THE EFFECT OF COVID-19 PANDEMIC ON FIRMS: EVIDENCE FROM VIETNAM

Vo Thi Thuy Anh, Tran Nguyen Tram Anh*

The University of Danang - University of Economics

*Corresponding author: tramanhtn@due.edu.vn

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Abstract - This paper investigates the effect of the COVID-19 pandemic on firm performance, cash flows, cash holdings and leverage. Using quarterly data of 415 firms listed in the Vietnamese stock market, this study employs the *t*-test method to compare firms' outcomes between the two main periods, including the happening of COVID-19 period (from Q1-2020 to Q1-2021) and the normal period (from Q1-2010 to Q4-2019). The results show that the pandemic significantly impairs firm performance and its cash flows. In addition, firms are found to hold more cash and reduce their leverage ratios to combat the disease outbreak. This study also provides supportive evidence that the COVID-19 pandemic may not necessarily affect firms across industries equally.

Key words - The COVID-19 pandemic, firm performance, cash flows, cash holdings, leverage.

1. Introduction

As a part of the ongoing worldwide pandemic of coronavirus disease 2019 (COVID-19), Vietnam declared the first case of the country on 23 January 2020 and the disease transmission began to develop afterwards. However, during 2020, Vietnam successfully controlled the epidemic due to the national lockdowns in time [1]. In May 2021, Vietnam officially entered the pandemic when the Delta variant was discovered and caused a faster acceleration in new cases in Ho Chi Minh city. According to the Vietnamese Ministry of Health (MOH), by 31 December 2021, the pandemic has infected 1.7 million Vietnamese citizens and resulted in over 32 thousand deaths (Available at https://covid19.gov.vn).

The outbreak of COVID-19 pandemic has resulted in severe consequences for economic activities and social life [2, 3]. In the first quarter of 2020, the first round of COVID-19 in Vietnam, the national GDP was reported to grow slower than expected by 3.8 per cent [4]. Approximately 7.8 million workers lost their jobs because firms reluctantly employed staff-cutting strategies to survive [4]. Almost all stocks on the Vietnamese market suffered declining prices during the first quarter of 2020 [1].

From the firm perspective, the quarantine policy induced by COVID-19 has prohibited firms from carrying out their operations, which ultimately lowers their performance [5]. Using a sample of listed Chinese companies, Shen et al. [5] find that the COVID-19 outbreak has a significant negative impact on the performance of sampled firms. More recently, Bose et al. [6], Hu and Zhang [7] document that firms worldwide have experienced a serious decline in firm value/firm performance due to the COVID-19 pandemic. In addition, the adverse effect of the COVID-19 pandemic on firm performance is found to be less pronounced for firms with better sustainability performance [6] or in countries having better healthcare systems, more advanced financial systems, and better institutions [7]. In another paper, Golubeva [8] explores the impact of firm-, finance- and country-specific indicators on firm performance under the COVID-19 outbreak. Using a data set of 13 countries, the author finds that sector, size, participation in exports and market demand for firm's products are likely to impact company performance during this health crisis.

With regard to the Vietnamese market, as reported by Tan and Tran [9], 81 per cent of Vietnamese firms reported a reduction in sales in June 2020 compared to the previous year. Using quarterly data of 714 firms listed on the Vietnamese stock market, Dang, et al. [10] document that the average profit of sampled firms in Q1-2020 decreased by 35 per cent and 14.1 per cent, compared to that of Q4-2019 and Q1-2019, respectively.

Under tough restrictions induced by the COVID-19, all sectors have been affected by the pandemic, which is mainly reflected in the decline in stock prices, revenue and profits. However, the COVID-19 may not necessarily affect firms across industries equally. According to Bose, et al. [6], firms operating in the tourism or travel sectors have been seriously affected due to cuts in domestic and international flights as well as cancellations of business trips and holidays during the COVID-19 outbreak. Accordingly, transportation, catering, film and TV entertainment sectors are also the most affected industries since these companies are characterized by social contact and hence the implementation of the quarantine measures has resulted in job and incomes losses [11]. Based on these arguments, Shen, et al. [5] find that the negative impact of COVID-19 on firm performance is more pronounced in serious-impact industries. Dang, et al. [10] provide evidence that due to the COVID-19, the service sector and consumer goods sector experienced a high rate of reduction in its profit (37 per cent and 36 per cent, respectively) while the medical sector seems to have the lowest influence.

