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The Effects of Non-interest Activities on Banking Loan Risk in China

Nan Lin, Li Zhang* Xiaofang Guo

Abstract

This research focuses on the impacts of non-interest business activities of commercial banks on the quality of bank loans. Chinese commercial banks are expanding into many fields relative to traditional savings and loans, and the effects of these non-interest business lines are showing up not just in financial statements, but also in their total operating and risk management. Taking annual data on 60 commercial banks in China from 2009 to 2017, this study uses empirical analysis to verify what influences exist and identifies the impacts of non-interest activities on the traditional business of commercial banks to test how the risk-taking operations of such banks change with a greater amount of non-interest activities. We want to see whether the reforms of Chinese banks have negative influences on their bank lending behaviors from the perspective of credit risk. Findings do show a significantly positive relationship between credit risk and non-interest activities in the group of large banks, but there is no such correlation for small commercial banks.

Keywords: commercial banks, credit risk, non-interest activities, China, loan risk

1. Introduction

A traditional commercial bank is a financial organization with deposits and loans as its main business. In the past, those large amounts of deposits and loans truly could bring a higher rate of return to the bank due to a greater interest spread. According to simple univariate analysis on data from 1997 to 2012, Laeven and Levine (2007) demonstrate that commercial banks under a traditional operating model are more likely to survive than other commercial banks with a non-traditional business model. However, commercial banks are now being confronted with many different challenges due to reforms in the banking sector, the rise of the marketization of interest rates, and the increase of banking financial institution.

Degryse and Cayseele (2000) demonstrate that banks should diversify as much as possible in order to reduce the possibility of bankruptcy due to high leverage. However, Servaes (1996) argues that financial intermediaries should focus on one single line of financial activity through management's expertise and target to reduce asymmetric information. One-way commercial banks can cut internal information asymmetry is by acquiring more information from customers according to theoretical analysis based on non-interest activities. Conversely, borrowers can enjoy lower guarantee requirements and higher credit lines through longer-term business cooperation with the banks. Therefore, it is hard to say that non-interest business segments have a negative effect on the credit risk of bank loans or a positive effect.

A conservative, traditional operating policy is certainly not suitable for today's competitive financial markets. Moreover, the interest income share is decreasing along with the strict regulation of banking systems and changes in economic development areas. Sufian (2009) shows that non-interest business can greatly improve bank efficiency levels. Therefore, it makes sense that some commercial banks are diversifying so as to offer more non-interest products to increase their profitability.

Non-interest income is by definition income that a commercial bank expects to earn from the interest spread. It is widely known that non-interest services in a bank are more popular nowadays than traditional bank interest service. In fact, there are ways to gain efficiency from the non-traditional banking model by diversifying different activities and using information acquired from lending activities such as underwriting or insurance sales. Actually, many commercial banks have been relying on income that comes from non-interest activities other than loans, but evidence from other studies

*School of Finance and Accounting, Fuzhou University of International Studies and Trade, China *Corresponding Author: Li Zhang, Email: czzhangli@126.com*

shows that profit complementarity between non-interest activities and bank loans is prevalent in a developing financial environment, which can help banks gain potential advantages of diversification (Abedifar, Molyneux, and Tarazi 2018).

1.1 Benefits of Non-interest Activities

Deyoung and Rice (2004) indicate that large commercial banks are more likely to rely on non-interest income, because of the lower interest rate on loans, but a better managed group relies less on non-interest revenue. An increase in non-interest income is related to higher but more fluctuating profits, denoting that non-interest income positively correlates with higher bank performance. Specifically, bank loans can benefit from synergy effects associated with diverse businesses, which include more information collection and closer client relationships. Berger, Hasan and Zhou (2010) stress that commercial banks can obtain internal information through close client relationships, helping them avoid asymmetric information problems. Petersen and Rajan (1994) show that familiar borrowers with close relationships might enjoy low collateral requirements. Using data of German savings banks, Puri, Rochell, and Steffen (2011) demonstrate that borrowers with prior transactions default less. Data on 18,000 bank loans to small Belgian firms show that expanding bank relationships can decrease interest rates. In addition, small firms may also benefit from established relationships with commercial banks in order to acquire lower loan rates by signaling their quality (Degryse and Van Cayseele 2000).

