Determinants of business performance of listed information technology companies in Vietnam

Dinh The Hung[1] ✉
Pham Ngoc Thuy Tram[2]

[1]*National Economics University, Vietnam.*
Email: hungdt@neu.edu.vn
[2]*Tran Dai Nghia High School for the Gifted, Vietnam.*
Email: thuytram1701.2007@gmail.com
(✉ *Corresponding Author*)

Abstract

The information technology (IT) industry is rapidly growing and playing a significant role in modern society, impacting almost every aspect of life. The operations of IT businesses have been increasing and developing rapidly in recent years. For a business to achieve sustainable development, its production and business activities must be as efficient as possible. This paper aims to determine the impact of various factors on business performance based on data collected from the financial reports of 14 listed IT companies on the Vietnamese stock market from 2019 to 2023. The paper employs a regression model using Stata17 software, and the results show that two factors, Capital structure and Age of the company, have a significant impact on business performance; while two other factors, Fixed asset investment and Liquidity, have no significant impact on business performance. Based on the research findings, the authors provide several recommendations to help IT companies improve their business performance.

1. Introduction

The information technology (IT) industry is increasingly developing and playing a crucial role in today's society. IT is a prerequisite for economic and social development (Castells, 1999). The IT industry now influences almost all aspects of life, including economics, education, healthcare, entertainment, and many others. With the development of technology and the internet, the demand for IT services has increased significantly, including data storage, software development, and information security. The global value of the IT market in 2024 is 800 million US dollars and is expected to quadruple by 2030. Revenue in Vietnam's IT-Telecommunications sector has continuously grown over the past 10 years from 40 billion USD in 2013 to 148 billion USD in 2024. Vietnam has consistently been in the top 10 countries exporting IT services, with hardware and electronics exports in 2022 reaching approximately 136 billion USD, an increase of 11.6% compared to 2021. The total number of IT businesses in Vietnam is around 70,000 and there are over 1500 digital technology businesses with revenue approaching 10 billion USD. IT labor has increased from 226,300 people in 2009 to 1,005,206 people in 2019, with a 4.4 - fold increase (Ministry of Information and Communications, 2023). With these developments, IT has transformed from a small secondary economic sector into the largest secondary economic sector in Vietnam, with the highest growth rate, highest labor productivity, and largest export value. Moreover, the IT industry has benefited significantly from the impact of the Covid-19 pandemic due to the increased demand from consumers for technology applications. Applications related to education and health have witnessed a surge in visits and usage as students and companies have had to study and meet online.

In operations, every business aims to achieve high efficiency in business activities. To achieve this goal, managers need to consider which factors have a positive impact and which have a negative impact on business performance, thereby establishing strategies suitable for the specific characteristics of the business.

This article focuses on studying the factors affecting the business performance of 14 IT companies listed on the HNX and HOSE stock exchanges from 2019 to 2023. The article uses Return on Equity (ROE) as a key measure of business performance. Based on previous studies, this article will present a research framework showing the independent variables to be included in the model and the research hypothesis. From the collected data set, the research team will select a suitable model for the data to conduct impact analysis. The results obtained will be the basis for the research team to provide recommendations for IT companies listed on the HNX and HOSE to improve operational efficiency.

2. Research Overview
2.1. Research on Business Performance

Numerous theoretical and empirical studies on business performance have been conducted worldwide. Theoretical research is grounded in macroeconomic principles, while empirical studies primarily focus on two key areas: measuring business performance and examining the factors influencing it. Business performance is defined as the ability to utilize and manage a company's resources in various ways to develop a competitive advantage (Iswatia and Anshoria, 2007). It is evaluated based on three dimensions: productivity, profitability, and market share (Walker, 2001). There are two types of business performance: financial and non-financial performance (Hansen and Mowen, 2005). Financial or economic performance is often reflected in revenue growth, increased profits, or stock prices (Havnes and Senneseth, 2001). Common performance metrics are categorized into five groups: liquidity ratios, asset management ratios, debt management ratios, profitability ratios, and market value ratios. These ratios can be combined to create composite performance measures. For instance, combining profitability ratios and asset management ratios yields ROA and ROE. However, three primary measures are commonly used by researchers: ROA (Chu Thi Thu Thuy et al, 2015; Dam Thi Phuong Thao and Nguyen Tien Manh, 2017; Gjoni, 2022; Chawla and Manrai, 2019) ROE (Chu Thi Thu Thuy et al, 2015; Dam Thi Phuong Thao and Nguyen Tien Manh, 2017; Chawla and Manrai, 2019) and ROCE (Chawla and Manrai, 2019). In studies by Diaz and Pandey (2019) and Nguyen et al (2021) etc., business performance is measured by ROA. Meanwhile, ROE is used to measure business performance in studies by Onaolapo and Kajola (2010) and Pouraghajan et al (2012). Some studies utilize all three ratios: ROA, ROE, and ROS, when measuring business performance (Pham and Nguyen, 2018; Tran and Nguyen, 2019). However, the most suitable measure of business performance remains a subject of debate.

