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ISTANBUL SABAHATTIN ZAIM UNIVERSITY

GRADUATE EDUCATION INSTITUTE

DEPARTMENT OF BUSINESS ADMINISTRATION

THE EFFECT OF FIRM-SPECIFIC FACTORS ON SYSTEMATIC RISK ACROSS VARIOUS INDUSTRIES IN ASEAN 4 COUNTRIES

MA THESIS

Youssouf MHADJOU

Istanbul

July-2025

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MA THESIS

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DECLARATION OF SCIENTIFIC ETHICS AND ORIGINALITY

This is to confirm that I adhered to academic standards and scientific ethics when writing my thesis titled " The effect of firm-specific factors on systematic risk across various industries in ASEAN 4 countries." Following scientific ethics and Sabahattin Zaim University's thesis writing rules, I have gathered and utilized all information and data. All direct and indirect quotations as well as all sources I used in this work have been completely cited, both in the text and bibliography.

Youssouf MHADJOU

Istanbul, July 2025

ACKNOWLEDGEMENT

All praise to Allah swat who helped me to accomplish this thesis paper despite the limited time and the many challenges and limitations I have faced. not to be forgotten, thanks to lecturer Dr. Burhan ULUYOL is willing to share his hands with materials to guide me. other than that, I also want to thank my other lecturers and friends with the supervisor of Dr. Tuğçenur EKİNCİ FURTANA who gave full encouragement and support in writing this thesis. A big thanks also goes to all my classmates who were pleased to cooperate and share some thoughts and ideas that allowed me to write this thesis on the effect of firm-specific factors on systematic risk across various industries in ASEAN 4 countries. Finally, thanks to all members of the students of the different departments for every commitment guidance cooperation, and encouragement given by all Izu classmates and friends that allowed me to complete this thesis research paper on the effect of firm-specific factors on systematic risk across various industries in ASEAN 4 countries.

Youssouf MHADJOU

Istanbul, July 2025

ABSTRACT

THE EFFECT OF FIRM-SPECIFIC FACTORS ON SYSTEMATIC RISK ACROSS VARIOUS INDUSTRIES IN ASEAN 4 COUNTRIES

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July -2025, Pages: 244

Systematic risk cannot be eliminated by diversification by nature. Systematic risk is a significant factor in estimating the company's worth and anticipated investment returns. The organization’s valuation might increase as general market risk decreases. This, a high level of overall market risk, could jeopardise the stability of the company. Prior research revealed that systematic risk in both domestic and foreign enterprises was influenced by firm-specific factors. The hypothesis that managerial financial choices have an impact on firm performance, which in turn has an impact on systematic risk, is supported by this finding. Even though systematic risk is thought of as an outside factor outside of a company's control, managerial choices can alter it. The impact of firm-specific factors on systematic risk has been the subject of numerous studies, but the findings have been conflicting. The results of earlier research, which only looked at one industry or nation in an empirical study, were unable to adequately describe and explain how systematic risk behaves in different nations and industries. As a result, the main variables influencing firm systematic risk across nations and sectors are still the subject of ongoing empirical research. This study looked at the firm-level determinants influencing the market risk of non-financial corporations in ASEAN-4 across a range of industries from 1997 to 2016. It was motivated by the problem of inconsistency and inconclusiveness in the literature regarding the effect of firm-specific factors on systematic risk. The effects of the global financial crisis in 2008 and the Asian financial crisis in 1997 on systematic risk are also examined in this study. This study utilizes existing data sources from Thomson Reuters DataStream,

which is utilized throughout this research. Quantitative method, Pre-existing data, analytical techniques used, longitudinal regression analysis. Utilising a multi-period data approach, which incorporates both time-series and cross-sectional data, the chapter outlines the dataset, analytical methods, and the panel regression models employed—namely, pooled OLS, fixed effects, and random effects.

