

Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2022.vol9.no9.0309

Technological Contribution, Capital Structure, and Firm Performance: An Empirical Study in Vietnam

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Received: April 15, 2022 Revised: October 08, 2022 Accepted: October 15, 2022

Abstract

In 2011, the 4th industrial revolution officially occurred and developed in most countries. The fourth industrial revolution has given organizations numerous business opportunities, enabling them to optimize their manufacturing processes, cut costs, and thereby improve their operations. The development of enterprises is a decisive factor in increasing national productivity, thereby improving economic growth and per capita income. Therefore, it is necessary to grasp the digital transformation plan and apply science and technology to domestic enterprises and improve the operational efficiency of the economy. Research on small and medium enterprises in Hanoi, Vietnam, which is considered a successful country in economic development and digital transformation and has become a middle-income economy and a highly open economy, the research results suggest that the ability to apply technology in businesses is capable of improving corporate financial performance. The choice of capital structure favoring debt has a negative effect on the financial performance of the enterprise; that is, enterprises in Vietnam should limit the choice of financing investment projects with debt, on the contrary, enterprises should choose to finance with equity. Finally, the study also discusses managerial implications for improving business performance in the context of the rapidly evolving 4.0 technology revolution.

Keywords: Business Performance, Technological Contribution, Capital Structure, Firm Performance

JEL Classification Code: D22, D23, D25

1. Introduction

In the socio-economic development of each country, the contribution of businesses is extremely important. Enterprises as important economic entities have a role in creating jobs, promoting production, and thereby generating output for the economy. Businesses also play a role in contributing budget revenues to the state, to ensure spending activities in each country. So it can be said that the growth of enterprises is a reflection of the growth of each country, or in other words, it is to maintain economic growth in each country.

The efficiency of the business is often represented by the profitability of the business (Oweis, 2022). Indeed,

businesses are formed through the contribution of equity by shareholders, and shareholders want to receive dividends or increase the value of the business so that the share capital owned by shareholders can be value increased. To achieve that desire, the profit after tax of the business must be expressed through growth, and that is the part where the business can pay dividends or extract the retained earnings component to carry out investment in business activities.

Previous studies have shown that many factors can affect the performance of enterprises. First of all, it may be the cause of the form of capital use, as the study by Do and Dam (2019), the authors said, the choice of capital structure in favor of debt has a negative impact. Financial performance of the business. In other words, businesses can increase the use of the equity to make the business have a stronger financial base, and not be dependent on creditors or external funding. Research by Nguyen et al. (2020) suggested that leadership factors can affect the financial performance of enterprises. The higher the education level of the leader, the more knowledgeable the leader is about leadership and the ability to lead his or her business to become more successful and profitable. From there, it shows a positive relationship

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between the education level of the leader and the financial performance of the business. In addition, leadership is also reflected in the ability to manage and make decisions. Business leaders who can seize business opportunities well often bring practical results to the business, and improve business performance.

Since 2019, the world in general and Vietnam, in particular, have been affected by the COVID-19 pandemic (Huyen, 2022). The pandemic has changed many economic activities, such as the maintenance of isolation, social distancing, and vaccination policies, that have changed the forms of economic transactions. Simultaneously with the development of the 4.0 technology revolution, economic activities have changed, especially the development of the digital economy, digital banking services, and the promotion of online economic forms. This changes production activities in enterprises, those businesses that can adapt to the pandemic and grasp scientific and technological developments can improve operational efficiency.

The objective of this study is to evaluate the impact of technology, especially the human factor and other factors inside the business such as leadership capacity and capital structure choice. The study aims to provide evidence for researchers, managers, and politicians with a practical case study in Vietnam. In addition to the introduction already presented, the remainder of this study has four parts. Section 2 discusses previous studies. Section 3 discusses data collection and research methods. Section 4 discusses the results of the study and section 5 is the general conclusion of the study.