Using the sample of listed Vietnamese firms, we first examine the effect of COVID-19 on firm performance. Furthermore, we are then motivated to explore whether the COVID-19 outbreak affects firm cash flows, firm cash holdings and its leverage. This motivation is particularly relevant because the capital structure decisions and working capital management would change to help firms better cope with potential risks associated with the pandemic. Indeed, Vo, et al. [12] provide the first evidence

that firms tend to adjust their capital structure more quickly towards the target in the period following the outbreak of COVID-19. Furthermore, Qin, et al. [13] document that firms choose to increase the level of cash holdings during the COVID-19 to protect firms against sudden risks.

To address these research issues, we employ the *t*-test method to compare firm outcomes before and during the COVID-19 pandemic. We find that firms experience a reduction in performance (measured by ROA), lower leverage and cash flows but greater cash holdings during the COVID-19. We further examine whether firms from different sectors are affected by the COVID-19 equally. The results show that the pandemic and the resulting lockdowns affect different sectors in different ways.

Our study contributes to the literature in two ways. First, to our knowledge, this is the first study to provide evidence of the effect of COVID-19 on different aspects of firms including performance, cash flows, cash holdings and leverage, in the context of Vietnam. Second, our findings provide evidence to support Shen et al. [5] and Dang et al. [10] that the effect of COVID-19 varies across industries. Although Vietnam was recognized as a country that successfully contained the COVID-19 pandemic during the early stages, the ongoing waves of infections may destroy any effort of government and then the resilience of the economy. Accordingly, this study helps to reaffirm the negative effect of the COVID-19 pandemic on different aspects of firms, thereby raising the willingness of firm managers as well as policymakers to deal with the disease outbreak and its aftermath.

2. Data and methodology

Table 1. *Variables and definitions*

Variables	Acronyms	Definitions
Firm performance	ROA	Operating income after depreciation divided by the book value of total assets.
Cash flows	CFLOWS	Operating income before depreciation divided by the book value of total assets.
Cash holdings	CHOLDINGS	Cash and short-term investment divided by the book value of total assets.
Leverage	LEV	Sum of long- and short-term debt divided by the book value of total assets.

To explore the effect of the COVID-19 pandemic on firms listed in the Vietnamese stock market, this study employs quarterly financial data from Q1-2010 to Q1-2021 and makes the comparison between the two main periods, including, the happening of COVID-19 period (from Q1-2020 to Q1-2021) and the normal period (from Q1-2010 to Q4-2019). The financial firms, such as banks, securities companies, are removed from the sample due to their unique features. Additionally, firms are required to have relatively complete data on the variables of interest over the sampled period. This filtering process results in a sample of 415 listed firms with a total of 8,182 firm-quarter observations. All data and variables are obtained from Compustat. To eliminate the potential effects of outliers, all variables are winsorized at the 1st and 99th percentiles. Variable definitions are summarized in Table 1.

In this paper, the *t*-test method is adopted to address the research issues. The *t*-test is a type of statistical test, which is used to compare the mean of two groups to determine whether they are significantly different from one another. The reason for using the *t*-test method instead of the regression one is further discussed. First, the number of infected cases in Vietnam is relatively low (2,852 cases) (Author's calculation from https://covid19.gov.vn) during the observed period (from Q1-2020 to Q1-2021). However, the immediate nationwide lockdowns imposed by the Vietnamese government lead to severe consequences for individuals, businesses and the economy. Thus, the effect of COVID-19 on firms should not be examined by regressing the number of COVID-19 cases on the firm's output to avoid unreliable and biased estimates. In addition, it is worth noting that the lockdown periods occurred between quarters in 2020[1] whereas the financial data is obtained quarterly. This implies that the effect of health crisis on firms is impossibly examined according to the lockdowns. Thus, using the *t*-test method to compare firm outcomes between the happening of COVID-19 and the normal period is more appropriate in the context of our research.

3. Results

3.1. The effect of COVID-19 on firm performance, cash flows, cash holdings and leverage

Table 2 shows the average values and pairwise differences of key variables across the two subsamples, the happening of COVID-19 and the normal period. In line with Shen, et al. [5], Bose, et al. [6], Hu and Zhang [7], among others, the results show that firms suffer from a significant decrease in firm performance (measured by ROA) due to the COVID-19 pandemic. The mean of ROA is reported to drop from 0.020 in the normal period to 0.016 in the happening of COVID-19. This result lends support to the view of that the COVID-19 pandemic destroys firm performance.

