

How does the stock market value bank diversification in
Thailand?



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Accepted by the FACULTY OF COMMERCE AND ACCOUNTANCY, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Science

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This paper investigates the impact of bank diversification on stock market-based value and risk in Thai banking system. Particularly, this paper is focused on income diversification. More specifically, the influence of various kinds of diversification business on bank risk and value is analyzed in this paper, the effect of each components of non-interest shares on bank value and risk is examined. Additionally, alternative income diversity measure is computed and used for robustness tests. The results show that income diversification has a positive influence on a bank market value. The stock market investor anticipation is that there would be more benefits of income diversification for Thai banks. On the contrary, there is no evidence to indicate that bank risk is reduced when share of non-interest income increases. Therefore, proposing that Thai banks should increase their non-interest income as diversification strategy to gain more stock market values. Nonetheless, bank management teams or regulators should be prudent in deciding the strategies about changing or improving the policies or regulations associated with bank diversification or financial conglomerates especially for bank risk in the future.

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Abstract

This paper investigates the impact of bank diversification on stock market-based value and risk in Thai banking system. Particularly, this paper is focused on income diversification. More specifically, this paper analyses the influence of various kinds of diversification business on bank risk and value, the impact of each components of non-interest shares on bank value and risk is examined in this paper. Additionally, alternative income diversity measure is computed and used for robustness tests. The results show that income diversification has a positive influence on a bank market value. The stock market investor anticipation is that there would be more benefits of income diversification for Thai banks. On the contrary, there is no evidence to indicate that bank risk is reduced when share of non-interest income increases. Therefore, proposing that Thai banks should increase their non-interest income as diversification strategy to gain more stock market values. Nonetheless, bank management teams or regulators should be prudent in deciding the strategies about changing or improving the policies or regulations associated with bank diversification or financial conglomerates especially for bank risk in the future.

1. Introduction

1.1 Background and problem review

The economy system and market environment have been changed over time. Nowadays, Technology plays more important role in economic and financial activities contribute to adjustment and development in banking system for client's satisfaction. Furthermore, there are some enterprises outside financial industry expanding their business into financial sector. Therefore, conditions in financial business become greater challenging and competitive. To compensate for diminished incomes from enlarged competition, the business of many commercial banks is expanded from focusing on traditional activity to non-traditional activity as a diversification strategy, causing the banks' income structure to change from the past.

Meanwhile, Bank of Thailand (BOT) has continuously encouraged broadening banking business scope to be consistent with emerging economy and financial systems and to enhance competitiveness and efficiency of commercial banks. The BOT permits Thai commercial banks to conduct five types of business which are insurance business, securities business, derivatives business, e-banking and other financial services.

However, in the current literature, the inquiry of whether banks should diversify is globally discussed but the answer remains inconclusive as existing papers provide different outcomes. For example, Laeven and Levine (2007) using cross-country data suggest that banks which involve in various businesses, market values are much less than those banks were split into financial institutions being an expert in the exclusive activities. Additionally, Stiroh and Rumble (2006) using sample of US banks shows

positively significant relation between the risk (volatility) of market returns, yet no relation banks average returns and non-interest income. On the contrary, Baele et al. (2007) inform a negative link of revenue diversification and idiosyncratic risks and positively strong link between the level of revenue diversification and franchise value among European banks. In, addition, Sawada (2013) demonstrate that there is a positive influence of functional diversification on market value but there is no evidence for reducing risks for the Japanese banking sector data. Moreover, they state that idiosyncratic risk, systematic risk and total risk are reduced by an increase in fee income activities.

1.2 Objective and Conceptual Framework

Given that Thai banks faces pressure from economic conditions, competition, technological development and regulations in financial sector pushing them to seek for new strategies to generate incomes where diversification strategy is a part of these. Diversification strategy indicates to income structure and risk leading to bank performance and stability. Commonly, banking system is an important part in financial sector and economy. Banking system collapse can reach to financial crisis and instability economy. Recently, commercial banks still account for almost half of the financial sector in Thailand. Thereby, the influence of bank diversification on the long-term bank performance and stability should be investigate.

Meanwhile, there still be inconclusive for the answer whether banks should diversify. In the existing literatures, there is no consensus both theoretically and

empirically. For instance, diversification can be beneficial by reducing expected costs of financial distress or bankruptcy (Boot & Schmeits, 2000) and providing stronger monitoring (A. Saunders, 1994; Anthony Saunders & Walter, 1994). On the contrary, focus strategy may be better for reducing agency problem (Berger & Ofek, 1995; Denis, Denis, & Sarin, 1997; Jensen, 1986).

Particularly, using different data set in a lot of research produce inconclusive results. For example, Baele et al. (2007) argue that a study applied with data of European banks, diversification adds firm values and reduces risk. Conversely, Laeven and Levine (2007) assert that a study applied with a cross-country data set, values of financial conglomerates are decreased by diversification. In addition, Stiroh and Rumble (2006) inform that the raise in vary fluctuated non-traditional activities cause the more risk exceeds the benefits gain from diversification.

Moreover, a lot of attention on majority of existing investigations is given to the banks in developed markets (Vo, 2017). Furthermore, as Doumpou et al. (2016) explain that banks in less evolved countries obtain more benefits from revenue diversification compared with banks in progressive countries, researching bank diversification effects in various countries with different financial and economic conditions is crucial.

In addition, For Thailand, existing literatures investigate the influence of bank diversification on bank risk and current performance for the time span from 2011 to 2015 for the banks of the Philippines, Malaysia, Indonesia, Vietnam, and Thailand (Moudud-Ul-Huq, Ashraf, Gupta, & Zheng, 2018). In that research, ROE, ROA, cost

efficiency (EFF) and net interest margin (NIM) represent as the bank performance measures and use risk indicators which are standard deviation of ROA indicates the total income risk for bank, the standard deviation of ROE represents the risk of equity stakeholder revenue, the standard deviation of NIM indicates bank credit risk and Z-score represents the probability of bank default. The result suggests that bank both income and asset diversification have negatively significant relation with bank risk measures while positively with performance measures.

In this paper, the influence of bank diversification on stock market value and risk is investigated. Particularly, income diversification is focused on this paper. More especially, the effect of various kinds of diversification business on bank risk and performance is analyzed, the impact of each components of non-interest on bank value and risk is examined. Additionally, alternative income diversity measure is computed and used for robustness tests. The methodology for this paper is based on a panel regression. Applying quarterly data from 2007 to 2019.

