

The Relationship between Firm Sizes and Stock Returns of Service Sector in Ho Chi Minh City Stock Exchange

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Abstract

The paper aims at investigating the existence of size effect in Vietnamese financial market. Particularly, the relationship between firm size and stock turns would be explored. Having 160 observations of the companies in service sector from 2009 to 2014, the multiple regression model was employed to test that effect. As a result, a significantly negative relationship between firm size and stock returns was studied. Besides, some implications and limitations were also discussed.

Keywords: firm sizes, stock returns, service sector, Ho Chi Minh stock exchange, Vietnam

1. Introduction

Although there are a numerous studies related to size effect phenomena, it's still in debate of the existence of size effect in financial markets. Size effect is studied as an inverse relationship between two variables, size and returns of companies that so-called the size anomaly (Banz, 1981; Fama & French, 1993; Daniel & Titman, 1997). While several assumption and modification were made, Banz (1981) indicated that the negative relationship has been reinforced throughout the time by practically observing 50-year performance of the New York Stock Exchange. However, Keim (1983) proved that the size effect only appears in January (i.e., seasonal effect). Arguably, most updated researches showed totally different findings. Fama and French (2011) observed the market for 20 years from 1990 and explored no premium for the size effect. That exploration was also supported by Dimson and Marsh (1999) which stated that returns for small firms do not exist for a long time horizon. Overall, presence of size effect has not yet reached the final conclusion.

Another point worth discussing for the research motivation is a restriction in the applicability of the size effect. Nobody has unveil what are the underlying factors of company sizes affected the returns. The size anomaly is not a widely applicable theory which can be implemented in all markets. Thus, it appears necessary to study the size effect (i.e., the relationship between firm size and firm's returns) in Vietnamese financial market, particularly Ho Chi Minh stock exchange, which is quite young and don't get much attention from researchers.

In fact, it has still questioned the possibility for the size effect to appear in Vietnam than the US stock market. When comparing between Vietnam and the US, Vietnamese securities market is very youthful and microscopic. More importantly, a large gap exists between the efficiency levels of two markets. If in the US, the size effect is just a small violation of a strong-form efficient market. After 1981, this violation tended to disappear that reinforce the attribute of a strong efficiency market where people cannot exploit mispriced stocks to earn superior returns. On the other hand, weak-form efficiency does not hold in Vietnam which means mispriced securities are available. Hence, an anomaly of size and returns is highly possible in this market. It sounds to empirically test the existence of size effect in such an emerging market as Vietnam.

The study aims at providing fresh insights relating to size effect in Vietnamese financial markets for both managers and investors. For manager perspective, the paper could be a reference to examine the current business conditions for business plan of growth. For investor perspective, the understanding of size effect could help them classify securities regarding their accompanying risks for different risk tolerance levels or even beat the market. What is more, it also enriches practice-related experience of size effect in such an emerging market as Vietnam. It supports to complete the understanding of size effect theories in different institutional contexts.

2. Literature Review and Hypothesis Development

2.1 Prosperity of Size Effect

There are three main theories known as the foundation of the relationship between size and returns. First, it is the Capital Asset Pricing Model (CAPM). Sharpe (1964), Lintner (1965) and Mossin (1966) attempt to prove the hypothesis that high risk can lead to high return of stock. CAPM takes risk free rate and market risk premium as representatives of risk factors. Theoretically, risk free rate is defined as the return on a risk-free-asset which investors can earn with certainty, while the risk premium is additional compensation for the stockholders which expose to higher risk in comparison to investing in risk free assets (Sharpe, 1964). The company size contributes partially to the risk premium as big companies are safer for investment (Mossin, 1966). However, several assumptions have been made in this theory (e.g., every investor will include risk free and risky assets in their portfolio; costs of lending and borrowing are risk-free rates; all investors hold their stocks for an identical horizon; there is no tax and no transaction costs and investors are risk avoidant in their nature with a desire to maximize returns with their capital investments) (Sharpe, 1964). The risk premium is affected by beta—the extent of risk of a stock when comparing the market risk. The theory is then written down as a formula:

$$R_e = R_f + (R_m - R_f) * \beta$$

Where:

R_e : Required rate of return on a stock

R_f : Risk free rate

R_m : Market return

$(R_m - R_f)$: Market risk premium

β : Beta

Similarly to Capital Asset Pricing Model, Fama and French three-factor model also strived to define securities returns. While Capital Asset Pricing Model solely focuses on the risk factor, Fama and French (1993) specified other two factors to their three-factor model such as the size and books-to-market ratio into their consideration. The stimulus for their research is the observation that small capitalization stocks and low book-to-market stocks actually brings higher return than other stocks in the market.

The final theory which is related to the linkage between size and return is the Efficiency Market Hypothesis (EMH). Fama (1970) stated that prices of stocks will fully reflect their inherent information when the market is efficient. To determine whether the market is efficient or not, it provides several assumptions. All investors' analysis of the stock market to choose securities for investment; all information coming to the market independently and voluntarily; all securities reacting quickly to new information and the reflection of all information in securities' prices are four main assumptions in this theory.

Empirically, returns of small companies surpassed returns of large companies in the first period, from the beginning of 1960s to the ending of 1980s in the US market. The most well-known empirical research about size and return in this stage belongs to Banz (1981) observing companies on New York Stock Exchange (NYSE) during 50 years from 1936 to 1975 and the companies must be existed on the exchange for at least five years during the period. Return was calculated by CAPM theory which is a function of beta and some other factors. Market value of equity represented for the size factor of studied companies. The model can be expressed in the formula below:

$$E(R_i) = \gamma_0 + \gamma_1 \beta_i + \gamma_2 [(\phi_i - \phi_m) / \phi_m]$$

Where:

$E(R_i)$: Expected return on security i

γ_0 : expected return on a zero-beta portfolio

γ_1 : expected market risk premium

γ_2 : constant measuring the contribution of ϕ to the expected return of a security

ϕ_i : market value of security i

ϕ_m : average market value

The analyzing process began with grouping observed firms into different portfolios (Banz, 1981). First, it grouped them into only five portfolios depending on their sizes. Then, it grouped once again based on their beta

and came up with twenty five portfolios. Afterwards, Ordinary Least Squares regression (OLS) and Generalized Least Square regression (GLS) were performed to generate the final result (Banz, 1981). In reality, either of the OLS or GLS is acceptable, Banz (1981) had strived different manners to minimize the possible errors. The result turned out that from 1936 to 1975, the common stocks of small firms had higher returns than the ones of big companies. However, this result contains several limitations. The first limitation is the market capitalization and the returns do not share a linear relationship. This means low market capitalization does not always lead to higher return, so there is a certain level of possibility for the inverse cases to happen. Besides, not providing any theories which directly explains the phenomenon is the second limitation of the research. Thus, the outcome of the research was also unable to identify whether the size is truly a factor impacting on the return or it is just a proxy for some other hidden factors. However, Banz (1981) had put a strong evidence for the existence of the size effect.

Besides, Keim (1983) conducted another research which is also about the subject of companies' size and return in 1982. The analyzed sample contained firms which were listed on either NYSE in the period from 1963 to 1979. The findings supported the hypothesis of Banz (1981) in terms of the existence of negative relationship between the sizes of firms and their returns on the market.

Although Banz (1981) is considered as an initiator and a pioneer in size and returns practice, the research seems to be the most skeptical one in the eyes of other researchers and competitors. The main reason belongs to the fact that no theory was provided in his study. The study of Berk (1995) could be recognized as another backing for Banz (1981). Berk (1995) stated that "we certainly cannot rule out the possibility of such a relation". Moreover, the researcher clearly differentiated between a proxy of risk and a source of risk. The conclusion of the study is that size is actually a proxy for risk. This means there are some types of risk which underly the size factor to bring superior returns for small firms.

