


Does Financial Leverage Fit Firm Performance During the COVID-19 Pandemic: Evidence From Vietnam

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ABSTRACT

The paper aims to determine the effect of financial leverage on the performance of Vietnamese small and medium enterprises during the COVID-19 pandemic. Based on the agency theory and pecking order theory, combined with the quantitative method, the financial leverage and COVID-19 are statistically significant factors affecting the performance of small and medium enterprises in Vietnam. Significantly, the author emphasizes that financial leverage has a positive effect on the performance during the pandemic. Furthermore, there is the existence of homoscedasticity and no-autocorrelation in the model when using feasible general least squares. It confirms that the model estimation is unbiased and reliable.

KEYWORDS

Feasible General Least Squares, Financial Leverage, Performance, Small and Medium Enterprises, Vietnam

1. INTRODUCTION

Small and medium-sized enterprises (SMEs) are the fastest growing business sector in many countries, including developing countries, as evidenced by the fact that they are the growth engine of many economies, or least developed (Savlovski & Robu, 2011). The OECD estimates that SMEs make up 90% of businesses and employ 63% of the world's workforce (Munro, 2013). According to the Asian Development Bank-ADB (2016) report, SMEs account for a large proportion of the total number of businesses in a country, region, and globally, potentially employing more than 50% of the total. The number of social workers and large volumes of jobs for workers globally (up to 65%). Concerning economic growth, many statistical results worldwide show the critical role of SMEs in the economic growth of the region/country. SMEs contribute about 50% of GDP and represent many areas of business: 50% is distributive trade, 10% in manufacturing, 10% in services, and 30% in agriculture.

Many studies have identified numerous challenges confronting SMEs in a globalized environment (Subhan et al., 2013; Mwika et al., 2018). SMEs face various challenges, including a

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lack of funding, low productivity, a high regulatory burden, and limited human capital development (Tran & Nguyen, 2019). SMEs face several challenges in the emerging market, including a lack of managerial capabilities and difficulties accessing quality management and technology (Wafa et al., 2005; Mwika et al., 2018; Nguyen, 2019).

The importance of finance for the growth of SMEs, especially SMEs' financial structure, has not been studied commonly compared to the large firms (Kumar & Rao 2015). In fact, financial constraints have considerable effect on the annual growth of small firms (Beck & Demirguc-Kunt, 2006). Also, many studies demonstrated SMEs' important role in the economic development of countries. However, in terms of the empirical assessment, most of the studies looked at the performance of SMEs at the microeconomic (organizational) level, explaining the relationships of SMEs' performance with their internal environment factors or with a combination of internal and external factors.

This study's primary objective is to estimate the effect of financial leverage on the performance of SMEs in Vietnam from 2010 to 2020, a period of COVID-19 pandemic. The research question is formulated to accomplish this goal: "To what extent does financial leverage affect SMEs' performance in the Ho Chi Minh City area during the COVID-19 pandemic?"

2. LITERATURE REVIEW AND EMPIRICAL STUDIES

2.1 Literature Review

SMEs broadly include both micro and small and small enterprises. According to Muriithi (2017), there is no universally accepted small and medium-sized businesses definition. So, each country and organization have its own SMEs definition. Tewari et al. (2013) state that when identifying small and medium-sized businesses, they frequently use the following primary criteria: number of employees; annual revenue/assets/level of investment; and industry of operation (ownership).

The Small Business Administration (SBA) defines small and medium-sized businesses (SMEs) in the United States as those with fewer than 500 employees and annual revenue of less than \$7 million (for industry production revenue below 35.5 million). Similarly, Canada defines SMEs as businesses with fewer than 500 employees and annual revenue of less than \$50 million. The European Union defines SMEs as businesses with fewer than 250 employees and annual revenue of fewer than 50 million euros or a balance sheet total of fewer than 43 million euros. These countries and organizations classify small and medium-sized businesses based on their employee count and revenue/assets. Meanwhile, the World Bank classifies small and medium-sized businesses based on a broader range of loan size criteria. This organization defines small and medium-sized businesses as those with fewer than 300 employees, less than \$15 million in assets or annual sales, and a loan size of less than \$1 million (less than \$2 million in advanced countries). To define SMEs in the context of Vietnam, according to the Government's Decree 39/2018/ND-CP dated March 11, 2018, small and medium-sized enterprises are classified according to two sets of criteria: their field of operation and numbers of employees, annual revenue, and income; or/ and capital.