From all the above reasons, the contributions to the extant literature are in plenty ways by studying the influence of income diversification on stock market value and risk in Thai banking system which stock market value implies as a prospective performance and stability for firms. In addition, Thailand is one of Asian emerging economy which is important and interesting for extending research area. This paper can provide interesting new evidence and be supportive for existing literatures with different data set and conditions in Thailand. Moreover, this paper becomes the first

study which examines the impact of bank diversification on stock market value, bank systematic risk, idiosyncratic risk and total risk for Thai banking system.

Furthermore, this paper helps identify whether diversification strategy should apply to Thai banks to adding bank value and mitigating risk. Providing more understanding which types of non-interest incomes could better drive bank value and mitigate risk. Lastly, benefit to Banks and regulators (Central bank) to use the information when promoting the strategy and structure of banks.

1.3 Research Hypothesis

Firstly, since bank diversification in Thailand is likely to increase, while the existing papers studying whether banks in many countries globally should diversify their investments have conflicting results, it would be interesting to investigate the impact of this diversification in Thai banking environment.

Secondly, as bank diversification indicates strategy and structure of banks to generate incomes including the way to manage risks and performance. Then bank risks and performance are expected to respond to bank diversification.

Thirdly, using capital market data to accounting data for stock market valuation due to a forward-looking property of equity prices and thus better indicators for prospective risks and performance related with various strategical and structural options. Thereby stock market valuation is expected to respond to bank risks and performance.

Fourthly, as stock market valuation is expected to respond to bank diversification, I investigate the association between stock market valuation and bank diversification whether there is positive or negative relationship. Furthermore, I examine effect of bank diversification on bank risks.

Lastly, bank diversification would be beneficial if it generates enough positive revenue from implementing various non-traditional activities or if it brings the operating cost down lower than that of the loan focused strategy. For example, there is economy of scope from sharing inputs such as labor, technology and information leading to cost saving. The income-generating capability of diversification strategy is improved if sharing inputs can be used to generate income for both traditional and non-traditional activities. Hence, banks with diversification strategy can enjoy the advantage of economy of scope that boost performance and market valuation. Moreover, income from traditional business is mainly from interest income which fluctuates widely depending on various factors such as policy interest rate, economic conditions, regulations and competitions. Thus, banks try to adjust their strategies to cope with uncertainty and seek for more certain revenue which is consistent with the clients' satisfaction. If banks can define the appropriate range of diversifying activities, performance and market value can be promoted by this advantage.

From the risk aspect, insurance and securities businesses can potentially reduce risk for conglomerate, but the impact mainly relies on the sort of diversification businesses that banks engage (Kwan & Laderman, 1999). Furthermore, when diversified banks broaden business over various industries or products, risks may be

lower and hence reduce expected costs of bankruptcy or financial distress (Boot & Schmeits, 2000).

Supported by the results from Moudud-Ul-Huq et al. (2018) that banks in Thailand have effective diversification policies to minimize risks and maximize performance, I hypothesize that there is a positive relation between stock market valuation and bank diversification. This suggests that investors prefer banks to have diversification strategy. Whereas, the relationship between bank diversification and the market risk is expected to be negative as diversified banks should have less fluctuated valuation in response to changing economic conditions.



2. Literature review

Researches related to bank diversification, in particularly income or functional diversification.

Diamond (1991), Rajan (1992), Saunders and Walter (1994), and Stein (2002) suggest that commercial banks are involved in a scope of activities which diversify their income because banks are able to collect information from customers in order to cross-sell products, such as insurance products, brokerage, underwriting, and mutual fund services through the process of lending. Commercial banks in the US are studied and shown that they diversify their income primarily by increasing their non-interest income. DeYoung and Roland (2001), Stiroh (2004a, 2004b, 2006), and Stiroh and Rumble (2006) claim that income diversification in the commercial banks results in the conversion of profit-driven activities into fee-charged activities, trust receipts, and other non-interest activities.

Decision whether bank focus or diversification policies and their effects on performance and stability have been an interesting topic of argument in the academic literature and beyond. There are both benefits and drawbacks for these two strategies to firms. The number of existing literatures show beneficial aspects for bank diversification. Banking institutions are proposed as unique kinds of enterprises by classical bank researches, and the delegated monitoring debate as Diamond (1984) and Boyd and Prescott (1986) propose that from the financial intermediaries' perspective of monitoring, diversification is the optimal strategy that banks should undertake. Saunders (1994) finds that the takeover market could perform more intense

monitoring on supervisors of financial institutions when there are cross-activity mergers, thus the ability of revenue diversification through the operation of takeover market improves corporate governance. Stein (1997) reports that conglomerates could produce more efficient allocation of their resources via internal capital markets. Boot and Schmeits (2000) suggest that broadening activities across various industries or products may lower bank risks through diversification, hence mitigation for expected costs of bankruptcy or financial distress are occurred.

In contrast, corporate finance theory as from Jensen (1986), Berger and Ofek (1995), and Denis et al., (1997) informs that firms should focus for employment management skill and diminishing possible agency problems. Beck and De Jonghe (2013) argue that when borrower's financial problems are explored and promptly response to reduce risk including higher level of monitoring and screening practice are enabled form focus banks.

Because of data limitations and econometric problems, it is not clear whether bank diversification's advantages are more significant than the costs. to assess the actual effect of agency costs or economies of scope for banking has proven to be very difficult. Berger and Ofek (1995) inform that, even if industry diversification decreases value on average, it also lessens the value loss. Potentially, there is higher degree of similarity for the activities undertaken in financial conglomerates than in most other industries. Cybo-Ottone and Murgia (2000) report that cross-product businesses have greater abnormal returns than horizontal bank mergers for the sample of European financial mergers. DeLong (2001) suggests that geography and activity

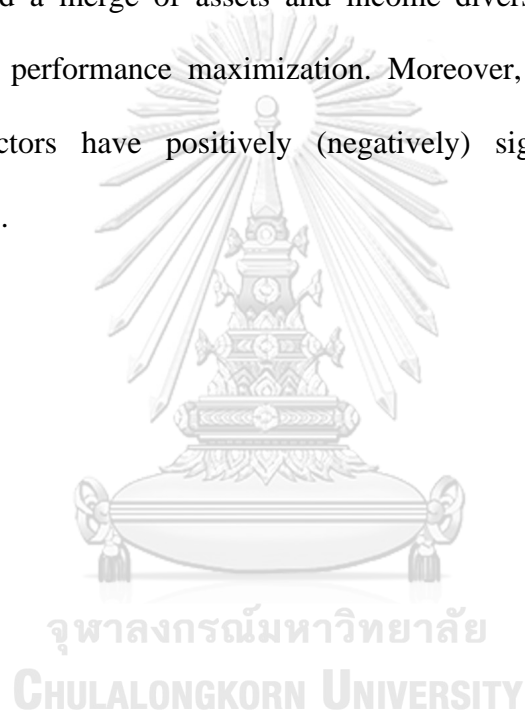
types of bank mergers improve stockholder value, while value is not generated from mergers focusing on revenue diversification. Vander Venet (2002) reports that specialized European banks have less cost efficiency than financial conglomerates. Nevertheless, a valuable benefit in terms of profit capability does not be transferred from the cost advantage.

