Emerging Markets Finance & Trade, 55:1417–1428, 2019

ISSN: 1540-496X print/1558-0938 online
DOI: https://doi.org/10.1080/1540496X.2018.1524326

Determinants of Bank Profitability—Evidence from Vietnam

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ABSTRACT: This article investigates the determinants of bank profitability in Vietnam covering the period from 2006 to 2014. Employing a number of econometric panel data methods with a unique dataset, the findings of the article indicate that bank size, capital adequacy, risk, expense, and productivity have strong impacts on profitability. We also find that bank industry characteristics and macroeconomic variables affect bank profitability. However, we find that the direction of causality is not uniform across profitability measures.

KEY WORDS: bank profitability, emerging markets, Vietnam

JEL CLASSIFICATION: G10, G12

The current Vietnamese banking system comprises a number of large government-controlled banks and a much larger number of smaller privately owned and foreign banks. This heavily segmented market is typically intermediated and lacking in institutional complexity. It provides a setting to test theories on the role banking plays in a developing economy and the impact changes in the regulatory structure have on competition and bank profitability. Minimal role of the stock and bond markets mean that financial intermediation remains critical for the supply of credit. Another critical issue associated with the segmented market is the undercapitalization in the Vietnam banking system. This becomes worse in an environment depressing bank margins due to weak loan demand and banks are struggling to offset credit costs and improve internal capital generation.

Since the mid 1980s, the Vietnamese government has aimed at developing a strong and sound financial system as an important part of the comprehensive economic reform. Vietnam's financial system has been vastly restructured over the last two decades and the market has witnessed a strong development of the financial system in recent years. However, there is a lot more to be done in the financial reform process to develop a sound and prudent financial system of international standard. Notably, the Vietnamese bond market is still at an infant stage of development. There is only a limited number of large corporations which are able to obtain finance by issuing bond in this market. The stock market is still far behind the developed countries in terms of both the number of listed firms and the trading volume even though the number of listed firms and the stock market capitalization increased significantly in the last decade.[1] This makes commercial bank system in Vietnam playing a pivotal role in supplying credit to firms in the economy due to the underdevelopment of other credit markets. Therefore, the soundness and stability of the banking sector play a crucial role for the Vietnamese economy and it remains one of the main objectives of the authority and other stakeholders in many economic reform packages.

However, the lack of appropriate regulatory capacities and recent macroeconomic developments in Vietnam have resulted in risks looming over the financial system's stability. Recent work by Leung, Taylor, and Evans (2015) highlights the importance to investors of studying the fundamentals. Many previous works acknowledge that corporate governance, accounting standards, and transparency of

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the banking system are still behind other emerging markets. Bank regulators need to be aware of these issues to improve those to the international standard practices. Central banks and regulatory authorities should implement decisive policies to address these concerns to deal with many problems associated with the recent developments in Vietnam banking system although recent signs of stabilization on the macroeconomic front and regulatory measure are recognized. As a result of unstable development, the increased volume of nonperforming loans is a central issue in many public discussions among policy makers and financial experts. According to a recent estimate by Moody, problem assets in the Vietnam banking system is at least 15% in 2013, significantly above the 4.7% nonperforming loan reported by the central bank authority (the State Bank of Vietnam). In addition, bank profitability remains stagnant as a consequence of the 2008 global financial crisis and recent problematic issues of Vietnamese banking system. Moreover, commercial banks are operating in a challenging environment lacking an improved external position to revise domestic demand. All of these factors highlight the importance for a thorough understanding the main drivers of bank profitability.

The recent global financial crisis and its consequences on the financial system worldwide proves the importance of maintaining a stable bank system. Recent attention is also focused on the discussion about the existence of bank risk taking channel (Batten and Vo 2016; Borio and Zhu 2012). A clear understanding of the determinants of commercial bank profitability is important for the evaluation and management of the banking system. It is even more critical in a country like Vietnam where most of funding for private investments and economic growth is financed by banks. This article first facilitates a further understanding on the drivers of bank profitability highlighted by the deep recession following the global crisis. Moreover, the article deepens the understanding of determinants of bank profit in general and in an emerging market like Vietnam in particular. By analyzing a rich and detailed dataset of bank-specific characteristics, and studying the determinants of bank profitability in Vietnam, we identify various factors that determine bank profitability that are common in the literature. The main reason for employing similar bank profitability determinants is that banking system in Vietnam is gradually required to follow international standard in both risk management and corporate governance. This practice also allows us to identify if there is any difference in determinants of bank profitability in an emerging country by enabling comparison of the bank behaviors among different country datasets.

An important motivation for the current article arises from the current crises in the Vietnamese banking system while many studies in the literature empirically show that bank profitability is an important predictor of financial distress and bank crisis (Demirgüc-Kunt and Detragiache 1999). Recent study by Batten and Vo (2016) shows that Vietnamese banks are under competitive pressure to look for other sources of non-traditional income. However, income diversification adds to risk. Apart from the recent issues relating to high level of non-performing loans, the conventional practice of the Vietnamese commercial banks is also a major concern to different stakeholders. While it is an important factor, monitoring bank profitability is a difficult task, especially in an emerging market environment which is more prone to external shocks. Another problem lies with the frequency of the reporting standard because detailed information about bank profitability is available at best quarterly for large and listed banks (Albertazzi and Gambacorta 2009). Further, banks with narrow net interest margins tend to have more incentives in pursuing risky non-traditional banking activities (Firth, Li, and Shuye Wang 2016). On the other hand, bank-specific factors might be observed with more frequency because of the legal requirement and accounting standard. Therefore, a detailed analysis of factors affecting bank profitability in Vietnamese context provides a better understanding to maintain a stable financial landscape.