Bharath et al. (2007) present the advantages of relationships between banks and borrowers from the position of the former, claiming that close lending relationships should increase the trust between participants and create opportunities for attracting new loans and investments. Boot (2000) notes that private information for commercial banks can be obtained from the same client over time via the channel of providing multiple financial services. Moreover, banks can also obtain information through more channels and use the information to improve customer interaction.

The lending behavior of small commercial banks is generally affected by engaging in different non-interest activities. The following points support the hypothesis that extending bank activities can improve the quality of loans. First, banks are able to gather more valuable information about client quality by accessing a wide range of potential borrowers. Second, banks' franchise value can be enhanced by various businesses that acquire information, and relationship and reputational factors also decrease the potential costs of financial distress and lead to more prudent lending behavior (González 2005). Finally, revenue from other businesses could encourage information collection from clients, which might enhance lending as it leads financial intermediaries to offer lower interest rates. Carbó, Rafael and Francisco (2007) also indicate that revenues from non-interest activities affect the net interest margins of loans based on possible complementary effects. Moreover, cooperation between banks and insurance companies might reduce the risk of default, whereas cooperation with real estate companies raises credit risk. Berger, Demsetz, and Strahan (1999) claim that financial consolidation with different services provides a benefit for risk diversification, but not for efficiency improvements.

1.2 Disadvantages of Non-interest Activities

Engaging in too much activities can lead to some problems for commercial banks, such as moral hazards and conflicts of interest. In addition, they might make the operations of banks too complicated to manage. Alternatively, fewer regulatory restrictions permit banks to realize economies of scope (Claessens and Klingebiel 2001). As non-interest services are more popular than traditional interest services at banks in recent years, some studies show that the former increase independent risk in commercial banks and systemic risk in economies when combined with traditional banking activities. Therefore, restrictions on various non-interest businesses of banks have been recommended in post-crisis regulatory reforms for the U.S. and Europe.

Most fee-based activities are short term in nature and have lower switching costs than traditional activities. This means that banks might need to offer loans to maintain non-interest income client relationships so as to gain more fee revenues. Hence, the information produced by a bank about the quality of borrowers might be biased if non-interest businesses offer profitable incentives for weaker loan regulations. The risk of loans also increases due to a focus on immediate interests (Deyoung and Roland 2001).

Lepetit et al. (2008) state that banks might underestimate credit risk when obtaining additional fees of other deals from borrowers. Moreover, agency problems increase, because managers pursue short-term profit from more non-interest activities in order to gain a greater bonus.

Therefore, agency costs might be more than the benefits of activity diversification (Akhigbe and Stevenson 2010). Deyoung and Roland (2001) show that costs may outweigh benefits for diversified financial services in commercial banks. In a serious situation, the expansion of non-interest activities might be the determinant of lending, but could absolutely violate market rules.

Stiroh and Rumble (2006) demonstrate that increasing the diversification of profitable activities for financial intermediaries does not improve bank performance from the profit inspective. More non-interest income should also increase the franchise value of commercial banks. Laeven and Ratnovski (2016) demonstrate that the relationships between a bank and its borrowers is damaged by cooperating in too many fee-based activities. In particular, diseconomies of scope are highlighted by them when non-interest activities and traditional commercial business are combined with the high-speed development of financial markets. In fact, lower credit exposure might encourage banks' leaders to be less conservative in their loan activities.