The first hypothesis is empirically validated by the panel data regression findings, which indicate that financial leverage is positively related to systematic risk in ASEAN-4 firms except for Singapore. Furthermore, in Malaysian firms, systematic risk is strongly correlated with both liquidity and profitability, whereas in Singaporean firms, the main firm-specific factors influencing systematic risk are profitability and firm size. Thai companies with high liquidity also have high systematic risk, just like Malaysian companies do. The results show that systematic risk behaves differently depending on the industry and country. The findings differ across industries and countries. In Malaysia, across all industries, firm systematic risk is primarily determined by profitability. In the meantime, different industries in other ASEAN-4 countries have different results. Next, the systematic risk of non-financial firms in the 1997 Asian financial crisis and the 2008 global financial crisis led to an increase in economic activity in Malaysia, Singapore, and Thailand, this supports the seventh and eighth hypotheses, but only the 2008 global financial crisis had an impact on the systematic risk of Indonesian firms. The 2008 global economic downturn and the Southeast Asian financial collapse of 1997 had an impact on Thai firms' overall systemic risk across all industries. The results for the other three ASEAN countries vary by industry. The main finding of this study was the significance of firm-specific factors in influencing firm systematic risk. Since systematic risk has an impact on firms' value and return on investment, it is essential to comprehend the factors that influence it in various countries and industries. Furthermore, the results may help to clarify how to control firm-specific factors during a financial crisis and in times of normal economic growth to manage systematic risk.

Keywords: Firm-Specific Factors, Systematic Risk, Industries in Asean, Four Countries

ÖZET

ASEAN-4 ÜLKELERİNDE ÇEŞİTLİ SEKTÖRLERDE FİRMAYA ÖZGÜ FAKTÖRLERİN SİSTEMATİK RİSK ÜZERİNDEKİ ETKİSİ

Youssouf MHADJOU

Yüksek Lisans, İşletme Bölümü

Tez Danışmanı: Dr. Öğr. Üyesi Tuğçe

July-2025, 244 + xvii Sayfa

Sistematik risk, doğası gereği çeşitlendirme yoluyla ortadan kaldırılamaz. Sistematik risk, bir şirketin değerinin ve beklenen yatırım getirilerinin tahmin edilmesinde önemli bir faktördür. Genel piyasa riskinin azalmasıyla birlikte işletmenin değerlemesi artabilir. Buna karşılık, yüksek düzeydeki genel piyasa riski şirketin istikrarını tehlikeye atabilir. Önceki araştırmalar hem yerli hem de yabancı işletmelerde sistematik riskin firma-özel faktörlerden etkilendiğini ortaya koymuştur. Yönetsel finansal kararların firma performansı üzerinde etkili olduğu ve bunun da sistematik riski etkilediği yönündeki hipotez bu bulgu tarafından desteklenmektedir. Sistematik risk her ne kadar işletmenin kontrolü dışında dışsal bir unsur olarak kabul edilse de yönetsel kararlar bu riski değiştirebilmektedir.

Firma-özel faktörlerin sistematik risk üzerindeki etkisi birçok çalışmada ele alınmış olsa da bulgular çelişkili olmuştur. Sadece tek bir ülkeye veya sektöre odaklanan önceki ampirik araştırmalar, sistematik riskin farklı ülkeler ve endüstrilerdeki davranışlarını yeterince açıklayamamıştır. Dolayısıyla, ülkeler ve sektörler arasında firma sistematik riskini etkileyen temel değişkenler, halen süregelen ampirik araştırmaların konusu olmaya devam etmektedir. Bu çalışma, literatürdeki tutarsızlık ve sonuçsuzluk sorunundan hareketle, 1997–2016 yılları arasında ASEAN-4 ülkelerindeki finansal olmayan şirketlerin piyasa riskini etkileyen firma düzeyindeki belirleyicileri incelemiştir. Ayrıca 1997 Asya finansal krizi ile 2008 küresel finansal krizinin sistematik risk üzerindeki etkileri de araştırmaya dahil edilmiştir. Çalışmada,

Thomson Reuters DataStream'den elde edilen mevcut veriler kullanılmıştır. Nicel yöntem, mevcut veriler, kullanılan analitik teknikler ve boylamsal regresyon analizi temel alınmıştır. Zaman serisi ve yatay kesit verilerini birlikte içeren çok dönemli veri yaklaşımıyla, kullanılan veri seti, analitik yöntemler ve panel regresyon modelleri (OLS, sabit etkiler ve rassal etkiler) ortaya konulmuştur.

