in the event of default” (Cha, 2012) to the Korean population, luring individuals with high interest rates. When light was shed on this practice, investors withdrew their money from the savings banks, causing them to crash (Cha, 2012).

In global comparison and absolute figures, the Korean economy is constantly growing and thereby secures its spot in the economic elite (World Bank, 2019c). At the beginning of the research period, in 2011, the country was ranked 13th, with a total GDP of USD 1.2 trillion (World Bank, 2019c). By 2016, South Korea had surpassed the economies of Australia and Spain, coming in 11th with a GDP of USD 1.4 trillion, contributing 1.9 percent to the world’s GDP (World Bank, 2019c).

3.2.3.2 Inflation Rate

The development of prices in Korea is shown by *Figure 21*. The chart displays the volatility of inflation from 1990 until the end of the research period in 2016 (World Bank, 2019d). What is immediately evident is that the country showed inflationary years, and up until the early 2000s, price developments were bumpy and mostly well above 5 percent (World Bank, 2019d). The AFC caused a brief jump, up to 7.5 percent in 1998, followed by an equally sharp slump to 0.8 percent the following year (World Bank, 2019d). In the wake of the crisis and the bailout through the IMF (Hyun, 2017, p. 3), the Bank of Korea (BOK), the Korean central bank, adopted “inflation targeting” (Chang, Choi, & Park, 2016, p. 222) to ensure “price stability [...] [through] conduct[ing] monetary management by controlling short-term interest rates” (Takeshi, Yuki, & Shigeyuki, 2012, p. 3).

In the years leading up to the GFC, inflation was relatively stable at around 3 percent (World Bank, 2019d). Less than on the global scale, the country experienced the price increases and aftereffects of the financial meltdown (Emmott, 2010), resulting in an inflation rate of 4.7 percent in 2008 (World Bank, 2019d). From 2011 to 2016, Korea, however, showed a steady decline of its inflation rate, starting out at 4.0 percent, lowering itself to 0.7 percent in 2015 and slightly increasing to 1.0 percent in 2016 (World Bank, 2019d).

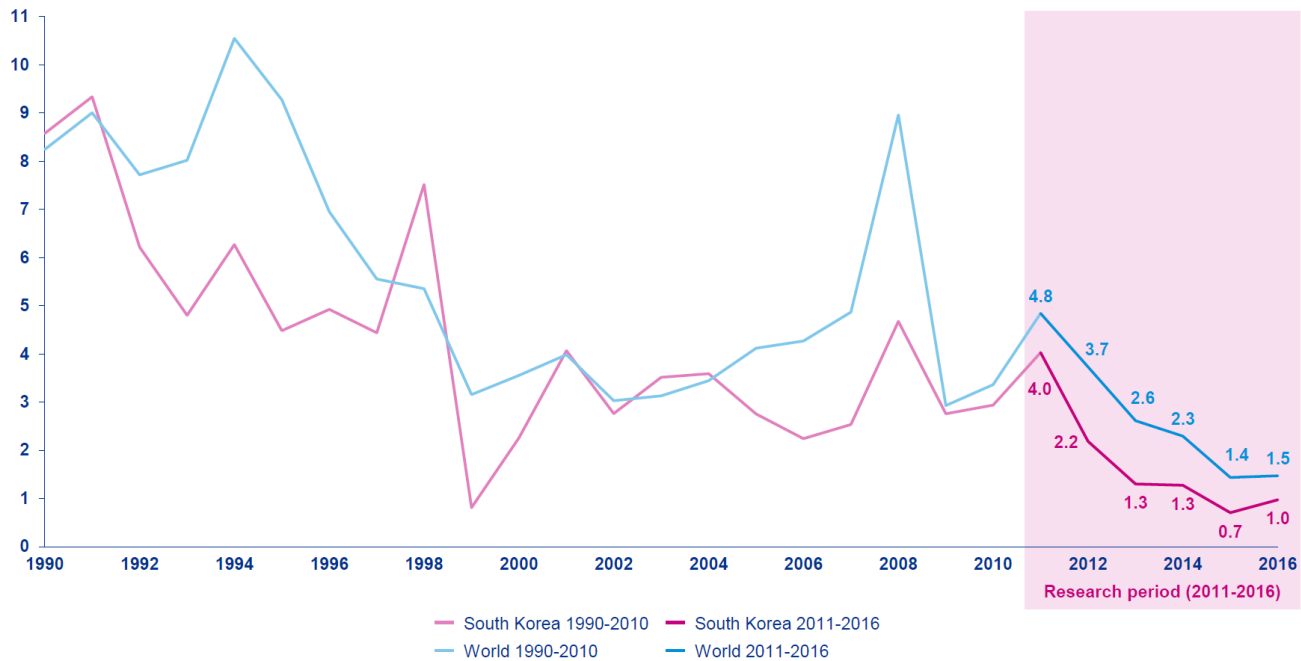


Figure 21: Development of South Korean inflation rate from 1990 to 2016 in percent⁶⁰

Since 2013, the country has been falling below its targeted inflation rate of 2 percent (Roh & Kim, 2019). One key explanation for this convergence to price stability is the fact that Korea's decade-long transition, from lagging-behind to becoming an Asian turbo-capitalist economy, is over and the country needs to become accustomed to yet another transition, namely to that of a "slow-growth model" (Chang, Choi, & Park, 2016, p. 228). Accompanying problems of Korea's advanced and tenured economy include an over-ageing population, less attractive investment options domestically, as well as a labor market split between high-yielding, attractive jobs, which educated Koreans favor, and short-termed assignments typically only staffed by foreign workers (Chang, Choi, & Park, 2016, p. 228). While "these factors could have both inflationary and disinflationary consequences [...], the overall impact seems to be disinflationary" (Chang, Choi, & Park, 2016, p. 228). In essence, South Korea follows the global trend of falling inflation rates since 2011 but does so about 0.5 to 1.5 percent below the world average (World Bank, 2019d).

3.2.3.3 Changes in the Regulatory Environment

The South Korean economy has seen strong economic growth from the 1960s onwards, following the postwar era after the Korean War (Gilbert & Wilson, 1998, p. 133). It was not until almost two decades later that the financial system came under the government's full influence (Gilbert & Wilson, 1998, p. 133) and "was classified as one of the most repressive" (Park Y. C., 2013, p. 227). From interest rate definition to exchange rate definition for currency conversion to "control over the allocation of credit" (Gilbert & Wilson, 1998, p. 133) to "[a]sset-liability management" (Park Y. C., 2013, p. 227) – it was all in the hands of the Korean government.

⁶⁰ Based on data from World Bank (2019d), own visualization.

From the early 1980s onwards, however, the Korean banking industry saw several major phases of bank deregulation and privatization (Hyun, 2016, p. 709; Lee & Kim, 2013, p. 86; Park Y. C., 2013, pp. 227-231). The first step was the end of the privatization of banks under then-president Chun Doo Hwan; this step was nevertheless considered “no more than cosmetic” (Park Y. C., 2013, p. 227). In 1993, after “32 years of military regimes” (Hyun, 2016, p. 709), the freeing of the financial sector picked up speed. Elements of the deregulation measures included the broadening of allowed areas of business for domestic banks, the support of the establishment of more merchant banks supporting companies with imports and/or exports, or the incentivization of foreign credit to the chaebol (conglomerates) and other huge corporations as a means to bolster the country’s globalization efforts (Hyun, 2016, p. 709; Park Y. C., 2013, pp. 227-228). The latter trend led to the swift and massive accumulation of foreign debt and increases in non-performing loans, which ultimately pushed “the entire financial system to the edge of insolvency” (Park Y. C., 2013, p. 228) in parallel to the turmoil of the AFC in 1997 (Hyun, 2016, p. 709). Despite the efforts made until 1997 to privatize and strengthen the financial sector, the landscape remained feeble and risk-prone and the government was still strongly entangled with the chaebols (Hahm, 2005, p. 386). Not least pressured by the IMF which bailed out the sector, the banking industry was heavily restructured and, by 2003, 787 banks – over one-third of all banks (Hahm, 2005, p. 386; Park Y. C., 2013, p. 228) –, “were either closed or merged” (Hahm, 2005, p. 386). “In particular, weaker banks with a capital adequacy ratio below the 8% threshold were acquired by healthier banks, and healthier banks were encouraged to form financial holding companies together with non-bank financial institutions” (Hong & Lee, 2018, p. 110). Additionally, the Financial Supervisory Commission (today named Financial Services Commission (FSC) (Financial Supervisory Service, n.d.)) and the Financial Supervisory Service (FSS) were founded for regulation and supervision (Park Y. C., 2013, p. 228). The final years of the 2000s mainly saw deregulation acts for the financial markets to establish investment banking in South Korea, all while protecting private persons (Park Y. C., 2013, pp. 230-231).

By the time the 2007-2008 GFC hit, the Korean banking sector was in good enough shape that it escaped major losses; only savings banks were hit hard as they funded many real estate projects, with some of them ending up bankrupted (Hyun, 2016, p. 710). Overall, however, the aggregated capital adequacy ratio stayed over 12 percent and NPL remained around 1 percent (Hyun, 2016, p. 710). The new requirement of the loan-to-debt ratio needing to be less than 100 percent was a key regulatory change as a result of the GFC (Hyun, 2016, p. 710).

With regards to the regulatory and governmental environment, four developments are worth noting. As a cautionary aftereffect of the AFC and GFC, Korean banks refrained from giving collateralized funds to SME (Hong & Lee, 2018, pp. 110-111). As a consequence, the government started providing state guarantees to encourage loan disbursement to SME – as of 2015, over 77 percent of all loans are SME loans (Hong & Lee, 2018, p. 111). Another post-crisis development is that of “cross-representation at key decision-making level” (Hong & Lee, 2018, p. 111). Ensuring checks and balances for macroprudential measures, the two agencies FSC and FSS, together with another three – the Ministry of Strategy and Finance, the BOK, and the Korea Deposit Insurance Company –, established a joint collaboration mechanism through interagency conferences (Hong & Lee, 2018, p.

111). Moreover, a special tax was introduced in 2011 to further strengthen the financial sector's resilience, namely "a macroprudential stability levy" (Hong & Lee, 2018, p. 111) that taxes "non-core foreign currency liabilities held by domestic and foreign banks" (Hong & Lee, 2018, p. 111). Furthermore, at bank level, a new law was passed in 2014 to improve overall corporate governance, that is, among others, management decision making, board member appointments, and board member transparency and accountability (Lee, 2015, pp. 2-3).

3.3 Analysis (B): Financial Ratio Analysis

3.3.1 China

3.3.1.1 Return on Assets

The development of the ROA of Chinese banks is one of steady decline from 2011 to 2016. The details depicts *Figure 22*.

While China started off with a weighted average ROA of 1.19 percent in 2011 and more or less maintained that value the following years, 2015 and 2016 saw an annual decline of 13 and 22 percent based on the 2011 starting value, resulting in an ROA of 1.03 and 0.93 percent respectively. These developments mean that Chinese banks' combined total assets generated net profits of more than 1 percent in 2011 and visibly below 1 percent by 2016. The median ROA shows a similar picture – 2011 stood at 1.15 percent, by 2015, the 1-percent mark was undercut, reaching 0.76 percent in 2016.

Upon inspection of the input data shown in the bubbles in *Figure 22*, they provide an interesting picture. While the ROA did drop over time, it did not drop at the same rate as the absolute values of average net income and average total assets (OBF, 2017). While 2011 saw more than USD 5 billion average income per bank, that value had receded to USD 1.2 billion in 2013 (OBF, 2017). A similar effect shows the plummeting of average total assets from USD 442 billion to just over USD 100 billion in the same time period (OBF, 2017). At the same time, the ROA remained constant, at just under 1.20 percent. There are two reasons behind these results. First, the number of banks in the sample is just 26 for 2011, making any average prone to strong influences by strong players (OBF, 2017). This leads to the second reason: the high average profits and assets are heavily tainted by the "big four" (Heffernan & Fu, 2010, p. 1598) banks, namely the ICBC, CCB, ABC, and BOC, which were all in the initial sample for 2011 (OBF, 2017). That year, the four behemoths accounted for more than 70 percent of total assets and even more with regards to profits⁶¹ (OBF, 2017). By 2013, when the bank sample had risen to 185 banks and later to over 200, that influence was reduced to 46 percent of assets and 52 percent of profits (OBF, 2017). As a consequence, it is sensible to only compare developments of net income and total assets from 2013 onwards regarding the development of the ROA. As can be seen, average net income declined by 9 percent from USD 1.245 billion in 2013 to USD 1.130 billion in 2016 (OBF, 2017). Average total assets rose from USD 106 billion to USD 121

⁶¹ As a side note, each of the four banks reported more than USD 26 billion in profits in 2016, ICBC taking the absolute lead with more than USD 40 billion (OBF, 2017).

billion (OBF, 2017), resulting in the decline of the ROA to 0.93 percent in 2016. The fact that Chinese banks accumulated assets at a faster pace than they did profits led to a decline in the overall ROA.

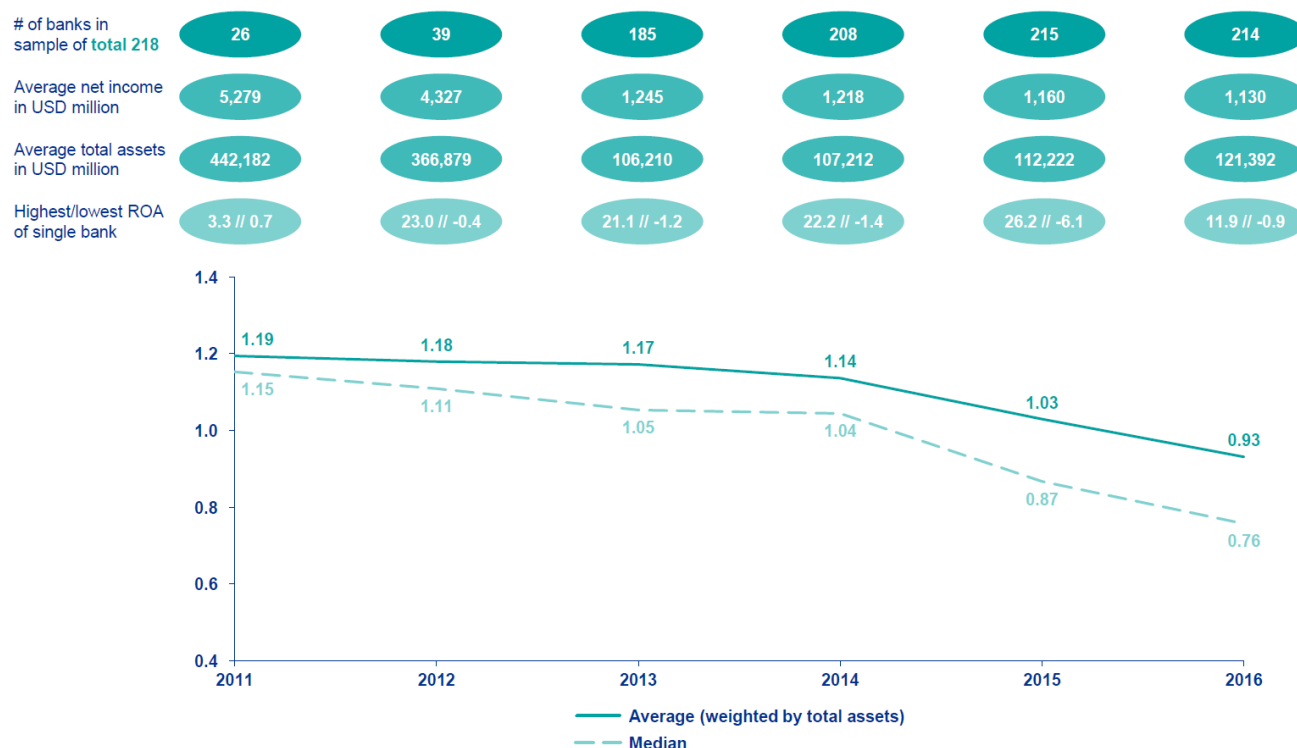


Figure 22: Development of weighted average and median ROA of Chinese banks from 2011 to 2016 in percent⁶²

In terms of leading and lagging banks, the spread was comparatively small in 2011, when the highest ROA was at 3.3 percent and the lowest was at 0.7 percent. The spread was no longer as tightly knit in subsequent years when values of more than 20 percent were achieved by individual banks. Investment banks are predominantly among the leading banks in terms of ROA (OBF, 2017), with their core business focused on accumulating wealth and generating high yields. Laggards reported negative ROA, stemming from incurred losses (OBF, 2017). Despite these negative ROA, the number of banks reporting losses was 7 in one year, and for all other years no more than three banks had negative income (OBF, 2017).

When looking at the two input variables, net income and total assets, from a per capita point of view, it can be seen that net profits per capita rose from USD 102 by 72 percent to USD 175 in 2016 (OBF, 2017; World Bank, 2019g). Total assets per capita took off even more drastically by more than doubling, totaling almost USD 19,000 in 2016 (OBF, 2017; World Bank, 2019g). In comparison, during the same time span, the Chinese population rose by just 3 percent (OBF, 2017; World Bank, 2019g).

3.3.1.2 Return on Equity

Figure 23 shows the ROE's development for the research period.

⁶² Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

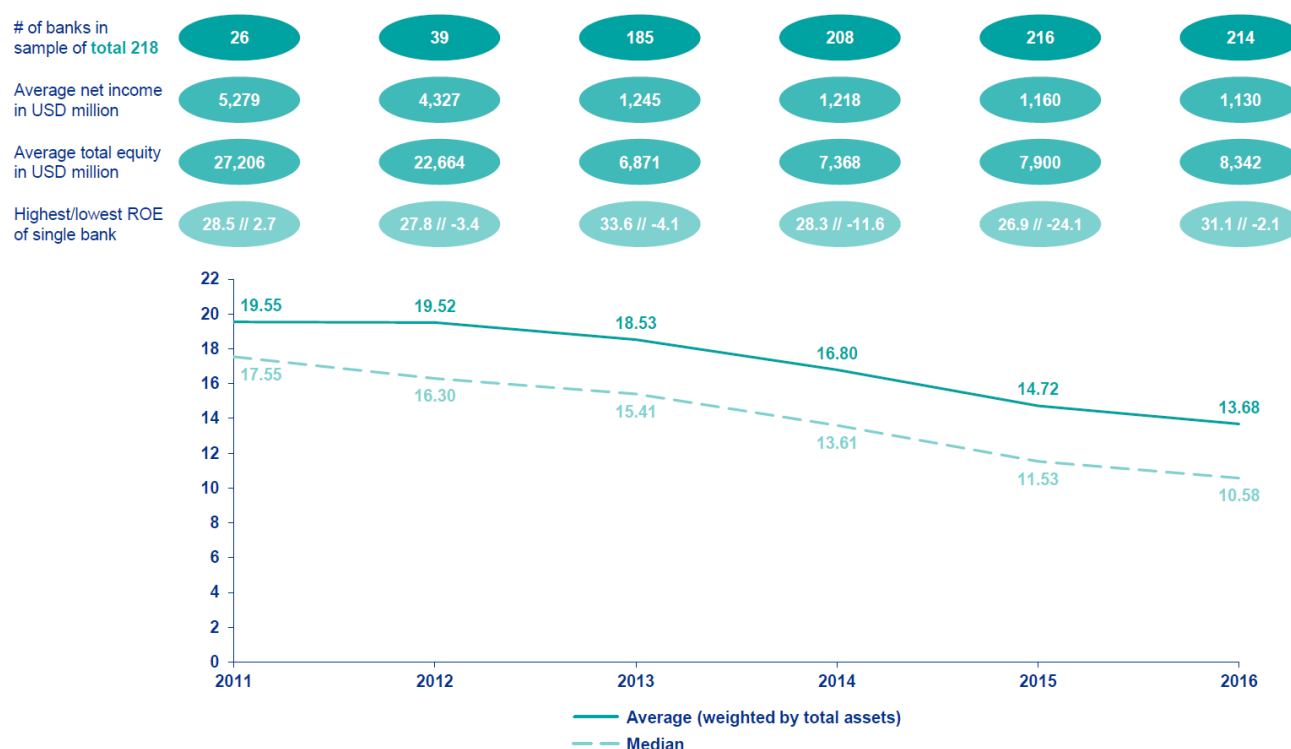


Figure 23: Development of weighted average and median ROE of Chinese banks from 2011 to 2016 in percent⁶³

Both the average and the median ROE show a similar downward trend over the six years, starting at 19.55 and 17.55 percent respectively and eventually sagging down to 13.68 and 10.58 percent. It is important to note here, though, that for the initial years, the number of banks in the sample is still quite low (OBF, 2017), as has already been addressed under 3.3.1.1 *Return on Assets* above. While for all years under scrutiny, the four giants, the ICBC, CCB, ABC, and BOC, shape the average ROE values, they are especially tinting for the earlier years of this study. Nonetheless, there is a noticeable overall decline in banks' ROE, a development also seen with the behemoths (OBF, 2017).

From 2013⁶⁴ onwards, average net income declined slightly from USD 1,245 million to USD 1,130 million. At the same time, average total equity increased by more than 21 percent from USD 6,871 million to USD 8,342 million (OBF, 2017).

Concerning maximum and minimum ROE, for all the years, there are banks that show values in the high 20s and lower 30s in percentage. With the exception of the first year, all years saw negative ROE due to losses incurred (OBF, 2017).

3.3.1.3 Net Interest Margin

Figure 24 depicts how Chinese banks performed in terms of net interest margin.

It is immediately visible from the chart that weighted average and median NIM are basically identical on the Chinese banking market from 2011 to 2016. In 2011, the NIM was at 2.36 percent (2.35

⁶³ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

⁶⁴ Values pre-2013 are tainted for comparison due to the small sample size, for more details also refer to 3.3.1.1 *Return on Assets*.

percent for the median value) and remained at that niveau until 2014, when the NIM started to descend, reaching 1.84 percent for average and 1.76 percent for median NIM by 2016. This descent could potentially be the result of the lifting of state-prescribed interest rates on deposits, which came into effect in 2015 (Chen, Qu, Tan, & Yung, 2016, p. 1). What is striking about the consistency throughout the first four years is the stark increase in the absolute number of banks in the sample, from 26 in 2011 to 214 in 2016 (OBF, 2017). Nonetheless, the NIM remains relatively unchanged, which is only possible with the relation of net interest income to total assets remaining intact.

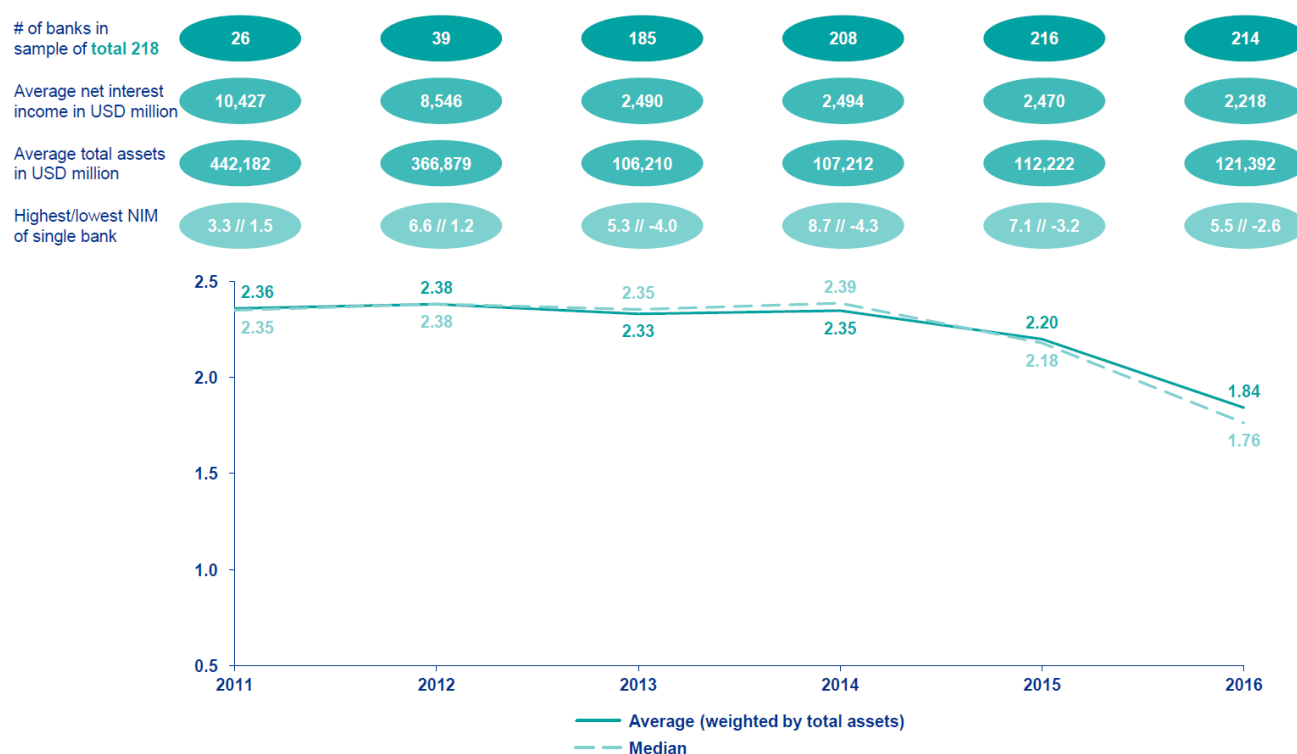


Figure 24: Development of weighted average and median NIM of Chinese banks from 2011 to 2016 in percent⁶⁵

As has also been touched upon in more detail in 3.3.1.1 *Return on Assets*, the years 2011 and 2012 saw comparatively high average net interest incomes and total assets due to the fact that the world's four largest banks by total assets were already in the then still small sample (OBF, 2017; Relbanks, 2017). As of 2013, when the sample has a significantly larger size, average net interest income is quite stable, at just below USD 2.5 billion per bank, recording a slight drop to USD 2.2 billion in 2016 (OBF, 2017). In contrast, from 2013 to 2016, the amount of total assets increased by almost 15 percent to an average of USD 121 billion per bank (OBF, 2017).

Looking at interest paid expressed in relation to interest received, Chinese banks paid out 41 percent (2011) and 48 percent (2016) of their interest income through interest payments to customers and other banks (OBF, 2017). The total of interest received slowly declined from USD 4,640 million in 2013 down to USD 4,230 million in 2016 (OBF, 2017). Interest paid also declined, but at a slower rate, thus explaining the increase in the relation of interest paid to interest received (OBF, 2017).

⁶⁵ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

3.3.1.4 Cost-Income Ratio

In *Figure 25* below, one can follow the development of the fourth profitability measure used for the analysis of the Chinese banking market.

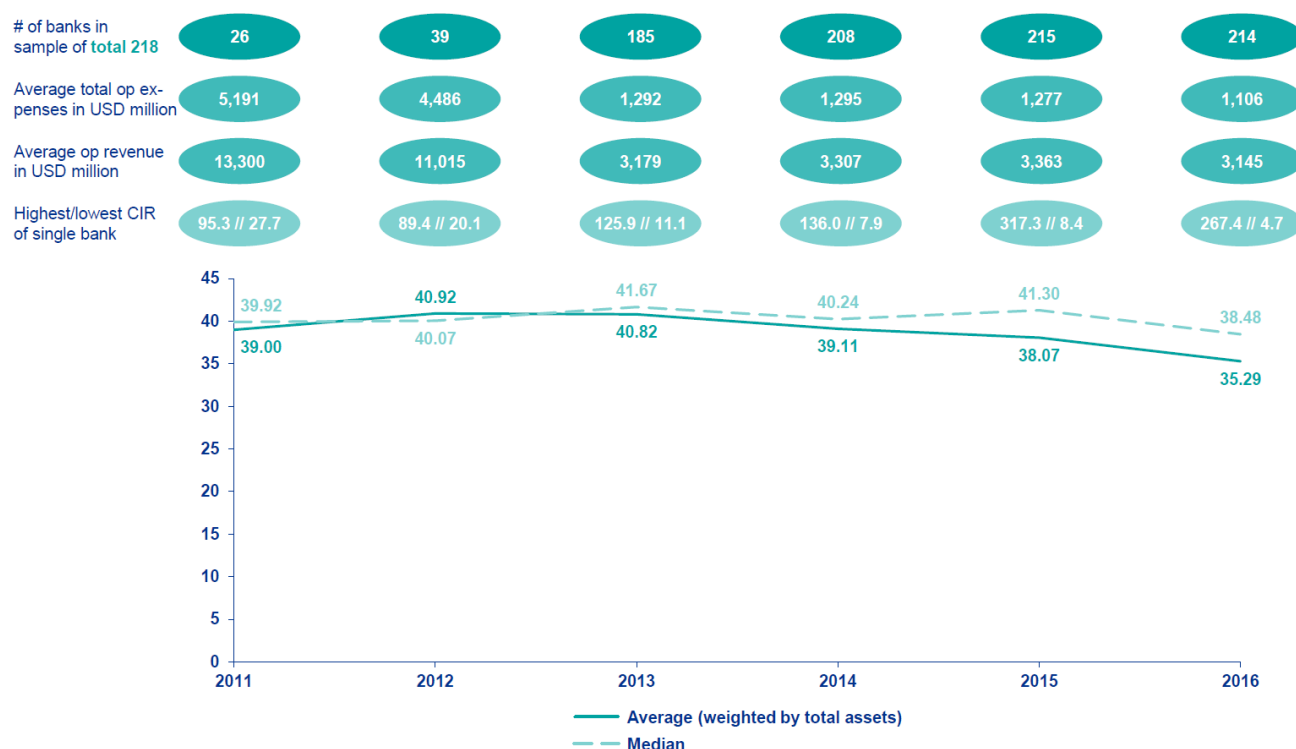


Figure 25: Development of weighted average and median CIR of Chinese banks from 2011 to 2016 in percent⁶⁶

Despite the fact that for the first years of the analysis, the sample size is just over 10 percent of the total sample size in 2016 and, again, includes the four behemoths ICBC, CCB, ABC, and BOC (for more see 3.3.1.1 *Return on Assets*), the CIR remains quite constant. In addition, the spread between the weighted average CIR and the median CIR is negligible, further suggesting constant performance. Put into figures, Chinese banks showed a CIR of anywhere between 35.29 and 41.67 percent between 2011 and 2016. This means that, in effect, for every yuan or dollar gained through the sale of its products and services to private individuals or corporations, Chinese banks spent two-fifths of it on operating expenses such as payroll and rent.

Looking at the relation between OPEX versus operating revenue from 2013 onwards, when the sample size is more adequate, the average total expenses fell constantly from USD 1,292 million down to USD 1,106 million, declining by almost 15 percent (OBF, 2017). Operating revenue, on the other hand, remained relatively unchanged at around USD 3,200 to 3,300 million per bank per year (OBF, 2017). This explains the slight decline of the average CIR by the end of the period, and at the same time indicates an increase in efficiency at Chinese banks. They managed to keep revenue constant while reducing expenses, typically through process improvements like automatization and digitalization, often paired with subsequent layoffs (Selman & Özsürünç, 2019, p. 945).

⁶⁶ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

CIR values higher than 100 percent occur when a bank spends more on its OPEX than it actually generates in operating revenue. Between 2013 and 2016, this was the case for a total of 14 banks; however, few of them had a CIR higher than 100 percent for more than one year (OBF, 2017). More than half of these 14 banks are foreign banks participating in the Chinese banking market, such as US investment bank Morgan Stanley, the French Société Générale, Switzerland's UBS or Korea's Woori and Industrial Bank of Korea (OBF, 2017). For many of the giant global banks, it is a strategic aim to get a foothold in growing economies despite local competition and the losses involved – UBS, despite its 126 and 76 percent CIR in 2013 and 2014 respectively, managed to become “the biggest wealth manager in Asia” (Arnold & Hall, 2014). The absolute spike in CIR shows Shenzhen Qianhai Weizhong Bank, better known as WeBank, with a CIR of 317 percent in 2015 (Wong, 2014). WeBank was founded in late 2014 with heavy financial backing by Tencent, China's “internet services giant” (Nikkei Asian Review, 2019a) with revenue of almost USD 50 billion, starting operations as a fully digital neobank⁶⁷ (Wong, 2014). By 2016 the CIR had recovered to 54 percent.

Banks such as Sichuan Tianfu Bank, Bank of Kunlun, or Bank of Qinghai are on the lower end of the CIR spectrum (OBF, 2017). They are all commercial banks that offer services to individuals and companies alike (Bloomberg, n.d. d; Bloomberg, n.d. e; Bloomberg, n.d. f; OBF, 2017). They reported CIR values of 30 percent and below on a yearly basis. What unites these banks is that they are comparatively small with total assets between USD 8 and 45 billion and manage to provide their services effectively without heavy operational expenses (OBF, 2017). CITIC Trust & Investment Co as well as Dalian Huaxin Trust Co, both of them investment banks, have even lower CIR (OBF, 2017). The latter even shows a one-digit CIR for three out of four years in the sample. Investment banks tend to have higher CIR than other banking types due to complex IT infrastructure and personnel expenses; however, since investment banks manage and trade large amounts of funds with the sole aim of generating high yields, while reducing the need for physical representation, they can also be established quite effectively (Roengpitya, Tarashev, & Tsatsaronis, 2014, p. 61).

3.3.1.5 Funding Cost

Funding cost of the Chinese banking market is represented by *Figure 26* below.

Throughout the research period, the median funding cost was above the average, with a gap of 0.31 percentage points in 2011, which eventually diminished to 0.08 percentage points. The average FC started at 1.38 percent in 2011 and rose to 2.53 percent in 2014 before sinking back to just over 2 percent in 2016. A similar trend reflects the median FC development. Beginning with an upward tendency at 2.14 percent in 2011, there was already a brief decline in 2013 before ultimately shifting into a downward trend from the 2014 high of 2.68 percent. In 2016, the 2011 result was reached, almost right down to the decimal. In essence, this means that Chinese banks paid somewhere around 2.0 to 2.5 percent interest per year for the funds available to them for loan disbursement.

⁶⁷ The term neobank refers to technology-driven financial institutions that are typically completely digital, offer seamless services tailored for mobile devices, and aim to attract tech-savvy younger generations (Pritchard, 2019).

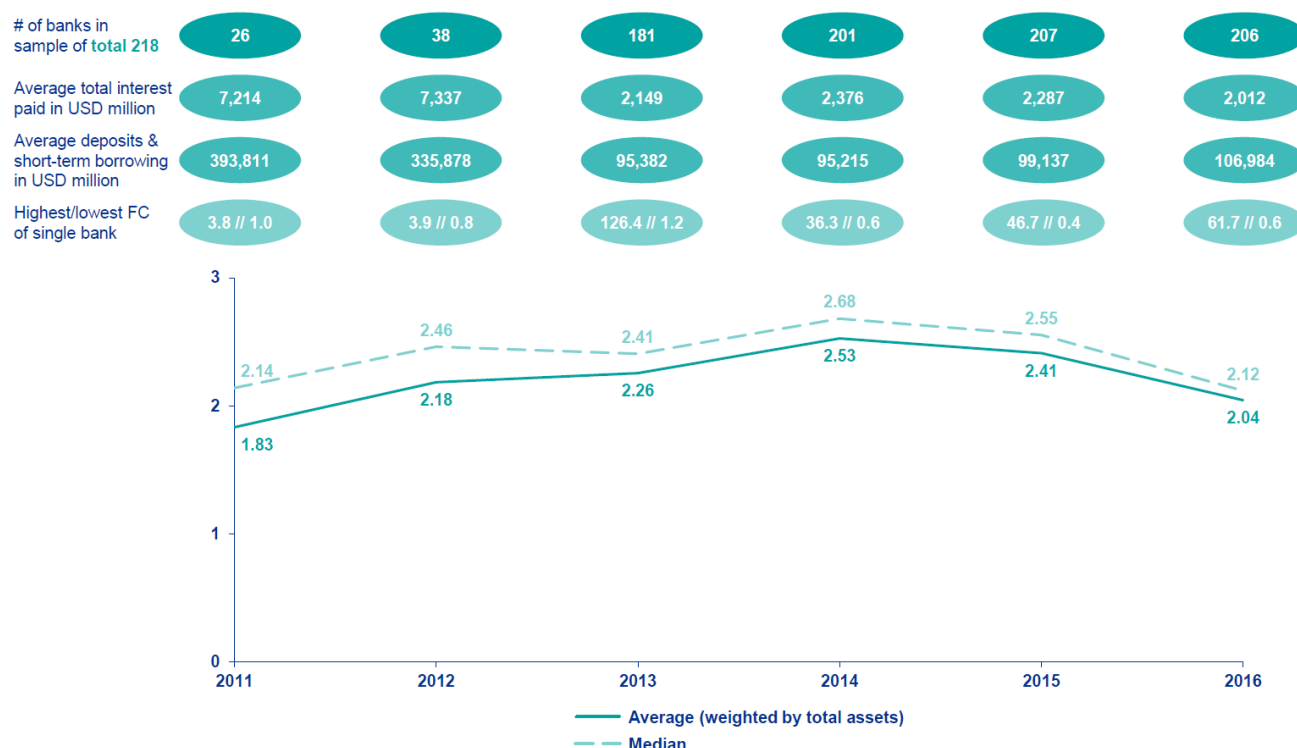


Figure 26: Development of weighted average and median FC of Chinese banks from 2011 to 2016 in percent⁶⁸

Put into concrete figures, on average, Chinese banks had to bear USD 2 billion or more in interest expenses (not considering the years 2011 and 2012, as they have a drastically reduced number of banks in the sample) (OBF, 2017). This total interest paid faced average deposits and short-term borrowing of USD 95 billion in 2013 which rose to USD 107 billion by 2016 (OBF, 2017). This increase in average deposits and short-term funds of 12 percent explains the reduction of FC in that period, making lending cheaper for Chinese banks.

Looking at the highest and lowest FC throughout the sample and over the years, the first two years show that the FC were dispersed quite close to each other with 3.8 and 1.0 percent representing the upper end, and 3.9 and 0.8 percent the lower end. In 2013, the spread increased, with the Chong Sing Holdings Fintech Group showing FC of 126.4 percent (OBF, 2017). As this bank's core business is the provision of a platform for peer-to-peer and business-to-business lending, the bank's total deposits and short-term borrowing was about USD 5 million compared to a total of USD 6 million of interest paid (Bloomberg, n.d. I; OBF, 2017). On the lower end of FC was, for example, the SPD Silicon Valley Bank (OBF, 2017), the first Sino-US bank brought together by US start-up accelerator bank Silicon Valley Bank and Shanghai Pudong Development Bank, focusing on the Chinese tech- and innovator-scene (Silicon Valley Bank, n.d.). The bank repeatedly reported, in comparison, extremely low FC values, never coming close to 1 percent.

⁶⁸ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

3.3.1.6 Liquid Assets to Total Assets

The percentage of liquid assets held by Chinese banks in relation to the balance sheet total is shown in Figure 27.

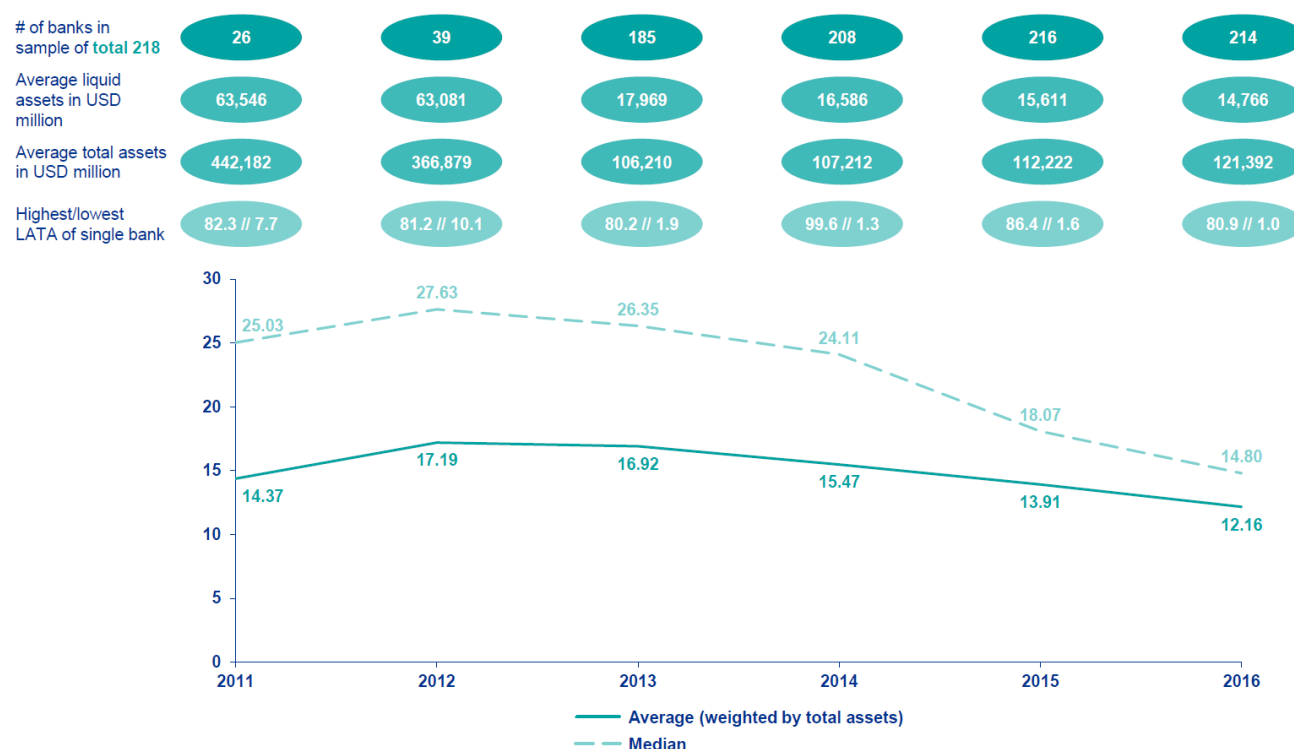


Figure 27: Development of weighted average and median LATA of Chinese banks from 2011 to 2016 in percent⁶⁹

Over the years, weighted average and median LATA converged. The average LATA was at 14.37 percent in 2011, increasing the following year to 17.19 percent and then gradually dropping to just over 12 percent in 2016. Over the course of these six years, the average Chinese bank had less than one-fifth of its balance sheet at its immediate disposal in case of a serious need for liquidity. The median value remained at a higher level for the same period. Showing similar trends as the average LATA, it was just over 25 percent in 2011, reaching its peak with 27.63 percent the following year, and constantly fell before reaching 14.80 percent in 2016.

Just as the number of banks in the sample increased, both the average liquid and total assets per bank decrease over the years (OBF, 2017). By 2016, the average balance sheet total was USD 121 billion, of which around USD 15 billion were liquid assets (OBF, 2017).

The distribution of the individual data points within the sample shows banks with one-digit LATA and maximum values of up to almost 100 percent. Jiangsu Financial Leasing was even close to 0 percent, with values of just 1.29, 1.50, and 1.03 percent in the years 2014 through 2016 (OBF, 2017). In other words, for any USD 100 of assets held by the bank, just USD 1 was highly liquid. Between four and 16 banks over the years showed liquid assets of over 50 percent, of which all, with only a few

⁶⁹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

exceptions, were affiliates of international banks such as Bangkok Bank, Credit Agricole CIB, or East West Bank (OBF, 2017).

3.3.1.7 Net Loans to Total Assets

What percentage of total assets of Chinese banks is tied up in loans tells *Figure 28*.

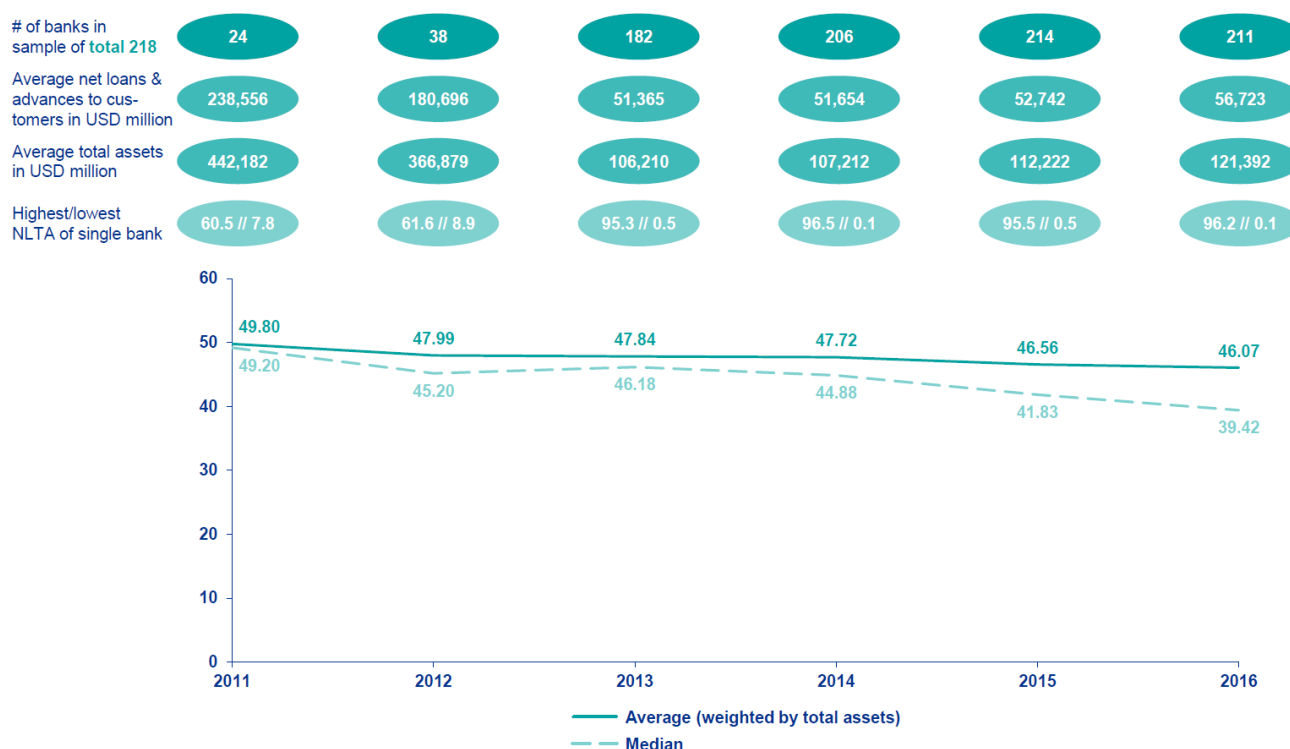


Figure 28: Development of weighted average and median NLTA of Chinese banks from 2011 to 2016 in percent⁷⁰

At the beginning of the research period, quite accurately half of Chinese banks' assets were parked in loans and cash advances to customers. Moreover, it made hardly any difference in 2011 when looking at the average (49.80 percent) or median (49.20 percent) NLTA. Over the course of the following years, the measures slightly branched out and declined. The average NLTA dropped less strongly to 46.07 percent in 2016. The median values declined by almost 10 percentage points to 39.42 percent in the same year. Based in these numbers, this means that Chinese banks either reduced their loan volumes or increased other positions on the asset side of the balance sheet, such as securities or investments in associated companies (OBF, 2017).