Many previous articles investigate bank profitability from different perspectives in the current literature. Short (1979) and Bourke (1989) are among the first authors to investigate the determinants of bank profitability employing cross-country data sets. Since then, there have been many published articles investigating this topic using cross-country data set (Demirgüç-Kunt and Huizinga 1999;

Molyneux and Thornton 1992)(Athanasoglou, Delis, and Staikouras 2006; Goddard, Molyneux, and Wilson 2004; Kosmidou, Pasiouras, and Tsaklanganos 2007; Micco, Panizza, and Yanez 2007; Staikouras and Wood 2004). Moreover, many other articles employ individual country data set to study the determinants of bank profitability (Athanasoglou, Brissimis, and Delis 2008; Berger 1995b; Berger, Hanweck, and Humphrey 1987; García-Herrero, Gavilá, and Santabárbara 2009; Mamatzakis and Remoundos 2003; Naceur and Goaied 2008; Neely and Wheelock 1997). Similarly, Bolt et al. (2012) acknowledge that there are many articles examining the profitability impact of a particular factor, such as non interest income (DeYoung and Rice 2004; Nguyen 2012), loan loss provisioning (Bikker and Metzemakers 2005; Bouvatier and Lepetit 2008; Laeven and Majnoni 2003), bad bank loans (Louzis, Vouldis, and Metaxas 2012; Mario 2007; Vicente and Jesús 2002), loan defaults (Castrén, Dées, and Zaher 2010; Duffie, Saita, and Wang 2007; Jacobson, Lindé, and Roszbach 2005; Pesaran et al. 2006), or bank loan recovery rates (Khieu, Mullineaux, and Yi 2012). More recently, Saghi-Zedek (2016) explores the role of bank diversification strategy in creating bank performance and find that the impact of diversification on profit depends on ownership types.

Other external determinants of bank profitability are included in the regression models in prior studies. For example, Albertazzi and Gambacorta (2009) assert the importance of studying business cycle fluctuations and banking sector profitability. Potential explanatory factors such as central bank interest rate, inflation, GDP development, and taxation are commonly controlled for in the bank profitability analysis. Interestingly, most studies show that inflation, central bank interest rates, and GDP growth are pivotal drivers of bank profitability (Albertazzi and Gambacorta 2009; Athanasoglou, Brissimis, and Delis 2008; Bolt et al. 2012; Bourke 1989; Demirgüç-Kunt and Huizinga 1999; Molyneux and Thornton 1992; Naceur and Omran 2011). Specially, employing a semi-parametric approach, Kanas, Vasiliou, and Eriotis (2012) reveal the evidence that bank profitability is affected by the business cycle, short-term interest rates, and inflation expectations. However, Naceur and Omran (2011) advocate that inflation has a significant impact on bank profitability while macroeconomic and financial development indicators do not. Moreover, changes in regulation are also reported to have a strong impact on both the level and persistence of bank profitability in the US (Chronopoulos et al. 2015). Notably, some recent articles highlight the importance of global financial crisis on assessing bank profitability (Chronopoulos et al. 2015; Saghi-Zedek and Tarazi 2015).

From the perspective of emerging markets, this article is one of the very first few studies carefully shedding light on the determinants of bank profitability in Vietnam. This is important since the literature on determinants of banks profitability of Vietnamese banks is still very limited. Our first main contribution to the literature is to conduct an extensive empirical analysis of this issue in Vietnam. Particularly, we provide further insights into what drives bank profitability in emerging markets. The construction of extensive data, together with the detailed attributes of commercial banks and other industry and macroeconomic factors, allows us to achieve this objective. In addition, the consideration of factors driving profitability of banks is an important tool for bank regulators as it supports prudential analysis.

The remainder of this article is structured as follows. Section two introduces model, data, and variable description. Section three describes the research method. Section four reports the empirical results. Finally, section five concludes the article.

Model, Data, and Variable Description

Given the limited availability of data relating to commercial banks in Vietnam, our dataset is relatively considered as a comprehensive data set covering most banks in Vietnam over a quite long period. Our data sample includes 35 domestic Vietnamese commercial banks for the period from 2006 to 2014. The data are collected from different sources including Bankscope, the State Bank of Vietnam, the Vietnam Bureau of Statistics, and individual bank reports. The bank-specific attributes

data are manually collected from financial reports of the all commercial banks if they are missing from other databases.

In the current literature, bank profitability is normally measured by the net interest margin as it is one of the useful indicators to describe the core earning ability of banks. Apart from net interest margin, two other variables are often used in previous articles including the return on average assets and the return on average equity (Naceur and Omran 2011; Olson and Zoubi 2011; Van Horen 2007). The average assets and equity are used to capture changes during the fiscal year. In this article, we use all of these measures covering different perspectives of bank profitability in order to provide a more accurate and robust results. For example, net interest margin focuses on measuring the profits from interest activities. Return on average assets reflects the ability of the bank's management to generate revenues and profits from assets while return on average equity measures the returns to shareholders.[2] Importantly, the use of different profitability measures allows us to capture different aspects of bank businesses.