Panel veri regresyonu bulguları, ilk hipotezi ampirik olarak doğrulamaktadır. Buna göre, finansal kaldıraç ASEAN-4 ülkelerindeki işletmelerde (Singapur hariç) sistematik risk ile pozitif ilişkilidir. Malezya'da faaliyet gösteren şirketlerde sistematik risk hem likidite hem de kârlılıkla güçlü bir şekilde ilişkiliyken, Singapur'daki firmalarda sistematik riski etkileyen temel firma-özel faktörler kârlılık ve firma büyüklüğüdür. Tayland'daki şirketlerde de yüksek likidite, tıpkı Malezya'daki gibi, yüksek sistematik risk ile ilişkilidir. Bulgular, sistematik riskin ülke ve sektörlere göre farklılık gösterdiğini ortaya koymaktadır. Malezya'da tüm sektörlerde sistematik riskin temel belirleyicisi kârlılık iken, diğer ASEAN-4 ülkelerinde sektörler arasında farklı sonuçlar elde edilmiştir.

1997 Asya finansal krizi ve 2008 küresel finansal krizleri, Malezya, Singapur ve Tayland'daki şirketlerin sistematik riskinde artışa yol açmıştır. Bu durum yedinci ve sekizinci hipotezleri desteklemektedir. Ancak, Endonezya'daki şirketlerde sadece 2008 küresel finansal krizinin sistematik risk üzerinde etkili olduğu bulunmuştur. 2008 küresel ekonomik durgunluğu ve 1997 Güneydoğu Asya finansal çöküşü, Tayland firmalarının tüm sektörlerdeki sistematik riskini etkilemiştir. Diğer üç ASEAN ülkesinde ise sonuçlar sektörlere göre değişmektedir.

Bu çalışmanın temel bulgusu, firma-özel faktörlerin sistematik risk üzerinde önemli bir etkiye sahip olduğudur. Sistematik risk, firmaların değeri ve yatırım getirisi üzerinde etkili olduğundan, farklı ülke ve sektörlerde bu riski belirleyen faktörlerin anlaşılması büyük önem taşımaktadır. Ayrıca elde edilen sonuçlar, finansal kriz dönemlerinde ve normal ekonomik büyüme süreçlerinde firma-özel faktörlerin nasıl kontrol edilebileceğini açıklığa kavuşturarak sistematik riskin yönetilmesine katkı sağlayabilir.

Anahtar Sözcükler: firmaya özgü faktörler, sistematik risk, ASEAN'daki endüstriler, 4 ülke

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LIST OF ABBREVIATIONS

CAPM:	Capital Asset Pricing Model
IRR:	Interest Rate Risk
PR:	Price Risk
MR:	Market Risk
C/ER:	Currency/Exchange Rate Risk
CR/PR:	Country Risk / Political Risk
IR:	Inflation Risk/Purchasing Power Risk
BR:	Business Risk
LR:	Liquidity Risk
FR:	Financial Risk
DCR:	Default/Credit Risk
MM:	Modigliani and Miller
GDP:	Gross Domestic Product
SET:	Stock Exchange of Thailand
JKSE:	Jakarta Stock Exchange Composite Index
STI:	Straits Time Index
KLSE:	FTSE Bursa Malaysia KLCI Index
BP-LM:	Breusch and Pagan-Lagrange Multiplier
FEM:	Fixed Effect
REM:	Random Effect
OLS:	Ordinary Least Squares
VIF:	Variance Inflation Factor

CHAPTER I

INTRODUCTION

1.1. Background of the Study

Any investment is by its very nature risky. Risk is the chance that the achieved return on the investment will be lower than anticipated; the higher returns typically come with increased levels of risk. Unsystematic risk and systematic risk are the two main categories of risk. Unsystematic risk is a type of risk unique to a company that results from sporadic occurrences like labor strikes, subpar marketing campaigns, poor management, regulatory changes, and so forth. It is a small factor that only impacts one company and can be removed by effective diversification. Other names for unsystematic risk include unique risk, residual risk, and diversifiable risk. On the other hand, systematic risk refers to stock risk that is linked to market portfolio risk and impacts the market as a whole. It is not preventable or mitigated. Macroeconomic variables that are outside the boundaries of the organization's system, such as interest rates, foreign exchange rates, and inflation, are examples of systematic risk (Gitman & Zutter, 2012; Parthasarathy, 2019; Zeng & Chen, 2019, Qiu et al., 2020).

