

Volume 38, Issue 2

Income diversification and bank performance: evidence from malaysian banks

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Abstract

Using annual financial information from Malaysian banks over the period of 2005-2015, we study the diversification effect on bank's performance. Specifically, we test the link between non-interest income and risk-adjusted performance. Our fixed effect panel regression results show that income diversification increases bank's performance confirming risk reduction hypothesis and resource-based view theory. In our view, the less integrated financial market in Malaysia gives advantage for Malaysian banks to achieve better diversification gains. Moreover, the surging of Islamic banking might play important role to the performance of income diversification. Further research is needed to explore further other possibilities that may explain this association.

Citation: Rayenda Brahmna and Maria Kontesa and Rachel Elfra Gilbert, (2018) "Income diversification and bank performance: evidence from malaysian banks", *Economics Bulletin*, Volume 38, Issue 2, pages 799-809

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Submitted: July 31, 2017. **Published:** April 15, 2018.

1. Introduction

The role of diversification on performance continues to be heavily investigated amid the conflicting empirical and theoretical disagreement documented in economics and finance literature. Thus far most of those findings are either based on developed countries or within the context of non-financial industry. Little is known about the diversification effect on banking industry, especially within the context of developing countries. Comparatively, developing countries could offer different snapshot due to its institutional setting. Banking industry in developing countries tends to have less efficient operation activity, and less developed external market forcing them to impose diversification strategies. Resource base view theory and internal market hypothesis argue that diversification may induce firm's operating efficiency, broaden debt capacity, and lower taxes (Berger and Ofek, 1995; Lu and Beamish, 2004; Zahavi and Lavie, 2013). Even though so, there are also potential costs in diversification strategy. Diversified firms may have increased discretionary resources to undertake value-decreasing investments, cross-subsidies that allow poor segments to drain resources from better-performing segments, and misalignment of incentives between central and divisional managers (Fauver et al., 2003; Lee et al., 2012). Therefore, it will be interesting to investigate the diversification strategy effect on bank's performance.

In banking and finance literature, product diversification in general reduces the risk of loan failure. This strategy leads to greater diversification of income sources, which might help banks to reduce risks and stabilize profits, provided the different income components are imperfectly correlated. However, banking institutions may reach disintermediation by expanding non-interest product activities. Some non-interest income activities are associated with much higher risks than other income sources and therefore, they could contribute to a destabilization of both individual banks and the whole banking system. The case of subprime mortgage through CDS/CDO is a good example for this matter.

Note that the inconclusive empirical results of bank's income diversification are commonly found in Europe context and this topic is rarely empirically tested in emerging countries context such Malaysia. For example, De Jonghe (2010) and Fiordelisi et al. (2011) found that income diversification raises the Europe banks' risk but beneficial. Lee et al (2014) and Meslier et al. (2014) test the hypothesis within US and Europe context. They found out that a shift towards non-interest income will increase the bank profitability and risk-adjusted profits. Banks are able to diversify their income sources by running new business activities such as brokerage, trading securities, investment banking and other financial activities.

Contrarily, DeYoung and Roland (2001) address three main reasons why non-interest income may harm bank's income. First, revenue from traditional lending activities is likely to be more stable over time compared to non-interest activities. Because non-interest income gives more disadvantages to bank rather than to customer due to low switching cost. However, in loan scheme, switching cost is relatively high for bank and customers. Second, diversifying to non-interest income can require heavy fixed investments in technology and human resources leading to higher capital expenditure and initial investment. Therefore, it gives higher payback period, incremental operating leverage, and volatile earnings. Lastly, non-interest income activities are commonly performed under little regulatory capital, especially in less developed market. This suggests a higher degree of financial leverage, and uncertain earnings generation.