In the existing empirical literatures for income or functional diversification, there has been indecisive. Laeven and Levine (2007), Schmid and Walter (2009), and Berger et al. (2010), state that diversification decreases diversified banks or financial conglomerates values, using cross-country, American banks, and Chinese banks data (respectively). On the contrary, Vander Venet (2002) and Baele et al. (2007) studying European financial system and Elsas et al. (2010) researches about huge banks from many developed countries show evidence for diversification premiums.

Given in more details, Stiroh and Rumble (2006) inform that financial holding firms in U.S. with diversification strategy can generate benefits offsetting with a raise in vary fluctuated non-interest income activities. Especially, Stiroh (2006) confirms that when banks depend less on non-interest income relish with greater equity returns, while they have total risk and idiosyncratic risk (as a proxy of the volatility of their equity returns) and systematic risk (market beta) less than that of depend more on non-interest income. In addition, Baele et al. (2007) suggest that systematic risk and market value are added from income diversification, but idiosyncratic risk is reduced.

Existing literatures involving Thai banks is Moudud-Ul-Huq et al. (2018) bank data from Vietnam, Malaysia, Indonesia, the Philippines and Thailand, and for the

time span in 2011–2015 are applied, they state that in overall, banks with diversification strategy have lower risk and higher performance. Nevertheless, additional observation shows that diversified businesses heterogeneously generate benefits for banks. Whereas from country-to-country, the impact of assets diversification differs, the effect of income diversification on bank performance and stability is positive and robust. For Thailand, the results indicate that Thai banks have capable to proceed a merge of assets and income diversification policies for risk minimization and performance maximization. Moreover, commission, trading and other income factors have positively (negatively) significant effect on bank performance (risk).



3. Data

This study applies the data includes market information of the listed banks in the Stock Exchange of Thailand for the period from 2007 to 2019. According the mentioned criteria, there are nine banks whose stock ticker symbols are BBL, KBANK, KTB, TMB, SCB, BAY, KKP, CIMBT, and TCAP in the data set. The main data source is Bloomberg which provides information of market data and accounting data of the listed banks. Market data are quarterly market value of equity, daily stock return and daily SET index. Accounting data are from financial statement which are non-interest income, fee and commission income, trading income, total operating income, book value of liabilities and book value of assets. If examining is needed for more details on financial statement, information can be provided from the Securities and Exchange Commission and the bank websites.

3.1 Independent variables

To examine the impact of bank diversification on stock market valuation and to measure functional or income diversification, this study is interested in a structure of bank income and gross values is used for income diversification measures. Non-interest income indicates to revenue from non-traditional business which is composed of other non-interest income, trading income and fee income. Therefore, there are measures for income diversification as follows:

Non-interest income share

$$\text{Non Interest Income Share} = \frac{\text{Non Interest Income}}{\text{Total Operating Income}}$$

Fee income share

$$\text{Fee Income Share} = \frac{\text{Fees and Commissions}}{\text{Total Operating Income}}$$

Trading income share

$$\text{Trading Income Share} = \frac{\text{Trading Income}}{\text{Total Operating Income}}$$

Other non-interest income share

$$\text{Other Non Interest Income Share} = \frac{\text{Other Non Interest Income}}{\text{Total Operating Income}}$$

Revenue diversity: This is a supplementary measure of functional diversification from previous study following Sawada (2013)

$$\text{Revenue diversity} = 1 - \left| \frac{\text{Interest Income} - \text{Non Interest Income}}{\text{Total Operating Income}} \right|$$

In this equation, when 0.5 is non-interest income share, the maximum value of revenue diversity is equal to 1; when 1 or 0 is non-interest income share, the minimum value of revenue diversity is equal to 0. Stiroh and Rumble (2006) apply this indicator which is related to the HHI-type measures.

The assumption behinds this measure is the optimal diversification combination between lending and non-lending activities is an equal separation. To check the stability of the results, this measure is applied (Baele, De Jonghe, & Vennet, 2007).

3.2 Dependent variables

Tobin's Q is used for this study as a stock-based measure for performance where is determined as the ratio of the present value of a bank future cash flows to the replacement cost of assets. Investigators have applied Tobin's Q as an indicator for a market value, long-term performance or company's franchise value (Keeley, 1990; Lang & Stulz, 1994; Sawada, 2013). Using the Tobin's Q ratio has an advantage for direct comparison among different sizes of banks are allowed because it includes book value of liabilities, hence, it is adjusted to the size of the bank.

Despite there are several advantages of the Tobin's Q ratio for measuring bank valuation, there are some concerns because if banks naturally have high level of leverage, a very small variance tends to be the Tobin's Q's property. Thereby, the analysis using the market-to-book equity ratio is also conducted to overcome this shortcoming.

Tobin's Q

$$\text{Tobin's Q ratio} = \frac{\text{Market Value of Equity} + \text{Book Value of Liabilities}}{\text{Book value of Assets}}$$

Market-to-book equity ratio

$$\text{Market to book equity ratio} = \frac{\text{Market Value of Equity}}{\text{Book value of Equity}}$$

Risk measures based on stock market data including idiosyncratic risk, systematic risk, and total risk are used to investigate bank risk. The following market model (Sawada, 2013) will be examined to acquire these measures:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \gamma_1 YS_t + u_{it} \quad (1)$$

Where R_{it} represents the daily stock return of bank i at time t

R_{mt} is the return on the stock market index at time t . The Stock Exchange of Thailand Index (SET index) is applied as a represent for the market index.

YS_t indicates the change in the yield spread between long-term and short-term bonds on time t , using the yields for 1-year and 10-year Thailand government bonds to represent the yields for short-term bonds and long-term bonds, respectively.

