The South East Asian Journal of Management

Volume 14
Number 2 *October*

Article 1

10-30-2020

The Impact of Intellectual Capital Configuration on Diversification in Banking Industry: Evidence from Indonesia

Rangga Yusuf Aiyubi
Department of Management, Faculty of Economics and Business, Universitas Indonesia, Depok, Indonesia

Dony Abdul Chalid
donny.abdul@ui.ac.id

The Impact of Intellectual Capital Configuration on Diversification in the Banking Industry: Evidence from Indonesia

Rangga Yusuf Aiyubi and Dony Abdul Chalid*
Department of Management, Faculty of Economic and Business, Universitas Indonesia, Depok, Indonesia

Revised 20 October 2020
Accepted 26 October 2020

Abstract

Research Aims - This study aims to examine the impact of Intellectual Capital configuration on business diversification in the Indonesian banking industry

Methodology - This research employs panel data regression analysis, using data of 88 commercial banks in Indonesia during the year of 2014 to 2019.

Research Findings - The results of this study show that Human Capital Efficiency and Structural Capital Efficiency affect the strategy of income diversification. While Capital Employed Efficiency affects the strategy of asset diversification.

Theoretical Contribution/Originality - Previous researches more focus on the effect of diversification on performance. Research on how the internal capital of an organization affects the level of diversification in the banking industry is still limited. Using data of a country where the banks are very heterogeneous (both in terms of size and intellectual capacity), this research can analyze how these differences affect the level of diversification.

Managerial Implications in the Southeast Asian Context - This study might help the bank to formulate and implement strategies to increase diversification. For example, by give more attention to the aspects of human resources and internal processes, since these two aspects greatly affect the diversification of banking products. Furthermore, diversification of bank assets will be strongly influenced by working capital, which is currently a concern for financial services authorities in some Asian countries.

Research Limitations and Implications - The indicators used to measure intellectual capital in this study rely more on financial information in the financial statements. These indicators might have a limitation on measuring the intellectual capital of a bank organization.

Keywords - Asset Diversification, Revenue Diversification, Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency

INTRODUCTION

Competition has forced banks to innovate in terms of products, product distribution, and technology platforms. Innovation encourages a bank to look for new sources of income and to diversify its assets to maintain a positive performance trend. In recent decades, numerous banks around the world have diversified their portfolios to offer non-traditional services. This strategy has shifted a part of bank income sources from interest income to noninterest income. One example of this tendency is the increase in off-balance sheet activities, which have been expanding rapidly. Scholars have reported that the portion of noninterest income has been increasing in banks form several countries (Elsas, Hackethal, & Holzhäuser, 2010).

*The corresponding author can be contacted at: donny.abdul@ui.ac.id

The existing literature on income diversification in the banking industry mostly focuses on the link between diversification and performance or the impact of diversification on risk profile. This is understandable, given that the income stability of banks and their capacity to resist risks are the major interests of regulators and supervisors, particularly in times of financial transformation. However, there is no consensus on whether income diversification will improve banking performance and mitigate risks. Some studies provide evidence that diversification reduces a firm's risks and promotes profitability (Calmès & Théoret, 2010; Elsas et al., 2010; Sanya & Wolfe, 2011), while other studies support the opposite conclusion (Demsetz & Strahan, 1997; Stiroh, 2004; Berger, Hasan, & Zhou, 2010).

At the same time, there is a lack of systematic understanding as to why diversification varies across banks (DeYoung and Rice, 2004). Some scholars believe that bank diversification reflects a variety of managerial abilities in managing a bank (Meng, Cavoli, & Deng, 2018). Another study has also argued that diversification is related to a bank's intellectual capital (Duho & Onumah, 2019). However, research on the impacts of a bank's intellectual capital is limited, although some studies have examined the role that intellectual capital plays in banking performances (Mondal & Gosh, 2012; Mention & Bontis, 2013; Adesina, 2019).

