



The Research and Development of Financial Stability Assessment

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 11 Aug 2023	<p><i>This research article to study appropriate indicators and use the research results to design a financial stability assessment model. This study applied both quantitative and qualitative method. The sample group used in this study was 322 companies listed in the Stock Exchange of Thailand during a period of 5 years between 2016–2020. The research questionnaire was developed to form the assessment model and calculate the value of financial stability. A Linear Structural Equation Model (Path Analysis) and qualitative method were used to help develop a financial stability assessment model. The research results showed that financial performance and non-financial performance factors were positively associated with financial stability and had an effect on financial stability. Recommendations from this study were that investors, financial companies, business companies and information users should apply the results of this study to create financial stability of their companies. In addition, investors should find other sources to support their decision making if they want to invest in such businesses even after assessing financial stability.</i></p>
CC License CC-BY-NC-SA 4.0	Keywords: <i>Financial Stability, Financial Performance, Non-financial Performance, Investors, Stock Exchange Markets.</i>

1. Introduction

The recent Asian Financial Crisis and the global financial crisis have a widespread impact in Thailand and other countries around the world causing businesses to worry about the impact of the economic crisis. It is an external factor that is difficult to control. Many researchers are trying to use statistical principles to develop models that can be used to forecast business trends. A good planning can prevent failures that may occur in advance.

A literature review was found that financial stability forecasting is not only of interest to business executives but also to the company's external stakeholders. Stakeholders are interested in finding the best methods for forecasting the company's ongoing performance. As a guideline for rationalizing the decision-making process in the past, shareholders, managers, creditors, employees of the company including investors are often concerned about the financial stability of the company that may be at risk and will be determined using tools for financial analysis. The most commonly used tools are financial ratios.

Financial ratio analysis is commonly used by companies around the world to measure financial accuracy and company credibility, but among academics, there is a concept that financial ratio analysis is an inadequate analytical technique for evaluating the performance of business enterprises. The studies found problems in the operation and finances of the company. It is extremely sensitive to the analysis of financial ratios (Channuwong et al., 2023; Chouhan et al. 2010, 2011a,b; Snongtaweeporn et al., 2022). In the present, business competition in Thailand is increasingly competitive and changes rapidly. Various business operators such as small business, medium, or large

investment decisions need to be carefully considered and taken into account, and must be subjected to more precise decisions in order to make the most efficient investment.

Many researchers are trying to use statistical principles to develop models that can be used to predict financial stability for planning to prevent financial instability that may occur in advance. Economic crises are often observed in financial ratios related to income, assets and liabilities. In addition to financial performance, many companies listed in the Stock Exchange of Thailand also recognize the link between non-financial performances and investment behavior trends of investors, especially institutional investors who focus on the use of information. Non-financial performance should be taken into account on decision on investment.

The study confirmed that non-financial factors affect the financial stability of the company and is important to the operations of listed companies because it shows an effective management system that is transparent and linked to corporate governance (Corporate Governance), social responsibility (Corporate Social Responsibility) and to all stakeholders including giving importance to anti-fraud and corruption in all forms. This research will help to build trust and confidence among shareholders, investors, stakeholders and all involved parties. For this reason, the researchers would like to study and use Development of Financial Stability assessment of companies listed on the stock exchange of Thailand

