The Review of Contemporary Scientific and Academic Studies
An International Multidisciplinary Online Journal
www.thercsas.com

ISSN: 2583-1380 Vol. 2 | Issue 10 | October 2022 Impact Factor: 4.736 (SJIF)

Debt Financing and Firm Performance: Evidence from Vietnam

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 Crossref/DOI: https://doi.org/10.55454/rcsas.2.10.2022.001

Abstract: *This paper examines the effect of debt financing on firm performance using a dataset created out of 352 firms listed on Vietnam's stock exchanges in 2015-2019.The Two-step System Generalized Method of Moments is used to tackle the endogeneity, unobserved heterogeneity, and autocorrelation problems in our estimation model. The findings reveal a significant negative relationship between debt financing and corporate performance. High levels of debt result in suboptimal investment due to the fear of default and higher costs. Clients often doubt the product quality of firms with high debt, easily switching to other sellers who benefit them the most. Accordingly, firms with high debt have to devote more resources to retaining clients and attracting new ones. Besides, the outcomes also indicate an inverted U-shaped nexus between competition and performance. Firm growth boosts performance, while the fixed assets-to-sales ratio hurts it significantly. Given the results, this paper proposes recommendations regarding the usage of debt financing to improve firm performance.*

Keywords: Capital Structure, Debt, Debt Financing, Financial Leverage, Firm Performance, Vietnam

Introduction

Debt financing decision is one of the most critical issues in corporate finance. It appeals to researchers and policymakers strongly, leading to a wide range of inconsistent findings. The capital structure irrelevancy theory mentions the irrelevance of debt financing to firm performance (Modigliani & Miller, 1958). However, later studies point out the nexus between them. Some scholars assert that the debt ratio of a firm is considered as a significant antecedent for improving firm performance (e.g., Margaritis & Psillaki, 2010; Detthamrong *et al.*, 2017; Wassie, 2020; Simamora, 2021). The disciplining effect of debt reduces the amount of idle cash flow controlled by managers and impedes moral hazard, thus reducing agency costs. Leveraged firms can take advantage of the tax-deductibility of debt interest to minimize operating costs and maximize profits. Differently, other authors point out a negative between debt financing and firm performance (Dawar, 2014; Vithessonthi & Tongurai, 2015; Ibhagui & Olokoyo, 2018; Towo *et al.*, 2019). Extreme debt financing may lead to suboptimal investment due to the fear of default. Customers may not trust the product quality of highly leveraged firms, resulting in a possible drop in their sales.

Distinct from developed countries, capital markets of developing economies retain shortcomings such as illiquidity, lack of long-term debt markets, and crowding out of the private sector from the publicly traded debt markets (Tarhan, 2005). Thus, the findings indicated in developed countries may be of limited use in developing economies since the economic gap still exists significantly (Hoskisson*et al.*, 2000). In such circumstances, it is worthwhile to have empirical studies on the debt financing-performance nexus in developing countries, especially Vietnam. Vietnam – a developing country with a strong presence of state-owned enterprises (SOEs), a less robust regulatory and legal environment, and rampant corruption – may be a typical case of countries of this type. Vietnamese capital market fails to play the full role of a capital channel in the country since it remains young (Nasir, 2021). As a result, the banking system becomes the principal financing source for its firms (Chau *et al.*, 2018). In other words, debt is essential for Vietnamese firms to invest and increase corporate performance. Given the features of the Vietnamese capital market - a typically capital market of developing economies, the paper contributes to the extant literature by providing firsthand evidence of the impact of debt financing on firm performance using a panel dataset of 352 firms listed on Vietnam's Stock Exchanges in 2015–2019, totaling 1,760 firm-year observations.

This paper proceeds as follows. Section 1 is the introduction, followed by the literature review in Section 2. Section 3 presents the Vietnamese capital market, and section 4 shows our data and research methodology. Section 5 analyzes our findings, and the last section (section 6) concludes the paper and proposes recommendations.

Literature Review

The capital structure irrelevancy theory proposed by Modigliani and Miller (1958) is the first one that tries to relate firm performance to capital structure. According to this theory, if the capital market is perfect (i.e., without corporate taxes, transaction costs, and asymmetric information), performance is irrelevant to capital structure. Differently, this assumption does not hold in the real world. In 1963, they thus revised their earlier theory taking into account the role of the tax shield, arguing that firms can use tax deductibility to maximize profits. The relationship between leverage and firm performance is also explained by agency costs, including two types of them (Jensen & Meckling, 1976). The first is the agency cost of outside equity arising from the conflict of interest between managers (the agent) and shareholders (the principal). Asymmetric information allows managers to have more information than shareholders. Managers hence have an incentive to engage in moral hazards to maximize their utility since they have to share profits with shareholders. Such behavior translates into higher costs since it calls for increased monitoring of managers. Higher levels of debt may mitigate the costs and thus improve performance.