To fill this knowledge gap on how a bank's intellectual impacts diversification, this article examines the diversification patterns of banking business in terms of assets and income in relation to Human Capital, Structural Capital, and Capital Employed Efficiency. The main contribution of this article is to empirically analyse the determinants of banks' income- and asset-diversification decisions by investigating the effects of intellectual capital. Indonesia's banking industry provides an interesting context for such a study: the level of competition is high, and there is banking variety in terms of size and ownership type, factors that may influence banks' investment in intellectual capital.

The study is organised as follows: The second section reviews the literature, and the third section describes the research methodology. The fourth section contains the analysis of the data, the results, and the discussion. Finally, the fifth section provides the conclusion, while the sixth section considers the implications of the study.

LITERATURE REVIEW

The benefits of diversification have to do with bank-specific economies of scope. Banks can gather extensive customer information and reuse that information not only in the business area in which the information was originally gathered but also in other, unrelated business areas. Moreover, diversification is necessary to maintain the sustainability of the banking business in times of growing financial risks. Banks have extended their business scope, mainly as a strategic response to business uncertainty (Elsas et al., 2010). Banking diversification can be implemented in two ways: as asset diversification and income diversification. Asset diversification involves optimizing the placement of securities owned by a bank or establishing a strategy for providing loans. In contrast, income diversification involves optimizing

intermediation activities or other sources of income, such as commissions and sales of financial instruments (Duho & Onumah, 2019).

Several studies in the banking sector have shown that diversification is essential in increasing profitability and reducing risk. For example, using panel data from nine countries (Australia, Canada, France, Germany, Italy, the UK, the US, Spain, and Switzerland) from the 1996–2008 period, Elsas et al. (2010) found that diversification increased bank profitability and, as a consequence, market valuations. Sanya and Wolfe (2011), using a panel dataset of 226 listed banks across 11 emerging economies, found that diversification decreased insolvency risk and enhanced profitability.

However, there are also studies with conflicting results. Based on data from 472 US commercial banks from the 1988–1995 period, de Young and Roland (2001) found that there was no advantage in separately diversifying commission income and interest income. Moreover, income diversification in relation to commission income can contribute positively to income volatility. According to Stiroh (2004), who used data from the US banking industry, greater reliance on noninterest income, particularly trading revenue, is associated with lower nsk-adjusted profits and higher risk. Using a sample of listed and unlisted banks that operated in the Gulf Cooperation Council countries between 2001 and 2014, Abuzayed, Al-Fayoumi, and Molyneux (2018) showed that there was evidence of a non-linear relationship between noninterest (non-financing) income and stability, which indicates that only banks with higher levels of diversification can reduce risk by increasing noninterest income.

Unlike research on diversification impact, scholarship on the determinants of diversification in the banking sector is still very limited. Intellectual capital is said to be one of the factors influencing diversification (Duho & Omunah, 2019). Massaro, Dumay, and Bagnoli (2015), based on 1,392 questionnaire responses, examined whether strategic intent influences the development of intellectual capital and whether intellectual capital affects performance measured in terms of product and service diversification in small and medium enterprises over time. The results showed that intelectual capital consists of relational, human, and structural capital and strongly supports a firm's performance measured in terms of product and service diversification. Brighi and Venturelli (2014) found that in terms of capital ownership, banking diversification in Italy is strongly influenced by how much capital a company can optimize.

Previous studies have also documented intellectual capital's impact on performance in the banking industry. Mention and Bontis (2013), using a dedicated survey instrument administered to over 200 banks in Luxembord and Belgium, showed that human capital contributes both directly and indirectly to business performance in the banking sector. Mondal and Gosh (2012), based on data from 65 Indian banks from the 1999–2008 period, indicated that the relationship between the performance of a bank's intellectual capital and financial performance indicators, namely profitability and productivity, is varied. Saengchan (2008) found that, in relation to the banking context in Thailand, Capital Employed Efficiency had a positive effect

on a bank's profit. Adesina (2019), using a data panel of 339 commercial banks that operated in 31 African countries in the 2005–2015 period, found that intellectual capital related to human resources positively impacted efficiency. Meanwhile, in terms of asset and income diversification in the context of banking in Ghana, scholars found no significant relation between Capital Employed Efficiency and diversification efforts (Duho & Onumah, 2019).

