

Comparing Value and Performance between the Finance Industry and the Technology Industry under the Impact of Innovation: A Case of Listed Companies in Vietnam

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The study compares the value and performance between the finance industry and the technology industry before and after considering the impact of innovation. Data is collected from audited financial statements of 9 technological companies and 14 financial institutions on the Vietnam Stock Exchange for the period 2011-2019. T-Test is used to examine the difference between two industries, and the linear regression models for testing the impact of innovation on value and performance. Research findings show that, in most cases, innovation has a significant positive impact on value and performance, and innovation makes a change in the difference in firm value and firm performance between the two industries by bringing more benefits for the finance industry than the technology industry. Besides that, the findings open new research horizons in the performance, value, and innovation of the fintech company, which is a hybrid company of finance and technology.

Key words: *Value, performance, innovation, finance, technology.*

JEL Classification: O16, O30, L20

Introduction

In a competitive environment, most companies must be innovative. Innovation plays the most important role in the company operation, especially the role of tacit knowledge in innovation processes (Koskinen & Vanharanta, 2002). Innovation pushes the firm to keep moving-forward. The relationship between innovation, performance, and firm value has received much attention (Griliches, 1981) (Alex Coad & Rao, 2006) (Townsend, 2010). The result of Blundell, Griffith, and Van Reenen (1999) and Lewin, Massini, and Peeters (2009) showed a robust and positive effect of innovation on market value and profitability.

After the 2008-2009 financial crisis, the financial service industry faced more difficulties than before, and needed a significant change in operation. The innovative solutions have been applied for the operation and it has brought more benefit for financial institutions. Financial innovation helped to improve the performance of banks in Kenya (Muthinja & Chipeta, 2018). Technological innovation has seemed to cover all aspects of the financial institutions, and it has created a new concept, namely “fintech” in the modern world (Arner, Arner, Barberis, & Buckley, 2015); increasing customer satisfaction and the competitiveness of products (Parameswar, Dhir, & Dhir, 2017). In the financial industry, innovation is happening strongly, so what about the technological industry - the core field of the industry revolution 4.0? Are there differences in firm value and firm performance between two industries? Answering this question is the main purpose of this study.

This study is organised as follows: introduction, theoretical framework, methodology, results, discussion, conclusion and implications, and lastly references.

Theoretical Framework

The Difference between the Finance Industry and the Technology Industry

The combination of the finance industry and the technology industry has created a new industry, namely the fintech industry, which has been growing rapidly since the financial crisis in 2008-2009 (Dorfleitner, Hornuf, Schmitt, & Weber, 2017). The fintech company mainly uses technology development to distribute financial products (Varga, 2017), and most fintech companies are a start-up (Das, 2019). Under the view of business objectives, the fintech company belongs to the finance industry because the products of fintech companies are the same as the products of financial institutions, which are financial and financial derivatives, while the technological products belong to software, application, and digitalisation.

Under the view of the academy, finance is the special sector, which is completely different to other sectors in business objectives and financial structure. The relationship between the finance sector and the economy is very strong and sensitive (Levine, 1997). Most economic crises have been driven by the financial crisis (Stiglitz, 2000) (Güven, 2012). Therefore,

besides the common rule of law, the financial institution must obey some special rule of law (McNulty, Harper, & Pennathur, 2007). On the other hand, the technology company is a normal enterprise but receives more attention from both government and investors because it is the key sector for innovation in the industry revolution 4.0 (Lasi, Fettke, Kemper, Feld, & Hoffmann, 2014) (Morrar, Arman, & Mousa, 2017). Overall, the finance industry is special while the technology industry is hot in the economy. Is there a difference between the two industries, especially in firm value and firm performance, which are the most key indicators in modern corporate management? The first hypothesis is formulated by the author's expectations:

H1: There is a difference in performance and value between the finance and the technology industry