2. Literature Review

The topic of business performance is of interest to many authors. For example, Lee et al (2019) explore potential strategic determinants of firm performance, with a focus on R&D investment and operational efficiency in companies that manufacture goods. head of the United States. In particular, it studies R&D as a driver of technological innovation, and operational efficiency and as an indicator of best practices, in terms of their impact relative to Q and the Market Value of Tobin. The study combines using ordinary least squares multiple regression (OLSMR) and backpropagation neural network (BPNN), not only to measure statistical significance. of factors but also to uncover new insights into their relative importance and to determine the different effects of each factor under different performance levels. One key finding was that proactive investment in R&D and operational excellence were the strongest drivers of both performance metrics compared to the other conventional factors used in this study. Another encouraging finding is that both R&D intensity and operational efficiency have an even greater

effect on above-average performers and yield higher returns on market valuations. Through a combined OLSMR-BPNN approach, this study presents insightful findings on this fascinating topic and highlights potential research opportunities.

From another perspective, Jarboui (2021) asserts Energy economy and environmental protection are important issues in a modern society with the desire for sustainable development. Performance and environmental assessment will be an important first step toward sustainable development. Renewable energy, especially hydropower, geothermal, solar, and wind plays an increasingly important role in the energy industry. Therefore, oil and gas companies are gradually transforming into energy companies under the policy of energy transition. This raises the question of whether renewable energy promotes the environment and the performance of oil companies. First, the paper examines two types of performance measures - operational and environmental - for 45 US oil and gas companies over the period 2000–2018 using a True Fixed Effect model. - TFE). Second, this study aims to investigate the effect of renewable energy on both types of efficiency. The results show that the overall average operating efficiency (desired output) of U.S. oil and gas companies is 76% over 19 years, while the overall average CO₂ efficiency level (zero output) desired) of oil and gas companies is 79%. The results show that US oil and gas companies have begun to move towards low CO₂ emissions in recent years. Furthermore, renewable energy and biomass contribute to the destruction of operational efficiency and promote the environmental performance of oil and gas companies.

Regarding the performance of manufacturing enterprises, in particular, Asaleye et al. (2021) asserted that an adequate energy supply is important for sustainable growth in an economy. Nigeria's electricity development growth rate is very slow and inefficient compared to other emerging economies; on the other hand, this has discouraged production, especially in the manufacturing sector. In this regard, the study analyzes the long-term effects of electricity consumption on the performance of the manufacturing sector in terms of output, employment, and capital using standard-linked regression. Evidence from the output equation shows that electricity consumption and credit to the manufacturing sector are negatively related to output. In the employment equation, electricity consumption and interest rates have a negative effect on employment. In the capital equation, electricity consumption is not statistically significant. In summary, the impact of consuming electricity as an input in the manufacturing sector has not improved performance in this sector. To improve the situation, the study recommends that other parties create a framework to promote energy efficiency by maximizing output from the power sector and minimizing waste.

Following this theme, Meng and Pang's (2022) analysis of performance is a fundamental work for the adjustment of management policies of the power sector in China and many other countries, but it is difficult to carry out because of its complexity. The authors use the network structure to simulate the operating process of this industry. By incorporating a dynamic delay-based measurement algorithm into this structure, the performance of the entire industry and each stage (power generation and transmission - distribution) in each period is evaluated. On this basis, extension methods are also designed to measure the effectiveness of the factors and technology gaps of each group. This model is applied to China's power sector, and the following conclusions are drawn: (i) The performance levels of provinces and regions are relatively different; (ii) In general, the operational efficiency of power generation is significantly lower than that of transmission - distribution; (iii) Effective factors ranked from highest to lowest are capital, labor, and energy; (iv) Key policy implications include removing barriers to promote intercity power transmission, developing energy storage industry, implementing flexible conversion of thermal power units, and reducing cross-subsidy for the remaining power consumption.

From another perspective, Liu et al. (2022) argued that despite the proliferation of customer engagement (CE) documents on social media, few studies shed light on how to leverage CE to improve the performance of companies. This study proposes a new framework that uses social media data to improve demand forecasting accuracy, leading to a cost-effective inventory control strategy. Especially from the point of view of resource mobilization, this study quantifies the structure of CE from the point of view of evaluating input-output efficiency using the Data Envelopment Analysis (DEA) model.), then leverage CE to forecast consumer demand online and reconfigure inventory management strategies. Using a 71-week dataset from a social commerce startup in China, this study shows that this new framework significantly increases demand forecasting accuracy and reduces operating costs in inventory management. This study contributes to the literature by demonstrating the value of social media data in improving operational efficiency, particularly in relation to inventory management.

