ANALYSIS OF INFLUENTIAL FACTORS OF INTANGIBLE ASSET VALUATION: AN EMPIRICAL STUDY FOR VIETNAMESE SEAFOOD MANUFACTURING LISTED COMPANIES

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ABSTRACT

As intangible assets are gradually becoming one of the essential sources of competitive advantages of business enterprises in developing economies including South-East countries, it is important to have a comprehensive investigation of underlying factors of intangible assets value creation. Therefore, this study examines the influential factors of intangible asset value of seafood manufacturing companies listed on Vietnam's Stock Exchange from 2014 to 2016. The authors collected panel data of 53 listed seafood manufacturing firms and employed Random effect model to examine the relationships between possible influential factors and intangible assets value as proxied by Tobin's Q. The results indicate that firm's age and firm's size have statistically significant positive and negative effects on intangible assets value, respectively. Meanwhile, intangible assets investment, sale growth, capital intensity and dividend are found to have no statistically significant relationships with intangible assets value. In general, these findings of capital intensity's and firm size's effects on intangible assets value do not conflict with previous studies. Nonetheless, the influences of dividend, intangible assets investment and sale growth on intangible assets value in this research are documented to be different from previous works by Allayannis and Weston (2001), Lu et al. (2010). The lack of an empirical and significant relationship between dividend factor and intangible assets value represented by Tobin's Q implies that dividend in fact does not transmit a meaningful signal of intangible assets value improvement for the case of listed seafood manufacturers in Vietnam, which is contradictory to theoretical expectation. Additionally, as investments in intangible assets and sale growth are proven to not empirically enhance intangible assets value either, the efficiency of intangible assets investment projects and value-added capability of sale growth of Vietnamese listed seafood manufacturers now become questionable.

Key words: Intangible Assets, Asset Valuation, Tobin's Q

INTRODUCTION

In the context of globalization, the trends of investment, expansion, mergers and acquisitions are taking place heatedly in many economies around the world. To survive in such a competitive business world, firms need to increase their value and rely on it to improve their position in the market. Among the factors which contribute to the total value of a firm, intangible assets (IAs) are one of the most significant components with increasing contributing weights, especially in knowledge-based economy where intangible and intellectual resources are considered as the main sources of firms' added value.

As a result, a question should be raised about what factors influence the value of firms IAs. Such issue has never been more relevant as it has highly practical implications for business today. When the influential factors of IAs value are clearly identified, managers can give appropriate solutions to maintain and improve IAs value accordingly, thus helping to enhance firms' total value. This is the case of not only developed economies with enormous IAs value and well-developed body of knowledge of IAs valuation but also developing economies including Vietnam where IAs valuation is still a rather new topic.

Several studies have examined potential influential factors of IAs value, but their findings may be not unanimous due to distinctive context of each research. In Vietnam, the knowledge about impacting factors of IAs is extremely poorly developed, as there has been no comprehensive study on such topic so far. Most studies instead just concentrated on applying and developing valuation models for specific types of IAs. The lack of a thorough study for IAs' influential factors in Vietnam is thus a research gap which needs to be fulfilled. This is particularly relevant for Vietnamese seafood manufacturers as their industry relies heavily on IAs as a competitive advantage for success in exporting and international market expansion.

This research is conducted as an attempt to contribute to the body of knowledge regarding IAs' influential factors, especially in the context of developing countries such as Vietnam. In particularly, this paper aims at identifying financial and non-financial factors which have statistically significant effects on IAs value of seafood manufacturing companies in Vietnam, followed by discussion/explanation about their effects.

LITERATURE REVIEW

Intangible assets and measurement of intangible assets value

According to international accounting standards (IAS) #38, intangible assets are an "identifiable non-monetary asset without physical substance. An asset is a resource that is controlled by the entity as a result of past events (for example, purchase or self-creation) and from which future economic benefits (inflows of cash or other assets) are expected". Therefore, there are three essential characteristics of an IA: Identifiability, control (power to obtain benefits from the asset) and future economic benefits (such as revenues or reduced future costs).

Vietnam's accounting standard (VAS) #04 defines intangible assets as non-physical assets which can be evaluated and controlled by business enterprises and can generate economic benefits in future. Basically, the IA definition of Vietnamese accounting standards is similar to the one in IAS.

Several professional organizations and researchers note that factors which should be considered as firms' IAs include not only the ones meeting the accounting standards above. Organisation for Economic Co-operation and Development (OECD) (2011) defines IAs as non-physical and non-financial assets, which can also be referred to as intellectual assets, and classifies them into 3 groups: computerized information (such as software and databases); innovative property (such as scientific and nonscientific R&D, copyrights, designs, trademarks); and economic competencies (including brand equity, firm-specific human capital, networks joining people and institutions, organizational know-how that increases enterprise efficiency, and aspects of advertising and marketing). In some empirical studies, scholars also identified certain sources such as brand, employees' skills and experience, leaders' competency, relationships with customers and suppliers and efficient operation mechanism as firm's IAs even though they are not recognized so by accounting standards. Such point of view was shared by Lev (2001) (as cited in Osterland, 2001) and Daum (2001), who pointed out that the identification of IAs in practice is so complicated that it went beyond merely following accounting standards. One of the reasons for that is that IAs, as separated from other relevant factors, cannot generate economic benefits on their own. In other words, to become a beneficial source for firms, IAs need to be combined with other business factors. Besides, some IAs' components are also intertwined, making it difficult to separate and assess each single component. Lev (2005) also noted another different characteristic of IAs that most IAs cannot be traded because there is practically no official and unique market for them.