The benefits of debt are also attributable to the discipline regarding interest payment precommitments (Jensen, 1986), the threat of bankruptcy (Grossman & Hart, 1982), and the informational content of debt (Harris &Raviv, 1990). Issuing debt enables managers to engage in precommitments related to paying out future cash flows (Jensen, 1986). Concretely, the pressure of incurring debt compels managers to curb mismanaging the idle cash flow and run profitable businesses to ensure the payment of interest and principal. According to Grossman and Hart (1982), the threat of bankruptcy creates a stimulant effect on the quality of corporate management. Managers will lose benefits if firms go bankrupt. Thus, this forces the agent to conform to the principal's interest. Besides, debts also convey information about the quality of management and efficiency of business strategy to investors (Harris & Raviv, 1990).The firm's income and prospects are revealed through the information about the ability of repayment and costly investigations regarding default. Hence, shareholders often let firms incur a high level of debt to gain more information.

The second is the conflict of interest between shareholders and creditors (Jensen & Meckling, 1976). Since shareholders enjoy profits accrued, but losses are shared proportionally with creditors, they prefer debt financing and often like excessive risk-taking. Debt holders may foresee such behavior, so they often raise the interest rate to offset the risks, pushing up the cost of borrowing for the firm. Thus, debt financing can harm firm performance, especially highly leveraged firms. Since debt holders capture part of the benefits of investments, the firms with high debt probably reject valuable investment opportunities if the interest rate is higher, leading to suboptimal investment and reduced market value (Myers, 1977). Although debt financing may mitigate overinvestment problems, it can exacerbate underinvestment problems because regular interest payments to debt holders place further resource constraints on managers (Stulz, 1990).Furthermore, the conflict of interest between a firm and its stakeholders also increases agency costs. Clients may have doubts about the product quality of highly leveraged firms, leading to a decline in their sales. Clients only transact with a high-debt firm if its product prices are low (Maksimovic & Titman, 1991). The reluctant transaction implies that customers tend to switch to sellers who benefit them the most. Debt holders may impose more restrictions on firms that have already used high levels of debt. In this case, high-debt financing increases agency costs and thus impedes firm performance.

The trade-off theory confirms a positive relationship between financial leverage and firm performance. Concretely, a firm has to adjudicate between costs of using debts and its benefits (Myers & Majluf, 1984). The higher benefit arising from the tax-deductibility is, the more optimal financial leverage is. Hence, firms tend to use more debt to get advantages from tax-shield (Jensen, 1986). Although high-leverage firms suffer from borrowing costs, they may take significant advantage of the tax-shield to enhance profits. Thus, their probability of financial distress is also lower than zero and low-leverage ones. Similarly, the free cash flow theory also indicates the positive leverage-performance nexus. Concretely, firms often attempt to maintain a high level of debt to curb mismanaging the idle cash flow. Managers have the right to allocate free cash flow. Holding too much free cash flow may lead to a waste of corporate resources and hence increase agency

costs. Thus, higher leverage may impede the self-interest motive of managers and strengthen the disciplining effect of debt, thereby increasing performance.

In contrast, the pecking order theory shows an inverse relationship between financial leverage and firm performance (Myers, 1977; Myers & Majluf, 1984). Firms usually follow a financing choice hierarchy, including internally generated funds (i.e., retained earnings), debt, and external equity. In other words, firms first choose internal funds and then turn to debt if additional funds are needed, and finally, they may raise funds through external equity. The costs of debt are often higher than the costs of internal funds but lower than the costs of external equity. If firms are highly profitable, they will use internal funds to capture growth opportunities instead of using debt or issuing external equity. Conversely, less profitable firms tend to use debt to finance their operations, implying that there is a negative relationship between debt ratio and firm profit (Myers & Majluf, 1984). The market timing theory argues that a firm will choose the financing instrument (debt or equity) which is more valued by the financial markets at a given time (Baker &Wurgler, 2002; Abor, 2007). Firms will prefer to raise funds by debt if the costs of equity are high and vice versa. High-leverage firms raise funds when their market value is low, while low-leverage firms raise funds when the value is high. Thus, firms with a high level of debt are expected to have poor financial health and low market value, thereby having lower firm performance. In other words, the market timing theory also predicts an inverse relationship between leverage and performance.

Based on these major theories, many empirical studies were conducted to clarify the relationship between debt financing and firm performance. Therein, Kyereboah-Coleman (2007) investigated the impact of capital structure on the performance of microfinance institutions in Ghana, using a panel dataset covering the ten-year period 1995-2004. The findings show that highly leveraged microfinance institutions perform better, thereby enhancing their ability to deal with risk. Margaritis and Psillaki (2010) found that a higher level of debt improved firm performance, using a dataset comprising French firms from two traditional manufacturing industries (textiles and chemicals) and a growth industry (computers) over the period 2002-2005. Bei and Wijewardana (2012) examined the relationship between financial leverage, firm growth, and financial strength of the listed firms in Sri Lanka from 2000-2009. The results divulge the positive effect of leverage on both firm growth and financial strength. Fosu (2013) finds that the leverage-performance relation is positive, and market competition enhances the performance impact of leverage. Detthamrong*et al.* (2017) tested the impact of corporate governance and capital structure on firm performance of Thailand firms in the period 2001 –2014. The results indicate that leverage positively affects firm performance while audit committee size affects it negatively.