SMEs contribute significantly to economic and social cohesion by creating jobs and supporting national economic growth (Keskin, 2006; Muriithi, 2017; Kumar, 2017). SMEs contribute to the growth of private ownership and business skills, create jobs, are adaptable to changing market supply and demand conditions, diversify economic operations, and contribute significantly to export activity (Keskin, 2006). These enterprises have made significant contributions to socio-economic development in recent years in Vietnam. Small and medium-sized enterprises account for approximately 97 percent of all businesses in Vietnam, contributing more than 45 percent to the national GDP, about 30% of total budget revenue, and employing approximately 5 million people (Ministry of Planning and Investment, 2020). They create connections, exploitations, and mobilizations of their potential communities inextricably. Thereby, this is fostering a more competitive market and generating a positive spillover effect on the economy (Vu et al., 2020). SMEs will continue to play a critical

role in developing the national economy in the coming years, promoting innovation and innovation activities (Nguyen, 2019).

Theoretically, firm performance is defined as optimizing the organization's and stakeholders' profits to meet the needs of a group of affected individuals through the organization's activities (Nnamani et al., 2017). Measuring performance is critical in today's business management environment (Koufopoulos et al., 2008; Bititci et al., 1997), enabling managers to effectively monitor results, progress reports, and the accurate identification of business problems (Waggoner et al., 1999).

Business performance is measured by many different metrics based on three perspectives: accounting, marketing, and operations. However, for a long time, managers worldwide have used financial evaluation (from an accounting perspective) to represent corporate performance. Neely and Kennerly (2002) identify most techniques and methods for evaluating corporate performance based on financial aspects in use in the early 20th century. In this study, measuring firm performance, the authors use accounting-based. In addition, many researchers often use profitability indicators when measuring business efficiency, namely Return on Total Assets (ROA), Return on Equity (ROE), Return on sales (ROS), Return on investment (ROI), Gross profit margin, Operating Cash Flow (OCF). Among them, according to research by Al-Matari (2014), two indicators reflecting operational efficiency in terms of accounting are commonly used by many researchers are ROA (accounting for 46%) and ROE (accounting for 27%).

However, in this paper, the authors use ROE as a measurement of SMEs' performance. Because ROE is a two-part ratio that combines the income statement and balance sheet, and net income is compared to shareholders' equity. The figure represents the total Return on equity capital and demonstrates the firm's ability to profit from equity investments. In other words, it quantifies the profits generated by each dollar of shareholders' equity. A company has a high stable ROE that can be interpreted as demonstrating effective capital allocation. This ratio varies according to the size and risk appetite of the business.

2.2 Literature Reviews

2.2.1 Agency Theory

From the practical point of view, owners' constraints have related to management and operation ability (Quoc Trung, 2021). It is necessary to hire managers to deal with entity activities, including steadily increasing performance and earning per share (Kim, 2022). The managers' presence in the entity has accelerated the conflicts of interests between owners and managers (Shah, 2014). That is considered a platform of agency theory, found by Jensen and Meckling (1976) and developed later by Fama and Jensen (1983) (Quoc Trung, 2021). The core of this theory is the arrangement of conflicting interests through the separation of ownership and control of the organization (management rights).

Eisenhardt (1989) emphasized that an appropriate corporate governance system can reduce conflicts within the agency problem. Several mechanisms are used to reduce conflict in the owner-manager relationship, including Managerial ownership (Jensen & Meckling, 1976); executive compensation (Core, Holthausen, & Larcker, 1999); leverage ratio and debt (Friedman & Viswanath, 1994); the labor market (Fama, 1980); board of directors (Rosenstein & Wyatt, 1990); blockholders (Burkart, Gromb, & Panunzi, 1997); dividends (Jensen, 1986; Myers, 2000; Park, 2009); the market for corporate control (Kini, Kracaw, & Mian, 2004).

2.2.2 Pecking Order Theory

The pecking order theory was initially studied by Myers and Majluf (1984). The theory holds that managers prefer to finance investment opportunities using three sources: first through the firm's retained earnings, secondly through debt, and thirdly through equity financing. Ownership is the last resort. Hypotheses of the theory include: (i) information asymmetry exists between corporate managers and outside investors; (ii) the corporate administrator will act in the best interests of the current owners.