Figure 28 shows that the loan volumes rose by 10 percent from 2013 when it was on average USD 51 billion per bank to almost USD 57 billion in 2016 (OBF, 2017). However, the average total assets held rose at a stronger rate, precisely 14.3 percent during the same period (OBF, 2017). In absolute numbers, the average Chinese bank increased its total assets by USD 15 billion, but the loan volume rose only by USD 6 billion (OBF, 2017), resulting in the decline of NLTA.

⁷⁰ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

The extreme cases in the Chinese bank sample show that the highest NLTA registered were between 60.50 and 96.20 percent. Three banks reported NLTA in the upper 80 or over 90 percent, namely the Bank of Communications Financial Leasing, Avic International Leasing, and Volkswagen Finance China (OBF, 2017). The first two specialize in complex leasing schemes such as “airplanes, ships, utilities, energy equipment, and other equipment” (Bloomberg, n.d. h; Bloomberg, n.d. i). Volkswagen Finance China is, too, heavily engaged in leasing, though with a focus on the automotive industry (Volkswagen Financial Services, n.d.). All three of these outliers can be attributed to the heavily credit-focused business models of these banks. On the other end of the scale, banks with NLTA of one-digit percent can be seen. Among these banks, one predominantly finds the investment banking and/or wealth management affiliates of European or North American investment banks, such as UBS, Morgan Stanley, or Bank of Montreal (OBF, 2017; UBS (China) Limited, n.d.). These banks do not engage so much in the lending business, but they strike international deals and provide interbank lending services (UBS (China) Limited, n.d.).

3.3.1.8 Net Loans to Deposit and Borrowing

Figure 29 presents NLDST the ratio of net loans and cash advances to customers to Chinese banks' deposits and short-term borrowing.

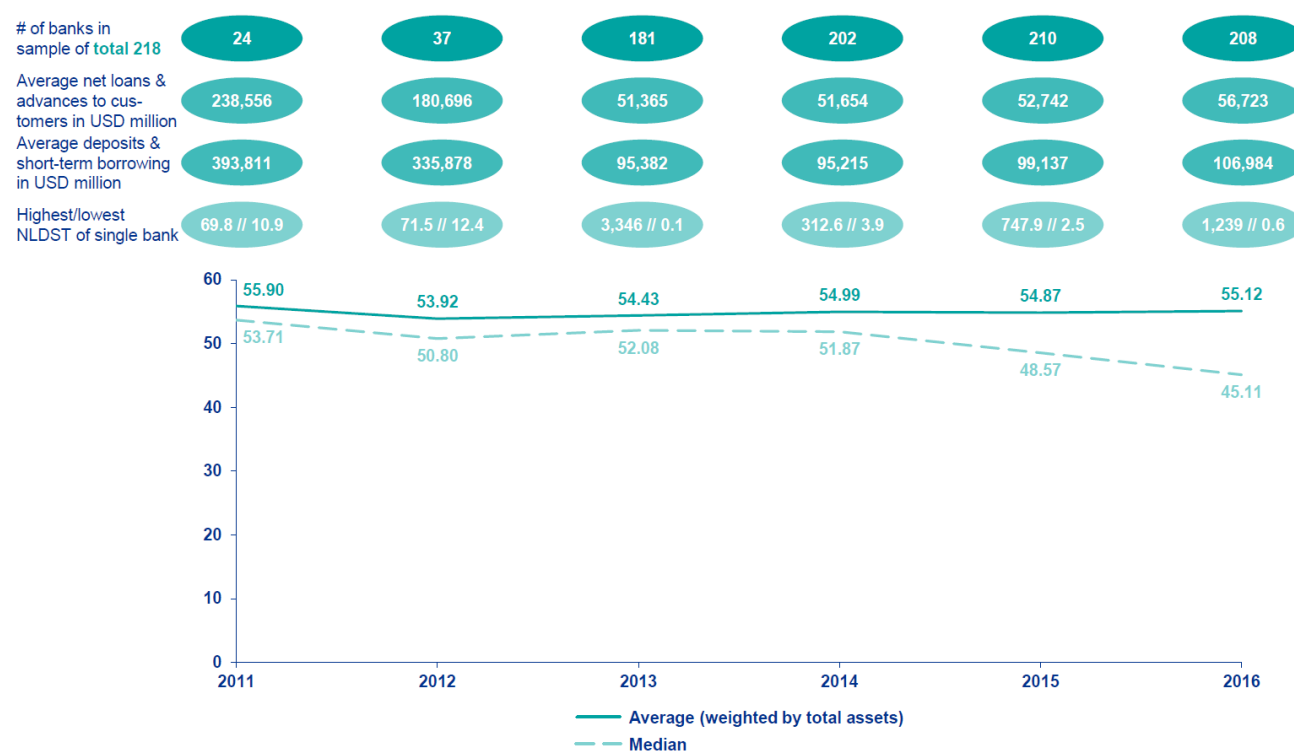


Figure 29: Development of weighted average and median NLDST of Chinese banks from 2011 to 2016 in percent⁷¹

In short, Chinese banks had throughout the research period on average and in terms of median roughly half of their deposits and short-term borrowing used for loans. More precisely, the average NLDST was quite constantly at around 55 percent, with only the years 2012 and 2013 showing a

⁷¹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

marginal fall by 1 to 2 percentage points to about 54 percent. At the same time, the median values were slightly lower. In 2011, median NLDST was at 53.71 percent, falling to 45.11 percent by 2016.

The development of NLDST's components has already been discussed above under 3.3.1.5 *Funding Cost* and 3.3.1.7 *Net Loans to Total Assets*. What is of relevance though for NLDST is that the ratio remains constant over the years, despite a decrease over the first three years and a subsequent increase in the latter three years for both the numerator and the denominator (OBF, 2017).

The extreme results for NLDST show a stark gap widening from 2013 onwards. The starkest outlier comes from Chong Sing Holdings Fintech Group with an NLDST of 3,346 percent (OBF, 2017). As the lending platform is not in the business of providing deposit plans for its customers, the USD 164 million in net loans of balance sheet lending activities preponderate against this ratio (Bloomberg, n.d. I; OBF, 2017). The majority of banks with NLDST of over 100 percent were leasing companies though – as they engage in deposits to a lesser extent than commercial or cooperative banks, a higher ratio is not unusual (OBF, 2017). Higher ratios have also been observed by other scholars using FRA (e.g., Cheng, Zhao, & Lin (2017, p. 393) or Lardic & Terraza (2019, p. 38)). Mostly national and international investment banks are among the handful of banks with an NLDST of under 20 percent and, in most cases, they neither focus on lending nor on taking in deposits (OBF, 2017).

3.3.1.9 Equity to Assets

Below in *Figure 30* is the development of the Chinese banking industry's EA mapped out.

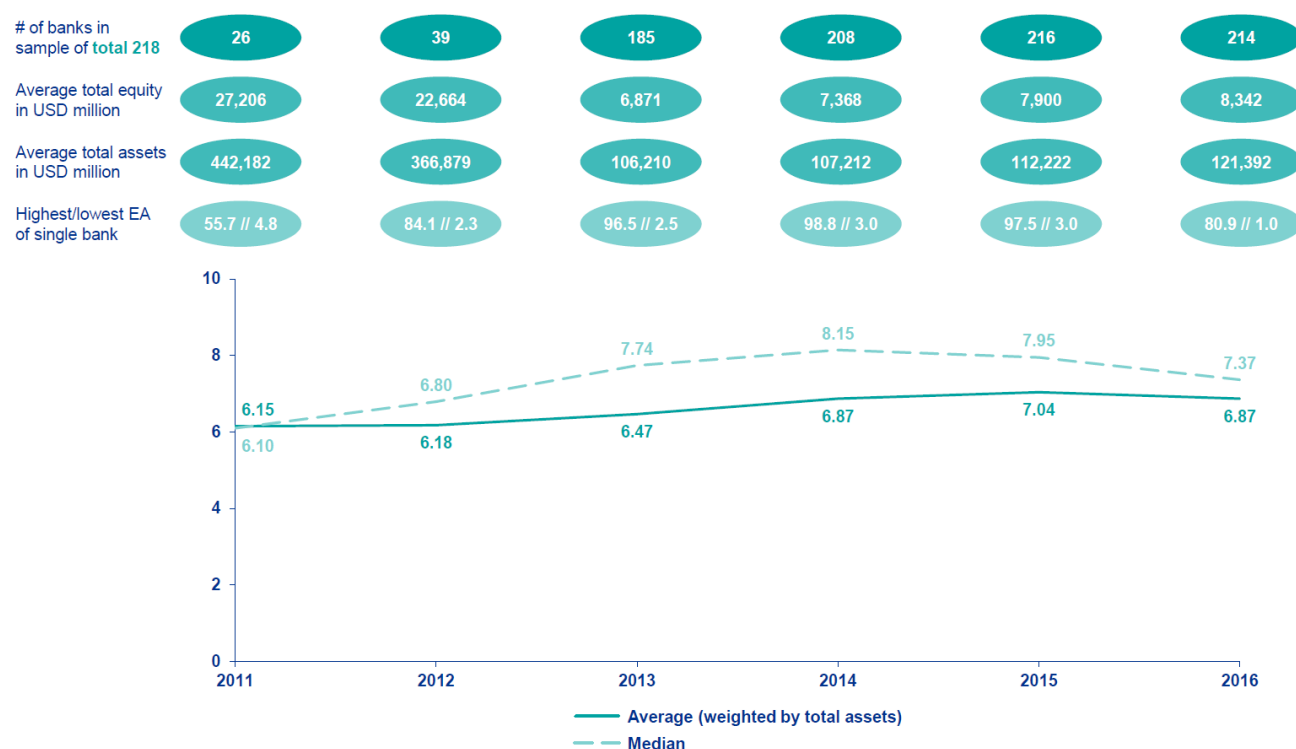


Figure 30: Development of weighted average and median EA of Chinese banks from 2011 to 2016 in percent⁷²

⁷² Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

Overall, Chinese banks relied to a strong degree on borrowed capital to finance their assets from 2011 through to and including 2016. On average, between 6.15 to 7.04 percent of the balance sheet total was equity. In other terms, the average bank's debt represented more than 15 times their average equity volume. The median value is on par or slightly above the weighted average EA, with the highest value amounting to 8.15 percent.

Despite averaging single-digit figures, the sample's data points are quite concentrated, with 77 to 84 percent of all banks ranging from 5 to 15 percent. Banks with 5 percent or less equity predominantly include regional commercial banks such as the Datong City Commercial Bank, Bank of Tianjin, Bank of Dalian, or Xiamen Bank (OBF, 2017).

3.3.1.10 Income Diversification

How income diversification plays out for Chinese banks from 2011 to 2016 details *Figure 31*.

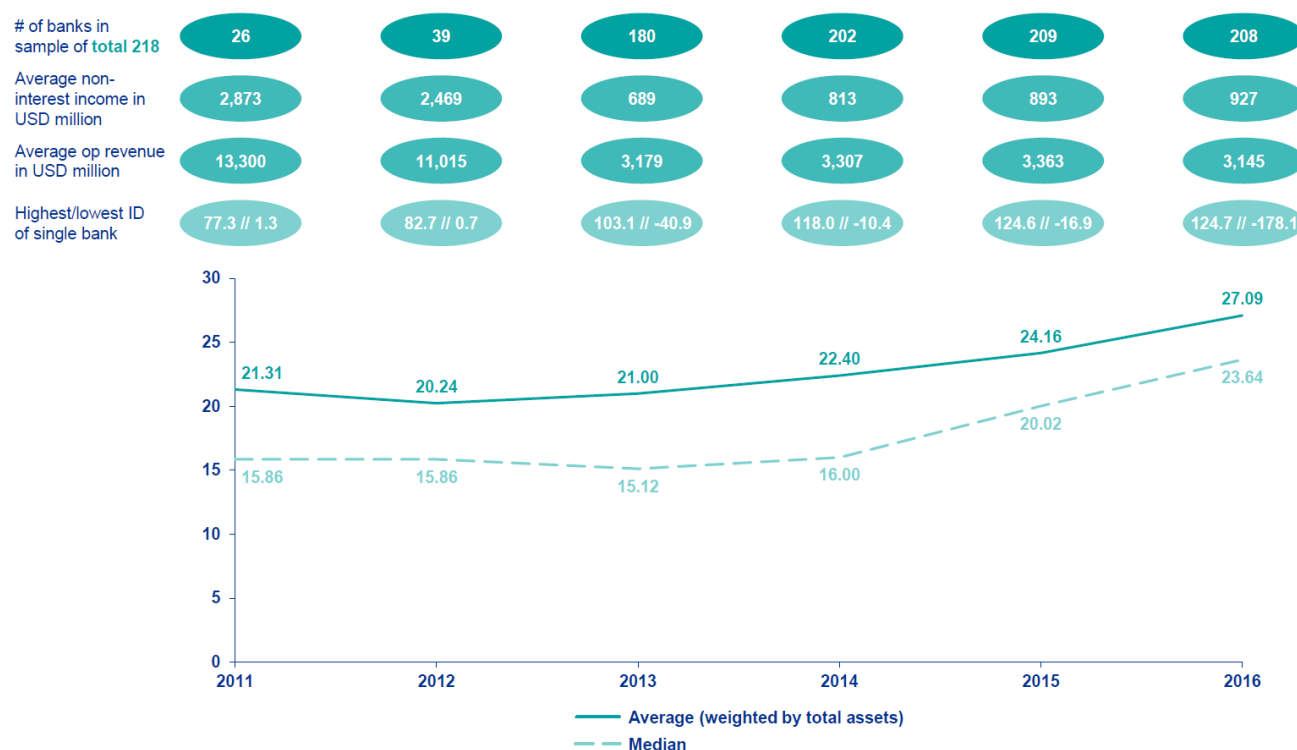


Figure 31: Development of weighted average and median ID of Chinese banks from 2011 to 2016 in percent⁷³

As can be seen, Chinese banks increased their stake in non-interest-bearing business activities over the course of the research period. When the average ID in 2011 was at 21.31 percent (the median was lower at 15.86 percent), it increased to 27.09 percent by 2016 (again, the median was below that, by then to a lesser extent, totaling 23.64 percent). This means, over a quarter of netted operating revenue stems from commission income and trading activities.

⁷³ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

From 2013 to 2016, non-interest income increased by 35 percent, from USD 689 million to USD 927 million for the average bank (OBF, 2017). Operating revenue was quite constant at over USD 3 billion for the same years (OBF, 2017).

On the level of individual banks, ID sees a strong gap between the extremes, which widens over the years. While the lowest value of ID in the earlier years was close to 0 percent, it dropped to -178.1 percent in 2016. None of the Chinese banks had negative operating revenue (some reported very low revenue though), but up to eight banks reported negative non-interest income per year (OBF, 2017). The lowest ID was that of the China division of Bank SinoPac, a Taiwanese credit institution, which amassed USD 7 million of non-interest losses facing just USD 4 million of total operating revenue (OBF, 2017; Bank SinoPac, 2017). Among the high ID values are those of investment banks, private banks, and banks focusing on leasing as these bank types follow business models with a large share of activities outside the interest-earning one (OBF, 2017). Moreover, occasional one-offs are also seen for commercial banks like the Bank of Suzhou or Yingkou Coastal Bank, which have comparatively jumpy ID journeys, with both low and high values over time (OBF, 2017). On a side not, any value of over 100 percent means that a bank had to endure losses on the interest side.

3.3.1.11 Non-Performing Loans

The path of the rate of impaired loans by Chinese banks presents *Figure 32*.

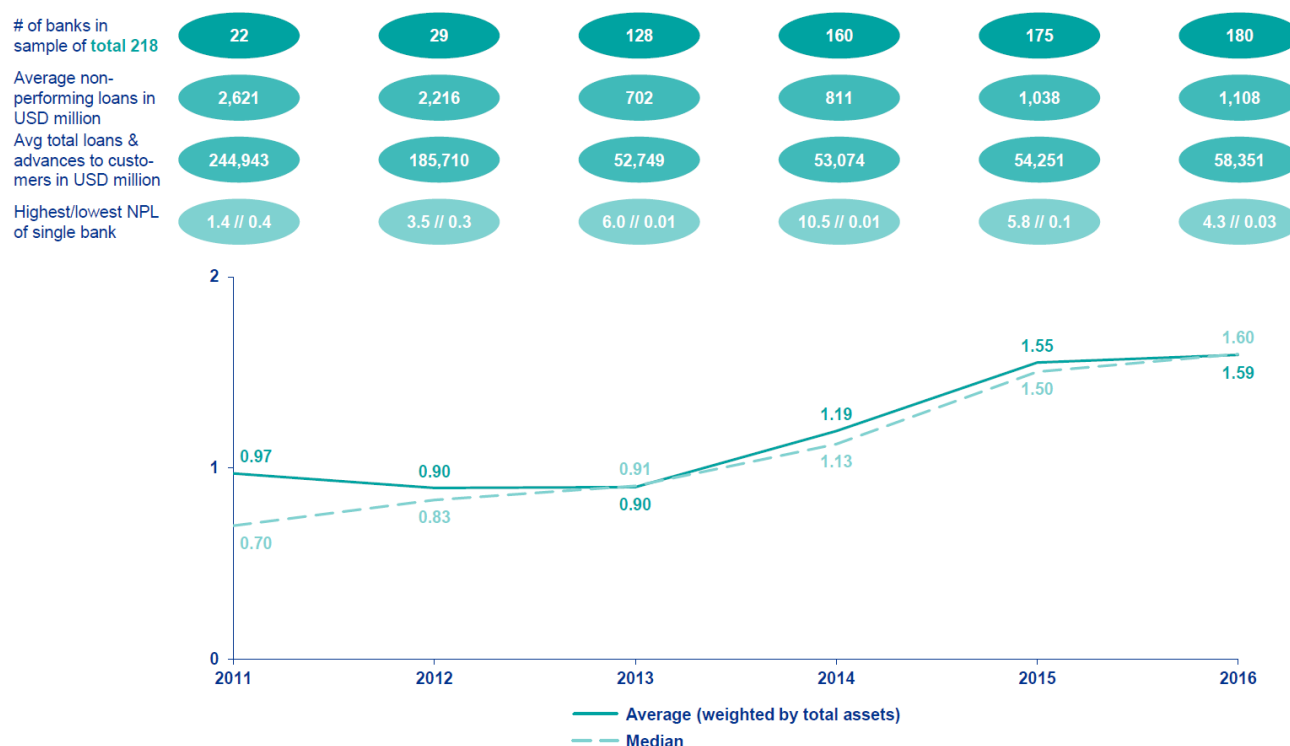


Figure 32: Development of weighted average and median NPL of Chinese banks from 2011 to 2016 in percent⁷⁴

Over the years under scrutiny, the average NPL ratio increased from 2013 onwards after a brief decline from its 2011 value of just under 1 percent. By the end of 2016, the NPL had risen to 1.59

⁷⁴ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

percent, overall increasing by almost two-thirds from the starting value. The median NPL follows a similar path, only visibly lower than the average in the first two years, after that the two measures followed a similar trajectory. Of every USD 100 given out as credit to customers, between USD 0.97 and 1.60 had to be written off as defaulted and hence unlikely or impossible to be collected.

While the amount of average total loans per bank only increased by 10.6 percent from USD 53 billion in 2013 to USD 58 billion in 2016, the value of non-performing loans rose by 58 percent, reaching USD 1.1 billion for the average bank (OBF, 2017). Purely arithmetically, a bank with a total of USD 53 billion in loans, of which USD 1.1 billion are impaired, would report an NPL of 1.9 percent, meaning that every fiftieth USD disbursed as credit will become uncollectable.

All years see banks that have NPL very close to 0 percent, of which some banks are affiliates of international banks, such as Credit Agricole Corporate and Investment Banking, Toyota Motor Finance, Deutsche Bank, or HSCB (OBF, 2017). But some commercial regional banks also showed low NPL, even sustaining these low rates of defaults over several years (OBF, 2017). One example is that of the Bank of Tangshan, which had an NPL of anywhere between 0.05 to 0.31 percent from 2013 to 2016, all the while increasing its balance sheet total from USD 6 billion to USD 29 billion over the same period (OBF, 2017).

For all banks with comparatively high NPL, those are one-off effects whereby the NPL was significantly reduced in the following years. China Huarong Asset Management is an exception (OBF, 2017). For the three years of data available on the bank, Huarong had an NPL of 6.07, 5.82, and 3.88 percent respectively (OBF, 2017). This is not entirely surprising, as the bank was founded in 1997 through government funds to act as a bad bank for big, state-owned banks to dump defaulted loans (Wildau, 2016b). The business model behind this was, one, to polish the big banks' NPL and, two, to try to reclaim as much of the bad debt as possible (Wildau, 2016b). While no longer under the Chinese parliament's regimen, Huarong is still absorbing and gilding bad debt – in 2014, for example, the company “bailed out Credit Equals Gold 1, a high-yield wealth management product sold by Industrial and Commercial Bank of China [...] just days before a potential default that could have spread contagion through China's financial system” (Wildau, 2016b).

3.3.2 Japan

3.3.2.1 Return on Assets

Figure 33 below summarizes how the sample of Japanese banks performed in terms of ROA.

The weighted average ROA, from 2011 to 2016, was clearly above the median ROA. The average ROA started at 0.32 percent in 2011, climbed up to 0.42 percent and then fell slightly below its starting value by 2016. The median ROA remained anywhere between 0.22 to 0.31 percent.

During the entire time span, the Japanese banking industry saw companies with negative profits – up from 12 banks in 2011, a handful of banks with losses remained throughout the research period (OBF, 2017). Three banks reached ROA of more than 10 percent in 2015 and 2016 (OBF, 2017). One of them is SMBC Consumer Finance, a bank focusing on credit cards and consumer loans,

speculating with high returns from the consumer society (Bloomberg, n.d. a; OBF, 2017). This behavior is reflected in the ROA, which, over the years fluctuated wildly from -19 percent up to more than 5 percent, before falling back down to -8.4 percent, just to bounce back up to almost 11 percent the following year (OBF, 2017). The other two high-yielding banks show a steadily positive development, never falling below 5 percent ROA (OBF, 2017).

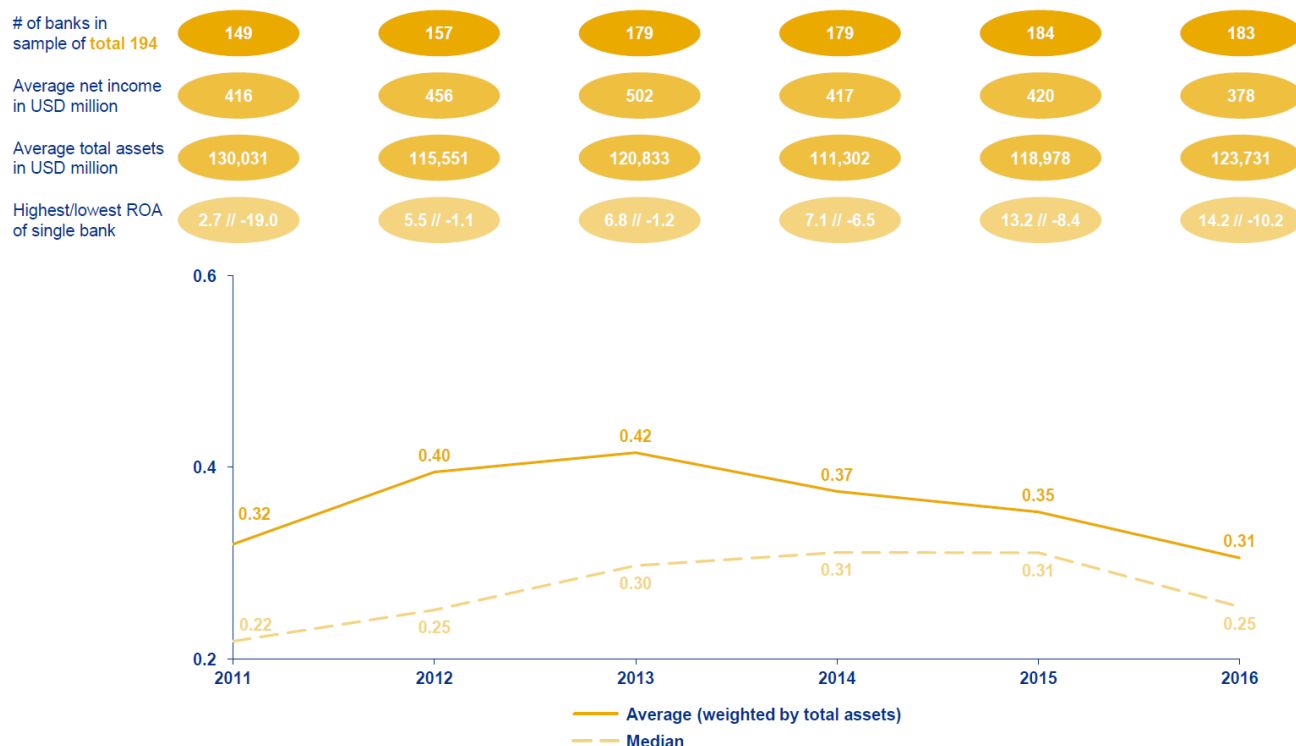


Figure 33: Development of weighted average and median ROA of Japanese banks from 2011 to 2016 in percent⁷⁵

Looking at average net income, Japanese banks' profits saw a slight increase in between, but declined overall by 9 percent from USD 416 million in 2011 to USD 378 million in 2016 (OBF, 2017). The development of average total assets is quite similar, as they were at USD 130 billion in 2011 and at USD 124 billion in 2016, with the in-between years displaying figures at around the USD 115-billion mark (OBF, 2017).

In terms of per capita performance, net income started off in 2011 with USD 484 and rose to USD 545 by 2016, in the years in between even reaching more than USD 700 per Japanese citizen (OBF, 2017; World Bank, 2019g). The total assets rose from USD 152,000 to USD 180,000 per person (OBF, 2017; World Bank, 2019g). During the research time span, the Japanese population saw a decline of almost 1 percent, losing roughly 800,000 of its 127 million inhabitants (World Bank, 2019g).

3.3.2.2 Return on Equity

Figure 34 presents the Japanese banks' ROE development.

⁷⁵ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

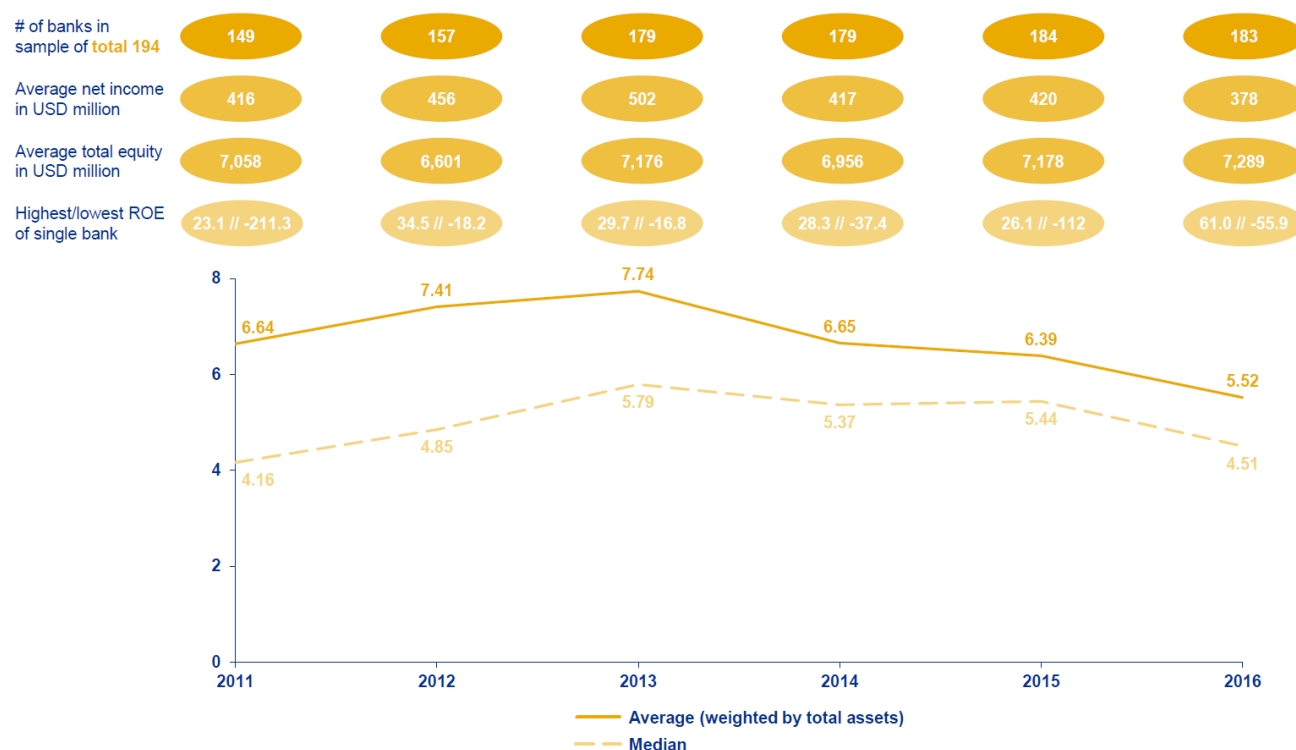


Figure 34: Development of weighted average and median ROE of Japanese banks from 2011 to 2016 in percent⁷⁶

Similarly to the analysis in 3.3.2.1 *Return on Assets*, the average ROE shows higher results than the median ROE, with a margin of between 1.0 and 2.5 percentage points. The average values are mostly above 6 percent, even reaching 7.74 percent in 2013. Only 2016 displays a lower result, with 5.52 percent. The average ROE starts with just over 4 percent in 2011. In the subsequent years, this value increases to 5.79 percent before, however, declining to the final value of 4.51 percent for 2016.

The somewhat lower values in 2011 stem from 12 institutions reporting negative profits, while holding 9 percent of the sample's total equity (OBF, 2017). By 2012, the situation had improved, with only four banks (accumulating 4 percent of total equity) recording losses (OBF, 2017). Over the course of the research period, average total equity went up by roughly USD 200 million to USD 7,289 million (OBF, 2017). At the same time, average net income diminished by almost USD 40 million (OBF, 2017).

Given that there are banks in all years reporting losses (OBF, 2017), the individual minimum values for ROE are all negative from 2011 to 2016. In terms of maximum values, they reach values in the 20- to 35-percent range. The year 2016 shows an outlier with 61 percent. This is again the case of SMBC Consumer Finance with its comparatively volatile business model (the bank has already been introduced under 3.3.2.1 *Return on Assets*) (Bloomberg, n.d. a; OBF, 2017).

3.3.2.3 Net Interest Margin

Figure 35 below shows the Japanese banking sector's net interest margin, or NIM for short.

⁷⁶ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

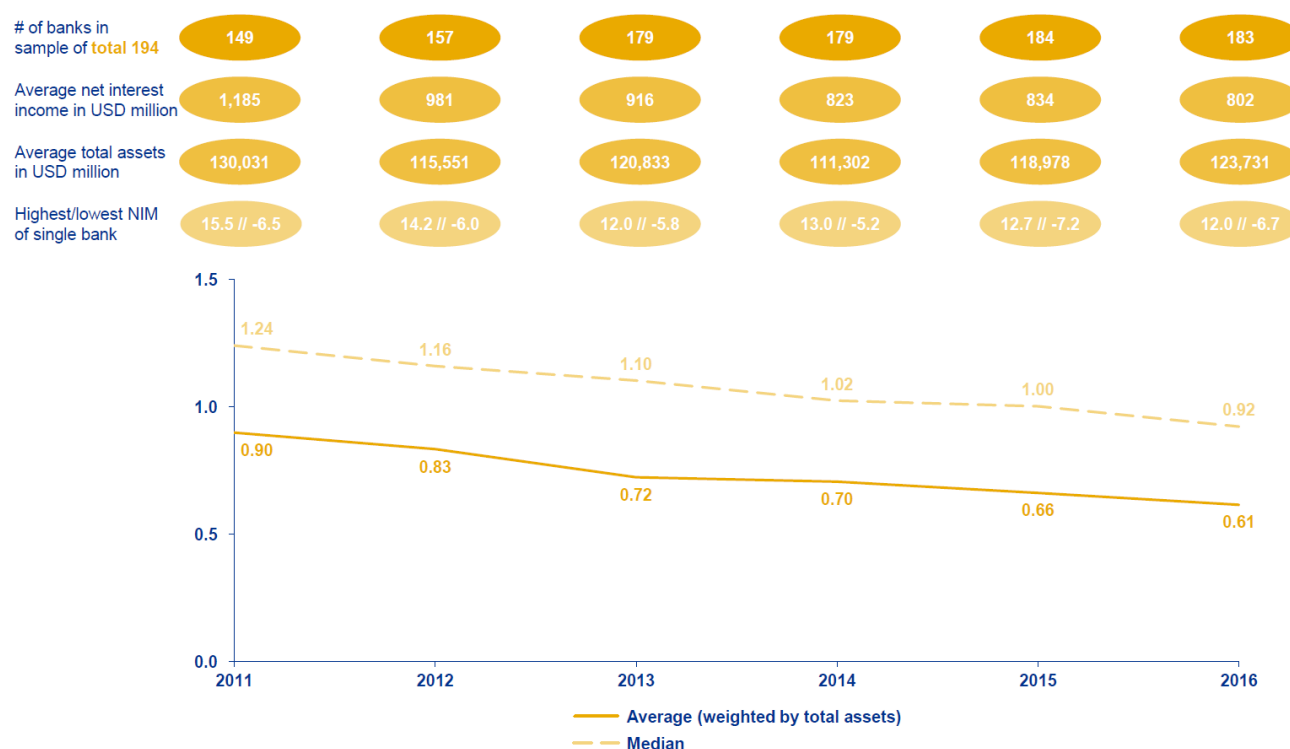


Figure 35: Development of weighted average and median NIM of Japanese banks from 2011 to 2016 in percent⁷⁷

There is a clear downward trend for the net interest margin from 2011 to 2016. The median NIM performed at a higher rate, starting at 1.24 percent in 2011 and leveling down to 0.92 percent five years later. The average NIM already started below the median value of 2016 with 0.90 percent and steadily declined to 0.61 percent by 2016.

While the average total assets of the more than 150 banks in the sample remained quite constant, at around USD 110 to 130 billion, their average net interest income nosedived (OBF, 2017). Was the average interest income per bank USD 1,200 million in 2011, it had declined by almost USD 400 million to just above USD 800 million in 2016 (OBF, 2017).

The absolute amounts of interest received started at USD 1,501 million, declining by 21 percent to USD 1,187 million by 2016 (OBF, 2017). Interest paid showed more of a seesaw development, ranging from anywhere between USD 268 million to USD 385 million in 2016. (OBF, 2017). When expressing interest paid in relation to interest received, the payments represented 21 to 32 percent of the yielded interest payments.

3.3.2.4 Cost-Income Ratio

Figure 36 shows how the Japanese banking market performed in terms of CIR, which is of special interest to management and shareholders (Richter & Gischer, 2019, p. 354).

Throughout the years, the average weighted cost-income ratio of banks in Japan was in the upper 60 percent, even reaching 70.59 percent in 2016. The lowest ratio was in 2012, when banks only had

⁷⁷ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

64 percent of their profits marginalized through operating expenses. Median values floated somewhat above the average CIR with 7 to 11 percentage points difference. The picture drawn below highlights in effect that half of the 183 institutions had a cost-income ratio higher than 78.36 percent in 2016, thus spending close to four-fifths of revenue on running the bank.

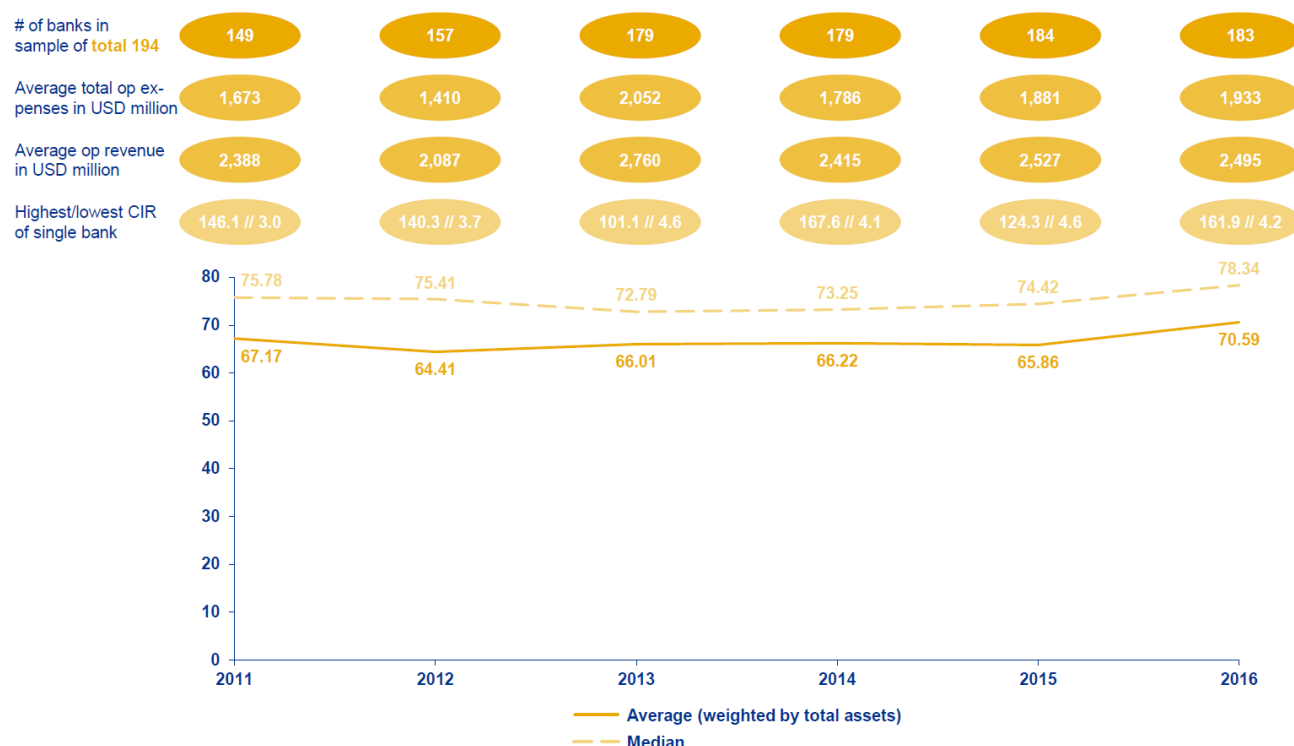


Figure 36: Development of weighted average and median CIR of Japanese banks from 2011 to 2016 in percent⁷⁸

There is numerical evidence for this development through an uptake in operational expenses in Japanese banks, up from an average of USD 1,673 million per bank in 2011 to USD 1,933 million in 2016, which represents an increase of over 15 percent (OBF, 2017). Operating revenue was volatile over the years, showing values between USD 2,087 million and USD 2,760 million (OBF, 2017).

Of the 149 or more banks under analysis, each year, at least one and up to 11 banks had a CIR of over 100 percent, meaning they spent more money on operational costs associated with running the bank than actually receiving income through their customers. While most banks experienced such undesirable outliers as single events, two banks were repeat offenders (OBF, 2017). Japan Finance showed a CIR of over 100 percent for three of the six years, and for Traders Holding Co., this even occurred five times (OBF, 2017). The former is a public entity representing “a policy-based financial institution that aims to complement financial activities carried out by private financial institutions and contributes to the improvement in the living standards of Japanese people” (Japan Finance Corporation, 2019), thus shouldering bureaucratic duties as well as a focus on aid provision, rather than pure cost optimization (Bloomberg, n.d. b). The latter, on the other hand, “engages in financial instruments trading business” (Nikkei Asian Review, 2019b), specializing in niche topics such as

⁷⁸ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

“wood biomass gasification power generation” (Nikkei Asian Review, 2019b), while reporting losses in most years (OBF, 2017). The low CIR of 3 to 4 percent stems from the Japan Finance Organization for Municipalities, which has as sole focus to provide long-term funds to municipalities by issuing bonds, running on very low OPEX (Bloomberg, n.d. c; Japan Finance Organization for Municipalities, 2019; OBF, 2017).

3.3.2.5 Funding Cost

The overall interest rate paid by Japanese banks for its funds from 2011 to 2016 can be seen in *Figure 37*.

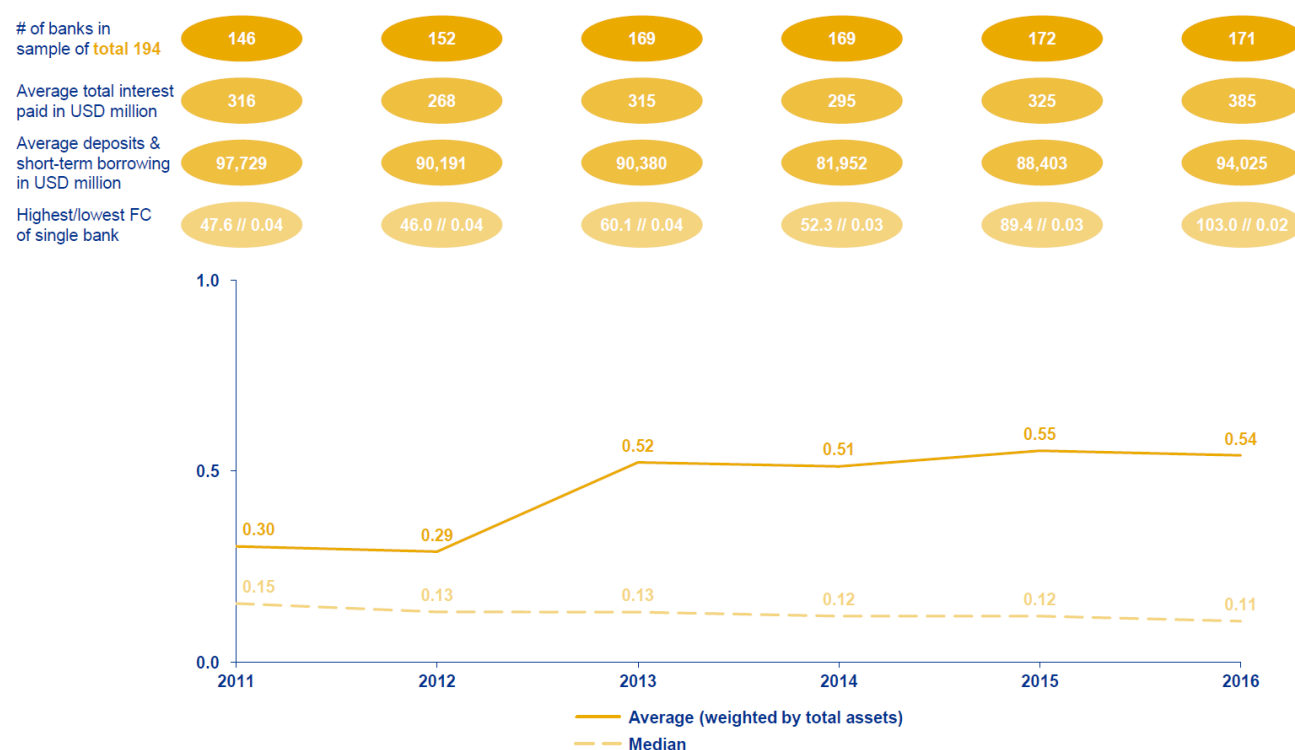


Figure 37: Development of weighted average and median FC of Japanese banks from 2011 to 2016 in percent⁷⁹

The FC of Japanese banks was on average clearly above the median values, with, in 2011, the average being 0.30 percent and the median 0.15 percent. The latter remained almost constant, falling to 0.11 percent in 2016. The former, however, jumped almost 80 percent in 2013 to 0.52 percent, a level held for the remainder of the observation period.

The majority of Japanese banks had FC of 1 percent or less for the full six years; nonetheless, drastic outliers occurred. This becomes more apparent upon taking a closer look at the upper- and lower-end values of the FC. While the lowest values were nestling close to 0 percent – in any of the years, 22 to 78 of all banks in the sample had FC of less than 0.10 percent, meaning that for any US dollar or yen disbursed to customers, these banks had to pay less than a cent or one-hundredth of a yen in interest. Banks with higher costs for their funds include Sumitomo Mitsui Finance and Leasing and NTT Finance, which both have a strong focus on leasing services that do not necessarily require

⁷⁹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

them to hold large amounts of customer deposits, as they rely on borrowed funds (NTT Finance, 2020; OBF, 2017; Sumitomo Mitsui Finance and Leasing, 2020). The two highest accounts of FC, 89.4 and 103.0 percent in 2015 and 2016, were those of Traders Holdings, whose business model of brokerage services and foreign currency exchange via call centers does not require any applicable short-term borrowing options either (Bloomberg, n.d. g; OBF, 2017).

The overall development of interest expenses as well as deposits and short-term borrowing shows erratic developments (OBF, 2017). Average total interest paid by Japanese banks in 2011 was at USD 316 million and, by 2016, this had increased to USD 385 million (OBF, 2017). In between, the interest burden, however, fell by almost USD 50 million from the previous years to just USD 268 million (OBF, 2017). Average deposits and short-term borrowing started at USD 97 billion per bank, fell to USD 81 billion, and bounced back to USD 94 billion in 2016 (OBF, 2017).

3.3.2.6 Liquid Assets to Total Assets

Figure 38 shows Japanese banks' liquid assets to total assets.