Similarly, Zaman et al. (2020) examined the relationship between leverage and managerial efficiency, using 249 non-financial listed firms in Pakistan from 1999 to 2018. The results reveal a positive effect of leverage on managerial efficiency, implying that restraining managerial discretion through debt financing may help managers to work more efficiently. Wassie (2020) tested the effect of capital structure on the profitability of construction firms in Ethiopia, using a sample of 30 firms over the period 2011–2015. The results indicate that debt to equity positively impacts firm performance while debt to assets has a negative effect. Tripathy and Shaik (2020) investigated the relationship between leverage and financial performance for 56 Indian food processing firms over the period 2000-2018. The results show a positive effect of leverage on firm performance. Simamora (2021) estimated the moderating effect of managerial ability on the nexus between capital structure and firm performance. The research data includes 109 manufacturing firms listed on the Indonesian Stock Exchange over the period 2012-2015. The findings reveal that a higher level of debt improves firm performance, which positively moderates this relation by managerial ability. Concretely, managers with high-managerial ability may mitigate the costs of debt, thereby enhancing firm performance. Based on the theoretical framework and empirical evidence, the first hypothesis of this paper is formulated as follows:

H1. There is a positive relationship between debt financing and firm performance

In contrast, Salim and Yadav (2012) confirmed a negative relationship between debt financing and firm performance, but a positive growth-performance nexus, using panel data procedure for a sample of 237 Malaysian listed companies on the Bursa Malaysia Stock exchange during 1995-2011. Dawar (2014) found a negative effect of capital structure on firm performance, investigating a dataset of 100 listed Indian firms retrieved from the Centre for Monitoring Indian Economy (CMIE) over the period 2003-2012. Nguyen and

Nguyen (2015) examined the impact of capital structure on firm performance in 147 selected firms listed on the Ho Chi Minh Stock Exchange over the period 2006-2014. The results indicate a negative relationship between financial leverage and firm performance. Moreover, firm size and firm growth impact performance positively, while tangibility negatively affects it. Using a dataset of 46 families and 46 non-families Malaysian firms over the period 2009-2011, Hamid *et al.* (2015) confirmed a negative and significant effect of debt ratio on profitability. Vithessonthi and Tongurai (2015) tested the relation between debt financing and firm performance for a panel dataset of 159,375 non-financial firms in Thailand during the financial crisis of 2007−2009. The results divulge that the leverage-performance nexus is harmful for domestically-oriented firms while is positive for internationally-oriented firms. Furthermore, the nexus is also moderated by firm size, implying that the impact of leverage on performance is larger in magnitude for the larger firms. Ibhagui and Olokoyo (2018) **surveyed**101 firms listed on the Nigerian Stock Exchange from 2003 to 2007 to clarify the true effect of financial leverage on firm performance. The findings indicate that debt financing impact negatively the accounting-based performance, but positively the market-based performance.

Similarly, Nguyen *et al.* (2019) tested the impact of debt financing on firm profitability, using 58 real estate firms listed on Vietnam Stock Exchange with 464 observations over the period 2017-2018. The results reveal that the debt ratio impacts the return on assets negatively but the return on equity positively. Applying fixed effect regression models on the panel data of 115 microfinance co-operatives, Towo*et al.* (2019) indicated that higher levels of debt led to lower labor productivity due to underinvestment and high labor costs. Bui (2020) examined the impact of debt financing and supply chain finance on firm performance of 30 Vietnamese construction firms in the period from 2015 to 2018. The results show that supply chain finance enhances firm performance while debt financing negatively impacts the performance. Using a sample of 18 firms retrieved from the Nigerian Stock Exchange over the period 2014-2018, Ibrahim and Isiaka (2020) confirmed a negative effect of debt financing on firm value, implying that the firms should take less long-term debt and raise funds by external equity. Danso*et al.* (2020) tested the relationship between debt financing and firm performance and the moderating effect of firm size on the nexus, using data from 2,403 Indian firms over the period 1995–2014. The results show that the effect of debt financing on firm performance is negative, and this impact is moderated by firm size significantly. Based on the above outcomes, the second hypothesis of this paper is presented as follows:

H2. There is a negative relationship between debt financing and firm performance

Vietnamese Capital Market

Since 1986, Vietnam has gradually transformed its centrally-planned economy into an oriented-market one to overcome the macroeconomic turmoil and curb hyperinflation. The reform has unleashed economic activities, openly inviting the involvement of households and firms of all ownerships. Such achievements turn Vietnam into a lower-middle-income country. However, credit misallocation between private firms and SOEs has been an obstacle to economic growth in many countries transiting from planning to market economies, including Vietnam. Politically connected firms often enjoy favorite privileges from the government and easily access resources at preferential terms, including bank credit from state-owned commercial banks and land use rights from provincial and local governments. The low-interest rates and implicit or explicit government guarantees benefiting those firms squeeze the resources available for other, more productive firms. Resource allocation is improper since most SOEs and politically connected firms have lower productive efficiency, which reduces aggregate productivity and economy-wide growth.