Models of determinants of bank profitability normally express profitability as a function of internal and external variables. Specially, most of the regression models explaining the bank profitability control for internal variables including bank attributes such as bank size, risk, capital ratio, and operational efficiency. Moreover, the external variables normally are also controlled. The latter reflects banking industry-specific characteristics in a country (market concentration and competition) and macroeconomic indicators (GDP, inflation, central bank interest rate, and inflation rate).

In the current article, our first objective is to provide a comprehensive examination on the determinants of bank profitability. In other words, we investigate the effects of the internal and external variables on bank profitability in the context of Vietnam. To be in line with the previous literature (Sun, Mohamad, and Ariff 2017), the estimated equation is a standard linear regression model as follows.

$$y_{i,t} = \alpha + \beta X_{i,t} + \varepsilon_{i,t}$$

where $y_{i,t}$ denotes the profit of bank i at time t; $X_{i,t}$ is a vector of control variables representing the bank-specific characteristic, industry and macroeconomic variables i at time t; α is a constant term, and $\varepsilon_{i,t}$ is the error term.

As discussed above, since a second objective is to provide a more comprehensive analysis, we use a number of dependent variables to proxy for profitability including net interest margin (NIM), return on average assets (ROAA) and return on average equity (ROAE). Moreover, the use of an extensive number of measures allows us to focus on different aspects of bank business and to achieve a more robust result.

Our control variables for the bank profitability model in the Vietnamese context include the following. *SIZE* is a variable which controls for bank size, measured as the logarithm of the total assets at year end. *CAPAD* is a variable which controls for capital adequacy, which is the standard capital asset ratio at year end. *CRISK* is a variable which controls for bank risk, calculated as the ratio of provisions for credit risk to total loans at year end. *COST* is a variable which controls for operating expenses, measured by the ratio of total operating expenses to total assets. *PRO* is a variable which controls for bank productivity, measured by the log of the profit per employee ratio.

We also control for bank industry characteristics in our model. *HHI* is a variable which controls for market structure, which is measured by the summation of the squared bank market share for each bank using bank asset ratio (Herfindahl-Hirschman concentration index). Further, we use two variables to control for macroeconomic environment which are the inflation measure (INFLATION) and the growth rate of GDP (GDPGR).

Table 1 presents the descriptive statistics of variables employed in the article. Notably, the net interest margin of the Vietnamese banks is quite high with the average is about 3%. Further, all of the banks in our data sample enjoy positive profits suggesting strong market power of Vietnamese banks.

Table 1. Description of the variables.

	NIM	ROAA	ROAE	SIZE	CAPADE	BCOST	PRO	RISK
Mean	0.0302	0.0124	0.1046	17.3107	0.1355	0.0155	5.1988	0.0117
Median	0.0273	0.0111	0.0969	17.3006	0.1030	0.0146	5.3115	0.0103
Maximum	0.1049	0.0595	0.4449	20.3095	0.6141	0.0692	8.5641	0.0389
Minimum	–0.0059	0.0001	0.0007	13.0115	0.0291	–0.0098	0.7949	0.0001
Std. Dev.	0.0147	0.0091	0.0672	1.4724	0.0971	0.0075	0.9156	0.0069
Observations	300	299	299	301	301	299	250	297

Estimation Method

We utilize standard estimation techniques for panel data in the analysis. In the first approach, we use panel data regression estimators. Following the standard procedure to estimate the model with panel data, we estimate the equation using both fixed effects and random effects. We then conduct Hausman tests to select between fixed effects and random effects. The results of Hausman tests suggest the use of fixed effects panel data estimator. To conserve space, we report the estimates for fixed effects analysis.

In addition, following García-Herrero, Gavilá, and Santabárbara (2009) and Dietrich and Wanzenried (2011), we employ a dynamic model to provide a robustness of the test and to take into account the serial correlations and the tendency of persistence over time of bank profitability as identified by Berger et al. (2000). Particularly, we employ GMM estimator suggested by Arellano and Bond (1991) for further robust results. This estimator ensures efficiency and consistency. However, two important conditions are that i) the model is not subject to serial correlation of order two and ii) the instruments employed are valid (which could be confirmed by the Sargan test). The GMM estimator also allows us to account for the endogeneity problem in the estimation of bank profitability.

Empirical Results

Table 2 reports the correlation coefficient matrix between profitability variables and bank characteristics for the dataset. This table offers some initial overview on the correlation between variables of interest. Moreover, most of the correlation values are relatively small and this suggests that there is no significance concern of multicollinearity.

In the next section, we elaborate our regression results on the relationship between bank profitability and explanatory variables. Tables 3, 4, and 5 present the results of regression analysis where

Table 2. Correlation matrix among variables.

	NIM	ROAA	ROAE	SIZE	CAPADE	BCOST	PRO	RSK
NIM	1							
ROAA	0.39	1						
ROAE	0.01	0.53	1					
SIZE	–0.23	–0.33	0.33	1				
CAPADE	0.61	0.44	–0.31	–0.70	1			
COST	0.71	–0.04	–0.28	–0.17	0.48	1		
PRO	0.14	0.58	0.63	0.17	0.01	–0.23	1	
CRISK	0.04	–0.30	–0.05	0.55	–0.26	0.08	–0.08	1

Table 3. Regression results—The dependent variable is NIM.