Lin et al. (2012) find that non-interest revenues could mitigate the sensitivity of interest margins. Indeed, fewer regulatory limits might increase the charter value of commercial banks, thus encouraging financial managers to behave radically (Barth et al., 2013). Laeven and Levine (2007) note that a comprehensive financial group with multiple non-interest activities has a lower market value than the sum of the market values had that group been divided into separate financial institutions. Different activities in the same banking institution may lead to a loss of focus and agency problems. Furthermore, the pricing of bank loans could be affected by allowances across fee-based businesses. However, the function of more non-interest activities should likely be limited for very large commercial banks, because they rely greatly on technology to collect necessary information and provide different financial services via seperated subsidiary institutions. Therefore, more attention should be paid on smaller banks for the mutual effects between lending and non-interest activities.

1.3 Current Situation of China's Commercial Banks

As the biggest emerging economy in the world over the past few decades, China has maintained strong GDP growth at an average of about 10% per year. The allocation of financial resources has been very important for its speedy development, with indirect finance as the most important type of finance in this emerging market. Specifically, the China stock market has existed for just about 20 years, offering financing services for a limited number of large-size companies. Commercial banks in China have become the most important intermediaries in channeling money from savers to demanders. Moreover, banks are influenced by policy makers under this very special banking system. Specifically, state-owned banks in China are permitted to spread their branches and financial services across the country. Conversely, most regional and city commercial banks face restrictions on branch expansion. Moreover, all commercial banks must offer their financial services under the guidance of the central government's financial authority. They enjoy limited freedom in terms of designing their own products and services, thus setting up barriers for them in their diversification and innovation plans. However, some strict limitations have been relaxed since 2001, when China became a member of the World Trade Organization (Berger et al. 2010).

The original operations of commercial banks face political interference due to state ownership. Since 1950, state-owned banks have been like a kind of vehicle for the country to raise capital for financing projects with high social returns. Low-profit financial returns and possible risks are not considered, because of these official characteristics.

The banking industry in China has faced many problems due to the immature financial system and serious restrictions from regulators. Since 1979, gradual banking reforms have been undertaken by the authorities to address various problems in the banking industry. The dramatic reshaping of the banking sector began from 2003 with measures such as shareholding restructures and the introduction of foreign strategic investors. Many banks have listed on Chinese exchanges or in Hong Kong. Dong et al. (2014) state that these reforms have transformed commercial banks' ownership structure by improving their management quality with market-oriented operations.

The banking industry in China in recent years has developed rapidly with increasing profitability, but commercial banks face more intense competition due to the increasing number of competitors in the market. The number of banking organizations has been increasing on the back of reforms in the financial industry by the China government. Furthermore, interest rate marketization reforms, more stringent capital regulatory requirements, and developing Internet finance have influenced the market shares of traditional financial organizations. The traditional

concept of "bigger is better" has been greatly challenged in the modern economic environment for commercial banks, and the classic profit pattern of gaining a return from the interest spread can no longer be used effectively in the expanding banking market. Therefore, most commercial banks have expanded their business scope to non-interest business, meaning non-traditional banking services unrelated to the interest spread. Managers of these banks believe that the increasing proportion of non-interest activity can effectively improve bank performance.

Information globalization has become an irreversible and inevitable trend in China, as evidenced by many large domestic technology companies such as Tencent, Baidu, and Alibaba being very popular among electronic product users. These online platforms are designing new ways for clients to access financial products throughout China, because of their popularity and ability to create a much broader and deeper market. For example, the online investment service called Yu'e Bao offers higher interest rates and convenient services for customers and is gaining many traditional deposit resources from commercial banks. Hence, these banks have begun to diversify into non-interest services to increase the proportion of non-interest income and use leverage to increase profitability. However, the impacts of service diversification on bank performances seem to be complicated in terms of the actual situation of China's banking industry.

1.4 Research Objectives

It is necessary to study the influences of non-interest revenues on a bank's interest business to identify how its financial performance changes with more non-interest activities. This research offers some important contributions to the literature. We aim to examine how non-interest activities affect the quality of Chinese commercial bank lending, making this effort the first to investigate this issue as far as we know. Previous works about China's banking industry have generally focused on inside agency problems of mixing traditional loan services and non-interest activities or the diversification gains from business expanding. It is thus meaningful to study whether the recent diversified businesses of commercial banks in China have negative influences on bank lending behaviors in terms of default risk. Moreover, this study targets to identify commercial banks' rationality of the income structure and the impacts of non-interest income on the quality of bank loans. The effects identified from this study can help government and managers in China to learn the value of the current system and service model for reasonable operations in the future.

