

An Assessment of Factors Affecting Business Efficiency of Fishery Enterprises Listed on Vietnamese Stock Market

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Abstract—The study is to identify factors affecting business performance of fishery enterprises listed on Vietnamese stock market. The study was based on panel data sample collected from annual report of 20 companies listed on the stock market, ensuring continuous data from 2007 to 2017 through three regression methods (Pooled OLS, FEM and REM). The results show that business performance of listed fishery enterprises is influenced by 4 factors including fixed asset investment ratio, capital structure, inventory management and the speed of capital circulation. To improve business efficiency, enterprises should aim at reducing inventory cost, ordering goods cost, using reasonable capital structure, sharing machinery and equipment to reduce the pressure on investment in fixed asset and accelerate working capital circulation.

Index Terms—Equity yield, financial structure, fixed asset investment, inventory turnover.

I. INTRODUCTION AND OVERVIEW OF RESEARCH ISSUE

Business performance is one of the issues that interest many financial researchers. It can be illustrated in the form of ratios on asset yield, equity yield, turnover, or EPS (*earnings per share*). Many groups of factors are found to be related to business performance such as capital structure, working capital management, business characteristics, or environment, business condition. Based on results from previous studies, this research was conducted on the basis of analyzing factors affecting business performance (*in the form of ROE*) of fishery enterprises listed on Vietnamese stock market.

The study tested the impact of internal factors affecting business performance of 20 fishery companies listed on the stock market of Vietnam with continuous data from 2007 to 2017 by three regression methods on panel data (Pooled OLS, FEM and REM). After selecting the appropriate and non-defective regression model, the study showed that business performance of listed fishery enterprises was influenced by factors of fixed asset investment ratio, capital structure, inventory management and the speed of capital circulation.

The study contributes to enriching researches on this issue and proposes some suggestions for managers in taking measures to improve business efficiency.

II. DATA SOURCE AND ANALYTICAL METHOD

A. Data Source

The study was conducted by collecting secondary data

from financial statements of fishery companies listed on Vietnamese stock market for the period from 2007 to 2017 with 20 companies in total. The collected financial statements include: balance sheet, income statement and cash flow statement. To ensure consistency on balance sheet, the researcher used average method to recalculate data at the beginning of the year and data at the end of the year on a yearly basis. The purpose of this is to create uniformity about time and space with the data on the two remaining financial statements.

B. Analytical Method

As panel data was applied, the author used Eview software to conduct regression using the following methods: Pooled Ordinary Least Square, Fixed Effects Model and Random Effects Model. Based on the three proposed methods, the author would conduct the test to select the best model through following steps. Step 1, Likelihood Ratio test is used to check Pooled OLS, FEM model and REM model. If the test result indicates that the Pooled OLS model is not suitable, the author would proceed to step 2, using Hausman test to select FEM or REM model. Once the most appropriate model is identified, the research would perform a test to remove unnecessary variables from the model and re-evaluate the model to present final regression equation.

III. HYPOTHESES OF THE RESEARCH MODEL

When researching factors affecting business performance of an enterprise, one of the most popular factors mentioned by researchers domestically and abroad is the scale of the business. The scale of the business can be expressed in terms of capital scale, asset scale, or product scale. Most studies have shown that business scale has a significantly positive effect on business performance, such as that of [1]. On the other hand, some studies illustrated that the business scale does not raise any relationship with business efficiency such as in [2].

By taking these studies into account, we will also see enterprise scale as an independent variable in studying factors affecting business performance. Business scale in this study is defined through revenue target as in the research of [x]. The first hypothesis is as follows:

Hypothesis 1: Business scale has a positive relationship with business performance

Apart from business scale, facilities, machinery, equipment and technology are factors promoting labor productivity, lowering production cost and improving product quality. Therefore, investing in these factors, or in general, investing in fixed asset is one of the ways a firm can improve business efficiency. In the study of [1], the problem was clearly shown when the results of empirical research of

the author pointed out that there is a positive relationship between fixed asset investment and business performance of the enterprise. However, in the context of poor business practices, increased investment in fixed asset will cause a significant capital outflow in time of unfavorable capital formation. This will increase the risk of the business, so the relationship between fixed asset investment and business performance will become less positive as in research of [2]-[5].