In conclusion, there is no unanimous definition of IAs in the academic world. However, most scholars agree that IAs in fact involve more resources than those recognized by accounting standards and recorded on financial statements. In addition, two basic characteristics of IAs are commonly realized: their non-physicality and their economic benefits.

Due to the fact that IAs value recorded on financial statements does not include all intangible resources of firms, researchers usually have to use other criteria to measure or represent IAs value, such as market-to-book-value or M/B (Little et al., 2008; Hulten and Hao, 2008), Economic value added or EVA (Le et al., 2008; Moradi et al., 2012; Savickaitė, 2014), Calculated intangible value or CIV (Stewart, 1994; Volkov and Garanina, 2007; Shiri, 2012; Lim and Ryu, 2013…). Among those proxies, the most commonly used is Tobin's Q, which was first introduced by Tobin (1969):

$$\textit{Tobin's Q} = \textit{Firm's market value / Replacement cost of firm's assets} \quad (1)$$

Tobin's Q and its variants have been employed by Hall (2000, 2001), Laitner and Stolyarov (2003), Wright (2006), Anghel et al. (2008), Tsutomu et al. (2013), Peters and Taylor (2014) etc. to represent IAs value. If Q > 1, the market value of the firm is higher than its book value and that difference is attributed to the IAs which are not recorded on the firm's financial statements. According to Savickaitė (2014), Tobin's Q is quite easy to calculate compared to other criteria and it also covers both the overall value of IAs as well as the value of each recognized and unrecognized component of IAs, thus it may be useful for decision making of investors but sensitive to market fluctuations and speculation.

Influential factors of intangible assets value

Financial factors

Rao et al. (2004), Black et al. (2006), Gleason and Klock (2006), Fukui and Ushijima (2007) argued that firm value reflects market perception and evaluation of expected earnings generated from firm's tangible and intangible assets. Therefore, **investments in IAs** such as R&D activities, advertising, fair conduction should increase firm value in the same way as the investments in tangible assets do. Gleason and Klock (2006) considered R&D expenses and advertising expense as investment to increase IAs value with expected positive impact on firm's future cash flows and firm value. The study by Lu et al. (2010) gave the same conclusion. According to Klock and Megna (2000), Rao et al. (2004), Gleason and Klock (2006), Fukui and Ushijima (2007), the factors above have strong impact on the relationship between IAs and firm's business performance, but the effect's direction is not always as expected.

Firm's intangible value may also be affected by **sale growth**, which is an indicator of growth opportunities. The effect of sale growth on firm's value was examined by Wiwattanakantang (2001), Claessens et al. (2002), La Porta et al. (2002), Lang et al. (2003), Klapper and Love (2004), Rao et al. (2004), Fukui and Ushijima (2007), who found that firm's annual sale growth rate has positive and statistically significant relationship with firm's Tobin's Q. The research by Kodongo et al. (2014) in Kenya once again confirmed the positive and significant effect of sale growth on Tobin's Q for listed firms of small size but discovered a new point that such effect does not exist in case of large-sized firms. This may hint that firm's size factor may somehow moderate the relationship between sale growth and Tobin's Q.

Capital intensity, which can be interpreted as the contribution weight of capital to output value of firms and measured by fixed assets / net sales ratio, is also a potential factor to affect firms' IAs, as it indirectly reflects firm's investment opportunities. However, the results of most empirical studies in the past were opposite to expectation or statistically insignificant (Allayannis and Weston, 2001; Claessens et al., 2002; Lins, 2003; Klapper and Love, 2004). Basically, the effect of capital intensity on IAs value is yet to be clearly and unanimously defined.

Allayannis and Weston (2001) also suggested that **dividend** can be a relevant factor to determine IAs value and firm value as firm's dividend policy partly depends on firm's demand of funds for investment opportunities, which is also an impacting factor of firm value. If a firm can pay dividend, it is less likely to be capital-constrained, and the possible redundance of funds may give way to overinvestment in low-NPV projects, which lowers firm's value and its Tobin's Q. The empirical study by Lu et al.

(2010) for companies of various industries except utilities and financial services in Taiwan confirmed that firm's decision to pay dividend has statistically significant effect on Tobin's Q, thus it affects investors' valuation of firm's IAs, but such effect does not necessarily follow the negative direction as suggested by Allayannis and Weston (2001). However, a recent study by Pascareno and Siringoringo (2016) found that there is no significant relationship between Tobin's Q and dividend payment of insurance and banking companies in Indonesia. Therefore, the relationship between dividend payment and Tobin's Q appear to vary depending the specific context of each industry and economy.

Moreover, the studies by Gleason and Klock (2006), Black et al. (2006), Fukui and Ushijima (2007) discovered negative and statistically significant relationship between **firm's size**, which is measured by natural logarithm of firm's average total assets, and firm's IAs value. Their findings can be explained by the fact that biggest business enterprises are often the oldest ones, which already reached the maturity phase of their business development cycle and do not have as many growth opportunities as the smaller and younger ones, so it is more difficult for them to enhance firm value even more. Similarly, Kodongo et. al (2014) found empirical evidence for negative effect of firm size on Tobin's Q of listed companies in Kenya, but this is only the case of small firms. For large firms, these authors did not find any significant relationship between firm's size and Tobin's Q.