2.2 Disappearance of Size Effect

The size and return relationship has disappeared from the beginning of 1980s. In this period, the correlation of those variables turned out to be blurring not only in the US market but also the UK market. Horowitz (2000) marked the disintegration of the size effect in the US market. The sample size of Horowitz (2000) consists of listed US firms from 1980 to 1996 which is right after the tested period of Banz (1981). For validating the results, Horowitz (2000) examined the sample in three distinctive manners. At the initiating, the paper retrieved from the observation for performance in terms of annual returns between the groups of smallest size decile and largest size decile. The group of larger firms defeated the group of smaller ones. This illustrates the first idea of the disappearance of the size effect. For second manner, Horowitz (2000) utilized the method from the study of Fama and French (1993). The outcome pointed out that firms' size is not a significant element in defining the returns. For the third test, the paper performed the linear spline regression model to reexamine the data. Once again, the result proves that size and return did not hold in this horizon. Additionally, Amihud (2002) also performed a similar study by using regression analysis from 1964 to 1997. It found that the size affected returns strongly from 1964 to 1980. In contrast, size was not important in explaining returns from 1980 to 1997 in the statistical perspective.

Similar phenomenon took place in the UK market for size and return relationship during comparable period. Dimson and Marsh (1999) did an outstanding research for this market from 1955 to 1998. They did not only identify which size generates more returns but also offered a specific number for illustrating the threshold which small size companies outperform the larger ones. Explicitly, from 1955 to 1986, small companies provided investors average 6.2% higher profits than the larger companies. On the other hands, 6.5% is the portion of returns that bigger firms brought to investors higher than smaller companies from 1986 to 1998. In the UK market, the turning point of an existence of that relation between size and returns tended to be different. While in the US market, the bigger companies started outperforming smaller ones from 1980 or 1981, the turning point in the UK market started from 1985 to 1986. Although UK market lagged behind US market for a couple of years, the symptom of two markets are identical.

However, the size effect did not disappear completely. Moore (2000) conducted a research of 1500 companies which were taken from "1999 Value Line Investment Survey" for the period from 1989 to 1998. This study did not use market capitalization to measure companies' sizes as other studies. Instead, the study employed total assets, net income, earnings per share ratio, price-earnings ratio and beta to measure the magnitude of the size variable. The size effect holds for the findings of this study. Thus, size effect may still exist with different measurements of company size.

More importantly, a more detail cycle of appearance has been discovered. There are at least three studies found that size effect happened mostly on January which is called the January effect or seasonality attribute of size effect. The oldest study was Rozeff and Kinny (1976) which detected that smaller companies could generate 3.48% higher returns on January while only 0.42% higher in other months. The next study is Keim (1983). It examined whether the linkage between size and return happens continuously or at specific time. However, it also realized that the actual abnormal return relative to firms' sizes only appears at a specific time within a year. In specific, the author found that from 1963 to 1979, 50% of the abnormal return related to size factor appeared in January. Moreover, over fifty percent of the January abnormal return only occurred on the first trading week of the year. The outcomes had proved the presence of seasonality factor on the size effect. In spite of the empirical result was clear, the implicit causes of seasonality feature on size effect were still not be uncovered by the paper. In the same year, two more studies of Reinganum (1983) and Roll (1983) verified the subjection of January attribute to the size effect for smaller market capitalization enterprises. Besides, Easterday, Sen and Stephan (2009) established a research for nearly 62 years from 1946 to 2007. The January effect still existing during that long horizontal was the final finding. Until this point, size effect is strongly attributable to seasonality properties. Therefore, the size effect may not disappear completely. It is shifting to other form, such as the January effect, which is harder to detect. This happens due to the changes of market conditions.