Commercial banks can reduce asymmetric information by acquiring more information with customers from non-interest businesses. Moreover, borrowers can enjoy lower collateral requirements and longer-term business cooperation such as from non-banking activities. Therefore, non-interest business does not lead to opposite effects on the credit risk of bank loans, and in fact there might be a complementary relationship between non-interest activities and loan business. This study shall use empirical analysis to verify whether or not this hypothesis is true.

2 Methodology

2.1 Data and Sample Selection

This research focuses on the effects of non-interest businesses on credit risk in traditional loans to identify whether cross-subsidization between traditional interest businesses and non-interest activities exists. We consider dynamic panel models with variables measuring credit risk based on the previous literature (Lepetit, Rous and Tarazi 2008), employing annual data on 60 commercial banks in China from 2009 to 2017. Commercial banks in China are classified into five categories: state-owned commercial banks, joint stock commercial banks, city commercial banks, rural commercial banks, and town banks. The China Banking Regulatory Commission indicated in 2018 that there are about 4500 commercial banks in the country. The six largest state-owned commercial banks are the principal organizations in China's banking sector, while the twelve joint stock commercial banks make up the second level of commercial banks. There are 134 city commercial banks, which represent the third kind of domestic banks that provide financial services for local economic development. All state-owned and joint stock commercial banks, some city commercial banks, and several listed rural commercial banks are chosen as the samples, because of their representativeness. The group of most rural commercial banks and town banks cannot be chosen since they are dominated by small banks without too much non-interest activities. Economies of scale might depend on the overall scope of a bank's businesses, which is not achievable for banks with a very small size. Moreover, it can be said that bank size is particularly important for complementarity analysis about the influences of non-interest

activities on bank performance (Jonghe, Diepstraten, and Schepens 2015). Therefore, the sample banks are classified into two categories: Small Banks with less than 500 billion Yuan in total assets and Large Banks with more than 500 billion Yuan in total assets.

2.2 Variables of the Model

Credit risk is identified by the ratio of loan-loss provisions to average gross loans (LLP) as the dependent variable. It is a dynamic indicator to identify the loan quality and the adjustment of loan-loss reserves. Moreover, the ratio of non-performing loans to gross loans (NPL) is also chosen for robustness check (Abedifar et al. 2018). The dependent variable is assumed to be influenced by the lagged variable, because the risks would accumulate into next year. Therefore, the first-order lagged variable is used in the model as the independent variable, which makes the model dynamic. There are many kinds of non-interest activities in commercial banks of China, which include income from fiduciary activities, fees and commissions from annuity sales, income from other insurance activities, net servicing fees, and so on. However, the characteristics of different categories for commercial banks imply different operating activities in different banks. In addition, many medium-size and small-size banks have been operating a few non-interest activities. Hence, the data collection for specific non-interest activities is too hard for research purposes. The rate of non-interest activities revenue to gross revenue (NIAR) can only be used as the other independent variable.

The ratio of equity capital to total assets (CAR) is chosen as a control variable in this model and is related to less problems of asymmetric information, because banks with more equity capital have a greater ability of risk prevention. However, an increase in equity capital might also encourage risk-taking behavior. Moreover, the asset size of commercial banks (ASS) is concluded as the second control variable in the model. Credit risk should be impacted by the asset size of banks due to the different business models used by different banks. Banks with a larger size rely more heavily on non-interest businesses that provide benefits from diversification and economies of scale (Hughes et al. 2013). Moreover, they can make deals with more transparent borrowers, while small banks are more likely to gain access to risky firms. Furthermore, large banks can easily access the financial markets for financing, but they may also hold riskier loan portfolios in order to benefit from being “too big to fail”. Gross loan balance (GLB) is a third control variable due to the negative relationship between credit risk and loan quantity (Foos, Norden and Weber 2010). Lastly, the growth rate of GDP is considered as an exogenous variable, because it also influences credit risk as the probability of default should decrease during economic prosperity. Table 1 shows all the variables’ definitions and measurements.