Several authors also examined the influence of **capital structure** on Tobin's Q. However, most studies did not find any significant relationship between financial leverage and Tobin's Q (Kodongo et al., 2014; Pascareno and Siringoringo, 2016; Manurung et al., 2016), implying that adjusting the amount or ratio or debt did not automatically create more intangible value for firms.

Non-financial factors

Wiwattanakantang (2001), Claessens et al. (2002), Oxelheim and Randoy (2003), Gompers et al. (2003), Black et al. (2006) considered **firm's age** as one of the potential influential factors of IAs. Black et al. (2006) explained that older firms tend to have better information disclosure, higher liquidity, more diversified business activities, thus less financial distress and higher firm value. However, on the other side, younger firms tend to have more growth opportunities, higher growth rate, thus higher accumulated IAs value. Nonetheless, the empirical research by Lu et al. (2010) did not discover any statistically significant relationships between firm's age and Tobin's Q of Taiwanese companies. This finding was later shared by Sucuahi and Cambarihan (2016), who conducted similar research for diversified companies in the Philippines. In general, the effect of firm's age on firm's IAs value is still not examined widely in empirical studies, and its impacting direction is not defined clearly yet.

IAs value also varies across **industries**. According to Tseng and Goo (2005), industries which require a lot of intellectual resources such as IT industry have much higher IAs value than the traditional manufacturing industries. Similarly, statistical information by Klock and Megna (2000) showed that companies in telecommunication industry had average Tobin's Q of approximately 10, which was much higher than that of traditional industries (approximately 1.0), indicating that the telecommunication industry had obviously higher weight of IAs. Nonetheless, a different result was provided by Sucuahi and Cambarihan (2016), who found that the industry factor empirically has no effect on Tobin's Q for firms in the Philippines.

Ownership structure may affect firm value via the actions of shareholders. Empirical research showed that controlling shareholders tended to have negative effect on firm's intangible value (Stulz, 1999; Claessens et al., 2002; La Porta et al., 2002; Fan and Wong, 2005; Fauzi and Locke, 2012). That effect might be even more serious due to pyramid ownership structure in some businesses, the co-existence of different stock types and cross-ownership, as pointed out by Morck and Yeung (2003) and Silva et. al (2006). However, such negative effect can be reduced by corporate governance measures such as establishing board of directors, managerial ownership or outsiders' supervision (Bhagat and Black, 2002; Jung and Kwon, 2002; Lins, 2003; Oxelheim and Randoy, 2003; Lu et al., 2010; Fauzi and Locke, 2012).

In addition, other studies suggested several more possible impacting factors of IAs such as firm's diversification (Allayannis and Weston, 2001), firm's internationalization (Allayannis & Weston, 2001; Oxelheim & Randoy, 2003; Black et al., 2006), market concentration (Anderson et al., 2004; Rao et al., 2004), analysts' following (Diamond and Verrecchia, 1991; Lang et al., 2003), etc. However, most of these studies only focus on the effects of those factors on overall value of firm without separating their effects on specific value of firm's IAs. Some of them basically just provide qualitative description of such effects with no empirical testing or quantitative measurement. For some potential factors, the directions of their impacts on IAs value are not clearly or unanimous determined, or the results are not statistically significant.

In summary, several international studies on influential factors of firm's IAs value have discovered both financial and non-financial, internal and external, micro and macro factors which can possibly affect IAs value of different types of companies in various industries in developed as well as developing countries. While most authors agreed on the effects of IAs investment and ownership structure, they often reached different conclusions about the influences of other factors including sale growth, capital intensity, dividend, firm's size and age. Notably, several studies in the context of emerging economies in Asia such as Indonesia, Taiwan and the Philippines provided results that are different from the previous research in developed countries such as US or Japan. This suggests that more research on influential factors of IAs value need to be conducted for developing countries including Vietnam in order to clearly determine which factors affect IAs value and explain how they can influence IAs value in the specific context of those countries.

In Vietnam, there has been no comprehensive study of impacting factors of IAs value. Most studies just focused on applying valuation models for specific IAs but did not investigate IAs value's influential factors. Le (2008) conducted brand valuation of a Vietnamese plastic joint-stock company using the Economic Value Added (EVA) model and Interbrand model. Do (2014) developed a brand valuation model, which partially relied on Interbrand model, for Vietnamese commercial banks. Hay and Tran

(2014) developed an adjusted version of Black-Scholes optional pricing model for the purpose of IAs valuation and applied it to determine the value of agricultural harvesting machine patent, etc. None of those studies considered examining influential factors of IAs.

