The Risk Indicators for the Return Volatility of Earnings Per Share:
Evidence from Service Industry Firms Listed on the Stock Exchange of Thailand

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Abstract

This research was undertaken to examine the volatility of the earnings per share of firms in service industry listed on the Stock Exchange of Thailand. Measuring risks by indicating the volatility of firms is one of key tools used to represent risks affecting firms' capacity to generate returns, especially earnings per share. One hundred and forty-six service industry firms in Thailand listed on the SET and MAI were selected as the unit of analysis to collect secondary cross-sectional data about their average financial information in the annual reports submitted from 2016 to 2020. Multiple regression was employed for the analysis of the secondary data by using PLS-SEM statistics. The research results found that earnings per share influenced the size of service firms listed on the SET and MAI. The findings suggest that firms in the service industry will have increased earnings per share if they have a high level of risk. Additionally, the type of firm acted as a moderator in the model. In terms of implications, our findings suggest that the level of volatility could be used as a tool to assess firms and estimate and predict their future returns.

Keywords: Earnings Per Share, Risk Indicator, Service Industry Firms, SET, MAI, Volatility

Introduction

The first prioritized goal of a business is generating profit, which is an indicator of the capability, stability, competitiveness, and survival of a firm. There are many factors which firms must consider as they move through the processes to evaluate the information related to performance, for example, Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) (Arora & Sharma, 2016; Yang, Bento, & Akbar, 2019). However, no business can guarantee good performance all of the time when there are multiple unpredicted situations that affect business operations, such as political stability, commodity prices, volatile interest rates, and customer trends. There are critical impacts which influence firm performance which lead to financial volatility, such as profitability, firm growth rate, and market value (Wongsuwatt & Suntrayuth, 2019). One of financial tools used to indicate the profitability of a firm is Earnings Per Share (EPS), which isolates net income to explore what shareholders gain by investing in the firm (Ghimire & Mishra, 2018; Haskins & Simko, 2017). This indicator can help firms to compare the potential performance when choosing the most suitable investment options. A consistently growing EPS means that the investors are getting a share of firm's growing profits, which shows that the firm is creating value for its investors. In contrast, a consistently falling, or negative, EPS indicates that a firm is having financial trouble and has low profitability.

In the context of Thailand, earnings per share is publicly presented for firms that are registered members of the Stock Exchange of Thailand (SET), which are divided into two main categories – The Stock Exchange of Thailand (SET) and Market for Alternative Investment (MAI) – which depends on the size of the firms. In the face of uncertain situations between 2016 and 2020, for example, political instability in Thailand, a world-wide trade war, economic depression, and the Coronavirus Disease (COVID-19) pandemic, many firms in Thailand have faced various impacts related to attempting to maximize profits and minimize the costs of business, especially

firms in the service industry that have been most affected by the COVID crisis. With travel restrictions around the world, the lack of tourists has been a crucial factor that has negatively affected all sectors in the tourism industry. For example, hotels in Chiang Mai Province were forced to completely stop all of their services (Chanyasak, Koseoglu, King, & Aladag, 2022). This has led to a higher level of volatility in firms' EPS which has influenced the confidence of both domestic and international.

Even though firms listed on the Stock Exchange of Thailand possess good business operations capacity from several perspectives, they have been facing volatility from present, and potential future, situations, as well. With respect to the financial perspective, firms have used financial ratios, such as profitability, growth, and stability, to represent their performance and persuade investors to organize capital and allot budgets. Although they are shown in the firms' annual report, which discloses the firms' financial status, these financial risk indicators are not shown to the public. Volatility is also a key factor that should be thoroughly scrutinized with regard to business operations (Baek, Mohanty, & Glambosky, 2020). Thus, measuring risks by indicating the volatility of firms is also one of key tools to represent risks affecting firm's ability to generate returns, especially their earnings per share. In the concept of risk management, the risk indicators of earnings per share are a key element of clearly understanding risk by analyzing the volatility and accurately prioritizing risk by assessing the probability of its occurring.