Systematic risk is the one that worries investors and firm managers the most out of these two types of risk. Since diversification effectively limits unsystematic risk, it remains the sole risk influencing the stock price Since this kind of risk is thought to be the primary factor influencing an investment, managers and investors have focused more on figuring out by the early foundational work by Baird and Thomas (1990) and Gu and Kim (2002) established the theoretical base, while subsequent studies (Alaghi, 2013; Fahad et al., 2020; Safira, 2020; Nizam et al., 2020) have expanded and adapted these ideas to address current organizational dynamics.

Undiversifiable risk stems from external factors that cannot be avoided or reduced through diversification. The capacity to forecast systematic risk in the event of future financial instability is a greater source of concern for researchers (Allen, Bali, & Tang, 2012; Fahad et al., 2020, Nizam et al., 2020). Studies that can offer a better understanding of this kind of risk in diverse industries across international borders are

therefore necessary. These studies could help investors, firm managers, and policymakers better understand systematic risk and how to manage it. It appears to be true that maximizing profit through the reduction of systematic risk is one of the objectives of investing. To create fresh approaches to managing this risk, managers of businesses must comprehend its characteristics and origins (Iqbal & Ali Shah, 2012; Ibrahim & Haron, 2016).

In the past, a great deal of research has mostly concentrated on creating various models to quantify systematic risk. The Capital Asset Pricing Model (CAPM) is one of the most widely used models (Parthasarathy, 2019). Systematic risk has an impact on the firm value and the expected return on investment, according to the CAPM (Hooy & Lee, 2010; Nguyen, 2019). Based on beta (β), which is a stock return volatility related to the market return, the systematic risk is measured (Xing & Yan, 2018).

According to Al-quasi (2011), the CAPM is widely used in finance and portfolio management and is regarded as the core of the financial domain because it is very useful in estimating the expected return on investment. On the other hand, Gahlon and Gentry (1982) contended that the CAPM is not intended for estimating the beta using real variables, but rather has only demonstrated the required balance of security prices reflects their random behavior over time. To put it another way, the CAPM does not explain how to estimate β based on actual economic factors; rather, it is only used to estimate the expected return on investment.

According to Lee and Jang (2007), managerial decisions have the power to modify the degree of systematic risk, even though they stem from uncontrollable external factors. Stated differently, financial performances are impacted by managerial decisions about investments, operations, and finance, and these decisions ultimately affect the level of systematic risk. For instance, choosing to take on more debt to grow the company could eventually put it in financial trouble, which would put businesses at high systematic risk. This means that firm-specific factors like financial leverage, liquidity, profitability, firm size, operating efficiency, firm growth, and others can interpret systematic risk. This indicates that firm-level characteristics have an impact on undiversifiable risk behavior in addition to macroeconomic variables as a factor influencing systematic risk (Xing & Yan, 2018; Parthasarathy, 2019).

Numerous studies show how firm-specific variables affect systematic risk. Financial variables are potential factors that could affect systematic risk (Tandelilin, 1997; Hooy & Lee, 2010; Ibrahim & Haron, 2016; Nawaz et al., 2017; Nizam et al., 2020). Businesses that use too much leverage, for instance, would have to pay bankruptcy fees, which would affect the systematic risk. Considering that numerous studies have discovered strong correlations between financial variables, it can be claimed that these factors have a greater influence on systematic risk. This is because the majority of investment activities, including the creation of new projects, the improvement of capabilities, the adoption of new operational procedures, and the need for new technology, demand financial support. According to Alaghi (2013), a shift in financial choices may therefore influence a shift in systematic risk.

Many studies that have previously examined how internal firm characteristics affect systematic risk among businesses within narrowly focused industries. The aviation industry (Lee & Jang, 2007; Hooy & Lee, 2010; Evripidou, 2012), the restaurant industry (Borde, 1998; Gu & Kim, 2002; Park et al., 2017; Jung et al., 2018), manufacturing industry (Kumar & Tan, 2014), casino industry (Lee & Park, 2001; Simmons & Cho, 2009), cement industry (Iqbal et al., 2012; Rehman & Abbas, 2018), and banking and finance (Martinez & Costa, 2013; Zafar et al., 2021) are a few examples of industries that fall under These studies examined systematic risk in particular industries and produced varying results. Prior research on the determinants of systematic risk has produced inconsistent and inconclusive results, making it difficult to identify the factors influencing systematic risk. This leads to a deficiency in knowledge regarding the origins of systematic risk in different sectors within a given market.