According to the theory, firms prefer to finance themselves with internal funds over external sources of capital. Firms will choose in a way that minimizes the cost of asymmetric information. The theory states that firms do not seek the optimal capital structure, instead, trying to determine an order of priority in selecting capital sources in the financing decision. The pecking order theory suggests that corporate managers will have an advantage over outside investors in knowing more information about the business's prospects, risks, and values. Again, the order of priority in the selection of capital sources includes (1) internal capital, (2) debts, and (3) owner-contributed capital.

However, some enterprises take advantage of the owner's capital to limit the default risks because cash flows will decrease during a downturn in the economy. Therefore, according to the pecking order theory, they take the priority selection of the internal capital (Ain, Jan, & Rafiq, 2011). Besides, the theory can predict the relationship between macro-economic factors and capital structure during a financial downturn (Frank & Goyal, 2009; Köksal & Orman, 2015).

According to Kalantonis, Kallandranis, and Sotiropoulos (2021), corporate finance theory points out the way enterprises determine their financial decisions. It means that the selection of the capital structure and the optimum capital structure is based on the theories proposed by Modigliani and Miller (1958, 1963), especially the trade-off theory and the pecking order theory. The former mentions the benefits of tax shields because of the construction in an optimal debt ratio, while for the latter, firms prefer a sequential choice of the funds.

Previous empirical studies have explored the effect of leverage on a firm's performance with different results. Chen (2004), Salawu (2007) show the reverse relationship, while Robb and Robinson (2014) give evidence to support the positive relationship between leverage and a firm's performance. However, other studies conclude that leverage is a statistically insignificant factor affecting a firm's performance (Brick & Ravid, 1985; Margaritis & Psillaki, 2010; Gill & Mathur, 2011).

2.3 Empirical Studies

Berger and Di Patti (2006) prove an increase in leverage leads to improved firms' profitability in the U.S banking sector. Also, Vätavu (2014) demonstrates the positive correlation between firm size and profitability, while debt to equity has a negative effect on profitability.

Mwangi and Murigu (2014) have investigated the determinants of firm performance listed on the Kenyan stock exchange. They have discovered a significant positive impact of equity capital, leverage, and management competence index on ROA.

Tsuruta (2015) investigates the relationship between leverage and firm performance of small businesses in Japan. The findings imply the difference effect of leverage on performance between large listed firms and small firms. Besides, the paper gives evidence that leverage can improve firm performance because leverage is considered the mechanism to assist a firm to avoid overinvestment with negative net present value.

Matar et al. (2018) examine the impact of macroeconomic and firm-specific factors (including financial leverage) on corporate performance. Their findings show that financial leverage has a positive effect on the firm value, measured by ROA.

Ibhagui & Olokoyo (2018) confirm with the companies with small sizes that there is a negative relationship between leverage and firm performance. However, the negative impacts decrease when the company has grown, at that point, the firm size becomes invisible in the relationship.

Tunyi et al. (2019) investigated the interconnections between firms' internal and external environments that influence corporate performance. Some variables include the ratio of cash flow from operating activities minus investment costs of fixed assets over total assets; leverage ratio; liquidity ratio; firm size; firm age; property plant and equipment; effective management; market size; GDP Growth; other national macroeconomic variables. Their findings confirm that (1) firms' internal capabilities (as measured by financial resource availability and growth prospects) are critical enablers of performance in both weak and strong institutional environments, (2) individual firms perform well in environments where their peers perform well, and (3) national governance quality

directly improves aggregate firm performance and, in turn, individual firm performance. The findings emphasized the critical role of financial resource availability and growth prospects at the firm level in determining corporate success in this challenging institutional environment.

Gharsalli (2019) explores the effect of leverage on SMEs' performance located in France. The findings show the negative relationship between leverage and firm performance. It means that firms with highly leveraged performance will perform poorly. Alo, Gharsalli (2019) points out the positive relationship between leverage and firm performance.

Vo and Tran (2021) examine the effect of COVID-19 on firm performance of 415 firms listed in the Vietnamese stock market. However, they do not address the effect of leverage on financial performance in their model.

