



The effect of leverage and liquidity on financial performance: Evidence from Vietnam

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Abstract

This paper empirically examines effect of leverage and liquidity on financial performance of Vietnamese firms using data collected from companies listed on the stock market in Vietnam during 2008-2019. The study adopted multiple regression method, with Generalized Least Squares as estimation technique. Return on equity and Return on assets are used measure of financial performance. Liquidity of Vietnamese listed enterprises is measured by current assets to current liabilities, whereas leverage is measured by debt to equity ratio. The results of correlation and regression analysis showed that there is a significant negative relationship between leverage and financial performance while liquidity has significant positive relationship with profitability, whereas days accounts receivables and days accounts payables has no correlation with firm's performance. From this result, this article has provides helpful ideas and empirical evidence on the effect of leverage and liquidity on financial performance of the companies mentioned in Vietnam. The results show that there is a need to balance the components of the capital structure so as to obtain the optimal mix which will yield maximum growth to the firm and returns to the shareholders. The findings of this article might useful for manager, analysts, regulators, investors and other stakeholders.

Keywords: leverage, liquidity, performance, Vietnam

Introduction

In the age of globalization, competition is fiercer than ever. Reducing barriers to trade, spreading technology and reducing communication and transportation costs have reduced international competition. Economic changes in Eastern European countries, the maturation of the European Union and the emergence of new economic powers in the global market have enhanced the competitiveness of key national industries. Fierce competition in global and local markets requires companies to improve their financial performance. This is especially true for smaller countries like Vietnam, where profits can allow firms to overcome market constraints. This improvement not only brings benefits to company policies and businesses, but also has a direct impact on the competitiveness of the entire economy. Vietnam's stock market in the period 2008-2019 continuously fluctuated strongly in stock prices. This is explained by two endogenous and exogenous factors in which one of the very important endogenous factors is the financial performance of the companies. However, when looking at the financial performance of listed non-financial firms in this period, the authors found that many listed firms have continuous losses, leading to financial performance. The main negative (Thanh Cong Trading Company (TCM); Ninh Van Bay Travel Real Estate JSC (NVT)), but in contrast, some businesses achieve high financial efficiency with the above rate of return. Total assets reached over 30% (Dam Sen Water Park JSC (DSN), Small Mountain Stone JSC (NNC).

Financial performance is a fundamental issue in the economic entities and all businesses must try to get the highest financial performance. There are many factors that affect the financial performance of a business. These factors may be either internal factors or external ones (Dinh & Pham, 2020) [8]. Financial liquidity is the situation where the assets of the companies can be

easily and quickly sold for cash at minimal cost and price impact (Allen & Bolton, 2004) [2]. The financial liquidity may have an impact on determining the price and how the property should be marketed. On the other hand, financial leverage indicates how the companies utilized the proportion of debt and preferred equity in order to finance the existing assets within the company. Basically, financial leverage applied by enterprises aims to gain higher on fixed charges funds rather than their cost (Enekwe, Agu, & Eziedo, 2014) [9]. The interest payments appeared when there is a high degree of financial leverage; therefore, this leads the profit after tax or earning per share to become lower (Raj kumar, 2014). The study of the effect of leverage and liquidity on financial performance of listed companies is a necessary research topic. There have been a number of studies conducted such as Ghosh and Jain (2000) [13], Berger and Patti (2006) [6], Gleason, Mathur, and Mathur (2000) [11], Simerly and Li (2000) [28], Liargovas and Skandalis (2008) [21], Dinh and Pham (2020) [8], Lee (2009) [20] and Almajali, Alamro, and Al-Soub (2012) [3].

Thus, the article focuses on research on the effects of leverage and liquidity to the financial efficiency of the enterprises listed on the Vietnam stock market to help businesses promptly adopt appropriate policies for their business activities and to avoid the risk of bankruptcy, at the same time create conditions for economic stability and development, develop the stock market, stabilize and curb inflation.

The remainder of this article is structured in five sections, including Section 2: Literature Review and Hypotheses, Section 3: Research Methodology, Section 4: Empirical results on the relationship between leverage, liquidity and performance of Vietnamese non-financial listed companies, Section 5: Discussion on Recommendations and Conclusion are given in the last section.

