



Original Article

Impacts of COVID-19 on Vietnamese Bank Performance: The Role of Bank Diversification

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Abstract: Although the COVID-19 pandemic has been undisputedly found to exert negative impacts on bank performance in general and their traditional lending activities specifically, the strategy of banks to deal with such a problem is still an open question. Our study attempts to answer this question through an empirical analysis of the impacts of COVID-19 on bank performance and the role of bank diversification. Specifically, data of all listed commercial banks in Vietnam over the period from 2015 to 2021 are estimated by the two-step system GMM models. COVID-19 is confirmed to have negative impacts on bank profitability. Bank diversification is found to increase bank profitability over the entire study period. Additionally, the study contributes to the extant literature by offering evidence that bank diversification has helped preserve bank profitability during COVID-19. It is suggested that to deal with the worsened traditional lending activities, diversification towards non-interest activities is an effective strategy for banks to improve their performance.

Keywords: COVID-19, diversification, bank performance, Vietnam.

1. Introduction

From the first case in China at the end of 2019, COVID-19 was declared as a global pandemic by the World Health Organization (WHO) on March 11, 2020 (WHO, 2020). The

pandemic caused the worst economic recession on a global scale since World War II, leading to the negative 3.3% growth of world GDP in 2020 (World Bank, 2022). COVID-19 resulted in consumer spending cuts, job losses and decreases in firm profitability (Chetty et al.,

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2020). These negative economic impacts of COVID-19 were associated with tightened credit standards and lower credit demand from both firms and consumers (European Central Bank, 2020), thus affecting banks' traditional lending activities. Pessimism about the impacts of COVID-19 on banking performance is reflected in the stock prices of many countries; for example, the Nasdaq Bank Index fell continuously for two months from 3887.94 to 2136.63 points (from February 5 to March 23, 2020) (Bloomberg, 2020a). The TOPIX Bank Index also saw a plummet from 149.89 to 106.98 points (from January 6 to March 23, 2020) (Bloomberg, 2020b).

The impacts of COVID-19 on the bank performance of emerging economies tend to be more detrimental than the impacts on advanced economies, due to smaller firms' capitalization and weaker households' financial resources (Abbas et al., 2021), along with under-developed technology and infrastructure (Kozak, 2021). The banking system, with its paramount importance in the economy, also suffered stronger and longer-lasting impacts on its performance than corporates and non-bank financial institutions as the banking system absorbed the shocks from COVID-19 in other sectors (Demirgüç-Kunt et al., 2021).

In Vietnam, GDP growth was dragged back to only 2.9% in 2020 compared to the 7.0% of the previous year (World Bank, 2022). Commercial banks, as the bloodstream of Vietnam's economy (Asian Development Bank, 2015), also experienced significant disturbances in their performance during the COVID-19 pandemic.

This study aims to investigate the impacts of COVID-19 on bank performance in Vietnam by conducting empirical research on bank profitability before and after the pandemic. Moreover, given the tightened credit and reduced demand for loans and thus the consequential negative impacts on banks' traditional lending activities, we examine the role of bank diversification in absorbing such negative impacts. By definition, bank

diversification is the shifting away from interest-income generating activities towards non-interest, fee and commission sources of income. In recent years, commercial banks in Vietnam have increasingly been engaged in diversification because of a more liberalized economy, technological adoption and fierce competition (Luu et al., 2019). To the best of our knowledge, this is the first attempt to study the role of bank diversification on bank performance during COVID-19. Thus, this study augments the literature by examining not only the impacts of COVID-19 on bank performance before and after the COVID-19 pandemic, but also the role of bank diversification in preserving bank profitability during the pandemic.

The remainder of this study is organized as follows. Section 2 presents the literature review on the impacts of COVID-19 on bank performance and the role of bank diversification. Section 3 discusses the data and methodology. Section 4 presents results' analysis and discussion. Section 5 concludes the study.