This present research aimed to examine the volatility of the earnings per share on firm's size and its risk indicators of firms in service industry, which would be a crucial element indicating a firm's performance and reflecting the volatility which is represented by its standard deviation, coefficient of variation, and value at risk. In addition, this study also investigated the moderating role played by the type of firm among the firms listed on the SET and MAI because the type of firm can reflect their capability and readiness to operate their businesses. By including moderating effects, this study may gain a preliminary understanding of the interaction effects of the type of firm that would not have otherwise been found if the type of firm variables were simply treated as control variables. This research may be useful as a guideline for measuring the return volatility of firms in the service industry based on their risks.

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Literature Review

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Earnings Per Share and Firm Size

From the financial perspective, one of the most popularly used indicators for analyzing profitability by investor, which captures the capability of a firm to generate wealth for shareholders, is Earnings Per Share (EPS) (Sanoor, Kumar, & Venoor, 2018). EPS refers to the relationship between the revenue (net income) and the number of outstanding stocks, which is the ratio of after-tax income divided by the number of outstanding stocks, which illustrates the firm's ability to generate net gain on each share (Kumar, 2017; Sha, 2017). Increase in EPS is a crucial measure of firm performance in terms of management, which not only shows how much gain the firm is making for its shareholders, but also creates the confidence for shareholders to invest in the firm. Firm size refers to the amount of assets owned by the firm. Capital costs and short-term debt are more commonly used by small firms rather than larger firms, that are more likely to focus on long-term debt because of having strong funding sources (Akbar, Amir, Rahayu, & Machpuddin, 2019; Jasman & Kasran, 2017). Whereas, some previous research has defined firm size by the number of employees to separate firm size into different categories (Haltiwanger, Hyatt, Kahn, & McEntarfer, 2018). Moreover, an empirical study measuring firm size by Dang, Li, & Yang (2018) stated that three firm size measures were employed: total assets, total sales, and market value

of equity. Several previous research studies have found that earnings per share was positively correlated to firm size (Ejoh, Oko, & Akpanke, 2019). Some previous studies referred to the positive influence firm size had on earnings per share, where larger sized firms earned more profit per share, and also had greater profitability overall, than smaller firms (Al-Natsheh & Al-Okdeh, 2020; Hama & Santosa, 2018). Odalo, Achoki, & Njuguna (2016) stated that company size had a significant positive influence on financial performance in which larger companies showed having stronger competitive advantages over smaller companies because of an array of resources and the economies of scale. However, some previous studies referred that earning per share had significant effect on firm's size, especially during the COVID-19 pandemic (Suyanto, 2021). Thus, in this study, the researchers approached the issue from the perspective that the generation of earnings would have a positive influence firm size, in other words, when firms generated higher earnings it would have a greater positive influence on the size of the firm. Thus, the following hypothesis was formulated:

H_1: A high earnings per share is positively associated with firm size.

Earnings Per Share and Its Risk Indicators

Measuring risks from the financial perspective has mainly been related to the firm's returns and have defined risk as the unpredictable consequences on a firm's revenues. Information about financial risk can be used to measure volatility by using variance, standard deviation, coefficient of variation, value at risk, and conditional variance (Huang, 2020; Wongsuwatt & Suntrayuth, 2019). This research focuses on risk indicators to investigate the volatility of EPS of service industry firms listed on the SET and MAI which consist of three components. Firstly, the standard deviation of EPS is one of the key fundamental risk measures that analysts, portfolio managers, advisors use. It is applied to the annual rate of return of an investment and sheds light on that investment's historical volatility. In general, measures of error in the context of statistics are quantified as a "deviation" of the variable's non-constancy (Rockafellar & Uryasev, 2013). Secondly, the coefficient of variation of EPS, from the financial perspective, quantifies the dispersion of an asset's returns in relation to the expected return, and, thus, it represents the relative risk of the investment. Earning volatility is one of the factors that might influence a firm's risk of insolvency (Ghosh, Khatun, & Tarafdar, 2018). Finally, Value at Risk (VaR) is a risk measure that is widely used by financial institutions for allocating risk (Tsiotas, 2018). It is a mathematical tool that can be used for optimal asset allocation in financial management strategies that incorporate the concept of risk in assets or portfolios (Armstrong & Brigo, 2019; Bernard, Rüschendorf, & Vanduffel, 2017). Thus, measuring firms' earning volatility is also a crucial indicator to understanding the firms' financial risk and its impacts on capital structures. Some investors measured the risk of a portfolio by considering the variance and standard deviation of the expected rate of returns. However, in this study, the risk indicators used represented the earnings per share of service industry firms listed on the SET and MAI were measured by the standard deviation, coefficient of variation, and value at risk of the EPS. It is expected that having higher levels of risk indicators will have a positive influence on the return of a firm's earnings per share as in the High-risk High-return concept (Budiarso & Pontoh, 2019). Therefore, the following hypotheses were presented:

H_2: A high standard deviation for the EPS predicts an increase in a firm's earnings per share.

H_3: A high coefficient of variation for the EPS predicts an increase in earnings per share.

H_4: A high value at risk for the EPS predicts an increase in earnings per share.

Moderating Roles of Type of Firm

Some previous studies found that different types of firms in the same industry may have their output in affected in several ways. For example, in the study by Wongsuwatt & Suntrayuth (2019), the type of firm had a moderating effect where firms that performed below their average median target of Return on Assets (ROA) had a stronger positive relationship between perceived risk and proactive behavior, than firms who performed above. In addition, the types of cooperative activity of a firm were moderated by the effect of family ownership on firm innovation (Kim & Marler, 2020). In this study, the differences in the types of firms listed on the SET and the MAI will be examined to determine their moderating effect, if any, on the positive relationships between risk indicators and earnings per share. It is expected that the type of firm of the firms listed on the SET and MAI will have a moderating effect on the positive relationships between risk indicators and earnings per share. Thus, the following hypotheses were formulated:

H_5: The positive relationship between the standard deviation of the EPS and earnings per share is moderated by the type of firm.

H_6: The positive relationship between the coefficient of variation of the EPS and earnings per share is moderated by the type of firm.

H_7: The positive relationship between the value at risk of the EPS and earnings per share is moderated by the type of firm.

Methodology

Research Designs and Unit of Analysis

Quantitative methods, in which statistical techniques are used to measure numerical data, were used in this study to analyze data from secondary information. According to the research objective, this study aimed to examine the effect of earnings per share on its risk indicators. One hundred and forty-six service industry firms in Thailand listed on the SET (105 firms) and MAI (41 firms) were selected as the unit of analysis to collect secondary cross-sectional data about their financial information from their annual reports from 2016 to 2020.

Sample and Data Collection

In order to collect secondary data which was complete and accessible, the financial information for the 146 service industry firms listed on the SET and MAI, was gathered by accessing their annual reports for 2016 through 2020 (The Stock Exchange of Thailand, n.d.). These reports included information on their net incomes, dividend payments, and total outstanding shares. Additionally, data on their total assets was obtained for use as a mediating variable to standardize and represent the size of the firms. It was appropriate to choose service industry firms to examine the effect of earnings per share and its risk indicators because the service industry is one of the industries in Thailand which was most affected by the crisis caused by the world-wide COVID-19 pandemic. Moreover, this impact also influenced several aspects of these firms, such as their performances, financial outcomes, and stakeholders. With this occurring, it has been imperative for management and investors to understand how to measure the volatility of the earnings per share how it influences a firm's size and performance.

Measures

Earnings Per Share (EPS) was measured using the financial information to indicate the ability of a firm to earn a net income for each share for its shareholders (Jasman & Kasran, 2017). A higher EPS is highly valued by investors who tend to invest in the shares of a firm. First, it was calculated by dividing the net income of the firm

by the total outstanding shares of the firm, if the firm has no preferred shareholders. Secondly, in regard to preferred shareholders, it was calculated using the formula: net income, minus the dividend paid to preferred shareholders, divided by the total outstanding shares (Atidhira & Yustina, 2017). Additionally, it was calculated using the average of the 5-year period that was being examined.