Intellectual capital is widely acknowledged as the most critical resource of modern organizations. Nevertheless, empirical evidence on the actual impacts of intellectual capital on the dynamics of the value creation process remains scarce, especially in certain sectors and geographic regions. Intellectual capital is an intangible asset—that is, the knowledge and experience that skilled staff can use to attain a competitive advantage for the company via creative strategies (El-Bannany, 2008). Intellectual capital is an intangible asset that used to create added value for the company and society (Mavridis, 2005).

Several types of intellectual capital components have been examined in the literature. For the purposes of the present study, human capital is the most important of these components. In this study, we measure intellectual capital performance based on the assumption that the existence of physical capital is essential for human capital to contribute to creating added value. Human capital cannot act without physical capital (the initial investment to buy the core components of the business), something that cannot be ignored when constructing an index of intellectual capital performance. Structural Capital and Capital Employed Efficiency are in the form of intangible assets that involves resources, capabilities, and competencies that can affect organizational performance and value creation (Saengchan, 2008)

The increasing attention to the importance of intellectual capital in the value creation process has resulted in the development of alternative methods for measures intellectual capital. One widely used method is the value added intellectual capital method developed by Pulic (1998). The first component of intellectual capital is human capital, used by companies to improve their efficacy and efficiency and hence gain a competitive advantage (De Pablos, 2003; Duho & Onumah, 2019). Human capital reflects an organization's collective intelligence (Bontis, 1998). The second component is Structural Capital, which complements the aspects of human capital mentioned earlier. Structural Capital functions as an organization's internal mechanism and structure, improving employees' knowledge and enabling business processes to run better, and includes technology investment and the work climate (Bontis, 1998). The second component of intellectual capital—basically, a bank's internal process—has a positive effect on the diversification of products and services (Massaro et al., 2015).

RESEARCH METHOD

Data

This paper analyzed data from Indonesian banks in the 2014–2018 period, with a total number of 88 banks and 415 observations. More specifically, we retrieved

bank-specific data on conventional commercial banks that were on the OJK list for the 2014–2018 period. We did not include Islamic banks because their characteristics are different from those of conventional commercial banks. Financial reports on commercial banking published by the Financial Services Authority were our primary sources. In addition, we extracted several relevant variables from the Bank Scope database, which includes raw retail banking data, and Thompson Reuters database.

Empirical Model

In our study, we used two empirical models. The first model used asset diversification as a dependent variable, while the second model used income diversification as a dependent variable (Onumah & Duho, 2019). We used intellectual capital indicators as the main independent variable and added specific factors from certain banks as control variables. The details of the variables are presented in Table 1.

Asset Diversification Model:

$$ADIV_{it} = \alpha + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + Lev_{it} + Comp_{it} + Listed_{it} + Gov_{it} + Reg_{it} + For_{it} + v_{it} \quad (1)$$

Income Diversification Model:

$$IDIV_{it} = \alpha + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + Lev_{it} + Comp_{it} + Listed_{it} + Gov_{it} + Reg_{it} + For_{it} + v_{it} \quad (2)$$

RESULTS AND DISCUSSIONS

We used panel data regression to analyze the data. Our research process involved various kinds of tests, from the best model to classical assumptions. Finally, we decided to base our conclusions on the random effects model. After conducting the

No	Variable	Definition	Measurement
1	ADiv	The level of bank's assets diversification	$1 - \left\lvert \frac{Net\ Loan - Other\ Productive\ Asset}{Total\ Productive\ Asset} \right\rvert$
2	IDiv	The level of bank's income diversification	$1 - \left\lvert \frac{Net\ Interest\ Income - Noninterest\ Income}{Total\ Operating\ Income} \right\rvert$
3	HCE	Human Capital Efficiency	Gross income minus operational costs (including interest expenses and administrative expenses without labor costs) divided by labor costs.
4	SCE	Structural Capital Efficiency,	Gross income minus labor load divided by gross income minus operational costs (including interest expenses and administrative expenses without labor costs).
5	CEE	Capital Employed Efficiency	Gross income minus operational costs (including interest expenses and administrative expenses without labor costs) divided by the book value of the company's total assets
6	Lev	A bank's leverage	Total liabilities divided by the total assets of a bank.
7	Size	A bank's size	The natural logarithm of total assets.
8	Comp	Competition level	The result of 1 minus the sum of square from the market share of loans issued by each bank.
9	Gov	Central government bank	1 represents a bank owned by the central government, and 0 represents that a bank does not belong to the central government.
10	Reg	Regional government bank	1 represents a bank owned by the regional government, and 0 represents that a bank does not belong to the regional government.
11	For	Foreign bank	1 represents a foreign-owned bank, and 0 represents a non-foreign-owned bank.
12	Listed	Public bank	1 represents an open bank, and 0 represents a closed bank.