Table 1. **Variable Descriptions**

Variable	Symbol	Definition and Measurement
Main Variable		
Dependent variable		
Credit risk	NPL	Ratio of non-performing loans to gross loans: $(\frac{\text{Interest income}}{\text{average earning assets}}-\frac{\text{interest expense}}{\text{average interest-bearing liabilities}})$
LLP		Ratio of loan-loss provisions to average gross loans, which is a dynamic indicator to identify the loan quality and the adjustment of loan-loss reserves.
Independent variable		
The rate of non-interest activities revenue	NIAR	Rate of non-interest activities revenue to gross revenue.
Control variables		
Bank size	ASS	Natural logarithm of a commercial bank’s total assets.
Capital adequacy ratio	CAR	Ratio of equity capital to total assets.
Gross loan balance	GLB	
Growth of GDP	GGDP	Annual growth of real gross domestic product.

2.3 Empirical Model

We employ NPL and LLR, which represent the indicators of credit risk for banks, as the dependent variables in two separate regressions for robustnes check. The model in the following part is used to identify the relationship between credit risk and the rate of non-interest activities revenue to gross revenue with a first-order lagged dependent variable.

$$Y = \beta_0 + \beta_1 Y_{it-1} + \beta_2 NIAR_{it} + \beta_3 CAR_{it} + \beta_4 ASS_{it} + \beta_5 GLB_{it} + \beta_6 GGDP_{it} + \varepsilon_{it}$$

Here, i and t subscripts indicate individual commercial banks and time dimension, respectively. The lagged Y represents the first-order lagged NPL or first-order lagged LLP, which is seen as an exogenous variable. NIAR is one of the main dependent variables, indicating the rate of non-interest activities revenue to gross revenue. In addition, the coefficients β_2 are expected to be significantly positive in the model with the dependent variable of LLR and negative in the regression model with the dependent variable of NPL. The three control variables, which include CAR, ASS, GLB, and GGDP, appear in the model.

We divide the 60 banks into two groups, based on whether the size of assets is more than 500 billion Yuan. Hence, there are 28 banks in the large-size group and 32 banks in the other group. The dynamic panel model setting allows this research to address persistence in bank risk-taking with the lagged dependent variable, which becomes endogenous (Delis and Kouretas 2011). We employ the difference GMM technique, because of panels with a small t and large n (Roodman 2009).

3. Empirical Analysis

3.1 Data and Descriptive Statistics

The empirical investigation in this study is based on 60 Chinese commercial banks' annual data between 2009 and 2017 with a total of 534 observations found from the Wind Database and banks' annual reports. A few data observations cannot be found, which could be handled by the dynamic panel model.

Table 2 demonstrates the descriptive statistics for Large Banks and Small Banks respectively. The means of the two groups are obviously different. The LLP of Large Banks equals 2.56%, which is a little less than that of Small Banks (3.00%); Large Banks also exhibit a lower NPL (1.09%) than Small Banks (1.49%). The average NIAR in the Large Banks group is higher (18.75%) than that of the Small Banks group (16.06%), which means that large-size banks now take part in more non-interest activities. For the control variables, CAR is almost the same for the two groups, because of authority regulations. ASS and GLB are obviously different, which does not need an explanation due to the basis of grouping. Lastly, the control variable for the macroeconomic level, GGDP, is the same for both groups.

