Benefit from Income Diversification of Viet Nam Commercial Banks

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Abstract: In this study, relationship between non-interest income generating activities (income diversification) and bank performance is investigated by using an unbalanced panel dataset of ten commercial banks listed on Vietnam stock market during the period 2007–2016. Our empirical results indicate that income diversification decrease insolvency risk and enhance performance of listed banks and the relationship between income diversification and bank performance is non-linear. In addition to be affected by factors of income diversification, bank performance is also affected by banks' characteristics and business environment factors. Bank size, deposit on total liabilities ratio, the first lags risk adjusted returns have positive effects on bank performance while the effect of enforcement index on bank performance is negative.

Keywords: Income diversification, bank performance, banks.

1. Introduction

The abolition of regulations, technological advances and financial innovation over the past two decades until the global financial crisis has urged banks to expand their operations and diversification [1]. Expansion of scale and scope is believed to help banks to increase profitability and thus an increase in value results from an economic advantage in size and scale, or risk reduced by the benefits from Economies of Scope and Scale [2]. From the early researches of Short (1979) and Bourke (1989), subsequent empirical studies suggest that there is a relationship between diversification and bank performance.

In Vietnam, practice has shown that many commercial banks have implemented income diversification strategies for nearly a decade [3]. The income structure of banks has gradually changed. In addition to the interest income from traditional lending activities, non-interest income from services, forex trading activities, securities trading and other activities, also accounts for increasing proportion of the bank's income structure. However, diversification is really beneficial for commercial banks in Vietnam or not, the answer is still not satisfactory and there are many contradictions.

This study is, therefore, conducted to review the relationship between income

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diversification and performance of Vietnam commercial banks. Unlike existing studies, (i) this study uses only data collected from financial statements of listed banks to ensure that data standards are met [4, 5]; (ii) Variable selection procedure is more concerned to ensure model reliability, and (iii) Several country-level control variables are added to control the relationship between income diversification and banks performance.

2. Review of the literature on bank performance and income diversification

In general, researches on the impact of income diversification to bank performance can be divided into 3 groups. The first group is based on the *Market Power Theory*, the *Modern portfolio theory*, and the *Economies of Scope and Scale* to affirm benefits of diversification. Accordingly, diversification enables banks to reduce cost, increase profits and bank value, or reduce idiosyncratic risks or improve performance [5-7]

In contrast, the second group is based on the *Agency theory*, the *Efficiency Structure towards X-efficiency* approach in order to prove the adverse impact of diversification to the bank performance. This group argues that banks are more engaged in non-interest activities, although they would provide higher returns, but also make banks encounter greater risk because of high volatility of these activities, resulting in reducing bank performance [8, 9]. De Jonghe et al (2015), Lepetit et al (2008), Mercieca et al (2007), Odesanmi and Wofle (2007), Pennathur at el (2012), also find similar evidences of the adverse effect of diversification on bank performance: reducing the safety of banks, increasing the risk of bankruptcy, and thus intensifying the trade-off between returns and risk for banks [1, 2, 4, 10, 11].

The third group emerged recently based on the Institutional Theory to explain the contradicted conclusions on the impact of diversification of business activities to the performance of banks. Amidu and Wolfe (2013), Brighi and Venturelli (2014), Mensi and Labidi (2015), Sanya and Wolfe (2011) argue that this relationship is governed by a number of determinants: the capacity of effective risk management, the ownership structure of banks, the market structure, the level of competition, the volatility of macroeconomic and institutional environment for operation of banks [5, 12-14]. It appears that features at national level have been more emphasized in researches to explain disagreements on the benefits of diversification [2].

3. Methodology

3.1. Measures of diversification

To measure income diversification, we compute the Herfindahl Hirschman Index (HHI) for all banks. Following Elsas et al (2010) , our income-based diversification indicators captures diversification across the four main types of bank income, namely interest income, commission income, trading income, other operating income [15]. It is calculated as follows:

$$DIV = 1 - \left[\left(\frac{INT}{TOR}\right)^2 + \left(\frac{COM}{TOR}\right)^2 + \left(\frac{TRAD}{TOR}\right)^2 + \left(\frac{OTH}{TOR}\right)^2 \right]$$

(1)

Where: INT is the gross interest revenue, COM is the net commission revenue,TRAD is the net trading revenue, OTH stands for other net operating income,and TOR is the total operating income (TOR as the summation of the absolute values of INT, COM, TRAD and OTH). Consistent with Elsas et al (2010), Doumpos et al (2016) we use gross interest revenue so that the income diversitymeasure is not unduly distorted by the profitability of income related activities.The DIV index takes values between zero if the bank is fully specialized in a business area and 0.75 if the bank generates a mixture of incomes totallybalanced on the four sectors. Increasing

DIV index shows that banks tend to the taller income diversification level to seek new income sources [15, 16].