2.3 Hypothesis Development

The hypothesis of this study bases on the fundamentals of Capital Asset Pricing Model and Fama and French three-factor model. Small companies are basically riskier than big companies. For granted, some types of risk associated with small businesses can be thought of difficulty to approach financing sources, lower market share or less reputable brand names. According to CAPM, small companies will get higher returns. Investments in these companies can be considered to be at the highest level of risks and are deserved to earn higher returns. However, there is an assumption which need to be made in this study. The risk levels of firms also depend on the risks of the industry as well as the projects that the companies are undertaking. Hence, big companies can also bear higher risk if they are in a risky industry. The assumption is that this study will neglect factors which make big companies to be riskier than smaller companies. With the assumption, CAPM can successfully support the hypothesis of small firms can bring higher profits where high risks investments should be compensated with higher returns. To provide an even stronger evidence, Fama and French three-factor model is employed. This theory draws a clearer picture which take firms' size into explaining the returns. Since CAPM only uses risks factors and smaller firms are implied to have more risks, the relationship of size to returns is reinforced through three-factor model. Thus, it sounds to propose that:

Hypothesis: "Firm size has a negative relationship with return".

3. Methodology

3.1 Estimation Model

The paper employed multiple regression model to test its hypothesis (Jaccard et al., 1990; Aiken & West, 1991; Moore, 2000). First, all control variables would be entered into Step 1 of the model. Second, the independent variable, Total Assets, was input into Step 2. Although this study only focused on the impact of total asset on the firm performance variable, it's necessary to examine this relationship under a set of some control variables (e.g., Earnings-Per-Share, Price-Earnings ratio, Net income and Beta). It is studied that those control variables vary that relationship for a certain extent (Al-Khazali, Osamah, & Zoubi, 2011). Besides, the underlying assumption of multiple regression, outlier, was thoroughly checked to enhance the validity of the research findings (Aiken & West, 1991). By examining the beta-coefficient of Total Assets variable, its significance, as well as the change in the adjusted R-squared attributed from its existence, the relationship between firm size and firm return would be confirmed (Jaccard et al., 1990).

3.2 Variable Measurements

Dependent variable—stock return would be calculated by dividing the sum of stock price and dividend payment by previous stock price to achieve stock return in percentage.

Independent variable—there are various indicators to measure firm size: Total Assets (Hopkins, 1988), market capitalization (Al-Khazali, Osamah, & Zoubi, 2011), etc. However, Moore (2000) referred total assets rather than market capitalization to avoid inflation or deflation of securities. This assumption is appropriate for the context of Vietnamese market due to its inefficiency in which stock prices do not reflect all accompanying information. Thus, stock prices may be volatile due to informal reasons. It appears sensible to employ Total Assets as an independent variable for this study.

Control variable—some control variables were utilized in this study in order to test the relationship between Total Assets and Stock Returns under a thorough consideration of all interaction among indicators affecting on stock returns. They are Net Income (Basu, 1977; Ball, 1978; Reinganum, 1981), Earnings-Per-Share (i.e., Net income divided by total shares outstanding), Price-Earnings ratio (i.e., stock price divided by EPS) (Ball, 1978), Risk measured by beta (i.e., coefficient of regression equation between stock return and market return) (Litzenberger & Rasmuswamy, 1979; Miller & Scholes, 1982).

3.3 Data

Both Ho Chi Minh Stock Exchange (HOSE) and Ha Noi stock exchange (HNX) are the official ones in Vietnam. However, HOSE has higher standards for listing and market capitalization. Thus, HOSE could be seen as a driver for the whole Vietnamese financial market. Besides, service sector has mostly contributed to GDP of Vietnam in recent years, which accounted for 44% of GDP in 2014. As a result, the research sample of all firms in service sector that have been currently listed in HOSE would be employed.