Innovation and the role of innovation

The definition of innovation in enterprise has occurred in various studies, and innovation has been defined by different aspects. Firstly, Rogers (1988) defined innovation as a word that was used to illustrate the change in improving firm performance in all aspects (product, investment, marketing, technology, etc.). Secondly, Cumming (1998) illustrated that innovation was the process of creativity to achieve the successful application of a product or process, which brought effectiveness, profitability, and customer satisfaction for the enterprises. Thirdly, Schumpeter and Backhaus (2003) said that innovation is a combination of many new and existing factors such as knowledge, equipment, resources, etc. to push the enterprises forward. Based on the three definitions above and the author's experience, innovation in the firm concerns thinking about applying new or existing solutions to achieve the business goals in all perspectives such as the financial perspective, customer perspective, and the internal and external process.

In quantitative research, estimating innovation value exactly is a big challenge for scholars. Depending on the scope and aim of the study, the suitable tools to measure innovation is applied to estimate the innovation variable. Measurement of innovation can be approached by way of innovative activities (Rogers, 1988). Innovation is measured by the output or input of innovative activities. Firstly, the output of innovation is sales, quality, and the share of innovative products. Secondly, the input of innovation includes R&D expenditures, and the capital for innovative activities. Innovation was measured by the value of an innovative asset, which was the intangible assets of the enterprise (Hall, 1999). The book value of intangible assets is shown clearly in financial statements. Valuation of market intangible assets is a challenge, despite how the firm value is determined every day by the stock price on the financial market. The market value of intangible assets could be under or over book value. It depends on more factors such as firm characteristics and economic condition (Gu & Lev,

2011). Therefore, depending on the capability and the aim of the study, researchers will choose a suitable measure to calculate the innovation variable.

Innovation is the platform for the development and competitiveness of both economies (Hausman & Johnston, 2014) (Maradana et al., 2017) and enterprises (Cefis & Marsili, 2006). However, in the scope of this study, innovation is only considered under the view of the firm, which is the impact of innovation on firm performance and firm value.

Choosing the strategy of investment in innovation is a solution for the sustainable development of most modern business enterprises (Alexander Coad & Rao, 2010). The outcomes of innovative activities strongly influences firm performance (Alex Coad, Segarra, & Teruel, 2016). The impact of innovation on firm performance has been proved by various studies. Firstly, using the data of 845 manufacturing companies in Canada, Thornhill (2006) confirmed how innovation was a positive impact on firm performance. Secondly, the innovation variable had a positive impact on firm growth, which was measured by sales, productivity, and the number of employees. This relationship was moderated by firm age variable (Alex Coad et al., 2016). Thirdly, the study of Grillitsch, Schubert, and Srholec (2019) used the data of Statistics Sweden to measure innovation and firm performance through knowledge and firm growth respectively, and the results showed that there was a positive relationship between knowledge and firm growth. Overall, the author expects the positive impact of innovation on firm performance, thus, the second hypothesis is as follows:

H2: There is a positive impact of innovation on firm performance

Cash flow, discount rate, risk of market, free risk are the frequency factors that often occur in the valuation methods for firm. In the modern valuation method, knowledge and intangible assets are being attended, and they are the core factors of innovation (Johnson, Neave, & Pazderka, 2002). An intangible asset is derived from innovative activities, and is a part of firm value (Hall, 1999). One of the solutions to optimise the firm value is to focus on investment in innovative activities (Alexander Coad & Rao, 2010). In experimental research, the impact of innovation on firm value has been explored through a fraction study and most results confirmed the positive link between innovation and firm value (Boer, 1994) (Abrahams & Sidhu, 1998) (Fatemi, Glaum, & Kaiser, 2018). Therefore, the third hypothesis is formulated as below:

H3: There is a positive impact of innovation on firm value

Overall, in theory, innovation has a positive impact on firm value and firm performance, and there is a difference between the finance industry and the technology industry. Therefore, the author expects that there is a difference in performance and value between two industries under the impact of innovation.

Methodology

Data Analysis

Based on the purpose of the study and the hypotheses, the process of examination is organised by the following steps:

Step 1: T-Test is used to confirm the difference in value and performance between the finance industry and the technology industry.