2.2. Research on Factors Affecting Business Performance

Chu Thi Thu Thuy et al (2015) found that the state capital ratio, company size, financial leverage, business cycle, quick payment ability, and management competence have a negative impact on financial performance.

Pham Sơn Tùng's (2015) research on the financial performance of joint-stock companies in the real estate industry revealed that liquidity, size, operating time, and GDP growth positively impact the ROA, which is the financial performance measure used in the article. Conversely, a high fixed asset ratio and a long business cycle have a negative impact on ROA.

Raghav Chawla and Rishi Manrai (2019) showed that the debt-to-equity ratio and company size have a negative impact on the ROA and ROE of manufacturing companies in India.

Dam Thi Phuong Thao and Nguyen Tien Manh (2017) indicated that the fixed asset ratio has a positive impact on ROA but a negative impact on ROE. Additionally, the study found that operating time has a positive impact on both ROA and ROE.

Studies by Ghosh, Nag, and Sirmans (2000); Berger and Bonaccorsi (2006); Gleason et al (2000); Simerly and Li (2000) and Liargovas and Skandalis (2008) among others, in different research contexts, have consistently shown that financial leverage has a significant impact on business performance.

Miruna Florina (2020) indicated that profitability, asset utilization efficiency, and capital structure are related to company performance.

Hoang Thi Thu Ha and Nguyen Thi Tuyet Mai (2023) found that capital structure, size, investment in fixed assets, and growth rate all impact business performance.

3. Theoretical Foundation and Research model
3.1. Theoretical Foundation

Business performance is a concept that has garnered significant attention from numerous researchers and has been interpreted in various ways. Primarily, it is understood from two perspectives: the company's achievements related to financial activities and those related to non-financial activities (Taouab and Issor, 2019). According to Lebans and Euske (2006) Business performance refers to the operational results achieved by a company. It encompasses multiple facets of the company, from non-financial factors that provide information about flexibility or the degree to which company objectives are met, to financial factors, including financial indicators for assessing performance and Business performance. Business performance is not only a measure of quality and reflects the level of organization and management of a business but also serves as the foundation for a company's survival and growth. A company's survival and growth are determined by its reputation and influence in the market. Ultimately, a company's market reputation and its ability to gain customer trust are influenced by its Business performance. Here, Business performance cannot be simply understood as minimizing costs and maximizing profits. Rather, the achieved Business performance is due to the quality of the products produced and supplied by the company to its customers. In this paper, the authors use financial performance to measure a company's performance.

3.2. Research Model

There have been numerous studies worldwide, including in Vietnam, on the factors influencing business performance. Zeitun and Tian (2014) demonstrated that the debt ratio has the strongest negative impact, while growth in total assets, size, and tax rate have a positive impact on ROA. Moreover, the study indicated that significant investments in fixed assets do not necessarily yield high returns. Additionally, other factors such as industry and the macroeconomic environment also have a considerable impact on this factor. In the study by Onaolapo and Kajola (2010) the debt ratio and the fixed asset ratio have a negative impact on both ROA and ROE, while asset turnover has a positive impact on these ratios.

Vo Van Can (2017) when investigating foreign-invested seafood enterprises in Khanh Hoa during the period 2011-2015, indicated that the growth rate of assets, revenue, total assets, and the structure of fixed assets have an impact on ROA but not on ROE. The research by Diaz and Tin (2017) showed that asset size has a positive impact on financial leverage, leading to increased debt and consequently, a decrease in business performance.

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The number of years a company has been operating increases business experience and will affect business performance. However, previous studies have yielded different results. Loderer et al (2009) indicated that the longer the company's tenure, the better the business performance. However, studies by Liu et al (2014) and Marinova et al (2016) showed that company tenure has a negative impact on the business performance of companies.