2. Literature Review

This research is based on the growth and study of Stakeholder Theory (Ansoff, H. L., 1965), it is a theory related to the relationship between an organization and its stakeholders. Although it is considered to be the first to term, this theory is referred to as "stakeholder theory," but more researchers have discussed it. It was accepted after the mid-1980s, some internal and external stakeholders had different expectations and some got conflict (Freeman, R. E., 1984). Stakeholders are an important part of an organization. Organizations need effective stakeholder management to achieve their goals. There are often conflicts among different stakeholders that the organization needs to pay attention and compromise the conflicting interests of those stakeholders. Whether they are customers, employees, shareholders, partners, competitors, government and communities, etc., the company has an obligation to be responsible and respond to their needs of its own stakeholders. In other words, this concept is about Stake - Holder Management of the company by considering the needs, interests and effect arising from the policy and operations of the company because the company's ability to survive, progress, or collapse is considered the legitimacy of those who have stakes in the company. Business Financial Stability Analysis has begun to develop tools from Financial Failure Analysis since the 1930s by Business Research Bureau by using the financial ratio analysis method from 29 different companies to determine the factors that cause bankruptcy (Bellovary, J., Giacchino, D., & Akers, M., 2007). This is the first of its kind in analytics to create a tool to predict financial failures. There are many of finance which still uses financial ratios as the main tool for analysis in using only one ratio (Smith & Winakor., 1935; Chudson, 1945; Jackendoff, 1962). But developing financial failure analysis tools model has been transformed into a modeling model, initiated by Beaver (1966), Altman (1968), and Ohlson (1980).

Later in the year 1968, Altman has a new multivariate model for forecasting financial failure and financial stability multivariate which are related by developing a 5-factor model in the manufacturing business. This model is called "Z-Score". It is a score based on financial ratios that are popularly used to predict financial failure and financial stability. Although the development Z-Score was developed from a small sample and is a manufacturing business However, it has been applied in many businesses such as service businesses. (Al -Sulaiti & Almwajeh, 2007). Z-Score is a calculation of a score that reflects the level of financial stability or business failure and shows the chance or possibility that the business will go bankrupt within 2 years. In addition to measuring financial failure, the Z-Score can also be applied to measure financial stability by using the Z-Score score as a measurement criterion. The high score shows more financial stability (Cihak & Hesse 2011). A comparative study was conducted on the average Z-Scores of Islamic and non-Islamic banking sectors to test which banks were more financially stable (Apergis et al, 2011), a comparison of financial strength with stock prices on the stock exchange showed that the Z-Score can also be used to determine financial stability.

The structure of the Z-Score is based on multivariate differential analysis (Multiple Discriminant Analysis: MDA) by using financial ratios as variables in the forecasting model.

3. Material and Methods

The researchers used the secondary database of the Stock Exchange of Thailand and the SETSMART database to collect various data by using study data from 2016-2020 with a total of 5 years. A total sample of 322 companies were used in the study. The quantitative research was used to test the research hypothesis. The results from quantitative hypothesis testing were included in addition to in-depth interviews in qualitative method. Qualitative data were collected from 5 interviewees who are experts in data usage.

Quantitative Research Process

The researchers divided the research procedures in this study into 6 steps as follows. Step 1 consisted of factors influencing financial stability and a review of related concepts and theories was reviewed. Step 2 consisted of stakeholder theory review related to financial stability including studies from other relevant documents from secondary data to develop a conceptual framework. Step 3 consisted of data collection and analysis of secondary data from the database obtained from electronic media in the information dissemination system of the Stock Exchange of Thailand (SETSMART), including performance data files of listed companies in the Stock Exchange of Thailand in the information system of the Stock Exchange of Thailand and from the Office of the Securities and Exchange Commission. Step 4 presented the research goals that are relevant to the situations and are useful for data analysis. In this test, the researchers summarized the results and discussed the results that cover the objectives and hypotheses of the research that the researchers have defined. Step 5 presented the research method with the presentation of research results that demonstrate the rationale based on the guiding principles of the accepted cause and effect theory. The researchers have studied, analyzed, drawn conclusions and discussed the results of the research study. It is also an understandable form of communication. Step 6 disseminated research by publishing articles in relevant academic journals in order to disseminate for the benefit of interested persons in the future by financial stability, the researchers applied the score of Z-Score (Altman, E.I., 1968) and concept Tobin's Q by Professor James T. Tobin as a measurement by forecasting model of Altman Z-Score. The ratios are weighted systematically, which can be formulated as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5 \quad (1)$$

Whereas;