Data frequency for R_{it} , R_{mt} and YS_t is daily basis. Then, estimating Equation (1) for each quarter and bank. Hence, β_i as a quarterly basis represents bank systematic risk. Moreover, the standard deviation of the bank stock returns for a quarter represents total risk and the standard deviation of the residuals estimated from Equation (1) represents idiosyncratic risk.

3.3 Control variables

There are the control variables as follows:

Bank size: is log of total assets. Larger-sized banks have ability to extend into new business fields since they are capable to invest in more advanced technologies and commonly have better risk management. Thereby it is expected to be positively linked between profits and size and negatively between risk and size.

Equity-to-assets: represents bank capital structure including financial leverage, a cushion of negative shocks or agency cost. Thus, the impacts of it on bank risk and value could be in various ways and are less clear in advance.

Loan-to-assets: indicates the performance of bank's lending policies related to its other earning assets.

Loan growth rate: if the stock investors assess it as a performance indicator for traditional bank activities, it is predicted to be positively related with bank value and negatively related to risk. Conversely it is probable to be positively related with risk if the stock investors perceive that it will raise a credit risk for bank.

Return on Assets (ROA): indicates a bank current profitability. It is unclear about its impact on bank risk even it is anticipated to has positive link on bank valu

4. Methodology

To examine the impact of bank diversification on bank risk and value, the following equation (Sawada, 2013) is estimated with panel regression:

$$Y_{it} = \alpha_1 + \alpha_2 DIV_{it} + \gamma X_{it} + \varphi QT + \eta_i + \varepsilon_{it} \quad (2)$$

Here, subscripts i in quarter t represent the bank and quarter, respectively.

Where Y_{it} denotes a measure for market-based performance (Tobin's Q ratio and market-to-book equity ratio) or market-based risk (market beta, idiosyncratic risk, and total risk).

DIV_{it} is the income diversification measures.

X_{it} represents other control variables.

Main objective for this paper is to examine the income diversification impact on stock market value and risk. For doing so, first, using main explanatory variables which are non-interest income share, fee income share, trading income share and other non-interest income share as a proxy for income diversification together with other control variables and estimate its effect on each bank value and risk proxies.

Furthermore, to manage unobserved time heterogeneity and macro-level shocks, the Quarter dummy variables (QT) is include in the equation (2). The term η_i stands for individual fixed effects. Endogeneity is possible to exist between return and measures of diversification or risk. For example, firm-specific characteristics like

geographic location or manager expertise may influence the diversification choices, bank risk or performance. Hence, controlling individual effects is important thing to do (Campa & Kedia, 2002; Sawada, 2013; Stiroh & Rumble, 2006). Equation (2) is estimated with a within-effects model to control individual effects. The one quarter lagged values of the explanatory variables are mainly used for mitigation potential simultaneity.

Nevertheless, loan growth rate is used its value in the same time with the dependent variables because information on both one- and two- quarter lagged values of the outstanding amount of loans is needed to calculate the one- quarter lagged value of loan growth rate, thus the sample size of loan growth rate reduces.

Figure 1 shows non-interest share of some sample banks for quarterly basis from 2007 to 2019. Non-interest share varies and tends to increase over time which implies that Thai banks are likely to take part in new non-interest revenue businesses.

Table 1 provides descriptive statistics for the nine sample banks. As the fact that banks are highly leveraged firms. There is probability that the standard deviation of the Market-to-book equity ratio is much bigger than that of the Tobin's Q ratio (in Table 1) as expected. Table 2 shows the correlation matrix involved with the principal variables for this research. The highest value of correlation among the explanatory variables in the same model is 0.6095 which is the correlation between the equity-to-assets and the ROA. However, Kennedy (2008) claims that when the correlation between two variables are over 0.70, multicollinearity problem is challenged.

Figure 1

The evolution of income diversification for some Thai banks.

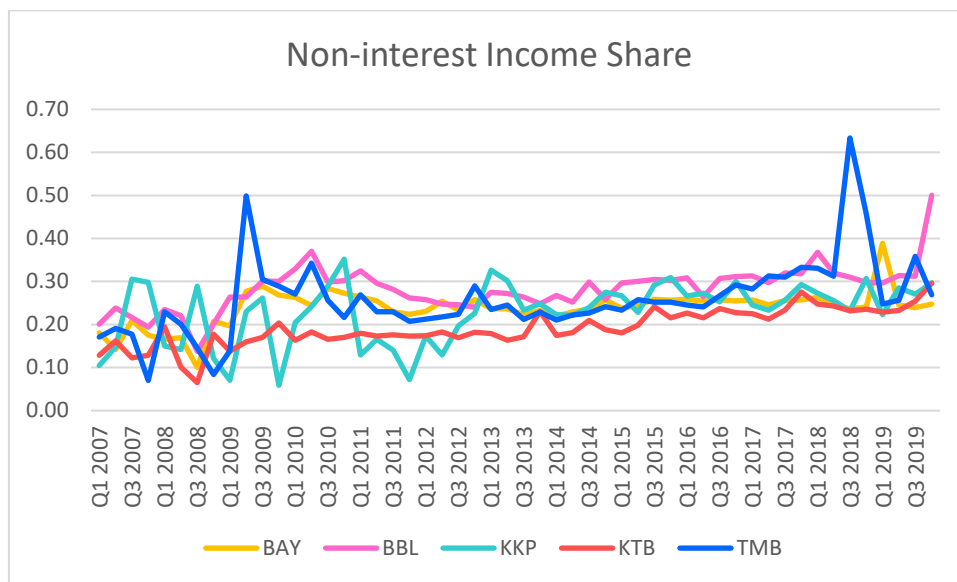


Table 1

Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Measures for performance and risk</i>					
Tobin's Q	464	1.0273	0.0589	0.9207	1.2867
Market-to-book equity ratio	464	1.4034	0.6412	0.3534	4.5793
Total risk	464	0.0188	0.0084	0.0072	0.0619
Systematic risk	435	1.0693	0.3223	0.2800	1.8828
Idiosyncratic risk	434	0.0141	0.0056	0.0065	0.0467
<i>Income diversification measures</i>					
Non-interest income share	457	0.2551	0.0779	0.0448	0.6335
Fee income share	464	0.1694	0.0583	0.0000	0.5221
Trading income share	429	0.0590	0.0573	0.0001	0.5038
Other non-interest income share	427	0.0441	0.0585	0.0000	0.4730
Revenue diversity	457	0.5080	0.1483	0.0895	0.9984
<i>Other control variables</i>					
Bank size	467	13.7420	0.9734	11.2485	14.9987
Equity-to-assets	467	0.0982	0.0327	0.0032	0.2289
Loan-to-assets	467	0.6992	0.0659	0.3832	0.9085
Loan growth rate	468	0.0206	0.0823	-0.9270	1.0073
Return on Assets (ROA)	464	0.9894	1.0677	-6.4200	2.8100

Table 2

Correlation matrix.