During the COVID-19 pandemic, all businesses have gone down such as decreased revenue, or profits, and declined in stock market prices. Shen et al. (2020) find that the Covid-19 affect negatively on firm performance, especially, in tourism or travel sectors have to cuts in domestic and international flights (Bose et al., 2022) as well as transportation, catering, film, and TV entertainment sector also have income losses (Fu & Shen, 2020). According to Dang et al. (2021), the study highlights the significantly decreased income of both the service (with 37 percent) and consumer goods sectors (with 36 percent) during the pandemic outbreak. However, there are a few sectors that have been less impacted by the pandemic such as the medical sector or public company (Dang et al., 2021; Alsamhi et al., 2022).

2.4 Factors Affect SMEs' Performance

From the literature review and empirical studies, the paper focuses on the effect of financial leverage and COVID-19 of SMEs' performance with the other factors considered as control variables.

2.4.1 Financial Leverage

The leverage ratio indicates optimal capital structure, showing the extent to which, a business uses financial resources to support their activities (Dogan, 2013). Put in another way, the debt-to-assets ratio shows the proportion of assets financed by debt by comparing total liabilities (short-term and long-term debt) to total assets (Drake & Fabozzi, 2010). The ratio of total liabilities to total assets is referred to as leverage (Akhtar et al., 2012). It is considered a complement to equity holders' residual claims (Kim, 2022). When debt increases, leverage also increases (Maghanga & Kalio, 2014). This shows that the company employs leverage to gain more earnings on the fixed charges resources than the company cost. The extent of liabilities brings the greater motivation to improve the profit management based on the firm performance that affects the credit makers.

Onaolapo and Kajola (2010); Salim and Yadav (2012); Iavorskyi (2013) found that there is a relationship between leverage ratio and financial performance of a firm. However, depending on the circumstances of a particular country, the coefficient of linear expansion of leverage ratio on firm performance may be positive or negative.

In this paper, financial leverage is measured by total liabilities/total assets.

As a result, the author proposes the hypothesis 1 (H1) that leverage ratios have a positive effect on the performance of SMEs in Vietnam.

2.4.2 COVID-19

The COVID-19 pandemic has negative consequences for businesses around the world. A crisis impacts the operations and the capital structure and financing decisions of firms. The pandemic's rapid spread affects financial markets worldwide (Chen & Yeh, 2021). The entire world, including enterprises, consumers, and the economy, was forced to confront the COVID-19 pandemic (Chen & Yeh, 2021; Piccarozzi et al., 2021). Practically, the epidemic has severely impacted enterprises in all sectors and industries (Islam et al., 2020; Xu et al., 2021). Policies and efforts to control the ongoing

COVID-19 pandemic (Zhao & Feng, 2020) include lockdowns and social distance restrictions. As a result, the performance of firms decreases significantly, especially SMEs with potential constraints.

Besides, during the COVID-19 pandemic, all businesses have gone down such as decreased revenue, or profits, and declined in stock market prices. Inline, Shen et al. (2020) find that the Covid-19 affect negatively on firm performance, especially, in tourism or travel sectors have to cuts in domestic and international flights (Bose et al., 2022) as well as transportation, catering, film, and TV entertainment sector also have income losses (Fu & Shen, 2020). According to Dang et al. (2021), the study highlights the significantly decreased income of both the service (with 37%) and consumer goods sectors (with 36%) during the pandemic.

In this paper, COVID-19 is a dummy factor and takes the value of 1 if the year incurred COVID-19 pandemic, equals 0 otherwise.

As a result, the author proposes the hypothesis 2 (H2) that COVID-19 has a negative effect on the performance of SMEs in Vietnam.

2.4.3 Control Factors

- **Firm age:** According to Lumpkin and Dess (1996), Shane and Venkataraman (2000), younger firms are more proactive and have a more understanding about the risks associated with the various investment alternatives that arise, so they have more chances to improve their profits. Stierwald (2009) demonstrates the positive relationship between firm age and profitability. While Salman and Yazdanfar (2012); Mehari and Aemiro (2013) demonstrate that the firm age has an inverse relationship with profitability.

In this paper, firm age is measured by one plus the difference between the investigation year and the firm's birth year.

The proposed hypothesis is firm age affects SMEs' performance positively in Vietnam.