Table 1
Research Variables

Chow test and Hausman test, we decided the best model to be the randomeffect model. This model did not have strong multicollinearity between the independent variables. However, the modified Wald test revealed a heteroscedasticity problem in the model. We later overcame the heteroscedasticity problem by Generalized Least Square estimation.

The summary of the regression results is presented in the Table 4. Table 4 shows that the adjusted R-squared value for Model 1A is 0.1369 and for Model 1B is 0.3627. Furthermore, the significance and direction for each independent variable are presented in Table 4, along with the value of *t*-statistics.

The results show that Human Capital Efficiency has a significant positive effect on diversification strategy in terms of banking income. This result indicates that human capital is important as source of income diversification. This result differs from Onumah and Duho's (2019) findings, according to which Human Capital Efficiency and Structural Capital Efficiency have negative effects on income diversification. Our research, on the contrary, did not find that these two elements of intellectual capital significantly impacted asset diversification. Only Capital Employed Efficiency had a negative impact on banking asset diversification strategy. This finding also contradicts the previous findings by Onumah and Duho (2019), according to which Capital Employed Efficiency has a positive effect on income diversification. In general, our findings support the results of studies by Brighi and Venturelli (2014) and Massaro et al. (2015), which found a positive link between intellectual capital and diversification.

Table 2
Descriptive Statistics

Variable	Observation	Mean	SD	Min.	Max.
IDIV	415	0.3228	0.2088	0.0000	0.9753
ADIV	415	0.4259	0.2084	0.0016	0.9975
HCE	415	1.0580	1.5242	-0.0116	10.4880
SCE	415	0.5653	0.8157	-1.7674	12.4823
CEE	415	0.0524	0.1278	-1.2577	0.7565
LEV	415	0.8367	0.0851	0.1379	0.9479
SIZE	415	16.6524	1.5908	12.3501	20.9832
COMP	415	0.9991	0.0036	0.9750	1.0000
GOV	415	0.3409	0.4745	0.0000	1.0000
REG	415	0.3068	0.4616	0.0000	1.0000
FOR	415	0.3636	0.4815	0.0000	1.0000
LISTED	415	0.4772	0.5000	0.0000	1.0000

Table 3
Corellation Matrix

VAR	HCE	SCE	CEE	LEV	SIZE	COMP	GOV	FOR	LISTED	REG
HCE	1.0000									
SCE	0.0782	1.0000								
CEE	-0.0536	0.0859	1.0000							
LEV	0.1740	0.0611	-0.2960	1.0000						
SIZE	0.7152	0.1123	-0.0971	0.3810	1.0000					
COMP	-0.3600	-0.0412	-0.0069	-0.0474	-0.5168	1.0000				
GOV	-0.0383	0.0997	0.0206	0.2517	0.1721	-0.2065	1.0000			
FOREIGN	0.1045	-0.0146	-0.0157	-0.2594	0.0336	0.1433	-0.5437	1.0000		
LISTING	0.2586	0.0143	-0.0865	-0.0348	0.2273	-0.2205	-0.3512	0.1290	1.0000	
REG	-0.2235	0.0827	0.0210	0.2103	-0.0741	0.1400	-0.0568	-0.5029	-0.4384	1.0000

MANAGERIAL IMPLICATIONS IN THE SOUTH EAST ASIAN CONTEXT

Our results have practical implications for bank management. As intellectual capital has a significant impact on diversification, the choice of a beneficial diversification strategy depends on a bank's knowledge base. Intellectual capital is a key strategic asset and should be accounted for. In terms of banking products, management should pay attention to human capital and the company's internal processes, in this case the ownership of technology infrastructure, because, based on the results of our study, these factors are important for implmenting product diversification. In addition, there is currently a banking trend to move towards digital services, which means that all forms of diversification should be digital and easily accessible to customers. This important aspect can shape banking specialization in terms of products.