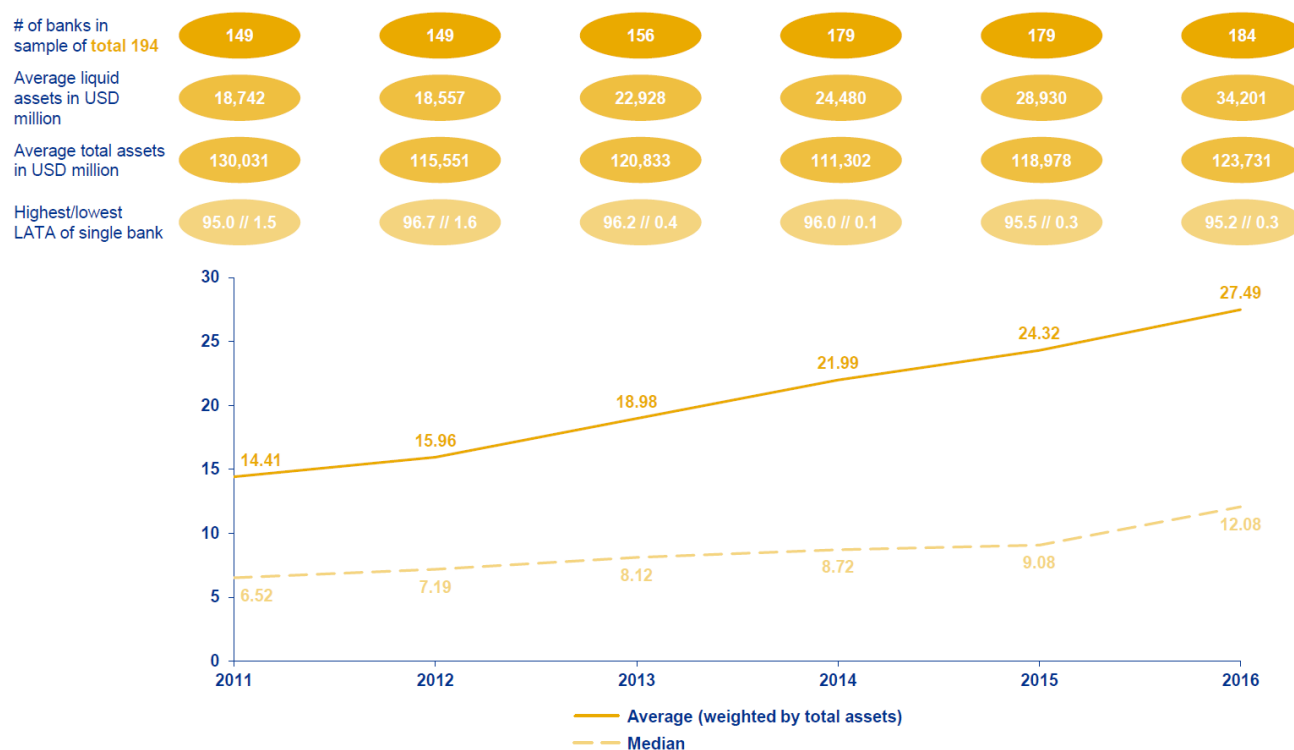


Figure 38: Development of weighted average and median LATA of Japanese banks from 2011 to 2016 in percent⁸⁰

The development of LATA is characterized by a significant upward trend from 2011 to 2016. The weighted average LATA of the average Japanese bank was at 14.41 percent at the start of the research period. The compound annual growth rate of liquid assets was at 13.80 percent until 2016, when liquid assets eventually reached 27.49 percent of total assets. The less steep incline of the

⁸⁰ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

median LATA starts with the 2011 value of 6.52 percent, almost doubling to 12.08 percent by 2016. By then, the two measures showed a gap of over 15 percentage points.

In 2011, the two variables, liquid assets and total assets, stood at USD 19 billion versus USD 130 billion for the average Japanese bank (OBF, 2017). Six financial years later, the average liquid assets had risen by 82 percent to USD 34 billion whereas the average total assets had fallen by close to 5 percent to USD 123 billion (OBF, 2017).

On the level of single banks, the spread of data points was quite scattered. LATA reached values of almost 0 percent as well as close to 100 percent. On the lower end, the majority of Japanese banks were predominantly engaged in leasing services (OBF, 2017). But Hokuto Bank also features there, a nondescript commercial bank with just about 2 percent of liquid assets (Bloomberg, n.d. k; OBF, 2017). On the liquid side of the spectrum, with values above 80 percent, we find, for any given year, some 10 banks (OBF, 2017). Most of the banks on that side of the spectrum are investment banks, as the core of their balance sheet represents positions considered as liquid assets, such as financial assets, reverse repurchase agreements, and net loans and advances to banks (OBF, 2017).

3.3.2.7 Net Loans to Total Assets

Japan's banking sector NLTA from 2011 to 2016 is shown in *Figure 39*.

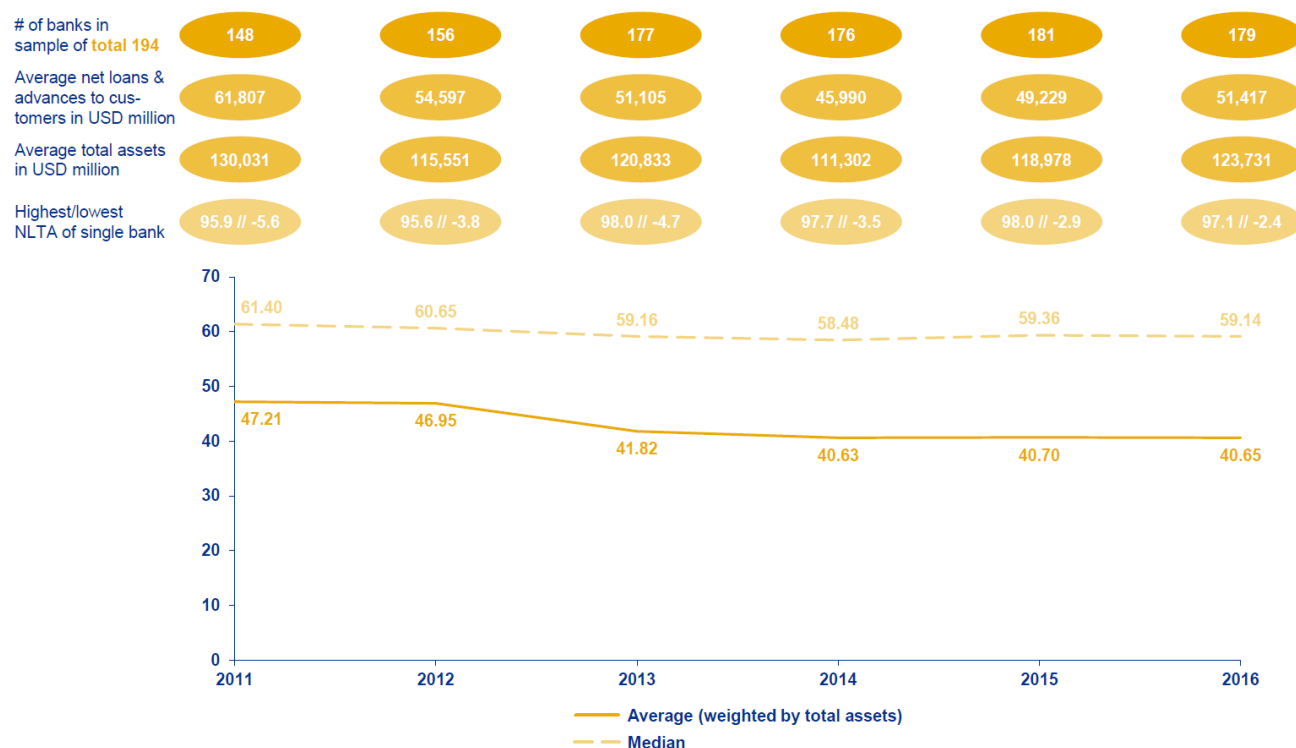


Figure 39: Development of weighted average and median NLTA of Japanese banks from 2011 to 2016 in percent⁸¹

The above chart shows an intriguing picture. For the 148 to 181 banks with relevant data for the analysis of NLTA, there is a consistency with respect to the gap between average and median NLTA

⁸¹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

results. For all of the six years, there is at least a gap of 14 to 19 percentage points. The average NLTA shows the greatest change, with a reduction of 6.57 percentage points, from 47.21 percent in 2011 to 40.65 percent in 2016. The superjacent median line shows a start value of 61.40 percent and a somewhat reduced end value of 59.14 percent. This means that half of the banks in the sample show NLTA of over 60 percent. At the same time, there is a significant number of banks with NLTA of less than 40 percent – in 2015 even a quarter of the total sample – some of which even showed negative NLTA, providing the arithmetic rationale of the two measures' gap.

The constancy of the average NLTA is not least reflected by the parallel changes in both net loans and total assets. These two input variables did not remain steady over the years, but rather kept their relative ratio constant. In 2013, they did alter their synchronicity, this is when the banks' average total assets increased while their average net loans and cash advances to customers decreased, thereby setting the new equilibrium for the following years. Overall, average net loans per bank declined from USD 61 billion to USD 51 billion in 2016 (OBF, 2017). Total assets lessened by USD 6 billion, from USD 130 billion to USD 124 billion (OBF, 2017).

Of the four banks that show an NLTA of over 90 percent for all six years, two – Japan Finance Organization for Municipalities and Japan International Cooperation Agency – have a societal purpose in their provision of funds for local municipalities and international aid (Japan Finance Organization for Municipalities, 2019; Japan International Cooperation Agency, 2020; OBF, 2017). The third bank, Jaccs (OBF, 2017), is the complete opposite, with its prime focus on consumer loans to “[pursue] further growth and development to deliver more affluent lifestyles” (Jaccs Corporation, n.d.). Bank number four is the captive bank⁸² of Japanese car manufacturer Honda, providing leases and credits for their products and equipment (Honda, n.d.; OBF, 2017). For all years, Japanese banks also show close to 0 percent and even negative values for NLTA. Negative NLTA is the result of banks not reporting any gross loans and cash advances to customers. They nonetheless have loan loss reserves, which result in negative net loan positions. Banks with NLTA of 2 percent or less are mostly investment banks whose core business is often not zeroing in on disbursing loans but rather providing securities services and the like (OBF, 2017). Seven Bank, part of the Seven & I Holdings, which also owns the convenience store chain 7-Eleven, also has a NLTA between 0.41 percent and 2.07 percent (OBF, 2017) (Seven & I Holdings Corporation, n.d.), the reason being that Seven Bank is predominantly “[cooperating] with affiliated financial institutions to establish the nationwide ATM network and provide banking services, including deposits and loans” (Bloomberg, n.d. j).

3.3.2.8 Net Loans to Deposit and Borrowing

Upon closer inspection of *Figure 40*, one can see that the net loans to deposits and short-term borrowing remained relatively constant over the years.

As the chart shows, median NLDST was about 7 to 12 percentage points higher than the average NLDST, with a value of between 67 and 69 percent from 2011 to 2016. The average NLDST was

⁸² A captive bank is a bank that is fully owned by a parent company (Twin, 2019), in this case the car manufacturer Honda. Car manufacturers often use captive banks to promote the sales of their cars through the offering of leasing or other financing options to their customers.

slightly more active in those years, beginning with 57 percent, and from 2013 onwards, it slowly increased to ultimately reach 61 percent in 2015 and 2016. The numerator and denominator of the formula for the average NLDST changed over time, quite similarly to one another, with one interruption in 2013 when average deposits and short-term borrowing did not see any change and the average loan volume per bank fell by USD 3 billion (OBF, 2017). Overall, the net loan volume for the average Japanese bank declined from USD 62 billion to USD 51 billion, while deposits and short-term borrowing fell from USD 98 billion to USD 94 billion, with some volatility in between (OBF, 2017).

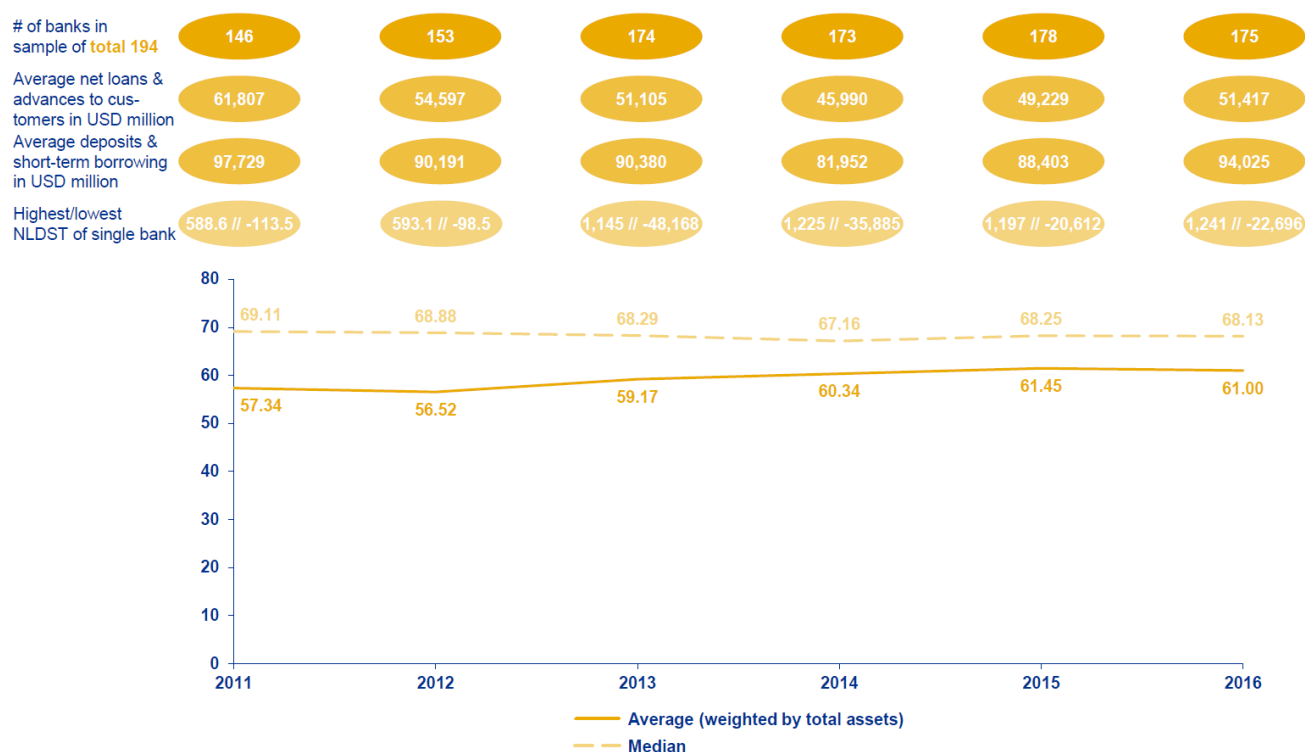


Figure 40: Development of weighted average and median NLDST of Japanese banks from 2011 to 2016 in percent⁸³

For all years, Japan showed both negative NLDST as well as NLDST as high as several hundred and even thousand percent. Looking at the extreme low ends of the ratio, Zenkoku Hosho Bank shows values of between -48,168 and -20,612 percent (OBF, 2017). This investment bank, with comparatively small total assets of around USD 2 billion (in comparison, Mizuho Securities or Nomura Securities investment banks hold 50- to more than a 100-times larger balance sheet totals), did not disburse any loans from 2013 to 2016, but held loan loss reserves, which are calculated as negative net loans for each period, thus resulting in these high negative NLDST (OBF, 2017). Banks with opposite NLDST include three of the four banks which also held high NLTA as described under 3.3.2.7 Net Loans to Total Assets – Japan Finance Organization for Municipalities, Jaccs, and Honda Finance (OBF, 2017). The remaining banks with elevated NLDST, over a dozen, are mostly leasing- or consumer finance-oriented, hence the higher ratio is part of their business models (OBF, 2017).

⁸³ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

3.3.2.9 Equity to Assets

Figure 41 shows the development of EA of the 194 Japanese banks in the analysis sample.

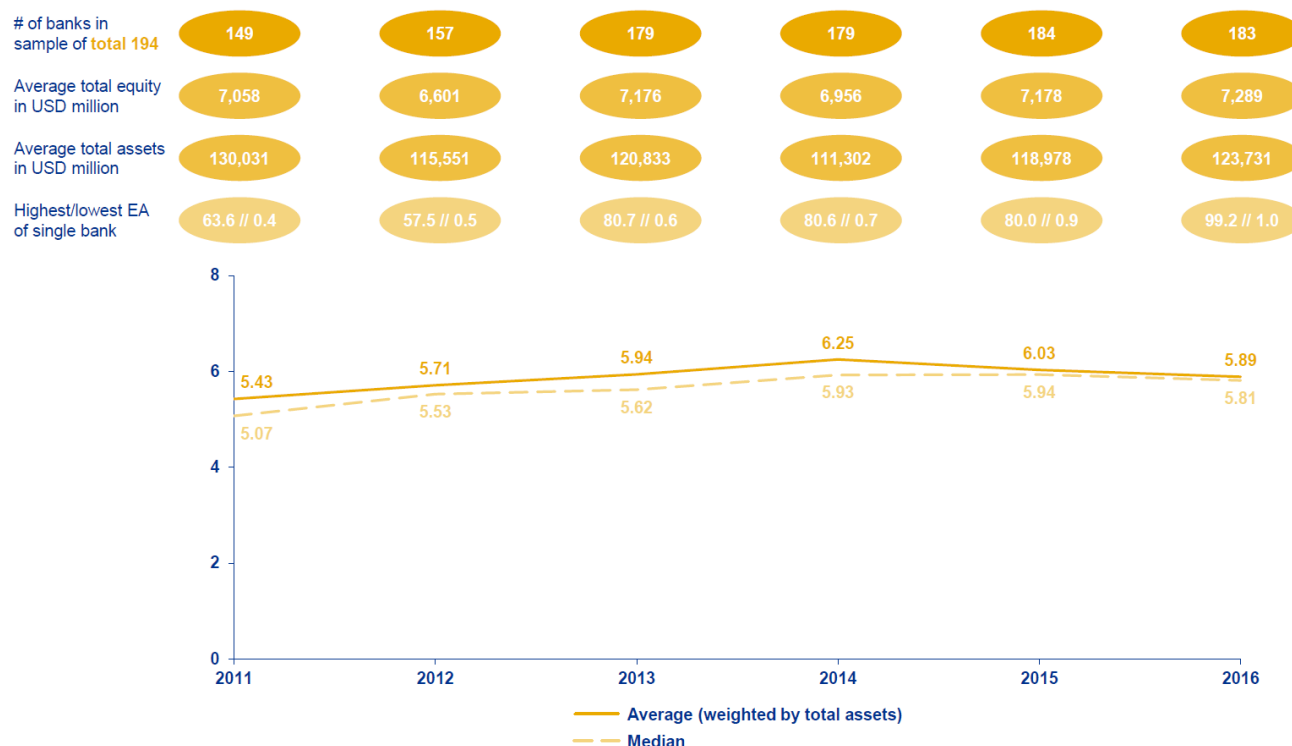


Figure 41: Development of weighted average and median EA of Japanese banks from 2011 to 2016 in percent⁸⁴

The average and median EA were almost on par throughout the six years. Slightly below average, the median EA started at 5.07 percent, slowly increased to almost 6 percent in 2014 and reached 5.81 percent in 2016. The weighted average EA remained a touch higher than the median, with a starting value of 5.34 percent and a final value of 5.89 percent. In all those years, about one-twentieth of total assets of Japanese banks were secured through equity. That makes for leverage with a multiple of 16 to 18 for debt over equity.

Despite overall EA being constant at around 6 percent, there are banks in the sample that go up as high as 80 percent (2013 to 2015) or even 99.2 percent (2016). Investment banks such as Shinkin Securities, Mito Securities, or SMBC Friend Securities feature most prominently among those that are highly equity-funded (OBF, 2017). Citigroup Japan secured a value of 99.2 percent, with an EA of 5 to 8 percent in the years preceding 2016 (OBF, 2017). The reason for this EA spike is that Citigroup Japan was discontinued as of March 31, 2017 (the end of the 2016 financial year) and the banks' dealings were transferred to Citibank's Tokyo Branch, which since April 1, 2017 started business for institutional clients for the global Citibank Group (Citigroup, 2019; Citigroup, n.d.).

3.3.2.10 Income Diversification

The ID performance of Japanese banks is represented in Figure 42 below.

⁸⁴ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

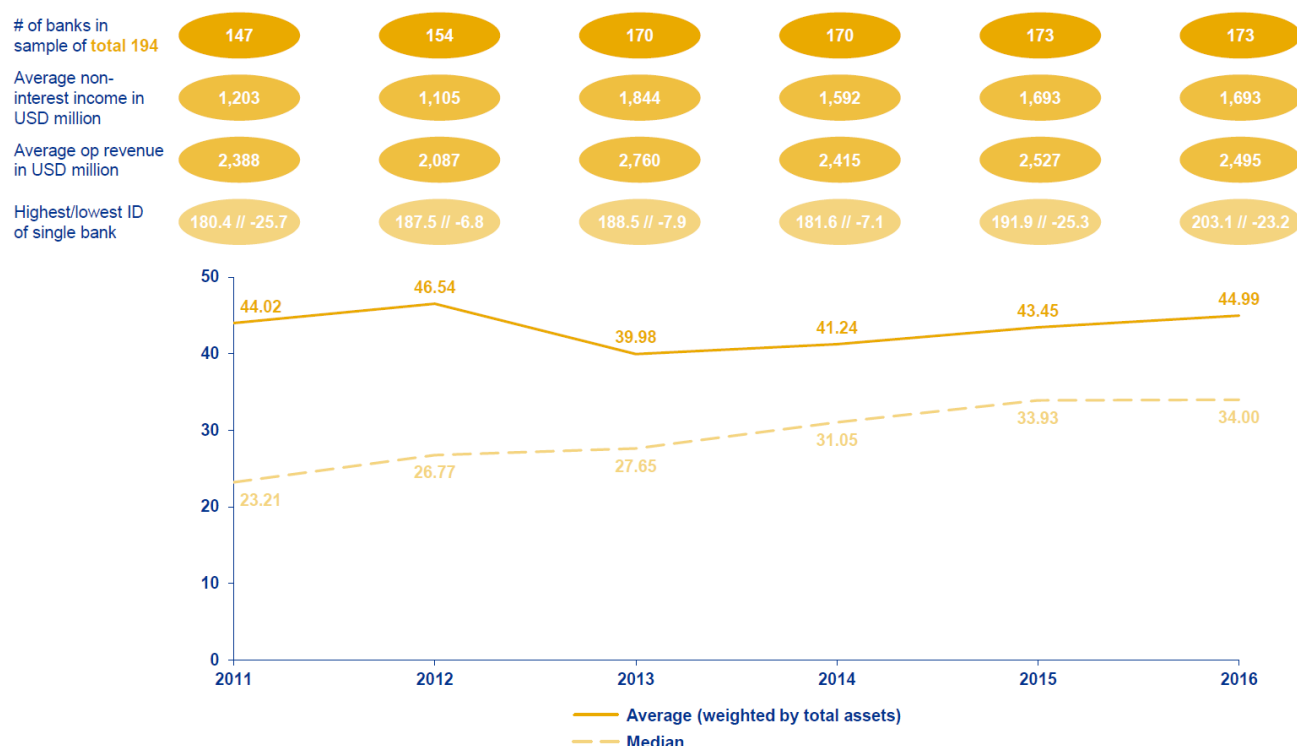


Figure 42: Development of weighted average and median ID of Japanese banks from 2011 to 2016 in percent⁸⁵

Japanese banks reported, on average, over two-fifths of their total operating revenue from non-interest-bearing activities. As has also been discoursed above under 3.2.2.1 *GDP Growth*, Japan has historically low interest rates that come with necessary countermeasures – which to some degree fall into the category of non-interest income – for banks to still show profitability (Hong & Kandrac, 2018, p. 27). Overall, the weighted average started at 44.02 percent in 2011, fell briefly under 40 percent in 2013, and ended at 44.99 percent in 2016. When comparing these weighted averages with total averages, it becomes apparent that large banks, especially, show high ID (the unweighted average in 2011, for example, was at 33 percent). Median ID, over all these years, was lower, with a starting value of 23.21 percent and after a steady climb, it ended at 34.00 percent.

Banks yielding operating revenue of more than 50 percent from non-interest activities did not only include investment banks, which naturally generate more commission income and income from trading activities, but also the Japanese banking industry's big players (OBF, 2017). These big players have USD several trillion in total assets (OBF, 2017). Some banks showed consistent ID of close to or more than 50 percent for all the years under scrutiny. These are: Mitsubishi UFJ Financial Group (six-year average of 52 percent for ID, total assets of USD 2.7 trillion in 2016), Sumitomo Mitsui Financial Group (six-year average of 64 percent for ID, total assets of USD 1.8 trillion in 2016), as well as Mizuho Financial Group and Mizuho Bank (six-year average of 55 and 48 percent respectively for ID, total assets of USD 1.8 and 1.5 trillion respectively in 2016) (OBF, 2017). A handful of smaller commercial banks showed negative ID (OBF, 2017). These commercial banks,

⁸⁵ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

nonetheless, showed positive results on their income statements; it is just that their non-interest activities resulted in a loss that interest-bearing activities needed to cover (OBF, 2017).

3.3.2.11 Non-Performing Loans

The ratio of Japanese banks' impaired loans versus the total of the loan portfolio is portrayed in *Figure 43*.

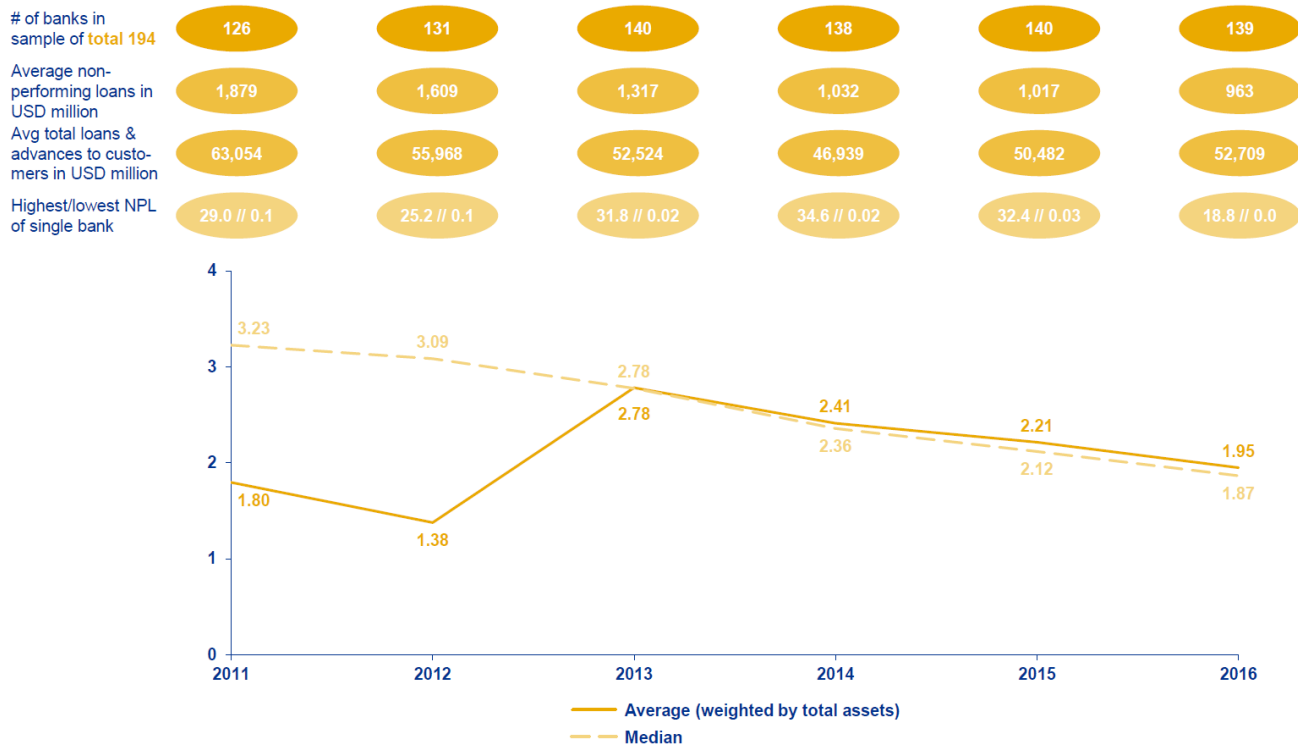


Figure 43: Development of weighted average and median NPL of Japanese banks from 2011 to 2016 in percent⁸⁶

This paints a rather interesting picture. For one, the average NPL was, at 1.80 percent and the following year at 1.38 percent in 2011 and 2012, much lower than the median NPL, which was at over 3 percent. But the following year, in 2013, the average NPL jumped up to exactly the same point as the declining median value, continuing to decline on par, all the way down to just under 2 percent in 2016. This denotes the second visible development; the asset quality of Japanese banks over time improved, reducing the rate of default to under 2 percent. The initial jump and the subsequent steady decline cannot be attributed to single events or the number of banks in the sample, but rather signifies an industry-wide improvement in loan quality. As *Figure 43* shows, the average values of impaired loans in the banks' portfolios halved over the course of the six years from USD 1,897 million to USD 963 million (OBF, 2017). The total amount of loans given out to customers declined from an average of USD 63 billion to USD 53 billion (OBF, 2017).

That being said, Japan, notwithstanding, also saw outlier NPL developments with some banks reporting NPL of close to 0 percent, others with values in the double digits. Of the former, Japanese labor banks, the so-called "Rokin banks" (Kurimoto & Koseki, 2019, p. 4), are strongly represented

⁸⁶ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

(e.g., Kyushu Rokin Bank, Okinawa-ken Rokin Bank, and Chuo Rokin Bank) – all remaining at under 1 percent throughout the research period (OBF, 2017). Providing financial inclusion for the Japanese working class, impaired loans are less frequent and the outstanding totals smaller, as the business model is focused on mortgage loans and financial credit for crisis-struck individuals (such as after job loss or global crises), “whereas other banks’ major loans product is business loan, that is more likely to be affected by economic volatility” (Kurimoto & Koseki, 2019, p. 29). The sad leaders on the scale’s other end are Aiful Corporation and Mitsubishi UFJ Nicos, both reporting NPL ratios of 19 to 35 percent (OBF, 2017). While the latter is not entirely focused on loan origination, since under 20 percent of its total assets can be attributed to total loans, the former has an infamous reputation (Hazama & Flynn, 2019; OBF, 2017). Aiful Corporation is among the many lenders of consumer finance in Japan that “lend to millions of lower-income people at sky-high interest rates” (Hayashi Y, 2006). Aiful Corporation nearly bankrupted itself in 2009, but was given the possibility to restructure and continue its high-yield, high-default business scheme (Hazama & Flynn, 2019).

3.3.3 South Korea

3.3.3.1 Return on Assets

Figure 44 gives an overview of the performance of the South Korean banking industry in terms of ROA from 2011 and 2016.

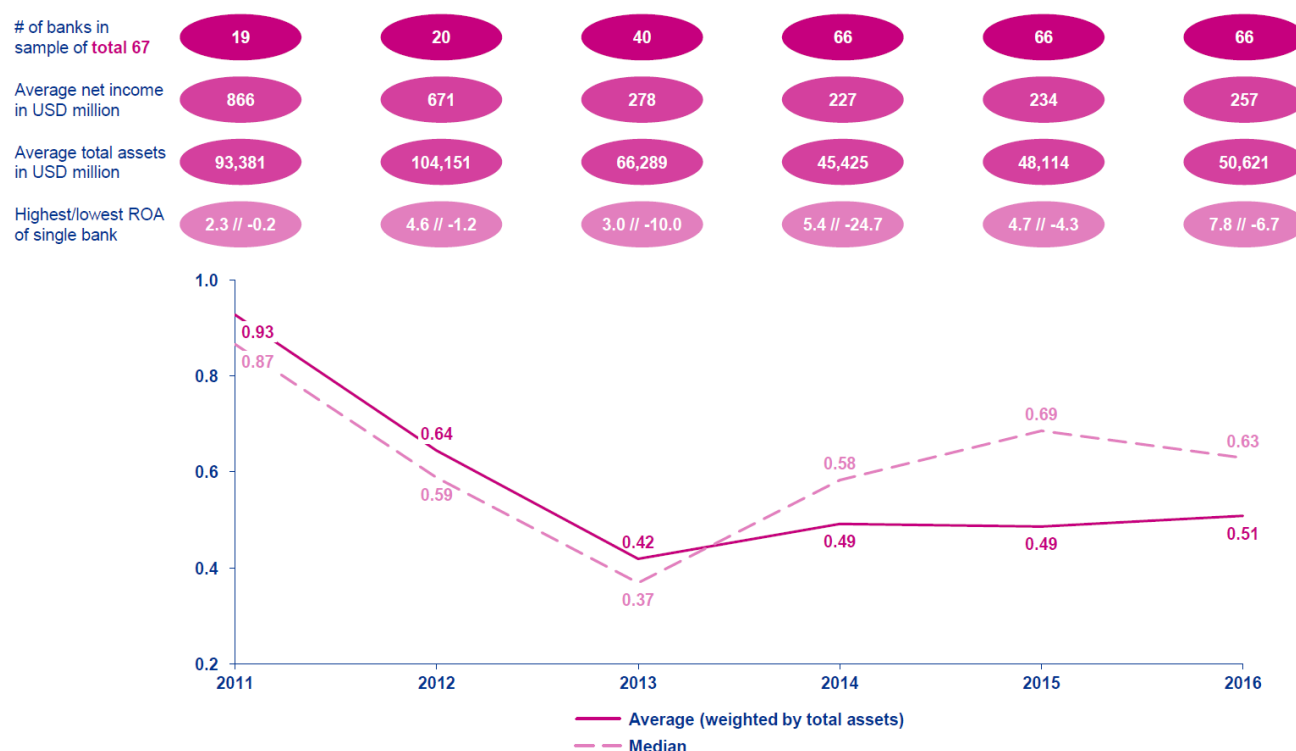


Figure 44: Development of weighted average and median ROA of South Korean banks from 2011 to 2016 in percent⁸⁷

⁸⁷ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

Up from 0.93 percent in 2011, the average ROA plummeted the following two years, stabilizing and leveling off at around 0.5 percent. The median ROA displays a similar pattern, as it was close to the average ROA until 2013, then showing a slight upswing, reaching 0.63 percent in 2016. Causes for the somewhat lower performance of the average ROA can be attributed to both an increase in the number of banks reporting losses and a stronger concentration of Korean bank ROA between 0 and 1 percent.

Concerning the average values of net income and total assets, the significantly higher values in 2011 and 2012 can be attributed to the fact that some of the country's – and the world's – largest banks were already in the sample⁸⁸ when its size was just one-third of its size in later years. Hence, it is more sensible to look at the average values from 2013 onwards, when the average net profits remained quite constant, at around USD 250 million per bank (OBF, 2017). In contrast, by 2016, the average total assets per bank had fallen from USD 66 billion to USD 51 billion (OBF, 2017).

Looking at the banks' ROA from a population point of view – the population grew by 3 percent throughout the observed period – the net income remained relatively constant with USD 330 per capita in 2011, compared to USD 332 in 2016 (OBF, 2017; World Bank, 2019g). At the same time, the banks bore assets of more than USD 35,000 per Korean in 2011 and nearly doubled them to USD 65,000 in 2016 (OBF, 2017; World Bank, 2019g).

Deduced from the above analysis and the sample's data, it is not surprising that the spread of the individual banks' ROA is quite dense. In 2011, all ROA values were within a range of 2.5 percentage points. In the subsequent years, the spread increased, however, foremost caused by outliers rather than a general trend of a broader range of ROA.

3.3.3.2 Return on Equity

The development of Korean banks' ROE is presented in *Figure 45*.

The values for average and median ROE were almost abreast over the years. While 2011 still saw an ROE of well over 10 percent, the variable halved over the next two years, reaching its lowest point within the six years in question, at 5.04 and 4.35 percent respectively. Then, until 2016, the ROE climbed slightly, peaking at 6.51 (average) and 7.06 (median) percent.

The average profits of Korean banks remained at around USD 250 million per bank from 2013 onwards (OBF, 2017). The total equity plummeted strongly from USD 5.5 billion in 2014 to just below the USD 4-billion mark in 2016 (OBF, 2017). Average values per bank for profits and equity need to be treated with caution as the sample size is smaller for these years (for more details on sample size influence, see 3.3.3.1 *Return on Assets*) (OBF, 2017).

Looking at the edges of the ROE series, the highest values were between 12.6 percent in 2012 for Samsung Card, the country's largest credit card acquirer, ahead of KB Kookmin and Hyundai Card (Robertson, 2016, p. 8), and 32.5 percent in 2014 for Hanwha, a savings bank (OBF, 2017). Since

⁸⁸ For example, Shinhan Financial Group (80th-largest bank globally in 2016) or KB Financial Group (83rd-largest bank globally in 2016) are part of the bank sample in 2011 and 2012 (OBF, 2017; Relbanks, 2017).

all years saw at least one and up to six banks reporting negative profits, there are negative ROE for all years (OBF, 2017).

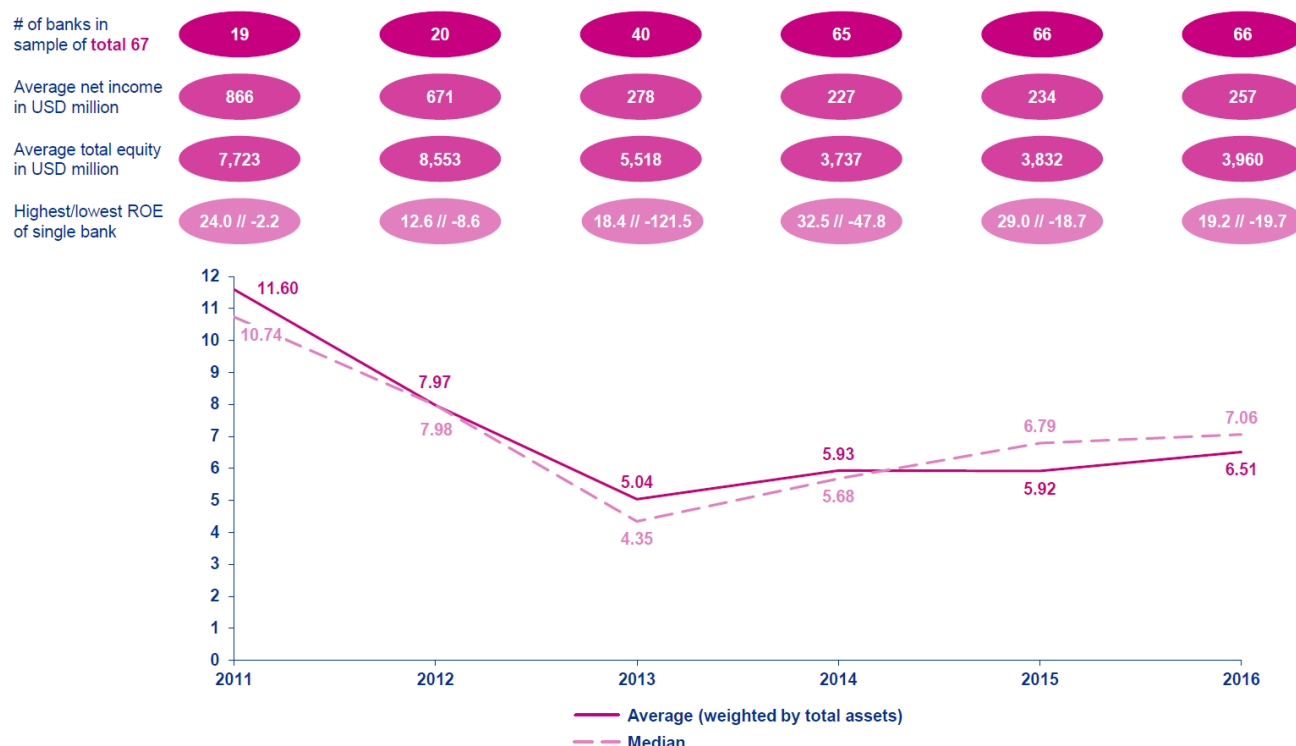


Figure 45: Development of weighted average and median ROE of South Korean banks from 2011 to 2016 in percent⁸⁹

3.3.3.3 Net Interest Margin

Figure 46 depicts the development of NIM in the South Korean banking industry from 2011 to 2016.

Both the weighted average and the median NIM show a downward trend throughout the research period. Both values were relatively on par throughout the years, with median NIM in most years being slightly higher. In 2011, the values started at 2.36 and 2.31 percent respectively, dropping to 1.65 percent for both NIM by 2016. Overall, the average NIM fell by 28 percent, while the median value even decreased by 30 percent over the entire period.

The average net interest income was more than twice as high in 2011 as it was in 2016 (OBF, 2017). In 2016, and for the previous two years, the net interest income was at around USD 850 million for the average bank in the sample (OBF, 2017). A similar picture can be drawn from the development of average total assets (OBF, 2017). What needs to be borne in mind, however, is the fact that while 66 banks were included in the second half of the research period, before that, this figure was just 19, 20, and 40 from 2011 to 2013 (OBF, 2017). Hence, the sample size might have affected the visible downward trend.

Looking at interest paid as a percentage of interest received conjures a compelling image. Leaving 2011 and 2012 out of the equation, the average interest received almost halved from USD 2.6 billion

⁸⁹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

per bank to USD 1.4 billion just three years later (OBF, 2017). At the same time, interest paid made up 50 percent of interest received in 2013 and just 20 percent in 2016 (OBF, 2017), indicating that Korean banks managed their interest rather efficiently.

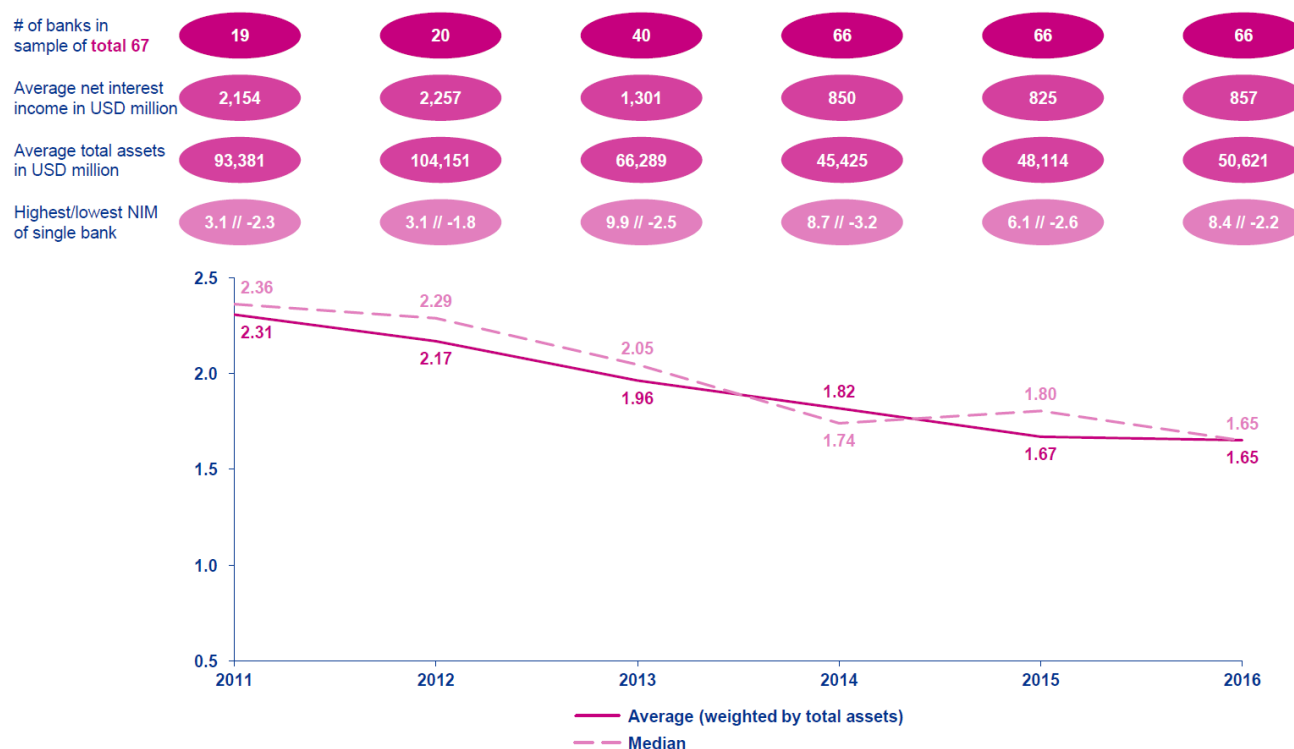


Figure 46: Development of weighted average and median NIM of South Korean banks from 2011 to 2016 in percent⁹⁰

3.3.3.4 Cost-Income Ratio

How the CIR performed in Korea for the banking industry is represented by Figure 47.

The chart below shows that average and median CIR are almost identical throughout the six-year period. The median value is only slightly above the weighted one in the first three years. Striking is the stark increase in CIR by almost 20 percentage points, showing a growth of 37 percent. The CIR was at 52.58 percent (average value) in 2011, while in 2016 it reached 71.82 percent, continuously growing year after year. One reason for this development could be the tripling of the sample size; however, this argument does not hold true when looking at the early samples from 2011 and 2012, which show the same growing CIR trend as the years 2014 to 2016 (OBF, 2017).

Despite OPEX decreasing over the years, operating revenue showed adverse developments at an even stronger rate (OBF, 2017). While the overall decrease in per-bank values for both figures can in fact be explained by the larger sample size from 2014 onwards (the country's leviathans such as Shinhan Financial Group, KB Financial Group, and Woori Bank are all in the 2011 sample), the results for 2014 to 2016 still display a decrease in efficiency (OBF, 2017). Banks did, nonetheless, improve their average operating revenue by more than USD 130 million, but also incurred additional total operating expenses of USD 172 million (OBF, 2017).