Vietnamese capital market fails to play the full role of a capital channel in the country since it remains young (Nasir, 2021). As a result, the banking system becomes the principal financing source for its firms (Chau *et al.*, 2018). In other words, debt is essential for Vietnamese firms to invest and increase corporate performance. Vietnam's banking system has shifted to a new business model emphasizing lending to private households and firms, including mortgages and other consumer lending. But, a large volume of non-performing loans (NPLs) problems in the banking sector is the legacy of lending to connected firms in Vietnam (Katagiri, 2019). In Vietnam, the financial regulations are relatively suboptimal, and the enforcement is weak (Maruichi & Abe, 2019). Rampant corruption harms the financial market such as raising the instability and boosting illicit financial flows. Concretely, some big firms manage to pay substantial bribes to public officials to take favorite privileges from the government (Rand &Tarp, 2012; Maruichi & Abe, 2019; Malesky*et al.*, 2020).

Research Methodology

Empirical model

Based on the literature previously reviewed, we specify the following model to estimate the effect of debt financing on firm performance:

$$Perf_{i,t} = \beta_0 + \beta_1 Debt_{i,t} + \kappa Z_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the equation (1), the dependent variable $Perf_{i,t}$ is the performance of firm *i* in year *t*(%), measured by the return on sales (Moradi*et al.*, 2017;Shamsi&Farjana, 2017;Gadzo&Asiamah, 2018). $Debt_{i,t}$ is the debt financing of firm *i* in year *t*, measured by the debt-to-equity ratio (Wassie, 2020; Tripathy & Shaik, 2020; Bui, 2020; Simamora, 2021). This ratio refers to the level at which firm assets are financed by debt versus equity. As was previously reviewed, the impact of debt financing on firm performance is inconclusive. Therefore, coefficient β_1 can be either positive or negative. $Z_{i,t}$ is a set of control variables, and $\varepsilon_{i,t}$ is the error term of the model.

$$\begin{aligned} Perf_{i,t} &= \beta_0 + \beta_1 Debt_{i,t} + \beta_2 Comp_{i,t} + \beta_3 Comp_{i,t}^2 + \beta_4 Fage_{i,t} + \beta_5 Size_{i,t} + \beta_6 Labor_{i,t} \\ &+ \beta_7 Fass_{i,t} + \beta_8 Growth_{i,t} + \beta_9 Perf_{i,t-1} + \beta_{10} Trade_{i,t} + \beta_{11} Manu_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

In the equation (2), $Comp_{i,t}$ is competitive intensity facing firm *i* in year *t* measured by the BI. The BI is the percentage drop in firm profit when the marginal cost rises by one percent. It shows how sensitive a firm's profit is to its efficiency in the output market. Differently stated, highly competitive markets penalize inefficient firms more severely in lost profits. This indicator is free from reallocation effects in product markets, overcoming the setback of the structural approach (i.e., the Herfindahl-Hirschman Index, the four-firm concentration ratio, etc.). The BI that is simple in data requirements appears appropriate for empirical studies in developing and transition economies where relevant data is hard to obtain. The BI can be estimated as follows (Boone, 2008; Fosu, 2013):

$$\ln(\pi_{i,t}) = \delta + \lambda \ln(MC_{i,t}) + \mu_{i,t} \quad (3)$$

where $\pi_{i,t}$ is the profit of firm *i* in year *t* measured by the ratio of profit to total assets so as to avoid bias due to firm size. $MC_{i,t}$ is the marginal cost of firm *i* in year *t*, and $\mu_{i,t}$ is the error term of the Boone model. In the equation (3), coefficient λ is the BI. As just explained, ψ is negative, implying that the larger the absolute value of λ is, the higher competition intensity will be. Since firms may incur losses, their profits are negative. Thus, all variables in the equation (3) are transformed by using the inverse hyperbolic sine (IHS) transformation, expressed as $\ln^* X = \arcsin h(X) = \ln\left[X + \sqrt{X^2+1}\right]$. The IHS transformation helps keep null and negative observation values and the properties of the log transformation (Bellemare & Wichman, 2020; Clemens & Tiongson, 2017). Calculating the BI requires marginal cost. We estimate the marginal cost using the following translog cost function (Phan *et al.*, 2019; Shijaku, 2017):