Literature Review and Hypotheses

Literature Review

Research by Ghosh and Jain (2000)^[13], Berger and Patti (2006)^[6], Gleason, Mathur, and Mathur (2000)^[11], Simerly and Li (2000), Liargovas and Skandalis (2008)^[21], Dinh and Pham (2020)^[8] with research spaces various differences indicate that financial leverage has a strong impact on financial performance. However, the impact dimension is not the same due to the effect of the trade-off between the tax shield from the interest rate and the cost of financial pressure. Hu and Izumida (2008)^[14], Le and Buck (2011)^[19], Wang and Xiao (2011)^[31] measures the financial performance of enterprises by ratio of return on total assets (ROA) and return on equity (ROE) are currently the two most commonly used coefficients. ROA is calculated by dividing the target "Profit" by the target "Total assets", the ROE is calculated by dividing the "Profit" by the "Equity" target. Profit before tax and interest (EBIT) are chosen by many researchers to calculate two coefficients of ROA and ROE.

Studies by Liargovas and Skandalis (2008)^[21], Lee (2009)^[20], Almajali, Alamro, and Al-Soub (2012)^[3], have shown the impact of firm size and financial performance. These studies present conflicting views on the relationship between size and financial performance. The first is based on the basic theory of economies of scale. According to this theory, economies of scale occur due to a variety of reasons such as: Finance (Big companies can borrow at lower interest rates and have the ability to buy more goods more commercial discount); Organizational structure (big companies have high professional qualifications and specialization levels); Technological and technical level (Big companies have the advantage of a fixed cost-to-product ratio). Thus, according to this point of view, the larger the size of the company, the higher the financial efficiency. However, the opposite view is based on alternative theory that there is an inverse relationship between firm size and financial performance. In addition, if the company size is too large, it can negatively affect financial performance due to some problems of corruption and other reasons (Yuqi, 2007)^[33]. On the other hand, large companies may be ineffective due to poor control, which also has a negative impact on financial performance. Firm size is measured by the size of total assets. Firm size is measured as the logarithm of the total asset book value (Huynh & Nguyen, 2017)^[16]. There is quite a bit of research in the past on the relationship between firm size and financial performance.

In a study carried out by Liargovas and Skandalis (2008)^[21] argues that firm can use liquid assets to finance its activities and investments when external finance is not available. On the other hand, higher liquidity can allow a firm to deal with unexpected contingencies and to cope with its obligations during periods of low earnings (Almajali, Alamro, & Al-Soub, 2012)^[3] found that firm liquidity had significant effect on financial performance of insurance companies. The result suggested that the insurance companies should increase the current assets and decrease current liabilities because the positive relationship between the liquidity and financial performance.

In a study by Mogaka and Jagongo (2013)^[24] on the effects of working capital management on firm's profitability (measured by ROA) using panel data, they found out a significant negative relationship between profitability and number of AR and CCC, but an insignificant positive relationship with INV and AP (significant). Financial leverage, sales growth, current ratio and

firm size were used as control variables and were found to have significant effect on the firm's profitability. A study by Kulkanya (2012)^[18] on the relationship between working capital and profitability (measured by GOP) using a panel regression revealed a significant negative relationship between profits and inventory conversion period, receivables conversion period and cash conversion cycle. Therefore managers can improve profitability by reducing the cash conversion cycle, inventory conversion period, and receivables conversion period. Accounts payables have an insignificant negative relationship with profitability and managers cannot increase profitability by lengthening the payables deferral period.

Research Hypotheses

Leverage refers to the proportion of debt to equity in the capital structure of a firm. The financing or leverage decision is a significant managerial decision because it influences the shareholder's return and risk and the market value of the firm. The ratio of debt-equity has implications for the shareholders' dividends and risk, this affect the cost of capital and the market value of the firm (Tikkiwal & Pandey, 2007)^[30]. Berger and Patti (2006)^[6] were the first to employ a simultaneous-equations model that accounts for reverse causality from performance to capital structure. We also control for measures of ownership structure in the tests. The study employed a number of different measures of firm performance which include: financial ratios from balance sheet and income statements; stock market returns and their volatility; and Tobin's Q, which mixes market values with accounting values. The study reported a positive relationship between leverage and financial performance, while Gleason, Mathur, and Mathur (2000)^[11], Simerly and Li (2000)^[28] showed negative relationship between financial performance and leverage level. According to Almajali, Alamro, and Al-Soub (2012)^[3], Maleya and Muturi (2013)^[22] solvency has a positive relationship with financial performance. In contrast, Khalifa (2019)^[17] show that solvency has a negative impact on financial performance. From the above arguments, the hypothesis of leverage and firm performance:

H1: *Leverage is positively correlated with firm performance.*

Ali and Faisal (2020)^[4] argues that firm can use liquid assets to finance its activities and investments when external finance is not available. Liquidity refers short time paying abilities to pay out its debts. On the other hand, higher liquidity can allow a firm to deal with unexpected contingencies and to cope with its obligations during periods of low earnings (Almajali, Alamro, and Al-Soub, 2012)^[3] found that firm liquidity had significant effect on financial performance of insurance companies. The result suggested that the insurance companies should increase the current assets and decrease current liabilities because the positive relationship between the liquidity and financial performance. Therefore, the hypothesis is given as:

H2: *Liquidity is positively correlated with firm performance.*

Firms' management can create value by reducing the number of days accounts receivables (AR) to a reasonable level, take long to pay their creditors in as far as they do not strain their relationships with these creditors. Nyamweno and Olweny (2014) revealed that days of accounts receivables have an indirect effect on performance measured by gross operating profit and the

management of a firm can create more value for their shareholders by reducing the AR. Therefore, the hypothesis is given as:

H3: Days accounts receivables is positively correlated with firm performance.

Nyamweno and Olweny (2014) ^[25, 26] show that Days accounts Payables (AP) were found to have a significant direct effect on firm performance. Firms' management can therefore create value for their shareholders by lagging payments to their creditors taking care not to ruin their credibility which may prevent future credit facilities and possible litigation from creditors. By reducing the days in accounts receivable, firms will have ready cash to reinvest and can prevent the cash from getting eroded by effects of inflation as well as benefit from cheap source of financing owing. Therefore, the hypothesis is given as:

H4: Days accounts receivables is positively correlated with firm performance

Methodology

Research Model

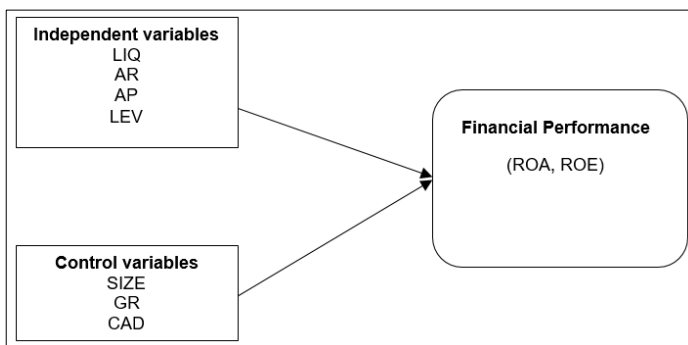


Fig 1: Research Model

The relationship of leverage, liquidity and financial performance is shown in the following two models:

$$ROE_{it} = \alpha_i + \beta_1 LIQ_{it} + \beta_2 LEV_{it} + \beta_3 AR_{it} + \beta_4 AP_{it} + \beta_5 SIZE_{it} + \beta_6 CAD_{it} + \beta_7 GR_{it} + \varepsilon_i$$

$$ROA_{it} = \alpha_i + \beta_1 LIQ_{it} + \beta_2 LEV_{it} + \beta_3 AR_{it} + \beta_4 AP_{it} + \beta_5 SIZE_{it} + \beta_6 CAD_{it} + \beta_7 GR_{it} + \varepsilon_i$$

Variable names and measurements in two models are explained in Table 1.