Variables	NIS	FIS	TIS	ONIS	RD	Size	E/A	L/A	LG	ROA
Non-interest income share (NIS)	1									
Fee income share (FIS)	0.4381	1								
Trading income share (TIS)	0.3466	-0.1051	1							
Other non-interest income share (ONIS)	0.3742	-0.4134	-0.0662	1						
Revenue diversity (RD)	0.9842	0.4773	0.2728	0.3733	1					
Bank size	0.3143	0.5238	-0.1002	-0.2491	0.3328	1				
Equity-to-assets (E/A)	0.1437	0.3164	0.0238	-0.1795	0.1545	-0.0778	1			
Loan-to-assets (L/A)	-0.0947	-0.0209	-0.1779	-0.007	-0.1109	-0.1509	0.2858	1		
Loan growth rate (LG)	0.1046	-0.0233	0.0238	0.1227	0.1096	-0.0712	0.1193	0.0611	1	
Return on Assets (ROA)	0.3164	0.3031	-0.0922	0.0344	0.3278	0.1982	0.6095	0.2607	0.1172	1



5. Empirical results

Table 3 provides the estimated results of equation (2) which the dependent variable is Tobin's Q measures for bank market value. Column (1) demonstrates the non-interest income share which its coefficient is positively significant. It indicates that bank market values can be grown when non-interest income share increases. Column (2), fee income, trading income, and other non-interest income shares are a composition of non-interest income share. The results show that fee income share has a positive link to bank market value. Column (3) provides the results that revenue diversity has the coefficient which is also positively significant. This result indicates that bank revenue or functional diversification has positive influence on bank stock market value.

These results have consistence with Baele et al. (2007) (the sample of European financial system) and Sawada (2013) (the sample of Japanese banks). The investigation of Baele et al. (2007) informs that diversified activities for European banks are highly evaluated by stock market. This is the result from their longer experience in diversification and non-banking activities have been dedicated sufficient management resources to. Sawada (2013) points out that Japanese banks may be anticipated by stock market investors that they would have more advantage from income or functional diversification than their peers in other financial systems. Since they which are in the bank-centered economy have set up a stronger relationship with customer than banks in other economies. Thai banks do not have prolonged experience with revenue diversification compared to European banks. Nonetheless, they are also in the bank-centered economy and have a strong customer

base. Therefore, the functional diversification activities positively influence bank stock market value.

For control variables are tested in this model. The coefficient for bank size and equity-to-assets are negatively significant in all cases, which points out that raise in size or portion of equity in capital structure can decrease their market values. While in all cases, the coefficient of ROA is positively significant, informs that bank value is positively affected by current profitability. However, other control variables, including loan-to-assets and loan growth rate has no significant influence on banks' market values.



Table 3

Tobin's Q regressions.

	Dependent variable: Tobin's Q ratio					
	(1)		(2)		(3)	
<i>(Income diversification)</i>						
Non-interest income share	0.0830	***				
	(0.0281)					
Fee income share			0.1972	***		
			(0.0653)			
Trading income share			0.0205			
			(0.0399)			
Other non-interest income share			0.0697			
			(0.0428)			
Revenue diversity					0.0490	***
					(0.0152)	
<i>(Control variables)</i>						
Bank size	-0.1016	***	-0.0953	***	-0.1015	***
	(0.0079)		(0.0090)		(0.0079)	
Equity-to-assets	-0.9186	***	-1.0095	***	-0.9237	***
	(0.1069)		(0.1307)		(0.1068)	
Loan-to-assets	-0.0106		-0.0103		-0.0083	
	(0.0343)		(0.0390)		(0.0343)	
Loan growth rate	0.0092		0.0070		0.0078	
	(0.0202)		(0.0197)		(0.0202)	
Return on Assets (ROA)	0.0063	**	0.0109	***	0.0063	**
	(0.0026)		(0.0030)		(0.0026)	
Constant	2.5192	***	2.4253	***	2.5135	***
	(0.1172)		(0.1347)		(0.1170)	
Observations	450		393		450	
R-squared	0.4029		0.3965		0.4051	
Number of groups	9		9		9	

Denote “***”, “**” and “*” as significance at 1%, 5% and 10% level, respectively. The figures in parentheses represent the standard errors. Each regression includes with quarter dummy variables.

Table 4 presents the results of the assessment when the dependent variable is the market-to-book equity ratio which uses for market value measures. The results of estimation for Table 4 are qualitatively similar to those exhibited in Table 3. Especially, income diversification which its coefficients are positively significant. Moreover, only fee income share positively influences bank market value.

Column (1) demonstrates that non-interest income share which the coefficient is positive and significant. It indicates that bank market-to-book equity ratio grow when they increase share of non-interest income. The results in column (2) show the influence of fee income share to the ratio of market-to-book equity is positive. Column (3) provides the results that income diversity which its coefficient is also positively significant. This result suggests that bank income diversification positively influences market-to-book equity ratio.

For control variables are tested in this model. The coefficient for bank size equity-to-assets and ROA are statistically and negatively significant in all cases, which points out that raise in size, portion of equity in capital structure or current profitability can decrease their market-to-book equity ratio. However, other control variables, including loan-to-assets and loan growth rate do not significantly influence banks' market-to-book equity ratio.

Table 4

Market-to-book equity ratio regressions

	Dependent variable: Market-to-book equity ratio					
	(1)		(2)		(3)	
<i>(Income diversification)</i>						
Non-interest income share	0.9025	***				
	(0.3350)					
Fee income share			1.4530	*		
			(0.7714)			
Trading income share			0.1456			
			(0.4764)			
Other non-interest income share			0.5264			
			(0.5049)			
Revenue diversity					0.5417	***
					(0.1812)	
<i>(Control variables)</i>						
Bank size	-1.1278	***	-0.9626	***	-1.1273	***
	(0.0941)		(0.1076)		(0.0939)	
Equity-to-assets	-11.5093	***	-12.6094	***	-11.5806	***
	(1.2797)		(1.5459)		(1.2776)	
Loan-to-assets	-0.0108		0.2892		0.0160	
	(0.4095)		(0.4594)		(0.4090)	
Loan growth rate	-0.0076		0.0096		-0.0241	
	(0.2409)		(0.2324)		(0.2408)	
Return on Assets (ROA)	-0.0784	**	-0.0615	*	-0.0781	**
	(0.0312)		(0.0354)		(0.0311)	
Constant	18.1542	***	15.7656	***	18.0897	***
	(1.4006)		(1.6056)		(1.3986)	
Observations	450		392		450	
R-squared	0.3645		0.3485		0.3669	
Number of groups	9		9		9	

Denote “***”, “**” and “*” as significance at 1%, 5% and 10% level, respectively. The figures in parentheses represent the standard errors. Each regression includes with quarter dummy variables.