Table 2. **Descriptive Statistics**

Variable (LB)	Obs.	Mean	Std. Dev.	Min	Max
NPL	251	1.09	0.45	0.10	3.88
LLP	251	2.56	0.70	0.81	4.92
NIAR	251	18.75	9.91	-1.50	54.33
CAR	250	12.26	1.41	8.88	16.31
ASS	250	37811.60	55023.17	543.82	260870.40
GLB	251	19143.40	29586.21	311.63	142334.50
GGDP	251	8.03	1.21	6.70	10.30
Variable (SB)	Obs.	Mean	Std.Dev.	Min	Max
NPL	283	1.49	1.30	0.00	13.97
LLP	278	3.00	1.18	0.00	9.57
NIAR	282	16.06	16.01	-5.34	84.69
CAR	281	12.90	2.14	7.00	33.97
ASS	281	1317.45	1006.59	33.40	4705.44
GLB	284	555.68	376.53	80.26	1885.40
GGDP	285	8.03	1.21	6.70	10.30

3.2 Empirical Results

The model includes annual panel data to identify whether banks' loan quality is affected by non-interest activities. The difference GMM technique can help identify the estimation results for Small and Large Banks respectively. Table 3 shows the results for the model on the group of Large Banks. Column 1 indicates that the coefficient on the lagged variable and NIAR is significantly positive in the model with NPL as the dependent variable. In addition, credit risk in large-size banks is positively affected by non-interest activities, indicating that these banks might be taking more risks for more profits due to the effects of non-interest businesses. Column 2 demonstrates the estimation result with LLP as the dependent variable for robustness check. The significant result shows that a large-size bank's risk attitude is

affected by non-interest activities.

Columns 3 and 4 present the results of the model for the group of Small Banks, indicating no significant relationship between non-interest activities and credit risk. In general, small Chinese commercial banks cannot operate too much non-interest activities due to their limited customer base and diseconomies of scale. Such limited non-interest activities do not change the risk-taking attitude of bank managers in their decision making over loan transactions.

Notes: The lagged non-performing loans to total loans (L.NPL) and lagged ratio of loan-loss provisions to average gross loans (L.LLP) are alternative independent variables for robustness check. The rate of non-interest activities revenue to gross revenue (NIAR) is the other independent variable to identify the relationship between non-interest activities and credit risk. Capital adequacy ratio (CAR), asset size of commercial banks (ASS), and gross loan balance (GLB) are bank-level control variables. Growth of GDP (GGDP) is a macroeconomic control variable that is not in the table due to its exogeneity. The values in parentheses are t-statistics. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3. **Results of the Regression**

Variable	(1)	(2)	(3)	(4)
L.NPL	0.559***		0.484***	
	[0.0368]		[0.0554]	
L.LLP		0.655***		0.323***
		[0.0521]		[0.0525]
NIAR	0.0107***	0.00967*	0.000199	-0.00265
	[0.0028]	[0.0039]	[0.0070]	[0.0047]
CAR	-0.0191	0.0483*	-0.115**	-0.0646*
	[0.0172]	[0.0218]	[0.0415]	[0.0296]
ASS	0.0000397***	0.0000332***	-0.000067	0.000148
	[0.0000]	[0.0000]	[0.0003]	[0.0002]
GLB	-.0000603***	-.0000593***	0.00107	0.000241
	[0.0000]	[0.0000]	[0.0009]	[0.0006]
Constant	0.155	0.0628	1.728**	2.568***
	[0.2010]	[0.2659]	[0.5794]	[0.4355]
Observations	195	195	213	209

Standard errors in brackets. * p<0.05, ** p<0.01, and *** p<0.001.

4. Conclusion

This research studies the impacts of non-interest activities in commercial banks on their traditional loan businesses from the standpoint of credit risk. Information asymmetry related to diversification into non-interest activities may cause a deterioration in loan quality. However, extending client relationships might also increase the quality of banks' credit by obtaining more soft information. Hence, investigating diversification into non-traditional banking businesses is interesting in order to understand the risk appetite of commercial banks coming from traditional banking business areas. To test the impacts, we utilize annual data on 60 commercial banks in China from 2009 to 2017, which are divided into two groups according to whether their asset size is more/less than 500 billion Yuan.