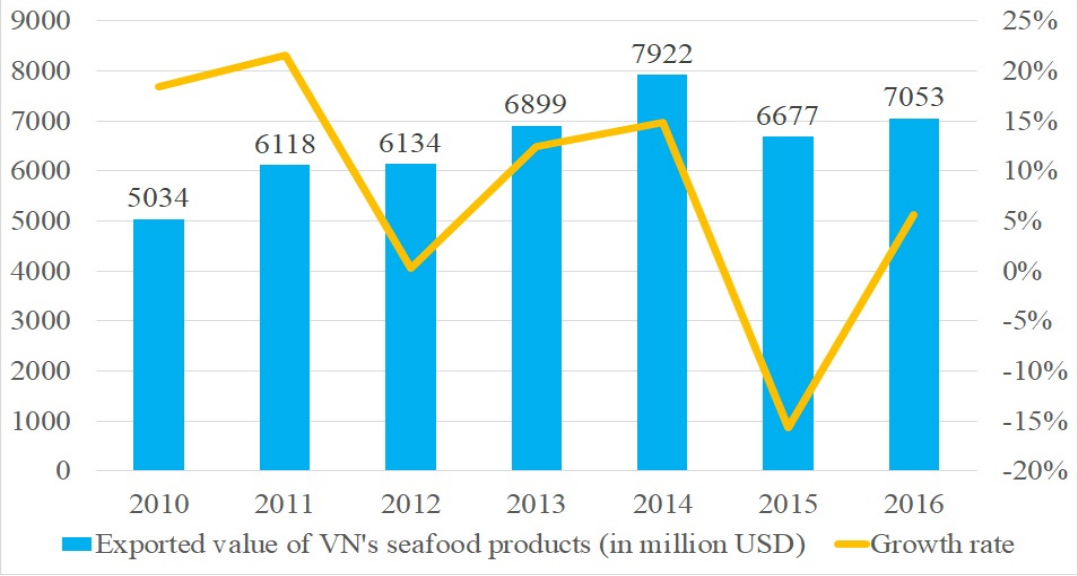
As asset valuation in Vietnam still has a lot of drawbacks in terms of knowledge and experience, the lack of in-depth studies of IAs value's determinants is really a noticeable research gap which needs to be fulfilled. Once these influential factors and their impacting direction and impacting size on IAs value are clearly determined, managers can build up a framework to control, supervise and analyze these factors, especially the internal ones, and follow up with solutions to maintain and improve IAs value, thus enhance the overall value of their firms.

OVERVIEW, DATA AND SAMPLING OF VIETNAMESE SEAFOOD MANUFACTURING INDUSTRY

Since 2010, the seafood manufacturing industry of Vietnam has undergone lots of both positive and negative changes. The total amount of fish farming and production continuously and stably increased at average annual growth rate of 4.78% per year over the last 6 years. The greatest contributor of fish farming and production is the Mekong River Delta, which always makes up for more than 56% of the national total production volume, followed by Northern Central Area & Central Coastal Area (approximately 21-22%) and the Red River Delta (11-13%). The region-based production structure does not change much over time. The production volume of each region also grows steadily from year to year, except for the only case of South - East Area, whose production volume decreased in 2013.

In addition, the seafood manufacturing also contributes a lot to exporting activities of Vietnam, as shown in figure 1:

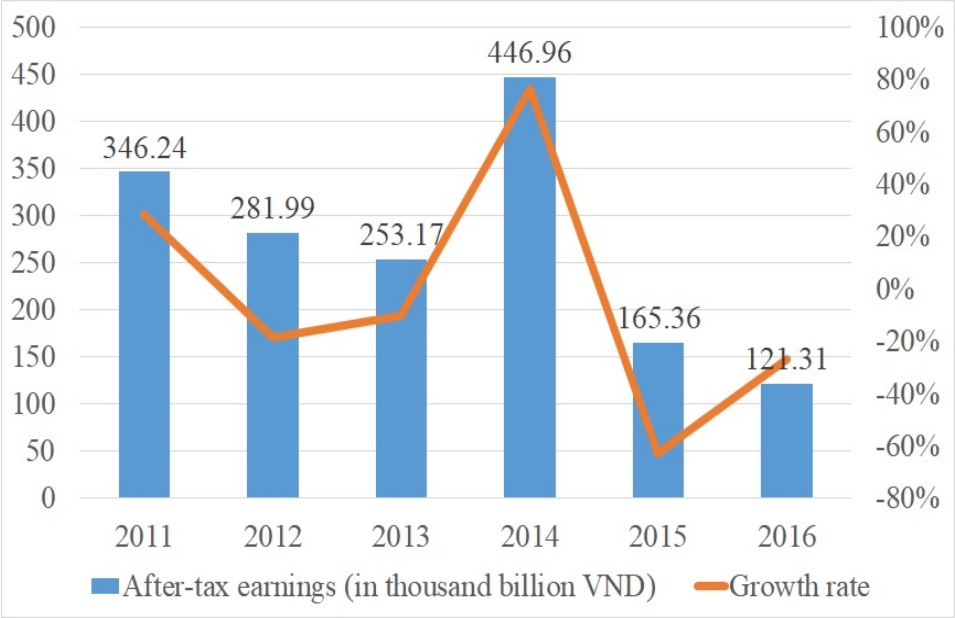
Fig. 1. Exported value of Vietnam's seafood products from 2010 to 2016



The exported value of Vietnam's seafood products increased from 5000 million USD in 2010 to nearly 8000 million USD in 2014. However, the growth rate of exported seafood value was not stable. The exported value of Vietnamese seafood products grew by nearly 20% during 2010-2011 but only by 0.3% in 2012 due to demand decline of international market for imported seafood products and technical barriers which started to come into effect at that time for Vietnam's exported seafood products. In 2013 and 2014, the exported value recovered and achieved growth rate of about 10% per year but declined again by nearly 16% in 2015 and only increased slightly by 6% in 2016. In general, Vietnam's exporting of seafood products is heavily affected by adverse and unpredictable impacts of climate changes, natural disasters (drought, flood, typhoon, etc.), environmental pollution (notably the incident of Mid-land area's sea pollution in 2016).