⁹⁰ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

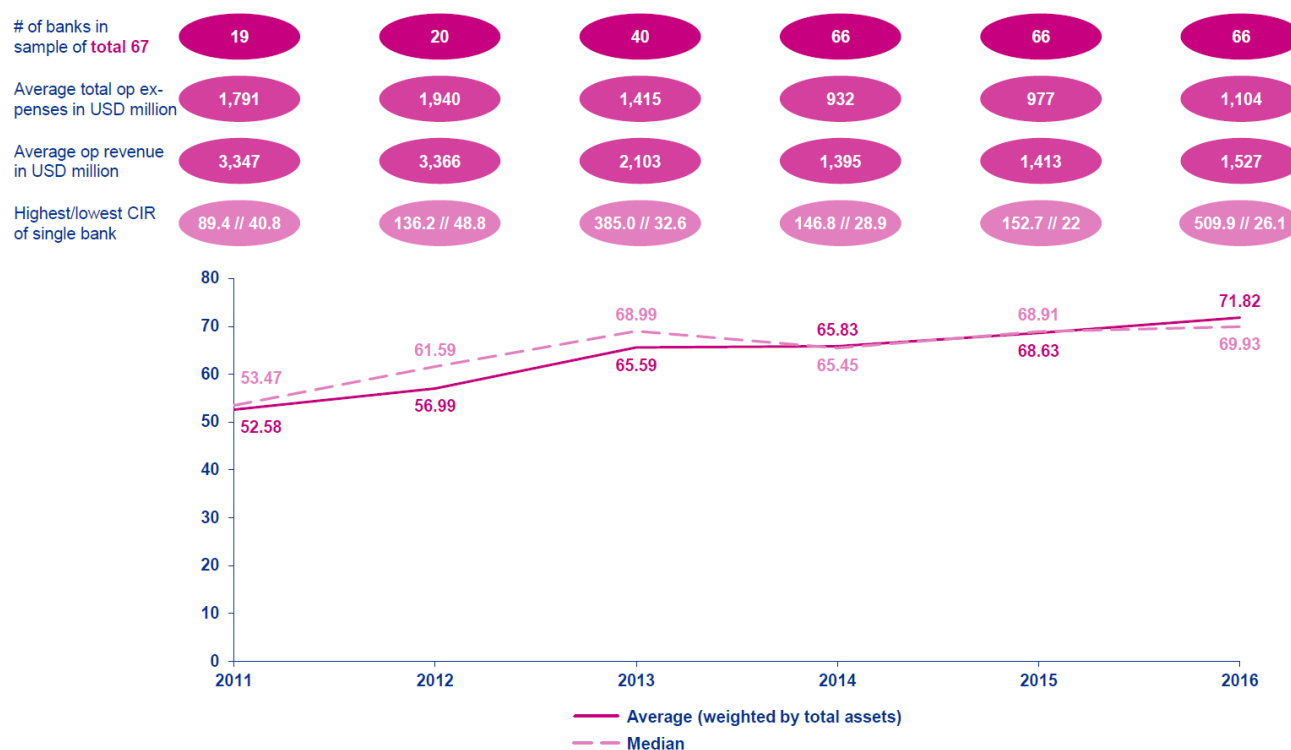


Figure 47: Development of weighted average and median CIR of South Korean banks from 2011 to 2016 in percent⁹¹

Regarding the highs and lows of CIR among the sample, one is worth specific mention. The speculating investment bank Hanwa Investment & Securities saw a tremendous spike in 2016, showing a CIR of 509.9 percent (Choi, 2016; OBF, 2017). Hanwa was out for extra profits and therefore engaged in equity-linked securities, a certain form of high-yield financial instrument (Chen J., 2020), despite “[being] short of expertise in derivatives hedging” (Choi, 2016). Moreover, the firm engaged in the practice of transferring profits and losses made from additional hedging activities to another bank for risk management purposes, paying provisions for those transfers (Choi, 2016). The result of these risk-affine practices resulted in strongly diminished operating revenue (OBF, 2017).

3.3.3.5 Funding Cost

Figure 48 shows how much Korean banks had to spend for the funds given out as loans to customers. Throughout the analyzed period, both the average and the median funding cost fell. This means that from 2011 to 2016 it became more affordable for banks to originate loans. In figures, the average FC of Korean banks, which remained higher than the median FC, was at 4.42 percent in 2011 and, after plateauing at around 3.75 percent from 2013 to 2015, it fell to 2.27 percent, close to the median value of 2.04 percent. The latter started at 3.75 percent in 2011 and continuously fell to reach its lowest figure in 2016. Overall, the price for funds almost halved in six years.

⁹¹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

When taking a closer look at the underlying variables, total interest paid as well as deposits and short-term borrowing, both saw a sharp decline despite the growth of the sample size (OBF, 2017). Throughout the whole period, the average total interest paid fell from USD 2,222 million to just over USD half a billion per bank. Similarly, deposits and short-term borrowing were at over USD 58 billion and by 2016 had declined to USD 37 billion (OBF, 2017).

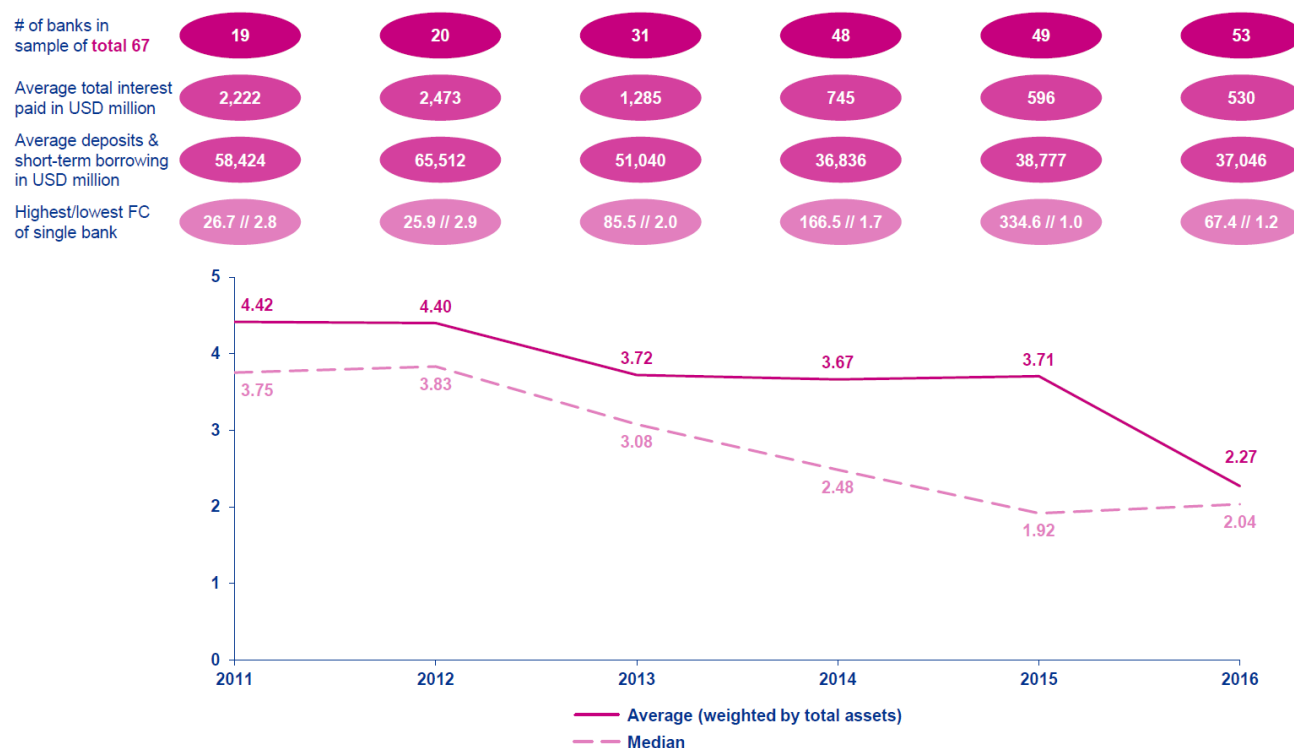


Figure 48: Development of weighted average and median FC of South Korean banks from 2011 to 2016 in percent⁹²

Looking at outlier values, the spread widened over the years, with the highest FC in 2015 at 334.6 percent and the lowest at 1.0 percent the same year. The spike is attributable to Samsung Card, which also holds the highest funding cost for almost all years (OBF, 2017). As credit card debt follows a revolving debt cycle, there is no need for the card company to disburse loans to customers for most service types; hence, the need for funds is different to, say, retail banks (Bloomenthal, 2020). The 1.0 percent funding cost shows KEB Hana Bank, whose parent Hana Financial Group is the fourth largest bank by assets in South Korea and the 89th largest bank globally (Hana Financial Group, 2019, pp. 9, 15; Relbanks, 2017). Hana Financial Group acquired the Korean Exchange Bank, abbreviated KEB, in 2012 and consolidated KEB and Hana Bank in 2015, renaming the institution to KEB Hana Bank (KEB Hana Bank (Germany), n.d.). With that merger in 2015, deposits and short-term borrowing increased 2.5-fold from USD 68 billion to USD 176 billion, whereas interest expenses only rose by 23 percent (OBF, 2017).

⁹² Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

3.3.3.6 Liquid Assets to Total Assets

The relation of liquid assets, i.e., assets easily available to be turned into cash, to total assets for South Korean banks is demonstrated in *Figure 49*.



Figure 49: Development of weighted average and median LATA of South Korean banks from 2011 to 2016 in percent⁹³

Throughout the research period, the median LATA stayed below the average LATA and, moreover, grew with an overall increase of 28 percent at a slower pace, from 7.90 percent in 2011 to 10.11 percent in 2016. The average LATA began at 9.70 percent and saw a stark ascent until 2014, when it reached 13.86 percent. From that point, the average LATA plateaued at around 14 percent. The variables' averages of liquid assets and total assets both saw ups and downs during the research period, but liquid assets managed to see a relative incline against the balance sheet total (OBF, 2017).

The banks with low LATA, around 5 percent of the total, include, especially, credit card, leasing, factoring, as well as consumer finance companies (OBF, 2017). Investment banks form the other end of the spectrum as liquid assets are the business model's playing field (OBF, 2017).

3.3.3.7 Net Loans to Total Assets

Figure 50 shows how NLTA developed for Korean banks from 2011 to 2016.

For the first three of the six years, NLTA, calculated as average and median values, were almost on the same level, with 69 percent in 2011 and 67 percent in 2013. After that, the median value dropped by nearly 11 percentage points down to 56.80 percent while the average value remained somewhat

⁹³ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

constant at around 65 percent. The median value approximated the average in the two years from 2014, eventually reaching 62.09 percent in 2016. In essence, Korean banks had about two-thirds of their total assets tied up as loans and cash advances to customers for the entire observation period.

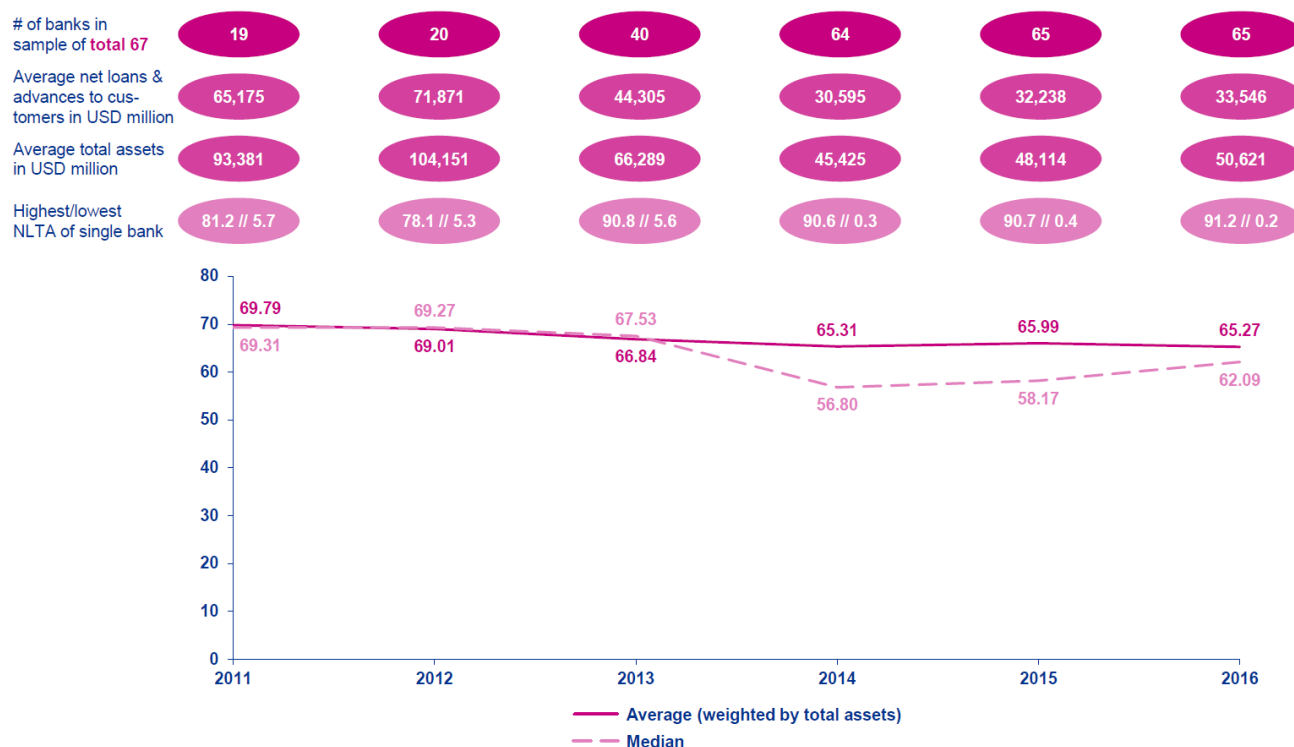


Figure 50: Development of weighted average and median NLTA of South Korean banks from 2011 to 2016 in percent⁹⁴

A probable explanation for the visible drop in the median value of the NLTA in 2014 is the increase in banks in the data sample (OBF, 2017). The bubbles in Figure 50 show that both net loans and total assets on average decreased with the increase in the sample size (OBF, 2017). Furthermore, the spread of outlier values rose, meaning that the median does not have to be as close to the average than it was in previous years. In 2011, the average net loans per bank were USD 65 billion, while by 2016 they almost halved to USD 34 billion (OBF, 2017). The average value of total assets displays a similar development (OBF, 2017). At the same time, the proportion between net loans and total assets remained nearly constant (OBF, 2017).

Looking at outliers among South Korean banks, there are a handful with NLTA in the one-digit area – even close to 0 percent – and others that are over 90 percent. All but two banks with low NLTA were investment banks (OBF, 2017), whose prime focus is on underwriting, securities services and trading, or financial and investment advice for wealthy individuals and the portfolios of huge corporations. The other two are, first, Q Capital Partner (OBF, 2017), a bank “mainly engaged in the venture investment business and provision of financial related services” (Reuters, n.d.), hence it is not focused on lending but rather on direct investment in its associates. The second is Samsung Card, which had an NLTA of between 5 and 8 percent until 2014, flipping to the opposite side of the

⁹⁴ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

spectrum with 88.72 percent and 87.93 percent in 2015 and 2016 respectively (OBF, 2017). This happened without any major change in the total assets of the credit card issuer, but rather with a stark jump in its net loan volume from around USD 1 billion until 2014 to USD 14.3 and 16 billion in 2015 and 2016 respectively (OBF, 2017). This 14-fold increase in net loans might be attributable to the sale of Samsung Electronics' 37.5 percent share in the bank to Samsung Life Insurance and, with that, a potential change in business focus (Reuters, 2016). While the news of the shareholder change did not come with reports of any income diversification strategy by Samsung Card – the conglomerate being dedicated to avoiding outsiders from acquiring too much information about their businesses – as of April 2020, Samsung Card also offered loans on its website (Kim C., 2016, p. 84; Samsung Card, n.d.).

3.3.3.8 Net Loans to Deposit and Borrowing

Figure 51's representation of the NLDST of South Korean banks paints a landscape-like picture due to its mountain-like spike in 2015.

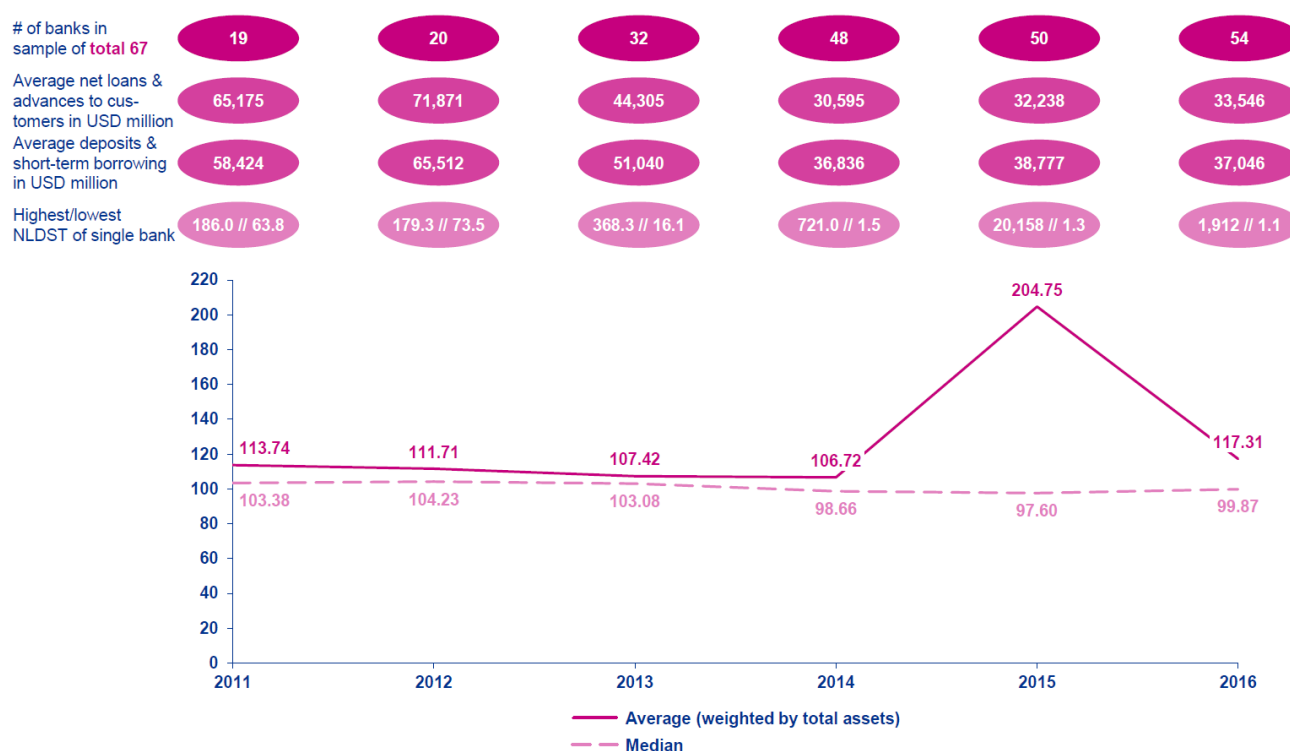


Figure 51: Development of weighted average and median NLDST of South Korean banks from 2011 to 2016 in percent⁹⁵

Starting with the less obvious of the NLDST developments from 2011 to 2016, the median value was up at 103 percent and slightly more for the first half of the observation period. In the second half, the ratio narrowly undercut the 100-percent mark, totaling 99.87 percent in 2016. For the whole observation period, 50 percent and more of all banks in the sample had an NLDST of over 100 percent. Arriving at the pyramidal elevation of the average NLDST represented in the chart, the ratio

⁹⁵ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

almost doubled from 106.72 to 204.75 percent within one year, before falling back to the almost pre-peak level of 117.31 percent in 2016.

When analyzing the average values of net loans and cash advances to customers as well as deposits and short-term borrowing (OBF, 2017), the sudden jump in 2015 was not to be assumed. While both variables saw fluctuations over time, their relative proportions did not trigger such a stark imbalance (OBF, 2017). Given that the average NLDST, as shown in *Figure 51*, is calculated through weighting by total assets to adjust for size differences in the sample, the answer to the peak lies at the single bank level.

The outlier NLDST of over 20,000 percent in 2015 stems from Samsung Card, the electronic conglomerate's credit card issuing bank, which is also engaged in other payment solutions, consumer finance, and leasing (OBF, 2017; Samsung Card, n.d.). As already highlighted in 3.3.3.7 *Net Loans to Total Assets*, the bank saw a significant jump in net loans (OBF, 2017). Simultaneously, deposits and short-term borrowing halved from 2014 to 2015, only to increase 31-fold from USD 71 million in 2015 to USD 2,3 billion in 2016 (OBF, 2017). It would seem that the new controlling shareholder of Samsung Card, Samsung Life Insurance, has grander plans with the company and both its net loans and deposit volumes going forward (Reuters, 2016). Despite only contributing to 0.51 percent of the total assets in the sample in 2015, the magnitude of the outlier of NLDST causes the entire sample's average to jump over 200 percent (OBF, 2017). Adjusting the sample to exclude Samsung Card, *ceteris paribus*, the Korean banking market's average NLDST would even decrease marginally from 106.72 percent in 2014 to 101.96 percent in 2015. After 2013, banks started showing one-digit NLDST, which is invariably the case, however, for investment banks (OBF, 2017), whose business models often do not include a focus on lending.

3.3.3.9 Equity to Assets

Figure 52 shows the development of the equity to assets ratio.

On average, Korean banks saw a decline of their equity in relation to total assets. In 2011, average EA was 8.27 percent and marginally declined over the years to end less than half a percentage point lower at 7.82 percent in 2016. The median value was, from the outset, close to the average value. Afterwards, it saw a jump, in parallel with the increase of the banks in the sample, to around 11 percent, where it plateaued.

It is interesting to note that the lowest values of EA in the sample did not fall far from the average value, around 2 to 4 percentage points below the average (OBF, 2017). This indicates that the distribution of EA values is rather densely assorted around the average – 41 to 74 percent of all banks showed EA of less than 10 percent in these six years (OBF, 2017). Nonetheless, there are few outlier positions when looking in the other direction. More precisely, 2014 to 2016 saw between one and five banks with an EA of over 50 percent (OBF, 2017). 2014 features five banks with more than half of their total assets parked in equity. This included two private equity- and venture capital-focused banks (Q Capital Partners and Woori Technology Investment), one private and asset management bank (Fine Asset Management), one SME-centered commercial bank (Mason Capital)

and, lastly, an investment bank (Yuhwa Securities) (Crunchbase, n.d.; OBF, 2017; Reuters, 2020; Reuters, n.d.).

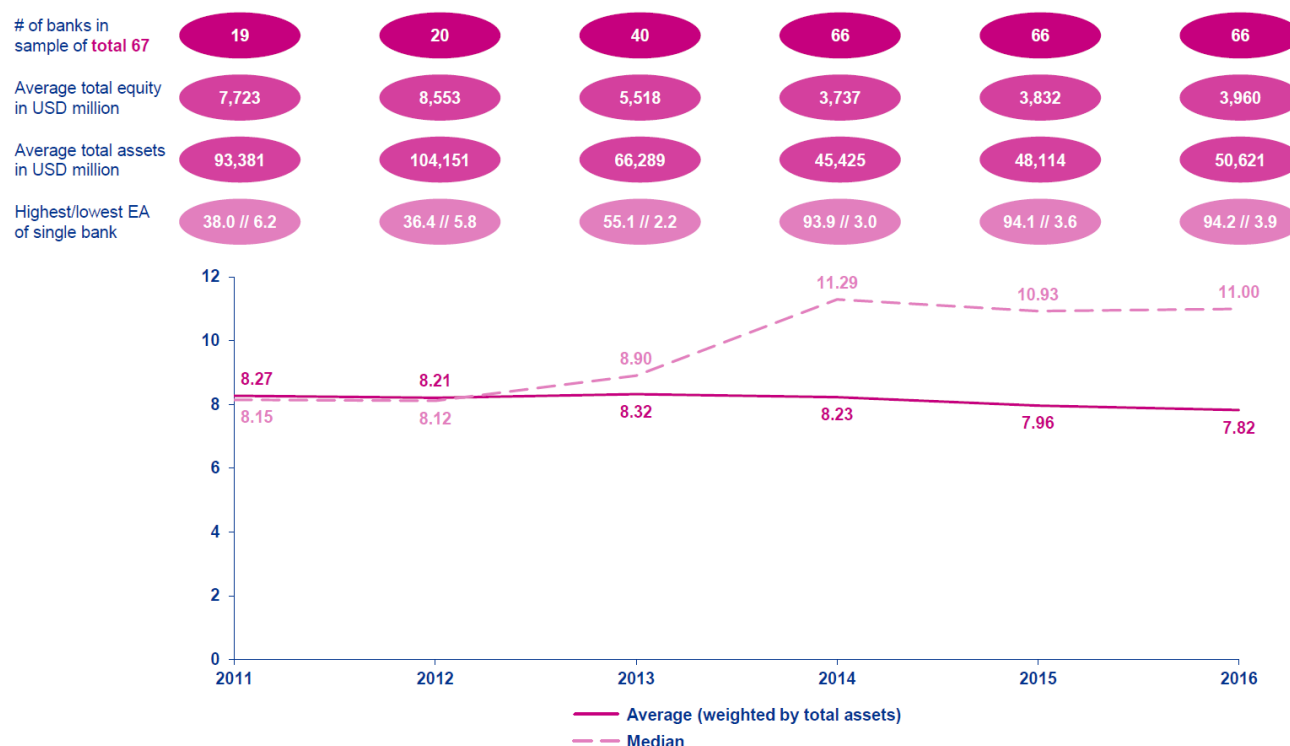


Figure 52: Development of weighted average and median EA of South Korean banks from 2011 to 2016 in percent⁹⁶

3.3.3.10 Income Diversification

The jumpy development of ID in the banking sector of Korea is highlighted in *Figure 53*.

The weighted average of ID stayed anywhere between 29 and 36 percent throughout the six-year research period – starting at 31.95 percent and finishing at 35.82 percent. Median income diversification, however, which was nearly on par with the average ID in 2011, fell to 26.57 percent the following year, before working its way up to 53.39 percent and slumping back to 39.55 percent in 2016. Sample size changes cannot explain the ID development. Instead, the number of banks with ID of less than 30 percent increased from 21 in 2014 to 27 in 2016 (OBF, 2017). This increase, however, is not the result of lessened profitability as both the average operating revenue and net income per bank increased over the same time span (OBF, 2017).

High ID results primarily stem from investment banks and credit card banks that built their business models with an emphasis on non-interest activities (OBF, 2017). From 2013 onwards, there were always two or three banks with negative ID (OBF, 2017). One of these banks is Hyundai Savings Bank, which had consistent negative ID from 2013 to 2016 (OBF, 2017). While the core mission of a savings bank is to store customers' deposits, continuously generating losses from non-interest activities is also not the desired business model. Impetus for this negative spiral for non-interest income was potentially triggered by the bank's recent history: Hyundai Savings Bank was founded

⁹⁶ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

as Daeyeong Savings Bank, then acquired by Hyundai Securities in 2011 and later merged into the KB conglomerate that took over Hyundai Securities, to then again be sold in 2017 (Lee & Lee, 2017).

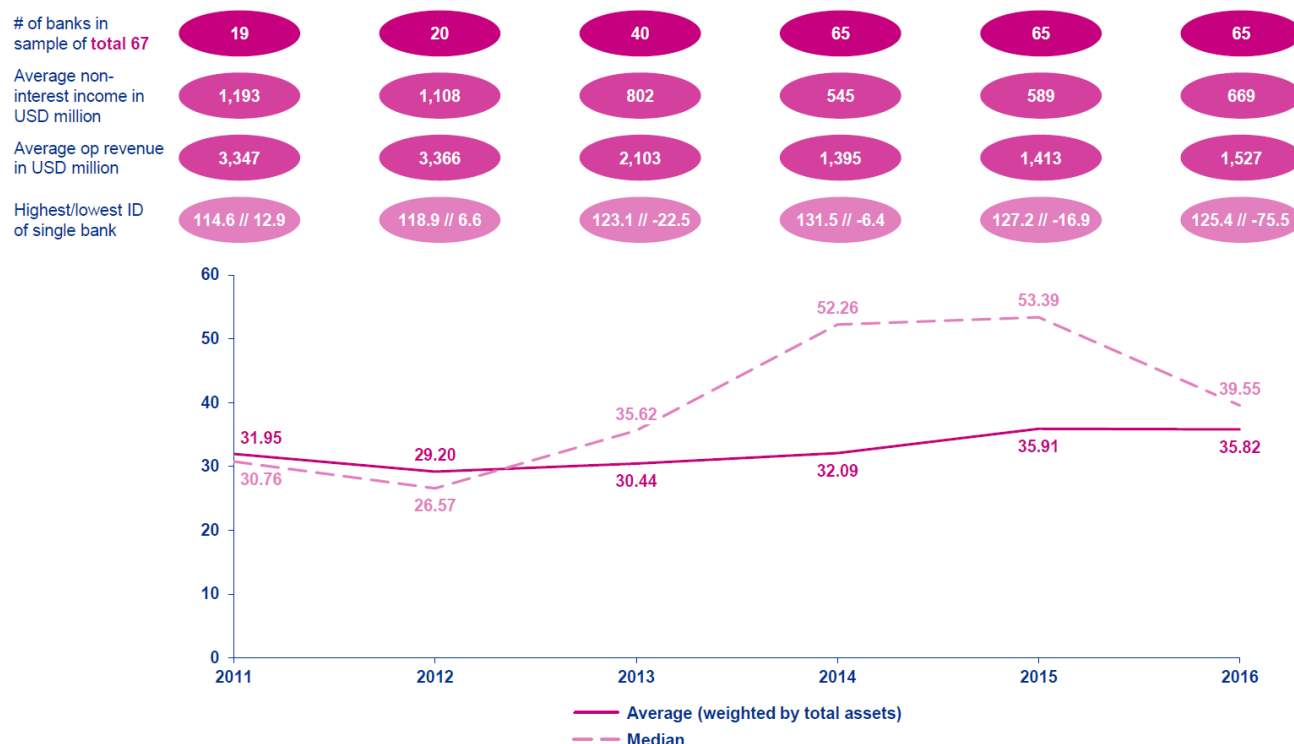


Figure 53: Development of weighted average and median ID of South Korean banks from 2011 to 2016 in percent⁹⁷

3.3.3.11 Non-Performing Loans

Figure 54 shows the percentage of impaired loan volume in Korean banks.

Despite some minor differences between weighted-average and median NPL, both lines show a clear trend of improved asset quality in Korean banks towards the end of the research period. Peaking in 2013, the NPL of 2.20 and 1.95 percent respectively more than halved for the former and also significantly fell for the latter. By the end of the research period, thus, the average NPL stood at 1.02 percent and the median NPL at 1.28 percent, also undercutting the values of 2011 and 2012.

This overall trend also becomes apparent when taking a closer look at the average non-performing loan values as well as total loans and advances to customers per bank. The first stood at USD 1,426 million in 2011 and it saw a significant drop by over two-thirds to USD 463 million in 2016 (OBF, 2017). Furthermore, when accounting for the reduced number of banks in the sample in the earlier years, the tendency holds true (OBF, 2017). The development of gross loans for this ratio is less representative as the initial years already included Korea's big players, thus explaining this stark reduction (OBF, 2017). After 2014, the average loan portfolio per bank rose in incremental steps (OBF, 2017).

Among the extremely low NPL positions, one counts the Korea Securities Finance Corporation, with a consistent NPL of 0.01 percent for the four years (2013-2016) it is included in the sample, despite

⁹⁷ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

having between 34 and 45 percent of total assets in the form of gross loans (OBF, 2017). In 2014, rating agency Moody's rated the bank as Aa3⁹⁸, commenting on the loan portfolio that it "comprises mostly short-term loans, such as margin money lending where loans are over-collateralized" (Moody's, 2014). This risk-averse approach led to the bank exhibiting impairments close to zero (OBF, 2017). Of the handful of banks with NPL in double digits, some do not show a high stake in the lending business (10 percent or less of the total assets amount to gross loans), such as investment bank Kyobo Securities (OBF, 2017). Others, on the contrary, follow a more risk-prone path with elevated NPL in consecutive years, including Woori Investment Bank and Acuon Capital Corporation (OBF, 2017).

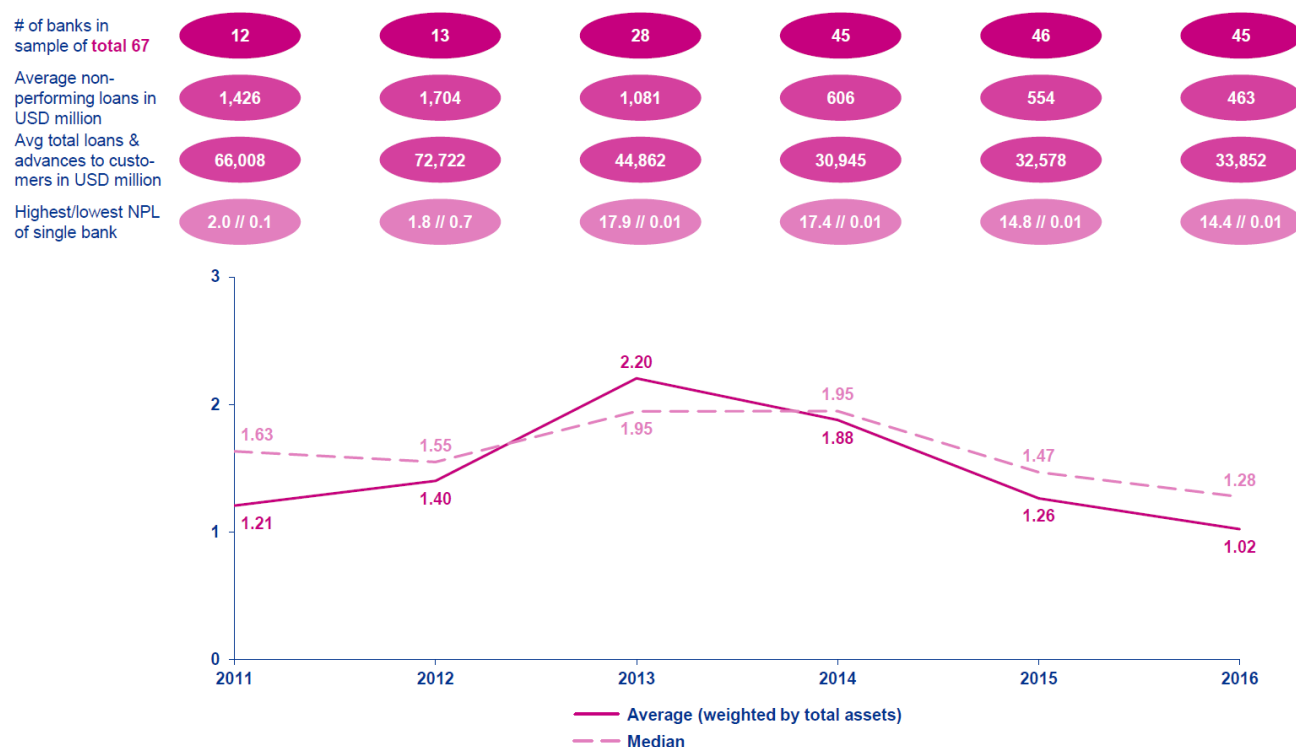


Figure 54: Development of weighted average and median NPL of South Korean banks from 2011 to 2016 in percent⁹⁹

⁹⁸ Aa3 is Moody's (2020) fourth-best grade, as it considers the rated organization "to have high intrinsic, or standalone, financial strength, and [is] thus subject to very low credit risk" (p. 23).

⁹⁹ Based on data from the OBF (2017), variable calculation and supporting data from own calculations, own visualization.

4 Interpretation and Discussion of Findings

4.1 Introduction

Based on the results of the 3 *Analysis*, this chapter is devoted to the thorough interpretation of the results and subsequent discussion of the analytical findings. Through combining the results of the analyses, first, per country and, second, comparing and contrasting them across China, Japan, and South Korea, the interpretation and discussion aim to provide answers to the initially stated research question, which reads:

“What are the similarities and differences of the banking environments and the banking sector performances of China, Japan, and South Korea after the global financial crisis, covering the period from 2011 to 2016?”

Maintaining alphabetical order, the individual junction of all variables of (A) the macroeconomic and regulatory environment analysis and (B) the FRA for each of the countries is performed. This allows for a bigger picture per country – additionally enriched by cross-variable interpretation – building the foundation for the concluding section, the 4.5 *Cross-Country Comparison*.

4.2 China

Looking at the consolidated results of the analysis of the Chinese banking sector – as shown in *Figure 55* – some findings are more obvious than others at first glance, with some interpretation required for the latter.

The first clearly visible development is the steady decline of GDP growth over the years, from 9.5 percent down to 6.7 percent. As is typical with a reduction in economic growth, usually with a brief time lag, non-performing loans increase – slimming growth is the result of a decline in products and services sold, which in turn leads to businesses failing and loans defaulting (Pham, 2018a). While 2012 and 2013 saw a slight improvement from the initial NPL starting value, 2014 saw a jump of 0.29 percentage points from 0.90 to 1.19 percent. This increase equates to a surge of 32 percent in defaulted loans. The next two years saw additions of another 30 and 3 percent respectively. Over the course of the six years under consideration, the compound average growth rate of the bad debt portfolio of Chinese banks was 10.4 percent on a yearly basis, consequently deteriorating the asset quality. In international comparison – see also the reference values for *Non-Performing Loans* under 2.3.3 *Analysis (B): Financial Ratio Analysis* – the NPL values shown in *Figure 55* are significantly lower (e.g., average in the EU in 2017 was 3.72 percent (Ciukaj & Kil, 2020, p. 29)). The numerically better asset quality of Chinese banks, however, should not be confused with proven better risk management. Bloomberg (2020) cites China as “one of the world’s biggest distressed debt markets” (Bloomberg, 2020), with private equity and investment funds cheaply buying sour loans and thereby taking them off the banks’ books. Despite such practices sanitizing NPL portfolios, from a more historical point of view, the overall asset quality seems to have improved (Cheng, Zhao, & Lin, 2017, p. 393). Cheng, Zhao, & Lin (2017, p. 393) found the average Chinese NPL from 2000 to 2013 to be

4.2 percent – potentially, however, part of the reason for the improved asset quality displayed by this thesis' data sample is the fair number of smaller and/or more rural Chinese banks (OBF, 2017) as the researchers only had 82 banks, many of which big players, in their sample.

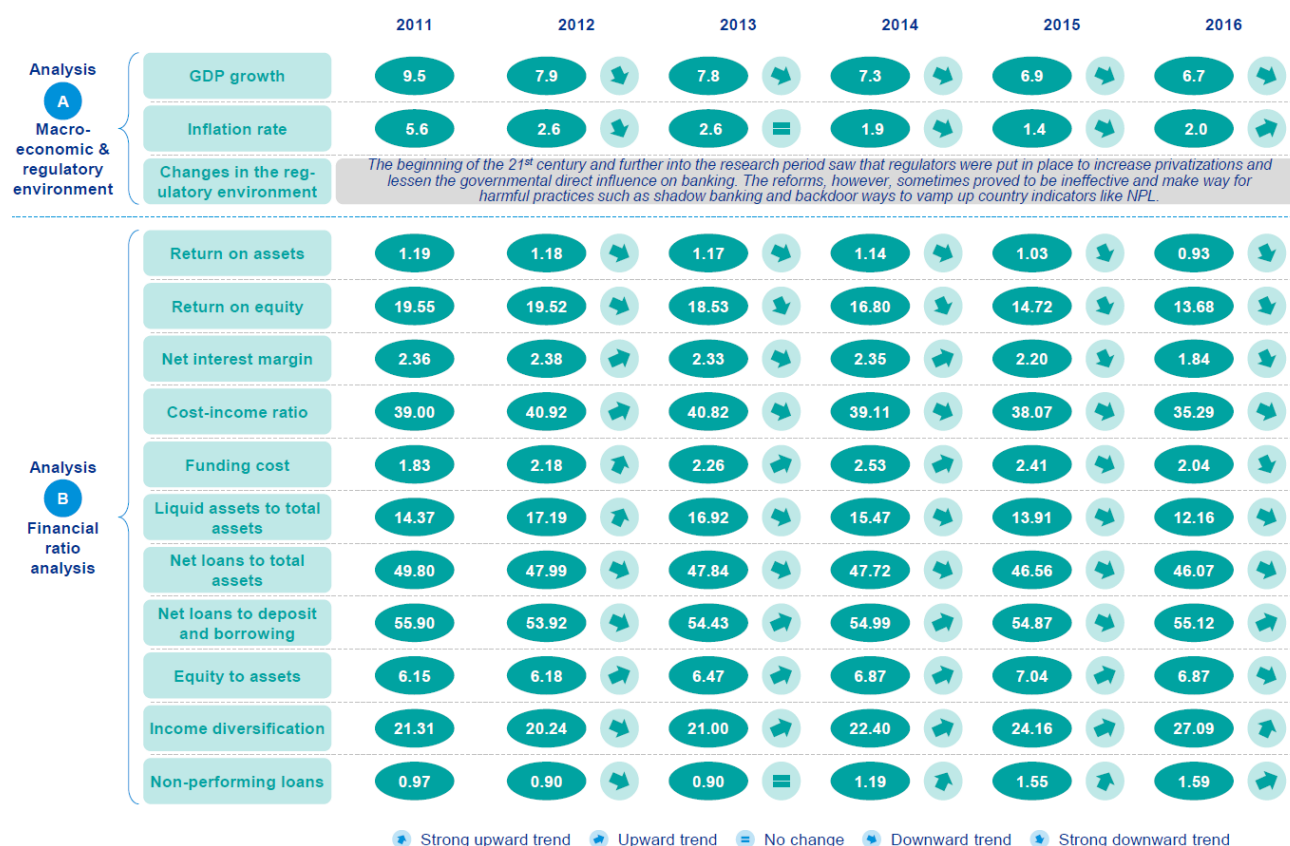


Figure 55: Consolidation of the results of analyses (A) and (B) for the Chinese banking industry

The decline in GDP growth goes hand in hand with an overall reduction of profitability, as both ROA and ROE show. The former drops by a total of almost 22 percent from 1.19 to 0.93 percent, the latter by 30 percent from 19.55 to 13.68 percent. A reduction in these two profitability measures can be triggered, in simplified terms, either by a decrease in returns or an increase in total assets and total equity respectively. Based on the general deterioration of the economic environment in China – or, rather, the path towards the proclaimed “new normal” (Holbig, 2018, p. 342; Yao, 2019) of around 7 percent annual GDP growth – the parallel deterioration of net income is the culprit in the weakening of ROA and ROE (OBF, 2017). Average total assets held per Chinese bank steadily rose over the course of the years, while net income, however, declined (OBF, 2017). Considering equity development, the loss in profitability becomes even more apparent: The rate of equity to assets has, in spite of growing total assets (OBF, 2017), improved by 0.72 percentage point from 6.15 percent in 2011 to 6.87 percent by the end of the research period (in 2015, EA even surpassed 7 percent). At the same time, ROE fell by almost 6 percentage points.

This picture of falling profitability is not initially visible when looking solely at Chinese banks' CIR – which, with 39 percent, was already at the forefront internationally in terms of efficiency in 2011 (Standard & Poor's, 2016). Six years later, the CIR had been optimized even further down to just

above 35 percent; meaning that for every USD or yuan earned, just above one-third was depleted by costs. The initial assumption drawn from an improved CIR was that it is the result of an increase in profits. As has been shown, though, the average net income per bank has weakened by 9.2 percent since 2013 (and 78.6 percent since 2011; this reflects, though, a considerably smaller sample size) (OBF, 2017). Chinese banks, instead, have put forward immense cost cutting and restructuring programs industry-wide, banking on headcount reductions and advances through automatization and digitalization; Wildau (2016c) from the Financial Times saying “[s]luggish top-line growth and rise of digital banking prompt lenders to trim workforce” (Wildau, 2016c).

Pressure on the top-line also becomes clear when looking at the NIM, the net interest income expressed in relation to total assets (Alper & Anbar, 2011, p. 143). Only 20 to 30 percent of Chinese banks’ income is generated through non-interest-bearing activities, meaning they rely on and are heavily influenced by interest income. In the case of China, the development of the NIM is therefore a strong indicator of profitability. While the initial four years saw NIM of above 2.30 percent, in the remaining two years, that value lost over 0.5 percentage points, a total drop of interest income of 21.7 percent. As stated under the variable introduction for *Net Interest Margin* under 2.3.3 *Analysis (B): Financial Ratio Analysis*, there is prima vista no clear interpretation of a potential NIM value without further information, since this variable can be influenced by a wide variety of potential factors (Demirgüç-Kunt & Huizinga, 1999, p. 381). Using the information available from the FRA, it becomes apparent that as the Chinese economy slowed down, overall business activities slowed and NPL rose, leading to a tightening of the Chinese bank spread – thereby leaving the country with an average NIM of 1.84 percent in 2016. Additionally, 2015 brought about the “interest-rate liberalization” (Chen, Qu, Tan, & Yung, 2016, p. 1), allowing banks to set the interest on deposits without state interference. This change could potentially be visible in the NIM value of 2016, with free market forces and the attraction of customers with favorable interest on their savings coming into play. Compared internationally, China lies well below the global average of around 3.5 percent (Datamarket, n.d.) and the Asian NIM of 2.45 percent (Saona & Azad, 2018, pp. 428, 441).

The reliance of Chinese banks on interest income requires further discussion of the additional loan- and liquidity-related ratios – FC, LATA, NLTA, and NLDST. Even though over 70 percent of net income was generated from interest-bearing activities, just under half of the balance sheet total – between 49.80 and 46.07 percent – was constantly “tied up in loans” (Bunda & Desquilbet, 2008, p. 365). International comparison shows that other banking industries have a much higher rate, in the area of 60 and 70 percent (see, e.g., Kumbirai & Webb (2010, p. 43) and Lardic & Terraza (2019, pp. 22, 36-37)).

The remainder of the banks’ assets is not immediately accessible, say, when a bank run occurs or sudden repayments are necessary (Vodová & Stavárek, 2017, p. 161), as the LATA liquidity measure shows. Starting the research period with 14.37 percent, LATA peaked the following year at over 17 percent, before subsequently dropping to 12.16 percent at the period’s end. The amount of liquid assets is a key indicator of both risk and liquidity (BIS, 2008, p. 1). While too high a LATA comes with the opportunity cost of failing to convert these assets into income-generating loans (Alper & Anbar,

2011, p. 144), the opposite, when too many assets are not available, shows potential cracks in a bank's "financial soundness" (IMF, 2006, p. 157). With nearly half of the assets tied up in loans and less than 15 percent that can be readily liquidated, that leaves roughly 35 percent of assets locked up in, for example, securities and investments in associated companies, but also in real estate or goodwill (OBF, 2017). Chinese banks' available assets lag behind the global value of well over 20 percent found by Bertay, Demirgüç-Kunt & Huizinga (2015, p. 329). While the conclusion is not that Chinese banks are financially unsound overall because of the lower LATA, it can be said that they are more prone to experience severe distress in case of financial shocks.

Additionally, Chinese banks score below the international level for NLDST, with a value of around 55 percent from 2011 to 2016. Murphy (2019) argues that "[t]ypically, the ideal loan-to-deposit ratio is 80% to 90%"¹⁰⁰ (Murphy, 2019). This result means that much of the funds theoretically available from customers as well as short-term funds are not wired into loans but are rather used for other investments like capital market activities, which can be both relatively secure or risky ventures (Pritchard, 2020). It was only in 2015 that Chinese regulators lifted the requirement for commercial banks (which make up the majority of the 218 banks in the sample (OBF, 2017)) that prescribed that the loan-to-deposit ratio could not exceed 75 percent (Reuters, 2015). This ban, which was in place for the majority of the research period, does not explain the comparatively low results. For one, research conducted by Cheng, Zhao, & Lin (2017, p. 393) found an average NLDST of roughly 70 percent for Chinese commercial banks from 2000 to 2013. Second, lifting the ban did not increase NLDST in the last two fiscal years under scrutiny – a tendency also predicted by Chinese bankers as a result of the slowdown in economic activity (Reuters, 2015). A probable key reason for what initially looks like Chinese banks not putting the deposited money to good use, may be the practice of "off-balance sheet lending, [thereby] sidestepping government efforts to rein in credit [...]. At the current pace, overall credit could surpass deposits on an adjusted basis within a few years" (CFO Innovation, 2016). This reflects the sometimes ill-functioning market liberalization efforts on behalf of the Chinese regulator (Huang & Wang, 2018, p. 291). Such off-balance sheet dealings are not reflected in NLDST. It seems, from the results and the additional research on the topic, that banks are dealing in various ways with their deposits and short-term funds – some on the cautious side, concerned with credit risk in a slowing economy, while others take on potentially riskier ventures, building vehicles to lend through off-balance sheet constructs, thereby reflecting to the outside (i.e., via their balance sheet) a low NLDST.