Estimator	Fixed Effects		GMM	
Variable	Coeff.	Prob.	Coeff.	Prob.
c	0.0549*	0.0847		
NIM(–1)			–0.0038	0.9289
SIZE	–0.0034**	0.0285	–0.0077**	0.0244
CAPADE	0.0357***	0.0019	0.0062	0.7976
CRISK	0.2574**	0.0147	0.2188	0.1966
COST	0.9027***	0.0000	1.2407***	0.0000
PRO	0.0034***	0.0000	0.0040***	0.0000
HHI	–0.1308***	0.0020	–0.4226**	0.0339
INFLATION	0.0134*	0.0728	–0.0577	0.5356
GDPGR	0.0841	0.3306	–1.2563**	0.0001
R-squared	0.8256			
Adjusted *R*-squared	0.7900			
F-statistic	23.2140			
Prob(F-statistic)	0.0000			
J-statistic			17.0196	
Prob(J-stat)			0.5885	

Note: *, **, *** indicates significance at the 10%, 5%, and 1% respectively

Table 4. Regression results—The dependent variable is ROAA.

Estimator	Fixed Effects		GMM	
Variable	Coeff.	Prob.	Coeff.	Prob.
c	0.0902	0.0001		
ROAA(–1)			0.2652	0.0000
SIZE	–0.0055***	0.0000	–0.0033**	0.0331
CAPADE	0.0213***	0.0090	0.0276	0.1107
CRISK	0.0273	0.7152	0.1367	0.1166
COST	–0.2578***	0.0000	–0.1825**	0.0198
PRO	0.0049***	0.0000	0.0047***	0.0000
HHI	–0.1085***	0.0003	–0.2266*	0.0662
INFLATION	–0.0025	0.6428	–0.0611	0.2521
GDPGR	0.0670	0.2783	–0.0670	0.8785
R-squared	0.7440			
Adjusted *R*-squared	0.6918			
F-statistic	14.2543			
Prob(F-statistic)	0.0000			
J-statistic			23.5054	
Prob(J-stat)			0.2158	

Note: *, **, *** indicates significance at the 10%, 5%, and 1% respectively

the dependent variable is NIM, ROAA, and ROAE respectively. Each table shows the estimates of all panel data estimation methods.

Previous studies generally report a positive relationship between bank size and bank profitability, for example, as in Pasiouras and Kosmidou (2007) and Naceur and Omran (2011). Two main reasons

Table 5. Regression results—The dependent variable is ROAE.

Estimator	Fixed Effects		GMM	
Variable	**Coeff.**	**Prob.**	**Coeff.**	**Prob.**
c	0.2336	0.2224		
ROAE(–1)			0.0760	0.3084
SIZE	–0.0212**	0.0216	0.0163	0.3877
CAPADE	–0.2824***	0.0001	–0.1937*	0.0829
CRISK	–0.3184	0.6137	0.1976	0.6584
COST	–0.3117	0.5476	1.9992***	0.0005
PRO	0.0422***	0.0000	0.0352***	0.0000
HHI	–0.2559	0.3093	–1.2776*	0.0539
INFLATION	0.0685	0.1258	1.1187***	0.0022
GDPGR	1.4835***	0.0047	0.9293	0.7267
R-squared	0.7325			
Adjusted *R*-squared	0.6780			
F-statistic	13.4318			
Prob(F-statistic)	0.0000			
J-statistic			22.3528	
Prob(J-stat)			0.2671	

Note: *, **, *** indicates significance at the 10%, 5%, and 1% respectively

are normally documented to explain this positive impact of size on profitability including the economies of scales and stronger market power of larger banks. However, in our regression analysis, the coefficients of size are negative and significant in most regressions. A reasonable explanation to this finding is from the fact that most of Vietnamese banks are small in comparison with large foreign banks whereas small-sized banks seem to grow faster, even at the cost of profitability and riskiness. This is also explained by the proposition that as banks become larger, lower standard of management quality and other factors could impair bank profitability. For example, larger banks tend to be more geographically diversified for branding purpose while higher geographic diversification is reported to be associated with lower valuation (Bandelj 2016).

Our results for negative impact of bank size on return on assets are in line with previous articles in emerging markets context such as Berger, Hanweck, and Humphrey (1987). These studies provide evidence that costs are reduced only slightly as bank size increases and that large banks often encounter scale inefficiencies due to lower level of management, bureaucratic and other reasons. Ekpu et al. (2016) report a similar finding and relate this finding to financialization. However, size is important in the sense that it reduces earnings volatility (De Haan and Poghosyan 2012) and large banking sector improves banking profitability (Ting 2017).

Capital adequacy is an important factor affecting bank profitability and this is widely documented in the current literature (Beltratti and Paladino 2015; Djalilov and Piesse 2016). Similarly, our estimated results stress the importance of bank capital adequacy in maintaining the profitability in Vietnamese commercial banks. Coefficients for bank capital are positive and significant in all regressions where net interest margin and return on average assets are dependent variables (Tables 3 and 4). However, these coefficients are negative and significant in regressions where return on average equity is dependent variable (Table 5). Even though bank capital negatively influences return on equity, however, in the long run, banks will perform better. This is because there is an improvement in core bank businesses (increase in net interest margin and better earnings of assets) resulting in higher profitability. This result is clearly relevant for the authority in setting supervisory policies requiring Vietnamese banks to maintain a good capital adequacy for the soundness and stability of the system. In addition, the estimated results prove that well capitalized banks are more profitable.