In addition, as shown in Table 2, on the average basis, firms cash flows also significantly decline by 0.004 from 0.029 to 0.025 across the pandemic. The reduction in firm cash flows possibly result from the business closures due to the mass quarantine induced by COVID-19.

Notably, the difference in the level of cash holdings between the two observed periods appears to be positive (0.021) and significant at 1 per cent level. This result is consistent with [13] and indicates that firm managers tend to hold more cash during the COVID-19 pandemic to protect firms against sudden risks, such as cash flow disruption and limited access to external financing.

[1] According to Lai [14], until the end of 2020, Vietnam had announced three lockdown periods, including (i) on 13 February 2020, in Son Loi commune, Vinh Phuc province, (ii) on 30 March 2020 in Hanoi and (iii) on 28 July 2020 in Da Nang city.

Table 2. *The COVID-19 pandemic and firm performance, its cash flows, cash holdings and leverage*

	Normal period (N=7324)		Covid -19 period (N=858)		Difference	
	mean	sd	mean	sd		
ROA	0.020	0.02	0.016	0.02	-0.004***	(-5.20)
CFLOWS	0.029	0.02	0.025	0.02	-0.004***	(-4.23)
CHOLDINGS	0.108	0.11	0.128	0.13	0.021***	(5.05)
LEV	0.325	0.18	0.285	0.17	-0.040***	(-6.20)

Note: *t*-statistics in parentheses. Asterisks indicate significance at 0.01 (***), 0.05(**) and 0.1(*) levels.

Additionally, compared to the normal period, firms are likely to reduce their leverage by 4 per cent during the COVID-19 crisis to avoid bankruptcy. The logical explanation for this reaction is that high leverage ratios are associated with high financial costs. Thus, highly leveraged firms are likely to face a large burden of financial distress, which possibly leads to bankruptcy [15].

3.2. The effect of COVID-19 by industry

This section provides further analysis of the effect of COVID-19 on firm performance, cash flows, cash holdings and leverage. Sampled firms are grouped according to different nine industries based on the two-digit SIC codes and then the effect of COVID-19 is investigated by industry. Generally, the results reported in Tables 3, 4, 5 and 6 show that all industries have been affected by the pandemic; however, the effect seems to be relatively different across sectors. The following subsections discuss the results according to alternative firm outcomes and different industries.

3.2.1. The effect of COVID-19 on firm performance and cash flows by industry

Figures 1 and 2 present the mean values of ROA (as a proxy of firm performance) and firm cash flows across the pandemic by industry. In general, most industries have lower ROA and cash flows during the COVID-19, compared to the normal period.

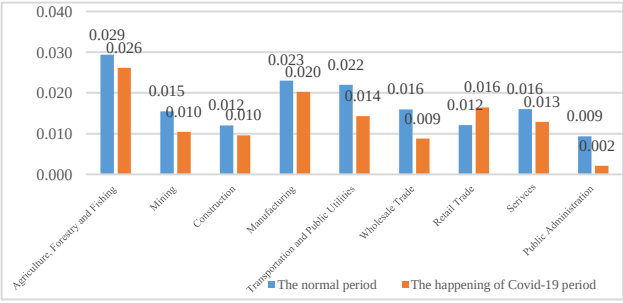

Figure 1. *The mean of ROA across the COVID-19 pandemic by industry*

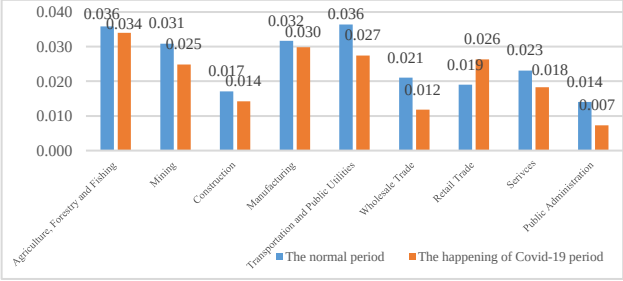

Figure 2. *The mean of firm cash flows across the COVID-19 pandemic by industry*

Table 3. *The effect of COVID-19 on firm performance by industry*

Industry	Obs	Difference in performance	
Agriculture, Forestry and Fishing	74	-0.003	(-0.35)
Mining	406	-0.005	(-1.24)
Construction	1021	-0.002	(-1.75)
Manufacturing	3992	-0.003**	(-2.58)
Transportation and Public Utilities	1587	-0.008***	(-4.38)
Wholesale Trade	292	-0.007*	(-2.14)
Retail Trade	112	0.004	(0.74)
Services	480	-0.003	(-1.10)
Public Administration	218	-0.007**	(-3.10)

Note: t-statistics in parentheses. Asterisks indicate significance at 0.01 (***), 0.05(**) and 0.1(*) levels.