Solvency plays a very important role in a company's financial situation, as demonstrated by several studies by Almajali et al (2012); Maleya and Muturi (2013); Amalendu (2010); Liargovas and Skandalis (2008) and Khalifa and Zurina (2013), etc. Low and prolonged solvency often indicates financial risk and the possibility of bankruptcy. However, if a company maintains excessively high solvency, it can also have a negative impact on financial performance. Specifically, when solvency is high, it means that the company either invests too much in current assets such as cash, inventory, accounts receivable, or uses too little short-term debt to finance current assets (not taking advantage of the low cost of short-term sources or non-interest-bearing sources), thus reducing profits.

Asset structure affects a company's business performance. When the proportion of fixed assets is large, the company has the opportunity to mortgage these assets to access external capital more easily. Previous studies have shown that a company with a higher proportion of fixed assets to total assets often uses more debt or has an asset structure that is proportional to the debt ratio. However, for businesses in industries that require large investments in fixed assets, it entails a significant risk due to the impact of fixed costs and the very low liquidity of fixed assets, making it difficult for businesses to change direction. Meanwhile, the research of Zeitun and Tian (2007) and Onaolapo and Kajola (2010) showed that the proportion of fixed assets has a negative impact on business performance. The research of Do Duong Thanh Ngoc (2010) indicated that the ratio of fixed assets to total assets has no impact on business performance.

According to the result above, the paper proposes a research model as the Figure 1. There are 4 following hypothesis:

1. Capital structure has negative correlation with business performance.
2. Investment on fixed asset has positive correlation with business performance.
3. Liquidity has positive correlation with business performance.
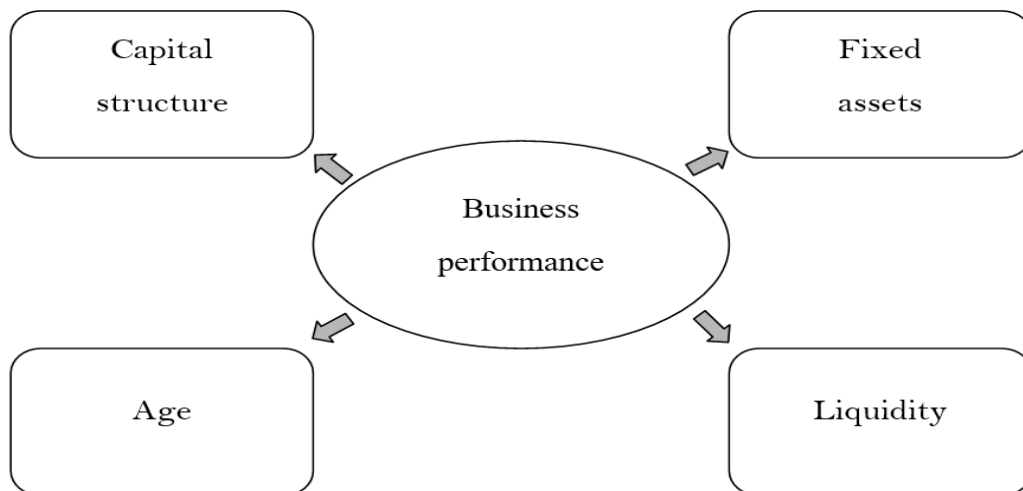4. Age of the company has positive correlation with business performance.

Figure 1.
Research model.

Variables in the model are measured as Table 1.

Table 1. Description of variables in the model.

Variable group	Symbol	Calculation	Reference
Dependent variables			
Business performance	ROE	Profit after tax/ Owner's equity	Salim and Yadav (2012); Hoang Cam Trang and Vo Van Nhi (2014); Dam Thi Phuong Thao and Nguyen Tien Manh (2017) and Chu Thi Thu Thuy et al (2015)
Independent variables			
Capital structure	CAP	Short-term debt/ Owner's equity	Gjoni and colleagues (2022); Chawla and Manrai (2019), Pham Son Tung (2015) and Hoang Thi Thu Ha and Nguyen Thi Tuyet Mai (2023)
Investment on Fixed assets	ASS	Fixed assets/Total assets	Dam Thi Phuong Thao and Nguyen Tien Manh (2017); Pham Son Tung (2015) and Hoang Thi Thu Ha and Nguyen Thi Tuyet Mai (2023)
Liquidity	LIQ	Total long-term assets/ Long-term debt	Gjoni and colleagues (2022); Chawla and Manrai (2019) and Pham Son Tung (2015)
AGE	YEAR	Year of financial statement - year of establishment + 1	Loderer et al (2009); Nagy (2009); Onaolapo and Kajola (2010) and Pham Son Tung (2015)

3.3. Research Model

Business Performance $= \beta_0 + \beta_1 \ast CAP + \beta_2 \ast ASS + \beta_3 \ast LIQ + \beta_4 \ast YEAR$

Including:
- CAP: Capital structure.
- ASS: Investment on fixed assets.
- LIQ: Liquidity.
- YEAR: Age of company.