3.2. Measures of bank performance

We construct two risk adjusted performance measures RAROA and RAROE [4-6, 8-10]. Both measures are derived from the following profit ratios; return on assets (ROA) and the return on equity (ROE); defined as the quarterly net income divided by assets and equity respectively. For each bank we also calculate the standard deviations of asset and equity returns over the lifetime of the bank in the sample to measure the volatility of profits. A combination of these measures define risk adjusted return on assets, RAROA and RAROE as follows:

$$RAROA = \frac{ROA}{SDROA}$$
$$RAROE = \frac{ROE}{SDROE}$$

Where, these ratios can be interpreted as accounting returns per unit of risk.

3.3. Control variables

In this study, we use the following control variables:

The bank – level control variables include: **SIZE,** whichis the natural logarithm of banks' total assets.This controls for the fact thatlarger banks may be inherently more stable, since idiosyncratic risk tends to decline withsize [17]. **EQUITY,** which is the ratio of book value of Equity to total Assets. This controls forthe relationship between bank fragility and levels of capitalization. According Sanya and Wolfe (2011) capital absorbs large shocks and protects banks when asset values decline reducingthe probability of failure [5]. **LOANS,**which is the ratio between total loans and bank assets to control for the effects on performance of the composition of banks' asset portfolio. Banks that have an asset based diversification strategy may shun non-interest income if loans are more profitable than other earning assets [9].

DEPOSIT, which is the ratio between total deposit and liabilities. This variable is used as a measure of funding structure and liquidity sources of banks. Of the bank's total liabilities, the source of customer deposits is considered to be a stable and cheaper sponsor source of funding than other sources [18,19]. Therefore, if this ratio is high, it will increase bank performance due to a decrease in capital cost.

Furthermore, we use several country-level control variables as: **(i) GDP_gr** (the real GDP growth) and **INF** (the inflation rate) to control for the impact of macroeconomic conditions; **(ii) ECONFR** to control for the overall level of economic freedom and institutional development. It is a composite index that is calculated by considering: business freedom, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption, labor freedom; **(iii) CONCR** (the assets concentration of the three largest banks) and **BANKZ** (the country-level Z-score of the banking sector, as an indicator of stability) to control for various conditions in the banking sector; and **(iv) ENF**, which is enforcement index calculated as the average of three indicators accounting for: rule of law, control of corruption. It takes values from -2.5 to 2.5, with higher scores corresponding to better outcomes. Most of them are standard control variables in the banking literature [16].

3.4. Data

We use financial information data from quarterly financial statements of ten commercial banks listed on Vietnam stock market during the period 2007 – 2016. The research sample does not include unlisted banks in order to minimize the lack of transparency and "polishing" the accounting data of banks that may distort the results of the study [4, 5]. In the case of data on an incomplete variable, we use the trend function on SPSS 23 to fill in the missing data to overcome the observed observations that may be lost when performing regression estimation.

The macroeconomic data is from the International Monetary Fund database. The overall level of economic freedom and institutional development data is from the Heritage Foundation. Banking sector structure and stability data are obtained from Financial Structure Database – World Bank, 2016 and enforcement index is from World Governance Indicators Database, 2015. Due to country-level control variables data can only be collected by annual data, so we use the squared average interpolation technique in Eview 8 to obtain the corresponding quarterly data of these variables.

With 10 listed banks, during our research period from Q1/2007 to Q4/2016, our research sample included 296 observations.

4. Empirical results

4.1. Statistical analysisn of the effects of variables on RAROE and RAROA

Table 1 presents descriptive statistics about the variables that we use in the analysis. Table 2 presents the correlation coefficients.Regarding bank performance, the sample includes both high and lowperforming banks as shown by the summary statistic on RAROA and RAROE, however, there is no evidence of the data being skewed towards either extremes as the mean is close to the median: 1.457 compared to 1.275 (RAROA); and 1.312 compared to 1.170 (RAROE).