Importantly, this is consistent with the notion that banks with higher liquidity ratios have a lower cost of funding resulting from lower prospective bankruptcy costs (Demirguc and Huizinga 1999). Evidence in many empirical articles suggest that banks maintaining a high level of equity relative to their assets are best-performing banks (Bourke 1989; Demirgüç-Kunt and Huizinga 1999; Fungáčová and Poghosyan 2011; García-Herrero, Gavilá, and Santabárbara 2009; Goddard, Molyneux, and Wilson 2004; Lee and Hsieh 2013; Naceur and Goaied 2001, 2008; Pasiouras and Kosmidou 2007).

Bank risk is a major concern for many stakeholders and many previous articles acknowledge the importance of risk-taking by banks. Higher risk taking is expected to be compensated by extra profit and the level of risk might be an objective for earnings management (Olszak and Pipień 2016). Excessive risk taking can be detrimental to the whole financial system and general economy. Importantly, excessive risk-taking is considered as the cause of the recent financial crises (Lassoued, Sassi, and Attia 2016). A recent article by Entrop et al. (2015) explores the channel of which risk is priced into bank margins. Bourke (1989), and Molyneux and Thornton (1992) document that bank risk is negatively correlated with the profitability of a bank. This suggests that banks with risky lending behavior tend to have a large volume of non-performing loans. This problem, in turn, negatively affects the bank profitability. However, Naceur and Omran (2011) report a reverse relation where they document that credit risk has a positive and significant impact on banks' net interest margin, cost efficiency and profitability. Interestingly, our analysis indicates that higher risk banks in general enjoy higher net interest margin. However, they tend to experience lower profitability measured by return on average equity (even though it is not statistically significant). This finding allows us to infer that higher risk banks in Vietnam might have higher net interest margin but the profit starts to decline in terms of return on equity.

Fungáčová and Poghosyan (2011) confirm that operation cost is an important driver of bank profitability. Our results also recognize the importance of operating expense as a determinant of bank profitability. The bank operation cost is reflected positively and significantly in net interest margin but negatively and significantly in return on assets. This finding implies that Vietnamese banks have not reached the maturity level. It is not a good long-term strategy not to bear any cost to maintain customers. On the contrary, this result clearly reflects the instability of income of the Vietnamese banks where bank profits are channeled from higher costs. In addition, the practice of passing bank operation cost on to depositors and borrowers is an indicator for increased risk if completion is intensified.

Productivity is positively and significantly explaining bank profitability in all regressions. This suggests that the constant improvement in bank productivity is necessary in maintaining sustainable profits for Vietnamese commercial banks. The result confirms that the focus on improving productivity is proven to bring higher profits for Vietnamese banks during the financial crisis. Therefore, in order to improve profitability prospects, banks should engage in constant improvement in productivity including the employment of better quality employees, implementation of workplace trainings and even the restructure/closure of nonperforming units.

It is commonly stated that market structure is important for banks in setting deposit and loan prices that could directly affect their performance (Mirzaei, Moore, and Liu 2013). The empirical results from our analysis is not consistent with the structure conduct performance paradigm, which states that banks have the ability to extract monopolistic rent in a concentrated market. The coefficients for concentration are negative and significant in regressions where net interest margin is the dependent variable. This is not consistent with the previous outcome that bank concentration ratio is positively correlated with the profitability of a bank (Berger 1995a; Demirgüç-Kunt and Huizinga 1999; Staikouras and Wood 2004).

One particular note here is that inflation positively affects bank net interest margin in our analysis. Inflation has been considered as an important variable explaining bank profitability in previous work (Bourke 1989; Molyneux and Thornton 1992). A potential explanation for this finding is that the ability to pass the costs of inflation onto customers. Another explanation is that the deposit rates and

lending rates are quickly adjusted as a reaction to the increase in inflation. The fact that inflation is positively associated with net interest margin implies that banks do not bear any inflation costs. However, the sign of the estimates is not consistent in different regressions.

Finally, an important finding of this research is that we do not report a consistent impact of output growth on bank profitability in most of the regressions. This finding is not in line with a number of previous articles in the established literature suggesting possible cyclical movements of bank profitability where bank profitability is correlated with business cycle (Athanasoglou, Brissimis, and Delis 2008; Athanasoglou, Daniilidis, and Delis 2014; Bolt et al. 2012). In addition, Kanas, Vasiliou, and Eriotis (2012) state that bank credit is linked with loan provisioning while loan provisioning is in turn associated with the business cycle. This is an interesting result since profitability of Vietnamese banks is expected to be dependent on the general economy where most of major sources of bank income are from domestic markets.

To sum up, main drivers of Vietnamese commercial bank profitability in Vietnam are capital adequacy, risks, expense and productivity. However, the direction of causality is not uniform across bank profitability measures. The findings from this article suggest that the regulatory authority should aim toward a more prudent policy. Specially, the policy should focus on maintaining bank capital adequacy ratio to improve the soundness of the bank system. Moreover, banks should follow strategies to enhance productivity in order to improve profitability.

Conclusion

Bank behavior and bank performance are notably influenced by internationalization and financial market deregulation (Bouzgarrou, Jouida, and Louhichi 2017, forthcoming, forthcoming). Understanding of bank profitability is clearly relevant since the implication is functional for bank regulatory authorities to maintain a sound banking sector (Menicucci et al. 2016). Investigation of commercial bank profitability in the emerging market of Vietnam is an interesting topic with its own backgrounds and merits. In light of the constant change in the financial system, we investigate the drivers of bank profitability in Vietnam including bank-specific characteristics, industry-specific and macroeconomic variables employing assorted econometric techniques of panel data analysis. By using a rich dataset on bank attributes and business environment, in addition with the use of appropriate panel data framework, we are able to characterize the drivers of Vietnamese bank profitability in details.