For the case of small and medium enterprises, some studies can be mentioned such as Luthra et al (2022) that argue that the principles of Cyclic Economy (CE) are relatively unexplored, especially in emerging economies. No studies to date have also explored the behavioral factors of CE performance and practice in the context of Small and Medium-sized Enterprises (SMEs). To address that gap, this study explores operational behavioral factors that contribute to the adoption of CE practices in SMEs of emerging economies for the sustainable development of their societies.

The study was carried out in three different phases. The study carried out an empirical investigation based on 162 responses from small and medium-sized enterprises, developed a factor structure model using Exploratory Factor Analysis (EFA), and built Network Relationship Map (NRM). The study contributes to the theory of planned and operational behavior by examining the influence of individual determinants on the assessment of CE adoption among small and medium-sized enterprises to examine these factors. behavioral factors affecting CE adoption in these organizations.

Adding another factor affecting the performance of small and medium enterprises, Xiang et al (2022) argue that the acceleration of modern industrialization has caused heavy environmental pollution. Environmental protection is a basic national policy of China. In 2011, China began to implement the "12th Five-Year Plan for National Environmental Protection" (the 12th FYP_NEP). Using survey data of small and medium-sized enterprises (SMEs) in China's Shandong province, this paper empirically explores the impact of the 12th FYP_NEP on energy use and operational efficiency. of small and medium enterprises. The environmental policy "12th FYP_NEP" has been found to have a significant encouraging effect on both the efficient performance of Chinese SMEs and a more positive effect on performance. Our heterogeneity analysis showed the following results. The incentive effect is different in different industries and businesses of different sizes. The "12th FYP_NEP" policy has a more positive impact on the energy efficiency of small and medium enterprises in China's first and second-tier cities, but it does not have a significant impact on the energy efficiency of small and medium enterprises. results of their activities. This suggests that SMEs in tier-one and tier-two cities are more effective in responding to the national environmental policy reform strategy. As can be seen, the enactment of China's environmental policies can significantly improve these SMEs' awareness of energy use. The larger the policy incentive effect on the two performances of SMEs in "heavy air" cities, indicating that the performance of the "12th FYP_NEP" for SMEs in urban areas is much larger. Such a city is better. It can be recognized as follows: the current situation of Chinese small and medium enterprises is low energy efficiency, while operational efficiency is high. Most businesses value their operating profit and economic growth, and awareness of energy use needs to be greatly enhanced. The "12th FYP_NEP" has a clear positive impact on the energy use and performance of SMEs, but there are slight differences between different types of businesses. It is suggested that governments can perfect their own environmental regulatory standards and implement different environmental regulations for different types of enterprises, to improve their performance of enterprises. domestic industry in the most efficient way.

3. Data and Methodology

3.1. Data

In this study, we collected data from 125 companies in Hanoi. Hanoi is the capital of Vietnam, one of the two places with the most important positions in the Vietnamese economy. Hanoi is also home to most of Vietnam’s important enterprises, and it can be said that conducting research in Hanoi is also relatively typical.

In general, I chose a sample with a sample size of 125, after dealing with errors and invalid surveys, the sample size was reduced to 120 and used in statistical analysis. According to Hair et al. (2010) sample size should be

$n = 8m + 50$, where n is the minimum sample size, and m is the number of independent variables in the model, in this study, there are 5 independent variables, so the minimum sample size should be 90. In this study, the sample size selected in the analysis is 120, which is larger than the minimum sample size, that is, it satisfies the conditions in the analysis. Therefore, choosing the sample size as in the study is appropriate.

3.2. Methodology

In this research, we develop based on previous studies and we will test the following hypotheses (Figure 1 & Table 1).