By examining how company-level factors influence systematic risk across various industries in the ASEAN-4 nations (Thailand, Malaysia, Indonesia, and Singapore), this research endeavors to fill the gaps left by prior studies. Its analysis spanning multiple sectors and countries could generate new findings and perspectives to enrich our understanding of the elements that drive systematic risk.

High systematic risk lowers a company's worth and how it is reciprocally affected, in line with the risk and return trade-off in finance. In light of this context, firm managers need to be aware of the factors that contribute to systematic risk, such as financial variables, to manage their investments more effectively. They ought to be able to rank

the particular variables that matter most for businesses to worry about. According to Gu and Kim (2002), who claimed that looking at financial ratios associated with systematic risk can help businesses avoid losses or even bankruptcy by reducing financial distress or losses. The term "firm-specific variables" refers to these financial variables.

As was previously mentioned, several studies have identified some significant factors that may affect systematic risk. The financial crisis appears to be one of many factors that can impact systematic risk; its effects extend beyond a single market to all markets in varying degrees and proportions. For instance, the depreciation of the local currency was the primary cause of the 1997 Asian financial crisis, which originated in Thailand. The high interest rates that banks are charging as a result of financial liberalization and the fixed exchange rate policy may be the cause of the devaluation of the Thai baht (Bello, 2007; Sayaseng, 2020).

Thailand is regarded as an ASEAN-4 group member. ASEAN-4 is a recently formed emerging market comprising four countries, namely Singapore, Malaysia, Indonesia, and Thailand. For any investor looking to invest to make money, these countries offer a variety of local stocks (Chen, Leng, & Lian, 2005). Other countries in the group—especially Malaysia and Indonesia—were also impacted by the 1997 financial crisis since these countries are somewhat economically integrated and have currency pegged to the US dollar. The ASEAN-4 group's currency and share price were devalued due to the Thai baht's floating. Speculators attacked the Malaysian ringgit, causing the exchange rate to spike from 4% to 80%. Investors lost faith in the Malaysian currency and stock market as a result of this significant exchange rate volatility, which led to a panic sale of stocks. After a few days, the value of the Malaysian ringgit finally decreased to the US dollar (Radelet & Sachs, 1998; Corsetti, Pesenti, & Roubini, 1999; Michie & Jonh Grieve-Smith, 2003).

The Asian economic meltdown of 1997 spread beyond East Asia to include other markets like Brazil (1999), Central America (1998), and Russia (1998). The reason is that the currency crisis constitutes an element of the overall economic crisis; a reduction in trading volume and a sharp decline in the price of primary goods would have an impact on the global economy as a whole (Karikomi, 1997). Due to problems and effects in a specific nation, for instance, the financial turmoil in Asia in 1997 and the worldwide crisis in 2008, the occurrence of financial crises each year may vary

(Warr, 2000; Hooy & Lee, 2010; Sayaseng, 2020). Prior research has indicated that systemic risk may also be influenced by other factors, such as financial crises. Due to low purchasing power during the financial crisis, businesses made less money than they would have under normal circumstances. Since businesses with more debt would be unable to pay their obligations, there would be a high systematic risk of business failure (Maroney et al., 2004; Choudhry et al., 2010; Loviscek & Riley, 2013; Abubakr et al., 2020). There are, however, few studies that explain the connection between systematic risk and financial crises, and the ones that do exist mostly concentrate on how one particular crisis affects systematic risk. This could result in a lack of knowledge regarding systematic risk and the financial crisis.

In response to the aforementioned issues, aside from looking at how firm-specific factors have affected systematic risk in a variety of ASEAN-4 industries over the last 20 years, from 1997 to 2016. This study compares the four countries and looks into how the financial crises of 1997 and 2008 affected different industries' systematic risk exposure. The results of this investigation might offer helpful details on fresh data and contributions to the body of literature, which could advance our knowledge of the causes of systematic risk. Additionally, policymakers and firm managers may find it easier to develop effective risk management strategies to address systematic risk both during normal business operations and during financial crises if they have a solid understanding of the sources of systematic risk and how financial crises affect it. This could lead to increased firm efficiency and profitability while also lowering risk to draw in new investors.