DIV index is from 0.010 to 0.660 with the mean of 0.195. This index has positive correlation with RAROA, RAROE. This relation is relatively high among other variables. This show during the studied period, Vietnamese commercial banks tend to diversify in order to look for new income sources. Although the diversification level still low (mean = 0.195) and the lending activities are still major activities of the banks (with the loans/total assets of the studied banks of 55.407%), the banks' performance is improved at certain level. Table 1 show that sizes of banks are not so different but there are significant differences in equities/assets (EQUITY) and deposits/liabilities (DEPOSIT) ratios. In correlation with RAROA and RAROE, bank size has positive correlation while equities/assets (EQUITY) and deposits/liabilities (DEPOSIT) ratios have negative and less significant correlation.

Table 1. Summary statistics

	Mean	Median	Maximum	Minimum	Std.Dev	Skewness	Kurtosis
RAROA	1.457	1.275	5.880	-3.870	1.308	0.203	4.279
RAROE	1.312	1.170	5.550	-4.400	1.227	0.234	5.070
DIV	0.195	0.170	0.660	0.010	0.122	1.202	4.766
SIZE	18.901	18.950	20.730	16.430	0.939	-0.299	2.712
EQUITY	8.640	8.300	24.770	3.140	2.946	1.814	8.899
DEPOSIT	0.716	0.719	0.967	0.205	0.134	-0.388	3.260
LOAN	55.407	56.445	71.820	26.54	10.105	-0.470	2.494
GDP_GR	0.059	0.060	0.094	0.031	0.010	0.078	4.180
INF	1.972	1.540	8.930	-1.630	1.933	1.414	5.266
ECONFR	51.103	51.190	52.280	49.580	0.612	-0.712	3.287
CONCR	63.472	64.400	100.250	35.920	22.359	0.222	1.543
BANKZ	6.349	6.270	8.820	5.040	0.814	0.651	3.298
ENF	-0.510	-0.540	-0.380	-0.590	0.070	0.499	1.612

(Source: Computation of authorson Eview 8.0)

Table 2. Correlation coefficients

	RAROA	RAROE	DIV	SIZE	EQUITY	DEPO	LOAN	GDP	INF	ECON	CONCR	BANKZ	ENF
RAROA	1												
RAROE	0.953	1											
DIV	0.267	0.234	1										
SIZE	0.281	0.245	0.064	1									
EQUITY	-0.113	-0.196	0.000	-0.524	1								
DEPOSIT	-0.064	-0.111	-0.068	0.182	0.041	1							
LOAN	-0.001	-0.001	-0.203	0.491	-0.141	0.428	1						
GDP_GR	-0.020	0.012	0.138	-0.009	-0.130	0.132	0.073	1					
INF	-0.091	-0.079	0.033	0.059	-0.064	0.231	0.070	0.197	1				
ECONFR	-0.181	-0.184	-0.138	0.245	-0.080	0.164	0.185	-0.173	-0.007	1			
CONCR	-0.314	-0.302	-0.055	0.309	-0.172	0.532	0.416	0.221	0.326	0.485	1		
BANKZ	0.283	0.253	0.170	-0.331	0.181	-0.443	-0.407	-0.093	-0.200	-0.556	-0.872	1	
ENF	-0.235	-0.224	-0.027	0.261	-0.174	0.463	0.349	0.327	0.366	0.512	0.918	-0.773	1

(Source: Data processing resultsof authors on Eviews 8.0)

In the studied period, while inflation rate (INF) and economic growth rate (GDP_gr) have no significant correlation with bank performance, level of economic freedom and institutional development (ECONFR), banking sector structure and stability (CONCR, BANKZ) and enforcement index (ENF) have more significant correlation. Of the 4 the above-mentioned variables, there is only BANKZ has positive correlation with RAROA and RAROE, the 3 remainders shows negative correlations to bank performance.

The results from statistic analysis reveal: (i) there seem be the positive effect of bank income diversification to bank performance in the studied banks; In addition to the effect of income diversification, bank performance is also affected by bank characteristics. Bigger banks tend to benefit from economy of scale, while the high levels of equities/assets and deposits/liabilities may negatively affect bank performance; (iii) the national characteristics may empower and generate interest conflicts, these in turn affect bank performance.