$\text{EPS}_{\text{First Case}}$ = Net Income of firm/ Total Outstanding Shares.

$\text{EPS}_{\text{Second Case}}$ = (Net Income of firm − Dividend to Preferred Shareholders)/ Total Outstanding Shares.

Risk indicators of the volatility of earnings per share were measured to indicate their level of risk by using the standard deviation, coefficient of variation, and value at risk based on the earnings per share information for the 2016–2020 period. These were calculated using the following formulas (Chattopadhyay & Kelley, 2016; Kaplan, 2019; Strand, 2017).

Standard Deviation $(\sigma) = \sqrt{\dfrac{\sum_{i=1}^{n}(xi-\bar{x})^2}{n-1}}$

Coefficient of Variation (CV) = Standard Deviation/ Mean

Value at Risk = Expected Return − (z-score of the confidence interval at 95% × Standard Deviation)

Firm size was determined to separate the service industry firms based on the firm's ability and opportunity to earn an income, which was computed as natural logarithm of the total assets of the firm (Atidhira & Yustina, 2017; Kuncová, Hedija, & Fiala, 2016). Additionally, it was also calculated for the next period of EPS (t + 1) to reflect the influence of EPS on the firm's size.

Data Analysis

Before evaluating the hypotheses in this study, correlation analysis was performed on the variables in this study to check problems with multicollinearity, as shown in Table 1. Toubiana & Maruenda (2021) stated that the R-value among variables should be lower than the threshold of 0.84. In this study, all variables had correlation coefficients between 0.163–0.806, indicating that there was no problem with multicollinearity in this research.

Table 1   Mean, Standard Deviation, Correlation Analysis

Variables	Mean	SD	1	2	3	4	5	6
1. EPS (Bath)	0.678	2.19	1.00	.163*	.329**	−.003	.806**	.173*
2. Firm Size	8.122	1.58		1.00	.205*	−.024	.024	.534**
3. S.D. of EPS	40.0%	0.824			1.00	.010	−.271**	.109
4. C.V. of EPS	64.11%	4.71				1.00	−.017	.113
5. VaR of EPS	8.4%	2.14					1.00	.099
6. Type of Firm	−	−						1.00

Note: * = P < .05; ** = P < .01; *** = P < .001

Multiple regression analysis was used in this study to examine the volatility of earnings per share of the firm and its risk indicators and was performed using partial least squares structural modeling (PLS-SEM) to analyze the data. PLS-SEM provides more robustness than other SEM estimations when using a small sample size of secondary, cross-sectional data and it also reduces bias when working with non-normal data (Hair, Matthews, Matthews, & Sarstedt, 2017). Additionally, PLS-SEM is appropriate for estimating a model with moderating variables like the conceptual model of this study. Multiple regression is used to estimate the slope and intercept of a model and allows researchers to estimate the relationship between earnings per share and the size of the service industry firms listed on the SET and MAI. Thus, researchers could then estimate the volatility of the earnings per

share in relation to the associated risk indicators. Additionally, PLS-SEM allowed researchers to estimate the moderating effect of the type of firm on the relationships between risk indicators and earnings per share.

Results

Overall, the average earnings per share was 0.678 baht, whereas the average percentage of risk perspectives, including standard deviation of EPS, coefficient of variation of EPS, and value at risk, of EPS were 40.00%, 64.12%, and 8.40% respectively. In regard to type of firm, 71.9% (105) of the service industry firms listed on the SET, and 28.1% (41) of those listed on the MAI. Examination of the financial information, classified by type of firm, found that the service firms listed on the SET had a higher average percentage of financial indicators than the firms listed on the MAI. The average earnings per share of the firms listed on the SET was 0.914%, whereas the average earnings per share of the firms listed on the MAI was 0.071%. In terms of risk perspectives, the firms listed on the SET had standard deviation, coefficient of variation, and value at risk of the EPS of 45.61%, 97.34%, and 21.64%, respectively. Whereas, the standard deviation, coefficient of variation, and value at risk of the EPS for the firms listed on the MAI were 25.65%, 20.95%, and 25.50%, respectively.