Besides, profitability indicators including after-tax earnings, return on assets (ROA) and return on equity (ROE) of Vietnam's seafood manufacturing industry fluctuated quite a lot during this time:

Fig. 2. Total after-tax earnings of Vietnamese listed seafood manufacturing companies from 2011 to 2016



As shown in figure 2, total after-tax earnings of listed firms in the industry grew strongly in 2014 but declined sharply in most of the other years, especially in 2016, when the firms' total net income reached the lowest level in 6 recent years. During this time, several seafood manufacturing firms including even the biggest ones had business difficulties and incurred losses.

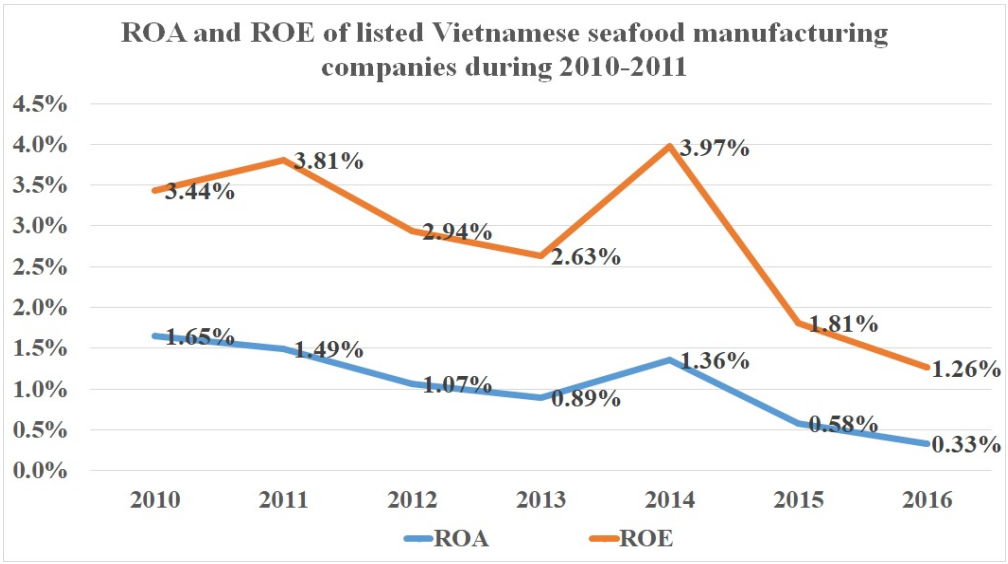


Fig. 3. ROA and ROE of Vietnam's listed seafood manufacturing companies from 2010 to 2016

Similarly, figure 3 shows that ROA and ROE of those firms also fluctuated a lot. Their ROA increased in 2014 but decreased in other years. ROE was only improved in 2011 and 2014. Both ratios reached their lowest levels in 2016. This suggests the downward trend of these firms' profitability in recent years, which can be attributed to decreasing prices of exported seafood products, adverse changes of exchange rates and considerable financial expenses due to heavy use of financial leverage.

Based on the practice of Vietnamese seafood manufacturing industry, the authors collect secondary data of listed Vietnamese seafood manufacturing companies from 2014 to 2016 from their publicized and audited financial statements and from HOSE's Stock Exchange. Specifically, the data collected from HOSE's Stock Exchange include market price of common stock at the beginning and ending of each fiscal year, number of outstanding common shares at those same points of time and firm's age

(which is calculated as the number of years since establishment); the data collected from companies' financial statements include average annual book value of preferred stock, average book value of total assets, annual research and development and advertising expenses, annual net sales, average book value of fixed assets and annual common dividend.

METHODOLOGY

Variables

Dependent variable

The dependent variable selected to represent the value of IAs is Tobin's Q, which is originally calculated by Tobin (1969) as below:

Tobin's Q = Firm's market price / Replacement cost of firm's assets (1)

In fact, both the values of numerator and denominator of the above formula are unobservable. Therefore, the formula of Tobin's Q is adjusted by the authors, following Lu et al. (2010) as follows:

Tobin's Q = (Market value of common stock + Book value of preferred stock + Book value of debt)/Book value of total assets (2)

All the values included in the numerator and denominator are average annual values. In other words:

Market value of common stock = (Market price of common stock at the beginning of the year × Number of outstanding common shares at the beginning of the year + Market price of common stock at the end of the year × Number of outstanding common shares at the end of the year)/2

Of which, market prices of common stock at the beginning and at the end of each year are consecutively defined as the opening price in the first transaction and the closing price in the last transaction of the stock in such year.

For book value of preferred stock, book value of debt and book value of total assets, their average annual values are calculated as the simple average of their values at the beginning and at the end of each fiscal year.

According to some scholars, if Tobin's Q > 1, there is a difference between firm's market value and firm's book value and that difference indicates the value of those IAs not recorded on firm's financial statements.

Independent variables

The independent variables are used to represent potential influential factors of firm's IAs value. Their notations and calculation are mentioned below:

- Investment in IAs: Variable IAINVEST, which is measured by firm's annual R&D and advertising expenses extracted from firms' annual financial statements.
- Sale growth: Variable SALEGROWTH, which is measured as the percentage rate of annual net sale changes of firms over time: SALEGROWTH = (Net $sale_t$ – Net $sale_{t-1}$)/Net $sale_{t-1}$
- Capital intensity: Variable CAPINTENSE, which is measured by the ratio of average book value of firms' fixed assets and net sale in each year: CAPINTENSE = Average book value of fixed $assets_t$/Net $sale_t$
- Dividend: Variable DIV, which is measured by annual common dividend taken from firms' annual financial statements.
- Firm's size: Variable SIZE, which is measured by natural logarithm of average annual book value of firms' total assets: SIZE = ln(Average book value of total $assets_t$)
- Firm's age: Variable AGE, which is measured by the number of years from the time of firm's establishment to the time of data collection.