$$\begin{aligned} \ln TC_{i,t} &= \alpha_0 + \alpha_1 \ln Q_{i,t} + \frac{1}{2}\alpha_2 (\ln Q_{i,t})^2 + \sum_{j=1}^{4} \psi_j \ln P_{j,i,t} + \frac{1}{2}\sum_{j=1}^{4}\sum_{k=1}^{4} \vartheta_{j,k} \ln P_{j,i,t} \ln P_{k,i,t} \\ &+ \sum_{j=1}^{4} \sigma_j \ln Q_{i,t} \ln P_{j,i,t} + \gamma_{1,t} T + \frac{1}{2}\gamma_{2,t} T^2 + \gamma_{3,t} T \ln Q_{i,t} + \sum_{j=1}^{4} \varphi_j T \ln P_{j,i,t} + \omega_{i,t} \end{aligned} \quad (4)$$

where $TC_{i,t}$ is total cost of firm *i* in year *t*. $Q_{i,t}$ is total output of firm *i* in year *t*, measured by total revenue to yield the same unit across industries. We use four input prices, including the price of materials ($P_{1i,t}$), the price of labor ($P_{2i,t}$), the price of fixed capital ($P_{3i,t}$), and the price of administration and other operations ($P_{4i,t}$). $P_{1i,t}$ is the ratio of material costs to operating revenue. $P_{2i,t}$ is the ratio of personnel expenses to total assets. $P_{3i,t}$ is the ratio of fixed asset depreciation to fixed assets. $P_{4i,t}$ is the ratio of administrative and other

operating expenses to operating revenue. T is the time trend, used to capture the influence of technological progress and shifts in the business cycle that leads to changes in the cost function over time. The cost function must be homogeneous of degree one in the input prices, so the following restrictions are imposed on its parameters (Phan *et al.*, 2019; Shijaku, 2017):

$$\sum_{j=1}^{4}\psi_j = 1; \sum_{j=1}^{4}\sum_{k=1}^{4}\vartheta_{j,k} = 0; \sum_{j=1}^{4}\sigma_j = 0; \text{and} \sum_{j=1}^{4}\varphi_j = 0 \quad (5)$$

The marginal cost is estimated by taking the first derivative of the cost function with respect to $Q_{i,t}$ as follows:

$$MC_{i,t} = \frac{\delta TC_{i,t}}{\delta Q_{i,t}} = \frac{TC_{i,t}}{Q_{i,t}}(\alpha_1 + \alpha_2 \ln Q_{i,t} + \sum_{j=1}^{4}\sigma_j \ln P_{j,i,t} + \gamma_{3,t}T) \quad (6)$$

The inclusion of $Comp_{i,t}^2$ - the squared BI - takes account of the possible inverted U-shaped effect of competition on performance (Carlin *et al.*, 2003; Aghion*et al.*, 2005; Bucci, 2005; Liu *et al.*, 2013). This effect means increased competition will boost performance if its intensity is reasonable. It also creates incentives for firms to innovate, resulting in low costs. Competition pressures force managers to work harder to avoid bankruptcy and losing their job. It also mitigates internal conflicts and makes firm employees more united. However, if going beyond a limit, competition will **impair** performance. Intense competition may lead to unfair competition and cruel price wars. If so, the coefficient of $Comp_{i,t}$ is positive and the coefficient of $Comp_{i,t}^2$ is negative.

In the equation (2), $Fage_{i,t}$ is the number of years in operation of firm *i* at year *t*. According to previous studies (e.g., Ahmed &Afza, 2019; Detthamrong*et al.*, 2017), the longer this duration is, the better its performance will be. Older firms often have low operating costs and rich market experience. Then, the coefficient of this variable is positive. However, if operating in saturated environments, older firms would become conservative to changes, leading to a lack of creativeness, backwardness in technology, and losing control of costs (Dawar, 2014;Towo*et al.*, 2019). This argument means their lower efficiency, so the coefficient of $Fage_{i,t}$ is negative.

$Size_{i,t}$ is the logarithm of total assets of firm *i* in year *t*. The economies of scale imply that a larger production scale leads to lower average costs. Upsizing helps firms reduce costs that underpin the decrease of output prices to compete. Larger firms often buy more inputs and attain more long-term contracts. Larger size forces firms to turn to specialization. Meanwhile, smaller firms find it hard to access external funds and lack high-quality human resources. Thus, firm size has a positive effect on performance (Ahmed & Afza, 2019; Wassie, 2020; Towo *et al.*, 2019), or the coefficient of this variable is positive.

$Labor_{i,t}$ (i.e., labor productivity) is the sales-to-labor expenses ratio of firm *i* in year *t*. Human resource is vital to competitive advantages (**Barney, 1991**). High labor productivity helps firms produce output with low costs. Hence, the higher labor productivity is, the better firm performance is (Charoenrat & Harvie, 2014; Pilar *et al.*, 2018). In contrast, low labor productivity may lead to overrunning costs, delaying schedules, and poor planning and managing. Consequently, there should be a positive relationship between labor productivity and firm performance.