Table 1: Measurement of variables used in research models

Variables	Codes	Measurement
Return on Assets	ROA	Net income/Total Assets
Return on Equity	ROE	Net income/ Equity
Liquidity	LQD	Current asset/current liabilities
Leverage	LEV	Debt to equity ratio
Days accounts receivables	AR	Average of accounts receivables / sales* 365
Days accounts payables	AP	Average of accounts payables / sales* 365
Firm size	SIZE	Natural logarithm of total assets
Capital adequacy	CAD	Equity to total assets
Sale Growth	GR	(Current period net sales – previous period net sales)/ previous period

Research Data

The study used panel data over a twelve-year period (2008 to 2019) to examine the effects of leverage, liquidity, firm size, day's accounts receivables and day's accounts payables on returns on equity and assets. Regression coefficients were interpreted using the STATA software output. To ensure that enough degrees of freedom in the models to be estimated are available, yearly data covering the entire study period was collected. The data collection method was secondary research, which essentially involved reviewing data sources that have been collected for some other purpose than the study at hand. Thus, all the relevant data for this study are available in secondary form. The data was extracted from the Vietnam Stock Exchange hand books for the period 2008-2019. The data of these companies is collected from their financial statements and the data set from Vietstock, as well as aggregated from the data published on some reputable securities websites such as cafev.vn or cophieu68.com.

Data Processing Methods

The data analysis technique used is descriptive statistical analysis and panel data regression analysis. The study uses the Ordinary Least Square, Fixed Effect and Random Effect regression methods to estimate the impact of leverage and liquidity on financial performance of listed companies in Vietnam. The research paper will use F-Test and Hausman tests to examine which models of Ordinary Least Square, Fixed Effect and Random Effect give better estimates. We, then, conduct the GLS test to examine the defects of the selected model and find approaches to overcome this issue.

Research Results and Discussions

Descriptive Statistics

Table 2 shows the return on assets shows the minimum value of -57.35, while the maximum value is 61.02, and the mean value is 5.50578, S.D is 7.599581. The average value of the return on equity is 11.3698, the lowest is -442.91 and the highest is 833.25. The variable liquidity has an average value of 16189.5, with a standard deviation of 7455.449. The mean value of days accounts receivables and days accounts payables are 402.128 and 686.398. The leverage rate has the largest value of 92.16, the smallest value is -35. The average value of the variable is 1.88990 with the standard deviation of 2.846289. The average value of capital adequacy is 0.4789, of which the lowest is -0.7484 and the highest is 0.9890. The variable firm size has an average value of 11.4042, with a standard deviation of 0.5763 (See Table 2).

Table 2: Statistical description of the sample for the year 2008 – 2019

Variables	Obs	Mean	Std. Dev.	Min	Max
ROA	3,036	5.50578	7.599581	-57.35	61.02
ROE	3,036	11.3698	23.74123	-442.91	833.25
LIQ	3,036	16189.5	7455.449	-14854.16	116,102.3
AP	3,036	402.128	7986.554	-12017.24	317,252
AR	3,036	686.398	14033.35	0.39	518733.1
LEV	3,036	1.88990	2.846289	-35	92.16
SIZE	3,036	11.4042	0.576310	10.0027	13.50088
GR	3,036	139.420	3994.649	-99.74	203,804
CAD	3,036	0.4789	0.232906	-0.748409	0.989010

Descriptive Statistics

Table 3 presents the autocorrelation matrix, showing the direction of impact among the research variables. The correlation

coefficient between the independent variables in the model does not have any pair greater than 0.8, so it is less likely to have multicollinearity, via VIF indicator.

Table 3: Autocorrelation matrix

Variables	ROE	ROA	LIQ	AP	AR	LEV	SIZE	GR	CAD
ROE	1.0000								
ROA	0.5133	1.0000							
LIQ	0.2055	0.3303	1.0000						
AP	-0.0247	-0.0385	-0.0468	1.0000					
AR	-0.0257	-0.0387	-0.0450	0.7503	1.0000				
LEV	-0.2726	-0.2145	-0.0537	0.0282	-0.0031	1.0000			
SIZE	-0.0053	-0.1764	0.1124	0.0297	0.0159	0.3571	1.0000		
GR	-0.0574	-0.0600	-0.0327	-0.0013	-0.0020	0.0026	0.0106	1.0000	
CAD	0.0226	0.3534	0.0691	-0.0274	0.0112	-0.5786	-0.5109	-0.0054	1.0000

Empirical Results: Regression results with ROE as dependent variable and LIQ, LEV, AP, AR as independent variables; SIZE,

GR and CAD are control variables are summarized in Table 4, Table 5, and Table 6 respectively.