Our research concludes there is no significant result that identifies the direct relationship between credit risk and non-interest activities for small commercial banks (assets less than 500 billion Yuan). Significant evidence of a positive relationship between credit risk and non-interest activities does appear in the group of large banks (assets over 500 billion Yuan). This finding is robust after checking with two different credit risk indicators, NPL and LLP. We also present evidence of cross-subsidization for several non-interest activities and traditional lending-borrowing business, because of the risk-taking operations in traditional loan businesses for customer retention of non-interest activities due to higher incomes in large banks.

References

[1] Abedifar, P., P. Molyneux, and A.Tarazi. 2018. Non-interest income and bank lending. Journal of Banking & Finance 87: 411–426. doi: 10.1016/j.jbankfin.2017.11.003

[2] Akhigbe, A., and B. A. Stevenson. 2010. Profit efficiency in U.S. BHCs: Effects of increasing

non-traditional revenue sources. Quarterly Review of Economics and Finance 50(2): 132-140. doi: 10.1016/j.qref.2009.11.003

[3] Berger, A.N., R. S. Demsetz, and P. Strahan. 1999. The consolidation of financial services industry: causes, consequences, and implications for the future. Journal of Banking and Finance 23: 135–194.

[4] Berger, A. N., I. Hasan, and M. Zhou. 2010. The effects of focus versus diversification on bank performance: evidence from Chinese banks. Journal of Banking and Finance 34(7): 1417-1435. doi: 10.1016/j.jbankfin.2010.01.010

[5] Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan. 2007. So what do I get? The bank's view of lending relationships. Social Science Electronic Publishing 85(2): 368-419. doi: 10.1016/j.jfineco.2005.08.003

[6] Boot, A. W. A. 2000. Relationship banking: what do we know?. Journal of Financial Intermediation 9(1): 7-25. doi: 10.1006/jfin.2000.0282

[7] Carbó, V. S., L. D. P. Rafael, and R. F. Francisco. 2007. Financial innovations in banking: impact on regional growth. Regional Studies 41(3): 311-326. doi: 10.1080/00343400600928350

[8] Claessens, S, and D. Klingebiel. 2001. Competition and scope of activities in financial services. The World Bank Research Observer, 16(1), 19-40. doi: 10.1093/wbro/16.1.19

[9] Degryse, H., and P. V. Cayseele. 2000. Relationship lending within a bank-based system: evidence from european small business data. Journal of Financial Intermediation 9(1): 90-109. doi: 10.1006/jfin.1999.0278

[10] De Jonghe, O., and O. Oztekin. 2015. Bank capital management: international evidence. Journal of Financial Intermediation, 24(2): 154-177. doi: 10.1016/j.jfi.2014.11.005

[11] Delis, M. D., and G. P. Kouretas. 2011. Interest rates and bank risk-taking. Journal of Banking & Finance 35(4): 840-855. doi: 10.1016/j.jbankfin.2010.09.032

[12] Deyoung, R., and T. Rice. 2004. Noninterest income and financial performance at U.S. commercial banks. The Financial Review (Statesboro) 39(1): 101-127. doi: 10.1111/j.0732-8516.2004.00069.x

[13] Deyoung, R., and K. P. Roland. 2001. Product mix and earnings volatility at commercial banks: evidence from a degree of leverage model. FRB Chicago Working Paper No. 1999-06. doi: 10.2139/ssrn.251356

[14] Deyoung, R., and G. Torna. 2013. Nontraditional banking activities and bank failures during the financial crisis. Journal of Financial Intermediation 22(3): 397-421. doi: 10.1016/j.jfi.2013.01.001

[15] Dong, Y., M. Chao, F. Michael and W. Hou. 2014. Ownership structure and risk-taking: comparative evidence from private and state-controlled banks in China. International Review of Financial Analysis 36: 120-130. doi: 10.1016/j.irfa.2014.03.009

[16] Fiordelisi, F., D. Marques-Ibanez, and P. Molyneux. 2011. Efficiency and risk in european banking. Journal of Banking & Finance 35(5): 1315-1326. doi: 10.1016/j.jbankfin.2010.10.005