In the difficult business context of most fishery businesses in recent years, the author believed that increased investment in fixed asset may have negative impact on business performance. Therefore, on the basis of previous studies, the author proposed the second hypothesis as follows:

Hypothesis 2: Fixed asset investment has a negative relationship with business performance of listed fishery enterprises

Capital structure is one of the important elements of the enterprise; hence, there are many theoretical and experimental researches on this issue. Modern capital structure theory was first studied by Modigliani and Miller (1958), which was later inherited and developed into trade theories, classification theory, and representative theory. All these theories acknowledged a relationship between capital structure and business performance in each specific condition. In recent times, there are many empirical studies reviewing the relationship between capital and business performance of the enterprise. The study in [1], [3] showed that capital structure is positively related to business performance while researches of [6]-[9] proved apposite result.

Reviewing business performance of fishery enterprises listed on Vietnamese stock market during study period shows that the use of debt with high coefficient happened in most of these enterprises while business activities faced difficulty, so from author's point of view, it is limited to use financial leverage in business activity. Therefore, the author proposes the third hypothesis as follows:

Hypothesis 3: Financial structure has negative effects on the business performance of enterprises

Working capital is an important part of business operation. In each business cycle, this kind of the capital exists in a variety of forms, from cash, inventory, receivables and then back to the original form of money. Good working capital management will greatly improve the cash flow of the business. As such, in some researches studying factors affecting business performance, working capital management

is considered as one of the most important influencing factors. Working capital management is often viewed in terms of debt management, inventory management, cash management. In this study, the author considered inventory management (*defined by inventory turnover*) as a representative factor for the management of working capital. Most studies on this relationship have shown that good inventory management (*through increased inventory turnover or reduced inventory days*) contributes to increasing business efficiency of the enterprise as in the studies in [10]-[14]. On the basis of these studies, the author assumes the fourth hypothesis.

Hypothesis 4: Inventory turnover has a positive relationship with business performance of enterprises

In addition to inheriting published results of previously empirical studies, it is believed that cost management in an enterprise plays a particularly significant role in increasing business performance. If a company saves costs, it helps reduce cost of products, improve competitiveness, especially in the market of severe price competition condition. For Vietnamese fishery enterprises, under difficult business conditions due to both objective and subjective factors, controlling business expenses is one of the important factors contributing to improving business efficiency. In this study, the author uses cost of goods sold ratio and general and administrative expenses ratio to represent expense management ability. Thus, the author suggests the following hypotheses:

Hypothesis 5a: General and administrative expenses ratio have a positive relationship with business performance

Hypothesis 5b: Cost of goods sold ratio has a positive relationship with business performance

It is expected that capital is continuously mobilized to increase turnover, contributing to improving profitability. Therefore, in this study, the author proposes capital circulation factor in analyzing the model of business performance of listed fishery enterprises. The higher this indicator is, the faster capital is moving; in contrast, if this indicator is low, this reflects a slow movement of capital circulation, which can be stagnated at some stage in business operation. This will affect the profitability of the business. Based on these analyses, the sixth hypothesis is as follows:

Hypothesis 6: Capital circulation has a positive relationship with business efficiency

Factors and dependent variables are summarized in the following Table I.

TABLE I: MARKING, FORMULA OF VARIABLES IN THE MODEL

Variable	Definition	Unit	Formula	Expected mark
<i>Dependent variable</i>				
ROE	Business efficiency	Time	Net income/Shareholders' equity	
<i>Independent variables</i>				
DTTSCD	Fixed asset investment ratio	Time	Fixed asset value/Total asset value	(-)
LNDDT	Business scale	Million dong	Logarith of net revenue	(+)
HSTC	Capital structure	Time	Liabilities/Owner's equity	(-)
VQTK	Inventory turnover	Round	Cost of goods sold / Inventory	(+)
TSCPQL	General and administrative expenses ratio	Time	Net revenue/General and administrative expenses	(+)
TSGVHB	Cost of goods sold ratio	Time	Net revenue/General and administrative expenses	(+)
VQVON	Capital circulation	Round	Net revenue/Total capital	(+)

TABLE II: STATISTICAL DESCRIPTION OF VARIABLES IN THE MODEL

	Mean	Median	Maximum	Minimum	Std.Dev	Skewness	Kurtosis	Jarque-Bera	Obs
ROE	0.079317	0.101223	2.427981	-3.674024	0.494746	-3.749029	33.04855	8792.079	220
LNDT	13.54139	1350964	16.69943	9.082280	1.455909	-0.220821	3.242915	2.328842	220
DTTSCD	0.248331	0.215789	1.701857	0.002895	0.181037	4.680898	35.26102	10343.82	220
HSTC	1.723436	1.421269	29.23528	-14.28345	3,744,174	0.689522	22.01180	3330.711	220
VQTK	7.651022	4.702850	274.4867	0.132248	25.46426	10.02591	103.6628	96571.44	220
TSCPQL	49.51355	40.43950	205.6315	-60.71665	38.83517	1.291979	6.164338	96571.44	220
TSGVHB	1,137,491	1.150644	1.739103	0.334970	0.154686	-2.493553	15.95130	1765.567	220
VQVON	1.360892	1.201636	5.836256	0.113871	0.816287	1.541913	7.262948	253.7582	220