Because the research object is limited to companies in one single industry (seafood manufacturing industry), the variables which represent industry characteristics are not needed to be included in the model. Other non-financial and/or qualitative factors which are unobservable in the context of Vietnam's seafood manufacturing industry and seafood market are also excluded.
Table 1 provides a summary of all used variables in the regression model.

Table 1. Summary of variables used in regression model

	Factor	Variable	Measurement
Dependent variable	Intangible assets value	Tobin's Q	(Market value of common stock + Book value of preferred stock + Book value of debt)/Book value of total assets
Independent variable	Investment in IAs	IAINVEST	Annual R&D and advertising expenses
	Sale growth	SALEGROWTH	(Net $sale_t$ – Net $sale_{t-1}$)/Net $sale_{t-1}$
	Capital intensity	CAPINTENSE	Average book value of fixed $assets_t$/Net $sale_t$
	Dividend	DIV	Annual dividend
	Firm's size	SIZE	ln(Average book value of total $assets_t$)
	Firm's age	AGE	Number of years since firm's establishment

Model

The following regression model is employed to estimate the effects of the above potential factors on firm's IAs value:

$$Tobin's\ Q = \alpha + \beta_1 IAINVEST + \beta_2 SALEGROWTH + \beta_3 CAPINTENSE + \beta_4 DIV + \beta_5 SIZE + \beta_6 AGE + u \quad (3)$$

The expected signs of regression coefficients are shown in table 2.

Table 2. Expectation of regression coefficients' signs

Variable	Coefficient	Expected sign
IAINVEST	β_1	+
SALEGROWTH	β_2	+
CAPINTENSE	β_3	+/-
DIV	β_4	+/-
SIZE	β_5	-
AGE	β_6	+/-

Analysis method

The following model is tested based on Ordinary Least Square method (OLS):

$$Y_t = \beta + \beta_1 X_t + e \quad (4)$$

Where: Y is the dependent variable, X is the independent variable, e is the standard error, assuming all regression coefficients are non-changing over time. The independent variables need to be strictly exogenous (Gujarati and Porter, 2009), which means the independent variables are not randomly dependent on historical, present and future values. Pooled Ordinary Least Square method groups all the independent variables without considering unique characteristic of each of them in the model. In other words, such method ignores the variables' uniqueness. Hence, the model groups the random uniqueness of samples and is easy to cause autocorrelation, leading to biased and inconsistent estimations. The test for possible correlated standard errors is then conducted and Arellano method is used to re-estimate the standard errors (Arellano and Bond, 1991).

As a remedy for autocorrelation, Random effect model (REM) may be used. To test for a choice between Pooled OLS and REM, Breusch-Pagan Lagrange Multiplier (Breusch-Pagan LM Test) is used (Breusch & Pagan, 1980). If p-value of the tested model is < 5%, REM is considered as more appropriate.

Next, to test for a choice between Fixed effect model (FEM) and REM, Hausman test is used (Hausman, 1978) with two following proposed hypotheses:

H_0: The estimators of the two methods are not different.

H_1: The estimators of the two methods are different.

Hausman test follows $\chi 2$ distribution. If H_0 is rejected, FEM is deemed to be more appropriate than REM.

RESULTS AND DISCUSSION

Descriptive statistics

Table 3. Descriptive statistics of variables used in the model

Variable	N	Min	Max	Mean	Standard deviation
Tobin's Q	107	0.09	21.328	2.556	4.012 983 537
IAINVEST	107	-1519.708	5643.965	59.471	549 313.209 2
SALEGROWTH	107	-0.883 77	1.740 09	0.049 9	0.380 587 59
CAPINTENSE	107	0.014 29	7.84	0.325 56	0.863 553 043
DIV	107	0	7 238 478	203 268	803 677.708 2
SIZE	107	11.77	31.91	21.57	7.064 712 359
AGE	107	5.00	56.00	19.74	12.040 188 02

As shown in table 3, there are 107 observations of each variable during the period 2014-2016. The average, maximum, minimum values and standard deviations in table 3 indicate the fluctuations of the value of each variable, thus hinting the probability distribution of the data.

In particularly, Tobin's Q has minimum value of 0.09 < 1 and maximum value of 21.328, indicating that aside from firms with market values exceeding their total assets' book values by a huge gap, some firms are perceived by the market to be actually less valuable than what they look like on accounting basis.

Net investment in IAs has lowest value of -1519.708 million VND and maximum value of 5643.965 million VND, indicating that investments in IAs vary across firms and fluctuate over years. Most of those firms are very active and caring in IAs investment and development but some companies reduce their IAs size, as shown by negative net investment in IAs due to additional investment in IAs being insufficient to cover amortization expense in the same year.

Annual sale growth rate has minimum value and maximum value of -88.377% and 174.009% respectively, showing that annual sale growth rates have a wide range of values and are substantially different among firms and over years. For some firms, their sales did not even increase a bit but instead decreased sharply during certain years, while for other firms their sales grow strongly in the same period.