The next examination is the impact of risk measures by income diversification. Table 5 outlines the estimated results when the dependent variable is total risk. The coefficients of non-interest income share and revenue diversity in column (1) and (3) are not statistically significant. As such, banks in general are unable to reduce their total risk by raising their diversification activities. Column (2) illustrates that other non-interest income share which its coefficients are significant and positive which notifies that total risk would be higher when banks raise share of other non-interest income.

For control variables are tested in this model. Bank size and equity-to-assets are negatively and significantly influence the banks' total risk in all cases. So that, banks that reduce their size or raise their leverage also raise their total risk. Even though other control variables (i.e., loan-to-assets, loan growth rate, and ROA) which the coefficients are not statistically significant.

Table 5

Total risk regressions.

	Dependent variable: total risk					
	(1)		(2)		(3)	
<i>(Income diversification)</i>						
Non-interest income share	0.0032					
	(0.0055)					
Fee income share			0.0084			
			(0.0123)			
Trading income share			0.0042			
			(0.0075)			
Other non-interest income share			0.0161	**		
			(0.0080)			
Revenue diversity					0.0017	
					(0.0030)	
<i>(Control variables)</i>						
Bank size	-0.0064	***	-0.006	***	-0.0064	***
	(0.0015)		(0.0017)		(0.0015)	
Equity-to-assets	-0.1165	***	-0.1148	***	-0.1165	***
	(0.0211)		(0.0246)		(0.0211)	
Loan-to-assets	-0.0020		0.0018		-0.0020	
	(0.0067)		(0.0073)		(0.0067)	
Loan growth rate	0.0051		0.0060		0.0051	
	(0.0040)		(0.0037)		(0.0040)	
Return on Assets (ROA)	0.0001		0.0000		0.0001	
	(0.0005)		(0.0006)		(0.0005)	
Constant	0.1175	***	0.1082	***	0.1173	***
	(0.0230)		(0.0254)		(0.0230)	
Observations	450		392		450	
R-squared	0.3110		0.2996		0.3109	
Number of groups	9		9		9	

Denote “***”, “**” and “*” as significance at 1%, 5% and 10% level, respectively. The figures in parentheses represent the standard errors. Each regression includes with quarter dummy variables.

The table 6 outlines the estimated results when dependent variable is the systematic risk (market beta). In Column (1) and (3), for share of non-interest income and revenue diversity which their coefficients are negative, but not significant, pointing that in general diminish in bank systematic risk is caused by an increase in their dependence on non-interest income. Column (3) exhibits that banks have less systematic risk when there is greater trading income share. Therefore, the correlation between trading income and the market return may be expected to be relatively low by the stock market investors comparative to other revenue sources.

These investigations also display that the coefficient of bank size and equity-to-assets in all cases are negatively significant, thus pointing that systematic risk can be raised when decrease in bank size or raise in a bank's leverage. On the contrary, ROA in all cases are positive and statistically significant, hence indicating that systematic risk can be increased when increase in ROA. In addition, other control variables in all cases (i.e., loan-to-assets and loan growth rate) which the coefficients are not statistically significant.

Table 6

Systematic risk (market beta) regressions.

	Dependent variable: systematic risk					
	(1)		(2)		(3)	
<i>(Income diversification)</i>						
Non-interest income share	-0.2438					
	(0.2353)					
Fee income share			0.1869			
			(0.5654)			
Trading income share			-0.6231	*		
			(0.3419)			
Other non-interest income share			0.2040			
			(0.3662)			
Revenue diversity						-0.1361
						(0.1276)
<i>(Control variables)</i>						
Bank size	-0.1796	***	-0.201	**	-0.1798	***
	(0.0686)		(0.0793)		(0.0686)	
Equity-to-assets	-2.7692	***	-3.5029	***	-2.7677	***
	(0.9215)		(1.1392)		(0.9210)	
Loan-to-assets	-0.0752		-0.1218		-0.0825	
	(0.3091)		(0.3530)		(0.3092)	
Loan growth rate	0.2990		0.2987		0.3026	
	(0.2808)		(0.2858)		(0.2810)	
Return on Assets (ROA)	0.0414	*	0.0469	*	0.0413	*
	(0.0228)		(0.0272)		(0.0228)	
Constant	3.9011	***	4.2504	***	3.9159	***
	(1.0236)		(1.1871)		(1.0238)	
Observations	424		371		424	
R-squared	0.0624		0.0889		0.0626	
Number of groups	9		9		9	

Denote “***”, “**” and “*” as significance at 1%, 5% and 10% level, respectively. The figures in parentheses represent the standard errors. Each regression includes with quarter dummy variables.

Tables 7 reports the estimated results when the dependent variable is idiosyncratic risk. Column (1) and (3) show that share of non-interest income and revenue diversity which their coefficients are statistically positive and significant. This point outs that increase bank non-interest income shares leads to an increase in their idiosyncratic risks. Column (2) shows that trading income share and other non-interest income share which their coefficients are positive and statistically significant. Particularly, other non-interest income share has more notable negative influence on idiosyncratic risk than other components, pointing that increase trading income and other non-interest income businesses leads to an raise in idiosyncratic risk.

Additionally, for control variables are tested in this model. Equity-to-asset ratio and ROA in all cases which their coefficients are negative and significant. Bank idiosyncratic risks can be increased when they lower size and profit but increase in their leverage. Moreover, other control variables (i.e., loan-to-assets and loan growth rate) which their coefficients in all cases are not statistically significant. Therefore, they cannot find any evidence to indicate that bank idiosyncratic risk is significantly influenced by these control variables.

Table 7

Idiosyncratic risk regressions.