The main driving forces behind the income diversification engaged by banks may be similar in both developed and emerging markets. But institutional characteristics could possibly lead to different diversification effects, which is the support level from capital markets. Literally, emerging countries like Malaysia may have little space to expand their non-interest income compared to developed countries. For example, wealth management products sold in Malaysia are dominated from non-banking industries. The participation in bond or stock markets is also relatively small. Unlike Germany (see Busch and Kick, 2009) or other developed countries (see Meslier et al, 2014), the expansion into non-interest income in Malaysia is relatively new, with limited capital in terms of technology and human resource. Therefore, one derived argumentation of the notion is that income diversification in emerging markets may give different and interesting perspective than in developed markets.

Malaysia offers unique environment for examining the relationship between income diversification and bank performance for numerous reasons. First, Malaysia banks are one of the steadily growth industries. Second, Malaysian banks are well diversified not only between interest and non-interest income, but also between traditional banking and Islamic banking. Note that Malaysian banking is the main player in Islamic banking in the world.

Malaysia Financial institution is an important aspect for Malaysia economy. Overall, there are 32 banks in Malaysia (commercial and merchants), and there are other financial institutions consists of 17 finance companies and 7 discount houses operating in the system together with other non-bank institutions. Unlike its peers in South East Asia, Malaysian banks have bloomed since early 1900 as the effect of rubber and tin trading. Malaysian banks have grown to be an essential pillar for economy, especially, for the liberalization movement in 1980s. The large scale movements towards industrial diversification in 1990s were supported by banking industry as part of Malaysia's economy liberalization (Lee et al, 2012). Yet, 1997 monetary crisis taught Malaysian banking industry a lesson about income diversification. Many banks were trembling during that crisis signaling it is urgent for banks to diversify their income to manage their going concern risk. This also explains why in early 2000s many Malaysian banks started opening Sharia banking unit.

The wave of commodities booms in 2004 had pushed the income diversification even further. Malaysia enjoyed the rising price of commodities such as palm oil, rubber, tin, oil, and gas, and earned a new level of upper-middle income society. Almost all banking lines such as retail banking, small business loan, business expansion loan, sharia financing, up to investment banking were boomed in that period. In fact, many Malaysian banks acquired other banks in South East Asia region as the result of commodities boom. This explains the plot in Figure 1, where more than 20% of bank income has been generated from other income sources since 2005.