Overall, we find that bank profitability is dependent on bank specific factors and bank industry attributes. However, the direction of causality is not uniform across profitability measures. The findings have a number of policy implications. The article is also relevant to different stakeholders in creating and maintaining a sound and efficient financial market and financial system. Further avenue of research could be the link between monetary policy and bank profitability as in Borio, Gambacorta, and Hofmann (2017).

Acknowledgments

The authors wish to thank Buu Kiem Dang for excellent research assistance. Any remaining errors and shortcomings are our own responsibility.

Notes

1. A number of articles present an overview of the stock market development in Vietnam (Batten and Vo 2014, 2015; Vo 2015, 2016, 2018a, 2018b).

2. Dietrich and Wanzenried (2011) state that return on average assets is a better indicator to measure bank profitability.

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References

Albertazzi, U., and L. Gambacorta. 2009. Bank profitability and the business cycle. *Journal of Financial Stability* 5 (4):393–409. doi:10.1016/j.jfs.2008.10.002.

Athanasoglou, P., M. Delis, and C. Staikouras 2006, 'Determinants of bank profitability in the Southern Eastern European Region', *Bank of Greece Working Paper No. 47*.

Athanasoglou, P. P., I. Daniilidis, and M. D. Delis. 2014. Bank procyclicality and output: Issues and policies. *Journal of Economics and Business* 72:58–83. doi:10.1016/j.jeconbus.2013.10.003.

Athanasoglou, P. P., S. N. Brissimis, and M. D. Delis. 2008. Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money* 18 (2):121–36. doi:10.1016/j.intfin.2006.07.001.

Bandelj, A. 2016. Should banks be geographically diversified? Empirical evidence from cross-country diversification of European banks. *The European Journal of Finance* 22 (2):143–66. doi:10.1080/1351847X.2014.960978.

Batten, J. A., and X. V. Vo. 2014. Liquidity and return relationships in an emerging market. *Emerging Markets Finance and Trade* 50 (1):5–21. doi:10.2753/REE1540-496X500101.

Batten, J. A., and X. V. Vo. 2015. Foreign ownership in emerging stock markets. *Journal of Multinational Financial Management* 32:15–24. doi:10.1016/j.mulfin.2015.05.001.

Batten, J. A., and X. V. Vo. 2016. Bank risk shifting and diversification in an emerging market. *Risk Management* 18 (4):217–35. doi:10.1057/s41283-016-0008-2.

Beltratti, A., and G. Paladino. 2015. Bank leverage and profitability: Evidence from a sample of international banks. *Review of Financial Economics* 27:46–57. doi:10.1016/j.rfe.2015.08.002.

Berger, A. N. 1995a. The profit – structure relationship in banking: Tests of market-power and efficient-structure hypotheses. *Journal of Money, Credit and Banking* 27 (2):404–31. doi:10.2307/2077876.

Berger, A. N. 1995b. The relationship between capital and earnings in banking. *Journal of Money, Credit and Banking* 27:432–56. doi:10.2307/2077877.

Berger, A. N., G. A. Hanweck, and D. B. Humphrey. 1987. Competitive viability in banking: Scale, scope, and product mix economies. *Journal of Monetary Economics* 20 (3):501–20. doi:10.1016/0304-3932(87)90039-0.

Berger, A. N., S. D. Bonime, D. M. Covitz, and D. Hancock. 2000. Why are bank profits so persistent? The roles of product market competition, informational opacity, and regional/macroeconomic shocks. *Journal of Banking & Finance* 24 (7):1203–35. doi:10.1016/S0378-4266(99)00124-7.

Bikker, J. A., and P. A. J. Metzemakers. 2005. Bank provisioning behaviour and procyclicality. *Journal of International Financial Markets, Institutions and Money* 15 (2):141–57. doi:10.1016/j.intfin.2004.03.004.

Bolt, W., L. de Haan, M. Hoeberichts, M. R. C. van Oordt, and J. Swank. 2012. Bank profitability during recessions. *Journal of Banking & Finance* 36 (9):2552–64. doi:10.1016/j.jbankfin.2012.05.011.

Borio, C., and H. Zhu. 2012. Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism? *Journal of Financial Stability* 8 (4):236–51. doi:10.1016/j.jfs.2011.12.003.

Borio, C., L. Gambacorta, and B. Hofmann. 2017. The influence of monetary policy on bank profitability. *International Finance* 20 (1):48–63. doi:10.1111/infi.v20.1.

Bourke, P. 1989. Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking & Finance* 13 (1):65–79. doi:10.1016/0378-4266(89)90020-4.

Bouvatier, V., and L. Lepetit. 2008. Banks' procyclical behavior: Does provisioning matter? *Journal of International Financial Markets, Institutions and Money* 18 (5):513–26. doi:10.1016/j.intfin.2007.07.004.

Bouzgarrou, H., S. Jouida, and W. Louhichi. 2017, forthcoming. Bank profitability during and before the financial crisis: Domestic vs. foreign banks. *Research in International Business and Finance*.

Castrén, O., S. Dées, and F. Zaher. 2010. Stress-testing euro area corporate default probabilities using a global macroeconomic model. *Journal of Financial Stability* 6 (2):64–78. doi:10.1016/j.jfs.2009.10.001.