THEORETICAL IMPLICATIONS

The results of this study not only strengthen the evidence regarding the influence of diversification on the level of a bank's diversification but also show that each component of intellectual capital has a different effect on each type of diversification. Human Capital Efficiency and Structural Capital Efficiency have a significant positive effect on the diversification strategy for banking income, while Capital Employed Efficiency has a negative impact on banking asset diversification strategy. This shows that the definitions, measurements, and determinations of the elements in intellectual capital greatly affect our understanding of how intellectual capital can affect banking performance, especially related to diversification. Prediction models should include intellectual capital efficiency metrics to ensure that the value derived from intangibles is accounted for. This will eventually enhance the precision of estimates and inferences regarding prediction model.

	Model 1a (Asset diversification)		Model 1b (Income diversification)	
	Coefficient	Probability	Coefficient	Probability
C	6.71855	0.343	-0.37748	0.949
HCE	-0.01149	0.308	0.04092	0.000***
SCE	0.00579	0.449	0.01830	0.006***
CEE	-0.01487	0.036**	0.00891	0.883
LEV	-0.62508	0.000***	0.19387	0.065**
SIZE	-0.00423	0.764	0.03706	0.002***
COMP	-5.66812	0.420	-0.13696	0.982
GOV	-0.04210	0.708	0.04623	0.625
BPD	0.07014	0.190*	-0.05079	0.258
FOREIGN	0.01327	0.783	0.02729	0.499
LISTING	-0.01096	0.802	0.02772	0.449
R-Square	0.1369		0.3627	
Prob *(F-test)*	0.0000		0.0000	
Observation	415		415	

Significance Level : ***) 1%, **) 5%, *)10%

Table 4
Regression Result

CONCLUSION

Our research was based on a total sample of 88 banks, which consisted of banks owned by the central government, private foreign exchange banks, private banks, non-foreign exchange banks, and regional development banks, and our research period lasted from 2014 to 2018. We found that Human Capital Efficiency and Structural Capital Efficiency have a significant positive effect on the diversification strategy for banking income, while Capital Employed Efficiency has a negative impact on banking asset diversification strategy.

We also found that the banking diversification needs to be dynamic to account for changing consumer needs. Our research shows that human capital and internal processes greatly affect the diversification of banking products. Furthermore, the diversification of bank assets is strongly influenced by working capital, which is currently a concern for financial service authorities in Indonesia.

The limitations of this study have to do with the measurement of intellectual capital. The indicators used to measure intellectual capital in this study relied on the financial information found in banks' financial statements. This indicator does not directly measure the intellectual capital of a bank organization. Future research needs to address this issue by using different techniques to measure intellectual capital directly while relying less on financial report indicators.

Our research could be complemented by qualitative research that examines various aspects of banking management in more detail, especially the daily operations. Research based on interviews, roundtable discussions, or archival analysis could be conducted to find out the exact details of the measurement issues. In addition, future studies could explore this topic in different context and with larger data sets to achieve a general understanding of the topic. Our research could be extended to cover other Asian countries. Scholars could examine other factor, such as corporate governance to understand the differences that come to play when considering the connection between intellectual capital and diversification strategy.

REFERENCES

Abuzayed, B., Al-Fayoumi, N., & Molyneux, P. (2018). Diversification and bank stability in the GCC. *Journal of International Financial Markets, Institutions and Money*, *57*, 17-43. https://doi.org/10.1016/j.intfin.2018.04.005.

Adesina, K. S. (2019). Bank technical, allocative and cost efficiencies in Africa: The influence of intellectual capital. *The North American Journal of Economics and Finance*, *48*, 419-433. https://doi.org/10.1016/j.najef.2019.03.009.