For capital intensity ratio, the minimum observed value is 0.014 290 and the highest observed value is 7.84, indicating that the extent to which seafood manufacturing firms rely on fixed assets to generate revenues visibly differ from year to year and from one firm to another. This may also be a result of difference in fixed assets utilization efficiency of these firms over time.

The lowest value of annual common dividend payment is 0 and its highest value is 7238.478 million VND. This reflects the differences in annual dividend payment decisions of seafood manufacturing firms, some of which even did not pay any common dividends in certain years.

Furthermore, total assets and ages of those above firms are also very different, which can be inferred from the statistical results above.

Regression results

Firstly, correlation matrix is constructed to check for correlation between independent variables:

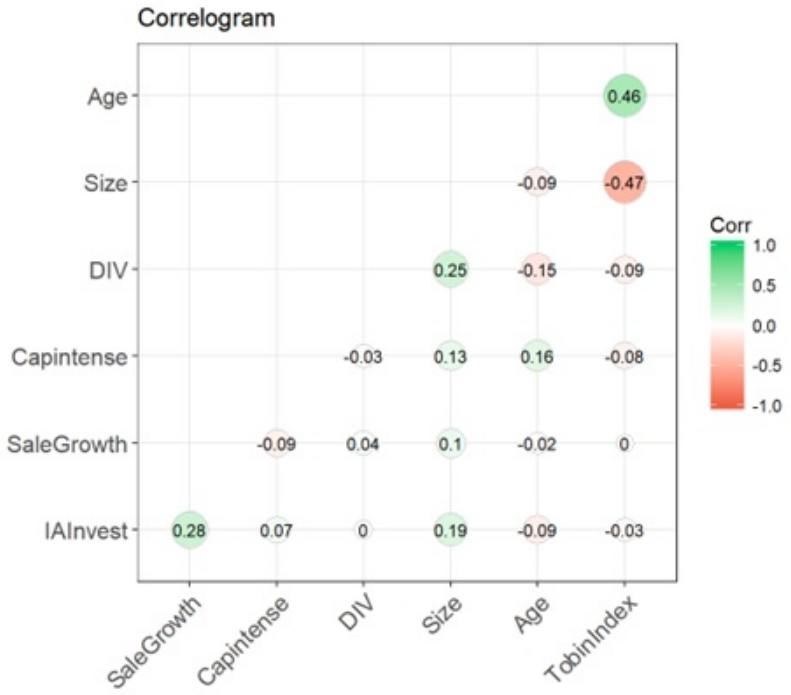


Fig. 4. Correlation matrix of independent variables

As shown in the correlation matrix, all the correlation coefficients are lower than 0.5, thus the model does not suffer from serious multicollinearity.

The results of running regression by Pooled OLS method is shown in table 4:

Table 4. Results of running regression model for influential factors of IAs value by Pooled OLS method

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	5.7595	2.1938	2.6254	0.011 395**
IAInvest	0.0001	0.0001	1.5418	0.129 317
SaleGrowth	0.1036	0.3775	0.2744	0.784 910
Capintense	-0.1438	0.0637	-2.2554	0.028 426**
DIV	0.0000	0.0000	2.3617	0.022 046**
Size	-0.2805	0.0834	-3.3631	0.001 469***
Age	0.1545	0.0637	2.4266	0.018 812**

Note:, **, *** denote significance level of 10%, 5% and 1% respectively.*

As shown in table 4, capital intensity (Capintense), dividend (DIV), firm's size (Size) and firm's age (Age) have statistically significant effects on IAs value. However, to confirm the model's fitness and reliability, Breusch-Pagan test is conducted. Breusch-Pagan test's results show that the standard errors of the model above are intercorrelated and the p-value is very low (p-value = 0.000 123 800 < 0.05), so it can be concluded that the model suffers from autocorrelation and it needs to be adjusted. Pooled OLS method needs to be replaced by either Random effect model (REM) or Fixed effect model (FEM).

The results of running REM and FEM are displayed in table 5 and table 6, respectively.

Table 5. Results of running REM for influential factors of IAs value

	Estimate	Std. Error	t-value	Pr(>|t|)
(Intercept)	5.759 500	2.090 700	2.7548	0.0081***
IAInvest	0.000 105	0.000 383	0.2729	0.7861
SaleGrowth	0.103 560	0.826 560	0.1253	0.9008
Capintense	-0.143 780	0.269 350	-0.5338	0.5958
DIV	0.000 000	0.000 000	0.6923	0.4919
Size	-0.280 490	0.079 548	-3.5261	0.0009***
Age	0.154470	0.044519	3.4698	0.0011***

*Note: *, **, *** denote significance level of 10%, 5% and 1% espectively.*

As shown in table 5, when REM is employed, size and age are found to have statistically significant effects on the value of IAs.

Table 6. Results of running FEM for influential factors of IAs value

	Estimate	Std. Error	t-value	Pr(>|t|)
IAInvest	0.000 058	0.000 402	0.1439	0.8872
SaleGrowth	0.162 260	0.880 530	0.1843	0.8559
Capintense	-0.076 364	0.283 110	-0.2697	0.7904
DIV	0.000 000	0.000 002	-0.0063	0.9951
Size	0.467 630	1.065 700	0.4388	0.6660
Age	0.522 100	0.466 360	1.1195	0.2776

Note:, **, *** denote significance level of 10%, 5% and 1% respectively.*

Table 6 shows that when FEM is employed, none of the independent variables are found to have statistically significant relationships with IAs value.