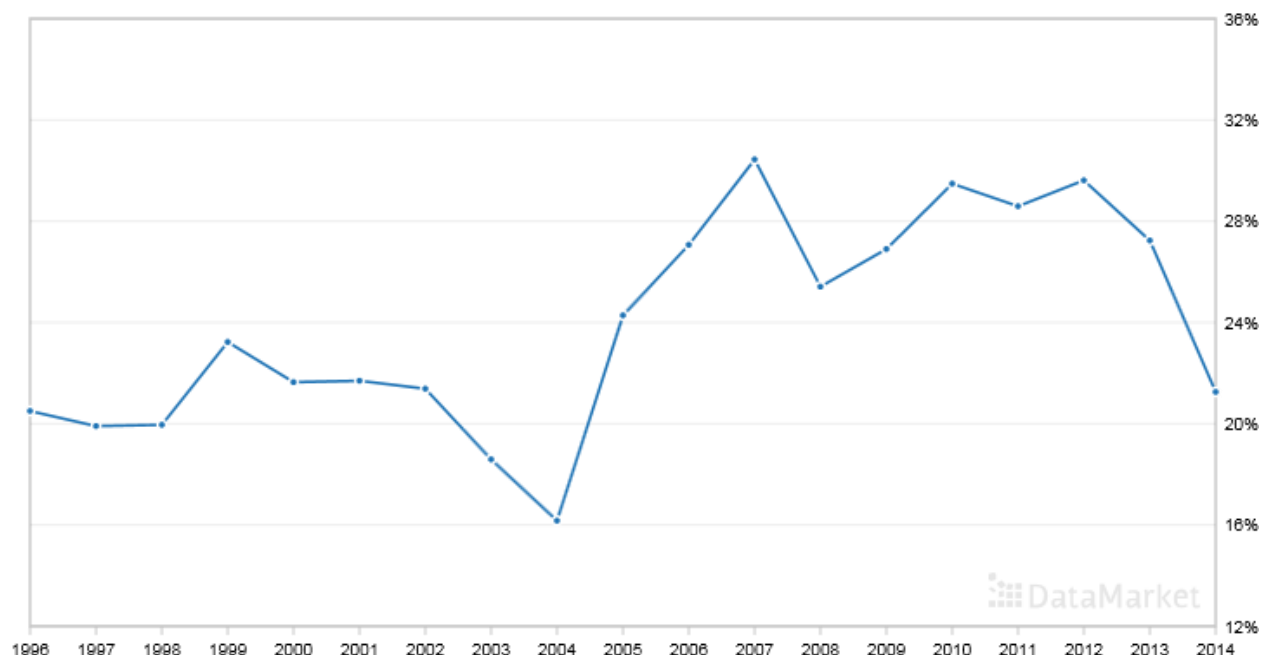


Figure 1 Bank's Non-Interest Income to Total Income for Malaysia (Source: World Bank)

In sum, our objective is to investigate the income diversification effect on bank performance. We replicate the method developed by Stiroh and Rumble (2006), and later modified by Chiorazzo et al (2008), in which we use diversification index as a proxy for income diversification. We also follow previous established studies by controlling the firm characteristics.

This study's contribution is threefold. First, we add to the literature by extending the understanding of this research area of an emerging country. Second, we document the empirical findings of income diversification's effect on bank performance in Malaysia. Third, we further establish the fact of the contestation between resource base view theory and risk reduction hypothesis, especially in the relationship between income diversification and bank performance.

The rest of this paper is organized in the following manner. Section 2 addresses the literature review and theoretical concepts. Section 3 describes the data and methodology. Section 4 reports the empirical results, and discusses the significance of the results. Lastly, Section 5 concludes this research.

2. Literature Review

Theoretically, income diversification can be viewed in the resource based view theory and risk reduction hypothesis. The diversification decision may relate to efficiency and risk management of a bank, where joint production of a wide range of financial services should increase a bank's efficiency, as the results of increasing bank's economies of scale. (Klein and Saldenberg, 2010; Chiorazzo et al, 2008). Having more resource with good production efficiency should lead bank to better performance. Meanwhile, in risk reduction hypothesis perspective, diversification leads to less risk with manageable income. The diversification may diminish if there is integration among financial markets. For instance, if lending market, mortgage market, capital market, and

money market are integrated, there is no extra risk-adjusted return for banks in doing diversification.

There are few studies have been done on the relationship between income diversification and bank performance, yet, the conclusion is still inconclusive. For example, there is Lee et al. (2014) who conducted research in 29 Asia Pacific, Europe, and US banks covering the period of 1995 to 2009, found that income diversification can give better return in less developed countries due to less integrated financial markets. They also use resource based view to explain that income diversification implies better resource and competitiveness, and it leads to better performance. Gurbuz et al, (2013) found that income diversification sturdily increases the risk-adjusted financial performance of the deposit banks in Turkey. Banks able to diversify their income sources by doing new activities such as brokerage, trading securities, and investment banking. If the bank diversifies their activities, they will able to increase their profitability and even their stability. There is also Meslier et al. (2014) found out that a shift towards non-interest income will increase the bank's profitability and risk-adjusted profits. Meanwhile, Chiarazzo et al (2008) study the link between non-interest revenues and profitability by using annual data from Italian banks and other EU banks. They found that bank gains better performance if they diversify their income source onto fee-based activities such as investment banking. However, when Chairazzo et al (2008) use US banks data, they found that there is no significant role of income diversification on bank performance. It is noteworthy that income diversification may harm bank's performance because of its risk exposure. De Jonghe (2010) and Fiordelisi et al. (2011) found out that income diversification raises the banks' risk due to the market structure of fee-based activities. Giving attention and resource to not-main income generation might harm the operation of bank, and leads to lower return.