Table 4. *The effect of COVID-19 on firm cash flows by industry*

Industry	Obs	Difference in cash flows	
Agriculture, Forestry and Fishing	74	-0.002	(-0.18)
Mining	406	-0.006	(-1.08)
Construction	1021	-0.003	(-1.64)
Manufacturing	3992	-0.002	(-1.48)
Transportation and Public Utilities	1587	-0.009***	(-4.19)
Wholesale Trade	292	-0.009*	(-2.20)
Retail Trade	112	0.007	(1.10)
Services	480	-0.005	(-1.50)
Public Administration	218	-0.007**	(-2.81)

Note: t-statistics in parentheses. Asterisks indicate significance at 0.01 (***), 0.05(**) and 0.1(*) levels.

However, Tables 3 and 4 indicate that the decline in firm performance and cash flows are only statistically significant for firms operating in the manufacturing, transportation and public utilities, wholesale trade and public administration sectors. For instance, the mean of ROA and cash flows for the transportation and public utilities are found to drop by 0.008 and 0.009 respectively at 1 per cent level of significance.

The significant reduction in firm performance and cash flows could be explained by the fact that these sectors are characterized by social contact, population mobility, and consumer and industry spending. Therefore, these firms are unable to remain fully its operations to obtain income and cash inflows during the social distancing periods.

3.2.2. The effect of COVID-19 on firm cash holdings by industry

Given cash being necessary for firm's daily operations, holding more cash helps firms survive during the tough time and cope with the rising rigid cost. Therefore, firms are found to have a higher level of cash holdings to prevent the sudden cash gap during the COVID-19 pandemic [13]. In support, Figure 3 and Table 5 show that the manufacturing, wholesale trade, retail trade and services are inclined to raise their cash holdings as a response to the COVID-19.

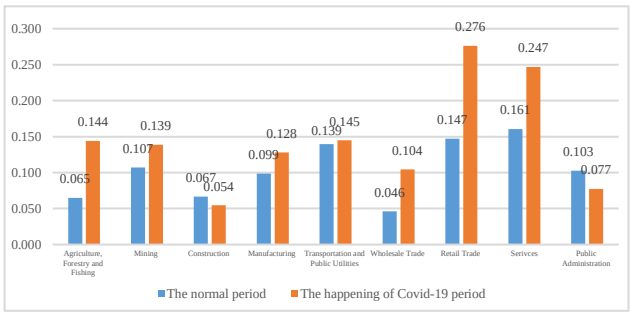

Figure 3. *The mean of firm cash holdings across the COVID-19 pandemic by industry*

Table 5. *The effect of COVID-19 on firm cash holdings by industry*

Industry	Obs	Difference in cash holdings	
Agriculture, Forestry and Fishing	74	0.079*	(2.42)
Mining	406	0.032	(1.26)
Construction	1021	-0.013	(-1.90)
Manufacturing	3992	0.029***	(5.36)
Transportation and Public Utilities	1587	0.006	(0.53)
Wholesale Trade	292	0.058**	(2.87)
Retail Trade	112	0.129***	(4.63)
Services	480	0.086***	(4.55)
Public Administration	218	-0.026	(-1.38)

Note: t-statistics in parentheses. Asterisks indicate significance at 0.01 (***), 0.05(**) and 0.1(*) levels.

3.2.3. The effect of COVID-19 on firm leverage by industry

Figure 4 provides comparisons of the mean value of firm leverage between the happening of COVID-19 period and the normal period by industry. Meanwhile, Table 6 presents the results obtained from the *t*-test method. It is evident that firms in the manufacturing, transportation and public utilities and agriculture, forestry and fishing have lower leverage during the COVID-19 outbreak, compared to the normal period. The results are consistent with that reported in Table 2 and support to the fact of that firms tend to reduce their leverage to avoid the possibility of bankruptcy due to the pandemic.