3.4. Research Methodology

The data used in this study was collected from the financial reports of 14 IT companies listed on the Vietnamese stock market from 2019 to 2023, available on https://finance.vietstock.vn/. This panel data consists of 70 observations. Therefore, to analyze the factors affecting business performance, this paper uses panel data regression models, including the fixed effects model (FEM) and the random effects model (REM).

Table 2. Descriptive statistics of variables in the model.

Summarize ROE CAP ASS LIQ YEAR, separator (5)					
Variable	Obs.	Mean	Std. dev.	Min.	Max.
ROE	70	1.469726	60.18256	0.0004986	286.0935
CAP	70	0.4890842	0.2316762	0.000269	1.423553
ASS	70	.0722663	0.0655542	0.0004066	0.2208568
LIQ	70	15.43383	23.77294	0	111.7877
YEAR	70	19.21429	4.892742	8	28

4. Research Results

4.1. Descriptive Statistics

Table 2 shows that during the period 2019-2023, the average return on equity (ROE) of the companies was 1.469726, meaning that for every dollar of equity, the company earned 1.469726 dollars in after-tax profit. The highest and lowest ROE ratios of the companies were 286.0935 and 0.0004986, respectively. The average capital structure (CAP) of the companies during this period was 0.4890842 times. The average liquidity (LIQ) of the companies was 15.43383. The average fixed asset investment (ASS) was 0.0722663 and the average age of the companies was 19.21429 years.

4.2. Correlation Analysis

Table 3 describes the correlation relationships among the variables in the research model, including the dependent variable ROE and the remaining 4 independent variables. The analysis results will show the correlation between the independent variables and the dependent variable, aiming to eliminate variables that may lead to multicollinearity before running the regression model.

Table 3. Correlation matrix of variables.

	ROE	CAP	ASS	LIQ	YEAR
ROE	1.0000				
CAP	–0.4424	1.0000			
ASS	0.0984	0.2803	1.0000		
LIQ	–0.0106	0.2868	0.2079	1.0000	
YEAR	–0.3822	0.0889	–0.1029	–0.0332	1.0000

According to the results in Table 3, the correlation coefficients between pairs of independent variables in the model are all less than 0.8, indicating a low probability of multicollinearity among the independent variables when included in the model. Therefore, it can be concluded that the model does not suffer from serious multicollinearity.

On the other hand, to obtain more concrete evidence of whether multicollinearity exists among the collected variables, we examined the Variance Inflation Factor (VIF) in the regression model. The results of the multicollinearity test are presented in Table 4.

Table 4. Results of multicollinearity test with variance inflation factor (VIF).

Variable	VIF	1/VIF
ROE	1.55	1.25
CAP	1.55	1.24
ASS	1.18	1.09
LIQ	1.12	1.06
YEAR	1.18	1.09
Mean VIF	1.32	

The multicollinearity test results using Stata 17 software, as presented in Table 4, show that the average VIF is 1.32, and no independent variable has a VIF value exceeding 10. Therefore, there is no evidence of multicollinearity based on the Variance Inflation Factor (VIF) criterion for the variables tested for linear relationships.

4.3. Regression Results

4.3.1. Regression Estimation Using POLS, FEM, and REM Models

Table 5 presents the regression results of factors affecting firm performance, according to two models: FEM and REM.

Table 5. Summary of regression results from FEM and REM models with the test results to compare the FEM and REM models (Hausman test), the REM model is the optimal model suitable for the study.

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                 ———  Coefficients  ———
                  (b)            (B)           (b-B)        sqrt(diag(V_b-V_B))
                  fe             re          Difference           S.E.

       Cap1     -69.5284      -81.09954       11.57114           16.68355
     Assets1    -11.05093      34.7617       -45.81262           82.3434
        Liq1     .1119529      .1175115       -.0055586           .0447946
        Year    -3.339908     -3.860502        .5205941          1.875934
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                    b = consistent under Ho and Ha; obtained from xtreg
             B = inconsistent under Ha, efficient under Ho; obtained from xtreg

     Test:  Ho:  difference in coefficients not systematic

            chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =          1.62
           Prob>chi2 =        0.8046
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4.4. Regression Test

Table 6.