4.2. Selection of variables for models

Based on collected data and statistic analysis results, the Automatics linear Modeling using SPSS 23 procedure is run in order to estimate the dimension and the importance of each variable to the bank performance (RAROA and RAROE). Estimated results according to information Criterion (AICC), include effects with p-values less than 0.05 and remove effects with p-values greater than 0.1 as table 3 below.

As DIV is an important variable, the Automatics Linear Modeling procedure has been run for a number of DIV forms. The results show that there is a relation between RAROA/ RAROE with DIV^2 at 5% important but there is no relation between *RAROA/ RAROE at the same time with DIV and DIV^2 in the same model.*

Table 3 shows the 7 variables should be included in the model to estimate their effects to bank performance. They areDIV, SIZE, EQUITY, DEPOSIT, CONCR, BANKZ, and ENF. DIV variable can be replaced by DIV^2; EQUITY and BANKZ variables can be considered to be excluded in order to select the best model. *(The shaded are the ones that should be excluded from the model).*

Table 3. Results of Automatics linear Modeling

Variables	RAROA			RAROE		
	Coefficient	Sig.	Importance	Coefficient	Sig.	Importance
Intercept	-2.022	.467		- 1.084	.614	
DIV	2.160	.000	0.100	1.947	.000	0.148
DIV^2	3.035	.031	0.036	2.921	.034	0.055
SIZE	0.598	.000	0.498	0.386	.000	0.248
EQUITY		>.100		- 0.056	.068	0.039
DEPOSIT	1.780	.001	0.074	0.901	.102	0.031
LOAN		>.100			>.100	
GDP_GR		>.100			>.100	
INF		>.100			>.100	
ECONFR		>.100			>.100	
CONCR	- 0.056	.000	0.223	- 0.049	.000	0.405
BANKZ	- 0.407	.078	0.022		>.100	
ENF	5.821	.014	0,043	6,342	.006	0.090

Source: Data processing results using SPSS 23

4.3. Estimate and analysis results

Statistic results of Pairwise Granger Causality Tests indicate that two RAROA and RAROE series have no "cause and effect" relation (Prob. value of RAROE does not Granger Cause RAROA and RAROA does not Granger Cause RAROE hypothesisrespectively is 0.3383 and 0.4370 > 0.05). Augmented Dickey-Fuller estimate forRAROA and RAROE givet-Statistics are -6.058465and -6.492080, with Prob. = 0.0000 show that 2 these are idle. Therefore, the current value can be used to estimate the model, while the difference is not needed.

Based correlogramand autocorrelation chart, ARIMA (1,0,1) model should be used to estimate RAROA, RAROE according to 5 variables including DIV (or DIV^2), SIZE, DEPOSIT, CONCR, ENF and no bounded variable. In the 2 models, ARMA structure both meets roots and correlogram conditions but have ARCH effect. To estimate following Autoregressive Conditional Heteroskedasticity Method, 4 can be proposed: GARCH (0,1) for RAROA and RAROE with DIV; GARCH (0,1) for RAROA and RAROE with DIV^2 as the table 4 below. Of the 4 models, GARCH(0, 1) model for RAROA and RAROE with DIV^2 is most suitable because regression coefficient of DIV^2 is greater than one of DIV.

Table 4. Relationship between income diversification and bank performance

Variables	GARCH(0,1)		GARCH(0,1)	
	RAROA	RAROE	RAROA	RAROE
DIV	1.510*** (0.452)	1.326*** (0.424)		
DIV^2			2.137** (0.843)	1.903** (0.809)
SIZE	0.395*** (0.074)	0.346*** (0.065)	0.410*** (0.078)	0.345*** (0.068)
DEPOSIT	1.980*** (0.561)		1.371*** (0.408)	0.931* (0.487)