Considering the funding cost, that is, the cost banks face for providing loans to their customers, Chinese banks proved to be efficient in so doing for most years by relying on both customer deposits and interbank lending. The base rate offered by the PBOC – the rate at which banks can take credit from the central bank – was 2.25 percent for all years under scrutiny (CEIC Data, 2021a). For 2011, 2012, and 2016 – the FC was well below the base rate (CEIC Data, 2021a), starting at 1.83 percent

¹⁰⁰ Murphy (2019) refers with the loan-to-deposit ratio to a similar, but slightly different ratio than NLDST. The former does not include short-term funds (Murphy, 2019), which NLDST does. During the time of the research period, the share of short-term funds in relation to the sum of deposits and short-term borrowing was between 2 and 5 percent (OBF, 2017); thus, I argue that the overall direction of the loan-to-deposit ratio also holds true for NLDST.

in 2011, the most cost efficient of the observed years, before later increasing to a high of 2.53 percent in 2014, and ending the observation period with 2.04 percent. The potential influence of inflation on FC is not visible, as inflation remained quite steady and low, between 2.6 and 1.4 percent (with the exception of an elevated inflation rate of 5.6 percent in 2011; this year, though, the cost of funds remained low) (Gupta, 2010).

The main takeaways from this synopsis of all variables used to analyze the Chinese banking industry are that the slowdown of economic activity is directly visible in the banks' profitability and NPL, despite banks being highly efficient in securing funds at a favorable rate. Furthermore, Chinese banks heavily relied on interest-bearing activities, which make up over 70 percent of net income – intentional diversification strategies could support the dispersion of income sources. All of this does not point to an immediate threat looming over the industry; however, if there were a sudden shock to the financial markets, liquidity buffers are below international levels, putting banks in a comparatively riskier position. Additional risks may come from the observed practice of greatly relying on off-balance sheet dealings (CFO Innovation, 2016). Finally, potential impacts of regulatory easing for banks are not directly visible in the FRA variables; it is therefore unclear whether regulation could help in cases of financial turmoil.

4.3 Japan

Figure 56 shows the overview of all variables of the analysis of the Japanese banking sector.

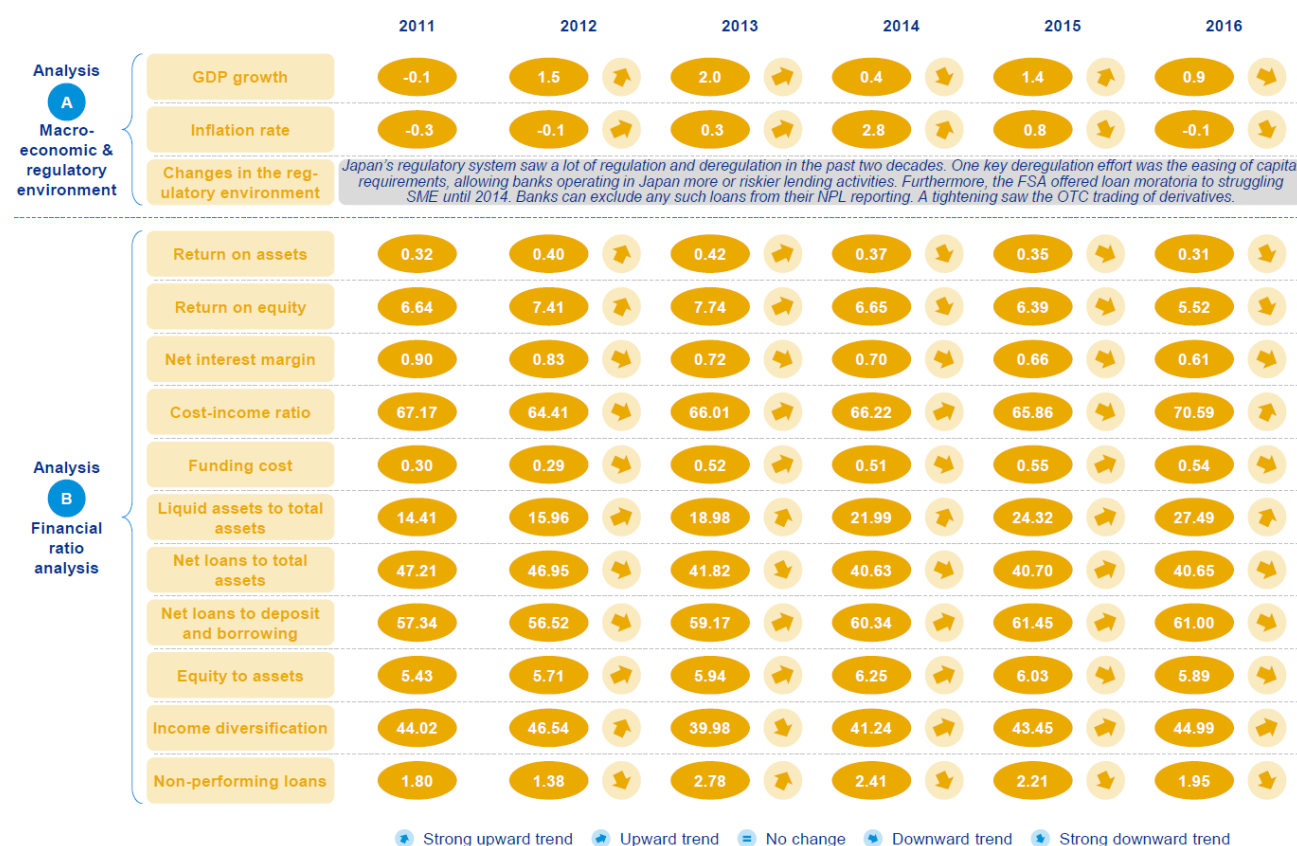


Figure 56: Consolidation of the results of analyses (A) and (B) for the Japanese banking industry

The Japanese economy saw ups and downs in terms of GDP growth from 2011 to 2016. These ups and downs are reflected immediately the following years, both in terms of the profitability variables, ROA and ROE, as well as NPL. In 2011, the economy saw a contraction, thereby negatively correlating with NPL, which was at 1.80 percent. The following year, GDP grew by 1.5 percent and NPL fell by 0.42 percentage points to 1.38 percent. In parallel, ROA and ROE saw an increase from 2011 to 2012. For most years, the GDP swings were directly mimicked by these three variables. Only 2015 saw an increase in GDP growth while ROA and ROE saw a slight reduction. Similarly, NPL development lagged behind in some years, which is reasonable as the impact of nearly stalling economic activity can take some time to impact businesses' and individuals' capacity to repay their credits (Ari, Chen, & Ratnovski, 2020). What is important to note concerning NPL is the degree of change witnessed within single years – the ratio stood at 1.38 percent in 2012, with that value increasing by over 101 percent within 12 months to 2.78 percent. This means that within a single year the proportion of outstanding loan volumes that customers were either overdue for a prolonged period of time or completely unable to repay in relation to sound debt, more than doubled. Post-GFC loan moratoria ended in 2014, allowing banks to exclude it from their NPL reporting (Imai, 2019, p. 15), heralding a return to normalcy not directly visible through the increases in the NPL values in 2015 and 2016 (both values declined in relation to the previous year).

Not only do ROA and ROE show the sinking profitability of Japanese banks, NIM further highlights the fall. NIM reflects how well banks manage to leverage the spread between lending and deposit interest rates (Weistroffer, 2013, p. 1). At the beginning of the research period, the bank spread was 0.90 percent, lowering itself every year to finally reach 0.61 percent, a negative compound annual growth rate of -7.5 percent. From a simplified income perspective, this means that, if a Japanese bank earned 100 yen from interest-bearing activities in 2011, it earned only close to 68 yen five years later. The global NIM stands in stark contrast, as, in 2015, it was 3.56 percent (Datamarket, n.d.), over five times larger than Japan's. The reason behind this slimming bank spread is the historically "ultra-low interest rate environment in which spreads between funding and lending rates have been compressed" (Weistroffer, 2013, p. 1). Income diversification shows that income from non-interest-bearing activities does not help declining profitability – the share of income from provisions and trading activities (excluding interest from trading activities) stays between 40 and 45 percent for all those years.

This overall dire picture put pressure on Japanese banks to reduce costs (Omi & Tisseverasinghe, 2014, p. 4; Weistroffer, 2013, p. 7). Interestingly, though, the development of the CIR tells a different story. This finding is in line with Weistroffer's (2013, p. 7) observation that Japanese banks managed to significantly reduce costs (especially through the reduction of headcounts) in the early 2000s. Nonetheless, from 2005 onwards, costs – and with them CIR – rose again, as revenue could not offset the reinstated costs (Weistroffer, 2013, p. 7). Japanese banks were able to lower their CIR from the 2011 starting point of 67.17 percent to 65.86 percent in 2015. In 2016, however, there was a jump to over 70 percent, displaying an average CIR increase per Japanese bank of more than 7 percent in a single year. Despite the heterogeneity of CIR values around the globe (Richter & Gischer, 2019, p. 361), it can be deduced that Japanese banks are on the upper end of figures witnessed by

various research endeavors (see, for example, Ledonne & Garrido (2019) or Richter & Gischer (2019, pp. 372-373)). In comparison with other Asian banks, where Ledonne & Garrido (2019) found the majority of banks within the 32- and 64-percent margin, Japan even outperformed them. The mounting pressure on Japanese banks within the very low interest rate regime of the BOJ (Weistroffer, 2013, p. 3) – the short-term interest rates offered by the central bank from 2011 to 2016 ranged between 0 and -0.1 percent (Trading Economics, 2021) – is, as already touched upon above, further supported and highlighted by the development of the main profitability variables. The banks struggled with keeping up with new business models and income streams, as well as efficiency efforts, all while the BOJ lowered interest rates and bought back government bonds to spur lending and consumption, a scheme the public is hesitant to fully engage in (Hong & Kandrac, 2018, pp. 8-9; Weistroffer, 2013, pp. 4-8).

The funds used for credits to customers come to a large extent from deposits, which is signaled by the liquidity ratio NLDST. Deposits from customers and the interbank market alike, as well as short-term borrowing, were the source of 57 to 61 percent of all funds used for loans to customers, which is slightly below, for example, the South African and Bangladeshi banking sectors (Kumbirai & Webb, 2010, p. 44; Qamruzzaman, 2014, p. 175). Despite the ratio of NLDST remaining relatively constant over the years, the proportion of the ratio's counter and denominator highlight an interesting development – the average net loan totals per bank fell by over USD 10 billion (OBF, 2017). Furthermore, deposits fell by almost USD 4 billion (OBF, 2017), meaning Japanese bank customers displayed less interest in taking out credit (as a possible result of mistrust in central bank measures and decreased inflation expectation (Nishizaki, Sekine, & Ueno, 2014, pp. 24-33)) and also reduced their deposits (for example, through shifting deposits to securities and derivatives or wiring funds abroad). FC for loans to customers was at around 0.3 percent in the first two and around 0.5 percent in the final four years under consideration. Japanese banks relied more on their customers' deposits and the interbank market instead of making use of funds from the BOJ. By doing so, Japanese banks accepted to pay a premium for funds as central bank funds were set at a base rate of 0.1 percent for all years but 2016, when the BOJ broke with tradition in imposing a negative interest rate of -0.1 percent (CEIC Data, 2021b; Harding, 2016). The BOJ's lending scheme was not directly encouraging banks to borrow money; Kihara, Canepa, & Schneider (2020) even said the central bank was "punishing banks for sitting on their idle cash" (Kihara, Canepa, & Schneider, 2020) with the negative rates. "The central bank [...] will charge banks 0.1 percent for parking additional reserves with the BOJ to encourage banks to lend and prompt businesses and savers to spend and invest" (Sano & Kihara, 2016). That change was a stunt by the BOJ to keep banks from depositing money with them on the one hand, as they would now have to pay interest on it, while on the other hand stimulating lending – two measures designed to incentivize Japan's banks to grant credit to SME in times of an expected upcoming recession (Kihara, 2020; Shirai, 2015, pp. 3-4). The BOJ's base rate change came along with an increased pressure on bank spreads, which, as discoursed before, is probably also a factor in the further decline of the NIM in 2016.

Continuing with liquidity ratios, NLTA and LATA signify that, first, Japanese banks are overall quite liquid and, second, improved their liquidity over time. The share of total assets assigned to customer

loans was 47.21 percent at the start of the analysis and within two years, it settled down to around 41 percent. Compared internationally, NLTA lies below observed values in Germany (55 to 62 percent) (Lardic & Terraza, 2019, pp. 36-37), Bangladesh (66 to 73 percent) (Qamruzzaman, 2014, p. 175), and South Africa (73 to 76 percent) (Kumbirai & Webb, 2010, p. 43). The level of NLTA leaves nearly 60 percent of total assets for other balance sheet positions, such as pure cash reserves, interbank lending, derivatives and securities, investments in affiliates, and real estate (OBF, 2017). Securities make up the largest share by far (OBF, 2017). They include highly liquid assets available for sale as well as tied up securities held to maturity (OBF, 2017). In total, securities account for anywhere between 25 and 33 percent of the total assets of all Japanese banks combined (OBF, 2017). While other asset positions like repurchase agreements (3 to 4 percent), derivatives, as well as loans to banks (both 2 to 3 percent), and other assets that include real estate, property, and insurance assets (constantly 6 percent) remained unchanged, the position of cash and balances with the BOJ rose from 5 percent in 2011 to 19 percent in 2016 (OBF, 2017). This increase absorbed the relative and absolute reduction of net loans to customers (OBF, 2017). The BOJ's further uptake in buying back government bonds to inject cash into the economy was likely a trigger for this uptake in cash and central bank deposits, as was the FSA announcing the introduction of the liquidity coverage ratio (LCR)¹⁰¹ for internationally active banks, driving the need for liquid assets up (BCBS, 2016, p. 4; Reuters, 2021). In accordance with the shift of net loans to cash and central bank balances, the LATA ratio saw a shift in unison. While LATA was at 14.41 percent in 2011, it almost doubled to 27.49 percent five years on, showing the opposite trends of NLTA (with one exception in 2015 where both ratios saw increases). Coming back to NLTA for a concluding remark, what is striking about the profitability pressure Japanese banks face is that the analysis of NLTA showed there is roughly 60 percent of the balance sheet left to potentially be put to use for non-interest income generation. Despite provision schemes for customers (e.g., transaction fees) or securities making up 10 to 15 percent of further income generating assets, Japanese banks do not manage to secure more than 46 percent of the total net income through additional sources of income as ID shows. In essence, this means, banks not only failed to uphold their NIM, but with non-interest income they are in an even heftier fight.

The regulatory landscape, especially, saw the easing of capital adequacy requirements, with banks needing to maintain the same capital adequacy levels (4 and 8 percent respectively) but the calculation itself being potentially to the benefit of banks (Tongurai & Vithessonthi, 2020, pp. 4-6). Such relaxed standards would have allowed banks to engage in riskier and/or simply more (in terms of volume) loan disbursement (Tuovila, 2020) – both of which would generate highly needed additional revenue. Overall, though, looking at NLTA, Japanese banks seem to have preferred to keep their distance from additional loans (maybe because of the low yield, as shown by the NIM) as NLTA fell, compounded by almost 3 percent per year. Speaking of capital, equity to assets – despite not directly impacted by the lifting of capital requirements (the easing was on the calculation of risk-

¹⁰¹ The LCR measures, in simplified terms, the relation of highly liquid assets to net cashflows (BCBS, 2016, pp. 9-10). The ratio is part of Basel III and Japan announced in 2014/2015 that LCR reporting will be required, coming "into effect in March and June 2015" (BCBS, 2016, p. 4).

weighted assets, hence no changes in equity were required) (Tongurai & Vithessonthi, 2020, pp. 5-6) – saw an increase of around 0.3 percentage points per annum in the first four years. At its peak, the average Japanese bank had an EA ratio of 6.25 percent. On the global scale, Japan trails behind an international benchmark (though for the period from 1999-2000) of 10.6 percent (Bertay, Demirgüç-Kunt, & Huizinga, 2015, pp. 327-328). It may be cheaper for Japan's banks to have an equity multiplier of anywhere between 16 and 18, rather than one of 9, as is the case with the global benchmark, but it makes for having less capability to absorb future shocks (Hayes, 2020).

The Japanese banking industry had long been facing challenges, largely attributable to heaps of mismanagement by regulating bodies as well as the struggling economy the industry is embedded in (Kanaya & Woo, 2000, p. 4; World Bank, 2019c). In conclusion, (A) the macroeconomic and regulatory environmental analysis and (B) the FRA showed that the challenges were not overcome during the years under scrutiny either. Japanese banks have a strong profitability issue, signaled by all of the profitability variables, which is further exacerbated by an increasing cost problem. Furthermore, banks fail to diversify their income as they are unable to generate sustainable revenue from non-interest income despite the majority of their assets not being tied to loans. Despite this dire picture, the Japanese banking industry cannot be diagnosed with an immediate threat to its stability, but the sector will, in the long run, need an overall transformation if it aims to prevail; a transformation that enables banks to be more profitable, more diversified, and more cost-sensitive.

4.4 South Korea

Figure 57 gives the summary of the South Korean results from the *3 Analysis*.

The country managed over the six years in question to keep its GDP level quite constant, at a rate of around 3 percent per annum. This constant growth is reflected in the two profitability indicators, ROA and ROE. As economic theory prescribes, a growing economy should also deliver measurable increases in return (Ferreira C., 2013, p. 25). With the growth directionality of the country's output indicated by the trend markers, the two variables follow suit. What appear to be heavy fallbacks in the first two years observed (from 2011 to 2012 both ROA and ROE lessen by more than 30 percent) can be attributed to the OBF's (2017) smaller sample size for those initial years. The 0.42-percent baseline for ROA in 2013 is therefore more reliable, improving to 0.51 percent by 2016. Similarly, ROE starts at 5.04 percent and reaches 6.51 percent. These developments correspond to compound annual growth rates of 6.7 and 8.9 percent respectively. The overall moderately positive performance of the two ratios places South Korean banks within the ranks of reference values – ROA typically hovers in the lower single-digits (the EU average in 2016 was 0.2 percent, Turkish banks were higher with 1.9 percent) (Alper & Anbar, 2011, pp. 147-148; ECB, 2019). ROE is slightly lower than the global average of over 10 percent in 2010 (ECB, 2010, pp. 15-16).

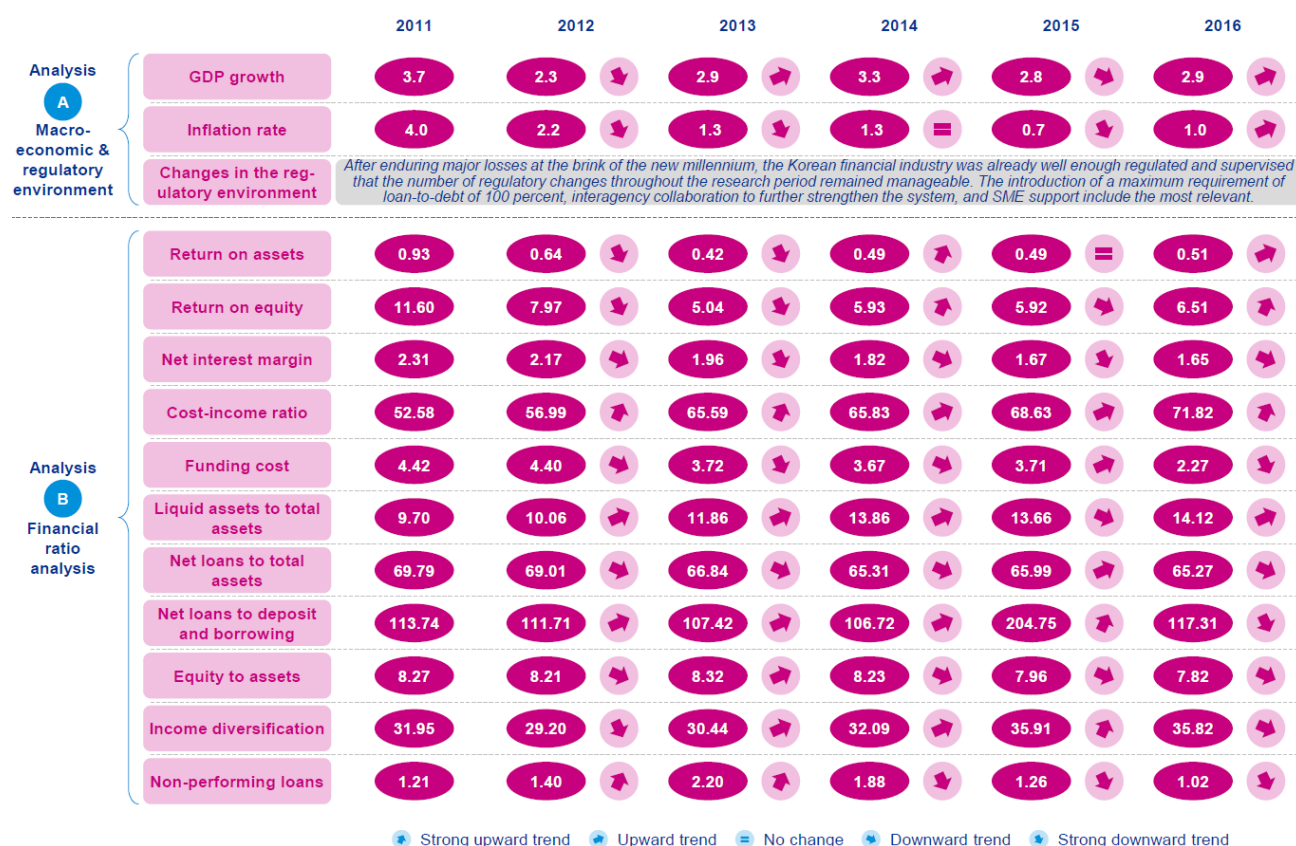


Figure 57: Consolidation of the results of analyses (A) and (B) for the South Korean banking industry

Korea's NPL portfolio is also in line with its GDP performance. Despite the trend markers not showing the reversed direction in any given year (as, for example, a strong increase in economic activity – often with a certain time lag – foreshadows a falling NPL (Pham, 2018a)), the NPL values speak for themselves. Ignoring the initial two years due to the reduced number of banks in the sample (OBF, 2017), Korean banks had on average 2.20 percent of total outstanding loan volumes labelled as defaulted in 2013. By 2016, that value has more than halved, on average reducing exposure by roughly 23 percent on a yearly basis. Compared internationally, South Korea managed to put itself in a highly favorable position, with just over 1 percent NPL while at the same time too low levels of NPL can take a toll on profitability as banks are highly restrictive in taking on risks in their lending portfolio. Korean banks, however, seemed to reach clearly reduced levels of defaulted loans without sacrifices in ROA and ROE (at least no more than they already lagged behind their global peers) through too much conservatism or reduced amounts of disbursed loans (NLTA remained more or less constant over the years). In the World Bank's (2020a) country NPL list, South Korea ranked third from last of a total of 137 countries in 2016¹⁰² – smaller NPL values were only shown by Macao and Monaco, each with a ratio of 0.2 percent. The world's unweighted average NPL was 7.42 percent for

¹⁰² The NPL ratio the World Bank (2020a) lists for South Korea in 2016 is 0.47 percent as opposed to 1.02 percent calculated for this thesis. Reasons for the difference include that (i) the data is submitted by the local authorities for compilation, thus the reported data includes every bank per country and (ii) the NPL derived for the thesis is weighted by asset size of the banks in order to adjust values in terms of impact on the total industry, something not done for the World Bank's (2020a) data.

the same year (World Bank, 2020a). EU countries too, in 2017, had an average NPL of 3.72 percent (Ciukaj & Kil, 2020, p. 29), almost four times the amount the South Korean banking industry reported.

Despite ROA, ROE, and NPL painting a positive picture, the results for CIR, NIM, and ID let one conjecture that there is also tension underneath this seemingly profitable and risk-mitigating surface. Korean banks, namely, seem to be facing pressure on both costs and bank spread. A closer look at the CIR shows that while just over half of the revenue received in 2011 ended up paying for the banks' cost base, in 2016 that ratio had risen to close to three-fourths. Even when only considering the years from 2013 onwards, the CIR rose by over 6 percentage points. Costs for South Korean banks climbed at a faster pace than inflation caused prices to increase over the same time period – indexed in 2013, inflation drove prices up by 3 percent overall until 2016, and CIR advanced by over 9 percent. The cost development of South Korea's banks, hence, was not the (sole) result of increases in salaries and prices for expenses made, but the inability to manage costs effectively and have income grow at the same or at a steeper inclination. Considering NIM, it is immediately visible that interest income per dollar or won lent must have significantly shrunk throughout the research period – the bank spread of 2.31 percent in 2011 had fallen by 0.66 percentage points or 29 percent until 2016, reaching 1.65 percent. ID, the proportion of non-interest income to total income, reveals the efforts undertaken to counter this development. From 2013 to 2016, banks managed to increase the share by 5.38 percentage points – Korean banks made themselves less dependent on their interest-earning activities. These improvements in ID, paired with the negative developments of CIR and NIM, seem to have warded off an overall decline in profitability and managed to produce the moderately positive developments of ROA and ROE, as described above.

Another positive effect on profitability comes from the cost of funds, which saw – with a brief and small interruption in 2015 – a continuous fall over the years. While South Korean banks paid a calculative average interest rate of 4.42 percent at the beginning of the research period, that rate almost halved by 2016. In essence, banks managed to cut their interest expenses in half. Looking singularly at FC, the conclusion is that Korean banks improved their funding costs. But when contrasted with the BOK-offered base rate, the picture shifts. The central bank's policy rate saw a rollercoaster ride over the years, while always staying clearly below the cost of funds Korean banks faced (Country Economy, 2021). At the start of the research period, the base rate was 2.50 percent, rising to 3.25 percent in 0.25-percent increments (that peak was recorded in 2011 and 2012), and then dropping to 1.25 percent in similar fashion, reaching the research period's lowest and final rate (Country Economy, 2021). The BOK would even offer South Korean banks favorable rates (that is, rates beneath their own FC), as their price chart from May 2020 suggests: Intraday trading is interest free, one-day liquidity loans come at a premium of 0.1 percent over the current base rate and one-month loans come at a 0.25 percent annual rate (Bank of Korea, 2020). Even if the conditions offered by the BOK were less favorable during the observed years, it is likely that financing more through the BOK's lending scheme would have been cost sensitive. Furthermore, it is striking that, when looking at NLDST, which shows that over the course of all the years assessed, Korea's banks used all of their customers deposits, short-term debt, and additional funds to finance their lending activities. The ratio remained anywhere between 107 and 117 percent. Only 2015 saw an outlier year, when the

country reached an NLDST ratio of 204.75 percent; that is, the total of loans given to customers was over twice the amount of banks' deposits and short-term borrowing. Besides the one-time irregularity witnessed for Samsung Card (see also the discourse under 3.3.3.8 *Net Loans to Deposit and Borrowing*), a likely additional cause for that spike was the regulatory relaxation by the FSC in 2014 on loan-to-value and debt-to-income ratios to give the underperforming housing market a boost; a relaxation curbed again the subsequent year (Tierno, 2017)¹⁰³. As Korean banks were indebteding the country by the time of the GFC, by generating new debt through the issuance of bonds towards lending activities, the FSC demanded that banks retain a loan-to-debt ratio of less than 100 percent (Hyun, 2016, p. 710). While NLDST is not a direct translation of the loan-to-debt ratio as it misses long-term debt, such as debt acquired through bonds, the surpassing of loans in relation to deposits and short-term funds indicates that South Korean banks likely lurk just below the regulatory threshold. NLDST over 100 percent for individual banks is not uncommon; however, seeing it for an entire country for at least six consecutive years sets off certain alarm bells – as it means that South Korean banks carry associated risks with their exposure in the events of, say, economic slowdown or a bank run (Lardic & Terraza, 2019, p. 24; Murphy, 2019). In terms of NLTA, the proportion remained relatively constant, with around two-thirds or slightly more of the balance sheet total being locked up in loans. Thus, both increases and decreases in loan volume went in lockstep with proportional increases and decreases in total assets.

The overall upward LATA trend counters – at least to some extent – the potential risks of an elevated NLDST as it provides South Korean banks with easily available liquidity, if needed. Nationally, the country improved its access to quickly accessible funds by almost 5 percentage points or over 45 percent, starting at 9.70 percent in 2011 and ending at 14.12 percent in 2016. Internationally, however, South Korea proves to be in the lower scoring segment of countries, which, on average have a LATA of almost 24 percent (Bertay, Demirgüç-Kunt, & Huizinga, 2015, pp. 327-329). While, admittedly, overly high levels of liquidity are also considered “an indicator of inefficiency (since too much liquidity comes at the cost of less bank intermediation)” (Bertay, Demirgüç-Kunt, & Huizinga, 2015, p. 328), with Korea ranking in the bottom half of over 100 countries under scrutiny, this is not the case. Subsequently, it can be surmised that it is a good sign for the banking industry's robustness to stress that liquidity levels rose (in absolute terms, the level stayed relatively constant from 2013 onwards but total assets decreased, thus the improved liquidity). The potential to cushion risks and financial shocks is accompanied by EA, as banks with a higher degree of shareholder equity (despite equity being more expensive than debt) are considered more stable in times of crisis (Kenton, 2020; Mergaerts & Vander Vennet, 2016, p. 68; Toader, 2014, pp. 426-427). However, for South Korean banks it is rather the case that, as is the case with LATA, when compared internationally, the country did not outperform the global average Bertay, Demirgüç-Kunt, & Huizinga (2015, pp. 327-328) found to be 10.6 percent for the first decade of the new millennium. Other countries were also shown to have more equity than South Korea (see, for example, Almazari (2014, p. 132) or Alper & Anbar

¹⁰³ From 2014 to 2015 the average net loan volume increased by over USD 1.6 billion per bank or 5.4 percent. The year after, that swelling reduced to just over USD 1.3 billion per bank or 4.1 percent, the curbing already showing first effects.

(2011, p. 147)). As a consequence, the EA values, anywhere between a high 7 and a low 8 percent during the research period, add to a picture of South Korea's banks not being entirely risk-averse.

The analysis of the South Korean banking industry proves to be heterogeneous. On the one hand, the country manages to secure increases in profitability over time and a reduction of its NPL portfolio all while its economic growth remains at around 3 percent annually. On the other hand, there lurk potential risks as costs swell, bank spreads diminish, and a certain credit risk exposure is given through the elevated levels of net loans to deposits and short-term funds. As a consequence, one can contend that on the surface, Korea manages to provide a solid snapshot of its industry, but once one starts to investigate below that surface, it is not all rosy.

4.5 Cross-Country Comparison

After having completed the interpretation and discussion of findings on a country level, this subchapter is solely focused on the similarities and differences between China, Japan, and South Korea. It is important to note that the absolute values of the variables and ratios provide fewer insights into the similarities and differences rather than trend evaluation, variable development over time, as well as a look beyond the three countries in order to compare them with international benchmarks. While absolute values provide additional information, they, as the *3 Analysis* has shown, differ greatly at times between the countries. Despite being sensible to additionally compare the absolute results and draw conclusions, the initial approach to discussing the results is to focus on the types of similarities and differences made visible through the analysis before getting into the margins between the quantitative variables.

Figure 58 provides an overview of the degree of similarities and differences among the countries both when looking at the individual trend over the course of the research period (labelled “country development”) and in contrast with a global benchmark where applicable (labelled “global benchmark”). The global benchmark trend is deduced from the countries’ developments and compared with global benchmark values. Similarities can occur between all three countries together or simply between two of them.

The high-level finding of the *3 Analysis*, also summarized in the lower section of *Figure 58*, across the three countries, throughout all variables of (A) the macroeconomic and regulatory analysis and (B) the FRA, is as follows:

- In direct comparison of the country developments, there are
 - five variables with a high degree of similarity in all three countries (all five of which occur for the FRA)
 - eight variables with a high degree of similarity to be found in two of the three countries
 - seven variables with clear differences, where one country diverges from the other countries’ results

- When comparing the Chinese, Japanese, and South Korean results with international benchmarks, there are
 - five variables with a high degree of similarity with all three countries homogeneously being either above or below international reference values (hence, a similarity across the countries is given on the global stage)
 - five variables with a high degree of similarity to be found in two of the three countries
 - seven variables with clear differences, where one country contrasts itself from both the sample and the global peers
- The regulatory environment and the overall picture drawn for each of the countries need a separate discussion due to their qualitative, more complex nature

In the following, the similarities and differences in the results are delved into and the findings discoursed.

		China		Japan		South Korea	
		Country development	Global benchmark	Country development	Global benchmark	Country development	Global benchmark
Analysis A Macro-economic & regulatory environment	GDP growth	—	—	+	+	—	=
	Inflation rate	—	—	+	+	—	—
	Changes in the regulatory environment	Not applicable due to individuality of regulation					
Analysis B Financial ratio analysis	Return on assets	—	—	—	—	—	—
	Return on equity	—	=	—	+	—	+
	Net interest margin	—	+	—	+	—	+
	Cost-income ratio	—	=	+	—	+	=
	Funding cost	+	n/a	+	n/a	—	n/a
	Liquid assets to total assets	—	=	+	=	+	=
	Net loans to total assets	—	+	—	+	—	—
	Net loans to deposit and borrowing	—	+	+	+	+	—
	Equity to assets	+	+	+	+	—	+
	Income diversification	+	+	+	—	+	—
	Non-performing loans	+	+	+	+	—	+
Summary for both analyses & all countries	# of similarities across all 3 countries	5	5				
	# of similarities across 2 countries	8	5				
	# of differences	7	7				

Country: Overall variable increase from 2011-2016
Global development: Benchmark values lie below country value

Country: Overall variable decrease from 2011-2016
Global development: Benchmark values lie below country value

Global development: Country values lie between benchmark values

Figure 58: Cross-country comparison of the results of analyses (A) and (B) among China, Japan, and South Korea as well as with reference to global benchmarks

Despite not showing strong direct similarities, it is important to start with the cross-country discourse on the level of (A) the macroeconomic and regulatory environments of China, Japan, and South Korea, as they frame the setting of the banking industries. The overall economic environment that these three countries faced throughout the research period is, for China and Japan, characterized by a slowing in economic output – the former saw an absolute contraction in GDP growth by 2.8 percentage points or almost 30 percent from 9.5 to 6.7 percent. This reduction, however, is part of China's overall strategic plan to transition from a less sustainable, booming economy to a more mature one (Holbig, 2018, p. 343). South Korea saw a reduction of roughly 22 percent from an annual GDP growth of 3.7 percent in 2011 to 2.9 percent in 2016. This picture, however, is not as drastic when also considering the years in between. After recovering from the GFC, South Korea managed to keep its yearly GDP growth in the vicinity of 3 percent (World Bank, 2019c). While not comparable to the levels of China, South Korea is considered part of an economic elite, especially among the more mature economies (World Bank, 2019c). Oversaturation, in contrast, is the fate Japan is facing with its sometimes negative GDP development. As GDP growth was -0.1 for the country in 2011, its absolute increase by 1.0 percentage points allowed the country to present a slightly more positive outlook by the end of the research period and is thereby in the club of economies such as South Africa, Cuba, or Canada (World Bank, 2019c). As heterogeneous as the GDP values are, so, too, is the comparison with an international benchmark. The global average GDP growth was 3.2 percent in 2016 – a value Japan underscored, South Korea was somewhat at par with, and China over exceeded (World Bank, 2019c). The heterogeneity continues when looking at inflation rates – China and South Korea both decreased their levels of inflation (China by 3.6 percentage points from 5.6 to 2.0 percent, South Korea by 3.0 percentage points from 4.0 to 1.0 percent). With that, the two countries lie above the global world inflation rate of 1.5 percent (World Bank, 2019d). Japan continued its misery in chronically suffering from deflation, staying in the negative when considering only beginning and ending values (besides one outlier of 2.8 percent inflation rate, the country lurked around 0 percent in all other years in between, too) (World Bank, 2019d). What all three countries have in common is that by 2016 neither of them were reaching their set target levels of inflation any longer; both Japan and South Korea aim for 2 percent (BBC, 2014; Roh & Kim, 2019), China for 3 percent (Lin & Wang, 2013, p. 3049).

Speaking of regulation, the similarity the countries share is that when compared internationally, the regulatory pressure in the research year seems to be much less than, say, in the EU, where, as a consequence of the GFC, a regulation deluge lastingly shaped the banking system (Darvas, Schoenmaker, & Véron, 2016, pp. 8-11, 36-39; Demirgüç-Kunt A., 2019). As can be seen from the respective regulation sub-chapters in 3 *Analysis*, China's regulation efforts were mainly concerned with country-specific regulation, whereas Japan and South Korea focused on the management of GFC-related savviness to improve banking sector stability, all while providing enough room for banks to handle their business. One main concern China tried to curb through intensified regulation is the practice of shadow banking, the structural bypassing of funds and credit from official banks (Chen J., 2019; Huang & Wang, 2018, p. 299). Moreover, debt-to-equity swaps were promoted to offer companies with momentary liquidity shortages some relief (Chen J., 2019). By far the most

progressive development, also highly specific to the country itself, was the lifting of state-prescribed interest rates and opening up this field of banking to free market forces (Chen, Qu, Tan, & Yung, 2016, pp. 1-3); an easing that fostered the reduction of banks' NIM, a finding also visualized by the FRA. Overall, the diagnose of Chen's, Qu's, Tan's, & Yung's (2016, pp. 1-3) analysis of regulatory changes in China was that, despite the country implementing new regulation, their effect is not that strong, still leaving some leeway and cracks that support instability in case of shocks.

Japan's and South Korea's regulation, and in the case of Japan, also deregulation, saw practices more typical of the aftermath of global financial turmoil. Both countries focused on providing SME with loans – Japan through moratoria, South Korea through ease of access to funds (Hong & Lee, 2018, pp. 110-111; Imai, 2019, p. 15). The two countries also intensified oversight and governance functions. Japan renewed its stress testing mechanisms and imposed stronger regulation of OTC trading of derivatives (Harada, Hoshi, Imai, Koibuchi, & Yasuda, 2015, pp. 55-60). Korea put an emphasis on the joint collaboration of relevant agencies as part of the regulation process and oversight, but also improved the governance structures at bank level (Hong & Lee, 2018, pp. 110-111; Lee, 2015, pp. 2-3). Moreover, the country introduced a special tax for banks to keep “non-core foreign currency liabilities” (Hong & Lee, 2018, p. 111) in check. Contrary to international developments, Japan deregulated the capital adequacy requirements in such a way that the threshold values remained intact but lifting some requirements allowed banks to reach these thresholds faster (Cohen, 2013, p. 25; Tongurai & Vithessonthi, 2020, p. 5). This deregulation came as a means to “[t]o reduce spillover effects that caused [...] the global financial crisis” (Tongurai & Vithessonthi, 2020, p. 5).

Despite the overall different base settings and environments for banks in the three countries, the results of (B) the FRA have revealed a fair amount of similarities, both on the country level as well as in comparison with international benchmarks; but naturally also some points upon which the countries differ greatly.

Starting with similarities that cover all three of the countries, the first three of them are variables of the profitability sequence. ROA, ROE, and NIM show the same overall negative trend for their respective country's developments from 2011 to 2016 when comparing both the initial and the final values. As the individual analyses have shown, the profitability for each of the countries deteriorated. Some variables showed a more volatile development with ups and downs (for example, the Korean ROA managed to slowly recover from a strong initial slump, while the NIM for Japan and Korea proved to show unmitigated downward developments). South Korea faced the direst situation, losing 45, 44, and 29 percent of the 2011 starting values for ROA, ROE, and NIM respectively. China comes second in terms of relative deterioration, as it had to sacrifice 30 percent ROE and 22 percent for ROA and NIM each. Japan stayed close to its initial ROA value, only losing 3 percent, but it had to take a 17 and 32 percent depreciation for the other two variables. Despite different levels of severity, neither of the countries managed to adequately keep profitability in check over the course of the six years under scrutiny. ROA provides a silver lining, as all three countries performed above international comparison averages. Both the starting and the ending values for each of the countries

remained above ECB figures for EU Member countries (ECB, 2019). In the EU, the average 2011 ROA was slightly in the negative, at -0.03 percent (ECB, 2019). At the same time, China reported 1.2 percent, Japan 0.03 percent, and South Korea 0.9 percent. While the European countries managed to recover from their post-GFC struggles with an ROA of 0.2 percent (ECB, 2019), the three countries' trend moved in the opposite direction (despite all three countries remaining above this international benchmark in 2016). South Korea lost 0.4 percentage points, eventually reaching 0.5 percent. China's ROA fell by 0.3 percentage points, while Japan's value stayed close to its starting point.

The picture concerning ROE is more heterogeneous, with China and South Korea outstripping the global benchmark of 10.0 percent at the beginning of the period (China had almost twice the ROE with 19.6 percent) (ECB, 2010). But while the global ROE rose over the course of the following six years, the three countries in question reduced shareholder returns by falling below the improved global average ROE of 14.2 percent (Global Economy, 2017). Falling a total of 5.9 percentage points, China endured the strongest absolute decline, closely followed by Korea, surrendering 5.1 percentage points of net income in relation to equity. Japan suffered the smallest reduction with 1.1 percentage points. Japan and Korea both finished 2016 clearly below the 14.2-percent benchmark, with 5.5 and 6.5 percent respectively, while China only lagged 0.5 percentage points behind, reaching 13.7 percent (Global Economy, 2017). For NIM, all three countries were performing beneath the global value of 3.6 percent (Datamarket, n.d.). China and Korea finished with similar absolute numbers, reaching 1.8 and 1.7 percent, having lost 0.5 and 0.7 percentage points respectively. Japan lost about one-third of its initial NIM or 0.3 percentage points, finishing with 0.6 percent and thereby coming in with the least favorable bank spread. What these three variables, ROA, ROE, and NIM show – the overall decline of profitability in the countries –, is symptomatic of too little an increase in diversifying their portfolios and managing costs at the same time, as the discussion especially of NLTA, ID, and CIR below highlights.

The final two similarities all countries share with regards to country development come from the other two spectrums, liquidity as well as risk and stability. The former concerns NLTA and the latter income diversification. For NLTA, China, Japan, and Korea all reduced the share of net loans expressed by total assets. This overall shared trend, however, is where the similarity among the countries ends, as the composition of the reduced NLTA is where the countries differ. While for Japan, the deterioration is caused mainly by the reduction of net loans paired with fluctuations in the average total assets of banks, China faced a surge in average total assets. South Korea saw a parallel dance of reductions and increases in both average net loans and average total assets, which, in total, led to an overall reduction of NLTA by 4.5 percentage points. A reduction in NLTA adds the potential benefit of providing a bank with more liquidity if freed up assets are converted into more liquid ones, allowing banks to access the funds swiftly in times of crisis to cover debt (Vodová & Stavárek, 2017, p. 161). When cross-referencing with LATA, the variable that measures this level of liquidity (Ghosh S., 2016, p. 375), it becomes apparent that improving liquidity seemed to only have been a top priority for banks in Japan, which almost doubled their share of liquid assets from 14.4 percent in 2011 to 27.5 percent in 2016. Korea's LATA also improved, almost at the same rate as NLTA decreased. A focused shift from tied up assets to liquid ones may also have been a focused strategy for the country,

though significantly less drastic than in Japan. China – on par with Japan in terms of NLTA in 2011 (14.4 percent) – branched off into the opposite direction, reducing its level of flexibility by 2.2 percentage points. The freeing up of assets in NLTA was thus not directly channeled into improved liquidity. In comparison with global reference values, the three countries' LATA developments stayed within the confines of what was seen on average internationally – this similarity, however, should not be given too much priority, as the bandwidth of liquidity levels ranged between 5 and 21 percent during the research period and is thus quite broad (Arora & Kohli, 2018, p. 26). Moreover, LATA developments are heavily influenced by national and international regulation, requiring countries to improve liquidity, especially as a consequence of the GFC (Chiaramonte, 2018, p. 131). The international reference, thus, mainly serves to show no severe outliers occurred in China, Japan, and Korea, but not much more.

After this excursion into LATA, I briefly want to return to the discussion of the three countries' NLTA results. Concerning South Korea, the final result of 65.3 percent places the country within and slightly above the range of international reference values (Bangladesh scores between 66 and 73 percent (Qamruzzaman, 2014, p. 175), Germany between 55 and 62 percent (Lardic & Terraza, 2019, pp. 36-37)), providing significantly less agility in case of an urgent need of liquidity. In contrast, China and Japan both optimized their NLTA in terms of absolute values even more and stayed clearly below international benchmarks (China reaches 46.1 percent in 2016, Japan 40.7 percent). As has been established above, freed up assets can be channeled into other asset positions. Such positions include, for example, securities or property (OBF, 2017), which, besides potentially providing more liquidity (not all asset positions outside of net loans can easily be liquefied, the criterion to qualify as liquid asset), should generate additional, mainly non-interest income. As discussed, Japan and South Korea managed to increase their LATA positions; hence, if done effectively, this should also be visible in ID, which measures the degree to which banks are capable of making themselves less reliant on interest income (He, Chen, & Liu, 2017, p. 4000). In this final similarity on the level of country development (i.e., the trend development from initial to ending value), all three countries saw an increase in the diversification of their portfolios expressed as the increase in the proportion of non-interest income in relation to operating revenue (He, Chen, & Liu, 2017, p. 4000). This means that the observed reduction on NLTA could be transferred into more diversified income streams. Being at different stages of this transition, China started off in the low-20 percent sphere and made the largest progression, with 5.8 percentage points to 27.1 percent in 2016. South Korea already found itself in the 30 percent range and raised its ID to 35.8 percent. Japan was clearly the most diversified of the countries, hence it showed the smallest increment, with an increase of 1.0 percentage points. However, it reported an ID value of 45.0 percent in 2016. With the longstanding low-interest environment in Japan, the comparatively higher ID shows the banks' efforts to improve and alter their business models (Omi & Tisseverasinghe, 2014, p. 14). China, as a consequence of the comparatively low ID, is the most dependent of the countries on interest-related income. Japan, in contrast, has a neatly 50:50 split of interest and non-interest income with every USD or yen earned giving them more resilience if either side of the income sources suffers losses. Despite painting a picture of overall improvements when it comes to income sources, be that through provisions,

proprietary trading, or property, all three countries failed to translate these advances into improved profitability as the discourse above on ROA, ROE, and NIM has revealed. However, the efforts that were taken to reduce NLTA and increase LATA were, nonetheless, visible in ID. The countries were simply unable to shift away from loans and simultaneously achieve the same, or higher, margins per unit of currency put to other use.