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. https://doi.org/10.1016/j.jbankfin.2010.01.010.

Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management Decision, 36*(2), 63-76. https://doi.org/10.1108/00251749810204142.

Brighi, P., & Venturelli, V. (2014). How do income diversification, firm size and

capital ratio affect performance? Evidence for bank holding companies. *Applied Financial Economics*, *24*(21), 1375-1392. https://doi.org/10.1080/09603107.2014.925064.

Calmès, C., & Théoret, R. (2010). The impact of off-balance-sheet activities on banks returns: An application of the ARCH-M to Canadian data. *Journal of Banking & Finance*, *34*(7), 1719-1728. https://doi.org/10.1016/j.jbankfin.2010.03.017.

Demsetz, R. S., & Strahan, P. E. (1997). Diversification, size, and risk at bank holding companies. *Journal of money, credit, and banking*, *29*(3), 300-313. https://doi.org/10.2307/2953695.

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. https://doi.org/10.1006/jfin.2000.0305.

DeYoung, R., & Rice, T. (2004). Noninterest income and financial performance at US commercial banks. *Financial review*, *39*(1), 101-127. https://doi.org/10.1111/j.0732-8516.2004.00069.x.

Duho, K. C., & Onumah, J. M. (2019). Bank Diversification Strategy and Intellectual Capital in Ghana: an Empirical Analysis. *Asian Journal of Accounting Research*, *4*(2), 246-259. https://doi.org/10.1108/AJAR-04-2019-0026.

El-Bannany, M. (2008). A study of determinants of intellectual capital performance in banks: the UK case. *Journal of Intellectual Capital*, *9*(3), 487-498. https://doi.org/10.1108/14691930810892045.

Elsas, R., Hackethal, A., & Holzhäuser, M. (2010). The anatomy of bank diversification. *Journal of Banking & Finance*, *34*(6), 1274-1287. https://doi.org/10.1016/j.jbankfin.2009.11.024.

Goh, P. (2005). Intellectual capital performance of commercial banks in Malaysia. *Journal of Intellectual Capital*, *6*(3), 385-96. https://doi.org/10.1108/14691930510611120.

Massaro, M., Dumay, J. and Bagnoli, C. (2015). Where there is a will there is a way: IC, strategic intent, diversification and firm performance. *Journal of Intellectual Capital*, *16*(3), 490-517. https://doi.org/10.1108/JIC-07-2014-0091.

Mavridis, D.G. and Kyrmizoglou, P. (2005). Intellectual capital performance drivers in the Greek banking sector. *Management Research News*, *28*(5), 43-62. https://doi.org/10.1108/01409170510629032.

Meng, X., Cavoli, T., & Deng, X. (2018). Determinants of income diversification: evidence from Chinese banks. *Applied Economics*, *50*(17), 1934-1951. https://doi.org/10.1080/00036846.2017.1383594.

Mention, A. L., & Bontis, N. (2012). Intellectual Capital and Performance Within The Banking Sector of Luxembourg and Belgium. *Journal of Intellectual Capital*, *14*(2), 286-309. https://doi.org/10.1108/14691931311323896.

Mondal, A., & Ghosh, S. K. (2012). Intellectual Capital and Financial Performance of Indian Banks. *Journal of Intellectual Capital*, *13*(4), 515-530. https://doi.org/10.1108/14691931211276115.

Pulic, A. (2004). Intellectual capital – does it create or destroy value?. *Measuring Business Excellence*, *8*(1), 62-68. https://doi.org/10.1108/13683040410524757.

Saengchan, S. (2008). The role of intellectual capital in creating value in the banking industry. *International Review of Business Research*, *7*(2), 157-169.

Sanya, S., & Wolfe, S. (2011). Can banks in emerging economies benefit from

revenue diversification?. *Journal of Financial Services Research*, *40*(1), 79-101. https://doi.org/10.1007/s10693-010-0098-z.

Stiroh, K. J. (2004). Diversification In Banking: Is Non-Interest Income the Answer. *Journal of Money, Credit and Banking*, *36*(5), 853-882. https://www.jstor.org/stable/3839138.