- **Firm size:** Dang, Li, and Yang (2017) analyze three firm size measures using natural logarithms: total assets, total sales, and market value of equity. According to Hall and Weiss (1967), firm size affects firm performance positively. Additionally, some authors confirm that an increase in firm size leads to a rise in profitability (Wyn, 1998; Gschwandtner, 2005). They argue that large firms have a greater capacity to benefit from economies of scale, diversify their activities and products, and increase their performance. According to Lee (2009), Vijayakumar and Tamizhselvan (2010), there is a direct connection between firm size and profitability.

In this paper, firm size is measured by the natural logarithm of total firm's assets.

Therefore, we suggest the following hypothesis is that firm size has a positive effect on SMEs' performance in Vietnam.

- **Liquidity ratio:** Liquidity measures a company's ability to meet its short-term obligations using the assets that can be converted into cash the quickest. The current ratio and the quick ratio are two of the most frequently used liquidity ratios (Drake & Fabozzi, 2010). According to Fama & Jensen (1983) and Myers & Rajan (1995), when firms have an excess of liquidity, managers can invest in projects that maximize their personal gains, reducing the firm's profitability. However, Ang (1991) concludes that excessive liquidity negatively influences SME profitability because of SMEs' ownership and management. Deloof (2003), Honjo and Harada (2006) have demonstrated the importance of liquidity on an increase in SMEs' performance.

In this paper, liquidity is measured by current ratio (current assets/ current liabilities).

From the above discussion, the hypothesis is proposed as follows: liquidity ratio affects SMEs' performance positively in Vietnam.

- **Fixed assets:** fixed assets refer to long-term tangible assets, such as premises, equipment, and machinery. Firms' productive capacity is enhanced through investment in these assets over the long term. This category of assets does not change frequently, and they are acquired to increase the productivity of sales and firm's performance. Therefore, assets play a significant role in determining a firm's performance (Olatunji & Adegbite, 2014). Pandey (1999) confirms that the fixed assets turnover ratio reflects a firm's efficiency in utilizing its fixed-asset investment. Additionally, it indicates the sufficiency of sales concerning capital expenditure on fixed assets. Khalid (2012) demonstrates a positive correlation between fixed assets and firms' performance. Moreover, according to Matar et al. (2018); Tunyi et al. (2019), investment on PPE is measured by cash flows from investment on fixed assets divided by total assets of SMEs, which has a positive effect on performance of firms.

In this paper, cash flows from investment on fixed assets divided by total assets is the measurement of fixed assets.

The hypothesis is proposed as follows: investment on fixed assets has an inverse relationship to SMEs' performance in Vietnam.

- **Gross domestic product (GDP):** GDP is a macro factor affecting organizations participating in the financial market. GDP growth is defined as the annual percentage growth of gross domestic product at market prices based on a constant local currency (Waqas et al., 2017). As a result, economic growth is positively related to net income (Pham, 2017). GDP has a significant positive effect on ROA's business performance (Matar et al., 2018). Hailegebriel (2016), Ngo and Nguyen (2020) confirm the effect of GDP on the performance of firms, including SMEs.

In this paper, GDP is taken from the website of the World Bank.

The hypothesis is proposed as follows: GDP has a positive relationship to SMEs' performance.

- **Inflation:** Inflation is another factor that has an effect on firms' performance significantly. The inflation rate represents the growth rate of the price level of the economy. Chaibi and Ftiti (2015) explored macroeconomic factors that have a powerful impact on the economic environment. Matar et al. (2018) observed an inverse relationship between inflation and the return on assets (ROA) of service and industrial enterprises in Jordan. Inline, Ehlers and Lazenby (2007), Sitharam and Hoque (2016) demonstrate that inflation hurts SMEs' performance.

In this paper, the inflation rate is taken from the website of the World Bank.

Therefore, the hypothesis is proposed as follows: inflation has a negative effect on SMEs' performance.

3. METHODOLOGY AND PROPOSED MODEL

3.1 Methodology

This study uses panel data that has been regressed using four methods: pooled OLS, FEM, REM, and FGLS. The fixed-effect model captures differences in the regression model's constant and intercept terms that vary across cross-sectional units. In this model, the intercept term represents the fixed firm effect. To determine which is the most appropriate regression method, the F test must be used (if the p-value of the FEM model is less than 5 percent, the FEM model is selected).