Chronopoulos, D. K., H. Liu, F. J. McMillan, and J. O. S. Wilson. 2015. The dynamics of US bank profitability. *The European Journal of Finance* 21 (5):426–43. doi:10.1080/1351847X.2013.838184.

De Haan, J., and T. Poghosyan. 2012. Bank size, market concentration, and bank earnings volatility in the US. *Journal of International Financial Markets, Institutions and Money* 22 (1):35–54. doi:10.1016/j.intfin.2011.07.002.

Demirguc, A., and H. Huizinga. 1999. Determinants of commercial bank interest margins and profitability: Some international evidence. *World Bank Economic Review* 13 (2):379–408. doi:10.1093/wber/13.2.379.

Demirgüc-Kunt, A., and E. Detragiache 1999, 'Monitoring banking sector fragility: Amultivariate logit approach', *IMF Working Paper*, no. 106.

Demirgüç-Kunt, A., and H. Huizinga. 1999. Determinants of commercial bank interest margins and profitability: Some international evidence. *The Word Bank Economic Review* 13 (2):379–408. doi:10.1093/wber/13.2.379.

DeYoung, R., and T. Rice. 2004. Noninterest income and financial performance at U.S. commercial banks. *Financial Review* 39 (1):101–27. doi:10.1111/fire.2004.39.issue-1.

Dietrich, A., and G. Wanzenried. 2011. Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money* 21 (3):307–27. doi:10.1016/j.intfin.2010.11.002.

Djalilov, K., and J. Piesse. 2016. Determinants of bank profitability in transition countries: What matters most? *Research in International Business and Finance* 38:69–82. doi:10.1016/j.ribaf.2016.03.015.
Duffie, D., L. Saita, and K. Wang. 2007. Multi-period corporate default prediction with stochastic covariates. *Journal of Financial Economics* 83 (3):635–65. doi:10.1016/j.jfineco.2005.10.011.
Ekpu, V., A. Paloni, N. Wagner, and N. Wagner. 2016. Business lending and bank profitability in the UK. *Studies in Economics and Finance* 33 (2):302–19. doi:10.1108/SEF-04-2015-0097.
Entrop, O., C. Memmel, B. Ruprecht, and M. Wilkens. 2015. Determinants of bank interest margins: Impact of maturity transformation. *Journal of Banking & Finance* 54:1–19. doi:10.1016/j.jbankfin.2014.12.001.
Firth, M., W. Li, and S. Shuye Wang. 2016. The growth, determinants, and profitability of nontraditional activities of Chinese commercial banks. *The European Journal of Finance* 22 (4–6):259–87. doi:10.1080/1351847X.2013.791632.
Fungáčová, Z., and T. Poghosyan. 2011. Determinants of bank interest margins in Russia: Does bank ownership matter? *Economic Systems* 35 (4):481–95. doi:10.1016/j.ecosys.2010.11.007.
García-Herrero, A., S. Gavilá, and D. Santabárbara. 2009. What explains the low profitability of Chinese banks? *Journal of Banking & Finance* 33 (11):2080–92. doi:10.1016/j.jbankfin.2009.05.005.
Goddard, J. A., P. Molyneux, and J. O. S. Wilson. 2004. The profitability of European banks: A cross-sectional and dynamic panel analysis. *Manchester School* 72 (3):363–81. doi:10.1111/j.1467-9957.2004.00397.x.
Jacobson, T., J. Lindé, and K. Roszbach. 2005. Exploring interactions between real activity and the financial stance? *Journal of Financial Stability* 1(3):308–341. Sveriges Riksbank (Central Bank of Sweden).
Kanas, A., D. Vasiliou, and N. Eriotis. 2012. Revisiting bank profitability: A semi-parametric approach. *Journal of International Financial Markets, Institutions and Money* 22 (4):990–1005. doi:10.1016/j.intfin.2011.10.003.
Khieu, H. D., D. J. Mullineaux, and H.-C. Yi. 2012. The determinants of bank loan recovery rates. *Journal of Banking & Finance* 36 (4):923–33. doi:10.1016/j.jbankfin.2011.10.005.
Kosmidou, K., F. Pasiouras, and A. Tsaklanganos. 2007. Domestic and multinational determinants of foreign bank profits: The case of Greek banks operating abroad. *Journal of Multinational Financial Management* 17 (1):1–15. doi:10.1016/j.mulfin.2006.02.002.
Laeven, L., and G. Majnoni. 2003. Loan loss provisioning and economic slowdowns: Too much, too late? *Journal of Financial Intermediation* 12 (2):178–97. doi:10.1016/S1042-9573(03)00016-0.
Lassoued, N., H. Sassi, and M. B. R. Attia. 2016. The impact of state and foreign ownership on banking risk: Evidence from the MENA countries. *Research in International Business and Finance* 36:167–78. doi:10.1016/j.ribaf.2015.09.014.
Lee, C. C., and M. F. Hsieh. 2013. The impact of bank capital on profitability and risk in Asian banking. *Journal of International Money and Finance* 32 (1):251–81. doi:10.1016/j.jimonfin.2012.04.013.
Leung, W. S., N. Taylor, and K. P. Evans. 2015. The determinants of bank risks: Evidence from the recent financial crisis. *Journal of International Financial Markets, Institutions and Money* 34:277–93. doi:10.1016/j.intfin.2014.11.012.
Louzis, D. P., A. T. Vouldis, and V. L. Metaxas. 2012. Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking & Finance* 36 (4):1012–27. doi:10.1016/j.jbankfin.2011.10.012.
Mamatzakis, E., and P. Remoundos. 2003. Determinants of Greek commercial banks profitability. *Spoudai* 53:84–94.
Mario, Q. 2007. Banks' riskiness over the business cycle: A panel analysis on Italian intermediaries. *Applied Financial Economics* 17 (2):119–38. doi:10.1080/09603100500486501.
Menicucci, E., G. Paolucci, M. M. Zain, and Z. Abdul Rasit. 2016. The determinants of bank profitability: Empirical evidence from European banking sector. *Journal of Financial Reporting and Accounting* 14 (1):86–115. doi:10.1108/JFRA-05-2015-0060.
Micco, A., U. Panizza, and M. Yanez. 2007. Bank ownership and performance. Does politics matter? *Journal of Banking & Finance* 31:219–41. doi:10.1016/j.jbankfin.2006.02.007.
Mirzaei, A., T. Moore, and G. Liu. 2013. Does market structure matter on banks' profitability and stability? Emerging vs. advanced economies. *Journal of Banking & Finance* 37 (8):2920–37. doi:10.1016/j.jbankfin.2013.04.031.
Molyneux, P., and J. Thornton. 1992. Determinants of European bank profitability: A note. *Journal of Banking and Finance* 16 (6):1173–78. doi:10.1016/0378-4266(92)90065-8.
Naceur, S., and M. Goaied. 2001. The determinants of the Tunisian deposit banks' performance. *Applied Financial Economics* 11 (3):317–19. doi:10.1080/096031001300138717.
Naceur, S., and M. Goaied. 2008. The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *Frontiers in Finance and Economics* 5 (1):106–30.
Naceur, S. B., and M. Omran. 2011. The effects of bank regulations, competition, and financial reforms on banks' performance. *Emerging Markets Review* 12 (1):1–20. doi:10.1016/j.ememar.2010.08.002.
Neely, M. C., and D. C. Wheelock. 1997. Why does bank performance vary across states?. *Federal Reserve Bank of St. Louis Reviews* 27–38, *March*.
Nguyen, J. 2012. The relationship between net interest margin and noninterest income using a system estimation approach. *Journal of Banking & Finance* 36:2429–37. doi:10.1016/j.jbankfin.2012.04.017.
Olson, D., and T. A. Zoubi. 2011. Efficiency and bank profitability in MENA countries. *Emerging Markets Review* 12 (2):94–110. doi:10.1016/j.ememar.2011.02.003.
Olszak, M., and M. Pipień. 2016. Cross-country linkages as determinants of procyclicality of loan loss provisions. *The European Journal of Finance* 22(11):1–20.
Pasiouras, F., and K. Kosmidou. 2007. Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance* 21 (2):222–37. doi:10.1016/j.ribaf.2006.03.007.
Pesaran, M. H., T. Schuermann, B.-J. Treutler, and S. M. Weiner. 2006. Macroeconomic dynamics and credit risk: A global perspective. *Journal of Money, Credit and Banking* 38 (5):1211–61. doi:10.1353/mcb.2006.0074.