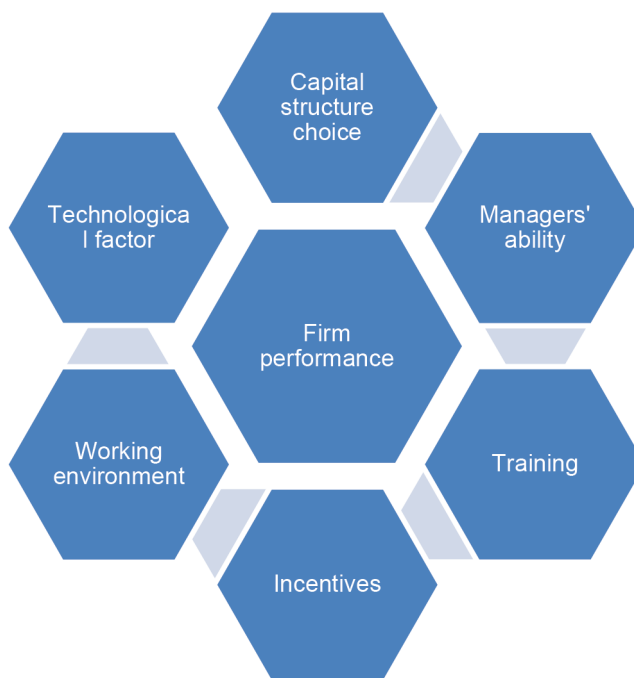


Figure 1: Developing Variables for the Model

Table 1: Variables Used in the Model

Variable	Explanation	Expected Sign
Y	Firm performance (FIRM)	
X ₁	Technological factor (TECH)	+/-
X ₂	Incentives (INCEN)	+/-
X ₃	Capital structure favoring debt (DEBT)	+/-
X ₄	Working environment (WE)	+
X ₅	Training (TRAIN)	+
X ₆	The ability of managers (ABILITY)	+

H1: There exists a positive relationship between technological factors (TECH) and firm performance (FIRM).

H2: There exists a positive relationship between incentives (INCEN) in the firm and firm performance (FIRM).

H3: There exists a negative relationship between capital structure favoring debt (DEBT) and firm performance (FIRM).

H4: There exists a positive relationship between working environment (WE) and firm profitability (FIRM).

H5: There exists a positive relationship between training (TRAIN) and firm profitability (FIRM).

H6: There exists a positive relationship between the ability of managers (ABILITY) and firm profitability (FIRM).

The study used regression analysis via SPSS25. Analysis, research results, and discussion of research results are the basis for proposing solutions through this study.

4. Results

According to Hair et al. (2010), variables with a scale are reliable when the correlation coefficient is greater than 0.3 and the Cronbach's alpha coefficient is greater than 0.6. Results of Cronbach's alpha analysis Table 2 shows that except for

Table 2: Cronbach's Alpha Analysis

Variable	Corrected Item-Total Correlation	Cronbach's Alpha If an Item Deleted
Technological Factor (TECH) – Cronbach's Alpha = 0.772		
TECH1	0.603	0.712
TECH4	0.576	0.756
TECH3	0.643	0.699
TECH2	0.570	0.725
Working Environment (WE) – Cronbach's Alpha = 0.810		
WE1	0.634	0.770
WE2	0.626	0.778
WE4	0.689	0.740
WE3	0.590	0.786
Training (TRAIN) – Cronbach's Alpha = 0.786		
TRAIN3	0.665	0.706
TRAIN1	0.526	0.788
TRAIN2	0.615	0.735
TRAIN4	0.607	0.744
The Ability of Managers (ABILITY) – Cronbach's Alpha = 0.342		
ABILITY3	0.257	0.330
ABILITY4	0.254	0.323
ABILITY1	0.438	0.632
ABILITY2	0.315	0.331
Incentives (INCEN) – Cronbach's Alpha = 0.820		
INCEN1	0.665	0.779
INCEN4	0.648	0.782
INCEN2	0.630	0.782
INCEN3	0.662	0.772
Capital Structure Favoring Debt (DEBT) – Cronbach's Alpha = 0.823		
DEBT1	0.645	0.795
DEBT2	0.670	0.775
DEBT4	0.710	0.752
DEBT3	0.580	0.758

the variable ABILITY whose Cronbach's alpha coefficient is not satisfied, all other variables satisfy the above conditions, confirming that the variables are reliable and suitable when performing the analysis. EFA accumulation. Therefore, when analyzing EFA, we will remove the variable ABILITY.

Table 3 and Table 4 present the analysis results of the dependent variable factor analysis, the coefficient KMO = 0.820, and the total variance extracted 66.443% and greater than 50%, confirming that the selection of the independent variable is reasonable.