2. Literature review

2.1. Impacts of COVID-19 on bank performance

As COVID-19 is more than a health crisis with far-reaching and long-term economic consequences, its impacts on the economy present a heated topic for the recent literature. The impacts of COVID-19 on bank performance are also a matter of significant prominence. Strong evidence was found in Elnahass et al. (2021) regarding the negative impacts of COVID-19 on banks in 116 countries, remarkably lowering their profitability and raising their default risk, liquidity risk and asset risk. Kozak (2021) indicated that banks in numerous European countries experienced higher levels of non-performing loans and as a result worsened profitability. Other studies investigating banks in developing countries also agreed that COVID-19 negatively impacted bank profitability and liquidity (Almonifi et al., 2021; Katusiime, 2021).

2.2. The role of bank diversification

A considerable number of researches have attempted to investigate the benefits and costs of diversification on bank performance. From theoretical viewpoints, diversification can bring additional sources of income while lowering risk exposure. Diversifying incomes leads to higher bank profitability from non-traditional fee-based revenues (Elsas et al., 2006). Banks also enjoy higher efficiency thanks to economies of scope (Meslier et al., 2014) and greater competitive advantages to enter new markets (Bodnar et al., 1997). In terms of risk reduction, the expansion of banks towards non-traditional activities seems to have stabilizing benefits for their overall earnings (Smith et al., 2003). By conducting numerous non-interest activities, banks benefit from the diversification of risks (Berger et al., 1999).

These benefits of diversification, however, have to be weighed against the related costs. Costs may arise from agency problems (Meyer et al., 1992), inefficient investment due to inefficient resource allocation (Rajan et al., 2000), and information asymmetry between headquarters and divisions (Harris et al., 1982). Additionally, some researches point out that diversification may lead to the increase in bank risks rather than risk reduction, due to the higher volatility of commission and fee-based earnings (Lepetit et al., 2008), increased operating costs and lack of management expertise (Berger et al., 2010). As such, there has been little consensus among the extant literature regarding the true benefits and costs of diversification on bank performance.

Empirical studies regarding the impacts of diversification on bank performance also yield somewhat mixed results. Among the literature investigating U.S. banks, Stiroh and Rumble (2006) found that non-interest activities are inherently more volatile and thus put bank profitability at risk of decreasing. Similarly, DeYoung and Roland (2001) stated that fee-based activities are associated with higher earnings volatility and higher leverage. Other studies examining European countries offer

evidence that revenue diversification leads to an increase in bank risks (De Jonghe, 2010; Fiordelisi et al., 2011). Utilizing Asian data, Lee et al. (2014) asserted that bank diversification helps increase bank profitability and also decrease risk, while Chen et al. (2018) indicated that diversifying away from traditional lending activities can have negative impacts on both bank profitability and asset quality. For commercial banks in Vietnam, there is also little consensus on the impacts of bank diversification on bank performance. Hoang et al. (2021) and Luu et al. (2019) found that diversification is positively associated with bank profitability. However, other studies reported the negative consequences of bank diversification on returns (Dang & Huynh, 2019; Ngoc Nguyen, 2019) and risk-adjusted returns (Xuan & Phuong, 2016).

The role of bank diversification on bank performance during COVID-19 is examined in Li et al. (2021), which indicates that noninterest revenues bring greater profitability to banks during this hard time.

3. Data and methodology

3.1. Model specification

Following Kim et al. (2020) and Luu et al. (2019), we investigate the impacts of COVID-19 on bank performance and the role of bank diversification by deploying the model as follows:

$$\begin{aligned}
 Performance_{it} = & \beta_0 + \beta_1 COVID_{it} + \\
 & \beta_2 Diversification_{it} + \beta_3 COVID * \\
 & Diversification_{it} + \beta_4 Size_{it} + \\
 & \beta_5 Loan\ Quality_{it} + \beta_6 Equity_{it} + \\
 & \beta_7 AssetGrowth_{it} + \mu_{it}
 \end{aligned} \tag{1}$$

in which $Performance_{it}$ is performance results of bank i in year t , proxied by return on assets (ROA) and return on equity (ROE) (following the literature such as Chiorazzo et al., 2008).