Another indicator of the symptomatic reduction of profitability becomes apparent when taking the levels of NPL into consideration. Increases in defaulted loans can have various trigger points – the stagnation or recession of economic activity in a country, banks' inertia to cushion shocks in industries most affected by economic slowdown, but also the uptake of riskier loan business in an attempt to boost profitability (and which ultimately leads to a larger percentage of defaulted loans) (Ari, Chen, & Ratnovski, 2020; Pham, 2018a). The positive result of the analysis is that the NPL ratios of all three countries remain, both at the beginning and at the end of the period, significantly below the international average, which was 6.0 percent in 2011 and 7.4 percent in 2016 (World Bank, 2020a). China and Japan followed suit with this global trend of NPL increase, China having a 64 percent larger volume of net loans being classified as failed (1.6 percent, up from 1.0 percent in 2011), in Japan it was 8 percent (2.0 percent, up from 1.8 percent in 2011). Defaulted loans reduce NIM and increase both the cost of funds and overall costs as only a fraction of the initial loan contract is fulfilled by the debtor (even if a debtor regains business stamina at a later point in time, banks face opportunity and depreciation costs (Dankensbring, et al., 2018, pp. 8-9)).

The deterioration of asset quality negatively impacted the FC for both countries, which saw an uptake in the average cost for the credits given out – in absolute values, the uptick was 0.2 percent in China and Japan, with more relative severity for Japan as FC increased by 80 percent (from 0.3 to 0.5 percent); China faced 11 percent higher funding costs. South Korea developed in the other direction regarding both NPL and FC, presumably also in a somewhat direct correlation. The country managed to further lower its already internationally favorable NPL position of 2011 to just over 1.0 percent, pushing South Korea to the forefront of the world's countries with the highest asset quality (World Bank, 2020a). Contrary to the other two countries, and in line with the NPL performance, FC improved during the research period, making it almost twice as affordable for South Korean banks to borrow money for their lending business from 2011 to 2016. While it initially cost an average of 4.4 percent per dollar or won lent, that price had dropped to 2.3 percent. Despite this overall positive development for South Korea, it should be viewed with caution. First, as also discussed in *4.4 South Korea*, at any given point in time, the FC were clearly higher than the BOK-offered base rate, despite the central bank incentivizing South Korean banks to make use of its lending scheme (the banks' rationale for doing so, unfortunately, is not clear to me and thorough research did not reveal potential causes either) (Bank of Korea, 2020). Furthermore, the year-end values of 2016 of the negative developments of China and Japan still resulted in more affordable FC than in South Korea, where the level of real interest rates was also higher at the end of the research period than in the other countries (World Bank, 2021a). The order of affordability of funds is, moreover, in lockstep with the levels of each country's base rates – South Korea, where the BOK-offered rate is the highest, also comes with the highest FC; Japan, persevering in its low interest rate environment, has the lowest

FC (CEIC Data, 2021a; CEIC Data, 2021b; Country Economy, 2021). In essence, the trend development of FC is good for South Korea, in absolute values, however, the picture becomes more dire as it is more cost intensive for banks there to disburse loans than in the other two countries.

The picture shown for the three countries regarding NPL and FC does, but only to some extent, further translate into the cost management of banks. The increase in NPL and FC led to Japan seeing increases in its CIR, an unsurprising tendency, not least in the additional context of overall deteriorated profitability. Japan's CIR increased by 3.4 percentage points. By 2016, for every USD or yen earned, operating expenses had increased by 3.4 cents or sen. South Korea, in that dimension, follows suit with Japan, but on a much larger scale. The positive effects of both reduced NPL and FC were more than counteracted by the increase in overall operating expenses – the country saw an increase of CIR of 19.2 percentage points or almost 37 percent. Even considering the smaller sample size in the initial years and for inevitable effects of inflation, the country did not translate efforts made on two core fronts of a bank business model (keep defaults in check, reduce the cost for funds) in its overall CIR. The improved NPL and FC have potentially rather reduced an otherwise even greater upsurge in costs and diminished profits. Overall, Japan and South Korea resemble each other in their final values regarding three of the four profitability measures. Their ROA stands at around 0.5 percent, ROE is slightly above/below 6 percent, and they both have a CIR in the low-70 percent. China, on the contrary, took the warning signs that come with slowed economic activity and reduced profitability seriously, planning against an even greater downward trend. The country's banks managed to reduce their internationally already favourable cost base even more and lowered the ratio by 3.7 percent, which equates to an even greater overall reduction of OPEX as the ratio includes reduced operating revenue and FC.

Additionally, the picture is also more heterogeneous among the three countries for the final two remaining variables of the FRA, namely NLDST and EA. For each variable, Japan shares a trend with both of the other countries. Concerning NLDST, Japan and South Korea both increased their levels of the ratio throughout the research period; in absolute values, however, Japan's NLDST is much closer to China's than South Korea's, which has an NLDST almost twice as high as that of Japan, and even more than double that of China. South Korea is thus significantly more risk-prone due to its unusually elevated NLDST, the remnants of a history of overall elevated loan-to-debt ratios among banks has also been discussed in more detail above in *4.4 South Korea* (Hyun, 2016, p. 710). It is thus the other two countries that share the similarity when it comes to international benchmarks, which China and Japan both underscore. Internationally, the variable lies typically anywhere between 70 and 90 percent (Cheng, Zhao, & Lin, 2017, p. 373; Kumbirai & Webb, 2010, p. 44; Murphy, 2019; Qamruzzaman, 2014, p. 175). China finished the research period with 55.1 percent, Japan with 61.0 percent. This means that the remaining deposits and short-term funds available to Chinese and Japanese banks – contrary to South Korean banks, which arithmetically more than use all of these funds – are directed to other, non-loan related ventures. It may be reasonable to assume, especially when cross-checking with ID, for which both countries saw increases, that the countries' banks aimed to make themselves less reliant on credit/funds tied up in loans and to acquire new sources of potential income. While it is unknown if the redirection of funds into, say, capital market investments

did in effect result in a less drastic contraction of profitability or, the opposite, rather increased the issue (Pritchard, 2020), the synopsis of NLDST and ID does reveal important points regarding certain strategic direction changes, especially for China and Japan.

Finally, EA is the last of the FRA variables to be discussed. The countries' development in this variable is thus in unison, as all three lie below international benchmarks, which are around and above 10 percent (Almazari, 2014, p. 132; Alper & Anbar, 2011, p. 147; Bertay, Demirgüç-Kunt, & Huizinga, 2015, pp. 327-328). China, Japan, and South Korea all finished clearly below that mark, settling anywhere between 5.9 percent (Japan) and 7.8 percent (South Korea), indicating that banks in these countries are leveraged at above average levels (Hayes, 2020). Mergaerts & Vander Venet (2016, p. 68) found that lower EA fosters poorer performance in ROA and NIM, but not necessarily ROE, as equity is more expensive than debt. This finding is, however, not visible in the results of the data sample of this thesis. China and Japan both improved their levels of EA by 0.7 and 0.5 percentage points respectively, but faced reduced profitability across all three profitability variables. South Korean banks, which reduced the level of EA by 0.4 percentage points, still saw the same fate as its counterparts in terms of deteriorated returns and margins. Levels of EA in the one-digit sphere are rarely seen, especially in the EU, but also for large international banks, as this is a topic of high regulatory focus (ECB, 2020). Since low levels of EA make banks less resilient in times of crisis, there are many binding and voluntary equity-defining thresholds, such as the minimum capital adequacy requirements (Gong, Hu, & Ligthart, 2015, p. 200; Toader, 2014, pp. 426-427). It is worth noting that, as a result, Chinese, Japanese, and South Korean banks can be viewed as less prepared for financial unrest, should it arise, due to their reduced equity buffers. Furthermore, shareholders of the countries' banks are also less likely to receive payouts in case of liquidation (Kenton, 2020), making bonds – a core method used by South Korean banks to finance themselves (Hyun, 2016, p. 710) – a riskier venture.

In sum, based on the combined analyses of (A) the macroeconomic and regulatory environment, (B) the FRA, as well as this cross-country discourse, the diagnosis is that the countries are somewhat closer to each other in terms of developments than when contrasted with international benchmarks (see also the summary of similarities and differences as presented by *Figure 58*). This is additionally signified through similar trend directions (e.g., the profitability variables ROA, ROE, and NIM) or a certain proximity of variable values among China, Japan, and Korea, while benchmarks are significantly higher or lower (e.g., the NIM values of the three countries are within 1.2 percentage points and the global reference is twice the closest value). All this, however, does not mean that the banking industries are much alike – each country faces different challenges. Chinese banks are highly dependent on interest income in times when low interest rates plague the industry globally (Hördahl, Sobrun, & Turner, 2016, p. 1). Relatively weak regulation (Huang & Wang, 2018, p. 291), rather low liquidity buffers, and shadow banking show that a certain level of caution – not least due to the fact that China is home to the largest banks in the world and is known to create vehicles to, say, get sour deals off the books (Wildau, 2016b) – is definitely not ill-advised. Japan's banks are, in terms of profitability and cost, the ones with the most dire situation and potential outlook, yet not when it comes to the expectation of stability. Years of mismanagement by regulating agencies, low interest

and inflation rates (Kanaya & Woo, 2000, p. 4; Weistroffer, 2013, p. 1), and overall economic stagnation/little growth are clearly visible in the FRA's results. However, this is a situation the country has now faced for decades and it has previously shown the stamina to steer through crises (Kanaya & Woo, 2000, p. 4; Lincoln, 2013, p. 154). As a result, it is to be expected that the sliverlining of the dire snapshot created through the analyses is at the same time providing the country a certain degree of resilience. South Korea provides a positive picture throughout – especially in contrast with the other countries – with its favorable NPL portfolio. Nonetheless, banks there need to watch their costs, profitability, and the elevated risk threat because of the high NLDST.

5 Conclusion

The research for this master's thesis had the aim to thoroughly compare and contrast the banking industries of China, Japan, and South Korea from 2011 to 2016, the time period following the initial recovery from the GFC. Comparing and contrasting the countries was done through a two-layered, eclectic analytical framework. The first, analysis (A), considered the macroeconomic and regulatory background of the three respective environments provided for the banking industry, and the second, analysis (B), combined a set of 11 financial variables based on data derived from 479 individual banks' balance sheets and P&L statements (OBF, 2017). The variable set – based on the studies of Ghosh S. (2016), Mergaerts & Vander Venet (2016), and Kumbirai & Webb (2010) – was selected with the rationale in mind to provide a balanced set of variables covering the viable performance triangle of profitability, liquidity, and risk and stability (Berríos, 2013; Bordeleau & Graham, 2010). Through the eclectic setup of the research a fuller picture of the individual settings banks face in China, Japan, and Korea were provided. Moreover, while the core aim of the research was rooted in comparing and contrasting the countries with one another, due to their relevance on the global banking market (Gunning, Yoshizawa, Chugh, Hu, & Chaplin, 2018, p. 9; Relbanks, 2017), both their individual assessment and an international viewpoint have been integrated into the discussion regarding the findings.

The key results of the research can be summarized in three main findings. First, there is a certain level of homogeneity among the countries that shows that they, in several aspects, are closer to one another than to international reference values. Such aspects include the overall trend development (falling or rising ratios throughout the research period) and variable proximity. Examples are the profitability measures ROA, ROE, and NIM, but also the level of NPL, which is considerably better than when referenced with the global average (World Bank, 2020a).

Second, on the basis of the individual comparison, the data showed that the countries and their banking industries are nonetheless quite individualistic and have specific characteristics of their own. This means that while there is the aforementioned homogeneity in terms of differentiation from international developments and benchmarks, the country analyses have revealed that each of the countries is facing different challenges. In a broader interpretation, it may be possible that China, Japan, and South Korea follow similar paths and have this certain degree of homogeneity, potentially rooted both in cultural and geographical proximity, but despite that, they may be embedded in different economic and systemic settings. The data for China, on the one hand, showed that the country is gradually settling into its “new normal” (Holbig, 2018, p. 342; Yao, 2019) economic growth setting and, as a consequence, has to deal with deteriorating asset quality, pressure on costs, and stagnating to falling profitability. Japan, on the other hand, has been in a phase of economic volatility for decades and is rather working on maintaining somewhat stable levels of growth and inflation (BBC, 2014; Berkmen, 2012, p. 3; Kanaya & Woo, 2000, p. 4). And South Korea, the third in the league, seems to be in a stage between China and Japan – the years of ongoing boom are over and it is visible in the data that the market has become more saturated (an example includes the increase of the CIR, often a sign of increased bureaucracy due to more established structures, an improved

sense of stability, as well as larger customer bases and bank ticket sizes) (Hyun, 2017, p. 3; Park Y. C., 2013, p. 225).

Third, for all three countries, the overall picture derived shows that none of the variables analyzed hint at any immediate concern regarding their banks' stability. Nonetheless, there are signs for low-level caution, as China, Japan, and South Korea alike are in somewhat exposed positions. For China, one sign is that the banking industry is heavily reliant on interest income – even at the end of the research period, where comparatively great improvements already materialized, almost three in four USD or yuan earned came from interest-bearing activities. At the same time, NPL are up and liquidity is down, a potentially toxic combination. Japan is predominantly in the need for a transformation of its banking business model in a way that allows it to improve profitability once again – for example, through beyond banking activities¹⁰⁴ that bring in additional non-interest income. Despite the country almost having a 1:1 relation of interest to non-interest income, a clear shift towards more independency from the low interest rate environment, the income is not translating into more promising profitability measures. It is not just on the income side, Japan is also facing a serious cost issue. Both the liquidity as well as the risk and stability variables, however, put Japan's banking industry in a position that enables banks to be resilient during crises (e.g., liquidity is up and the reliance on loans decreased). South Korea provided an ambivalent picture. The most common financial ratio indicators (ROA, ROE, and NPL) show a positive outlook for the country as these variables improved from the year 2013 onwards (the initial sample size increased from roughly 20 to eventually over 60 banks (OBF, 2017)). Though when peering beyond these indicators, there are also potential risks looming underneath the surface – the cost base banks face is going up just as in Japan, the NIM constantly fell, thereby putting pressure on non-interest income generation, and there is an uncommonly high level of net loans expressed as a percentage of deposits and short-term borrowing.

The research undertaken in this thesis has provided a comprehensive overview of both the banking industries' environments, but also of the overall industry itself. The underlying research question and the analytical framework were designed in a way that allows for a solid overview of the banking industries and the deduction of graspable insights. But, as with any research, it also comes with certain shortcomings, such as the fact that there is a high degree of complexity with banking sector performance analyses that do not allow for scrutinizing all dimensions or dependencies. This master's thesis is thus in its very design merely a high-level analysis, not least because of the weighted aggregation of the individual banks' data to, figuratively speaking, one giant bank per country.

This type of research, however, allows for fresh insights and interpretations as well as potentially highlights needs for other, more detailed research to get to the core of specific findings. It thus provides a foundation or basis framework for subsequent research into, say, a singled out financial ratio. As also discussed in more detail under *2.4 Limitations*, the analytical framework provides a

¹⁰⁴ Beyond banking activities are any activities banks perform outside the classic spectrum of bank and bank-related activities (that is, originating loans, taking in deposits, providing related services, etc) (McKinsey & Company, 2019). Beyond banking activities can be anything like generating platforms to SME for them to provide their products and services there or offering energy contracts to customers (McKinsey & Company, 2019).

limited and timeboxed insight into the research subjects, and is confined to the variables and research angle employed. Some of these limitations, however, provoke future research areas. Building on that and beyond, the most interesting focus areas for future research, in my opinion, include:

- A differentiation and analysis of similarities and differences in the underlying types of banks (e.g., commercial banks versus investment banks or domestic versus international banks) and their contribution to shaping a country's banking industry
- Use of regression analyses and other statistical models for a deeper understanding of correlations of variables on one another
- Deep dives into one or a few financial ratios to allow for concentrated analysis of the variable components as well as its influencers and influences, something, for example, Doliente (2005) did with his analysis of NIM in Southeast Asia
- Include interviews with experts on both the geographical area and the banking industries scrutinized to provide additional context for certain developments, geographical specifics, or language barriers – a subtext not necessarily deductible from mere data crunching alone as there is a multitude of factors adding to the complexity of banking industries that are otherwise potentially unseen
- Include more research subjects for a deeper comparison between China, Japan, and South Korea as similarities and differences can then be contrasted in more detail as international benchmark values would use the same database and analytical framework

Since 2016, technological advances (e.g., the rise of artificial intelligence (Biswas, Carson, Chung, Singh, & Thomas, 2020) or a more disruptive banking environment through the success of challenger banks and FinTechs (World Bank, 2020b)) and global trends and developments (e.g., the urgency of the climate crisis and the substantial role banks need to play in helping businesses to transition into more sustainable business models (European Commission, 2021, p. 5) or the coronavirus pandemic (WHO, n.d.)) have occurred and will no doubt have lasting and shaping effects on the banking industries. Some of these effects can already be seen, such as the rise of the “green asset ratio” (EBA, 2021), but also the ease of access of non-banking institutions to bank data for added-value services to customers (Doyle, Sharma, Ross, & Sonnad, 2017), or the anticipation of a surge in NPL across the globe once loan moratoria and government relief packages no longer support individuals and businesses alike in coping with the coronavirus pandemic (World Bank, 2021b). These developments will have such grave implications on the banking industry, that the future for banking industry analyses will need to find ways to successfully address and include them and will likely be the ignition of a shift from pure profitability and performance evaluations towards more long-term and qualitative measures that take into consideration an even further faceted complexity of the industry.

References

- Agoraki, M.-E. K., Delis, M. D., & Pasiouras, F. (2011). Regulations, Competition and Bank Risk-Taking in Transition Countries. *Journal of Financial Stability*, 7, 38-48.
- Allen, F., Bartiloro, L., & Kowalewski. (2005). *The Financial System of the EU 25*. Retrieved January 16, 2017, from Wharton School, University of Pennsylvania: <http://finance.wharton.upenn.edu/~allenf/download/Vita/financial%20system%20of%20the%20eu%20short%20version.pdf>
- Allen, F., Chui, M. K., & Maddaloni, A. (2004). Financial Systems in Europe, the USA, and Asia. *Oxford Review of Economic Policy*, 20(4), 490-508.
- Almazari, A. A. (2014). Impact of Internal Factors on Bank Profitability: Comparative Study between Saudi Arabia and Jordan. *Journal of Applied Finance and Banking*, 4(1), 125-140.
- Alper, D., & Anbar, A. (2011). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Emperical Evidence from Turkey. *Business and Economics Research Journal*, 2(2), 139-152.
- Amadeo, K. (2019a, January 21). *Economic Growth, Its Measurements, Causes, and Effects*. Retrieved March 24, 2019, from Balance: <https://www.thebalance.com/what-is-economic-growth-3306014>
- Amadeo, K. (2019b, January 16). *Inflation, How It's Measured and Managed*. Retrieved March 24, 2019, from Balance: <https://www.thebalance.com/what-is-inflation-how-it-s-measured-and-managed-3306170>
- Amadeo, K. (2019c, December 30). *The Causes of the Subprime Mortgage Crisis*. Retrieved February 16, 2020, from Balance: <https://www.thebalance.com/what-caused-the-subprime-mortgage-crisis-3305696>
- Amadeo, K. (2020, May 28). *GDP by Country as Measured by Three Methods*. Retrieved November 16, 2020, from Balance: <https://www.thebalance.com/gdp-by-country-3-ways-to-compare-3306012>
- Amel, D. F., & Rhoades, S. A. (1988, November). Strategic Groups in Banking. *Review of Economics and Statistics*, 70(4), 685-689.
- Anginer, D., Demirgüç-Kunt, A., & Mare, D. S. (2018). Bank Capital, Insitutional Environment and Systemic Stability. *Journal of Financial Stability*, 37, 97-106.
- Apătăchioaea, A. (2015). The Performance, Banking Risks and Their Regulation. *Procedia Economics and Finance*, 20, 35-43.
- Appleby, J., Helderma, J.-K., & Gregory, S. (2015). The Global Financial Crisis, Health and Health Care. *Health Economics, Policy and Law*, 10, 1-6.
- Ari, A., Chen, S., & Ratnovski, L. (2020, May 27). *COVID-19 and Non-performing Loans: Lessons from Past Crises*. Retrieved January 25, 2021, from ECB: <https://www.ecb.europa.eu/pub/economic-research/resbull/2020/html/ecb.rb200527~3fe177d27d.en.html>

- Arnold, M., & Hall, C. (2014, October 19). *Big Banks Giving Up on Their Global Ambitions*. Retrieved February 2, 2020, from Financial Times: <https://www.ft.com/content/95bed102-5641-11e4-bbd6-00144feab7de>
- Arora, A., & Kohli, H. K. (2018, October). Liquidity Risk and Asset-Liability Management: A Comparative Study of Public and Private Sector Banks. *IUP Journal of Applied Finance*, 24(4), 18-33.
- ASBJ. (2017a). *About Japanese GAAP*. Retrieved September 3, 2017, from Accounting Standards Board of Japan – Financial Accounting Standards Foundation: <https://www.asb.or.jp/en/jp-gaap/about.html>
- ASBJ. (2017b). *About JMIS*. Retrieved September 3, 2017, from Accounting Standards Board of Japan – Financial Accounting Standards Foundation: <https://www.asb.or.jp/en/ifrs/about.html>
- Asian Development Bank. (2006). *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*. Operations Evaluation Department. Organisation for Economic Co-Operation and Development. Retrieved August 19, 2017, from <https://www.oecd.org/derec/adb/37965974.pdf>
- Assaf, G. A., Barros, C. P., & Matousek, R. (2011). Productivity and Efficiency Analysis of Shinkin Banks: Evidence from Bootstrap and Bayesian Approaches. *Journal of Banking and Finance*, 35(2), 331-342.
- Avdjiev, S., Aysun, U., & Hepp, R. (2019). What Drives Local Lending by Global Banks? *Journal of International Money and Finance*, 90, 54-75.
- Avkiran, N. K. (1994). Developing an Instrument to Measure Customer Service Quality in Branch Banking. *International Journal of Bank Marketing*, 12(6), 10-18.
- Babihuga, R., & Spaltro, M. (2014, April). Bank Funding Costs for International Banks. *IMF Working Paper No. 14/71*, 1-38. Retrieved November 11, 2020, from <https://www.imf.org/external/pubs/ft/wp/2014/wp1471.pdf>
- Baek, J.-S., Kang, J.-K., & Park, K. S. (2004). Corporate Governance and Firm Value: Evidence from the Korean Financial Crisis. *Journal of Financial Economics*, 71, 265-313.
- BaFin. (2014, January 24). *Banking Supervision*. Retrieved May 4, 2019, from BaFin: https://www.bafin.de/EN/DieBaFin/AufgabenGeschichte/Bankenaufsicht/bankenaufsicht_node_en.html
- BaFin. (n.d.). *Imprint*. Retrieved June 10, 2020, from BaFin: https://www.bafin.de/EN/Service/Footer/Rechtliches/Impressum/impressum_node_en.html;jsessionid=4806F2B6534F02176D7937362B2FD184.1_cid393
- Baker, S. (2018, July 9). *World's 25 Most Powerful Countries from US to Egypt*. Retrieved November 17, 2018, from Independent: <https://www.independent.co.uk/news/world/world-most-powerful-countries-ranking-change-a8438711.html>
- Bank of Korea. (2020, May). *Lending and Deposit Facilities*. Retrieved February 13, 2021, from Bank of Korea: <https://www.bok.or.kr/eng/main/contents.do?menuNo=400028>

- Bank SinoPac. (2017). *Consolidated Financial Statements for the Six Months Ended June 30, 2017 and 2016 and Independent Auditors' Report*. Retrieved May 3, 2020, from Bank SinoPac: https://bank.sinopac.com/bsp/eng/investor/qr_pdf/e-17q2.pdf
- Barth, J. R., Caprio Jr., G., & Levine, R. (2001). Banking Systems around the Globe: Do Regulation and Ownership Affect Performance and Stability? In F. S. Mishkin (Ed.), *Prudential Supervision: What Works and What Doesn't* (pp. 31-96). The University of Chicago Press.
- Barth, J. R., Caprio Jr., G., & Levine, R. (2013). Bank Regulation and Supervision in 180 Countries from 1999 to 2011. *Journal of Financial Economic Policy*, 5(2), 111-219.
- Barth, J. R., Lin, C., Ma, Y., Seade, J., & Song, F. M. (2013). Do Bank Regulation, Supervision and Monitoring Enhance or Impede Bank Efficiency? *Journal of Banking and Finance*(37), 2879-2892.
- Barth, J. R., Prabha, A., & Swagel, P. (2012). Just How Big Is the Too-Big-to-Fail Problem? *Journal of Banking Regulation*, 13(4), 265-290.
- Barth, J., Caprio Jr., G., & Levine, R. (2012, December). *The Evolution and Impact of Bank Regulations*. World Bank. Retrieved May 4, 2019, from World Bank: <https://openknowledge.worldbank.org/bitstream/handle/10986/12183/wps6288.pdf?sequence=1&isAllowed=y>
- BBC. (2014, May 30). *Japan Inflation Rate Hits 23-Year High*. Retrieved April 27, 2019, from BBC: <https://www.bbc.com/news/business-27615551>
- BCBS. (2016, December). *Regulatory Consistency Assessment Programme (RCAP): Assessment of Basel III LCR Regulations – Japan*. Retrieved January 31, 2021, from Bank for International Settlements: <https://www.bis.org/bcbs/publ/d391.pdf>
- BCBS. (2017, December). *Basel III: Finalising Post-crisis Reforms*. Retrieved January 4, 2021, from Bank for International Settlements: <https://www.bis.org/bcbs/publ/d424.pdf>
- Becchetti, L., Ciciretti, R., & Paolantonio, A. (2016). The Cooperative Bank Difference before and after the Global Financial Crisis. *Journal of International Money and Finance*, 69, 224-246.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006, October 6). Bank Supervision and Corruption in Lending. *Journal of Monetary Economics*, 53, 2131-2163.
- Bellens, J. (2018). *How a Social Media Firm Created Korea's Fastest Growing Bank*. Retrieved November 10, 2020, from Ernst & Young: https://www.ey.com/en_gl/banking-capital-markets/how-social-media-firm-created-south-korea-s-fastest-growing-bank
- Bellens, J., & Hwa, G. (2015). *Banking in Asia-Pacific*. Ernst & Young. Retrieved January 27, 2019, from [https://www.ey.com/Publication/vwLUAssets/EY-banking-in-asia-pacific/\\$FILE/EY-banking-in-asia-pacific.pdf](https://www.ey.com/Publication/vwLUAssets/EY-banking-in-asia-pacific/$FILE/EY-banking-in-asia-pacific.pdf)
- Beltratti, A., & Stulz, R. M. (2012). The Credit Crisis around the Globe: Why Did Some Banks Perform Better? *Journal of Financial Economics*, 105, 1-17.
- Berger, A. N., Hunter, W. C., & Timme, S. G. (1993). Efficiency of Financial Institutions: A Review and Preview of Research Past, Present and Future. *Journal of Banking and Finance*, 17, 221-249.

- Berkmen, S. P. (2012). Bank of Japan's Quantitative and Credit Easing: Are They Now More Effective? *IMF Working Paper No. 12/2*, 1-15. Retrieved January 30, 2021, from <https://www.imf.org/external/pubs/ft/wp/2012/wp1202.pdf>
- Berríos, M. R. (2013). The Relationship between Bank Credit Risk and Profitability and Liquidity. *International Journal of Business and Finance Research*, 3(7), 105-118.
- Bertay, A. C., Demirgüç-Kunt, A., & Huizinga, H. (2015). Bank Ownership and Credit over the Business Cycle: Is Lending by State Bank Less Procyclical? *Journal of Banking and Finance*, 50, 326-339.
- Bijlsma, M. J., & Zwart, G. T. (2013, March). *The Changing Landscape of Financial Markets in Europe, the United States and Japan*. Bruegel. Retrieved November 12, 2020, from https://www.bruegel.org/wp-content/uploads/imported/publications/WP_2013_02_01.pdf
- Bikker, J. A., & Bos, J. W. (2008). *Bank Performance: A Theoretical and Empirical Framework for the Analysis of Profitability, Competition and Efficiency*. Routledge International Studies in Money and Banking.
- BIS. (2008). *Principles for Sound Liquidity Risk Management and Supervision*. Retrieved February 24, 2019, from BIS: <https://www.bis.org/publ/bcbs144.htm>
- BIS. (2014, October). *Basel III: The Net Stable Funding Ratio*. Retrieved September 24, 2017, from Bank for International Settlements: <http://www.bis.org/bcbs/publ/d295.htm>
- BIS. (2017). *High-level Summary of Basel III Reforms*. Basel Committee on Banking Supervision. Bank for International Settlements. Retrieved April 13, 2020, from https://www.bis.org/bcbs/publ/d424_hlsummary.pdf
- BIS. (n.d.). *Basel III: International Regulatory Framework for Banks*. Retrieved November 6, 2017, from Bank for International Settlements: <https://www.bis.org/bcbs/basel3.htm>
- Biswas, S., Carson, B., Chung, V., Singh, S., & Thomas, R. (2020, September 19). *AI-Bank of the Future: Can Banks Meet the AI Challenge?* Retrieved March 31, 2021, from McKinsey & Company: <https://www.mckinsey.com/industries/financial-services/our-insights/ai-bank-of-the-future-can-banks-meet-the-ai-challenge>
- Black, B. S., & Gilson, R. J. (1998). Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets. *Journal of Financial Economics*, 47(3), 243-277.
- Bloom, D. E., Chen, S., Kuhn, M., McGovern, M. E., Oxley, L., & Prettnner, K. (2018, September 26). The Economic Burden of Chronic Diseases: Estimates and Projections for China, Japan, and South Korea. *Journal of the Economics of Ageing*, 12, 1-13.
- Bloomberg. (2020, January 19). *U.S. Firms Could Win Lucrative Job of Cleaning Up China's Bad Debt*. Retrieved January 16, 2021, from Bloomberg: <https://www.bloomberg.com/news/articles/2020-01-17/china-opens-door-to-riches-from-bad-debt-cleanup-with-trade-deal>
- Bloomberg. (n.d. a). *SMBC Consumer Finance Co Ltd*. Retrieved December 22, 2019, from Bloomberg: <https://www.bloomberg.com/profile/company/8574:JP>
- Bloomberg. (n.d. b). *Japan Finance Corp*. Retrieved February 2, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/JPFINCZ:JP>

- Bloomberg. (n.d. c). *Japan Finance Organization for Municipalities*. Retrieved February 1, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/JAFZ:JP>
- Bloomberg. (n.d. d). *Sichuan Tianfu Bank Co Ltd*. Retrieved March 29, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/NANCCBZ:CH>
- Bloomberg. (n.d. e). *Bank of Kunlun Co Ltd*. Retrieved March 29, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/1314019D:CH>
- Bloomberg. (n.d. f). *Bank of Qinghai Co Ltd*. Retrieved March 29, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/1383450D:CH>
- Bloomberg. (n.d. g). *Traders Holdings Co Ltd*. Retrieved April 5, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/8704:JP>
- Bloomberg. (n.d. h). *Bank of Communications Financial Leasing Co Ltd*. Retrieved April 8, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/0791864D:CH>
- Bloomberg. (n.d. i). *AVIC International Leasing Co Ltd*. Retrieved April 8, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/1003733D:CH>
- Bloomberg. (n.d. j). *Seven Bank Ltd*. Retrieved April 8, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/0S7:GR>
- Bloomberg. (n.d. k). *Hokuto Bank Ltd*. Retrieved April 12, 2020, from Bloomberg: <https://www.bloomberg.com/profile/company/HKBKZ:JP>
- Bloomberg. (n.d. l). *Chong Sing Holdings FinTech Group*. Retrieved April 28, 2021, from Bloomberg: <https://www.bloomberg.com/profile/company/8207:HK>
- Bloomenthal, A. (2020, October 9). *Credit Card*. Retrieved December 29, 2020, from Investopedia: <https://www.investopedia.com/terms/c/creditcard.asp>
- Bordeleau, É., & Graham, C. (2010). The Impact of Liquidity on Bank Profitability. *Bank of Canada Working Paper No. 2010-38*, 1-22.
- Bourke, P. (1989). Concentration and Other Determinants of Bank Profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 13, 65-79.
- Brock, P. L., & Suarez, L. R. (2000). Understanding the Behavior of Bank Spreads in Latin America. *Journal of Development Economics*, 63, 113-134.
- Bunda, I., & Desquilbet, J.-B. (2008). The Bank Liquidity Smile across Exchange Rate Regimes. *International Economic Journal*, 22(3), 361-386.
- Bureau of Labor Statistics. (n.d.). *Consumer Price Index*. Retrieved March 24, 2019, from United States Department of Labor: Bureau of Labor Statistics: <https://www.bls.gov/cpi/>
- Busch, R., & Memmel, C. (2016, November 4). Quantifying the Components of the Banks' Net Interest Margin. *Financial Markets and Portfolio Management*, 30, 371-396.
- BVD. (2017a). *Orbis Bank Focus – Information on Banks – Global*. Retrieved August 20, 2017, from Bureau van Dijk: <https://www.bvdinfo.com/en-us/our-products/company-information/international-products/orbis-banks>

- BVD. (2017b). *Bankscope*. Retrieved August 27, 2017, from Bureau van Dijk: <https://www.bvdinfo.com/en-us/our-products/company-information/international-products/bankscope>
- Cabral, R. (2013). A Perspective on the Symptoms and Causes of the Financial Crisis. *Journal of Banking and Finance*, 37, 103-117.
- Calcagnini, G., & Favaretto, I. (2011). Introduction. In G. Calcagnini, & I. Favaretto (Eds.), *The Economics of Small Businesses* (pp. ix-xxi). Heidelberg, Dordrecht, London, New York: Springer.
- Calice, P., & Zhou, N. (2018, Juni). Benchmarking Costs of Financial Intermediation around the World. *World Bank Policy Research Working Paper No. 8478*, 1-42.
- Calvo, G. A. (2016, August). From Chronic Inflation to Chronic Deflation: Focusing on Expectations and Liquidity Disarray since WWII. *NBER Working Paper No. 22535*, 1-36.
- Cambridge Dictionary. (n.d.). *Performance*. Retrieved February 23, 2019, from Cambridge Dictionary: <https://dictionary.cambridge.org/dictionary/english/performance>
- Carvalho, R. (2017, August 9). *Graphics – Ten-Years from Global Financial Crisis: A Decade in Charts*. Retrieved September 10, 2017, from Reuters: <https://uk.reuters.com/article/uk-global-markets-creditcrunch/graphics-ten-years-from-global-financial-crisis-a-decade-in-charts-idUKKBN1AO2MT>
- Casu, B., Deng, B., & Ferrari, A. (2016). Post-crisis Regulatory Reforms and Bank Performance: Lessons from Asia. *European Journal of Finance*, 1-28.
- CBRC. (2018). *China Banking and Insurance Regulatory Commission Officially Unveiled*. Retrieved September 12, 2019, from China Banking Regulatory Commission: <http://www.cbrc.gov.cn/EngdocView.do?docID=F495CC398DAD4FA4B10B0B25A8BDC9E5>
- CEIC Data. (2021a). *China Policy Rate*. Retrieved February 9, 2021, from CEIC Data: <https://www.ceicdata.com/en/indicator/china/policy-rate>
- CEIC Data. (2021b). *Japan Policy Rate*. Retrieved February 9, 2021, from CEIC Data: <https://www.ceicdata.com/en/indicator/japan/policy-rate>
- CFA Institute. (2016). Financial Reporting Standards. In *Financial Reporting and Analysis* (11 ed., pp. 99-144). Wiley.
- CFO Innovation. (2016, November 15). *China's High Loan-to-Deposit Ratio a Warning Sign*. Retrieved January 23, 2021, from CFO Innovation: <https://www.cfoinnovation.com/management/china-s-high-loan-to-deposit-ratio-a-warning-sign>
- Cha, S. (2012, June 22). *A Crisis Cripples South Korea's Savings Banks*. Retrieved April 28, 2019, from Bloomberg: <https://www.bloomberg.com/news/articles/2012-06-21/a-crisis-cripples-south-koreas-savings-banks>
- Chang, M., Choi, C., & Park, K. (2016). Inflation Dynamics in the Post-crisis Period: Korea's Experience. *BIS Papers No 89*, 221-230.

- Chang, S.-S., Stuckler, D., Yip, P., & Gunnell, D. (2013). Impact of 2008 Global Economic Crisis on Suicide: Time Trend Study in 54 Countries. *British Medical Journal*, 347(f5239). Retrieved August 14, 2017, from <http://doi-org.uaccess.univie.ac.at/10.1136/bmj.f5239>
- Chao, C.-L., & Horng, S.-M. (2020, August). The Effects of Relaxing the Reconciliation Requirement in Foreign Private Issuers' SEC Filings on Earnings Management Strategies: IFRS Adopters versus U.S. GAAP Adopters (美國證管會鬆綁外國公司編制調節表對採用 IFRS 或 U.S.GAAP 公司之盈餘管理策略的影響). *NTU Management Review*, 30(2), 71-134.
- Chen, D. (2019). *Banking Regulation 2019*. Retrieved September 12, 2019, from Global Legal Insights: <https://www.globallegalinsights.com/practice-areas/banking-and-finance-laws-and-regulations/china>
- Chen, H., Qu, J., Tan, C., & Yung, W. (2016, August). *Price to Win under Interest-Rate Liberalization at China's Banks*. Retrieved January 24, 2021, from McKinsey & Company: <https://www.mckinsey.com/~media/McKinsey/Industries/Financial%20Services/Our%20Insights/Price%20to%20win%20under%20interest%20rate%20liberalization%20at%20Chinas%20banks/Price-to-win-under-interest-rate-liberalization-at-Chinas-banks.pdf>
- Chen, J. (2019, March 23). *Debt Security*. Retrieved February 16, 2020, from Investopedia: <https://www.investopedia.com/terms/d/debtsecurity.asp>
- Chen, J. (2020, January 12). *Equity-Linked Security (ELKS)*. Retrieved February 1, 2020, from Investopedia: <https://www.investopedia.com/terms/e/equity-linked-security.asp>
- Chen, X. (2012). The Dampening Effect of Bank Foreign Liabilities on Monetary Policy: Revisiting Monetary Cooperation in East Asia. *Journal of International Money and Finance*, 32, 412-427.
- Chen, Z., Li, Y., Wu, Y., & Luo, J. (2017). The Transition from Traditional Banking to Mobile Internet Finance: An Organizational Innovation Perspective – A Comparative Study of Citibank and ICBC. *Financial Innovation*, 3(12), 1-16.
- Cheng, M., Zhao, H., & Lin, J. W. (2017). The Effects of Bank Privatization on Performance and Prudential Behavior in China: Does State Ownership Matter? *Asia-Pacific Journal of Accounting and Economics*, 24(3-4), 387-406.
- Chiaramonte, L. (2018). The New International Liquidity Regulatory Framework for Banks. In L. Chiaramonte, *Bank Liquidity and the Global Financial Crisis* (1 ed., pp. 131-165). Palgrave Macmillan.
- Choi, J.-W. (2016, August 26). *Aggressive ELS Investment Causes Massive Losses in Hanwha Investment & Securities in H1*. Retrieved February 1, 2020, from Pulse: <https://pulsenews.co.kr/view.php?year=2016&no=606398>
- CIA. (2017, September 19). *World Factbook. East & Southeast Asia: Korea, South*. Retrieved September 24, 2017, from Central Intelligence Agency: <https://www.cia.gov/library/publications/the-world-factbook/geos/ks.html>
- CIA. (n.d.). *World Factbook. Field Listing: Fiscal Year*. Retrieved September 25, 2017, from Central Intelligence Agency: <https://www.cia.gov/library/publications/the-world-factbook/fields/2080.html>

- Citigroup. (2019). *Japan – Citibank, N.A., Tokyo Branch Company Overview*. Retrieved April 18, 2020, from Citigroup: <https://www.citigroup.jp/en/about/cbna-tokyo/index.html>
- Citigroup. (n.d.). *Japan – Corporate Profile*. Retrieved April 18, 2020, from Citigroup: <https://www.citigroup.jp/en/about/profile.html>
- Ciukaj, R., & Kil, K. (2020). Determinants of the Non-performing Loan Ratio in the European Union Banking Sectors with a High Level of Impaired Loans. *Economics and Business Review*, 6(20), 22-45.
- Cohen, B. (2013). How Have Banks Adjusted to Higher Capital Requirements? *BIS Quarterly Review*, 25-41. Retrieved March 27, 2021, from https://www.bis.org/publ/qtrpdf/r_qt1309e.pdf
- Collins, N. (2014, November 7). *Banks Have Become Too Complex to Grasp*. Retrieved August 15, 2017, from Financial Times: <https://www.ft.com/content/f94edb04-65c8-11e4-aba7-00144feabdc0?mhq5j=e4>
- Country Economy. (2021, February 12). *Interest Rates Fall in South Korea*. Retrieved February 13, 2021, from Country Economy: <https://countryeconomy.com/key-rates/south-korea>
- Crunchbase. (n.d.). *Woori Technology Investment*. Retrieved April 18, 2020, from Crunchbase: <https://www.crunchbase.com/organization/woori-technology-investment#section-overview>
- Dahl, J., Ng, E., & Sengupta, J. (2020, February 11). *How Asia Is Reinventing Banking for the Digital Age*. Retrieved November 9, 2020, from McKinsey & Company: <https://www.mckinsey.com/featured-insights/asia-pacific/how-asia-is-reinventing-banking-for-the-digital-age>
- Dankenbring, H., Quinten, D., Evans, M., Montes, C. R., Lewis, J., Briault, C., . . . Nicolaus, D. (2018). *Non-performing Loans in Europe – What Are the Solutions?* KPMG. Retrieved March 17, 2021, from <https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/05/non-performing-loans-in-europe.pdf>
- Darvas, Z., Schoenmaker, D., & Véron, N. (2016). Reform of the European Union Financial Supervisory and Regulatory Architecture and Its Implications for Asia. *Bruegel Working Paper No. 9*, 1-45. Retrieved March 27, 2021, from https://www.bruegel.org/wp-content/uploads/2016/11/WP_09_16.pdf
- Datamarket. (n.d.). *Bank Net Interest Margin (%)*. Retrieved January 28, 2019, from Datamarket: <https://datamarket.com/data/set/28ls/bank-net-interest-margin#!ds=28ls!2rqt=2m.1x.g.1f.1v.40.n&display=line>
- de Haas, R., & van Lelyveld, I. (2006). Foreign Banks and Credit Stability in Central and Eastern Europe. A Panel Data Analysis. *Journal of Banking and Finance*, 30, 1927-1952.
- Delke, R., & Lee, M. (2015). Do Foreign Bank Affiliates Cut Their Lending More Than the Domestic Banks in a Financial Crisis? *Journal of International Money and Finance*, 50, 16-32.
- Deloitte. (2017a). *China*. Retrieved August 27, 2017, from Deloitte: <https://www.iasplus.com/en/jurisdictions/asia/china>
- Deloitte. (2017b). *Korea*. Retrieved September 3, 2017, from Deloitte: <https://www.iasplus.com/en/jurisdictions/asia/korea>

- Demirgüç-Kunt, A. (2019, November 6). *Bank Regulation and Supervision a Decade after the Global Financial Crisis*. Retrieved March 27, 2021, from World Bank Blogs: <https://blogs.worldbank.org/allaboutfinance/bank-regulation-and-supervision-decade-after-global-financial-crisis>
- Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *World Bank Economic Review*, 13(2), 379-408.
- Demirgüç-Kunt, A., & Huizinga, H. (2013). Are Banks Too Big to Fail or Too Big to Save? International Evidence from Equity Prices and CDS Spreads. *Journal of Banking and Finance*, 37, 875-894.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., & Van Oudheusden, P. (2015). *The Global Findex Database 2014: Measuring Financial Inclusion around the World*. World Bank. Retrieved August 14, 2017, from <http://documents.worldbank.org/curated/en/187761468179367706/pdf/WPS7255.pdf#page=3>
- Dent, C. M. (2013, July). Paths ahead for East Asia and Asia-Pacific Regionalism. *International Affairs*, 89(4), 963-985.
- Desjardins, J. (2018, May 17). *These Are Asia's Most Influential Countries*. Retrieved January 27, 2019, from World Economic Forum: <https://www.weforum.org/agenda/2018/05/these-are-asias-most-influential-countries>
- Doliente, J. S. (2005). Determinants of Bank Net Interest Margins in Southeast Asia. *Applied Financial Economics Letters*, 1(1), 53-57.
- Dong, Y., Firth, M., Hou, W., & Yang, W. (2016). Evaluating the Performance of Chinese Commercial Banks: A Comparative Analysis of Different Types of Banks. *European Journal of Operational Research*, 280-295.
- Dowd, K. (1994). *Competition and Finance: A Reinterpretation of Financial and Monetary Economics*. Palgrave Macmillan.
- Doyle, M., & Quigley, P. (2014). *Banking Disrupted: How Technology Is Threatening the Traditional European Retail Banking Model*. Deloitte. Retrieved November 10, 2020, from <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Financial-Services/dttl-fsi-uk-Banking-Disrupted-2014-06.pdf>
- Doyle, M., Sharma, R., Ross, C., & Sonnad, V. (2017). *How to Flourish in an Uncertain Future: Open Banking and PSD2*. Deloitte. 1-34. Retrieved March 31, 2021, from <https://www2.deloitte.com/content/dam/Deloitte/cz/Documents/financial-services/cz-open-banking-and-psd2.pdf>
- Drake, L. M., Hall, M. J., & Simper, R. (2005, January). *The Impact of Macroeconomic and Regulatory Factors on Bank Efficiency: A Non-parametric Analysis of Hong Kong's Banking System*. Retrieved September 25, 2017, from Hong Kong Institute for Monetary Research: http://www.hkimr.org/uploads/publication/237/ub_full_0_2_100_wp200501_text.pdf
- EBA. (2018). *EBA/GL/2018/06 – Final Report: Guidelines on Management of Non-performing and Forborne Exposures*. EBA. Retrieved May 29, 2020, from <https://eba.europa.eu/sites/default/documents/files/documents/10180/2425705/371ff4ba->