Obviously, there was a crisis from 2007 to 2008 which made all financial data significantly change. To minimize the effect of the crisis in this study, the panel data from 2009 to 2014 would be adapted. In addition, to ensure the sense of validity and reliability of the study, the financial information (e.g., total assets, net income, total shares outstanding, dividend payments) would be extracted from the audited financial statements of the sampled companies from 2009-2014. Those financial statements could be achieved from the companies' websites. Besides, the respective stock prices and market returns were collected from the official website of HOSE. After satisfying all requirements, outliers of the data would be eliminated by using Cook's Distance and scatterplot. The remaining observations were 160. According to Tabachnick and Fidell (2007), the appropriate sample size should be larger than $50+8M$, which M stands for numbers of independent variable. Hence, the research sample confirmed on its generalization (Table 1).

Table 1. Sample outcomes

Industry	Total Companies	Number of selected companies (Satisfying analyzing conditions)
SERVICE SECTOR		
Wholesale and retail trade; repair of motor vehicles and motorcycles	45	18
Transportation and storage	25	7
Accommodation and Food service activities	3	0
Financial, banking and insurance activities	19	3
Real estate activities	38	5
Total		33*
Conditions:		
<ul style="list-style-type: none"> • Companies have been listed for at least 6 years from 2009 to 2014 • Financial statements need to be audited 		
Note:		
<ul style="list-style-type: none"> • *This number does not exclude the outliers and missing value observations • Industry is classified according to the classification of HOSE 		

4. Results and Discussion

4.1 Research Findings

To ensure the senses of validity, reliability and generalization of the research findings, three main assumptions of multiple regression model (i.e., outliers, sample size and multicollinearity) need to be satisfied. For outliers, by employing scatterplot and Cook's Distance, the observations whose standardized residuals are less than -3.3 or more than 3.3 would be removed from the sample. Consequently, 160 observations for each variable were

remained that could be effectively projected the findings for whole population. Last, the correlations among independent variables were less than 0.8, so no existence of multicollinearity problem was confirmed (Table 2).

Table 2. Correlations

		Returns	TA	NI	EPS	P/E	Beta
Pearson Correlation	Returns	1.000					
	TA	-.114	1.000				
	NI	.157	.537	1.000			
	EPS	.254	-.070	.307	1.000		
	P/E	.080	.011	.190	.651	1.000	
	Beta	-.011	.479	.343	-.051	.069	1.000
Sig. (1-tailed)	Returns	.					
	TA	.076	.				
	NI	.024	.000	.			
	EPS	.001	.190	.000	.		
	P/E	.156	.445	.008	.000	.	
	Beta	.447	.000	.000	.263	.192	.

For descriptive statistics, as shown in Table 3, the independent variable, nature logarithms of Total Assets, varied from 26.08 to 29.87 with a mean of 27.81. Otherwise, the range of stock returns variable fluctuated from the loss of 70% up to the gain of 201%. It also presents the average returns for listed companies in service sector in HOSE from 2009 to 2014 was 25.78%.

Table 3. Descriptive statistics

	Return	Total Assets	Net income	EPS	P/E	Beta
Mean	.2578	27.8091	79.9584	2358.37	.1216	1.0235
Std. Deviation	.58708	1.00418	137.30741	2714.120	.26541	.32648
Variance	.345	1.008	18853.325	7366445.958	.070	.107
Minimum	-.70	26.08	-304.54	-6980	-1.80	.04
Maximum	2.01	29.87	804.08	15101	1.40	1.78

Following the input of control variables, the presence of Total Asset increased the adjusted R-squared from 6% to 8.5% with significant value ($p=0.023<0.05$) (Table 4). In other words, Total Assets could be a statistically significant predictor to explain 2.5% fluctuation of Stock Returns. Besides, the goodness of fit indicator with F value of 3.959 ($p<0.05$) strongly confirmed that the explored statistical model would well fit to the set of observation, the relationship between firm size and stock return (Table 5). Last, as shown in Table 6, the unstandardized coefficient Beta of -0.134 with p value of 0.023 (i.e., less than 0.05) supported to accept the proposed hypothesis in a fashion of high confidence that stated the negative relationship between firm size and stock returns in Vietnamese market, especially in service sector.