xtgls ROE CAP ASS LIQ YEAR Cross-sectional time-series RE GLS regression with AR (1) disturbances Group variable: firm						
R-sq Within = 0.0993 Between = 0.4049 Overall = 0.3301 Corr (u_i, Xb) = 0 (Assumed)			Number of obs = 70 Number of groups = 14 Time periods = 5 Wald chi2 (5) = 13.43 Prob > chi2 = 0,0197			
ROE	**Coef.**	**Std. err.**	**z**	**P > | z |**	**[95% conf.**	**interval]**
CAP	-80.38026***	27.8843	-2.88	0.004	-135.0325	-25.72802
ASS	36.93763	113.4643	0.33	0.745	-185.4483	259.3236
LIQ	0.0981144	0.02022982	0.48	0.628	-0.2983828	0.4946115
YEAR	-3.940736**	1.81835	-2.17	0.030	-7.504636	-0.3768355
_cons	124.9064***	40.22018	3.11	0.002	46.07631	203.7365
rho_ar	0.31035076	(Estimated autocorrelation coefficient)				
sigma_u	32.561633					
sigma_e	31.422708					
rho_fov	0.51779442	(Fraction of variance due to u_i)				
Theta	0.50082622					

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The research team employed the RE GLS regression method, and the results indicated that the variables Capital Structure (CAP) and Age of company (YEAR) were statistically significant (supporting hypotheses H1 and H4), while Fixed Asset Investment (ASS) and Liquidity (LIQ) were not statistically significant. The final regression model is as follows:

$$ROE_{it} = 124.9064 - 80.38026*CAP_{it} - 3.940736*YEAR_{it} + i + U_{it}$$

The regression model reveals the following:

The variable Capital Structure (CAP) has a coefficient of -80.38026, with a p-value of 0.004 < 0.05, indicating a negative impact on business performance (ROE). This means that as a company's capital structure increases, its business performance decreases. This result is consistent with the findings of Rohaya et al. (2010); Gatsi et al. (2013); Pitulice et al. (2018), and others.

The variable Liquidity (LIQ) has a coefficient of 0.0981144, with a p-value of 0.628 > 0.05. This result suggests that there is no significant relationship between liquidity and business performance of the company.

The variable Fixed Asset Investment (ASS) has a coefficient of 36.93763, with a p-value of 0.745 > 0.05. This result suggests that there is no significant relationship between fixed asset investment and business performance of the company.

The variable Age of company (YEAR) has a coefficient of -3.940736, with a p-value of 0.030 < 0.05. This result suggests that there is a negative relationship between company operating time and business performance. This result is also consistent with the findings of Pouraghajan et al. (2012).

5. Conclusion and Recommendations

The research findings indicate that two factors: Capital Structure and Age of company, significantly impact the business performance of IT companies listed on Vietnamese stock exchanges from 2019 to 2023. Conversely, Fixed Asset Investment and Liquidity do not significantly affect the business performance of IT companies listed on Vietnamese stock exchanges. Based on the research results, to increase business performance, enterprises need to improve several financial indicators, specifically:

Firstly, building a reasonable capital structure: This is one of the most important tasks. If IT companies can establish a reasonable capital structure, they can significantly reduce the risk of bankruptcy and increase the efficiency of capital use in business operations. The efficiency of asset use and the debt ratio have an inverse relationship, so to increase the efficiency of asset use, companies should limit investment in assets using short-term debt, encourage the use of long-term debt; and simultaneously use other alternative sources of capital such as retained earnings; mobilize capital from issuing shares, funds, etc.

Secondly, enhancing market reputation and sustainable development orientation. Enterprises need to actively update information, train professional skills to improve knowledge, grasp market trends in order to adjust production and business accordingly to improve product quality. Companies need to build a reputation for management capacity, operational skills, financial capacity as well as business acumen.

Thirdly, the government should review the framework of fiscal and monetary policies to reduce inflation, stabilize the exchange rate, reduce interest rates, and prevent unhealthy interest rate competition. Closely monitor the stock market, ensure the safety and stability of the banking system; stabilize prices of important commodities, and prevent monopolistic price increases.

Fourthly, regularly organize training courses on professional skills and disseminate legal documents to enterprises. Regularly update knowledge for accountants through in-depth seminars on international accounting standards to integrate with global trends.

By using a quantitative method in the regression model through data analysis of 14 listed IT companies on HNX and HOSE from 2019 to 2023, the research team has demonstrated the correlation between influencing factors and business performance of the company. The research results show that there are two factors affecting business performance: Capital Structure and Operating Time. Among them, the most influential factor is Capital Structure. Based on the research results, we have also made some recommendations to government agencies and IT enterprises to improve the business performance of IT companies listed on HNX and HOSE through measures affecting the capital structure.

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