Step 2: estimating the coefficients in the regression models of the impact of innovation on performance and value with and without the control variable. Firm size is a control variable, which is found in the previous studies (Alex Coad et al., 2016) (Thornhill, 2006) (Fatemi et al., 2018).

Model 1: $Performance/Value = f(innovation) (1)$

Model 2: $Performance/Value = f(innovation, firm size) (2)$

Model 3: $Performance/Value = f(innovation, firm size, interaction of innovation and firm size) (3)$

Step 3: value and performance are re-estimated by the significant models and significant coefficients, and they will be used to compare value and performance between two industries. T-Test will be used again.

Sample and Data Collection

Based on the data analysis section above, all variables that are validated for this study include performance, value, innovation, and size. The performance variable consists of return on equity (ROE), return on assets (ROA), and the growth rate of sales (GRO). The firm value variable (VAL) is calculated by Tobin's q value. The innovation variable (INN) is an intangible asset on total assets. Firm size (SIZ) is computed by the logarithm of total assets.

Table 1 shows the detail of the variables.

Table 1: Description of variables

Variable		Obs.	Mean	Std. Dev.	Min.	Max.
VAL (%)	Tobin's q = Market value/Book value	207	114.12	82.46	22.54	676.32
ROE (%)	Earnings before taxes/Equity	207	13.65	10.70	-30.00	46.72
ROA (%)	Earnings before taxes/Total Assets	207	4.96	5.69	-15.00	32.41
GRO (%)	$(Sale_t - Sale_{t-1})/Sale_{t-1}$	207	12.40	31.67	-64.46	172.48
INN (%)	Intangible assets/Total assets	207	2.56	4.63	0.01	24.92
SIZ	Logarithm of total assets	207	9.02	3.14	2.71	14.03

Source: The Vietstock 2020

The data is collected from the audited financial statements of 9 technology companies and 14 financial companies from 2011 to 2019, which are downloaded on the website of Vietstock, a trusted statistical organisation on the Vietnam Stock Exchange Market.

Results

Table 2 shows the result of comparison in value and performance between the finance industry and the technology industry without the impact of innovation. Although the growth of sales of the finance industry is higher than in the technology industry, the ROA of the technology is higher than in the finance industry. Contrastingly, there is no difference between the finance industry and the technology industry in value and return on equity.

Table 2: Comparison between the finance and technology industry *without* the impact of innovation

	Obs.	Mean			
		VAL	ROE	ROA	GRO
Finance	126	115.316	12.920	3.160	15.487
Technology	81	112.262	14.785	7.766	7.586
Combined	207	114.121	13.650	4.962	12.395
Difference		3.054	-1.866	-4.607	7.901
t-value		0.2594	-1.2263	-6.1727	1.7607
Pro. (Ha: Fin. \neq Tec.)		0.7956	0.2215	0.0000	0.0798
Pro. (Ha: Fin. $>$ Tec.)		0.3978	0.8893	1.0000	0.0399
Pro. (Ha: Fin. $<$ Tec.)		0.6022	0.1107	0.0000	0.9601

Source: The author

Before testing the impact of innovation on value and performance, the author examines the correlation between the main variables in the quantitative model regression, which is shown in Table 3. Most absolute correlations are extremely small (less than 0.5), except the correlation

of ROE and ROA at 0.725, because both are the important profitability indicators of the firm. Notably, ROA and ROE are not in the individual regression model in simultaneous ways. Therefore, all variables in the three models above are appropriate (Gujarati & Porter, 2009).

Table 3: The correlation matrix between variables

	VAL	ROE	ROA	GRO	INN	SIZ
VAL	1.000					
ROE	0.488	1.000				
ROA	0.381	0.725	1.000			
GRO	0.041	0.173	0.008	1.000		
INN	-0.067	-0.044	0.150	-0.099	1.000	
SIZ	0.380	0.365	-0.073	0.062	-0.435	1.000

Source: The author

With the next step, the author considers the impact of innovation on value and performance throughout three models as above which have one independent variable (INN), two independent variables (INN and SIZ), and three independent variables (INN, SIZ, and INN*SIZ), respectively. The outcomes are shown in Table 4.