Source: extracted from Eviews

TABLE III: CORRELATION MATRIX OF VARIABLES

	ROE	LNDT	DTTSCD	HSTC	VQTK	TSCPQL	TSGVHB	VQVON
ROE	1,000	0.241331	-0.459875	-0.300045	0.077440	0.107790	0.377894	0.17353
LNDT		1,000	-0.444669	0.182573	-0.103068	0.428954	0.216030	0.343795
DTTSCD			1.00 0	-0.001728	0.283342	-0.267252	-0.379690	-0.060231
HSTC				1.00 0	-0.089527	0.019976	0.018446	0.141347
VQTK					1.00 0	-0.062733	0.034548	0.077257
TSCPQL						1.00	0.042145	0.511661
TSGVHB							1,000	-0.018554
VQVON								1,000

Source: extracted from Eviews

IV. RESEARCH RESULTS AND DISCUSSION

A. Research Results

On the basis of the proposed regression model using data collected, statistical description of the variables is shown in the following Table II.

Table III result shows that except for ROE, TSGVHB and business scale (LNDT), distributed data of most variables in the model has deviation in the right tail and does not follow standard distribution. It is also seen that distribution of indicators such as VQTK and HSTC is quite large, which reflects the degree of differentiation in inventory turnover and debt structure used in business activity of listed fishery firms.

In terms of business efficiency, it was measured by ROE indicator. The average ROE of these businesses was relatively low during research period. Specifically, the average ROE accounted for only 7.9%. Many companies during research period did not generate any profit or even experienced capital loss, so the specific ROE of some enterprises was negative. All these data strengthen the research's hypothesis of a less subjective business performance of listed fishery enterprises.

The largest correlation coefficient in the model is 0.5116, which is the ratio between general and administrative expenses (TSCPQL) and capital circulation (VQVON), showing that there is no multicollinearity between variables.

Based on previous researches and business practices of the listed fishery enterprises, the study recommended a regression model in order to consider and evaluate factors affecting business efficiency of listed fishery enterprises on

Vietnamese stock market during the period of 2007-2017 as follows:

$$ROE = \alpha_0 + \alpha_1 * LNDT + \alpha_2 * DTTSCD + \alpha_3 * HSTC + \alpha_4 * VQTK + \alpha_5 * TSCPQL + \alpha_6 * TSGVHB + \alpha_7 * VQVON$$

Based on the proposed regression model, the study ran Pooled OLS regression model. The result was as follows:

TABLE IV: ESTIMATION WITH POOLED OLS MODEL

Variable	Regression Coefficient	P value
C	-0.799733	0.0000
LNDT	0.022729	0.0000
DTTSCD	-1.122277	0.0000
HSTC	-0.044447	0.0000
VQTK	0.002619	0.0000
TSCPQL	-0.001902	0.0000
TSGVHB	0.703242	0.0000
VQVON	0.147516	0.0000
R ²	0.425596	
Adjusted R ²	0.424680	
R value	0.374453	
P value	0.000000	
Durbin-Watson stat	1.769653	

Source: extracted from Eviews

Estimated result with the Pooled OLS model shows that all variables in the model are statistically significant at 1% level. In particular, business scale (LNDT), inventory management (VQTK), cost of goods sold ratio (TSGVHB) and capital circulation is positive correlated with business efficiency (ROE). This means that if the scale of a business is expanded with quick inventory turnover, business saves production

costs and promotes capital circulation, it will increase business efficiency, especially profitability. In contrast, the ratio of fixed asset investment (DTTSCD), capital structure (HSTC), general and administrative expenses ratio (TSCPQL) is negatively correlated with business performance. If these variables increase, business efficiency decreases and vice versa. For Durbin-Watson statistic (D-W), according to [15], [16] in the study of "Econometric Analysis of Panel Data", if this indicator is between (1.5-2.5), there is no autocorrelation in the regression model. In Table IV, the D-W stat is 1.77, so the proposed model is not autocorrelated.