Table 4: Relationship between leverage, liquidity and ROE

Variables	VIF	Regression coefficients		
		OLS	REM	FEM
LIQ	1.09	0.00060*	0.00061*	0.00064*
AP	2.30	8.20e-06	0.000020	0.000027
AR	2.30	-0.00002	-0.000018	-4.06e-06
LEV	1.69	-3.14208*	-3.40431*	-3.671463*
SIZE	1.41	0.091860	-0.814268	-5.51555*
GR	1.00	-0.000295*	-0.000259*	-0.000231
CAD	1.87	-21.14051*	-24.65543*	-30.86543*
Cons		16.675***	29.05764	85.72741*
N		3,031	3,031	3,031
Prob (F-statistic)		0.0000	0.0000	0.0000
Hausman test		chi2(3) = 26.83 Prob>chi2 = 0.0000		
Modified Wald test		chi2 (253) = 1.5e+06 Prob>chi2 = 0.0000		
Wooldridge test		F(1, 252) = 5.936 Prob > F = 0.0155		

Note: (*), (**), (***) represent for the significant level at 1%, 5% and 10%, respectively

The Hausman test was adopted to select the suitable model estimation between fixed model and random model effect. The p-value results indicate that the fixed-effect model is suitable as the random-effect model because the Hausman p-value test is less than 0.05 (p = 0.00 < 0.05). The Wooldridge test indicates that the model has autocorrelation (p-value =0.01 < 0.05).

Furthermore, the Modified Wald test indicates that the model has heterogeneity (p-value =0.00 < 0.05) and the author proceeds to overcome the discovered defects of the model by GLS method (see Table 6).

The results of ROA model for all non-financial companies listed on the stock market in Table 5

Table 5: Relationship between leverage, liquidity and ROA

Variables	VIF	Regression coefficients		
		OLS	FEM	REM
LIQ	1.17	0.00031*^	0.0002918*	0.0003017*
AP	2.30	0.000014	0.0000154	0.0000155
AR	2.30	-0.000020	3.75e-06	-7.68e-06
LEV	1.52	-0.009671	0.0074732	0.0014125
SIZE	1.41	-0.727467*	-2.246372*	-1.345428*
GR	1.00	-0.000090*	-0.000052***	-0.0000599**
CAD	1.93	9.829573*	8.518213*	8.989717*
Cons		4.000208	22.32554*	11.67362*
N		3,031	3,031	3,031
Prob (F-statistic)		0.0000	0.0000	0.0000
Hausman test		chi2(3) = 5.37 Prob>chi2 = 0.1466		
Breusch and Pagan Lagrangian test		chibar2(01) = 1270.04 Prob > chibar2 = 0.0000		
Modified Wald test		chi2 (253) = 1.5e+06 Prob>chi2 = 0.0000		
Wooldridge test		F(1, 252) = 34.533 Prob > F = 0.0000		

Note: (*), (**), (***) represent for the significant level at 1%, 5% and 10%, respectively

The Breusch and Pagan Lagrangian Multiplier test for random effects results (Table 5) rejected the null hypothesis that the OLS model was appropriate. The Hausman test was adopted to select the suitable model estimation between fixed model and random model effect. The p-value results indicate that the random-effect model is suitable as the fixed-effect model because the Hausman p-value test is more than 0.05 ($p = 0.14 > 0.05$). The Wooldridge test indicates that the model has autocorrelation ($p\text{-value} = 0.000 < 0.05$). Furthermore, the Modified Wald test indicates that the model has heterogeneity ($p\text{-value} = 0.0000 < 0.05$) and the author proceeds to overcome the discovered defects of the model by GLS method (see Table 6).