In short, if bank performs more on non-traditional bank activities, *ceteris paribus*, proportion of non-interest income will increase while proportion of net interest income will decrease in bank's income source portfolio. As a result, income diversification effect will change accordingly. However, the strategy in diversifying income may face more risk exposures, and it is proven by De Jonghe (2010) and Fiordelisi et al. (2011). They have found that income diversification may increase banks' risk due to higher operating leverage and uncertain income generation.

3. Data and Methodology

3.1 Data

Data is collected from banks' annual reports and financial statements, over the period of 2005 to 2015. We choose 2005 as the starting point because Malaysian banks started to diversified their income significantly per that year (See Figure 1). Our data covers most of Malaysian banks, including local and foreign banks. In the end, we only take 15 out of 32 banks due to three reasons. First, many banks (mostly foreign bank) do not disclose their financial information publicly. This is not to mention that some of Malaysian banks was established after 2008, and to avoid bias estimation, those banks are excluded from the sample. Second, these 15 banks can be the good representatives for Malaysian banking industry because these banks are the major players in the

industry¹. It represents 94% of the total assets in Malaysia². Lastly, we exclude banks which only have sharia banking business.

This research uses annual data and utilizes annual report as the data sources. This means the financial information such as performance, diversification, capital adequacy, loan debt ratio and non-performing loan on bank profitability is manually collected from bank's annual report. At the end, this research collected 15 banks with the total pooled observations of 165 bank-year over the period of 11 years with completed data.

3.2 Methodology

Estimation Model

In testing for the effect of income diversification on bank's performance, it is imperative to consider other factors that could affect the bank's performance. We developed our model based on previous research such as Stiroh, (2004), Mercieca et al., (2007), Chiorazzo et al (2008) and Sanya & Wolfe (2011), where performance is the function of capital adequacy ratio (CAR), loan to deposit ratio (LDR), and non-performing loan (NPL). The function is as follow:

$$performanæ = f(CAR, LDR, NPL)$$

To estimate above model empirically, we pooled all the sample banks and estimate the following regression model:

$$PERF_{i,t} = \beta_0 + \beta_1 CAR_{i,t} + \beta_2 LDR_{i,t} + \beta_3 NPL_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $PERF_{i,t}$ is bank performance of bank i in time t.

To achieve our main objective, we introduce our main variable, income diversification (DIV) into our baseline model. For robustness reason, we run the model with two measure of performance. We use risk adjusted return on assets, and risk-adjusted return on equity as the proxy. The estimation model is as follow:

$$PERF_{i,t} = \beta_0 + \beta_1 CAR_{i,t} + \beta_2 LDR_{i,t} + \beta_3 NPL_{i,t} + \beta_4 DIV_{i,t} + \varepsilon_{i,t} \quad (2)$$

Our panel regression is run under proper procedure. Firstly, we investigate the poolability effect using Breusch Pagan LM test. The result shows that the estimation has to be run under panel regression. We then run Hausman test, LSDV F-Test, and Wald test to ensure the fixed effect and individual effect of the estimation. Based on the results, our panel regression is a fixed effect panel regression model. For endogeneity issue, Canning and Pedroni (2008) states that endogeneity may appear if there is dynamic behavior correlation between endogenous and exogenous variables due to number of firms is significantly higher than years, our data does not consist of that endogeneity issue. Yet, we still run Wooldridge test and found there is no autocorrelation. The AR(1) result also show no significant effect.