Direct Effects

The data in Table 2 and Figure 1 supports the proposed direct effects of EPS on the firm size (H_1). In regard to the effects on the firm's size, the model revealed that EPS had a positive effect on the size of a firm. The results show that service firms with higher earnings per share were larger in size because this reflects the ability of the firms to generate profits and expand their total assets. With regard to risk indicators, the results revealed that the effect of the standard deviation (H_2) and value at risk (H_4) had significantly positive influences on EPS. However, the model revealed that the coefficient of variation (H_3) had no effect on EPS. Thus, hypothesis 3 was not statistically supported. The results show that firms with higher levels of volatility, as measured by the standard deviation and value at risk of their EPS, tend to have a higher earnings per share. Therefore, the risk of firms in the service industry listed on the SET and MAI, in the respect to earnings per share, is also indicated by the standard deviation and value at risk.

The evidence indicates that firms gaining more earnings in relation to the number of shareholders will have an enhanced ability to increase the size of the firm. This is likely because the earnings per share reflects the firms' performance and their abilities to generate money for the business and their shareholders. Increases in total value arise from the firm's profitability. This is consistent with several previous studies that have shown the influences of earnings per share on firm size (Alarussi & Alhaderi, 2018; Batchimeg, 2017; Fajaria & Isnalita, 2018). Additionally, this result provides support to the signaling theory, in the context of finance, which states that a firm tries to represent signals of the firms' financial conditions to enhance the apparent quality of the firm for investors and shareholders (Connelly, Certo, Ireland, & Reutzel, 2011). For example, in respect to firm size, earnings per share is a crucial indicator a firm can use to represent a good performance with regard to its profitability for shareholders and investors.

The findings suggest that firms in the service industry will have an increased level of return in the context of earnings per share if they have a higher level of volatility. This is consistent with the concept of a High-risk High-return, which refers to a positive relationship between returns and an investment's risk (Budiarso & Pontoh, 2019). When firms want to gain higher returns, they also have to take on a higher level or risk, as well. Thus, the evidence shows that we can use the standard deviation of the EPS and value at risk to measure the risk of firms

regarding their earnings per share. However, the relationship between the earnings per share and its value at risk has not been confirmed by any previous studies. This is likely because the value at risk was mostly used to estimate and predict the amount of losses from changes in stock prices and uncertainties (Silahli, Dingec, Cifter, & Aydin, 2021).

Moderating Effects

The results in Table 2 and Figure 1 support the moderating effects proposed in hypotheses 5 and 7, regarding the type of firm's moderating role on the effect of the standard deviation of the EPS and value at risk on a firm's EPS. Whereas, it was revealed that the moderating effect of the type of firm had no significant influence on the relationships between the coefficient of variation and EPS (H_6) because the existence of a direct effect was not statistically supported. Therefore, the findings suggest that service firms listed on the SET will have greater increases returns in terms of earnings per share than those listed on the MAI when they take on a higher level of risks as measured by the standard deviation of their EPS and value at risk as shown in Figure 2. This is likely because the firms listed on the SET have more capital than those listed on the MAI, which reflects their potential and capability to diversify their investment risks. The evidence suggests that service firms listed on the SET which have a higher level of volatility are better able to increase their earnings per share than firms listed on the MAI. Thus, the role of the type of firm seems to be congruent with results from prior studies, which have also emphasized that the role of the type of firm listed on the SET moderated a positive relationship between the proactive behaviors of workers and firm performance in terms of financial and risk perspectives (Wongsuwatt & Suntrayuth, 2019). The results also corresponded to with literature that supported the important effect that the type of firm had as a moderator on the main model, such as cultural type of firm, size, and human resource practices (Leal-Rodríguez, Eldridge, Roldán, Leal-Millán, & Ortega-Gutiérrez, 2015; Zhong, Wayne, & Liden, 2016).