$Fass_{i,t}$ is the fixed assets-to-sales ratio of firm *i* in year *t*. This ratio shows how well a firm uses fixed assets (property, plant, and equipment) to generate revenue. A high fixed assets-to-sales ratio means that firms use fixed assets less efficiently (Abu-Abbas *et al.*, 2019; Alhassan & Ohene-Asare, 2016). Thus, the coefficient of this variable should be negative.

$Growth_{i,t}$, a proxy for growth opportunities (Maury, 2006), is measured by equity growth rate of firm i at time t. Since the equity growth rate affects investment opportunities, it can generate profits for firms. Furthermore, firm growth is positively related to subsequent profitability. A higher growth rate means better

prospects for firms, so they may capture profitable opportunities and expand market shares (Fuertes-Callén& Cuellar-Fernández, 2018). Therefore, the coefficient of this variable is positive.

$Perf_{i,t-1}$ is a one-year lagged performance of firm *i*. We include this variable to divulge the persistence of firm performance over time. A positive value of the coefficient of this variable implies that performance is persistent. Firms often use part of the profit in the preceding year to invest and seize profitable opportunities. Therefore, the coefficient of variable $Perf_{i,t-1}$ is positive.

$Trade_{i,t}$ and $Manu_{i,t}$ are included in the empirical model to test for the possible gap in performance among firms in different sectors (i.e., manufacturing, trade, and service). $Trade_{i,t}$ takes a value of 1 for trading firms and 0 otherwise. $Manu_{i,t}$ takes a value of 1 for manufacturing firms and 0 otherwise. The coefficient of $Trade_{i,t}$ and coefficient $Manu_{i,t}$ can be either positive or negative, depending on the environments in which firms operate.

Methodology and Data

The paper's sample includes 352 firms randomly selected out of listed firms in 2015-2019. In concrete, the list of firms is retrieved from Vietnam's Stock Exchanges. Then a random number generator (i.e., RAND function) is used to select firms. Firms that do not provide sufficient information are excluded. The two-step system Generalized Method of Moments (GMM) regression is applied to estimate the impact of competition on the relationship between financial leverage and firm performance. Although panel data captures the dynamic nature of performance, endogeneity, unobserved heterogeneity, and autocorrelation may lead to econometric bias and inconsistent results if using Fixed Effect or Random Effect model. The more appropriate model for solving those problems is the two-step system GMM model (Arellano & Bover, 1995; Blundell & Bond, 1998; Fosu, 2013; Phan *et al.*, 2019). Before running the two-step system GMM, we use unit-root tests (including the Hadri Lagrange multiplier test and Phillips-Perron test) to check the stationary of the data. Using the two-step system GMM is appropriate when the data is stationary. We continue to conduct post-diagnostic tests. Arellano-Bond tests for AR(1) and AR(2) check the first and second-order autocorrelation of the residuals. Hansen's J-test is used to test the validity of instruments of endogenous variables. The Wald test confirms the goodness of fit for all our models.

Results

Sample description

The dataset of the paper comes from audited financial statements, so it is precise and reliable, helping us investigate the effect of debt financing on the firm performance of Vietnamese firms and propose proper recommendations. Therein, 232 studied firms are manufacturing firms (accounting for 65.91% of the total number of the studied firms), 47 trading firms (13.35%), and 73 service firms (20.74%). The mean number of labor is approximately 1,300 employees, and the standard deviation of 4,105 implies a substantial difference in the number of employees across the firms since our data include firms in divergent sectors (i.e., manufacturing, trade, and service).

In Table 1, the mean performance of the firms ($Perf_{i,t}$) is approximately 7.7 percent, and the standard deviation of 8.22, which implies that there is only a minor difference in firm performance. The results indicate that firm performance declined during the studied period 2015-2019. Debt financing of the firms ($Debt_{i,t}$) has a mean of 1.59. Therein, 2018 is a year that the firms use debts to finance their operations the most. The mean competition of the firms ($Comp_{i,t}$) is 0.95 (with a standard deviation of 0.65) and fluctuated during the studied period.

Table 1: Key Indicators of the Studied Firms

Year	2015	2016	2017	2018	2019	Sample
$Perf_{i,t}$	7.30 (7.54)	7.23 (7.97)	7.40 (8.48)	6.78 (8.37)	6.60 (8.70)	7.07 (8.22)
$Debt_{i,t}$	1.58	1.57	1.61	1.65	1.55	1.59

Year	2015	2016	2017	2018	2019	Sample
	(2.33)	(2.12)	(2.23)	(2.36)	(2.13)	(2.23)
$Comp_{i,t}$	1.01 (0.73)	0.99 (0.72)	0.88 (0.62)	0.95 (0.54)	0.90 (0.62)	0.95 (0.65)
$Fage_{i,t}$	26 (14.31)	27 (14.31)	28 (14.31)	29 (14.31)	30 (14.31)	28 (14.36)
$Size_{i,t}$	13.30 (1.50)	13.41 (1.53)	13.52 (1.56)	13.61 (1.60)	13.66 (1.64)	13.50 (1.57)
$Labor_{i,t}$	366.11 (2,078.68)	760.87 (7,915.09)	7,057.73 (94,171.12)	1,232.37 (11,103.73)	5,007.76 (86,972.65)	2,884.97 (57,654.89)
$Fass_{i,t}$	0.28 (0.45)	0.29 (0.43)	0.28 (0.40)	0.29 (0.41)	0.32 (0.53)	0.29 (0.45)
$Growth_{i,t}$	24.37 (89.76)	15.90 (42.81)	12.83 (39.01)	9.19 (28.78)	6.83 (14.37)	13.82 (50.21)