Individual effects are distributed randomly across cross-sectional units in a REM, and the regression model is specified with an intercept term representing an overall constant term to capture the individual effects (Seddighi, Lawler, & Kalos, 2000). The Hausman test is commonly used to determine whether to use a FEM or REM model (if the p-value of the Hausman test is less than 5 percent, then FEM is appropriate). Then, if the presence of heteroskedasticity or autocorrelation still exists in the model, the FGLS method is used to control and solve these defects. As a result, the estimation is reliable and unbiased.

3.2 Samples

The primary source of the data is taken from Ho Chi Minh Stock Exchange (HOSE). Information is wisely collected from 300 SMEs listed on the HOSE from 2010 to 2020. Out of the 180,000 SMEs in the city, 300 SMEs fully met the sample size criteria and were determined based on the following formula of Yamane (1967):

$$n = \frac{N}{1 + Ne^2}$$

- n : The number of samples to be determined for the study
- N : Population
- e^2 : The level of precision

As a result, all other listed firms for which did not meet the requirement were eliminated. The criteria included (1) revenues; (2) numbers of employees during the sample period.

3.3 Proposed Model

The proposed model is as follows:

$$roe_{it} = \alpha_0 + \alpha_1 leverage_{it} + \alpha_2 COVID - 19_t + \sum_{k=3}^m \alpha_k control\ factors_{it} + \varepsilon \quad (1)$$

The dependent variable used for the study is firm performance measured by an accounting-based measurement; Return on equity (ROE) is defined as the Net Income divided by total owner's equity.

The proposed model [1] will be modified as follows:

$$roe_{it} = \alpha_0 + \alpha_1 lev_{it} + \alpha_2 covid_t + \alpha_3 age_{it} + \alpha_4 size_{it} + \alpha_5 liq_{it} + \alpha_6 ppe_{it} + \alpha_7 gdp_{it} + \alpha_8 inf_{it} + \varepsilon \quad (2)$$

where:

- roe_{it} : Return on equity of firm i at time t .
- lev_{it} : Financial leverage ratio of firm i at time t .
- $covid_t$: COVID-19 for the year to occur.
- age_{it} : Firm age at time t .
- $size_{it}$: Firm size at time t .
- liq_{it} : Liquidity ratio of firm i at time t .
- $ppet$: Leverage ratio of firm i at time t .
- gdp_{it} : Gross domestic product growth at time t .
- inf_{it} : Inflation rate at time t .

4. RESEARCH, RESULTS, AND DISCUSSIONS

The first section in this part presents the descriptive statistics analysis for all factors in model [2]. The descriptive statistics analysis includes the value of Mean, Minimum and Maximum.

Table 2 shows the statistics descriptive for all variables in the model. Return on equity (roe) has a mean value of 0.07 while its maximum is 25.72 and the minimum value is -14.81. Regarding the financial leverage factor, its minimum value and maximum value are in order of 0.01; 16.49. Hence, the mean value is 0.48.

For the covid factor, because it is a dummy factor, it receives two values of 0 and 1. The minimum value of this factor equals 0, which means that the years have no COVID-19, otherwise it equals 1. Practically, the COVID-19 is a global outbreak and has spread rapidly across Vietnam since December 2019. In 2020 and forgoing, it still exists and becomes serious problem to society and economy in Vietnam and other countries.

In the regression model, the correlation between independent variables implies multicollinearity that can influence the accuracy and reliability of the results. So, this phenomenon needs to be tested.

The multicollinearity phenomenon occurs when two or more predictors in the model are correlated (Quoc Trung, 2021). Multicollinearity was measured by variance inflation factors (VIF) and tolerance (Nguyen Kim et al., 2022). According to Hair et al. (2011), if the VIF value exceeds 4.0

Table 1. Statistics descriptive

Variable	Obs	Mean	Min	Max
roe	1,715	0.07	-14.81	25.72
age	1,715	1.96	0.69	3.83
size	1,715	25.88	20.04	30.03
lev	1,715	0.48	0.01	16.49
liq	1,715	32.65	0.01	26674.52
ppe	1,715	0.17	0.01	0.95
gdp	1,715	0.06	0.05	0.07
inf	1,715	0.06	0.01	0.19
covid	1,715	0.10	0.00	1.00

Table 2. VIF

Variable	VIF	1/VIF
age	1.77	0.57
gdp	1.59	0.63
inf	1.49	0.67
covid	1.19	0.84
lev	1.03	0.97
ppe	1.02	0.98
liq	1.01	0.99
size	1.01	0.99
Mean VIF	1.26	

or tolerance less than 0.2, there is a multicollinearity problem. However, some other authors argued that multicollinearity would occur when the VIF value exceeds 10 (Montgomery et al., 2001). In this paper, VIF is less than 4.0, hence in the model, the estimates of regression coefficients are reliable and stable (Table 2). It means that there is a free of multicollinearity in the research model. The next section of this paper will show the results of testing for autocorrelation and heteroskedasticity.