X_1 = Working Capital/Total Assets

X_2 = Retained Earnings/Total Assets

X_3 = Earnings before Interest and Tax (EBIT)/Total Assets

X_4 = Market Capitalization/Total liabilities

X_5 = Sales/Total Assets

The Z-Score, as mentioned above, is an indicator of the financial stability or viability of a company by categorizing companies according to their likelihood of bankruptcy. Interpreting Z-Score combines the interpretation of financial ratios with financial strength by considering profitability, revenue, resource efficiency and compensation from the market. Therefore, in interpreting the meaning of the Z-Score, 3 criteria have been set for interpretation, (Altman, Edward I., 1968). If the Z-Score value is greater than 2.99, it indicates that the financial status is at a stable level (Safe Zone). If the Z-Score is less than 1.80, it indicates an unstable financial position (Weak Zone). If the Z-Score value is between 1.80-2.99, it indicates the uncertainty in financial status. Altman's valuation of intercompany crisis based on financial stability indicators can be summarized in table 1.

Table 1: Critical Value of Altman's Model

Score	Zone	Result
$Z > 2.99$	Safe Zone	Financial status is stable
$1.80 < Z < 2.99$	Gray Zone	Uncertain financial status
$Z < 1.80$	Weak Zone	Unstable financial situation

In addition, Tobin's Q is a measure of the economic value of a business that reflects the financial stability of its owners as a measure of the company's value. This is the combination of accounting figures from financial statements with qualitative marketing information called the concept Tobin's Q by Professor James T. Tobin's Q can be calculated using the market price. (Market value) of company assets divided by replacement price (Replacement cost) of assets. The market value of assets is measured by the market value of the shares held by the shareholders and the liabilities. The calculation of Tobin's Q can be done in many ways therefore adjusts the formula to make it easier to calculate (Chung et al., 1994), which is calculated from the market value of the company from the sum of the market value of its ordinary shares. The market price of the common stock is multiplied by the number of shares held by the shareholders. Market Value of Preferred Shares (Redemption Value of Preferred Shares) and the market value of the liability (Book value of net current liabilities) can be calculated by using the book value of the asset instead of the replacement price of the asset as follows:

$$\text{Company Value (Tobin's Q)} = \frac{\text{Total market value of the company}}{\text{Book value of assets}}$$

Whereas;

Total market value of the company = Market value of common stock + Market value of preferred stock + Market value of liabilities

Market value of common stock = Market Price of Common Stock x shares in the hands of shareholders

Market value of preferred stock = Redemption value of preferred shares

Market value of liabilities = Book value of current liabilities and long-term liabilities

If Tobin's Q is between 0 and 1, it indicates that the market value of the company is less than the value of the company's assets. If Tobin's Q is greater than 1, the company is overvalued. The companies are encouraged to invest because they are worth more than the purchase price of such shares. Enterprise valuation is the driving factor behind investment decisions in Tobin's Model. Tobin's Q ratio is of great macroeconomic importance and usefulness as a link between finance and the market for goods and services. In other words, stock price movements largely reflect changes in consumption and investment. (Tobin, 1969)

Qualitative Research

After completing the quantitative study, the researchers discovered a model for determining the financial stability of data from qualitative data analysis. To develop assessments of financial stability and to validate the results of quantitative hypothesis testing from statistical analysis, the researchers conducted in-depth interviews with five key informants who are experts in this field, which included; (1) Professionals and scholars who are expert in accounting and finance; (2). Auditor who examines and verifies signatures on publicly available financial records; (3). Investors who analyze and make investment decisions based on published information; 4. Investment adviser who analyzes and provides investment advice using financial and business report data; and 5. Financial executive who takes charge of the organization's finances and accounting with strategic planning and Corporate Finance Policy.

Researchers analyzed the results of the in-depth interviews to support the findings of the hypothesis-based research and in conjunction with modeling to assess financial stability. The researcher used an interview form for a qualitative study. The interview form is divided into two parts: general

information about the respondent and interview questions. The interviewees' thoughts and experiences were separated into questions to validate the hypothesis-based quantitative test results.

Data Collection

Researchers used in-depth interviews, open ended questions and a structured questionnaire about financial performance and non-financial performance that have an influence on financial stability as a tool to collect data. The researchers spoke with scholars and experts without the interviewer's guidance. And then, the researchers repeated the interview using the same questions with the next interviewees until the sufficient information was obtained.