	Dependent variable: idiosyncratic risk					
	(1)		(2)		(3)	
<i>(Income diversification)</i>						
Non-interest income share	0.0074	*				
	(0.0038)					
Fee income share			0.0096			
			(0.0087)			
Trading income share			0.0091	*		
			(0.0053)			
Other non-interest income share			0.0136	**		
			(0.0056)			
Revenue diversity					0.0044	**
					(0.0021)	
<i>(Control variables)</i>						
Bank size	-0.0035	***	-0.0028	**	-0.0035	***
	(0.0011)		(0.0012)		(0.0011)	
Equity-to-assets	-0.0420	***	-0.0493	***	-0.0425	***
	(0.0149)		(0.0177)		(0.0149)	
Loan-to-assets	-0.0003		-0.0006		-0.0001	
	(0.0050)		(0.0055)		(0.0050)	
Loan growth rate	0.0041		0.0057		0.0039	
	(0.0044)		(0.0043)		(0.0044)	
Return on Assets (ROA)	-0.0012	***	-0.0013	***	-0.0012	***
	(0.0004)		(0.0004)		(0.0004)	
Constant	0.0658	***	0.0562	***	0.0652	***
	(0.0165)		(0.0183)		(0.0165)	
Observations	423		370		423	
R-squared	0.2140		0.2149		0.2156	
Number of groups	9		9		9	

Denote “***”, “**” and “*” as significance at 1%, 5% and 10% level, respectively. The figures in parentheses represent the standard errors. Each regression includes with quarter dummy variables.

Table 8 shows the impact of income diversification on bank performance after market-based risk is controlled when Tobin's Q ratio and the market-to-book equity ratio are dependent variables. Idiosyncratic risk, systematic risk and total risks are incorporated as explanatory variables. These estimations report that non-interest income shares are positively and statistically significant in all cases. Thus, when measures of stock market-based risk are controlled, the positive influence of income diversification on Tobin's Q ratio and market-to-book equity ratio (bank market value) remains robust.



Table 8

Risk-adjusted performance regressions.

Dependent variable:	Tobin's Q ratio			Market-to-book equity ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>(Income diversification)</i>						
Non-interest income share	0.0732 *** (0.0275)	0.0753 *** (0.0283)	0.0702 ** (0.0278)	0.7733 ** (0.3221)	0.7749 ** (0.3364)	0.7020 ** (0.3227)
<i>(Control variables)</i>						
Total risk	-0.6670 *** (0.2395)			-8.3097 *** (2.8056)		
Systematic risk		-0.0003 (0.0059)			-0.0675 (0.0706)	
Idiosyncratic risk			-0.6405 * (0.3674)			-7.4039 * (4.2658)
Bank size	-0.1048 *** (0.0078)	-0.0925 *** (0.0083)	-0.0954 *** (0.0082)	-1.1641 *** (0.0920)	-1.0172 *** (0.0989)	-1.0360 *** (0.0950)
Equity-to-assets	-0.9689 *** (0.1079)	-0.9028 *** (0.1110)	-0.8904 *** (0.1090)	-12.1264 *** (1.2681)	-11.7782 *** (1.3224)	-11.2110 *** (1.2701)
Loan-to-assets	-0.0091 (0.0334)	-0.0227 (0.0370)	-0.0145 (0.0366)	0.0050 (0.3914)	-0.2740 (0.4399)	-0.0366 (0.4247)
Loan growth rate	0.0112 (0.0197)	0.0461 (0.0335)	0.0466 (0.0322)	0.0140 (0.2305)	0.5593 (0.3986)	0.5517 (0.3736)
Return on Assets (ROA)	0.0065 ** (0.0025)	0.0070 ** (0.0027)	0.0059 ** (0.0027)	-0.0753 ** (0.0298)	-0.0644 ** (0.0326)	-0.0830 *** (0.0316)
Constant	2.5818 *** (0.1181)	2.4034 *** (0.1252)	2.4476 *** (0.1226)	18.8836 *** (1.3851)	16.9461 *** (1.4897)	17.0570 *** (1.4262)
Observations	446	420	419	446	420	419
R-squared	0.4184	0.3825	0.3975	0.3848	0.3439	0.3613
Number of groups	9	9	9	9	9	9

Denote “***”, “**” and “*” as significance at 1%, 5% and 10% level, respectively. The figures in parentheses represent the standard errors. Each regression includes with quarter dummy variables.

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6. Conclusions

This study empirically examines whether banks obtain benefit from income diversification across different types of activities. Specially, the impacts of bank income diversification on stock market based firm value and risk is examined which income diversification is measured using non-interest income share. In addition, the components of non-interest income share are explored include their effects on bank market value and risk. Furthermore, this research covers Thai banking sector known as a bank-centered economy.

The analyses find that there is a positive influence of income diversification on a bank market value. There would be more benefits from income diversification for Thai banks is an idea which stock market investors may anticipate since Thai banks have encouraged intimate connection with their clients and have formed a strong client base. On the contrary, there is no evidence to indicate that non-interest income share reduces bank risk. Nevertheless, raise in non-interest income share be able to raise in idiosyncratic risk. While increase in trading income share be able to decrease systematic risk but increase idiosyncratic risk. In addition, raise in share of other non-interest income be able to raise in idiosyncratic and total risk. Moreover, the results have shown here indicate that income diversification through a raise in fee income has significantly positive influence on bank market values, but it is unable to find evidence that fee income share decrease bank risk. Comparative to other sources of revenue, fee income is probably to be anticipated by stock market investors that it has a potential to be more reliable revenue for bank. Nevertheless, among Thai banks fee-based activities tend to be more competitive. Regard to these results, proposing that Thai banks should increase their non-interest income as diversification strategy to

gain more stock market values. Nonetheless, bank management teams or regulators should be prudent in deciding the strategies about changing or improving the policies or regulations associated with bank diversification or financial conglomerates especially for bank risk in the future. Therefore, investigating data for a time span in the future, research can be more interesting and benefit.