Table 4: The regression results

	VAL			ROE		
	Model 1.1	Model 2.1	Model 3.1	Model 1.2	Model 2.2	Model 3.2
INN	-1.1983 (-0.97)	2.1537* (1.69)	-1.2777 (-0.58)	-0.1025 (-0.64)	0.3259** (1.97)	-0.1553 (-0.54)
SIZ		11.3686*** (6.06)	10.0501*** (5.06)		1.4530*** (5.95)	1.2681*** (4.91)
INN*SIZ			0.8933* (1.92)			0.1253** (2.07)
CONS	117.1936*** (17.88)	5.9971 (0.31)	11.6524 (0.60)	13.9125*** (16.34)	-0.2987 (-0.12)	0.4943 (0.20)
N	207	207	207	207	207	207
R square	0.0045	0.1565	0.1715	0.0020	0.1496	0.1671
Sta. value	0.93	18.93***	14.01***	0.41	17.94***	13.57***
	ROA			GRO		
	Model 1.3	Model 2.3	Model 3.3	Model 1.4	Model 2.4	Model 3.4
INN	0.1838** (2.17)	0.1789* (1.89)	-0.3529** (-2.24)	-0.6738 (-1.42)	-0.6031 (-1.14)	0.5130 (0.56)
SIZ		-0.0168 (-0.12)	-0.2211 (-1.55)		0.2397 (0.31)	0.6686 (0.81)
INN*SIZ			0.1385*** (4.12)			-0.2905 (-1.49)
CONS	4.4909***	4.6547***	5.5312***	14.1229***	11.7780	9.9386

	(10.01)	(3.24)	(3.96)	(5.62)	(1.47)	(1.23)
N	207	207	207	207	207	207
R square	0.0224	0.0225	0.0980	0.0097	0.0102	0.0209
Sta. value	4.70**	2.34	7.35***	2.01	1.05	1.45

Note: *, **, and *** are the significant at 10%, 5%, and 1% respectively

Source: The author

There are common points in the results of the impact of INN on VAL and ROE. Firstly, the results of model 1.1 and model 1.2 are not significant, whereas the results of model 2.1, model 3.1, model 2.2, and model 3.2 are significant at 1%. Secondly, SIZ has a positive significant influence on VAL and ROE at 1% in four models: model 2.1, model 2.1, model 2.2, and model 3.2. Thirdly, both VAL and ROE are significantly impacted by INN and INN*SIZ, at 10% for INN and INN*SIZ of model 2.1 and model 3.1, respectively, and at 5% for INN and INN*SIZ of model 2.2 and model 3.2, respectively.

The significant impact of the INN on ROA is recorded by the results of model 1.3 and model 3.3 at 5% and 1%, respectively. While model 3.1's result shows, regarding INN, a significant positive influence on ROA at 5%. The results of model 3.3 reveal a significant negative relationship at 5% between INN and ROA; and INN*SIZ has a significant positive impact on ROA at 1%.

There is an insignificant impact of innovation on the growth rate of sales, which is proved by the results of model 1.4, model 2.3, model 3.4, and model 4.4.

Table 5: Comparison between finance and technology industry *with* the impact of innovation