Table 6. *The effect of COVID-19 on firm leverage by industry*

Industry	Obs	Difference in leverage	
Agriculture, Forestry and Fishing	74	-0.218***	(-3.93)
Mining	406	0.014	(0.40)
Construction	1021	0.019	(1.27)
Manufacturing	3992	-0.061**	(-6.65)
Transportation and Public Utilities	1587	-0.068***	(-4.70)
Wholesale Trade	292	-0.015	(-0.33)
Retail Trade	112	0.008	(0.22)
Services	480	0.010	(0.50)
Public Administration	218	-0.027	(-0.86)

Note: t-statistics in parentheses. Asterisks indicate significance at 0.01 (***), 0.05(**) and 0.1(*) levels.

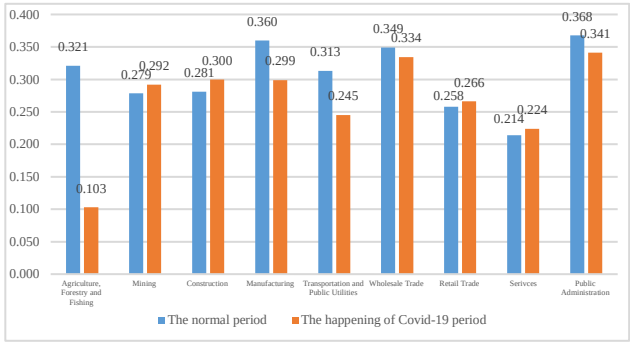

Figure 4. *The mean of firm leverage across the COVID-19 pandemic by industry*

3.3. Robustness checks

This section provides the details of robustness checks for the results reported in Tables 2 and 3. Specifically, firm performance is measured by ROE (return on equity) instead of ROA.

As shown in Table 7, compared to the normal period, sampled firms have lower ROE during the happening COVID-19 period. In addition, firms in the sectors of manufacturing, transportation and public utilities, wholesale trade and public administration, experience a significant decline in ROE while other firms do not. These results are consistent with those presented in Tables 2 and 3, indicating that the Covidd-19 pandemic harms the firm performance and its effect appears not to be similar across industries.

Table 7. *Robustness checks*

	Obs	Difference in firm performance (measured by ROE)	
Whole sample	8182	-0.014***	(-7.86)
By industry			
Agriculture, Forestry and Fishing	74	0.006	(0.44)
Mining	406	0.002	(0.14)
Construction	1021	-0.0167	(-1.20)
Manufacturing	3992	-0.012***	(-4.59)
Transportation and Public Utilities	1587	-0.023***	(-6.36)
Wholesale Trade	292	-0.017*	(-2.04)
Retail Trade	112	0.008	(0.49)
Services	480	-0.007	(-1.18)
Public Administration	218	-0.020**	(-3.08)

Note: t-statistics in parentheses. Asterisks indicate significance at 0.01 (***), 0.05(**) and 0.1(*) levels.

4. Conclusion

This study explores the effect of COVID-19 pandemic on firms listed in the Vietnamese stock market. A total of 8,182 firm-quarter observations from Q1-2010 to Q1-2021 and the *t*-test method are employed to address the research issues. Our results show that during the happening of COVID-19 period (from Q1-2020 to Q1-2021), sampled firms experience a significant decrease in their performance (measured by ROA and ROE), cash flows and leverage but a significantly higher level of cash holdings, compared to those prior to the pandemic (from Q1-2010 to Q4-2019). We also find that the effect of COVID-19 pandemic is different across industries.

Our results help to improve the understanding of the effect of COVID-19 on various aspects of firms in the context of Vietnam, the nation with different COVID-19 situations from other countries. From that, this study hopes to bolster the proactive preparedness and responses of Vietnamese regulators, policymakers and corporate decision-makers in curbing the pandemic outbreak and its consequences. In detail, the government should offer more subsidies and preferential policies to serious-impact industries to help them recover from the pandemic. For example, offering low and no-interest loans via public and private financial institutions, temporarily waiving or suspending collection of tax payments. To restore operations and protect their enterprises against the pandemic, managers need to change business operations or service delivery in time, for example, operating partially or teleworking, to access customers. Following on from this, the working patterns or work schedule should be more flexible to avoid layoffs and maintain business continuity.