¹ This research excludes conventional banks such as BNP Paribas Malaysia, Bangkok Bank, Bank of China, UFJ Bank, CCB Bank, Mizuho Bank, Deutsche Bank, India International Bank, Industrial and Commercial Bank of China, J.P Morgan Chase, National Bank of Abu Dhabi, and Bank of Nova Scotia

² <https://www.relbanks.com/asia/malaysia>

Measures

We base our empirical analysis on a set of variables that includes income diversification, risk-adjusted performance, and several control variables. For the income diversification, we follow Stiroh, (2004), Mercieca et al., (2007), Chiorazzo et al (2008) and Sanya & Wolfe (2011), where the income diversification is built using indexation approach. Consider that there are two type of incomes: net interest income (NET) and net non-interest income (NII). NET is measured as interest receivable minus interest payable, meanwhile, NII is commission receivables minus commissions payable plus other net profits (losses). Note that NII does not only consists of trading activities or other non-interest income (i.e forex gains), but also consolidated income from sharia unit business as stated in financial report.

The next step is the calculation of the proportion of income according to their source. Hence, RNET is the ratio of NET to the sum of NET and NII. Meanwhile, RNII is the ratio of NII to the sum of NET and NII. We follow Stiroh and Rumble (2006) and Chiorazzo et al (2008) by adopting Herfindahl-Hirschman Index of income specialization to calculate the income diversification as follow:

$$DIV = 1 - (RNET^2 + RNII^2) \quad (3)$$

This indexation constraint NET and NII to be positive values. It results an index varies from 0.00 to 0.50. It is equal to zero when diversification reaches its minimum, and equal to 0.5 when there is complete diversification.

Meanwhile, the profitability is measured by adjusting the risk. First, we have two basic measures for profitability: Return on Assets (ROA), and Return of Equity (ROE). Second, we compute their standard deviation to adjust its risk over the entire sample period. Following Chiorazzo et al (2008), we measure the performance of bank as the ratio between the annual return and its standard deviation. The ratio computations are as follow:

$$SHROE_{i,t} = ROE_{i,t} / \sigma_{ROE,i,t}, \quad (4) \text{ and}$$

$$SHROA_{i,t} = ROA_{i,t} / \sigma_{ROA,i,t} \quad (5)$$

Where $SHROE_{i,t}$ and $SHROA_{i,t}$ indicate risk-adjusted return, respectively, in terms of ROE and ROA, for the bank i in the year t

For the control variables, there are three measures, namely Capital Adequacy Ratio (CAR), Loan to Debt Ratio (LDR), and Non-performing loan (NPL). CAR is stated as a percentage of a bank's risk-weighted by the credit exposures. Meanwhile LDR is ratio of total financings (loans) to total assets. This variable is adopted in the studies of Stiroh (2004), Stiroh and Rumble (2006), Mercieca et al. (2007), Chiorazzo et al. (2008), Sanya and Wolfe (2011), Lee, et al. (2014), Lee et al (2014), and Meslier et al. (2014). Lastly, NPL is defined as the ratio of non-performing loans to total loans, the NPL ratio, is a standard and widely used statistic to measure the financial performance of a banking institution.

4. Results and Discussion

Descriptive Statistics

We report the descriptive statistics results in Table 1. It shows the distribution of data is good because the mean and median of each variable is close enough. Our performance proxies imply that average risk adjusted return for Malaysian banks is 0.5945 and 0.4372 for return on assets and return on equity, respectively. Meanwhile, the income diversification of banks is averagely at 22.39%. Refers to our brief explanation in Section 3, most of banks did not fully diversified their income. The minimum value of 0.0200 indicate there is a bank still did not want to diversified their interest-based income. Additionally, the capital adequacy ratio (CAR), Loan to Deposit Ratio (LDR), and Non-performing loan (NPL) have the mean value of 0.1312, 0.2118, and 0.315, respectively.