The p-value is 0.0032, which is less than 5%. Therefore, we have enough evidence to reject H0. Hence, the model contains an autocorrelation phenomenon (Table 3).

Besides, regarding the heteroskedasticity test, p-value is 0.000, which is less than 5%. Therefore, we have enough evidence to reject H0. Hence, the heteroskedasticity phenomenon exists in the model (Table 4).

Multiple regression analysis reveals the relationship between several independent or explanatory variables and a dependent variable. Ayele (2012) also examined the effect of determinants on companies' profitability using Classical linear regression. The author will perform regression methods sequentially pooled OLS, FEM, and REM, and corresponding tests such as the F-test, Hausman test, and Breusch and Pagan Test to choose between pairs of models pooled OLS-FEM; FEM-REM; pooled OLS-REM.

As shown in Table 5, the FEM model is suitable for the research model. However, heteroskedasticity still exists in FEM (Modified Wald test for GroupWise heteroskedasticity). Therefore, we use feasible generalized least squares (FGLS) to obtain reliable and unbiased results.

From the results in Table 6, there are six statistically significant variables, including financial leverage, COVID-19, firm age, firm size, gross domestic product, and inflation rate. Also, using FGLS estimation, disturbances are said to be homoscedastic and have no autocorrelation. It means that the estimated results are reliable and unbiased.

In the paper, we have estimated the direct linkage between financial leverage on SMEs' performance in Vietnam because of the positive coefficient (0.0361). The findings are in line with the proposed hypothesis and previous empirical studies, such as Ruland and Zhou (2005), Govindasamy and Chandrakumarmangalam (2010), Robb and Robinson (2014), Salim and Yadav (2012), Iavorskyi (2013). They argue that leverage offers significant benefits when returns exceed average interest costs. In addition, their earlier studies by Modigliani and Miller (1963) and Jensen (1986) confirm profitable firms use leverage to signal quality and that increases in leverage are followed by increased profitability.

Table 3. Test for autocorrelation in panel data

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
$F(1, 171) = 0.019$
Prob > F = 0.0032

Table 4. Test for heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
H0: Constant variance
Variables: fitted values of roe
$\chi^2(1) = 595.40$
Prob > $\chi^2 = 0.0000$

Table 5. Regression results (pooled_OLS, FEM, REM)

Test	F	Hausman Test	Breusch and Pagan test
Selection	OLS & FEM	FEM & REM	OLS & REM
Hypothesis	Null hypothesis:	Hausman test: the null hypothesis is that the preferred model is random effects (Greene, 2008).	The null hypothesis in the L.M. the test is that variances across entities is zero.
	OLS model: $y_{it} = a + b'X_{it} + \varepsilon_{it}$ and alternative the FE model: $y_{it} = a + b'X_{it} + \alpha_i + \varepsilon_{it}$		
	(Robert, 2009).		
p-value	Prob > F = 0.0000	Prob>chi2 = 0.0000	Prob > chibar2 = 1.0000
α	5%	5%	5%
Action	Reject H0	Reject H0	Accept H0
Selection	FEM	FEM	REM
Conclusion	FEM is chosen.		

Table 6. Regression from the GLS method

Factor	Coef.	P>z	Hypothesis
lev	0.0361	0.0000***	Accept
covid	-0.0153	0.0418*	Accept
age	0.2793	0.0000***	Accept
size	0.3512	0.0000***	Accept
liq	-0.0001	0.2330	Reject
ppe	0.1200	0.5550	Reject
gdp	0.9336	0.0000***	Accept
inf	0.2883	0.0000***	Accept

legend: * p<.05; ** p<.01; *** p<.001

Note: roe is return on equity (dependent factor); lev is financial leverage; covid is COVID-19; age is firm age; size is firm size; liq is liquidity ratio; ppe is fixed assets; gdp is gross domestic products; inf is inflation rate

Besides, the findings show that an unpredictable and uncontrollable external factor that has a statistically significant adverse effect on the performance of SMEs in Vietnam is COVID-19. Other factors remain constant when COVID-19 rises by one unit, leading to a decrease in SMEs' performance in Vietnam by 0.0153 units. The results are in line with the studies by Fu and Shen (2020), Islam et al. (2020), Shen et al. (2020), Xu et al. (2021), Bose et al. (2021), Dang et al. (2021).