Table 2 PLS-SEM Results: Hypotheses Testing

Paths/Hypotheses	β	S.E.	Sig. Level	f^2	R^2	Bootstrap 95% CI		Result
						Lower	Upper	
Direct Effects								
H_1: EPS ⟶ Firm Size	.118	.059	*	–	.245	.101	.157	Support
H_2: SD ⟶ EPS	.836	.039	***	–	.127	.422	.914	Support
H_3: CV ⟶ EPS	.007	.042	–	–	.031	-.087	.065	Reject
H_4: VaR ⟶ EPS	.813	.050	***	–	.658	.714	.912	Support
Moderating Effects (Type of Firm)								
H_5: SET x SD ⟶ EPS	.483	.191	**	.26	.180	.213	.753	Support
H_6: SET x CV ⟶ EPS	.046	.119	–	.001	.032	-.281	.190	Reject
H_7: SET x VaR ⟶ EPS	.727	.138	***	.37	.714	.453	1.000	Support

Note: 5,000 Bootstrap Samples; EPS = Earnings Per Share; SD = Standard Deviation;

CV = Coefficient of Variation; VaR = Value at Risk
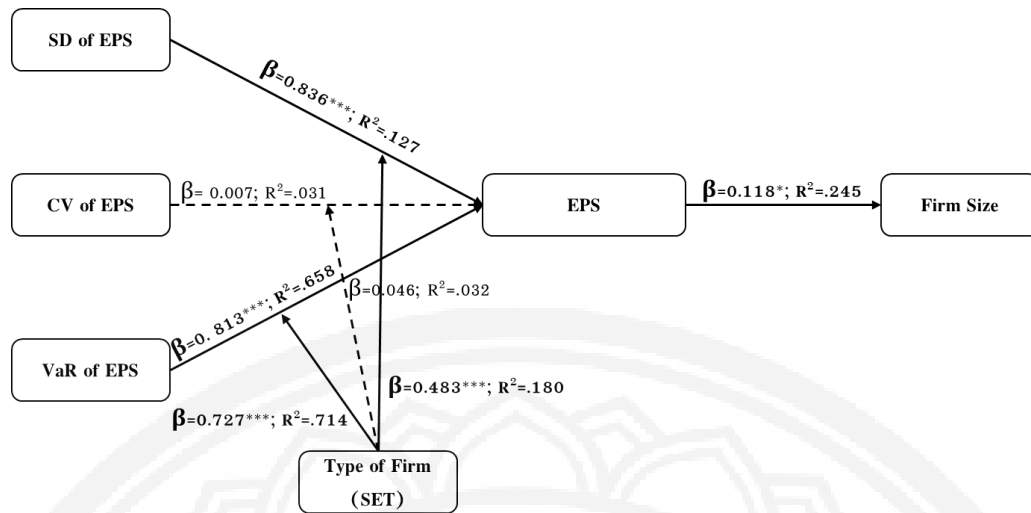
* = P < .05; ** = P < .01; *** = P < .001

Figure 1 PLS-SEM Result that are Significant are Shown with Solid Lines.

(***0.1% Significance Level; **1% Significance Level; *5% Significance Level)