Table I Descriptive Statistics Results

Variable	Mean	Std. Dev.	Median	Min	Max
SHROA	0.5945	0.2297	0.5620	0.4173	0.9299
SHROE	0.4372	0.227	0.3812	0.1988	1.2293
DIV	0.2239	0.0963	0.2184	0.0200	0.3406
CAR	0.1312	0.0611	0.1313	0.1285	0.1336
LDR	0.2118	0.0549	0.2122	0.1765	0.2487
NPL	0.315	0.0974	0.3758	0.0822	0.666

Correlation

Table 2 reports the correlation magnitude among variables. The table indicates that most variables have relatively strong correlation except for NPL. The correlation between adjusted risk return on equity (SHROE) and adjuster risk return on assets (SHROA) is the largest with coefficient value of 0.6477. The main effect, income diversification (DIV), has correlation coefficient values of 0.3701 and 0.3284 with SHROE and SHROA, respectively. Meanwhile, loan to deposit ratio (LDR) and capital adequacy ratio (CAR) also have strong correlation with both SHROE and SHROA with coefficient value around 0.3. Interestingly, only Non-performing loan (NPL) has negative correlation towards SHROE and SHROA, and the coefficient values are relatively smaller than the others are.

Table II Correlation Matrix

	SHROE	SHROA	DIV	LDR	CAR	NPL
SHROE	1					
SHROA	0.6477***	1				
DIV	0.3701**	0.3284***	1			
LDR	0.2825**	0.2991**	0.2068*	1		
CAR	0.3001***	0.3295***	0.2191*	0.1851	1	
NPL	-0.1034*	-0.0942	0.1850	0.1857	0.2029*	1

*Note ***, and ***** denotes the significant level at 5%, and 1% respectively.

Regression Results

Table 3 reports our panel regression results. As stated earlier in Section 3, our panel regression is fixed effect panel regression. We run first the baseline model of Adjusted-risk Return on Assets (SHROA) and Adjusted-risk Return on Equity (SHROE), and then the full model (income diversification/DIV included). Overall, all models have same conclusion implying it is robust, and is not bias.

Table 3 documents that income diversification has significant relationship with bank performance in both model. In SHROA model, DIV has coefficient value of 0.8407, and it is significant at 1% level. The same conclusion is found in SHROE, where DIV has coefficient values of 0.7054 and significant at 1% level. Therefore, we surmise that income diversification has positive relationship with bank performance. Our findings are consistent with previous research such as Chiarazzo et al (2008), and Meslier et al. (2014).

In terms of control variables, all control variables contribute significantly on bank performance, except for NPL. Our findings show that capital adequacy ratio (CAR) has positive and significant relationship with coefficient values of 0.4566 and 0.9648 for SHROA and SHROE respectively. Additionally, loan to deposit (LDR) also shows positive and significant relationship with bank performance. These results are in line with previous research such as Chen and Lin (2010).

There are three possible explanations for these findings. First explanation is using risk reduction hypothesis of Levy and Sarnat (1970), and Claessens et al (1999). This hypothesis states that diversification strategy is taken to reduce the risks associated with investment. However, in advance capital market such reduction cannot be beneficial, since the financial market diminish portfolio benefits due to low transaction cost and financial market integration (Stiroh, 2004). If money market, capital market, and loan market are integrated each other, banks will not gain anything by diversifying their income sources. However, Malaysia is a less-developed market with low level of financial market integration, banks still can earn benefit by diversifying their income source into non-interest income such as wealth management.

Table III Regression Results

	SHROA		SHROE	
DIV		0.8407*** (0.2736)		0.7054*** (0.2969)
CAR	1.4997*** (0.3740)	1.7712*** (0.4197)	1.5898** (0.6413)	1.6533*** (0.6164)
LDR	0.5283** (0.2114)	0.4566** (0.1745)	0.9643** (0.4508)	0.9648** (0.4664)
NPL	-0.366 (0.2820)	-0.2177 (0.3148)	-0.0155 (0.3364)	-0.01509 (0.3468)
CONSTANT	1.2975*** (0.3442)	1.8420*** (0.4617)	1.9127** (0.9312)	1.9069** (0.8466)
R2	0.3462	0.3928	0.3675	0.4018