Table 6: Results from GLS regression

Variables	Regression coefficients	
	ROE	ROA
LIQ	0.000606***	0.000282***
AP	-0.00000853	0.00000689
AR	-0.00000382	-0.00000762
LEV	-1.369***	-0.00847
SIZE	-1.368***	-0.767***
GR	-0.000196**	-0.0000879**
CAD	-12.17***	9.959***
Cons	25.73***	4.906**

Note: (*), (**), (***) represent for the significant level at 1%, 5% and 10%, respectively

Discussion

Analysis the effect of liquidity, leverage on financial performance is given as follows: The findings reveal that days accounts receivables and days accounts payables has no correlation with firm's performance (H_3 , H_4 is rejected). The findings are somewhat inconsistent with findings by Mathuva (2010) [23], Nyarige and Olweny (2014) [25, 26]. Leverage has a significant statistical impact on ROE (The regression coefficient obtained from the GLS regression is negative and statistically significant ($p\text{-value} = 10\%$)) but no correlation with ROA of listed companies (H_1 is rejected). This is supported by Gleason, Mathur, and Mathur (2000) [11], Simerly and Li (2000) [28] and is contrary by Liargavas and Skandalis (2008) [21], Almajali, Alamro, and Al-Soub (2012) [3], Maleya and Muturi (2013) [22] which stated that an increase in the leverage has a positive impact on their performance. Financial leverage is negatively related with firm's profitability which might depict that there is a decrease in the profitability with increased leverage because of the incurrence of increased financial cost.

Liquidity has a positive impact on financial performance of listed companies (H_2 is accepted). This study is supported by Chen and Wong (2004) [7], Almajali, Alamro, and Al-Soub (2012) [3] but it contradicts with Adams and Buckle (2000) [1]. Since liquidity measures the ability of managers in listed companies to fulfill their immediate commitments to policyholders and other creditors without having to increase profits on underwriting and investment activities and liquidate financial assets. This reasoning therefore implies that high liquidity obviates the need for management to improve annual operational performance. Furthermore, high liquidity could increase agency costs for owners by providing managers with incentives to misuse excess cash flows by investing in projects with negative net present value and engaging on excessive perquisite consumption.

For the control variable, the effect of size and sale growth was found to be negative with financial performance. This finding suggests that most Vietnamese firms do not take judicious use of their assets (in totality) which ordinarily have the tendency of boosting the profitability if put into proper use. Capital adequacy obtained a negative significant relationship with ROE but a positive impact on ROA.

Conclusion and Recommendations

This research uses a sample of 3,031 observations from companies listed on Vietnam's stock market in the period of 2008-2019 to examine the effects leverage and liquidity on financial performance.

The findings reveal that liquidity, leverage, firm size, sales growth, capital adequacy have statistically significant relationship with ROE. Days accounts receivables and Days accounts Payables has no correlation with firm's performance. On the other hand, liquidity, firm size, sales growth, capital adequacy have statistically significant relationship with ROA. Days accounts receivables, Days accounts Payables, leverage has no correlation with firm's performance.

Based on the research results, the authors propose the following policy implications:

Listed companies must maintain their level of liquidity because it greatly influences financial performance, where further increases in financial performance will affect the confidence of investors and prospective investors and creditors. Since the liquidity of a firm is a function of the amount of funds the firm can raise in a certain time and at specific cost, the sooner a firm can raise a given amount of funds in a certain period of time the more liquid it will be and this will improve performance firms also has to take into consideration local and national factors such as the type, sources and stability of deposit which are primary factors for the local level.

The relationship with financial performance and firm size was established to be negative relationship. Hence it is recommended that managers of the firms to decrease in over investment through the expansion programs but efforts be made by management to increase the value of the company through other means like the funding policy, the provision of incentives to managers in the form of bonus shares, and improvement of existing facilities and upgrading of ICT in order to improve company performance.

The results on the joint effect of leverage, liquidity, firm size, days in accounts receivables and days in accounts payables, sale growth, capital adequacy on financial performance show that there is a need to balance the components of the capital structure so as to obtain the optimal mix which will yield maximum growth to the firm and returns to the shareholders.

This study did not include all financial measurements such as Age of the firm, Cash flow holdings, working capital and their effect on the financial performance of listed non-financial firms. Further studies can be conducted with all these variables to test the significance of the above variables both on the return on equity and return on assets of the firms.

A more detailed study can be conducted on individual economic segments: Agriculture sector; Automobiles and Accessories; Commercial and Services; Construction and Allied Sector; Investment; Manufacturing and Allied; Telecommunication and Technology since this study covered all list non-financial firms at Vietnam Stock Exchange.

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