CONCR	-0.059***	-0.043***	-0.058***	-0.048***
	(0.007)	(0.006)	(0.007)	(0.008)
ENF	7.712***	5.379***	7.233***	5.737***
	(1.964)	(1.639)	(2.044)	(1.781)
AR(1)	0.891***	0.889***	0.889***	0.876***
	(0.043)	(0.041)	(0.044)	(0.050)
MA(1)	-0.609***	-0.631***	-0.593***	-0.596***
	(0.073)	(0.070)	(0.074)	(0.080)
Variance Equation				
C	0.134	0.172	0.136	0.174
	(0.162)	(0.210)	(0.174)	(0.226)
GARCH(-1)	0.836***	0.791***	0.837***	0.789***
	(0.197)	(0.253)	(0.207)	(0.270)
R-squared	0.505	0.428	0.495	0.429
F_test	49.140***	43,399***	47,213***	36,188***
Obs.	296	296	296	296

(Notes: ***, **,* indicates statistical significance at the 1%, 5% and 10% level respectively. Regression coefficients are reported with standard errors in parenthesis)

From the estimated results, the mean and variance equations for RAROA and RAROE can be rewritten as followings:

$RAROA_t = 0.889RAROA_{t-1} + 2.137DIV_t^2 + 0.410SIZE_t + 1.371DEPOSIT_t$

$- 0.058CONCR_t + 7.233 ENF_t + e_t - 0594e_{t-1}$

With $\sigma_t^2 = 0.4351 + 0.8375\sigma_{t-1}^2$

$RAROE_t = 0.876RAROE_{t-1} + 1.903DIV_t^2 + 0.345SIZE_t + 0.931DEPOSIT_t$

$- 0.048CONCR_t + 5.737 ENF_t + e_t - 0.595e_{t-1}$

With $\sigma_t^2 = 0.4368 + 0.789\sigma_{t-1}^2$.

Table 4 shows:

R^2 *(R Square)* of the GARCH (0,1) model gives RAROA and GARCH (0,1) model gives RAROE **(with DIV^2)** respectively are 0.495 and 0.429 at the statistical significance of 1% show that the model is suitable, independent variables of the model explain 45.9% of thevariation of RAROA and 42.8% of the variation of RAROE.

Results of the test show the variations of the two models are stable at high level. So, the modes are suitable and supportive to our forecasts.

The effects of variables to bank performance:

Table 4 show that income diversification has positive and non-linear on both RAROA and RAROE at the significance of 5%. Regression coefficient of DIV^2 in the two models are 2.137 and 1.903respectively show that the income diversification enhances significantly profitability (income per risk unit) of the banks. That is because when banks diversify, the volatility of bank income decrease *(ARCH (1, 0) model with dependent variables ROA_SD and ROE_SD both show negative effects of DIV^2 to ROA and ROE standard deviations at the importance of 5%)*. The conclusion support *modern portfolio theory* and similar to conclusions withdrawn by Le and Pham (2016) [19], Ho and Nguyen (2015) [18] as well as Sanya and Wolfe (2011) [5], Meslier et al (2014) [20] in their researches in emerging economies. In reverse side, the conclusion is not in agreement with Vo and Tran (2015) [3] in their research where the authors concluded that diversification would increase risks for banks then income per risk unit decrease.

The deposits per liabilities ratio (DEPOSIT) and bank size (SIZE) both have positive effects to both RAROA and RAROE. Regression coefficient of DEPOSIT in the two models respectively are 1.371 and 0.931 at the significance of 1% and 10% say that when deposits per liabilities ratio increase by 1%, the

ROA and the ROE as per risk unit increase by 1.371 and 0.931 units. While, if the bank size increase by 1 unit, the ROA and the ROE as per risk unit increase only by 0.41 and 0.345 units. The results support the market competence and economy of scale propositions as in Chiorazzo et al (2008) [6], Sanya and Wolfe (2011) [5] , Meslier et al (2014) [20].

The compliance (ENF) has strongest positive effect to bank performance while the industrial concentration level (CONCR) has reverse effect at very weak level. Regression coefficients of these two variables at the two models both have statistical significance of 1%. This result is in agreement with proposition of institutional and SCP theory when they conclude that a good institutional setting will facilitate a stable business environment, then banks can achieve higher profitability and the more industrial concentration, more difficult the bank can diversify to look for new income sources.

5. Conclusion and recommendations

Using data collected from the quarterly financial statements of 10 banks listed on the Vietnam stock market, the GARCH (0.1) model for RAROA and RAROE was developed to assess the impact of income diversification on the performance of commercial banks in Vietnam.