Table 4. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.289 ^a	.084	.060	.56919	.084	3.538	4	155	.009
2	.337 ^b	.114	.085	.56154	.030	5.254	1	154	.023

a. Predictors: (Constant), Beta, EPS, NI, P/E

b. Predictors: (Constant), Beta, EPS, NI, P/E, Total Assets

c. Dependent Variable: Returns

Table 5. ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.584	4	1.146	3.538	.009 ^a
	Residual	50.217	155	.324		
	Total	54.801	159			
2	Regression	6.241	5	1.248	3.959	.002 ^b
	Residual	48.560	154	.315		
	Total	54.801	159			

a. Predictors: (Constant), Beta, EPS, NI, P/E

b. Predictors: (Constant), Beta, EPS, NI, P/E, Total Assets

c. Dependent Variable: Returns

Table 6. Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.133	.164		.810	.419		
	NI	.000	.000	.092	1.051	.295	.773	1.293
	EPS	6.867E-5	.000	.317	2.958	.004	.513	1.948
	P/E	-.315	.227	-.143	-1.392	.166	.563	1.775
	Beta	-.029	.151	-.016	-.193	.847	.836	1.196
2	(Constant)	3.730	1.578		2.364	.019		
	NI	.001	.000	.207	2.076	.040	.577	1.734
	EPS	5.650E-5	.000	.261	2.403	.017	.487	2.053
	P/E	-.288	.224	-.130	-1.285	.201	.562	1.781
	Beta	.091	.158	.050	.573	.567	.745	1.342
	TA	-.134	.059	-.230	-2.292	.023	.573	1.744

4.2 Discussion

The research's finding is strongly supported by the argument of Berk (1995) which states the risky level of small firms is higher than big ones. Following the underlying understanding of CAPM model, the higher level of risk probably generates higher level of returns. Besides, this argument also appears persuasive by the study of Vanden (2015). In emerging markets, particularly the weak form of market efficiency, the noisy information significantly gets embedded in stock prices. For small enterprises in Vietnam, the availability of related information is quite rare and unreliable (Suret, Morrill, & Morrill, 1998), so stock value could be understated or overstated. At the same time, the insider trading problem may occur that can mislead the supply and demand in the market. It results in generating higher expected returns in comparison to its actual value. Otherwise, the big corporations tend to highly commit to the finance-related regulation from the government (Vanden, 2015). They always publish their financial information as required and their related information could be easily accessed via publish information channels. Comparing big and small firms in that discussion, it can be appreciated that the small ones would have higher probability to bear higher return.

5. Conclusion

The size effect in Vietnamese market was confirmed by statistical tests during the period 2009-2014 of service sector. The firm sizes and returns negatively related. In other words, smaller companies can actually bring investors higher returns in both dividends and capital gain. This may be due to higher risks which smaller companies have to expose to or Vietnamese market does not reach a strong-form efficient to avoid the usage of public information for defeating the market. The outcome of this study is supported by Banz (1981), Moore (2000) and Berk (2015).

There are two implications which are beneficial for managers and investors. First, the paper could be a good reference to examine the current business conditions for business plan of growing. Second, investors can earning a premium for less analysis. As the analysis is a big constrain for new investors, this study can help them to have some evidences in electing their first stocks portfolios. Moreover, for investors who are risk takers, this should be a good evidence for them to filter high risk stocks in Vietnamese financial market. Third, this study also validates the applicability of well-established theories in Finance, CAPM and EMH, into emerging market as Vietnam.

The paper also figures out some limitations worth discussing in future researches. It does not intent to explain the underlying factors of the size effect, so it appears necessary to deeply investigate the underlying factors of firm size that could be varied across industries and markets. Besides, the control variables should be separately and thoroughly examined by other researches to study their interaction and effect on stock returns. Last, this research did not conduct a yearly basic analysis. This study which employed longitudinal approach analyzed the data from 2009 to 2014. However, the size effect possibly appears in one year and disappears in other years. Thus, analysis should be conducted for each year rather than a period in order to even explore the seasonal size effect as discussed.

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