REFERENCES

- Baele, L., De Jonghe, O., & Vennet, R. V. (2007). Does the stock market value bank diversification? *Journal of Banking & Finance*, 31(7), 1999-2023. doi:10.1016/j.jbankfin.2006.08.003
- Berger, P. G., & Ofek, E. (1995). Diversifications Effect on Firm Value. *Journal of Financial Economics*, 37(1), 39-65. doi:Doi 10.1016/0304-405x(94)00798-6
- Boot, A. W., & Schmeits, A. (2000). Market discipline and incentive problems in conglomerate firms with applications to banking. *Journal of financial intermediation*, 9(3), 240-273.
- Campa, J. M., & Kedia, S. (2002). Explaining the diversification discount. *The Journal of Finance*, 57(4), 1731-1762.
- Denis, D. J., Denis, D. K., & Sarin, A. (1997). Agency problems, equity ownership, and corporate diversification. *The Journal of Finance*, 52(1), 135-160.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review*, 76(2), 323-329.
- Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American economic review*, 1183-1200.
- Kwan, S. H., & Laderman, E. S. (1999). On the portfolio effects of financial convergence-A review of the literature. *Economic Review*, 2, 18-31.
- Lang, L. H., & Stulz, R. M. (1994). Tobin's q, corporate diversification, and firm performance. *Journal of political economy*, 102(6), 1248-1280.
- Moudud-Ul-Huq, S., Ashraf, B. N., Gupta, A. D., & Zheng, C. J. (2018). Does bank diversification heterogeneously affect performance and risk-taking in ASEAN emerging economies? *Research in International Business and Finance*, 46, 342-362. doi:10.1016/j.ribaf.2018.04.007
- Saunders, A. (1994). Banking and Commerce - an Overview of the Public-Policy Issues. *Journal of Banking & Finance*, 18(2), 231-254. doi:Doi 10.1016/0378-4266(94)00034-4
- Saunders, A., & Walter, I. (1994). *Universal banking in the United States: What could we gain? What could we lose?* : Oxford University Press.
- Sawada, M. (2013). How does the stock market value bank diversification? Empirical evidence from Japanese banks. *Pacific-Basin Finance Journal*, 25, 40-61. doi:10.1016/j.pacfin.2013.08.001
- Stiroh, K. J., & Rumble, A. (2006). The dark side of diversification: The case of US financial holding companies. *Journal of Banking & Finance*, 30(8), 2131-2161. doi:10.1016/j.jbankfin.2005.04.030
- Vo, X. V. (2017). How does the stock market value bank diversification? Evidence from Vietnam. *Finance Research Letters*, 22, 101-104. doi:10.1016/j.frl.2017.06.005

- Batten, J. A., & Vo, X. V. (2016). Bank risk shifting and diversification in an emerging market. *Risk Management-Journal of Risk Crisis and Disaster*, 18(4), 217-235.
- Beck, T., & De Jonghe, O. (2013). *Lending concentration, bank performance and systemic risk: exploring cross-country variation*: The World Bank.
- Berger, A. N., Hasan, I., & Zhou, M. (2010). The effects of focus versus diversification on bank performance: Evidence from Chinese banks. *Journal of Banking & Finance*, 34(7), 1417-1435.
- Boyd, J. H., & Prescott, E. C. (1986). Financial intermediary-coalitions. *Journal of Economic theory*, 38(2), 211-232.
- Campbell, J. Y., Lettau, M., Malkiel, B. G., & Xu, Y. X. (2001). Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk. *Journal of Finance*, 56(1), 1-43.
- Cybo-Ottone, A., & Murgia, M. (2000). Mergers and shareholder wealth in European banking. *Journal of Banking & Finance*, 24(6), 831-859.
- DeLong, G. L. (2001). Stockholder gains from focusing versus diversifying bank mergers. *Journal of Financial Economics*, 59(2), 221-252.
- DeYoung, R., & Roland, K. P. (2001). Product mix and earnings volatility at commercial banks: Evidence from a degree of total leverage model. *Journal of financial intermediation*, 10(1), 54-84.
- Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The review of economic studies*, 51(3), 393-414.
- Diamond, D. W. (1991). Monitoring and reputation: The choice between bank loans and directly placed debt. *Journal of political economy*, 99(4), 689-721.
- Doumpos, M., Gaganis, C., & Pasiouras, F. (2016). Bank diversification and overall financial strength: international evidence. *Markets Inst. Instrum. Financ.*, 25(3), 169-213.
- Elsas, R., Hackethal, A., & Holzhauser, M. (2010). The anatomy of bank diversification. *Journal of Banking & Finance*, 34(6), 1274-1287.
- Jensen, M. J., & Meckling, W. R. (1976). Theory of the firm: managerial behavior, agency cost, and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Jouida, S., Bouzgarrou, H., & Hellara, S. (2017). The effects of activity and geographic diversification on performance: Evidence from French financial institutions. *Research in International Business and Finance*, 39, 920-939.
- Laeven, L., & Levine, R. (2007). Is there a diversification discount in financial conglomerates? *Journal of Financial Economics*, 85(2), 331-367.
- Liang, H. Y., Chen, I. J., & Chen, S. S. (2016). Does corporate governance mitigate bank diversification discount? *International Review of Economics & Finance*, 45, 129-143.
- Maudos, J. (2017). Income structure, profitability and risk in the European banking sector: The impact of the crisis. *Research in International Business and Finance*, 39, 85-101.
- Mirzaei, A., & Kutan, A. M. (2016). Does Bank Diversification Improve Output Growth? Evidence from the Recent Global Crisis. *International Review of Finance*, 16(3), 467-481.

- Rajan, R., Servaes, H., & Zingales, L. (2000). The cost of diversity: The diversification discount and inefficient investment. *Journal of Finance*, 55(1), 35-80.
- Rajan, R. G. (1992). Insiders and outsiders: The choice between informed and arm's-length debt. *The Journal of Finance*, 47(4), 1367-1400.
- Schmid, M. M., & Walter, I. (2009). Do financial conglomerates create or destroy economic value? *Journal of financial intermediation*, 18(2), 193-216.
- Sissy, A. M., Amidu, M., & Abor, J. Y. (2017). The effects of revenue diversification and cross border banking on risk and return of banks in Africa. *Research in International Business and Finance*, 40, 1-18.
- Stein, J. C. (1997). Internal capital markets and the competition for corporate resources. *The Journal of Finance*, 52(1), 111-133.
- Stein, J. C. (2002). Information production and capital allocation: Decentralized versus hierarchical firms. *The Journal of Finance*, 57(5), 1891-1921.
- Stiroh, K. J. (2004). Diversification in banking: Is noninterest income the answer? *Journal of Money Credit and Banking*, 36(5), 853-882.
- Tan, Y., Floros, C., & Anchor, J. (2017). The profitability of Chinese banks: impacts of risk, competition and efficiency. *Review of Accounting and Finance*, 16(1), 86-105.
- Vennet, R. V. (2002). Cost and profit efficiency of financial conglomerates and universal banks in Europe. *Journal of Money, Credit and Banking*, 254-282.

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