Developing Financial Stability Assessment Model

The researchers concluded data from the steps above to examine the causal factors that affect the financial stability of companies listed on the Thai Stock Exchange which include financial performance and non-financial performance. The researchers created a financial stability assessment form which used a model from the research results as well as concepts and theories to summarize the quantitative research results based on the hypothesis testing results. The study used a linear structural equation modeling (Path Analysis). Factors that have an influence on financial stability both positively and negatively can be obtained from statistical analysis, which was used to create a financial stability assessment. A qualitative study was conducted by interviewing experts with relevant expertise for a complete and accurate assessment form. A financial stability assessment helps users of business information recognize the needs to plan ahead and in time to prevent potential financial instability.

Developing Financial Stability Assessments by Creating Instruments Based on Quantitative Research

The researchers used the variables influencing financial stability from hypothesis testing about the influence of financial performance, i.e. Return on Asset Growth (ΔROA), Return on Equity Growth (ΔROE), Earnings per Share Growth (ΔEPS) and Revenue Growth (ΔR). The hypothesis testing about the influence of financial performance, i.e. Anti-Corruption (AC), Responsibilities to Shareholders (RS), Corporate Social Responsibility (CSR) and Corporate Governance (CG) was used to develop the equation. It can indicate the degree of financial stability achieved from the hypothesis testing. They are divided into questions that weigh the influence according to the equation. Weight values come from quantitative research and only the variables with significant influence were developed into equations as follows:

$$FV = -0.236(\Delta ROE) + 0.224(\Delta EPS) + 0.116(\Delta R) + 0.118(AC) + 0.098(CG)$$

The Development of a Financial Stability Assessment Model by Creating a Qualitative Research Tool

To assess financial stability from quantitative research, the researchers used the developed variables and tools. The financial stability assessment model was developed from qualitative research data. It was developed as a response to the assessment model to identify and calculate the financial stability achieved. The questionnaire was developed according to the opinions on financial stability assessment model and related theories. These can be divided into questions about financial performance and non-financial performance. The answers to the above questions allow researchers to evaluate variables consistency between quantitative and qualitative research. The influence of financial stability is calculated as lowest, low, medium, high and the highest. The developed financial stability assessment model provides guidance and explanation for the existence of financial stability. It enables users to use assessment models to make decisions on investment when assessing each level of financial stability.

4. Results and Discussion

The following information can be taken from the research on analysis of causal factors that have an influence on financial stability and securities returns of listed companies in the Stock Exchange of Thailand. The model was found to be consistent with the empirical data with the following values. $\chi^2=$

11.36, $df = 8$, $p = 0.18$, $\chi^2/df = 1.42$, $RMSEA = 0.016$, $CFI = 1.00$, $RMR = 0.018$, $SRMR = 0.006$, $GFI = 0.99$ and $AGFI = 0.99$. The structural equation model is appropriate; it can be said that it is harmonious and consistent with empirical findings (Hair et al., 1998). The model is consistent and harmonized with the empirical data as shown by the relative chi-square (χ^2/df) of 1.42 which is less than 2.00. The model is generally consistent and harmonious according to Comparative Fit Index (CFI) which is equal to 1.00 and greater than 0.90. Both index values were taken into account by Absolute Fit Index Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) are 0.99 and 0.99 respectively. In terms of empirical data showing that the GFI index and the AGFI index value are greater than 0.90, it can be said that the model is consistent and harmonious with the data. The models were consistent with actual data with an RMSEA index of less than 0.05 as indicated by the Root Mean Square Error of Approximation (RMSEA) value of 0.016. The Standardized Root Mean Square Residual (SRMR) which shows a value less than 0.05 indicates that the model is consistent with the real data.