Source: **The authors' calculation out of own dataset.** ***Notes*****: Mean and standard deviations in parentheses.**

The mean age of the firms ($Fage_{i,t}$) is around 28 years, revealing that most firms have relatively rich experience in their field of business. Firm size has a mean of 13.50 and constantly increased over the studied period. The mean labor productivity ($Labor_{i,t}$) is 2,884.97 and the standard deviation of 57,654.89. In the period 2015-2019, labor productivity fluctuated drastically. The mean fixed assets-over-sales of the firms ($Fass_{i,t}$) is 0.29. In 2019, the firms used fixed assets inefficiently the most. Firm growth ($Growth_{i,t}$) has a mean of 13.82 percent. The growth constantly drops over the studied period, indicating unpromising prospects for the firms over time. The correlation matrix of this study indicates no evidence of multicollinearity (Gujarati, 2004). These results imply that the explanatory variables used in our regression models can predict the dependent variable (firm performance) well. In other words, our regression results are reliable, which is valuable for proposing proper recommendations.

Findings

Before running the two-step system GMM, unit-root tests were run to test the stationary of our panel data. The results indicate that this paper's data is stationary since the panel does not contain unit roots. Thus, using the system GMM approach in the next step is appropriate. To solve the endogeneity in our estimation model, following Fosu (2013), Chau *et al.* (2018), and Phan *et al.* (2019), we apply instruments that are one-period lag of performance variable and one or two-period lags of independent variables. Table 2 presents the estimation results on the effect of debt financing on firm performance. The post-diagnostic tests reveal that the instrumental variables are valid and the estimation models are correctly specified.

The findings confirm a negative relationship between debt financing and firm performance (Table 2), which is broadly consistent with the empirical evidence in Vithessonthi & Tongurai (2015), Ibhagui & Olokoyo (2018), Towo*et al.* (2019), and Danso*et al.* (2020). In other words, the second hypothesis of this paper is accepted. The coefficient of $Debt_{i,t}$ is negative at a significance level of 5 percent. This negative effect bolsters the agency theory arguing that a high level of debt may increase agency costs. According to the agency theory, there are two conflicts of interest, including the conflicts between shareholders and debt holders and the dissensions between firms and stakeholders. Since the creditors share the risks, shareholders prefer to take high risks by using debts. Debt holders often hence set higher lending interest rates to offset their lending risks. Those imply that debt financing impacts firm performance negatively, especially highly leveraged ones. In addition, high levels of debt may lead to suboptimal investment due to the fear of default. Since a significant part of the benefits arising from the investment will be transferred to the debt holders, firms with high debt skip valuable investment opportunities, especially under high market uncertainty. Moreover, customers often doubt the product quality of the highly leveraged firms, easily switching to other providers who benefit them better. Accordingly, firms with high debts have to devote more resources to retaining clients and attracting new ones. In line with the pecking order theory (Myers, 1977; Myers & Majluf, 1984), the total cost of firms with high debt is often greater than that of ones with low or no debt. Therefore, higher levels of debt increase the agency costs of the firms, resulting in depressed performance.

The Review of Contemporary Scientific and Academic Studies
An International Multidisciplinary Online Journal
www.thercsas.com
ISSN: 2583-1380 Vol. 2 | Issue 10 | October 2022 Impact Factor: 4.736 (SJIF)

Table 2: Estimation Results

Variables		$Perf_{i,t}$ (Performance)	
(i)	*(ii)*	Coefficient *(iii)*	Z statistic *(iv)*
C	*Constant*	-11.103	(-0.980)
$Debt_{i,t}$	Debt-to-equity ratio	-0.365**	(-2.030)
$Comp_{i,t}$	The Boone indicator (BI)	21.380***	(3.020)
$Comp^2_{i,t}$	Squared BI	-5.822***	(-3.040)
$Fage_{i,t}$	Firm age (years)	-0.035	(-1.020)
$Size_{i,t}$	Natural logarithm of total assets	0.870	(1.130)
$Labor_{i,t}$	Sales over labor expenses	0.000	(-0.690)
$Fass_{i,t}$	Fixed assets over sales	-5.306***	(-2.960)
$Growth_{i,t}$	Annual growth in equity (%)	0.023*	(1.650)
$Perf_{i,t-1}$	Performance in the preceding year	0.332***	(2.710)
$Trade_{i,t}$	1 for trading firms and 0 otherwise	-6.634***	(-3.890)
$Manu_{i,t}$	1 for manufacturing firms and 0 otherwise	-7.379***	(-4.470)
Number of observations		1,408	
Number of groups		352	
Wald test		338.760	
Wald test p-value		0.000	
AR(1) p-value		0.000	
AR(2) p-value		0.370	
Hansen-J test p-value		0.773	