TABLE V: ESTIMATION WITH FEM MODEL

Variable	Regression Coefficient	P value
C	-0.748147	0.1583
LNDT	0.063957	0.1146
DTTSCD	-1.525171	0.0000
HSTC	-0.058667	0.0000
VQTK	0.002199	0.0586
TSCPQL	-0.001368	0.1513
TSGVHB	0.268937	0.2039
VQVON	0.136869	0.0119
R ²	0.543794	
Adjusted R ²	0.482336	
F value	8,848,238	
P value	0.000000	
Durbin-Watson stat	2.161054	

Source: extracted from Eview

After testing with the FEM model (Table IV), it was found that business scale variable (LNDT), cost management variable (TSCPQL and TSGVHB) were not statistically significant. Fixed asset investment ratio (DTTSCD), capital structure (HSTC), capital circulation (VQV) are statistically significant at 1% level while inventory management (VQTK) is statistically significant at 10% level. Estimation results with FEM model show that there is a negative relationship between the DTTSCD, HSTC and ROE, and a positive relationship between the VQVON and business efficiency as in the result of Pooled OLS model. With D-W stat of 2.1, the proposed FEM model is not autocorrelated.

TABLE VI: EVALUATION WITH REM MODEL

Variable	Regression Coefficient	P value
C	-0.799733	0.0191
LNDT	0.022729	0.2724
DTTSCD	-1.122277	0.0000
HSTC	-0.044447	0.0000
VQTK	0.002619	0.0103
TSCPQL	-0.001902	0.0150
TSGVHB	0.703242	0.0001
VQVON	0.147516	0.0001
R ²	0.425596	
Adjusted R ²	0.406630	
F value	22.43974	
P value	0.000000	
Durbin-Watson stat	1.878408	

Source: extracted from Eviews

Estimated result with REM model describes that business scale has no statistical value, indicating that there is no relationship between business scale and business efficiency of listed fishery enterprises. Remaining variables in the

model are statistically significant at 1% level. Variables such as VQTK, TSGVHB and VQV has positive relationship with ROE as estimated in Pooled OLS model and FEM model, the other variables have negative impact on ROE. D-W stat is 1.8, so the model is not autocorrelated.

To select the best regression model of the three proposed models, firstly, Likelihood ratio test was selected to decide whether the Pooled OLS model or FEM and REM model is appropriate with the following hypotheses:

- Hypothesis H0: The α coefficients of the models are equal (Selecting the Pooled OLS model is appropriate);
- Hypothesis H1: The α coefficients of the models are different (Pooled OLS model not selected). The result of the Likelihood ratio test is as follows:

TABLE VII: RESULT OF LIKELIHOOD RATIO TEST

Effects Test	Statistic	d.f	Prob.
Cross-section F	2.631791	(19,193)	0.0004
Cross-section Chi-square	50,685,320	19	0.0001

The estimation result indicates that Cross-section Chi-square is smaller than 0.5, so H0 hypothesis is rejected, which means that H1 hypothesis is selected. Thus, in this study, Pooled OLS model is not suitable. The study would continue use Hausman test to select the most appropriate between FEM model and REM model. The following hypotheses are proposed:

- Hypothesis H0: There is no correlation between explanatory variables and random component (REM model is appropriate);
- Hypothesis H1: There is a correlation between explanatory variables and random component (FEM model is appropriate).

The result of Hausman test is described in the following Table VIII:

TABLE VIII: HAUSMAN TEST RESULT

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section random	40.395181	7	0.0000

The result shows that p-value of 0.000 is less than 5%, so H0 hypothesis is rejected and H1 hypothesis is accepted, which means that FEM is the best model for the study. After selecting FEM model as the research model, the author removed three variables: business scale (LNDT), cost management (TSCPQL) and cost of goods sold ratio (TSGVHB) from the model because these variables were not statistically significant. The remaining variables including DTTSCD, HSTC, VQTK, VQVON were then re-estimated, and the result is shown in the following Table IX.

With the above result, the regression model has the form:

$$\text{ROE} = 0.367889 - 1.712216 \cdot \text{DTTSCD} - 0.052460 \cdot \text{HSTC} + 0.002262 \cdot \text{VQTK} + 0.154111 \cdot \text{VQVON}$$

Table IX shows that at the significance level of 5%, the R² equals to 52.63%, which means that the four variables of DTTSCD, HSTC, VQTK and VQVON explain 52.63% changes of ROE in the study period from 2007 to 2017 of listed fishery enterprises.