Note **, and *** denotes the significant level at 5%, and 1% respectively. Reported values are coefficient values, except values inside parentheses which are standard error values. SHROA is adjusted-risk return on assets, SHROE is adjusted-risk Return on Equity, DIV is income diversification, CAR is capital adequacy ratio, LDR is loan to deposit ratio, and NPL is non-performing loan

Second explanation is resource-based view theory. This theory explains the ability of banks in diversifying their products relies on their product innovation and bank capital as a whole. Malaysia banking industry has enjoyed the commodities booms, and it gave good fresh capital. With the incentive from Malaysia government in sharia banking, Malaysia banking industry has utilized that capital to explore more Islamic product. This leads to their competitiveness (Conner, 1991, Hitt et al,1997; Miller and Yang, 2016). In other words, this theory explains that diversification strategy imposed by Malaysia banks has made them to have strategic resource. This strategic resource induces not only the competitiveness but also the performance of the banks.

Additionally, our findings can be related to the surge of Islamic banking in Malaysia. Note that most of Malaysian banks have Islamic unit, where interest is prohibited. Malaysian banks use their Islamic unit not only for their non-interest lending, but also for financing, sharia bond (*sukuk*), sharia insurance (*takaful*), and other wealth management product. It contributes good proportion of profit to banks (Azhar Rosly and Affandi, 2003). Hence, bank income diversification leads to better performance.

Robustness Check: Test of Difference

To justify our findings in Table 3, we further investigate whether there is significant difference between banks with broader diversification and banks with minimum diversification. If there is significant different between these two groups, it can be concluded that diversification does play important role on firm performance.

Before we employed the T-Test difference of the performance, we regrouped the banks. We make quartile classes, and those banks in first top quartile is banks with broader diversification. Meanwhile, the rest is grouped as banks with minimum diversification. Using the new grouping (broader diversification vs minimum diversification), we conduct the t-test difference on the performance measures which are: Adjusted-risk Return on Assets (SHROA) and Adjusted-risk Return on Equity (SHROE). Table 4 below reports the findings.

Table IV T-Test result

	Mean	Std. Deviation	t	Sig. (2-tailed)
Div – LoDiv (SHROA)	-.896	.142	-3.961	.000
Div – LoDiv (SHROE)	-.694	.068	-3.562	.000

Table 4 reports there is significant difference between broader income diversified banks and low income diversified banks in terms of performance. This means the adjusted-risk return on assets (SHROA) and the adjusted-risk return on equity (SHROE) for broader income-diversified banks are significantly different from low income-diversified banks. These findings confirm our earlier result where income diversification plays important role on bank’s performance in Table 4. Therefore, we surmise that there is significant difference between those with highly diversification

and those with low diversification. Our findings are in line with previous research such as Chiarazzo et al (2008), and Meslier et al. (2014).

5. Conclusion

Our study addresses the phenomenon of recent-year surge in the income diversification engaged by Malaysian banks. Our study is mainly motivated by the lack of attention given to these deserving emerging countries despite the steady growth of income diversification taken by banks in their countries. This paper by all means lays the foundation for any further research in this topic on emerging markets with more focus on the institutional setting dimensions.

This paper follows the existing studies on income diversification and bank performance. We adopted the method employed by Chiarozzo et al (2008) with slight modification in our model and regression procedure. Our findings bring implication about certain conceptualized frameworks and empirical evidence found in the advanced countries may not necessary apply to the emerging countries in the context of bank's income diversification. Another contributing aspect of our study is that we use robust panel regression that allows for assessing changes in income diversification level over time and our procedure gives more reliable estimates.

However, our findings need to be validated by further research on other emerging countries in order to verify some facts about the association between income diversification and performance. A few extensions can be further built upon this analysis, for example, more in-depth insight can be gained through an examination of the difference between income diversification from conventional banking and sharia banking. Secondly, some internal aspects may give interesting perspective especially the managerialism and agency issues. For example, further research can explore the moderating role of board structure, role of family directors, board capital, or even bank's efficiency.

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