The research results show that Vietnam commercial banks have many benefits from income diversification: diversification brings new income to the bank, helping banks reduce risks and thus increase profits overa unit of risk or increase bank performance.

Income diversification has a positive and non-linear impact on the performance of Vietnam commercial banks - this finding is different from most nationally published studies since these studies only found linear relationships between diversification of income and performance of the bank. Research patterns, methods of data collection and data processing,

as well as, model building can be the core to explaining this difference.

In the context of increasing competition, banks' interest income tends to decrease and contains a lot of risk, banks should pay more attention to the expansion of non-interest income generating activities to improve operational efficiency on the basis of rational balance with resources and in accordance with the management capacity of the bank itself.

Refference

[1] Lepetit, L., Nys, E., Rous, P., Tarazi, A., Bank income structure and risk: An empirical analysis of European banks. Journal of Banking & Finance 32 (2008) 1452.

[2] De Jonghe, O., Diepstraten, M., Schepens, G., Banks' size, scope and systemic risk: What role for conflicts of interest?, Journal of Banking & Finance 61 (2015) S3.

[3] Vo, X.V., Tran, T.P.M., Risks and returns from Vietnamese banks' income diversification. Economics development journal 26 (2015) 54 (Vietnamese).

[4] Odesanmi, S., Wolfe, S., Revenue diversification and insolvency risk: Evidence from banks in emerging economies, Social Science Research Network, (2007).

[5] Sanya, S., Wolfe, S., Can Banks in Emerging Economies Benefit from Revenue Diversification? Journal of Financial Services Research 40 (2011) 79.

[6] Chiorazzo, V., Milani, C., Salvini, F., Income Diversification and Bank Performance: Evidence from Italian Banks, Journal of Financial Services Research, 33(3) (2008) 181.

[7] Trujillo-Ponce, A., What determines the profitability of banks? Evidence from Spain. Accounting and Finance 53 (2013) 561.

[8] Stiroh Kevin J, Diversification in banking: Is noninterest income the answer?, Journal of Money, Credit and Banking (2004) 853.

[9] Stiroh, K.J., Rumble, A., The dark side of diversification: The case of US financial holding companies. Journal of Banking & Finance 30 (2006) 2131.

[10] Mercieca, S., Schaeck, K., Wolfe, S., Small European banks: Benefits from diversification? Journal of Banking & Finance 31(2007) 1975.

[11] Pennathur, A.K., Subrahmanyam, V., Vishwasrao, S., Income diversification and risk: Does ownership matter? An empirical examination of Indian banks. Journal of Banking & Finance 36 (2012) 2203.

[12] Amidu, M., Wolfe, S., Does bank competition and diversification lead to greater stability? Evidence from emerging markets, Review of Development Finance 3(3) (2013) 152.

[13] Brighi, P., Venturelli, V., How do income diversification, firm size and capital ratio affect performance? Evidence for bank holding companies, Applied Financial Economics, 24(21) (2014) 1375.

[14] Mensi, S., Labidi, W., The Effect of Diversification of Banking Products on the Relationship between Market Power and Financial Stability. American Journal of Economics and Business Administration 7 (2015) 185.

[15] Elsas, R., Hackethal, A., Holzhäuser, M., The anatomy of bank diversification, Journal of Banking & Finance, 34(6) (2010) 1274.

[16] Doumpos, M., Gaganis, C., Pasiouras, F., Bank Diversification and Overall Financial Strength: International Evidence, Financial Markets, Institutions & Instruments 25(3) (2016) 169.

[17] Baele Lieven, Olivier De Jonghe and Rudi Vander Vennet, Does the stock market value bank diversification?, Journal of Banking & Finance, 31(7) (2007) 1999.

[18] Ho, T.H.M., Nguyen, T.C., Income diversifiction and factors influencing Vietnemse banks' profitability. Banking technology journal 106 - 107 (2015) 13 (Vietnamese).

[19] Le, L.H., Pham, X.Q., Effects of income diversification on Vietnamese banks' performance. Banking technology journal, 124 (2016) 11 (Vietnamese).

[20] Meslier, C., Tacneng, R., Tarazi, A., Is bank income diversification beneficial? Evidence from an emerging economy, Journal of International Financial Markets, Institutions and Money 31 (2014) 97.