***Source*: Authors' own survey in 2020. *Notes:* ***, **, and * denote significant at 1%, 5%, and 10%, respectively.**

The coefficient of $Comp_{i,t}$ is positive at a significance level of 1 percent, and the coefficient of variable $Comp^2_{i,t}$ is negative and statistically significant at the same level, implying that an inverted U-shaped effect of competition on firm performance, as indicated in Carlin *et al.* (2003), Aghion*et al.* (2005), Bucci (2005), and Liu *et al.* (2013). Concretely, increased competition improves the performance of the firms when its intensity is reasonable. Higher competition forces the firms to constantly innovate to reduce costs and provide high-quality products that suit consumer preferences. Competitive pressure also creates incentives for managers to work harder to avoid bankruptcy and losing their job. Since the firms' members focus more on competing with rivals instead of conflicting with one another, advanced competition helps the firms minimize internal conflicts. Nevertheless, if market competition goes beyond the optimal threshold, the firms' performance will plunge. In intensely competitive markets, firm-client relationships become unstable and short-lived since customers tend to switch to other sellers who satisfy them the most. Thus, the firms have to devote more resources to retaining current clients and attracting new ones. To save time and mitigate costs, the firms often copy the leaders instead of innovating under fiercely competitive pressures. Thus, the fiercer competition is, the more inferior firm products are. Intense competition may result in unfair competition and cruel price wars, which results in unexpected losses for the firms.

In Table 2, the coefficient of $Fass_{i,t}$ is negative at a significance level of 1 percent. This finding matches the expected sign of $Fass_{i,t}$ (Alhassan & Ohene-Asare, 2016; Abu-Abbas *et al.*, 2019), implying that the higher the fixed assets-on-sales ratio is, the less effective using fixed assets of the firms is. The coefficient of $Growth_{i,t}$ is positive at a significance level of 10 percent, revealing that the higher firm growth is, the better firm performance is. Firm growth is positively related to profitability. A higher growth rate means better prospects for the firms, so they may invest more to capture profitable opportunities and increase their market

shares, supporting the results of Fuertes-Callén& Cuellar-Fernández (2018). Besides, the studied firms with higher equity growth rates are in good financial health and use less debt than the others, consistent with the negative relationship between debt financing and the performance.

The coefficient of $Perf_{i,t-1}$ is positive at a significance level of 1 percent, divulging that firm performance of the past year continues over the studied period since the firms used part of the profit in the preceding year to invest and capture profitable opportunities. The firms also took advantage of the experience gained in preceding-year decisions to mitigate mistakes and risks. Achievements taken in a year enable the firms to operate more efficiently in the following year. The coefficients of $Trade_{i,t}$ and $Manu_{i,t}$ are negative at a significance level of 1 percent. The dummy variables are included to test for the possible gap in performance among firms in different sectors (i.e., manufacturing, trade, and service). Thus, this outcome implies that the service firms operate more efficiently than the manufacturing and trading ones.

Conclusion and Recommendations

This paper examines the true effect of debt financing on firm performance, using a panel dataset of 352 firms listed on Vietnam's stock exchanges from 2015 to 2019. The performance is measured by return on sales, while the debt-to-equity ratio is a proxy for debt financing. The two-step system GMM is applied to overcome the endogeneity problem of our panel dataset. The findings reveal a negative effect of debt financing on firm performance, implying that a higher level of debt results in lower firm performance. Concretely, high levels of debt lead to suboptimal investment due to the fear of default and higher costs. The outcome also indicates an inverted U-shaped relationship between competition and performance. A higher level of competition generates pressures that force firms to mitigate costs, improve output quality, and diversify products to retain clients and attract new ones. However, if competition is so intense, it no longer renders motivation for firm managers, which results in deteriorated firm performance accordingly. Besides, firm growth boosts performance, while the fixed assets-to-sales ratio hurts performance. The service firms operate more efficiently than manufacturing and trading ones.

The findings of this paper suggest that firms should avoid extreme debt financing, although they have to use debt to invest. Firms should maintain a conservative debt level in their capital structure. Lower levels of debt help firms reduce financial pressure and customers' suspicion about firm product quality. In addition, the government may pay more attention to moderating competition. Concretely, the government may tighten regulations to eliminate inefficient firms when market competition becomes too intense. Nevertheless, if competition is extremely fierce, the government should reduce entry barriers to encourage the formation of new firms and give more incentives to incumbent ones. Moreover, firms should optimize using fixed assets by planning annually. The findings of this paper are expected to provide a helpful reference, especially for future studies about this topic in transition economies like Vietnam.

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