Saghi-Zedek, N. 2016. Product diversification and bank performance: Does ownership structure matter? *Journal of Banking & Finance* 71:154–67. doi:10.1016/j.jbankfin.2016.05.003.
Saghi-Zedek, N., and A. Tarazi. 2015. Excess control rights, financial crisis and bank profitability and risk. *Journal of Banking & Finance* 55:361–79. doi:10.1016/j.jbankfin.2014.10.011.
Short, B. K. 1979. The relation between commercial bank profit rates and banking concentration in Canada, Western Europe, and Japan. *Journal of Banking & Finance* 3 (3):209–19. doi:10.1016/0378-4266(79)90016-5.
Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations Manuel Arellano Stephen Bond The Review of Economic Studies, 1 April 1991, 58 (2):277–297. doi:https://doi.org/10.2307/2297968.
Staikouras, C., and G. Wood. 2004. The determinants of European bank profitability. *International Business and Economics Research Journal* 3 (6):57–68.
Sun, P. H., S. Mohamad, and M. Ariff. 2017. Determinants driving bank performance: A comparison of two types of banks in the OIC. *Pacific-Basin Finance Journal* 42 (Supplement C):193–203. doi:10.1016/j.pacfin.2016.02.007.
Ting, H.-I. 2017. Financial development, role of government, and bank profitability: Evidence from the 2008 financial crisis. *Journal of Economics and Finance* 41(2):370–391.
Van Horen, N. 2007. Foreign banking in developing countries; origin matters. *Emerging Markets Review* 8 (2):81–105. doi:10.1016/j.ememar.2007.01.003.
Vicente, S., and S. Jesús. 2002. Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research* 22 (3):203–24. doi:10.1023/A:1019781109676.
Vo, X. V. 2015. Foreign ownership and stock return volatility – Evidence from Vietnam. *Journal of Multinational Financial Management* 30 (March). 2015:101–09. doi:10.1016/j.mulfin.2015.03.004.
Vo, X. V. 2016. Finance in Vietnam-an overview. *Afro-Asian Journal of Finance and Accounting* 6 (3):202–09. doi:10.1504/AAJFA.2016.079311.
Vo, X. V. 2018a. Bank lending behavior in emerging markets. *Finance Research Letters*. doi:10.1016/j.frl.2018.02.011.
Vo, X. V. 2018b. The role of bank funding diversity: Evidence from Vietnam. *International Review of Finance*. doi:10.1111/irfi.12215.