The Hausman test is then applied to make comparison between two models to identify the more appropriate one. According to Hausman test's result, p-value = 0.1013 > 0.05 so REM is more appropriate than FEM.

The final results show that the independent variable Size has negative and statistically significant relationship with the dependent variable Tobin's Q, the independent variable Age has positive and statistically significant relationship with the dependent variable Tobin's Q, while the other independent variables including IAInvest (net investment in IAs), SaleGrowth (annual sale growth rate), Capintense (capital intensity) and DIV (annual common dividend payment) have no statistically significant effects on Tobin's Q.

Based on the results, the standardized form of the model is identified as follows:

$$Tobin's\ Q_{it} = 5.759\ 500 - 2.804\ 900 \times SIZE_{it} + 1.544\ 700 \times AGE_{it} + u_{it} \quad (5)$$

Discussion

The variable Size has regression coefficient of -2.804 900 < 0, which means firm's size has negative relationship with IAs value, which is similar to the results Black et al. (2006), Fukui and Ushijima (2007), Gleason and Klock (2006). Bigger firms are usually at maturity phase of their life cycle, thus they do not have as many growth opportunities as the younger firms with smaller sizes. As growth opportunities are considered as one of the essential factors to improve firm's IAs value, the unfavorable effect of size on bigger firms is understandable.

Meanwhile, the variable Age has regression coefficient of 1.5447 > 0. According to previous studies, for example the one by Black et al. (2006), firm's age has two-sided effect (both positive and negative effects) on IAs. The empirical results in our study, however, shows that firm's age has positive relationship with IAs in fact. This can be interpreted that the positive effect of this factor practically outweighs its negative effect on manufacturing firms of Vietnam's fishery industry. Firms which are established earlier and thus have higher ages tend to have advantages in terms of market share, experience, business diversification, customer and supplier relationships, which are important intangible resources of the firms.

Besides, the research results do not show any statistically significant relationship between the variable IAInvest (net investment in IAs) and Tobin's Q, indicating that Vietnamese seafood manufacturing firms did not really make effective investments in IAs in recent years and these investments could neither positively affect investors' perception of firms' IAs value nor contribute to the increases of stock market price of those firms.

Similarly, the variable SaleGrowth (annual sale growth rate) is proved to have no statistically significant effect on Tobin's Q. In fact, the unstable sale growth over the last 3 years could hardly help to improve the IAs value as well as overall firm value of seafood manufacturing companies of Vietnam effectively.

In addition, the variable Capintense (capital intensity) does not have statistically significant impact on Tobin's Q either. This result does not conflict with that of previous studies by Allayannis and Weston (2001), Claessens et al. (2002), Lins (2003), Klapper and Love (2004). Therefore, it may be concluded that capital intensity in fact is not representative of investment opportunities, growth potential or IAs in case of Vietnamese seafood manufacturing companies.

Finally, the research does not find any evidence for statistically significant relationship between the variable DIV (annual common dividend payment) and Tobin's Q. This result is different from the conclusion of Allayannis and Weston (2001), Lu et al. (2010) in their previous studies. However, it can be explained by looking at the practice of Vietnam's stock market. Due to the inefficiency of Vietnam's stock market, firms' dividend policy and dividend payment decision may not affect investors' evaluation of firm's IAs, or the (generous) dividend payment is not necessarily an indicator of the possible negative fact that the firm has redundant funds to the point that it may invest in low-NPV projects, thus lowering IAs value and firm value as argued by Allayannis and Weston (2001).

CONCLUSION

In the everchanging market economy nowadays, the value of business enterprises' intangible assets is constantly increasing, which contributes to the improvement of firms' financial strength and market position. The research is conducted to identify the influential factors of firms' intangible asset value, including financial factors such as investments in intangible assets, sale growth, capital intensity, dividend and non-financial factors such as firm's size and firm's age.

Using Pooled OLS method, FEM and REM, the authors recognize REM as being fit for the data of Vietnamese listed seafood manufacturing companies. In general, the research results do not conflict with those of previous studies regarding capital intensity and firm's size. Nonetheless, regarding certain aspects, the research gives findings different from studies by Allayannis and Weston (2001), Lu et al. (2010). The empirical results show that dividend does not have statistically significant relationship with Tobin's Q, or it is arguable that dividend does not really affect IAs value of listed seafood manufacturers in Vietnam. Additionally, investments in IAs and sale growth are not found to have statistically significant effects on IAs value either. These findings indicate that it is not possible yet to conclude whether investments in IAs and sale growth can really affect firms' IAs value.

The results of regression coefficients' signs are determined by REM method and the expectation of coefficients' signs are based on literature review. In general, there are not so many differences between the results and expectations of the coefficients' signs. However, the variables of investments in IAs and sale growth are found to be statistically insignificant. In other words, there is not enough statistical evidence to confirm these two factors' effects on IAs value of Vietnam's listed seafood manufacturing firms. Although the underlying reasons are discussed above, it should be emphasized that these firms do not take enough care of IAs' investments to develop their value and are not active enough to strengthen the relationship between sale growth and IAs value.

Given the above results, the study could have been more in-depth had it considered the effect of changes of IAs value changes due to identified influential factors on firm value, which suggests the future prospective of the research.

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