TABLE IX: ESTIMATION RESULT OF ADJUSTED FEM MODEL

Variable	Regression coefficient	P value
C	0.367889	0.0000
DTTSCD	-1.712216	0.0000
HSTC	-0.052460	0.0000
VQTK	0.002262	0.0478
VQVON	0.154111	0.0030
R ²	0.526338	
Adjusted R ²	0.470755	
F value	9.353930	
P value	0.000000	
Durbin-Watson stat	2.119334	

Source: extracted from Eviews

B. Result Discussion

The results of testing model show that fixed asset investment ratio (DTTSCD) and capital structure (HSTC) are negatively correlated to business performance (ROE) and statistically significant at 1% level while inventory management (VQHTK) and capital circulation (VQVON) are positively correlated to ROE with significance level of 5% and 1% respectively.

In terms of fixed asset investment (DTTSCD), as described above, this factor is defined as fixed asset value divided by total asset value. This indicator reflects the level of investment in facilities and technology. Theoretically, investing in fixed asset will help businesses increase productivity, improve product quality, etc. and contribute to improving business efficiency. However, in this study, there is a reverse relationship between DTTSCD and business performance, which means that when an enterprise increases investment in facilities and technology, it will reduce business efficiency. In fact, in the past time, business activities of fishery enterprises faced some difficulty, many enterprises even operated in moderation, the increase of fixed asset investment sometimes was a waste of capital. In this context, instead of buying and renewing fixed assets, enterprises can rent or link with other businesses in the same industry to share machinery and equipment. Findings from the relationship between fixed asset investment and business performance are also consistent with the hypothesis 2 proposed and similar to studies in [2]-[5].

Regarding financial structure, it was measured by financial ratio, defined as liabilities divided by equity. The result shows that HSTC has negative effects on business efficiency (ROE), which means that the higher corporate debt structure is, the lower business efficiency is and vice versa. According to capital structure theories, when a firm uses debt, it will help save on loan interest, thereby increasing profit thanks to the benefits of the tax shield. However, if the business uses debt ineffectively or its performance is not optimistic, repayment pressure will increase, then, business face higher pressure. In case the pressure goes beyond tolerance threshold, business will face more serious risk. Thus, it can be seen that the use of debt is like using a double-edged sword. During the study period, debt structure of the listed fishery companies was very high, as described in Table I, the mean value of financial ratio is more than 1.7, which means debt is 1.7 times higher than equity and working capital mainly comes from debt. Business activities of these enterprises face both internal and external difficulties. Therefore, the fishery companies have not taken advantage of the tax shield from

debt. These findings are in line with the originally developed hypothesis and also in accordance with the study in [6], [7], [9].

In terms of inventory management, this variable is determined by inventory turnover. From the model, this factor has the same effect on ROE, particularly if inventory turnover rises to 1%, ROE will increase to 0.2262% and vice versa. This result shows that the faster inventory turnover is, the higher business efficiency is and vice versa. It is applied to not only listed fishery businesses but most businesses as well. Inventory management efficiency is of great importance to business operations. If the company has effective inventory management methods, it will help save on inventory costs and other financial expenses. In addition, reasonable inventory management will reduce the amount of stagnant capital for better operation. The results of the study are in accordance with hypothesis 4 and similar to findings in [11], [17] or of some domestic researches in [6], [13], [18], [19].

Working capital circulation (VQVON) is one of the indicators reflecting the speed of capital circulation of enterprises. This study shows that if VQVON increases by 1%, it will result in a rise of 15.41% in ROE and vice versa. This can be considered as the best influencing factor on ROE in the study model and the results are in line with the proposed hypothesis 6. As such, an increase in the speed of capital circulation will shorten the time of capital mobilization, thereby help save capital, contribute to reducing price and cost in production process.

V. CONCLUSION

The study result shows that business efficiency of listed fishery enterprises is influenced by four factors, including fixed asset investment ratio, capital structure, inventory management and speed of capital circulation.

In order to improve business performance of these enterprises, managers need to take measures to properly manage inventory, thereby minimizing inventory cost and ordering cost. In parallel with that, it is necessary to strengthen the speed of capital circulation, minimizing capital waste. In particular, a more rational capital structure should be identified by seeking additional funding to reduce external dependence through the use of flexible commercial credit policies for fast payment customers, searching for providers with reasonable discount rate, etc. Besides, it is suggested to limit expensive fixed asset investment by creating a link between businesses to share machinery, equipment, technology. In the context of the fourth industrial revolution, technological innovation is necessary, but in limited financial condition, handshake among businesses becomes even more necessary. Through the research results, it is hoped that this will be the basis for assisting listed fishery enterprises in improving business efficiency in the coming time. However, for fishery sector, apart from internal factors of the enterprises, there are also external factors from the economy such as economic growth, inflation, interest rates, etc. Those factors were not addressed in the study and can be the idea for further research on effectiveness of corporate business in general and fishery business in particular.

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