There are several important explanatory variables in this model. Firstly, $Covid_{it}$ is a dummy variable taking a value of 1 if it is the year 2020 and 2021 with the COVID-19

pandemic and 0 if otherwise. Secondly, $Diversification_{it}$ captures the level of bank income diversification, measured by one minus Herfindahl-Hirschman index (HHI) (Edirisuriya et al., 2019; Luu et al., 2019; Mercieca et al., 2007). HHI is the Herfindahl-Hirschman index that ranges from 0 to 1 for banks with zero diversification income to full diversification. Detailed discussion on the definition and measurement of $Diversification_{it}$ is presented in Subsection 3.2. Thirdly, $Covid * Diversification_{it}$ is the variable measuring the level of bank diversification in the years with COVID-19. It is worth noting that the inclusion of those three explanatory variables ($COVID$, $Diversification$, $COVID * Diversification$) follows the conventional practices in empirical studies to employ the dummy variable, the continuous variable and the interaction of both (Kim et al., 2020; Luu et al., 2019). This enables our study to investigate the channel of the impacts of COVID-19 on bank performance, specifically the role of bank diversification.

The model also incorporates numerous control variables that can affect bank performance as in the previous literature (Chiorazzo et al., 2008; Luu et al., 2019). $Size_{it}$ measures bank size as calculated by the natural logarithm of total assets. $Loan\ Quality_{it}$ is captured by the ratio of non-performing loans over total loans. $Equity_{it}$ evaluates bank equity capital by the ratio of total equity over total assets. $AssetGrowth_{it}$ captures the growth rate of bank assets year by year.

To assess the impacts of COVID-19 on bank performance and the role of bank diversification, one of the biggest empirical challenges is the endogeneity of the diversification-performance nexus (Elsas et al., 2006). The endogeneity problem may stem from reverse causality, as both high and low performance can encourage banks to diversify (Miller, 2004). High-performing banks have better profitability and a larger customer base to expand. Low-performing banks may be forced to engage in non-traditional activities due to highly competitive pressure in traditional banking activities. Additionally, the

endogeneity issue may present in the form of an omitted variable bias. Several factors that may have impacts on bank performance are not included in the research model due to data unavailability, including board diversity (García-Meca et al., 2015), risk-management corporate governance (Aebi et al., 2012) and bank supervisory framework (Barth et al., 2003). In an attempt to deal with such an endogeneity problem, model (1) is estimated using a two-step GMM panel methodology.

Moreover, the two-step system GMM estimator is deployed to estimate model (1) because such an estimator is suitable for dynamic panel data sets characterized by many individuals (banks) relative to the time (years) (Roodman, 2009) and where variables exhibit certain time-invariant characteristics. The system GMM estimator is preferred over the first difference GMM estimator (Arellano and Bond, 1991) for an unbalanced panel data set (Roodman, 2009). Additionally, as an attempt to determine the suitability of the two-step system GMM estimator, the study employs three diagnostics tests: (i) the Arellano-Bond test of the first-order serial correlation in the first-differenced error term – AR(1); (ii) the Arellano-Bond test of the second-order autocorrelation in the first differenced error term – AR(2); and (iii) the Sargan/Hansen test of over-identifying restrictions. The estimation results are reported in Table 3, which indicate the suitability of system GMM.

3.2. The measurement of diversification

The $Diversification_{it}$ index for each bank is computed as one minus HHI, specifically:

$$Diversification_{it} = 1 - HHI$$

$$= 1 - \left[\left(\frac{Noninterest\ income_{it}}{Total\ operating\ income_{it}} \right)^2 + \left(\frac{Interest\ income_{it}}{Total\ operating\ income_{it}} \right)^2 \right]$$

HHI measures the level of diversification by subdividing total operating income into two components of traditional interest income and

non-interest income (Luu et al., 2019). As such, the $Diversification_{it}$ takes a minimum value from zero (representing a bank with totally no other income besides the traditional interest income) to the maximum value of four (representing a bank with an income structure wholly stemming from non-interest income).