- d7db-4fa9-a3c7-231cb9c2a26a/Final%20Guidelines%20on%20management%20of%20non-performing%20and%20forborne%20exposures.pdf
- EBA. (2021, March 1). *EBA Advises the Commission on KPIs for Transparency on Institutions' Environmentally Sustainable Activities, Including a Green Asset Ratio*. Retrieved March 31, 2021, from EBA: <https://www.eba.europa.eu/eba-advises-commission-kpis-transparency-institutions%E2%80%99-environmentally-sustainable-activities>
- ECB. (2010). *Beyond ROE – How to Measure Bank Performance*. European Central Bank. Retrieved August 19, 2017, from <https://www.ecb.europa.eu/pub/pdf/other/beyondroehowtomeasurebankperformance201009en.pdf>
- ECB. (2016a). Recent Developments in the Composition and Cost of Bank Funding in the Euro Area. *ECB Economic Bulletin*, 1, 26-45. Retrieved February 9, 2020, from ECB Economic Bulletin: https://www.ecb.europa.eu/pub/pdf/other/eb201601_article01.en.pdf
- ECB. (2016b, September 12). *What Are Non-performing Loans (NPLs)?* Retrieved May 24, 2020, from ECB: <https://www.ecb.europa.eu/explainers/tell-me/html/npl.en.html>
- ECB. (2017). *Guidance to Banks on Non-performing Loans*. Frankfurt am Main, Germany: ECB. Retrieved June 7, 2020, from https://www.bankingsupervision.europa.eu/ecb/pub/pdf/guidance_on_npl.en.pdf
- ECB. (2019). *Macroprudential Database – Bank Sector Variables – Profitability*. Retrieved September 19, 2019, from ECB: <https://sdw.ecb.europa.eu/browseSelection.do;jsessionid=5C9D9EA56EB108D81F37EA65A5D54954?org.apache.struts.taglib.html.TOKEN=03afa9f945d1fbc9a3f5467e1f5f944&df=true&ec=&dc=&oc=&pb=&rc=&DATASET=0&removeItem=&removedItemList=&mergeFilter=&activeTab=CBD2&sh>
- ECB. (2020, January 28). *ECB Keeps Capital Requirements and Guidance for Banks Stable and Increases Transparency*. Retrieved April 13, 2020, from ECB: <https://www.bankingsupervision.europa.eu/press/pr/date/2020/html/ssm.pr200128~20e2703d8e.en.html>
- ECB. (n.d.). *Legal Framework*. Retrieved May 4, 2019, from ECB: <https://www.ecb.europa.eu/ecb/legal/html/index.en.html>
- Eichler, M., Grass, M., Torti, A., & Künnemann, M. (2013). *The Financial Sector and the Economy: A Pillar or a Burden?* Berne: State Secretariat of Economic Affairs.
- Elliott, L. (2011, August 7). *Global Financial Crisis: Five Key Stages 2007-2011*. Retrieved November 3, 2019, from Guardian: <https://www.theguardian.com/business/2011/aug/07/global-financial-crisis-key-stages>
- Emmott, B. (2010, April). *Korea's Geographic Advantage*. Retrieved April 28, 2019, from McKinsey & Company: <https://www.mckinsey.com/featured-insights/asia-pacific/south-korea-finding-its-place-on-the-world-stage>

- Ernst & Young. (2016). *JGAAP-IFRS Standards*. Retrieved September 3, 2017, from <https://www.shinnihon.or.jp/services/ifrs/issue/ifrs-others/other/pdf/ifrs-jgaap-comparison-v6-en.pdf>
- European Commission. (2021). *Platform on Sustainable Finance: Transition Finance Report*. European Commission. Retrieved March 31, 2021, from https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/210319-eu-platform-transition-finance-report_en.pdf
- European Commission. (2009). Impact of the Current Economic and Financial Crisis on Potential Output. *Occasional Papers*(49), 1-84. Retrieved November 9, 2020, from https://ec.europa.eu/economy_finance/publications/pages/publication15479_en.pdf
- Faccio, M., Masulis, R. W., & McConnell, J. J. (2006, December). Political Connections and Corporate Bailouts. *The Journal of Finance*, 61(6), 2597-2635.
- Fang, C., Garnaut, R., & Song, L. (2018). 40 Year of China's Reform and Development: How Reform Captured China's Demographic Divided. In R. Garnaut, L. Song, & C. Fang (Eds.). Retrieved March 2, 2019, from <https://press-files.anu.edu.au/downloads/press/n4267/pdf/book.pdf>
- Fast Company. (2018). *Most Innovative Companies: Kakao Bank*. Retrieved November 9, 2020, from Fast Company: <https://www.fastcompany.com/company/kakao-bank>
- Faust, M. (2019). Private Banking und Wealth Management – Ein Überblick über Marktsegmente und Leistungsangebote. In *Private Banking und Wealth – Strategie und Erfolgsfaktoren* (Vol. 3, pp. 1-21). Wiesbaden: Frankfurt School Verlag, Springer Gabler.
- Fensom, A. (2016, August 30). *Asia's Great Innovation Leap Forward*. Retrieved January 25, 2019, from Diplomat: <https://thedi diplomat.com/2016/08/asias-great-innovation-leap-forward/>
- Fensom, A. (2017, December 4). *Asia to Stay World's Fastest-Growing Region through 2030*. Retrieved January 25, 2019, from Diplomat: <https://thedi diplomat.com/2017/12/asia-to-stay-worlds-fastest-growing-region-through-2030/>
- Fernando, J. (2020, November 13). *Gross Domestic Product (GDP)*. Retrieved November 16, 2020, from Invesopedia: <https://www.investopedia.com/terms/g/gdp.asp>
- Ferreira, C. (2013). Bank Performance and Economic Growth: Evidence from Granger Panel Causality Estimations. *Technical University of Lisbon Working Paper No. 21/2013/DE/UECE*, 1-36. Retrieved February 7, 2021, from <https://depeco.iseg.ulisboa.pt/wp/wp212013.pdf>
- Ferreira, C. (2016). Does Bank Performance Contribute to Economic Growth in the European Union? *Comparative Economic Studies*, 58, 174-195.
- Ferreira, J. H., Zanini, F. A., & Alves, T. W. (2019). Bank Revenue Diversification: Its Impact on Risk and Return in Brazilian Banks. *Accounting and Finance Review (Revista Contabilidade e Finanças)*, 30(79), 91-106.
- Financial Management Association. (2017, January 16). *29th Asian Shadow Financial Regulatory Committee Statement*. Retrieved November 5, 2017, from Financial Management Association: <http://www.fma.org/assets/docs/shadow/asfrc26.pdf>

- Financial Stability Board. (2016). *2016 List of Global Systemically Important Banks (G-SIBs)*. Financial Stability Board. Retrieved November 2, 2017, from <http://www.fsb.org/wp-content/uploads/2016-list-of-global-systemically-important-banks-G-SIBs.pdf>
- Financial Supervisory Service. (n.d.). *History*. Retrieved January 5, 2021, from Financial Supervisory Service: <http://www.fss.or.kr/fss/eng/wpge/eng111.jsp>
- Financial Times. (n.d.). *Definition of Commercial Bank*. Retrieved November 5, 2018, from Financial Times: <http://lexicon.ft.com/Term?term=commercial-bank>
- Firtescu, B. (2012). Causes and Effects of Crises on Financial System Stability in Emerging Countries. *Procedia Economics and Finance*, 3, 489-495.
- Francois, E. J. (2014). Financial Management. In E. J. Francois, *Financial Sustainability for Nonprofit Organizations* (1 ed., p. 384). Springer Publishing Company.
- FSA. (2020a, July). *Organization*. Retrieved January 1, 2021, from FSA: https://www.fsa.go.jp/common/about/organization/fsa_responsibility_en.pdf
- FSA. (2020b, June). *Financial Services Agency – Pamphlet*. Retrieved January 4, 2021, from FSA: https://www.fsa.go.jp/en/about/pamphlet_e.pdf
- Fu, X., Lin, Y., & Molyneux, P. (2013). Bank Competition and Financial Stability in Asia Pacific. *Journal of Banking and Finance*, 38, 64-77.
- Fujiki, H., & Tomura, H. (2017). Fiscal Cost to Exit Quantitative Easing: The Case of Japan. *Japan and the World Economy*, 42, 1-11.
- Fukuda-Parr, S. (2008). *The Human Impact of the Financial Crisis on Poor and Disempowered People and Countries*. United Nations. Retrieved August 19, 2017, from http://www.un.org/ga/president/63/interactive/gfc/sakiko_p.pdf
- Fukuyama, H., Färe, R., & Weber, W. L. (2018, February 7). Valuing and Ranking Japanese Banks: Application to Japan Post Bank and Mizuho Bank. *Journal of the Operational Research Society*, 69(12), 2021-2033.
- Ganti, A. (2019, August 22). *Median*. Retrieved November 18, 2020, from Investopedia: <https://www.investopedia.com/terms/m/median.asp>
- Ganti, A. (2020, January 20). *Short-Term Debt*. Retrieved February 16, 2020, from Investopedia: <https://www.investopedia.com/terms/s/shorttermdebt.asp>
- García-Kuhnert, Y., Marchica, M.-T., & Mura, R. (2015, October). Shareholder Diversification and Bank Risk-Taking. *Journal of Financial Intermediation*, 24(4), 602-635.
- Ghosh, A. (2016). Banking Sector Globalization and Bank Performance: A Comparative Analysis of Low Income Countries with Emerging Markets and Advanced Economies. *Review of Development Finance*, 6, 58-70.
- Ghosh, S. (2016). Political Transition and Bank Performance: How Important Was the Arab Spring? *Journal of Comparative Economics*, 44, 372-382.
- Gilbert, R. A., & Wilson, P. W. (1998). Effects of Deregulation on the Productivity of Korean Banks. *Journal of Economics and Business*, 50, 133-155.

- Global Economy. (2017). *Return on Equity: Country Rankings*. Retrieved February 28, 2021, from Global Economy:
https://www.theglobaleconomy.com/rankings/bank_return_equity/#:~:text=Bank%20return%20on%20equity%2C%20in,181%20countries%20was%2015.91%20percent.
- GMAC. (2017). *GMAT Official Guide 2018*. Hoboken, NJ: John Wiley & Sons.
- Goddard, J., Molyneux, P., & Wilson, J. O. (2004). Dynamics of Growth and Profitability in Banking. *Journal of Money, Credit and Banking*, 36(6), 1069-1090.
- Goetz, M. R., Laeven, L., & Levine, R. (2016). Does the Geographic Expansion of Banks Reduce Risk? *Journal of Financial Economics*, 120, 346-362.
- Gong, D., Hu, S., & Ligthart, J. E. (2015, January 9). Does Corporate Income Taxation Affect Securitization? Evidence from OECD Banks. *Journal of Financial Services Research*, 48(3), 193-213.
- Gorener, R., & Choi, S. (2013). Risk, Return, and Income Mix at Commercial Banks: Cross-Country Evidence. *Journal of Applied Business and Economics*, 14(3), 123-152.
- Greenglass, E., Antonides, G., Christandl, F., Foster, G., Katter, J. K., Kaufman, B. E., & Lea, S. E. (2014). The Financial Crisis and Its Effects: Perspectives from Economics and Psychology. *Journal of Behavioural and Experimental Economics*, 50, 10-12.
- Gregoriou, A., Kontonikas, A., MacDonald, R., & Montagnoli, A. (2009). Monetary Policy Shocks and Stock Returns: Evidence from the British Market. *Financial Markets and Portfolio Management*, 23, 401-410.
- Grigorian, D., & Manole, V. (2005). A Cross-Country Nonparametric Analysis of Bahrain's Banking System. *IMF Working Paper No. 05/117*, 1-16. Retrieved January 30, 2021, from <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/A-Cross-Country-Nonparametric-Analysis-of-Bahrain's-Banking-System-17998>
- Gropper, D. M., Jahera Jr., J. S., & Park, J. C. (2013). Does It Help to Have Friends in High Places? Bank Stock Performance and Congressional Committee Chairmanships. *Journal of Banking and Finance*, 73, 1986-1999.
- Gropper, D. M., Jahera Jr., J. S., & Park, J. C. (2015). Political Power, Economic Freedom and Congress: Effects on Bank Performance. *Journal of Banking and Finance*, 60, 76-92.
- Gunning, G., Yoshizawa, R., Chugh, G., Hu, H., & Chaplin, V. (2018). *Asia-Pacific Banking Outlook 2019 – Headwinds Are Picking Up*. S&P Global Ratings. 1-33: Standard & Poor's. Retrieved November 9, 2020, from https://www.spglobal.com/_assets/documents/corporate/apac-bankingoutlook2019_ratings-.pdf
- Gupta, A. (2010, December 26). *Inflation Impacts Home Loan Rates*. Retrieved January 24, 2021, from Economic Times: <https://economictimes.indiatimes.com/inflation-impacts-home-loan-rates/articleshow/7162317.cms?from=mdr>
- Hahm, J.-H. (2005). The Resurgence of Banking Institutions in Post-crisis Korea. *Journal of Contemporary Asia*, 35(3), 386-403.

- Haile, A., Getacher, T., & Tesfay, H. (2015). Financial Performance Analysis of Selected Commercial Banks in Ethiopia. *Ethiopian Journal of Business and Economics*, 4(2), 251-282.
- Hamid, F. S. (2013). The Effect of Reliance on International Funding on Banking Fragility: Evidence from East Asia. *Journal of Applied Economic Research*, 7(1), 29-60.
- Hana Financial Group. (2019). *Annual Report 2018*. Retrieved April 6, 2020, from <https://www.hanafn.com:8002/eng/ir/financial/annualReportList.do>
- Harada, K., Hoshi, T., Imai, M., Koibuchi, S., & Yasuda, A. (2015). Japan's Financial Regulatory Responses to the Global Financial Crisis. *Journal of Financial Economic Policy*, 7(1), 51-67.
- Harding, R. (2016, January 29). *Japan Joins Negative Rates Club*. Retrieved February 9, 2021, from Financial Times: <https://www.ft.com/content/23ff8798-c63c-11e5-b3b1-7b2481276e45>
- Harding, R. (2017, March 16). *Bank of Japan Stands Pat on Interest Rates after Fed Hike*. Retrieved September 26, 2017, from Financial Times: <https://www.ft.com/content/4af60459-1405-30fe-ae40-8690eebe83ac>
- Harding, R., Wildau, G., & Jung-a, S. (2018, May 9). *China, Japan and South Korea Draw Closer on Trade*. Retrieved November 17, 2018, from Financial Times: <https://www.ft.com/content/d2b313a2-5336-11e8-b3ee-41e0209208ec>
- Harvard University. (2020). *Gita Gopinath: John Zwaanstra Professor of International Studies and of Economics*. Retrieved November 16, 2020, from Harvard University: <https://scholar.harvard.edu/gopinath/home>
- Hayashi, F. (1986). Why Is Japan's Saving Rate So Apparently High? *NBER Macroeconomic Annual*, 1, 147-210.
- Hayashi, Y. (2006, April 27). *Japan Cracks Down on Its Sky-High Loans*. Retrieved June 8, 2020, from Wall Street Journal: <https://www.wsj.com/articles/SB114610142850037170>
- Hayes, A. (2019a, May 8). *Shareholder Equity Definition*. Retrieved December 28, 2019, from Investopedia: <https://www.investopedia.com/terms/s/shareholdersequity.asp>
- Hayes, A. (2019b, August 11). *Non-controlling Interest*. Retrieved December 28, 2019, from Investopedia: https://www.investopedia.com/terms/n/noncontrolling_interest.asp
- Hayes, A. (2020, March 28). *Leverage Ratio Definition*. Retrieved April 13, 2020, from Investopedia: <https://www.investopedia.com/terms/l/leverageratio.asp>
- Hazama, I., & Flynn, F. (2019, May 31). *A 0.99% Bond in Japan Is Redefining What High Yield Means*. Retrieved June 8, 2020, from Bloomberg Quint: <https://www.bloombergquint.com/onweb/a-0-99-bond-in-japan-is-about-to-redefine-what-high-yield-means>
- He, L., Chen, L., & Liu, F. H. (2017). Banking Reforms, Performance and Risk in China. *Applied Economics*, 49(40), 3995-4012.
- He, W. P. (2012). Banking Regulation in China: Why, What, and How? *Journal of Financial Regulation and Compliance*, 20(4), 367-384.

- Heffernan, S. A., & Fu, X. (2010). Determinants of Financial Performance in Chinese Banking. *Applied Financial Economics*, 20(20), 1585-1600.
- Holbig, H. (2018). Whose New Normal? Framing the Economic Slowdown under Xi Jinping. *Journal of Chinese Political Science*, 23, 341-363.
- Honda. (n.d.). *Office, Sales and Others*. Retrieved April 8, 2020, from Honda: <https://global.honda/about/group/category.html?category=office>
- Hong, G. H., & Kandrac, J. (2018). Pushed Past the Limit? How Japanese Banks Reacted to Negative Interest Rates. *IMF Working Paper No. 18/131*, 1-50. Retrieved January 30, 2021, from <https://www.imf.org/en/Publications/WP/Issues/2018/06/13/Pushed-Past-the-Limit-How-Japanese-Banks-Reacted-to-Negative-Interest-Rates-45927>
- Hong, K., & Lee, J.-W. (2018). Banking and Finance in the Republic of Korea. In U. Volz, P. J. Morgan, & N. Yoshino (Eds.), *Routledge Handbook of Banking and Finance in Asia* (pp. 106-120). London: Routledge.
- Hördahl, P., Sobrun, J., & Turner, P. (2016, August). Low Long-Term Interest Rates as a Global Phenomenon. *BIS Working Paper No. 574*, 1-20. Retrieved March 27, 2021, from <https://www.bis.org/publ/work574.pdf>
- HSBC. (2015, July 9). *The Basel III International Regulatory Framework for Banks*. Retrieved November 6, 2017, from HSBC: <http://www.gbm.hsbc.com/financial-regulation/capital-and-liquidity/basel-iii>
- Hsiao, C., Shen, Y., & Bian, W. (2015, September). Evaluating the Effectiveness of China's Financial Reform – The Efficiency of China's Domestic Banks. *China Economic Review*, 35, 70-82.
- Hsu, S. (2017, April 5). *This Is Why China Wants Its Inflation Rate to Pick Up*. Retrieved April 6, 2019, from Forbes: <https://www.forbes.com/sites/sarahsu/2017/04/05/this-is-why-china-wants-its-inflation-rate-to-pick-up/#23dba611318c>
- Huang, Y., & Wang, X. (2018). Strong on Quantity, Weak on Quality: China's Financial Reform between 1978 and 2018. In R. Garnaut, L. Song, & C. Fang (Eds.), *China's 40 Years of Reform and Development 1978-2018* (pp. 291-312). ANU Press.
- Huang, Y., Wang, X., Wang, B., & Lin, N. (2013). Financial Reform in China. In Y. C. Park, & P. Hugh, *How Finance Is Shaping the Economies of China, Japan, and Korea* (pp. 45-142). New York; Chichester, West Sussex: Columbia University Press.
- Hyun, J. (2016). Gross Loan Flows, Financial Crises, and Banking Sector Reforms: Evidence from Korea. *Asia-Pacific Journal of Financial Studies*, 45, 705-728.
- Hyun, J. (2017). Trade Credit Behavior of Korean Small and Medium Sized Enterprises during the 1997 Financial Crisis. *Journal of Asian Economics*, 50, 1-13.
- IFRS. (2017a). *Why Global Accounting Standards?* Retrieved September 3, 2017, from IFRS: <http://www.ifrs.org/use-around-the-world/why-global-accounting-standards/>
- IFRS. (2017b, June 23). *South Korea*. Retrieved September 3, 2017, from IFRS: <http://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/south-korea/>

- IFRS. (n.d.). *Who We Are*. Retrieved August 27, 2017, from IFRS: <http://www.ifrs.org/about-us/who-we-are/>
- Imai, M. (2019). Regulatory Responses to Banking Crisis: Lessons from Japan. *Global Finance Journal*, 39, 10-16.
- IMF. (2006). *Financial Soundness Indicators: Compilation Guide*. Washington, DC: IMF.
- IMF. (2016, June 2016). *ASEAN-5 Cluster Report: Evolution of Monetary Policy Frameworks*. IMF. Retrieved November 5, 2017, from International Monetary Fund: <https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Asean-5-Cluster-Report-Evolution-of-Monetary-Policy-Frameworks-43988>
- Irwin, N. (2019, January 27). *The World Economy Just Can't Escape Its Low-Growth, Low-Inflation Rut*. Retrieved April 7, 2019, from New York Times: <https://www.nytimes.com/2019/01/27/upshot/world-economy-low-growth-low-interest-deflation.html>
- Jaccs Corporation. (n.d.). *About Jaccs*. Retrieved April 8, 2020, from Jaccs Corporation: <https://www.jaccs.co.jp/en/corporate/about/>
- Japan Finance Corporation. (2019). *Profile*. Retrieved February 2, 2020, from Japan Finance Corporation: <https://www.jfc.go.jp/n/english/profile.html>
- Japan Finance Organization for Municipalities. (2019). *Financial Information*. Retrieved February 1, 2020, from Japan Finance Organization for Municipalities: <http://www.jfm.go.jp/en/investors/financial.html#F.S>
- Japan International Cooperation Agency. (2020, April 1). *Organization*. Retrieved April 8, 2020, from Japan International Cooperation Agency: <https://www.jica.go.jp/english/about/organization/index.html>
- Jeon, Y., & Miller, S. M. (2005, June). Performance of Domestic and Foreign Banks: The Case of Korea and the Asian Financial Crisis. *Global Economic Review*, 34(2), 145-165.
- Johnston, D. (2016, October). *To the Miracle on the Han*. Retrieved April 28, 2019, from OECD Observer: http://oecdobserver.org/news/fullstory.php/aid/5657/To_the_Miracle_on_the_Han.html
- Kagan, J. (2019a, May 6). *Cost of Funds*. Retrieved February 2, 2020, from Investopedia: <https://www.investopedia.com/terms/c/costoffunds.asp>
- Kagan, J. (2019b, April 9). *Loan Loss Provision*. Retrieved April 7, 2020, from <https://www.investopedia.com/terms/l/loanlossprovision.asp>
- Kanaya, A., & Woo, D. (2000). The Japanese Banking Crisis of the 1990s: Sources and Lessons. *IMF Working Paper No 00/7*, 1-47. Retrieved January 1, 2021, from <https://www.imf.org/external/pubs/ft/wp/2000/wp0007.pdf>
- Kano, M., & Tsutsui, Y. (2003). Geographical Segmentation in Japanese Bank Loan Markets. *Regional Science and Urban Economics*, 33, 157-174.
- Karanikolos, M., Mladovsky, P., Cylus, J., Thomson, S., Basu, S., Stuckler, D., . . . McKee, M. (2013, April 13). Financial Crisis, Austerity, and Health in Europe. *Lancet*, 381, 1323-1331.

- Kawase, K. (2016, April 28). *As Multinationals Push into Asia, Asian Companies Are Pushing Out*. Retrieved August 1, 2019, from Nikkei Asia Review: <https://asia.nikkei.com/Business/As-multinationals-push-into-Asia-Asian-companies-are-pushing-out>
- Kearns, J. (2016). Global Inflation Forecasts. *BIS Working Papers No. 582*, 1-30. Retrieved April 7, 2019, from <https://www.bis.org/publ/work582.pdf>
- KEB Hana Bank (Germany). (n.d.). *Company*. Retrieved April 6, 2020, from <https://www.kebhana.de/en/about-us/company.html>
- Kennon, J. (2016, December 30). *How to Calculate Return on Assets or ROA*. Retrieved November 6, 2017, from Balance: <https://www.thebalance.com/return-on-assets-roa-357592>
- Kenton, W. (2019a, April 14). *Minority Interest*. Retrieved December 28, 2019, from Investopedia: <https://www.investopedia.com/terms/m/minorityinterest.asp>
- Kenton, W. (2019b, July 15). *Operating Expense*. Retrieved January 19, 2020, from Investopedia: https://www.investopedia.com/terms/o/operating_expense.asp
- Kenton, W. (2019c, September 18). *Interbank Rate*. Retrieved April 8, 2020, from Investopedia: <https://www.investopedia.com/terms/i/interbankrate.asp>
- Kenton, W. (2020, March 21). *Shareholder Equity Ratio*. Retrieved April 13, 2020, from Investopedia: <https://www.investopedia.com/terms/s/shareholderequityratio.asp>
- Kihara, L. (2016, December 27). *Japan Consumer Prices Slump in November, Look for 2017 Rebound*. Retrieved April 27, 2019, from Reuters: <https://www.reuters.com/article/us-japan-economy-cpi/japan-consumer-prices-slump-in-november-look-for-2017-rebound-idUSKBN14F15U>
- Kihara, L. (2020, May 21). *Bank of Japan to Create Its Version of Fed's 'Main Street' Lending Scheme*. Retrieved February 10, 2021, from Reuters: <https://www.reuters.com/article/health-coronavirus-boj-idUSL4N2D21AU>
- Kihara, L., Canepa, F., & Schneider, H. (2020, May 19). *Amid Rising Talk of Negative Rates, Policies in Japan, Europe Get Subtle Tweaks*. Retrieved February 10, 2021, from Reuters: <https://www.reuters.com/article/us-health-coronavirus-centralbanks-rates-idCAKBN22V0HP>
- Kim, C. (2016). The Samsung Media Empire. In C. Kim, *Samsung, Media Empire and Family: A Power Web* (1st ed., p. 156). Abingdon, Oxon; New York, New York: Routledge.
- Kim, J., & Kwon, Y.-S. (2012). Economic Development, the Evolution of Foreign Labor and Immigration Policy, and the Shift to Multiculturalism in South Korea. *Philippine Political Science Journal*, 33(2), 178-201.
- Köhler, M. (2015). Which Banks Are More Risky? The Impact of Business Models on Bank Stability. *Journal of Financial Stability*, 16, 195-212.
- Kojima, R., Nakamura, S., & Ohyama, S. (2005). Inflation Dynamics in China. *Bank of Japan Working Paper Series No. 05-E-9*, 1-36. Retrieved April 7, 2019, from https://www.boj.or.jp/en/research/wps_rev/wps_2005/data/wp05e09.pdf
- Kokaliari, E. (2016). Quality of Life, Anxiety, Depression, and Stress among Adults in Greece Following the Global Financial Crisis. *International Social Work*, 1-15.

- Köster, H., & Pelster, M. (2017). Financial Penalties and Bank Performance. *Journal of Banking and Finance*(79), 57-73.
- Kou, G., Peng, Y., & Wang, G. (2014). Evaluation of Clustering Algorithms for Financial Risk Analysis Using MCDM Methods. *Information Sciences*, 275, 1-12.
- KPMG. (2016). *IFRS Compared to US GAAP – An Overview*. KPMG. Retrieved September 3, 2017, from <https://home.kpmg.com/content/dam/kpmg/xx/pdf/2016/12/ifrs-us-gaap-2016-overview.pdf>
- KPMG. (2017, February 28). *IFRS Adoption in Japan Will Affect US Subsidiaries*. Retrieved September 3, 2017, from KPMG Institutes: <http://www.kpmg-institutes.com/institutes/ifrs-institute/articles/2017/01/ifrs-adoption-in-japan-will-affect-us-subsidiaries.html>
- KPMG. (n.d.). *Who We Are*. Retrieved August 31, 2019, from KPMG: <https://home.kpmg/xx/en/home/about/who-we-are.html>
- Kuepper, J. (2019, January 30). *A Brief History and Lessons of Japan's Lost Decade*. Retrieved April 24, 2019, from Balance: <https://www.thebalance.com/japan-s-lost-decade-brief-history-and-lessons-1979056>
- Kumbirai, M., & Webb, R. (2010). A Financial Ratio Analysis of Commercial Bank Performance in South Africa. *African Review of Economics and Finance*, 2(1), 30-53.
- Kurimoto, A., & Koseki, T. (2019). *Rokin Banks: 70 Years of Efforts to Build an Inclusive Society in Japan through Enhancing Workers' Access to Finance*. International Labor Organization. Retrieved June 7, 2020, from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_695734.pdf
- Laeven, L., & Levine, R. (2009). Bank Governance, Regulation and Risk Taking. *Journal of Financial Economics*, 93, 259-275.
- Lardic, S., & Terraza, V. (2019). Financial Ratios Analysis in Determination of Bank Performance in the German Banking Sector. *International Journal of Economics and Financial Issues*, 9(3), 22-47.
- Ledonne, G., & Garrido, F. (2019, August 26). *Bank Cost-to-Income Ratios Improve in Americas amid Worldwide Split*. Retrieved January 25, 2020, from S&P Global: <https://www.spglobal.com/marketintelligence/en/news-insights/research/cost-to-income-ratios-of-banks-worldwide-2019>
- Lee, C.-C., Yang, S.-J., & Chang, C.-H. (2014). Non-interest Income, Profitability, and Risk in Banking Industry: A Cross-Country Analysis. *North American Journal of Economics and Finance*, 27, 48-67.
- Lee, J. Y., & Kim, D. (2013). Bank Performance and Its Determinants in Korea. *Japan and the World Economy*, 27, 83-94.
- Lee, S.-Y. (2015). Keys to Effective Implementation of the Law on Corporate Governance of Financial Companies in Korea. *KIF Weekly Financial Brief*, 15(22), 2-3.
- Lee, Y.-W., & Lee, H.-Y. (2017, November 11). *Eugene Savings Bank Makes Fresh New Start with New Name*. Retrieved May 17, 2020, from Pulse: <https://pulsenews.co.kr/view.php?year=2017&no=769391>

- Levin, J. H. (1974). A Financial Sector Analysis of the Eurodollar Market. *Journal of Finance*, 29(1), 103-117.
- Levine, R. (2005, Fall). Bank Regulation and Supervision. *NBER Reporter*, 9-12. Retrieved from National Bureau of Economic Research.
- Li, J., Hsu, S., & Qin, Y. (2014). Shadow Banking in China: Institutional Risks. *China Economic Review*, 31, 119-129.
- Liao, M. (n.d.). *Progress and Impact of the Global Regulatory Reform in China*. Retrieved September 24, 2017, from World Bank:
http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Liao.M_Session5.pdf
- Lin, C.-Y., & Wang, C. (2013). Forecasting China's Inflation in a Data-Rich Environment. *Applied Economics*, 45(21), 3049-3057.
- Lincoln, E. J. (2013). Japan: Ongoing Financial Deregulation, Structural Change, and Performance. In Y. C. Park, & P. Hugh, *How Finance Is Shaping the Economies of China, Japan, and Korea* (pp. 143-224). New York; Chichester, West Sussex: Columbia University Press.
- Lindström, M., & Giordano, G. N. (2016). The 2008 Financial Crisis: Changes in Social Capital and Its Association with Psychological Wellbeing in the United Kingdom – A Panel Study. *Social Science and Medicine*, 153, 71-80.
- Liu, H., & Wilson, J. O. (2010). The Profitability of Banks in Japan. *Applied Financial Economics*, 20(24), 1851-1866.
- Liu, W. (2018). GDP and the New Concept of Development: Understanding China's Changing Concept of Development in regards to GDP after the Reform and Opening-Up. In R. Garnaut, L. Song, & C. Fang (Eds.), *China's 40 Years of Reform and Development 1970-2018* (pp. 67-75). ANU Press.
- London, S., & Lund, S. (2018, September). *How Secure Is the Global Financial System a Decade after the Crisis?* Retrieved November 3, 2019, from McKinsey & Company:
<https://www.mckinsey.com/industries/financial-services/our-insights/how-secure-is-the-global-financial-system-a-decade-after-the-crisis>
- Lopes, A. I., Lourenço, I., & Soliman, M. (2012). Do Alternative Methods of Reporting Non-controlling Interests Really Matter? *Australian Journal of Management*, 38(1), 7-30.
- Lozano-Vivas, A., Pastor, J. T., & Pastor, J. M. (2002). An Efficiency Comparison of European Banking Systems Operating under Different Environmental Conditions. *Journal of Productivity Analysis*, 18, 59-77.
- Mare, D. S., Cull, R. J., Demirgüç-Kunt, A., & Zhou, N. (2019, October 25). *Bank Regulation and Supervision Survey*. World Bank. Retrieved August 2, 2020, from World Bank.
- Markham, J. W. (2010, November). Banking Regulation: Its History and Future. *Florida International University Legal Studies Research Paper Series*, 4, 221-285.
- Markowitz, H. (1952, March). Portfolio Selection. *Journal of Finance*, 7(1), 77-91.

- Masry, S., Aloud, M., Tsang, E., Dupuis, A., & Olsen, R. (2010). A Novel Approach for Studying the High-Frequency FOREX Market. *2nd Computer Science and Electronic Engineering Conference*, (pp. 1-6).
- Matsui, K. (2011). Accounting Year-End Dispersion and Seasonality in the Japanese Corporate Bond Market. *Applied Economics*, 43(26), 3733-3744.
- Matsuki, T., Sugimoto, K., & Satoma, K. (2015). Effects of the Bank of Japan's Current Quantitative and Qualitative Easing. *Economics Letters*, 133, 112-116.
- McClory, J. (2018). *The Soft Power 30 – A Global Ranking of Soft Power*. Portland. Retrieved January 27, 2019, from <https://softpower30.com/wp-content/uploads/2018/07/The-Soft-Power-30-Report-2018.pdf>
- McKee, M., & Stuckler, D. (2020, May). If the World Fails to Protect the Economy, COVID-19 Will Damage Health Not Just Now but Also in the Future. *Nature*, 26, 640-648.
- McKinsey & Company. (2012). *Global Corporate and Investment Banking: An Agenda for Change*. McKinsey & Company.
- McKinsey & Company. (2016, October). *Digital Innovation in Asia: What the World Can Learn*. Retrieved January 25, 2019, from McKinsey & Company: <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-innovation-in-asia-what-the-world-can-learn>
- McKinsey & Company. (2019). *Beyond Banking: How Banks Can Use Ecosystems to Win in the SME Market*. McKinsey & Company. Retrieved March 31, 2021, from <https://www.mckinsey.com/~media/mckinsey/industries/financial%20services/our%20insights/how%20banks%20can%20use%20ecosystems%20to%20win%20in%20the%20sme%20market/how-banks-can-use-ecosystems-to-win-in-the-sme-market-vf.ashx>
- Mergaerts, F., & Vander Vennet, R. (2016). Business Models and Bank Performance: A Long-Term Perspective. *Journal of Financial Stability*, 22, 57-75.
- Merkel, C., & Stolz, S. (2009). Banks' Regulatory Buffers, Liquidity Networks and Monetary Policy Transmission. *Applied Economics*, 41(16), 2013-2024.
- Miao, M., & Jayakar, K. (2016). Mobile Payments in Japan, South Korea and China: Cross-Border Convergence or Divergence of Business Models? *Telecommunications Policy*, 40, 182-196.
- Migliardo, C., & Forgione, A. F. (2018). Ownership Structure and Bank Performance in EU-15 Countries. *Corporate Governance*, 18(3), 509-530.
- Miller, J., & Petranov, S. (2000). Non-banking Financial Institutions in Bulgaria. *Economic Policy in Transitional Economies*, 10(3), 363-379.
- Mo, Y. K. (2016, February 15). A Review of Recent Banking Reforms in China. *BIS Online Archive*, 90-109. Retrieved May 8, 2019, from BIS: <https://www.bis.org/publ/plcy07d.pdf>
- Mohanty, M. S., & Turner, P. (2010). Banks and Financial Intermediation in Emerging Asia: Reforms and New Risks. *BIS Working Papers No. 313*, 1-23. Retrieved January 27, 2019, from <https://www.bis.org/publ/work313.pdf>

- Moody's. (2014, March 6). *Rating Action: Moody's Assigns First-Time Rating of Aa3 to Korea Securities Finance Corporation*. Retrieved June 8, 2020, from Moody's: https://www.moodys.com/research/Moodys-assigns-first-time-rating-of-Aa3-to-Korea-Securities--PR_293068
- Moody's. (2020). *Rating Symbols and Definitions*. Moody's. Retrieved June 8, 2020, from Moody's: <https://www.moodys.com/sites/products/AboutMoodysRatingsAttachments/MoodysRatingSymbolsandDefinitions.pdf>
- Moody's. (n.d.). *Moody's Corporation*. Retrieved November 3, 2019, from Moody's: <https://www.moodys.com/Pages/atc.aspx>
- Muhui, Z. (2016). Growing Activism as Cooperation Facilitator: China-Japan-Korea Trilateralism and Korea's Middle Power Diplomacy. *Korean Journal of International Studies*, 14(2), 309-337.
- Mulder, A., & Westerhuis, G. (2015). The Determinants of Bank Internationalisation in Times of Financial Globalisation: Evidence from the World's Largest Banks, 1980-2007. *Business History*, 57(1), 122-155.
- Murphy, C. B. (2019, July 11). *Loan-to-Deposit Ratio (LDR)*. Retrieved April 9, 2020, from Investopedia: <https://www.investopedia.com/terms/l/loan-to-deposit-ratio.asp>
- Nasdaq. (n.d.). *Financial Glossary: Bank Regulation*. Retrieved May 4, 2019, from Nasdaq: <https://www.nasdaq.com/investing/glossary/b/bank-regulation>
- Nasir, M. A., & Du, M. (2017). Integration of Financial Markets in Post Global Financial Crises and Implications for British Financial Sector: Analysis Based on a Panel VAR Model. *Journal of Quantitative Economics*, 1-26.
- Natalia, A. H., Kurniawan, M. R., & Firsty, R. R. (2016). Bank Income Diversification from Stock Market Perspective: Evidence from ASEAN+3. *Indonesian Capital Market Review*, 8, 32-45.
- Neue Zürcher Zeitung. (2013, May 2). «Fremde» Gewinne in der konsolidierten Bilanz. Retrieved April 13, 2020, from Neue Zürcher Zeitung: <https://www.nzz.ch/fremde-gewinne-in-der-konsolidierten-bilanz-1.18074448>
- Nguyen, M., Skully, M., & Perera, S. (2012). Bank Market Power and Revenue Diversification: Evidence from Selected ASEAN Countries. *Journal of Asian Economics*, 23, 688-700.
- Nikkei Asian Review. (2019a). *Tencent Holdings Ltd*. Retrieved February 1, 2020, from Nikkei Asian Review: <https://asia.nikkei.com/Companies/Tencent-Holdings-Ltd>
- Nikkei Asian Review. (2019b). *Traders Holdings Co., Ltd*. Retrieved February 1, 2020, from Nikkei Asian Review: <https://asia.nikkei.com/Companies/Traders-Holdings-Co.-Ltd>
- Nishizaki, K., Sekine, T., & Ueno, Y. (2014). Chronic Deflation in Japan. *Asian Economic Policy Review*, 9, 20-39.
- Noman, A. H., Gee, C. S., & Isa, C. R. (2017, May 9). Does Competition Improve Financial Stability of the Banking Sector in ASEAN Countries? An Empirical Analysis. *PLOS One*, 1-27.

- Nordstrand Berg, L., Pinheiro, R., Geschwind, L., & Vrangbæk, K. (2017). Responses to the Global Financial Crisis – Lessons from the Public Sector in the Nordic Countries. *Scandinavian Journal of Public Administration*, 21(1), 3-8.
- Nougayrède, N. (2017, September 9). *Global Power Is Shifting to Asia – And Europe Must Adapt to That*. Retrieved January 25, 2019, from Guardian: <https://www.theguardian.com/commentisfree/2017/sep/09/global-power-shifting-asia-europe-must-adapt>
- NTT Finance. (2020). *Services*. Retrieved April 5, 2020, from NTT Finance: <https://www.ntt-finance.co.jp/eng/service/index.html>
- Oanda. (2017, August 10). *Historical Rates*. Retrieved August 10, 2017, from Oanda: <https://www.oanda.com/fx-for-business/historical-rates>
- OBF. (2017). *Orbis Bank Focus – World Banking Information Source*. Retrieved August 7, 2017, from Orbis Bank Focus: <https://orbisbanks.bvdinfo.com>
- Observatory of Economic Complexity. (n.d.). *South Korea*. Retrieved April 7, 2019, from Observatory of Economic Complexity: <https://atlas.media.mit.edu/en/profile/country/kor/>
- OECD. (2020). *Digital Disruption in Banking and Its Impact on Competition*. OECD. Retrieved November 10, 2020, from <http://www.oecd.org/daf/competition/digital-disruption-in-banking-and-its-impact-on-competition-2020.pdf>
- Omi, K., & Tisseverasinghe, T. (2014). *Survival and Success: Securing the Future for Japanese Banks*. Retrieved January 30, 2021, from PwC: <https://www.pwc.com/gx/en/banking-capital-markets/assets/pwc-future-of-japanese-banking-final-march-2014.pdf>
- Ötoker-Robe, I., & Podpiera, A. M. (2013). The Social Impact of Financial Crises: Evidence from the Global Financial Crisis. *Policy Research Working Paper No. 6703*. Retrieved November 9, 2020, from <https://openknowledge.worldbank.org/bitstream/handle/10986/16912/WPS6703.pdf?sequence=1&isAllowed=y>
- Ovi, N. Z., Perera, S., & Colombage, S. (2014). Market Power, Credit Risk, Revenue Diversification and Bank Stability in Selected ASEAN Countries. *South East Asia Research*, 22(3), 399-416.
- Park, J.-L., Yoo, S.-K., Lee, J.-S., Kim, J.-H., & Kim, J.-J. (2015). Comparing the Efficiency and Productivity of Construction Firms in China, Japan, and Korea Using DEA and DEA-Based Malmquist. *Architectural Urban Planning and Design*, 14(1), 57-64.
- Park, Y. C. (2013). Financial Development and Liberalization in Korea: 1980-2011. In Y. C. Park, & P. Hugh, *How Finance Is Shaping the Economies of China, Japan, and Korea* (pp. 225-301). New York; Chichester, West Sussex: Columbia University Press.
- Park, Y. C., & Hugh, P. (2013). Preface. In Y. C. Park, & P. Hugh, *How Finance Is Shaping the Economies of China, Japan, and Korea* (pp. VII-IX). New York; Chichester, West Sussex: Columbia University Press.
- Pham, P. (2018a, January 5). *How Do Banks Work in Asia?* Retrieved January 25, 2019, from Forbes: <https://www.forbes.com/sites/peterpham/2018/01/05/how-do-banks-work-in-asia/#575dfbbb1d21>

- Pham, P. (2018b, January 16). *Why Is Asia Home to the World's Biggest Banks?* Retrieved January 27, 2019, from Forbes: <https://www.forbes.com/sites/peterpham/2018/01/16/why-is-asia-home-to-the-worlds-biggest-banks/#794b31b333fe>
- Poon, G., & Amper, E. (2019, July 1). *Singapore: Private Equity and Venture Capital Activity in Southeast Asia*. Retrieved August 1, 2019, from Mondaq: <http://www.mondaq.com/x/818230/Corporate+Commercial+Law/Private+Equity+And+Venture+Capital+Activity+In+Southeast+Asia>
- Porter, M. E. (1979, May). The Structure within Industries and Companies' Performance. *The Review of Economics and Statistics*, 61(2), 214-227.
- PricewaterhouseCoopers. (2017). *IFRS Adoption*. Retrieved August 27, 2017, from PricewaterhouseCoopers: <http://www.pwc.com/us/en/cfodirect/assets/pdf/pwc-ifs-by-country-2016.pdf>
- Pritchard, J. (2019, September 25). *What Is a Neobank (And Should You Try One)?* Retrieved February 2, 2020, from Balance: <https://www.thebalance.com/what-is-a-neobank-and-should-you-try-one-4186468>
- Pritchard, J. (2020, April 1). *How Banks and Credit Unions Make Money*. Retrieved January 23, 2021, from Balance: <https://www.thebalance.com/how-banks-make-money-315473>
- Qamruzzaman, M. (2014). Analysis of Performance and Financial Soundness of Financial Institutions (Banks): A Comparative Study. *Research Journal of Finance and Accounting*, 5(7), 169-186.
- Rachdi, H., & Bouheni, F. B. (2016). Revisiting the Effect of Regulation, Supervision and Risk on Banking Performance. *Journal of Financial Regulation and Compliance*, 24(1), 24-39.
- Ramanna, K. (2012, August 27). The International Politics of IFRS Harmonization. *Harvard Business School Working Paper No. 11-132*, 1-44. Retrieved August 27, 2017, from Digital Access to Scholarship at Harvard: https://dash.harvard.edu/bitstream/handle/1/11320610/ramanna_the-international-politics_SSRN-id1875682.pdf?sequence%3D1
- Relbanks. (2017). *Top 100 Banks in the World*. Retrieved August 14, 2017, from Relbanks: <https://www.relbanks.com/worlds-top-banks/assets-2016>
- Reuters. (2015, June 24). *China to Scrap Commercial Banks' Loan-to-Deposit Ratio*. Retrieved January 23, 2021, from Reuters: <https://www.reuters.com/article/us-china-banks-deposit-ratio-idUSKBN0P41LC20150624>
- Reuters. (2016, January 28). *Samsung Life to Buy Samsung Electronics Stake in Samsung Card for \$1.3 billion*. Retrieved April 9, 2020, from Reuters: <https://www.reuters.com/article/us-samsung-life-samsung-card-samsung-ele-idUSKCN0V6083>
- Reuters. (2017, May 15). *Moody's Corp to Buy Bureau van Dijk for about USD 3.3 Billion*. Retrieved August 20, 2017, from Reuters: <http://www.reuters.com/article/us-bureauvandijk-m-a-moody-s-idUSKCN18B1CZ>
- Reuters. (2020). *Mason Capital Corp*. Retrieved April 18, 2020, from Reuters: <https://www.reuters.com/companies/021880.KQ>

- Reuters. (2021, January 5). *Japan's Cash Balance Hits Fresh High as Central Bank Keeps Support for Economy*. Retrieved January 31, 2021, from Reuters: <https://www.reuters.com/article/uk-japan-economy-boj/japans-cash-balance-hits-fresh-high-as-central-bank-keeps-support-for-economy-idUKKBN29A02V?edition-redirect=in>
- Reuters. (n.d.). *Q Capital Partners Co Ltd*. Retrieved April 9, 2020, from Reuters: <https://www.reuters.com/companies/016600.KQ>
- Rho, J.-H. (2007). The Revolution of Auditing System in Korea. In J. Mahlich, & W. Pascha (Eds.), *Innovation and Technology in Korea: Challenges of a Newly Advanced Economy* (pp. 87-92). Physica.
- Richter, T., & Gischer, H. (2019). Zur Leistungsfähigkeit europäischer Banken: Ist die Aufwand- Ertrag-Relation ein belastbarer Indikator? *Betriebswirtschaftliche Forschung und Praxis*, 71(3), 354-382.
- Robertson, D. (2016, September 19). *Nilson Report*. Robertson, David. Retrieved December 29, 2019, from Nilson Report: <http://files.constantcontact.com/610724ae101/1f134a60-3c5d-48c7-8536-80757c2d03d0.pdf?platform=hootsuite>
- Roengpitya, R., Tarashev, N., & Tsatsaronis, K. (2014, December). Bank Business Models. *BIS Quarterly Review*, 55-65.
- Rogers, C. (2017, March 6). *Implementation Timeline for the Net Stable Funding Ratio*. Retrieved September 24, 2017, from Office of the Superintendent of Financial Institutions: http://www.osfi-bsif.gc.ca/Eng/fi-if/in-ai/Pages/NSFR_def.aspx
- Roh, J., & Kim, C. (2019, April 2). *South Korea Inflation Slows to Near Three-Year Low, Bolsters Rate Cut Expectations*. Retrieved April 28, 2019, from Reuters: <https://www.reuters.com/article/us-southkorea-economy-inflation/south-korea-inflation-slows-to-near-three-year-low-bolsters-rate-cut-expectations-idUSKCN1RD3G3>
- Rosling, H., Rosling, O., & Rosling Rönnlund, A. (2018). *Factfulness: Ten Reasons We're Wrong about the World – And Why Things Are Better Than You Think*. London: Sceptre.
- Roy, A. D. (1952). Safety First and the Holding of Assets. *Econometrica*, 20(3), 441-449.
- Russell, J. (2019, January 22). *VCs Give Us Their Predictions for Startups and Tech in Southeast Asia in 2019*. Retrieved January 25, 2019, from TechCrunch: <https://techcrunch.com/2019/01/22/vc-predictions-southeast-asia-tech-startups/>
- Samsung Card. (n.d.). *Business Area*. Retrieved April 9, 2020, from Samsung Card: <https://www.samsungcard.com/company/english/introduction/business/UHPPCI0247M0.jsp>
- Sano, H., & Kihara, L. (2016, February 16). *BOJ Launches Negative Rates, Already Dubbed a Failure by Markets*. Retrieved February 10, 2021, from Reuters: <https://www.reuters.com/article/japan-economy-boj-idUSKCN0VP08T>
- Saona, P., & Azad, M. A. (2018). Bank- and Country-Based Determinants of Banks' Performance in Asia. *Journal of the Asia Pacific Economy*, 428-446.
- Schwarz, C., Karakitsos, P., Merriman, N., & Studener, W. (2014). *Why Accounting Matters: A Central Bank Perspective*. European Central Bank. Retrieved September 17, 2017, from <https://www.ecb.europa.eu/pub/pdf/scpops/ecbop153.pdf>

- Scott, J. W., & Arias, J. C. (2011). Banking Profitability Determinants. *Business Intelligence Journal*, 209-230.
- Segal, T. (2020, March 9). *Nonperforming Loan (NPL)*. Retrieved May 24, 2020, from Investopedia: <https://www.investopedia.com/terms/n/nonperformingloan.asp>
- Selman, O., & Özsürünç, Z. (2019). The Effect of Digital Channel Migration, Automation and Centralization on the Efficiency of Operational Staff of Bank Branches. *Procedia Computer Science*, 158, 938-946.
- Seven & I Holdings Corporation. (n.d.). *Corporate Profile*. Retrieved April 8, 2020, from Seven & I Holdings Corporation: <https://www.7andi.com/en/company/summary.html>
- Shah, S. (2018, September 7). *Is the Consumer Price Index (CPI) the Best Measure of Inflation?* Retrieved March 24, 2019, from Investopedia: <https://www.investopedia.com/ask/answers/012115/consumer-price-index-cpi-best-measure-inflation.asp>
- Shirai, S. (2015). *Unconventional Monetary Policies of the Bank of Japan and European Central Bank*. Bank of Japan. Retrieved February 10, 2021, from https://www.boj.or.jp/en/announcements/press/koen_2015/data/ko150909a1.pdf
- Sikarwar, D., & Pandey, V. (2013, December 16). *There Is Disappointment That India Has Not Realised Its Potential: Gita Gopinath*. Retrieved November 16, 2020, from Economic Times: <https://economictimes.indiatimes.com/opinion/interviews/there-is-disappointment-that-india-has-not-realised-its-potential-gita-gopinath/articleshow/27252065.cms>
- Silicon Valley Bank. (n.d.). *SVB in China*. Retrieved April 5, 2020, from Silicon Valley Bank: <https://www.svb.com/china>
- Song, M., & Chung, J. (2016). *Research Report No. 41: The Economic Consequences of IFRS Adoption in Korea: A Literature Review and Empirical Evidence*. Korea Accounting Institute.
- Soo, Z. (2018, October 26). *From Supermarkets to Super Apps, Southeast Asian Tech Start-Ups Are Looking to China Not Silicon Valley*. Retrieved January 25, 2019, from South China Morning Post: <https://www.scmp.com/tech/apps-social/article/2170181/supermarkets-super-apps-southeast-asian-tech-start-ups-are-looking>
- Standard & Poor's. (2016, April 7). *Cost-to-Income Ratios of Banks Worldwide 2016*. Retrieved January 16, 2021, from Standard & Poor's: <https://www.spglobal.com/marketintelligence/en/news-insights/research/cost-to-income-ratios-of-banks-worldwide-2016>
- Statista. (2019, November 5). *Cost-Income-Ratio der Banken in Österreich bis zum 2. Quartal 2019*. Retrieved January 19, 2020, from Statista: <https://de.statista.com/statistik/daten/studie/298799/umfrage/cost-income-ratio-der-banken-in-oesterreich/>
- Stuckler, D., Basu, S., Suhrcke, M., Coutts, A., & McKee, M. (2009). The Public Health Effect of Economic Crises and Alternative Policy Responses in Europe: An Empirical Analysis. *Lancet*, 347, 315-323.
- Sufian, F. (2011). Profitability of the Korean Banking Sector: Panel Evidence on Bank-Specific and Macroeconomic Determinants. *Journal of Economics and Management*, 7(1), 43-72.