According to the results, firm age positively affects SMEs' performance. The findings are in line with Lumpkin and Dess (1996), Shane and Venkataraman (2000), Stierwald (2009), Akinyomi and Olagunju (2013), Halil and Hasan (2012). Besides, firm size is demonstrated to have a direct effect on the performance of SMEs in Vietnam. This relationship is confirmed by the studies by Hall and Weiss (1967), Winter (1994), Hardwick (1997), Gschwandtner (2005). An interesting issue is that firm age and size are statistically significant and positively affect SMEs' performance. The results are based on the studies by Meyer, Tran, and Nguyen (2006); Aidis, Estrin, and Mickiewicz (2008); Du and Girma (2012); Giordani (2015). The positive coefficient implies that an increase in the two factors leads to a rise in SMEs' performance, and inversely. However, because young and small businesses

have yet to amass sufficient resources to build operational capability, their profitability cannot be improved. Besides, the young and small firms must deal with a severe asymmetrical information problem. Hence, they cannot enhance their success in creating profitability

Furthermore, GDP is another macroeconomic factor considered in this study, and its prominence may be attributed to recent performance issues (Alabdullah et al., 2014). Thus, most theoretical predictions are consistent with the empirical findings that GDP positively affects both firm performance indicators. Besides, due to GDP's comprehensive representation of the entire economic landscape, it is frequently referred to as a pertinent indicator for any economic element. As a result, a GDP that is strong and stable is conducive to achieving superior firm performance. Besides this, Ehlers and Lazenby's (2007) emphasize inflation and GDP with the scope of research distinguished from country-specific research. Inflation has a detrimental effect on small businesses. Increased demand will impede the growth of small and medium-sized businesses (Ehlers & Lazenby, 2007). According to Anyanwu (2001), the fact that the economy is in a state of inflation. The numbers above indicate that a higher percentage of the budget must be allocated to locally produced goods to remain in order for the economy to remain viable over time when demand exceeds supply. Because it results from both private and public sector spending and short-term losses, increased production may result in price increases. Increases in prices in this manner will result in inflation unless they are carefully managed. The GDP, inflation rate, and national governance quality are statistically significant variables that positively affect SMEs' performance. The result is consistent with the studies by Issah & Antwi (2017); Matar et al. (2018); Pervan et al. (2019). So, GDP and inflation can indeed enhance SMEs' performance. Research has found that economic growth helps the development of SMEs' profitability. Meanwhile, the inflation rate is a significant benefit to small and medium-sized businesses (Beck et al., 2005; Ajagbe, 2012) by allowing them to adjust the price of goods while holding operating expenses constant.

5. CONCLUSION AND LIMITATIONS

This paper explores six statistically significant factors that positively affect SMEs' performance by using the quantitative method (FGLS). These factors include financial leverage, COVID-19, firm age, firm size, GDP, and inflation rate. In addition, the model is free of autocorrelation and heteroscedasticity because of implementing FGLS estimation. As a result, the findings are reliable and unbiased. In particular, the paper highlights the effect of financial leverage on SMEs' performance in Vietnam during the COVID-19 pandemic. Although COVID-19 occurred at the end of 2019, its influence on the firm's performance still has a delay because it has threatened the survival of the tourism and entertainment industries.

However, along with emphasizing the study's contribution, it is necessary to be concerned about some limitations. First, the paper focuses on the listed SMEs in HOSE, limiting the sample size. Second, the model leaves out some macroeconomic factors, like the unemployment rate, the exchange rate, and general government spending, among others. Finally, the research still does not classify specific sectors, because in each sector they get the different impacts of the COVID-19 pandemic. Especially, the service sector takes an immediate impact on firm performance, such as tourism and hospitality sectors, while the manufactured sector takes later pandemic impacts because of supply chain issues such as exhausted inputs resources.

CONFLICT OF INTEREST

The author declares that there is no conflict of interests regarding the publication of this manuscript.

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