	Obs.	Mean					
		VAL _{IZ}	VAL _{IZIZ}	ROE _{IZ}	ROE _{IZIZ}	ROA _I	ROA _{IZIZ}
Finance	126	123.159	118.019	15.810	15.057	4.740	6.870
Technology	81	84.736	86.653	11.055	11.218	5.307	7.096
Combined	207	108.124	105.745	13.949	13.555	4.962	6.959
Difference		38.424	31.366	4.755	3.838	-0.567	-0.225
t-value		10.093	7.323	9.737	6.846	-4.929	-0.900
Pro. (Ha: Fin. ≠ Tec.)		0.000	0.000	0.000	0.000	0.000	0.3692
Pro. (Ha: Fin. > Tec.)		0.000	0.000	0.000	0.000	1.000	0.8154
Pro. (Ha: Fin. < Tec.)		1.000	1.000	1.000	1.000	0.000	0.1846
Note:		VAL _{IZ} = 2.1537*INN + 11.3686*SIZ		ROE _{IZIZ} = 1.2681*SIZ + 0.1253*INN*SIZ			
		VAL _{IZIZ} = 10.0501*SIZ		ROA _I = 4.4909 + 0.1838*INN			
		+0.8933*INN*SIZ		ROA _{IZIZ} = 5.5312 - 0.3529*INN +			
		ROE _{IZ} = 0.3259*INN + 1.4530*SIZ		0.1385*INN*SIZ			

Source: The author

Based on the outcomes of Table 4., the new value of the value variable and the performance, which are impacted by innovation are calculated and used to compare the difference in value and performance between two industries. Table 5 shows in detail the T-Test results. Firstly, the difference between the firm value of the two industries are changed by the impact of innovation, and so the value of the finance industry is higher than the value of the technology industry. Secondly, the return on equity of the finance industry is also higher than in the technology industry when ROE is impacted by innovation. Thirdly, return on asset of the finance industry is still lower than that of the technology industry when considering the impact of only the INN variable on ROA. However, there is no difference in ROA between two industries if adding SIZ and INN*SIZ variables into the regression impact model.

Discussion

Regarding hypothesis 1, there is a difference in value and performance between the finance and the technology industries. Firstly, there is no difference in value and ROE between the two industries without considering the impact of innovation. However, when innovation is considered, the value and ROE of the finance industry is higher than the technology industry. Secondly, innovation does not impact the difference in ROA between two industries. The ROA of the technology industry is still higher than the finance industry. Thirdly, the growth rate of sales is not impacted by innovation, and the growth rate of sales of the finance industry is higher than the technology industry. Overall, there is a small difference in performance between two industries in the normal conditions, but in the case of innovation impact, the finance industry gets more benefit in value and performance than the technology industry. This is a reason that could explain why there has been the trend of applying technology in the finance sector after the financial crisis 2008-2009 (Arner et al., 2015) (Dorfleitner et al., 2017), as well as the trend of penetration in the financial market of tech companies. In Vietnam, most financial institutions are developing the application on smartphones and applying new technologies in the operation such as Thanh Tam and Nhat Hanh (2018). The rapid growth of technology firms also provides financial products such as Momo, VnPay, and AirPay. All over the world, top tech companies are developing financial products such as Facebook, Samsung, and Apple.

Regarding hypothesis 2 and hypothesis 3, there is a positive impact of innovation on firm performance and firm value. Innovation does not influence the change of sales, but it affects other performance indicators, which are return on equity and return on assets. The biggest impact of innovation on value and performance are significant and positive. This is suitable for the results of the study (Grillitsch et al., 2019) (Alex Coad & Rao, 2006) (Thornhill, 2006) (Alexander Coad & Rao, 2010). This means that, if the firm intensive affects innovative activities, it will increase firm value and firm profitability.



Conclusion and Implications

Finance is a sensitive industry with economic change, while technology is a core industry in the industry revolution 4.0. The comparison results in performance and value under the impact of innovation between two industries are a good background for the Vietnamese Government in making policy. The impact of innovation on value and performance is examined by using the process of the linear regression model, while T-Test is used to test the difference between the value and performance of two industries. The outcomes show that there is a significant impact of innovation on firm value and firm performance, and the value and performance of the financial institutions are better than that of technological companies after being impacted by innovation.

Based on the findings, the author offers two conclusions, which may be considered in making the policy for the development of the finance industry and the technology industry. Firstly, encourage firms to innovate, especially to apply technological innovation in operations to increase productivity, efficiency, and firm value. Secondly, create a new legal framework for a new industry, which is formulated by the combination of the finance and technology industry, and is named the fintech industry.



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