The measurement of $Diversification_{it}$ is based on the calculation of total operating income and its categorization into interest and non-interest income. Such data is available in the audited financial statements of listed banks. Specifically for this study, interest income is generated from the lending activities of the banks, while non-interest income is resulted from fees and commissions, foreign currency and gold trading, security trading, security investment and other non-credit activities.

3.3. Data and sample

This study utilizes the FiinPro database to investigate 19 listed commercial banks in Vietnam over the period from 2015 to 2021, including the years of 2020 and 2021 when the COVID-19 pandemic exerted its economic impacts. The data is winsorized to eliminate outliers. The final sample consists of 133 bank-year observations.

4. Result analysis and discussion

4.1. Descriptive statistics

Table 1 presents the descriptive statistics of all variables. It can be seen from the table that on average banks earn 13.5% of ROE and 1.1% of ROA. Commercial banks in Vietnam engage in a moderate level of non-traditional bank activities, as indicated by the average value of 0.309 for the Diversification index. Regarding bank size and equity, the mean values are 33.153 and 0.079, respectively. On average, bank assets grew by 16.4% yearly.

The correlation matrix of all variables are reported in Table 2. It shows that most of the correlation coefficients among independent

variables are relatively low, indicating that a multicollinearity problem is not a significant issue that may affect the empirical results of this study.

4.2. Empirical analysis

Table 3 presents the empirical results for the impacts of COVID-19 on bank performance and the role of bank diversification. Columns 1 and 2 show the results of models employing ROE and ROA as dependent variables, respectively, with lagged ROE and ROA included in the independent variables. Strong empirical results are found for the negative impacts of COVID-19 on lowering bank profitability, which are consistent with previous literature (Almonifi et al., 2021; Elnahass et al., 2021; Katusiime, 2021; Kozak, 2021). Regarding the role of bank diversification, it is found that diversifying bank income tends to improve profitability, which augments the literature on the benefits of bank diversification (such as Elsas et al., 2006 and Lee et al., 2014). The most interesting result is perhaps the highly significant and positive impacts of diversification activities conducted by banks during COVID-19 on their profitability. It is indicated that during COVID-19 the non-interest income helped offset the negative impacts of the pandemic by improving both ROE and ROA. The possible explanation for this is that banks engaged in non-traditional activities as an attempt to cope with tightened credit standards, a decrease in firm performance and low credit demand affecting their traditional bank lending activities. This result is consistent with Li et al. (2021) which also indicates that bank diversification brought greater profitability to banks during COVID-19, and Quyen et al. (2021) who found the positive impacts of diversification on bank performance during a financial crisis.

In terms of other bank-specific control variables, the coefficients of *Loan Quality* are negative, indicating that a higher level of non-performing loans decreases bank profitability. In contrast, *Asset Growth* is positively associated

with bank profitability, suggesting that higher asset investments help improve bank incomes.

Finally, Equity is negatively associated with ROE, which is true by definition.

Table 1: Descriptive statistics

| | N | Mean | Sd | 25th | Median | 75th |
|-----------------|-----|--------|-------|--------|--------|--------|
| ROE | 133 | 0.135 | 0.079 | 0.075 | 0.127 | 0.207 |
| ROA | 133 | 0.011 | 0.008 | 0.006 | 0.008 | 0.017 |
| COVID | 133 | 0.286 | 0.453 | 0.000 | 0.000 | 1.000 |
| Diversification | 133 | 0.309 | 0.128 | 0.242 | 0.328 | 0.394 |
| Size | 133 | 33.153 | 0.875 | 32.459 | 33.029 | 33.654 |
| Equity | 133 | 0.079 | 0.027 | 0.059 | 0.073 | 0.094 |
| Loan Quality | 133 | 0.017 | 0.010 | 0.011 | 0.016 | 0.020 |
| Asset Growth | 133 | 0.164 | 0.112 | 0.103 | 0.159 | 0.212 |

Source: Author's calculation.