Despite the significant contribution mentioned above, this, like all studies, has its own limitation. At the time of writing, COVID-19 cases continue to evolve at a rapid rate across the nation. However, the financial data is collected until Q1-2021 and that future analysis with the latest dataset (i.e., until Q2 and Q3-2021) might affect the conclusions drawn from our research.

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REFERENCES

[1] D. L. T. Anh and C. Gan, "The impact of the COVID-19 lockdown on stock market performance: evidence from Vietnam", *Journal of Economic Studies* vol. 48, no. 4, pp. 836-851, 2020, doi: 10.1108/JES-06-2020-0312.

[2] H. Bapuji, F. G. A. de Bakker, J. A. Brown, C. Higgins, K. Rehbein, and A. Spicer, "Business and society research in times of the Corona crisis", *Business & Society*, vol. 59, no. 6, pp. 1067-1078, 2020, doi: 10.1177/0007650320921172.

[3] H. Liu, X. Yi, and L. Yin, "The impact of operating flexibility on firms' performance during the COVID-19 outbreak: Evidence from China", *Finance Research Letters*, vol. 38, pp. 101808-101808, 2021, doi: 10.1016/j.frl.2020.101808.

[4] H. H. Nguyen, V. M. Ngo, and A. N. T. Tran, "Financial performances, entrepreneurial factors and coping strategy to survive in the COVID-19 pandemic: case of Vietnam", *Research in International Business and Finance*, vol. 56, p. 101380, 2021, doi: 10.1016/j.ribaf.2021.101380.

[5] H. Shen, M. Fu, H. Pan, Z. Yu, and Y. Chen, "The impact of the COVID-19 pandemic on firm performance", *Emerging Markets Finance & Trade*, vol. 56, no. 10, pp. 2213-2230, 2020, doi: 10.1080/1540496X.2020.1785863.

[6] S. Bose, S. Shams, M. J. Ali, and D. Mihret, "COVID-19 impact, sustainability performance and firm value: international evidence", *Accounting & Finance* 2021, doi: 10.1111/acfi.12801.

[7] S. Hu and Y. Zhang, "COVID-19 pandemic and firm performance: Cross-country evidence", *International review of economics & finance*, vol. 74, pp. 365-372, 2021, doi: 10.1016/j.iref.2021.03.016.

[8] O. Golubeva, "Firms' performance during the COVID-19 outbreak: international evidence from 13 countries", *Corporate Governance*, 2021, doi: 10.1108/CG-09-2020-0405.

[9] S. Tan and T. Tran. "Impacts of COVID-19 on firms in Vietnam. Results from the 1st round of COVID-19 Business Pulse Survey." https://openknowledge.worldbank.org/bitstream/handle/10986/34580/Results-from-the-First-Round-of-COVID-19-Business-Plus-Survey.pdf?sequence=1&isAllowed=y (accessed 1 September, 2021).

[10] N. H. Dang, T. T. V. Vu, and V. C. Le, "Covid 19 pandemic and abnormal stock returns of listed companies in Vietnam", *Cogent Business & Management*, vol. 8, no. 1, 2021, doi: 10.1080/23311975.2021.1941587.

[11] M. Fu and H. Shen, "COVID-19 and corporate performance in the energy industry", *Energy Research Letters*, vol. 1, no. 1-5, 2020, doi: 10.46557/001c.12967.

[12] T. A. Vo, M. Mazur, and A. Thai, "The impact of COVID-19 economic crisis on the speed of adjustment toward target leverage ratio: An international analysis", *Finance Research Letters*, 2021, doi: 10.1016/j.frl.2021.102157.

[13] X. Qin, G. Huang, H. Shen, and M. Fu, "COVID-19 pandemic and firm-level cash holding-moderating effect of goodwill and goodwill impairment", *Emerging Markets Finance & Trade*, vol. 56, no. 10, pp. 2243-2258, 2020, doi: 10.1080/1540496X.2020.1785864.

[14] C. M. P. Lai, "How COVID-19 impacts Vietnam's banking stocks: An event study method", *Banks and Bank Systems*, vol. 16, no. 1, pp. 92-102, 2021, doi: 10.21511/bbs.16(1).2021.09.

[15] J. Khoo, R. B. Durand, and S. Rath, "Leverage adjustment after mergers and acquisitions", *Accounting & Finance*, vol. 57, pp. 185-210, 2017, doi: 10.1111/acfi.12148.