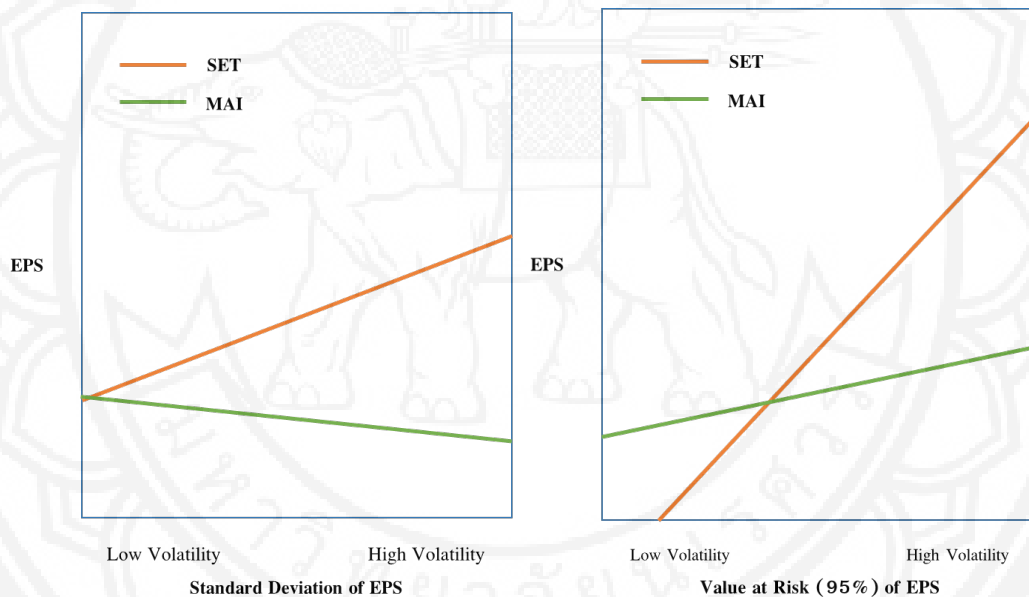EPS: Earnings Per Share; SD: Standard Deviation; CV: Coefficient of Variation; VaR: Value at Risk

Figure 2 Moderating Role of Type of Firm on the Relationship between Risk Indicators and EPS.

Conclusions and Recommendations

In the context of service industry firms listed on the SET and MAI, this research provides recommendations regarding some managerial actions which may need to be taken to measure firms' risk related to the volatility of their earnings per share. Firstly, service firms should consider assessing the level of risk measured by the standard deviation and value at risk when their earnings per share is likely to be increasing. The management of the service firm will need to implement some supportive policies to cope with the volatility of the returns and the appetite of shareholders regarding the amount of potential losses related to generating earnings. Moreover, businesses operating during the COVID-19 pandemic crisis also need to implement risk indicators as a crucial tool to assess and prioritize the risks of service firms, as they have been some of the firms that have been most severely affected by

this pandemic. Secondly, firms in the service industry listed on the SET and MAI face different patterns with regard to generating returns and its related risk. With regard to MAI firms, they should be concerned about the level of their EPS volatility, as measured by the standard deviation of their EPS and the value at risk, that may occur when they want to increase their level of returns because their level of risk is higher in comparison to the firms listed on the SET which obtain a similar level increase in their earnings per share. Whereas, the SET firms should place their emphasis the volatility of their returns as measured by their standard deviation and value at risk, because a higher level of risks can lead to increases in earnings per share. Ultimately, it must be concluded that the risk indicators related to earnings per share for firms in the service industry listed on the SET and MAI are clearly measured by the EPS's standard deviation and value at risk. This tell us that knowledge about risk indicating tools should be a high priority concern for firms, especially during the COVID-19 pandemic crisis, and that this knowledge should also be applied to other financial ratios to support effective risk management processes in their business operations.

Despite the contributions our study offers, some limitations do need to be acknowledged. The main limitation of this study is that our research was conducted only using the data from firms in the service industry that were listed on the SET and MAI. Because the research context was limited to a single industry analysis, the findings may not be generalizable firms from other industries that are listed on the SET. It would have been better if it could have been arranged to allow collecting data from firms in all of the industries listed on the SET and MAI. Additionally, investigation of what other financial ratios related to firm performance could be predicted using the volatility of risk indicators should also be undertaken.

Thus, this study also provides understanding of several things that may be applied to various other circumstances. First, expanding the size of firm should be well thought-out from the earnings perspective. Second, the concept of a High-risk High-return investment is still valid in business and investment. Finally, measuring the volatility risks of earnings can be used as indicators based on their standard deviation and the value at risk. Therefore, to benefit from change and volatility, the elements of the business's operations that are considered should be well thought-out form both the return and the risk perspectives.

Funding

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