Table 2: Correlation matrix¹

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------------|--------|--------|--------|--------|--------|--------|--------|---|
| 1 ROE | 1 | | | | | | | |
| 2 ROA | 0.871* | 1 | | | | | | |
| 3 COVID | 0.257* | 0.316* | 1 | | | | | |
| 4 Diversification | 0.266* | 0.335* | 0.219 | 1 | | | | |
| 5 Size | 0.419* | 0.277* | 0.254* | 0.358* | 1 | | | |
| 6 Equity | 0.200 | 0.589* | 0.181 | 0.377* | -0.105 | 1 | | |
| 7 Loan Quality | -0.203 | -0.102 | -0.118 | 0.247* | -0.059 | 0.158 | 1 | |
| 8 Asset Growth | 0.294* | 0.278* | -0.025 | -0.111 | -0.013 | -0.053 | -0.009 | 1 |

Source: Author's calculation.

Table 3: Empirical results

| | (1) | (2) |
|------------------------|----------------------|---------------------|
| | ROE | ROA |
| COVID | -0.229*** (0.063) | -0.015** (0.006) |
| Diversification | 0.730** (0.287) | 0.053** (0.021) |
| COVID* Diversification | 0.648*** (0.162) | 0.044*** (0.014) |
| Size | -0.032 (0.031) | -0.003 (0.002) |

¹ To examine the potential multicollinearity issue, the Variance Inflation Factor (VIF) is computed for the variables, generating all VIF values well below 5. Thus,

multicollinearity is presumably not a significant issue of this study. The VIF results are available upon request.

| | | |
|---|----------|-----------|
| Equity | -1.515* | -0.086 |
| | (0.820) | (0.088) |
| Loan Quality | -2.856** | -0.204*** |
| | (0.993) | (0.069) |
| Asset Growth | 0.139*** | 0.009* |
| | (0.041) | (0.005) |
| L.ROE | 0.461** | |
| | (0.194) | |
| L.ROA | | 0.786*** |
| | | (0.247) |
| Constant | 1.067 | 0.098 |
| | (1.016) | (0.072) |
| Number of groups | 19 | 19 |
| AR(1) of first-differenced residuals (p-value) | 0.099 | 0.063 |
| AR(2) of first-differenced residuals (p-value) | 0.446 | 0.250 |
| Sargan test (p-value) | 0.012 | 0.024 |
| Hansen test (p-value) | 0.734 | 0.639 |
| Observations | 133 | 133 |

Notes: Robust standard error in parentheses.
*, **, ***Significant at 10, 5 and 1 percent levels, respectively.

Source: Author's calculation.

5. Conclusion

Although the COVID-19 pandemic has been undisputedly found to exert negative impacts on bank performance, the way banks deal with this issue is still open for question. In this study, we attempt to answer that question by an empirical research on the impacts of COVID-19 on bank performance and the role of bank diversification. The study utilizes data of all listed commercial banks in Vietnam for the 2015-2021 period and estimates two-step GMM models to yield reliable and consistent results. It is indicated from the regression analysis that COVID-19 is confirmed to have negative impacts on bank profitability. Bank diversification is found to increase bank profitability over the study period and even preserved the profitability during COVID-19. This study contributes to the current literature on the impacts of COVID-19 and benefits of bank diversification on bank performance in a crisis. To deal with the worsened traditional lending activities, banks

can engage further in non-interest activities to improve their performance.

However, this study is not without limitations. For example, there might be other indicators of bank performance (e.g. bank risks) that could be included in future studies. In addition, testing for alternative measurement of bank diversification and examining the non-linear relationship between bank diversification and bank performance are other interesting avenues for future research.

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