[17] Foos, D., L. Norden, and M. Weber. 2010. Loan growth and riskiness of banks. Journal of Banking & Finance 34(12): 2929-2940. doi: 10.1016/j.jbankfin.2010.06.007

[18] González, F. 2005. Bank regulation and risk-taking incentives: an international comparison of bank risk. Journal of Banking & Finance 29(5): 1153-1184. doi: 10.1016/j.jbankfin.2004.05.029

[19] Heckman, J. J. 1979. Sample selection bias as a specification error. Econometrica 47(1): 153-161. doi: 10.2307/1912352

[20] Hughes, J. P., and L. J. Mester. 2013. Who said large banks don't experience scale economies? Evidence from a risk-return-driven cost function. Journal of Financial Intermediation 22(4): 559–585. doi: 10.2139/ssrn.1904527

[21] Jonghe, O., M. Diepstraten, and G. Schepens. 2015. Banks' size, scope and systemic risk: what role for conflicts of interest?. Journal of Banking & Finance 61: S3-S13. doi: 10.2139/ssrn.2394884

[22] Kim, D., and A. M. Santomero. 1988. Risk in banking and capital regulation. The Journal of Finance 43(5): 1219-1233. doi: 10.1111/j.1540-6261.1988.tb03966.x

[23] Laeven, L., and R. Levine. 2007. Is there a diversification discount in financial conglomerates? Journal of Financial Economics 85: 331–367. doi: 10.1016/j.jfineco.2005. 06. 001

[24] Laeven, L., L. Ratnovski, and H. Tong. 2016. Bank size, capital, and systemic risk: some international evidence. Social Science Electronic Publishing 69: S25-S34. doi: 10.2139/ssrn.2508910

[25] Lepetit, L., E. Nys, P. Rous, and A. Tarazi. 2008. The expansion of services in european banking: implications for loan pricing and interest margins. Journal of Banking and Finance 32(11): 2325-2335. doi: 10.1016/j.jbankfin.2007.09.025

[26] Lin, J. R., H. Chung, M. H. Hsieh, and S. Wu. 2012. The determinants of interest margins and their

effect on bank diversification: evidence from Asian banks. Journal of Financial Stability 8(2): 96-106. doi: 10.1016/j.jfs.2011.08.001

[27] Nguyen, J. 2012. The relationship between net interest margin and noninterest income using a system estimation approach. Journal of Banking & Finance, 36(9): 2429–2437 doi: 10.1016/j.jbankfin.2012.04.017

[28] Keeley, M. C., and F. T. Furlong. 1990. A reexamination of mean-variance analysis of bank capital regulation. Journal of Banking & Finance, 14(1), 69-84. doi: 10.1016/0378-4266(90)90036-2

[29] Petersen, M. A., and R. G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. The Journal of Finance 49(1): 3–37. doi: 10.2307/2329133

[30] Puri, M., J. Rochell, and S. Steffen. 2011. On the importance of prior relationships in bank loans to retail customers, ECB Working Paper No. 1395. (2) doi: 10.2139/ssrn.1572673

[31] Roodman, D. (2009). A note on the theme of too many instruments. Oxford Bulletin of Economics & Statistics 71(1): 135-158. doi: 10.1111/j.1468-0084.2008.00542.x

[32] Servaes, H. 1996. The value of diversification during the conglomerate merger wave. Journal of Finance 51: 1201–1225. doi: 10.1111/j.1540-6261.1996.tb04067.x

[33] Stiroh, K., and A. Rumble. 2006. The dark side of diversification: The case of US financial holding companies. Journal of Banking and Finance 30: 2131–2161. doi: 10.1016/j.jbankfin.2005. 04. 030

[34] Sufian, F. 2009. Determinants of bank profitability in a developing economy: empirical evidence from the China banking sector. Journal of Asia-Pacific Business 10(4): 281-307. doi: 10.1080/10599230903340205

[35] Williams, B. 2016. The impact of non-interest income on bank risk in Australia. Journal of Banking & Finance 73: 16–37. doi: 10.2139/ssrn.1929125