Research results in Table 5 show that there are only 2 factors that have an impact on corporate financial performance, namely capital structure choice and technology factor in enterprises. However, three factors, namely incentive mechanism, working environment, and training activities in enterprises, have no impact on financial performance.

The results in Table 5 confirm a negative relationship between the choice of capital structure in favor of debt and financial performance in enterprises. Specifically, enterprises finance projects with loans that have a negative impact on

Table 3: KMO and Bartlett's Test

Kaiser – Meyer – Olkin Measure of Sampling Adequacy		0.820
Bartlett's Test for Sphericity	Approx Chi-Square	1245.357
	df	114
	Sig.	0.000

Table 4: Rotated Component Matrix

Variables	Abbre.	Component				
		1	2	3	4	5
Technological factor (TECH)	TECH1	0.802				
	TECH4	0.760				
	TECH3	0.742				
	TECH2	0.700				
Training (TRAIN)	TRAIN3		0.810			
	TRAIN1		0.771			
	TRAIN2		0.762			
	TRAIN4		0.743			
Working environment (WE)	WE1			0.806		
	WE2			0.790		
	WE4			0.783		
	WE3			0.732		
Capital structure favoring debt (DEBT)	DEBT1				0.812	
	DEBT2				0.780	
	DEBT4				0.772	
	DEBT3				0.694	
Incentives (INCEN)	INCEN1					0.822
	INCEN4					0.800
	INCEN2					0.700
	INCEN3					0.692
Rotation sums of squared loadings (total)		5.353	2.656	1.765	1.623	1.413
Rotation sums of squared loadings (cumulative %)		26.332	42.654	47.324	56.765	66.443

Table 5: Regression Results – Dependent Variable of Firm Performance

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
C	2.123***	0.323		4.234	0.000		
DEBT	-0.220***	0.042	-0.232	2.230	0.000	0.912	1.096
TECH	0.208***	0.046	0.223	2.654	0.000	0.834	1.199
INCEN	0.212	0.049	0.321	0.145	0.757	0.887	1.127
WE	0.146	0.087	0.212	1.299	0.546	0.743	1.345
TRAIN	0.121	0.054	0.132	1.445	0.454	0.776	1.288

corporate profits. Or, the firm financing the project with equity has a positive effect on firm performance. Or it can be understood that businesses should finance their investment projects with their capital, then businesses will find a solution to finance with debt. Own capital can be mobilized by issuing shares to existing shareholders, which means the option of shareholders to contribute more of their capital to finance the project. Or this capital can also be financed through the company that retains the middle profit to finance the project. In the context of Vietnam, most enterprises are small and medium-sized, so their ability to withstand risks is low, so if businesses depend on external funding, their ability to withstand risks least. The results of this study are similar to the study of Do and Dam (2019), the author said that the choice of capital structure in favor of debt has a negative impact on the financial performance of enterprises. . In other words, businesses can increase the use of the equity to make the business have a stronger financial base, and not be dependent on creditors or external funding.

The research results also show that technology factors play an important role in the financial performance of enterprises. That is, the enterprise can grasp and improve the technology in the enterprise, the more advantage that enterprise has in production and business and the advantage in making profits, the more dividends the shareholders receive. than. In the context of the technological revolution, businesses have many benefits in embracing technology, however, only those that can grasp and apply technology can improve efficiency.

5. Conclusion and Managerial Implications

In the development of science and technology, the ability to grasp the level of technology affects the operation of enterprises. Enterprises must always grasp digital transformation and apply it in their businesses to optimize

production activities, reduce costs and improve business efficiency. Vietnam is known as a country with a low starting point, which has gradually become a fast-growing economy and an emerging country in Southeast Asia. The study was conducted through a survey of enterprises in Hanoi during the period of June 2022, using advanced quantitative analysis. The research results confirm that the choice of capital structure in favor of debt has a negative effect on corporate financial performance. Meanwhile, the ability to apply science and technology in production has a positive impact on the financial performance of enterprises.

The study has several governance implications. Firstly, enterprises in developing countries should maintain retained earnings or issue shares to existing shareholders to increase the company's share capital and thereby finance their investment projects. Second, businesses need to take advantage of the ongoing digital transformation plan in the 4.0 technology revolution to improve their operations, increase business capabilities and optimize their operating costs, thereby increasing the profits of the company.

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