Table 2: The Observed Variable Elements from Both Quantitative and Qualitative Studies Influencing Financial Stability

Factor	Factors Influencing Financial Stability from the Quantitative Research Results			Result of Qualitative Research
	beta	SE	t-value	
ΔROE	-0.236	0.039	-3.365**	Accept
ΔEPS	0.224	0.038	3.204**	Accept
ΔR	0.116	0.020	4.422**	Accept
AC	0.118	0.021	4.281**	Accept
CG	0.098	0.022	2.813**	Accept

Whereas;

ΔROE	=	Return on Equity Growth Rate.
ΔEPS	=	Earnings Per Share Growth Rate.
ΔR	=	Revenue Growth Rate.
AC	=	Against Corruption.
CG	=	Corporate Governance.

From the results of hypothesis testing, it was found that factors influencing and affecting Financial Stability (FS) measured by Firm Value (FV) from Tobin's Q, can be divided into financial performance as follows: Return on Equity Growth Rate (ΔROE), Earnings per Share Growth Rate (ΔEPS) and Revenue Growth Rate (ΔR). Non-financial results include: Against Corruption (AC), Corporate Governance (CG). There is an influence value (standard) that affects Financial Stability (FS) measured by Firm Value (FV) from Tobin's Q value equal to - 0.236, + 0.224, + 0.116, + 0.118 and + 0.098, respectively which is consistent with the qualitative research results. However, there was no significant influencing factor affecting Financial Stability (FS) measured by likelihood of Bankruptcy Opportunities (BO) from the Altman Z-score.

The results of hypothesis testing on financial performance factors have a positive effect on financial stability. It was in accordance with some assumptions as follows: Earnings per share growth rate (ΔEPS) and the revenue growth rate (ΔR) had a positive influence on financial stability because earnings per share is an indicator of profitability for business owners and income is the return arising from the use of assets. If the business has the ability to generate good income, it will result in better profit growth as well as leading to wealth and financial stability. This will reduce the likelihood of bankruptcy of the business as well which is consistent with the research results of Al-Kassar et al. (2012), Cihak and Hesse (2011) and Damrongsiri et al. (2022) who found that the higher the profitability, the lower the risk of bankruptcy. The results of this study are consistent with information from in-depth interviews with experts. Return on Equity Growth Rate (ΔROE) had a direct and negative influence on financial stability. It was found that this was not in line with the assumption. However, it may be that the return on equity reflects the ability of management to maximize the benefit of shareholders or return on equity growth rate (ΔROE) higher may be due to profit

enrichment or make fake money inability to collect debt from the debtor therefore making it not in the same direction as financial stability This is in line with data from in-depth interviews with experts.

5. Conclusion

The results of hypothesis testing showed that non-financial performance factors are positively associated with financial stability and had an influence on financial stability. The results of this hypothesis testing are in accordance with the findings of Bangbon et al. (2023), Channuwong (2018), Parker et al. (2002), Wang and Deng (2006), and Abdullah, Nahar (2006) who found corporate governance (CG) and anti-corruption (AC) had a positive direct influence on financial stability. This is because good corporate governance ensures that if the business environment is fair and transparent, companies are held accountable for their actions. That is, good corporate governance has a positive effect on the performance of the company. In this matter, Baker et al. (2006), Liberty and Zimmerman (1986) and Gilson (1989) found that the quality of corporate governance can be assessed on the basis of principles of disclosure and transparency, relationships with shareholders and stakeholders, the nature of the policy and compliance board, and ownership structure, and controlling. Meanwhile, these practices protect companies from the likelihood of imminent bankruptcy in terms of corruption, fraud, accepting bribes and manipulating accounting numbers that affect financial stability. In addition, Liberty and Zimmerman (1986) and Gilson (1989) found that accountants must find a way to develop regulatory frameworks that contribute to the improvement of successful fraud detection processes and establish good governance in accounting system.

Recommendations

The results of this study should be applied by investors, financial companies, business companies and information users to create financial stability of their companies. Investors should find other sources to support their decision making if they want to invest in such businesses even after assessing financial stability. There should be future study about other tools for financial stability forecasting such the Balanced Scorecard (BSC), Financial Perspective and Customer Perspective, the Internal Process Perspective and the Learning and Growth Perspective to increase more financial stability.

Conflict of Interest

The authors declare no conflict of interest.

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