- Sumitomo Mitsui Finance and Leasing. (2020). *Services and Solutions*. Retrieved April 5, 2020, from Sumitomo Mitsui Finance and Leasing: <https://www.smfl.co.jp/english/>
- Sun, G. (2019, November). China's Shadow Banking: Bank's Shadow and Traditional Shadow Banking. *BIS Working Papers No. 822*, 1-44.
- Takeshi, I., Yuki, T., & Shigeyuki, H. (2012, March 1). Inflation Targeting in Korea, Indonesia, Thailand, and the Philippines: The Impact on Business Cycle Synchronization between Each Country and the World. *Institute of Developing Economies Discussion Papers No. 328*, 1-23.
- Tamaki, N. (2008). *ifo Institute*. Retrieved January 4, 2021, from Bank Regulation in Japan: <https://www.ifo.de/DocDL/dicereport308-forum2.pdf>
- Tarawneh, M. (2006). A Comparison of Financial Performance in the Banking Sector: Some Evidence from Omani Commercial Banks. *International Research Journal of Finance and Economics*, 1(3), 101-112.
- Tarver, E. (2019, April 24). *Islamic Banking*. Retrieved January 19, 2020, from Investopedia: <https://www.investopedia.com/terms/i/islamicbanking.asp>
- Theissen, R. (2013). *EU Banking Supervision* (1 ed.). The Hague: Eleven International Publishing .
- Thibeault, A., Defrancq, C., & Vantieghe, J. (2012). *A Scorecard for Bank Performance: The Belgian Banking Industry*.
- Thomson Reuters Practical Law. (n.d.). *China Banking and Insurance Regulatory Commission (CBIRC) (中国银行保险监督管理委员会)*. Retrieved September 12, 2019, from Thomson Reuters Practical Law: [https://uk.practicallaw.thomsonreuters.com/w-015-0554?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&bhcp=1](https://uk.practicallaw.thomsonreuters.com/w-015-0554?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1)
- Tierno, P. (2017, September 29). *Federal Reserve Bank of San Francisco*. Retrieved February 13, 2021, from South Korea's Efforts to Contain Debt and Housing Prices Take Shape: <https://www.frbsf.org/banking/asia-program/pacific-exchange-blog/korea-household-debt-home-prices/>
- Toader, O. (2014, December 6). Estimating the Impact of Higher Capital Requirements on the Cost of Equity: An Empirical Study of European Banks. *International Economics and Economic Policy*, 12, 411-436.
- Tongurai, J., & Vithessonthi, C. (2020, May 28). Bank Regulations, Bank Competition and Bank Risk-Taking: Evidence from Japan. *Journal of Multinational Financial Management*, 56, 1-19.
- Trading Economics. (2021, January 27). *Japan Interest Rate*. Retrieved January 30, 2021, from Trading Economics: <https://tradingeconomics.com/japan/interest-rate?user=tradingeconomics>
- Tran, M. (2011, November 28). *South Korea: A Model of Development?* Retrieved April 28, 2019, from Guardian: <https://www.theguardian.com/global-development/poverty-matters/2011/nov/28/south-korea-development-model>

- Tsuchiya, M. (2016). Cyber Security of Financial Sectors in Japan, South Korea and China. In R. Taplin (Ed.), *Managing Cyber Risk in the Financial Sector* (1 ed., pp. 96-111). Abingdon, Oxon: Routledge.
- Tuovila, A. (2020, December 18). *Risk-Weighted Assets*. Retrieved January 24, 2021, from Investopedia: <https://www.investopedia.com/terms/r/riskweightedassets.asp>
- Twin, A. (2019, August 30). *Captive Finance Company*. Retrieved April 23, 2021, from Investopedia: <https://www.investopedia.com/terms/c/captivefinancecompany.asp>
- UBS (China) Limited. (n.d.). *Welcome to UBS (China) Limited*. Retrieved April 8, 2020, from UBS (China) Limited: <https://www.ubs.com/cn/en/ubs-china.html>
- Ulrich, D. (2019, March 15). Changing Facets of Leadership in East Asia: Globalization, Innovation and Performance in Japan, South Korea and China. *Asia Pacific Business Review*, 25(2), 159-160.
- UN Economic Commission for Europe. (2020). *Gross Domestic Product (GDP) in Absolute Value*. Retrieved November 16, 2020, from UN Economic Commission for Europe: <https://w3.unece.org/PXWeb/en/Table?IndicatorCode=7#:~:text=Statistical%20Division,time%2C%20often%20annually%20or%20quarterly.>
- UNDP. (2018). *Latest Human Development Index (HDI) Ranking*. Retrieved November 17, 2018, from UNDP: <http://hdr.undp.org/en/2018-update>
- US News and World Report. (2018). *Power*. Retrieved November 17, 2018, from US News and World Report: <https://www.usnews.com/news/best-countries/power-rankings>
- Vienna University of Economics and Business. (n.d.). *Bankscope*. Retrieved November 3, 2019, from Vienna University of Economics and Business: <https://www.wu.ac.at/bibliothek/recherche/datenbanken/info/bankscope>
- Vlerick Business School. (n.d.). *Research in Financial Services Management*. Retrieved August 31, 2019, from Vlerick Business School: <https://www.vlerick.com/en/research-and-faculty/research-in-action/financial-services-management>
- Vodová, P., & Stavárek, D. (2017). Factors Affecting Sensitivity of Commercial Banks to Bank Run in the Visegrad Countries. *E+M Ekonomie a Management*, 3, 159-175.
- Volkswagen Financial Services. (n.d.). *Volkswagen Finance (China)*. Retrieved April 8, 2020, from Volkswagen Financial Services: <https://www.volkswagen-finance-china.com.cn/content/sites/vwcorporate/volkswagen-finance-chinacomcn/en/home/0.html>
- Wagner, W. (2007). The Liquidity of Bank Assets and Banking Stability. *Journal of Banking and Finance*, 31(1), 121-139.
- Walter, J. R. (1991, July/August). Loan Loss Reserves. *Economic Review*, 20-30.
- Wang, Y.-S., Jiang, Y., & Liu, Z. J. (2016). The Use of Accounting and Stock Market Data to Predict Bank Financial Distress: The Case of East Asian Banks. *Asian Economic and Financial Review*, 6(9), 522-533.
- Weistroffer, C. (2013, June 10). *Ultra-Low Interest Rates: How Japanese Banks Have Coped*. Retrieved January 28, 2021, from Deutsche Bank Research:

- https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000451939/Ultra-low_interest_rates/%3A_How_Japanese_banks_have_.pdf?undefined&reaload=oU8qsHb6AoB8tayzXKXOJc~YViUjj0BEWASWYP451SvUWouqpxUNFoPe71p85viY3d5fMhQaVOLDqhbn3kay5g==
- Wells, P. (2017, May 25). *Bank of Korea Leaves Interest Rates Unchanged*. Retrieved September 26, 2017, from Financial Times: <https://www.ft.com/content/ba4acedb-eafa-3361-aa57-1cc5dda7b79c>
- WHO. (n.d.). *Coronavirus*. Retrieved March 31, 2021, from WHO: https://www.who.int/health-topics/coronavirus#tab=tab_1
- Wildau, G. (2016a, November 23). *China Banks Risk Lehman Moment as Wholesale Borrowing Rises*. Retrieved September 24, 2017, from Financial Times: <https://www.ft.com/content/1fcc5fd4-a719-11e6-8b69-02899e8bd9d1>
- Wildau, G. (2016b, March 31). *China's Bad Banks Swell as Defaults Spread*. Retrieved May 29, 2020, from Financial Times: <https://www.ft.com/content/2c7b64fa-eb35-11e5-9fca-fb0f946fd1f0>
- Wildau, G. (2016c, September 7). *China Banks Shed Staff and Slash Pay in Cost-Cutting Drive*. Retrieved January 17, 2021, from Financial Times: <https://www.ft.com/content/4b37b756-74a9-11e6-b60a-de4532d5ea35>
- Wildau, G., & Wells, P. (2017, May 7). *Hawkish Central Bank Sends China Interest Rates to 2-Year High*. Retrieved September 26, 2017, from Financial Times: <https://www.ft.com/content/e30a1566-2fec-11e7-9555-23ef563ecf9a>
- Wirth, C. (2015, February 1). 'Power' and 'Stability' in the China-Japan-South Korea Regional Security Complex. *Pacific Review*, 28(4), 1-23.
- Wolf, M. (2019, March 19). *Why Further Financial Crises Are Inevitable*. Retrieved May 5, 2019, from Financial Times: <https://www.ft.com/content/d9d94f4a-4884-11e9-bbc9-6917dce3dc62>
- Wong, F. (2014, December 13). *China's Tencent Wins Approval to Start Banking Business*. Retrieved February 2, 2020, from Reuters: <https://www.reuters.com/article/us-china-tencent/chinas-tencent-wins-approval-to-start-banking-business-idUSKBN0JR03Z20141213>
- World Bank. (2016). *Real Interest Rate (%)*. Retrieved September 26, 2017, from World Bank: https://data.worldbank.org/indicator/FR.INR.RINR?name_desc=true
- World Bank. (2017, April 20). *UFA 2020 Overview: Universal Financial Access by 2020*. Retrieved August 14, 2017, from World Bank: <http://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020>
- World Bank. (2019a, March 21). *GDP (Current USD)*. Retrieved March 24, 2019, from World Bank: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>
- World Bank. (2019b). *Bank Regulation and Supervision Survey*. Retrieved August 2, 2020, from World Bank: <https://www.worldbank.org/en/research/brief/BRSS>

- World Bank. (2019c, March 21). *Economy [GDP (Current USD)]*. Retrieved March 24, 2019, from World Bank: http://datatopics.worldbank.org/world-development-indicators/themes/economy.html#featured-indicators_1
- World Bank. (2019d, March 21). *Inflation, Consumer Prices (annual %)*. Retrieved March 24, 2019, from World Bank: <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>
- World Bank. (2019e, April 8). Email Conversation between the World Bank and the Thesis' Autor.
- World Bank. (2019f). *GDP per Capita (Current USD)*. Retrieved September 12, 2019, from World Bank: <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>
- World Bank. (2019g). *Population, total*. Retrieved December 22, 2019, from World Bank: <https://data.worldbank.org/indicator/SP.POP.TOTL>
- World Bank. (2020a). *Bank Nonperforming Loans to Total Gross Loans (%)*. Retrieved February 9, 2021, from World Bank: <https://data.worldbank.org/indicator/FB.AST.NPER.ZS>
- World Bank. (2020b, December 3). *Fintech Market Reports Rapid Growth during COVID-19 Pandemic*. Retrieved March 31, 2021, from World Bank: <https://www.worldbank.org/en/news/press-release/2020/12/03/fintech-market-reports-rapid-growth-during-covid-19-pandemic>
- World Bank. (2021a, February 17). *Lending interest rate (%)*. Retrieved March 17, 2021, from World Bank: <https://data.worldbank.org/indicator/FR.INR.LEND>
- World Bank. (2021b). *The Calm before the Storm: Early Evidence on Business Insolvency Filings after the Onset of COVID-19*. World Bank. Retrieved March 31, 2021, from <http://documents1.worldbank.org/curated/en/962221615273849133/pdf/The-Calm-Before-the-Storm-Early-Evidence-on-Business-Insolvency-Filings-After-the-Onset-of-COVID-19.pdf>
- World Bank. (n.d. a). *Universal Financial Access 2020*. Retrieved February 16, 2021, from World Bank: <https://ufa.worldbank.org/en/ufo>
- World Bank. (n.d. b). *Aslı Demirgüç-Kunt*. Retrieved February 17, 2019, from World Bank: <http://www.worldbank.org/en/about/people/a/asli-demirguc-kunt>
- World Bank. (n.d. c). *Nonbanking Financial Institution*. Retrieved November 5, 2018, from World Bank: <http://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/nonbank-financial-institution>
- Yang, Y. (2018, July 17). *Why Millennials Are Driving Cashless Revolution in China*. Retrieved January 25, 2019, from Financial Times: <https://www.ft.com/content/539e39b8-851b-11e8-a29d-73e3d454535d>
- Yao, K. (2019, January 11). *Exclusive: China to Set Lower GDP Growth Target of 6-6.5 Percent in 2019*. Retrieved March 27, 2019, from Reuters: <https://www.reuters.com/article/us-china-economy-targets-exclusive/exclusive-china-to-set-lower-gdp-growth-target-of-6-65-percent-in-2019-sources-idUSKCN1P50CJ>
- Yap, K. L., & Dormido, H. (2017, July 3). *Asia Can Power Through Another Financial Crisis*. Retrieved September 10, 2017, from Bloomberg: <https://www.bloomberg.com/graphics/2017-asian-financial-crisis-anniversary/>

- Ye-eun, J. (2020, September 16). *Kakao Bank's Pre-IPO Market Value Soars to 46 Trillion Won*. Retrieved November 9, 2020, from Korea Herald:
<http://www.koreaherald.com/view.php?ud=20200916000776>
- Yoon, A. (2012, October 1). *Total Global Losses from Financial Crisis: \$15 Trillion*. Retrieved August 19, 2017, from Wall Street Journal:
<https://blogs.wsj.com/economics/2012/10/01/total-global-losses-from-financial-crisis-15-trillion/>
- Yoshino, N., Nakabayashi, S., & Morgan, P. J. (2018). Japan's Financial System and Its Challenges. In U. Volz, P. J. Morgan, & N. Yoshino (Eds.), *Routledge Handbook of Banking and Finance in Asia* (1st ed., pp. 89-105). London: Routledge.
- Zhang, J., & Laiming, Z. (2017). Introduction. In J. Zhang, & Z. Laiming, *China and the World Economy: Transition and Challenges (China in the World)* (1 ed., p. 342). Abingdon; New York: Routledge.
- Zheng, J., Hu, A., & Bigsten, A. (2012). China's Growth Potential. In X. Fu (Ed.), *China's Role in Global Economic Recovery* (1st ed., pp. 203-221). Oxon and New York: Routledge.

Appendices

Appendix A: Abstract

The aim of this thesis is to analyze the similarities and differences between the Chinese, Japanese, and South Korean banking industries from 2011 to 2016. The research is focused on two different, single-country analyses – the first was a macroeconomic and regulatory analysis scrutinizing the environment banks face in their respective countries, the second was a financial ratio analysis (FRA) comprising 11 variables. The FRA was performed using a dataset comprising 479 banks from the three countries. The research provided three main findings. First, there is a certain level of homogeneity among the countries that shows that they are, in several aspects, closer to one another than to their international peers, especially when it comes to profitability measures. Second, the data showed that the countries and their banking industries are nonetheless quite individualistic, with their own specific characteristics and challenges. Third, for all three countries, the overall picture shows that none of the variables analyzed hint at any immediate concern regarding the stability of these countries' banks. Nonetheless, there are signs indicating low-level caution is advisable, as banks in China, Japan, and South Korea are all in different, yet somewhat exposed positions on the financial market.

Ziel dieser Masterarbeit ist es, Gemeinsamkeiten und Unterschiede der chinesischen, japanischen und südkoreanischen Bankenlandschaften von 2011 bis 2016 zu untersuchen. Dies erfolgt auf Basis zweier unterschiedlicher Analysen der einzelnen Länder – mit der ersten Analyse wird das makroökonomische und regulatorische Umfeld der einzelnen Länder beleuchtet, die zweite Analyse fokussiert mit 11 Variablen auf Finanzkennzahlen. Für diese zweite Analyse wird ein Datenset von insgesamt 479 Banken in den drei Ländern herangezogen. Aus den beiden Analysen sind drei wesentliche Erkenntnisse ableitbar. Erstens ist ein gewisser Grad an Homogenität zwischen den Ländern zu erkennen (insbesondere bei Profitabilitätskennzahlen), der zeigt, dass die Länder ähnlicher zueinander sind als zu anderen Ländern. Zweitens, unabhängig von diesen Ähnlichkeiten, zeigen die Daten dennoch, dass die Länder und ihre Bankenlandschaften nichtsdestotrotz viel Individualität durch spezifische Charakteristika und Herausforderungen aufweisen. Drittens sieht man, dass für alle drei Länder kein unmittelbares Risiko hinsichtlich der Stabilität ihrer Banken gegeben ist. Allerdings gibt es Anzeichen für niederschwellige Vorsicht da Banken in China, Japan und Südkorea zwar unterschiedliche, aber dennoch exponierte Positionen am Finanzmarkt einnehmen.

Appendix B: List of Top 100 Banks in Terms of Assets

#	Bank	Country	Assets (in USD billion)
1	Industrial & Commercial Bank of China	China	3.475
2	China Construction Bank Corp	China	3.018
3	Agricultural Bank of China	China	2.818
4	Bank of China	China	2.613
5	Mitsubishi UFJ Financial Group	Japan	2.598
6	JP Morgan Chase & Co	USA	2.491
7	HSBC Holdings	UK	2.375
8	BNP Paribas	France	2.196
9	Bank of America	USA	2.188
10	Wells Fargo	USA	1.930
11	China Development Bank	China	1.904
12	Credit Agricole Group	France	1.822
13	Japan Post Bank	Japan	1.808
14	Citigroup Inc	USA	1.792
15	Mizuho Financial Group	Japan	1.758
16	Deutsche Bank	Germany	1.682
17	Sumitomo Mitsui Financial Group	Japan	1.654
18	Barclays PLC	UK	1.491
19	Societe Generale	France	1.462
20	Banco Santander	Spain	1.416
21	Groupe BPCE	France	1.306
22	Bank of Communications	China	1.210
23	Postal Savings Bank of China	China	1.190
24	Lloyds Banking Group	UK	1.005
25	Norinchukin Bank	Japan	984
26	Royal Bank of Scotland Group	UK	981
27	UBS Group AG	Switzerland	919
28	UniCredit S.p.A.	Italy	909
29	ING Groep NV	Netherlands	894
30	Toronto-Dominion Bank	Canada	881
31	Royal Bank of Canada	Canada	862
32	Goldman Sachs Group	USA	860
33	China Merchants Bank	China	856
34	China CITIC Bank Corp	China	854
35	China Minsheng Banking Corp	China	849
36	Shanghai Pudong Development Bank	China	843
37	Industrial Bank Co Ltd	China	838
38	Morgan Stanley	USA	815
39	Credit Suisse Group	Switzerland	806
40	Credit Mutuel	France	782
41	BBVA	Spain	774
42	Intesa Sanpaolo	Italy	767
43	Commonwealth Bank of Australia	Australia	703
44	Rabobank Group	Netherlands	700
45	Australia & New Zealand Banking Group	Australia	662
46	Bank of Nova Scotia	Canada	658

47	Nordea	Sweden	651
48	Standard Chartered Plc	UK	657
49	Agricultural Development Bank of China	China	631
50	Westpac Banking Corp	Australia	607
51	European Investment Bank	Luxembourg	606
52	China Everbright Bank	China	579
53	National Australia Bank	Australia	563
54	Sumitomo Mitsui Trust Holdings	Japan	550
55	DZ Bank AG	Germany	539
56	KfW Group	Germany	536
57	Bank of Montreal	Canada	514
58	Commerzbank	Germany	508
59	Danske Bank	Denmark	496
60	State Bank of India	India	493
61	U.S. Bancorp	USA	446
62	Cassa Depositi e Prestiti (CDP)	Italy	446
63	Banco de Brasli SA	Brazil	431
64	The Import-Export Bank of China	China	428
65	Sberbank of Russia	Russia	420
66	ABN AMRO Group NV	Netherlands	417
67	Iltau Unibanco Holding SA	Brazil	416
68	Resona Holdings	Japan	412
69	Ping An Bank	China	402
70	Caixa Economica Federal	Brazil	386
71	Canadian Imperial Bank of Commerce	Canada	381
72	Nomura Holdings	Japan	370
73	CaixaBank	Spain	368
74	PNC Financial Services Group	USA	366
75	Banco Drandesco SA	Brazil	363
76	Capital One Financial Corporation	USA	357
77	Shinkin Central Bank	Japan	338
78	Bank of New York Mellon Corp	USA	333
79	DBS Group Holdings	Singapore	333
80	Shinhan Financial Group	South Korea	328
81	Hua Xia Bank	China	327
82	NongHyup Financial Group	South Korea	315
83	KB Financial Group	South Korea	312
84	DNB	Norway	309
85	Bank of Beijing	China	294
86	KBC Group NV	Belgium	291
87	Svenska Handelsbanken	Sweden	290
88	Sandinavinska Endskilda Banken	Sweden	289
89	Hana Financial Group	South Korea	289
90	OCBC Bank (Oversea-Chinese Banking Corp)	Singapore	283
91	China Guangfa Bank	China	277
92	Nationwide Building Society	UK	276
93	Brazilian Development Bank (BNDES)	Brazil	269
94	Korea Development Bank	South Korea	269
95	Woori Bank	South Korea	258
96	Landesbank Baden-Württemberg	Germany	258

97	Cathay Financial Holding	Taiwan	252
98	La Banque Postale	France	243
99	State Street Corp	USA	243
100	Bank of Shanghai	China	238

Table 4: List of top 100 banks globally in terms of assets as of December 31, 2016¹⁰⁵

Appendix C: Country Distribution of Top 100 Banks in Terms of Assets

Country	Continent	# of banks in top 100	Assets (in USD billion)	% of assets of total assets
China	Asia	20	23.644	27
USA	North America	11	11.822	14
Japan	Asia	9	10.472	12
France	Europe	6	7.812	9
UK	Europe	6	6.785	8
Germany	Europe	5	3.523	4
Canada	North America	5	3.295	4
Spain	Europe	3	2.558	3
Australia	Australia	4	2.535	3
Italy	Europe	3	2.122	2
Netherlands	Europe	3	2.011	2
Brazil	South America	5	1.865	2
South Korea	Asia	6	1.770	2
Switzerland	Europe	2	1.725	2
Sweden	Europe	3	1.230	1
Singapore	Asia	2	616	1
Luxembourg	Europe	1	606	1
Denmark	Europe	1	496	1
India	Asia	1	493	1
Russia	Asia	1	420	0
Norway	Europe	1	309	0
Belgium	Europe	1	291	0
Taiwan	Asia	1	252	0
Total		100	86.652	1

Table 5: Country distribution of top 100 banks globally in terms of assets as of December 31, 2016¹⁰⁶

Appendix D: Orbis Bank Focus Specialization Definitions

Specialization	Definition	Included in data sample?
Bank holdings and holding companies	"Holding companies of bank groups, which usually have very limited business activities" (OBF, 2017)	Yes
Central banks	"Supervising national banking systems" (OBF, 2017)	No
Clearing and custody institutions	"Institutions providing clearing and custody services" (OBF, 2017)	No
Commercial banks	"Mainly active in a combination of retail banking (individuals, SMEs), wholesale banking (large corporates) and private banking (not belonging to groups of saving banks, cooperative banks)" (OBF, 2017)	Yes

¹⁰⁵ Based on data from Relbanks (2017), own calculations and visualization.

¹⁰⁶ Based on data from Relbanks (2017), own calculations and visualization.

Cooperative banks	“Cooperative banks have a cooperative ownership structure and are mainly active in Retail Banking (Individuals, SMEs)” (OBF, 2017)	Yes (with the exclusion of Japanese shinkin banks – see also <i>Sample Size Adaptions</i>)
Finance companies	“Consumer Finance Companies, Credit Card Companies, Factoring Companies, Leasing Companies, Trade Finance Companies” (OBF, 2017)	Yes
Group finance companies	“Companies mainly active in attracting funding for and lending on behalf of the group” (OBF, 2017)	No
Investment and trust corporations	“Investment corporations/investment trust companies and private equity companies/property developers and covered bond issuers investing in various asset” (OBF, 2017)	No
Investment banks	“Mainly active in corporate finance, debt/equity issues, mergers and acquisitions, securities trading and usually in private banking” (OBF, 2017)	Yes
Micro-financing institutions	“Providing micro finance to individuals and very small companies” (OBF, 2017)	No
Multi-lateral governmental banks	“Active in multi-lateral development finance” (OBF, 2017)	No
Private banking/asset management companies	“Banks mainly active in private banking and asset management” (OBF, 2017)	Yes
Savings banks	“Mainly active in retail banking (individuals, SMEs) and usually belonging to a group of savings banks” (OBF, 2017)	Yes
Securities firms	“Mainly active in securities trading/arbitrage activities/securities brokerage/derivatives” (OBF, 2017)	No
Specialized governmental credit institutions	“Institutions providing national development finance, sectoral finance or export/import finance. This specialization category includes public institutions acting on privileged or protected segments or benefiting from governmental guarantee or sponsoring” (OBF, 2017)	No

Table 6: Definitions of all financial institution specializations for China, Japan, and South Korea in the initial data sample¹⁰⁷

Appendix E: Banks of Financial Ratio Analysis Data Sample from Orbis Bank Focus

#	Bank	#	Bank	#	Bank
China					
1	Agricultural Bank of China	44	Bank of Luoyang	87	China Resources Bank of Zhuhai
2	Australia and New Zealand Bank (China) Company	45	Bank of Montreal (China)	88	Chinese Mercantile Bank
3	Avic International Leasing	46	Bank of Nanjing	89	Chong Sing Holdings FinTech Group
4	Bangkok Bank (China)	47	Bank of Ningbo	90	Chongqing Rural Commercial Bank
5	Bank of Anshan	48	Bank of Ningxia	91	Chongqing Three Gorges Bank
6	Bank of Beijing	49	Bank of Qingdao	92	Citibank (China)
7	Bank of Cangzhou	50	Bank of Qinghai	93	CITIC Trust & Investment
8	Bank of Changsha	51	Bank of Quanzhou	94	Credit Agricole CIB (China)
9	Bank of Changzhi	52	Bank of Rizhao	95	Dah Sing Bank

¹⁰⁷ Based on OBF (2017), own visualization.

10	Bank of Chengde	53	Bank of Shanghai	96	Dalian Huaxin Trust
11	Bank of Chengdu	54	Bank of Shaoxing	97	Dalian Rural Commercial Bank
12	Bank of China	55	Bank of Suzhou	98	Datong City Commercial Bank
13	Bank of Chongqing	56	Bank of Taian	99	DBS BANK (China)
14	Bank of Communications	57	Bank of Taizhou	100	Deutsche Bank (China)
15	Bank of Communications Financial Leasing	58	Bank of Tangshan	101	Dongguan Rural Commercial Bank
16	Bank of Dalian	59	Bank of Tianjin	102	Dongying Bank
17	Bank of Dandong	60	Bank of Urumqi	103	East West Bank (China)
18	Bank of Dongguan	61	Bank of Weifang	104	Foshan Rural Commercial Bank
19	Bank of East Asia (China)	62	Bank of Wenzhou	105	Fubon Bank (China)
20	Bank of Fuxin	63	Bank of Wuhai Company	106	Fudian Bank
21	Bank of Gansu	64	Bank of Xi'an	107	Fujian Fuzhou Rural Commercial Bank
22	Bank of Ganzhou	65	Bank of Yingkou	108	Fujian Haixia Bank
23	Bank of Guangzhou	66	Bank of Zhengzhou	109	Great Wall West China Bank
24	Bank of Guilin	67	Bank Sinopac (China)	110	Guangdong Gaoming Rural Commercial Bank
25	Bank of Guiyang	68	Baoshang Bank	111	Guangdong Huaxing Bank
26	Bank of Guizhou	69	Beijing Rural Commercial Bank	112	Guangdong Nanyue Bank
27	Bank of Handan	70	Benxi City Commercial Bank	113	Guangdong Shunde Rural Commercial Bank Company
28	Bank of Hangzhou	71	BNP Paribas (China)	114	Guangxi Beibu Gulf Bank
29	Bank of Hebei	72	CCB Financial Leasing Corporation	115	Guangzhou Rural Commercial Bank
30	Bank of Huzhou	73	CDB Leasing	116	Haikou Rural Commercial Bank
31	Bank of Inner Mongolia	74	Chang'an Bank	117	Haitong Securities
32	Bank of Jiangsu	75	Chengdu Rural Commercial Bank	118	Hana Bank (China) Company
33	Bank of Jiaxing	76	China Bohai Bank	119	Hang Seng Bank (China)
34	Bank of Jilin	77	China CITIC Bank Corporation	120	Hangzhou United Rural Commercial Bank
35	Bank of Jinhua	78	China Construction Bank Corporation Joint Stock Company	121	Hanhua Financial Holding
36	Bank of Jining	79	China Everbright Bank Company	122	Hankou Bank
37	Bank of Jinzhou	80	China Guangfa Bank	123	Harbin Bank
38	Bank of Jiujiang	81	China Huarong Asset Management	124	Hefei Science & Technology Rural Commercial Bank
39	Bank of Kunlun	82	China International Capital Corporation	125	Hengfeng Bank
40	Bank of Langfang	83	China Merchants Bank	126	HSBC Bank (China)
41	Bank of Lanzhou	84	China Merchants Bank Financial Leasing	127	Hua Xia Bank
42	Bank of Liaoyang	85	China Minsheng Banking Corporation	128	Huarong Xiangjiang Bank
43	Bank of Liuzhou	86	China Ping An Trust	129	Huishang Bank
130	Industrial & Commercial Bank of China – ICBC	160	Nanhai Rural Commercial Bank	190	Toyota Motor Finance (China) Company
131	Industrial Bank	161	Nanyang Commercial Bank (China)	191	UBS (China)
132	Industrial Bank of Korea (China)	162	Ningbo Cixi Rural Commercial Bank	192	United Overseas Bank (China)
144	J Heng Bank	163	Ningbo Commerce Bank	193	Volkswagen Finance (China)
133	Jiangmen Ronghe Rural Commercial Bank	164	Ningbo Yinzhou Rural Cooperative Bank-Yinzhou Bank	194	Woori Bank (China)
134	Jiangsu Changshu Rural Commercial Bank	165	Ningbo Yuyao Rural Commercial Bank	195	Wuhan Rural Commercial Bank
135	Jiangsu Financial Leasing	166	OCBC Wing Hang Bank (China)	196	Wuxi Rural Commercial Bank
136	Jiangsu Haian Rural Commercial Bank Company	167	Panzhuhua City Commercial Bank	197	Xiamen Bank
137	Jiangsu Jiangnan Rural Commercial Bank	168	Postal Savings Bank of China	198	Xiamen International Bank
138	Jiangsu Jiangyin Rural Commercial Bank	169	Qilu Bank	199	Yantai Bank
139	Jiangsu Suzhou Rural Commercial Bank	170	Qishang Bank	200	Yibin City Commercial Bank
140	Jiangsu Zhangjiagang Rural Commercial Bank	171	Qujing City Commercial Bank	201	Yingkou Coastal Bank
141	Jiangsu Zijin Rural Commercial Bank	172	Shaanxi Fuping BEA Rural Bank Corporation	202	Yuhang Rural Commercial Bank
142	Jiangxi Bank	173	Shanghai Automotive Group Finance	203	Zhangjiakou City Commercial Bank

143	Jilin Jiutai Rural Commercial Bank Corporation	174	Shanghai Huarui Bank	204	Zhaoqing Duanzhou Rural Commercial Bank
145	Jinshang Bank	175	Shanghai Pudong Development Bank	205	Zhejiang Chouzhou Commercial Bank
146	JP Morgan Chase Bank (China)	176	Shanghai Rural Commercial Bank	206	Zhejiang E-Commerce Bank Company – Mybank
147	Kookmin Bank (China)	177	Shanxi Yaodu Rural Commercial Bank	207	Zhejiang Mintai Commercial Bank
148	Kunshan Lucheng County Bank	178	Shengjing Bank	208	Zhejiang Nanxun Rural Commercial Bank
149	Kunshan Rural Commercial Bank	179	Shenzhen Qianhai Weizhong Bank	209	Zhejiang Shaoxing Ruifeng Rural Commercial Bank
150	Laishang Bank	180	Shenzhen Rural Commercial Bank	210	Zhejiang Tailong Commercial Bank
151	Leshan City Commercial Bank Company	181	Shinhan Bank (China)	211	Zhejiang Wenling Rural Commercial Bank
152	Liaoyang Rural Commercial Bank	182	Sichuan Tianfu Bank	212	Zhejiang Wenzhou Lucheng Rural Commercial Bank Company
153	Linshang Bank	183	Societe Generale (China)	213	Zhejiang Xiaoshan Rural Cooperative Bank
154	Longjiang Bank Corporation	184	Southwest Securities	214	Zhejiang Yiwu Rural Commercial Bank
155	Metropolitan Bank (China)	185	SPD Silicon Valley Bank	215	Zhengxin Bank Company
156	Mizuho Bank (China)	186	Standard Chartered Bank (China)	216	Zhonghai Trust
157	Morgan Stanley Bank International (China)	187	Sumitomo Mitsui Banking Corporation (China)	217	Zhongyuan Bank
158	MUFG Bank (China)	188	Tianjin Binhai Rural Commercial Bank Corporation	218	Zhuhai Rural Commercial Bank
159	Nanchang Rural Commercial Bank-Nanchang Rural Commercial Bank	189	Tianjin Rural Commercial Bank		

Japan					
1	77 Bank	17	Bank of Iwate	33	Credit Saison
2	Accretive	18	Bank of Kochi	34	Daisan Bank
3	Ace Securities	19	Bank of Kyoto	35	Daishi Bank
4	Acom	20	Bank of Nagoya	36	Daito Bank
5	Aeon Bank	21	Bank of Okinawa	37	Daiwa Next Bank
6	Aeon Financial Service	22	Bank of Saga	38	Daiwa Securities Group
7	Aichi Bank	23	Bank of Toyama	39	Donan Umimachi Shinkin Bank
8	Aiful Corporation	24	Bank of Yokohama	40	Ehime Bank
9	Akita Bank	25	Cedyna Financial	41	Eighteenth Bank
10	Aomori Bank	26	Chiba Bank	42	Fidea Holdings
11	Aozora Bank	27	Chiba Kogyo Bank	43	First Bank of Toyama
12	Aplus Financial	28	Chikuho Bank	44	Fukuho Bank
13	Ashikaga Bank	29	Chugoku Bank	45	Fukui Bank
14	Awa Bank	30	Chukyo Bank	46	Fukuoka Chuo Bank
15	Bank of Ryukyus	31	Chuo Rokin Bank	47	Fukuoka Financial Group
16	Bank of Fukuoka	32	CJL K. K.	48	Fukushima Bank
49	GMO Financial Holdings	98	Mebuki Financial Group	147	Senshu Ikeda Holdings
50	Gunma Bank	99	Michinoku Bank	148	Seven Bank
51	Hachijuni Bank	100	MIE Bank	149	Shiga Bank
52	Higashi-Nippon Bank	101	Minami-Nippon Bank	150	Shikoku Bank
53	Higo Bank	102	Minato Bank	151	Shimane Bank
54	Hiroshima Bank	103	Mito Securities	152	Shimizu Bank
55	Hitachi Capital Corporation	104	Mitsubishi UFJ Financial Group – Kabushiki Kaisha Mitsubishi UFJ Financial Group	153	Shinhan Bank Japan – SBJ
56	Hokkaido Bank	105	Mitsubishi UFJ Lease & Finance Company	154	Shinkin Securities
57	Hokkaido Shinren Bank	106	Mitsubishi UFJ Nicos	155	Shinsei Bank
58	Hokkoku Bank	107	Mitsubishi UFJ Trust and Banking Corporation-Mitsubishi UFJ Shintaku Ginko Kabushiki Kaisha	156	Shinsei Securities
59	Hokuetsu Bank	108	Miyazaki Bank	157	Shizuoka Bank
60	Hokuhoku Financial Group	109	Miyazaki Taiyo Bank	158	Shizuoka Chuo Bank
61	Hokuriku Bank	110	Mizuho Bank	159	Shizuoka Labour Bank

62	Hokuto Bank	111	Mizuho Financial Group	160	Shonai Bank
63	Honda Finance	112	Mizuho Securities	161	Showa Leasing
64	Howa Bank	113	Mizuho Trust & Banking	162	SMBC Consumer Finance
65	Hyakugo Bank	114	Monex	163	SMBC Friend Securities
66	Hyakujushi Bank	115	MUFG Bank	164	SMBC Nikko Securities
67	Hyogo-ken Shinyo Nogyo Kyodo Kumiai Rengokai-JA Hyogo Shinren	116	Musashino Bank	165	Sony Bank
68	IBJ Leasing Company	117	Nagano Bank	166	SPARX Group
69	IwaiCosmo Holdings	118	Nakamichi Leasing	167	Sumitomo Mitsui Banking Corporation
70	Iyo Bank	119	Nanto Bank	168	Sumitomo Mitsui Finance & Leasing Company
71	Ja Bank Shizuoka	120	Nec Capital Solutions	169	Sumitomo Mitsui Financial Group
72	Ja Yamanashi Shinren	121	Niigata-ken Rokin Bank	170	Sumitomo Mitsui Trust Bank
73	Jaccs	122	Nishi-Nippon City Bank	171	Sumitomo Mitsui Trust Holdings
74	Japan Finance Corporation	123	Nomura Securities	172	Suruga Bank
75	Japan Finance Organisation for Municipalities (JFM)	124	Nomura Trust and Banking	173	Taiko Bank
76	Japan Housing Finance Agency	125	North Pacific Bank	174	Taisho Bank
77	Japan International Cooperation Agency	126	Ntt Finance Corporation	175	Tajima Bank
78	Japan Net Bank	127	Ogaki Kyoritsu Bank	176	Tochigi Bank
79	Japan Post Holding	128	Oita Bank	177	Toho Bank
80	Japan Securities Depository Center – JASDEC	129	Okasan Securities Group	178	Tohoku Bank
81	Jibun Bank Corporation	130	Okinawa Kaiho Bank	179	Tokai Tokyo Financial Holdings
82	Jimoto Holdings	131	Okinawa-ken Rokin Bank	180	Tokai Tokyo Securities
83	Joyo Bank	132	Orient Corporation	181	Tokyo Century Corporation
84	JP Morgan Securities Japan	133	Rakuten Securities	182	Tokyo Kiraboshi Financial Group
85	Juroku Bank	134	Resona Bank	183	Tokyo Star Bank
86	Kagoshima Bank	135	Resona Holdings	184	Tomato Bank
87	Kanagawa Bank	136	Retela Crea Securities	185	Tomony Holdings
88	Keiyo Bank	137	Ricoh Leasing Company	186	Tottori Bank
89	Kinki Rokin Bank	138	Saga Kyoei Bank	187	Towa Bank
90	Kiraboshi Bank	139	Saikyo Bank	188	Toyota Finance Corporation
91	Kirayaka Bank	140	Saitama Resona Bank	189	Traders Holdings
92	Kitakyushu Bank	141	San-In Godo Bank	190	Tsukuba Bank
93	Kita-Nippon Bank	142	Sawada Holdings	191	Yamagata Bank
94	Kiyo Bank	143	SBI Holdings	192	Yamaguchi Financial Group
95	Kyushu Financial Group	144	SBI Sumishin Net Bank	193	Yamanashi Chuo Bank
96	Kyushu Rokin Bank	145	Sendai Bank	194	Zenkoku Hosho
97	Marusan Securities	146	Senshu Ikeda Bank		

Korea

1	Acuon Capital Corporation	24	Industrial Bank of Korea	47	Mirae Asset Daewoo
2	Aju Capital Company	25	JB Financial Group	48	National Federation of Fisheries Cooperatives-Suhyup Bank
3	Bnk Financial Group	26	JB Woori Capital	49	NongHyup Financial Group
4	Bookook Securities	27	Jeju Bank	50	Pureun Mutual Savings Bank
5	Busan Bank	28	Jeonbuk Bank	51	Q Capital Partners
6	Choeun Saving Bank	29	KB Financial Group	52	Samsung Card
7	Citibank Korea	30	KB Kookmin Bank	53	Samsung Securities
8	Daegu Bank	31	Kb Kookmin Card	54	Sangsangin Investment & Securities
9	Daishin Securities	32	KB Securities	55	Shinhan Bank
10	Debec Mutual Savings Bank	33	KEB Hana Bank	56	Shinhan Capital
11	DGB Financial Group	34	Kiwoom Securities	57	Shinhan Card
12	Dongbu Securities	35	Korea Investment & Securities	58	Shinhan Financial Group
13	Fine Asset Management Corporation	36	Korea Investment Holdings	59	Shinhan Investment
14	Han Kook Capital	37	Korea Securities Finance Corporation	60	Shinyoung Securities

15	Hana Capital	38	Korean Federation of Community Credit Cooperative	61	SK Securities
16	Hana Financial Group	39	Kwangju Bank	62	Standard Chartered Bank Korea
17	Hanwha Investment & Securities	40	Kyobo Securities	63	Woori Bank
18	Hanwha Savings Bank	41	Kyongnam Bank	64	Woori Investment Bank
19	Hanyang Securities	42	Leading Investment & Securities	65	Woori Technology Investment
20	Hyosung Capital	43	Lotte Capital	66	Yuanta Securities (Korea)
21	Hyundai Capital Services	44	Lotte Card	67	Yuhwa Securities
22	Hyundai Card	45	Mason Capital Corporation		
23	Hyundai Savings Bank	46	Meritz Securities		

Table 7: List of all banks in China, Japan, and South Korea used in (B) the financial ratio analysis¹⁰⁸

¹⁰⁸ As presented by OBF (2017), own visualization.