1.2. Problem Statement

The nature of every company is to maximize profits while preventing investment losses. Since businesses create jobs, they are seen as a crucial component of economic development. As such, any factor that negatively impacts businesses may also have an indirect negative impact on the state of the economy. Previous research has shown that systematic risk can affect stock price, which could result in a significant decline in expected return since it could keep companies from achieving their objectives (Allen et al., 2012; Iqbal & Ali Shah, 2012; Wamba et al., 2020; Nizam et al., 2020). This systematic risk affects a country's development in addition to being a major worry for investors and businesses. For instance, if many businesses fail and fire staff, the unemployment rate will be high and the nation's crime rate will ultimately rise. From

this, it can be concluded that to keep businesses from going bankrupt, a sufficient estimate of systematic risk is necessary. Additionally, if the systematic risk is not sufficiently estimated, the firms may make costly mistakes in their operations, finance, and investment decisions.

Gitman and Zutter (2012) state that systematic risk is an inevitable factor that impacts the market as a whole and that it cannot be mitigated by diversification. Additionally, Qiu et al. (2020) emphasized the correlation between systematic risk and all volatile assets within the market portfolio, influenced by external elements such as macroeconomic indicators, social and political issues, and environmental and market-based factors. As a result, systematic risk issues need to be given extra consideration, and accurate predictions may aid businesses in making wise investment decisions.

The influence of systematic risk on expected returns, along with its potential origins, has been a central theme in past studies. Because it can pinpoint the key firm-specific factors influencing it, the investigation of its potential sources offers a deeper understanding of the behavior of systematic risk itself.

Although several studies have discovered that firm-specific factors impact systematic risk, the inconsistent or conflicting results of these studies have made it impossible to determine which variable is thought to be the primary factor affecting systematic risk. This might be the case because earlier research on systematic risk focused solely on a particular industry, such as restaurants, airlines, hotels, manufacturing, gaming, and so forth. As a result, it can be claimed that there is a knowledge gap regarding the origin of systematic risk in different market sectors. By analyzing the internal factors particular to the firm influencing industry-wide vulnerability to market risk in the 4 ASEAN countries between 1997 and 2016, this study filled in the gaps. When identifying the sources of systematic risk, concentrating on sectoral and national variations may yield superior outcomes and deepen our comprehension of firm-specific variables associated with systematic risk.

In addition to comprehending the origins of systematic risk, companies also need to be aware of the financial crisis. A financial crisis has an impact on all markets collectively, albeit to varying degrees and varying degrees. It is not limited to any one particular market. The impact and causes of financial crises tend to differ amongst different companies or industries, as evidenced by the numerous documented financial

crises. Excessive leverage has also been linked in the past to financial crises, which have been shown to impact risk, particularly systematic risk (Maroney et al., 2004, Loviscek & Riley, 2013; Choudhry et al., 2010; Abubakr et al., 2020). The paucity of research and insufficient analysis of multiple financial crises across various industries and nations has resulted in a limited and inconclusive body of work establishing a correlation between systematic risk and financial crises.

It might not be fair to estimate systematic risk without considering financial crises. The goal of conducting empirical research is to produce comprehensive and insightful data that can be utilized to make informed decisions. This cannot be accomplished if the financial crisis is ignored, even though numerous studies have looked into the effects of the global financial crisis in 2008 and the Asian financial crisis in 1997. However, this might not be sufficient to offer more detailed information that advances our understanding of the financial crisis and systematic risk. In response, this study examines how the ASEAN-4 countries' industries were affected by the global financial crisis of 2008 as well as the Asian financial crisis of 1997. Examining multiple financial crises across various sectors and nations can yield detailed data that helps investors and managers assess systematic risk in both crisis and regular circumstances by using the firm's attributes.

Systematic risk, which affects the real economy in many ways, including employment, recession, taxpayer-funded bailouts, individual bankruptcy, and many more, is the primary threat to the stability of firms, as numerous studies have demonstrated. This suggests that systematic risk is still a pressing concern that requires careful consideration.

It will be extremely difficult for firms to have sound risk management without a solid understanding of firm-specific factors affecting systematic risk in various industries concerning financial crisis issues. Businesses might not have a solid plan in place to control systematic risk to make wise financial decisions down the road.

Consequently, the study analyzes the internal business factors that contribute to systematic risk within non-financial enterprises across four ASEAN industries. It also looks at how financial crises affect systematic risk. Through industry comparisons across four ASEAN countries—three of which are developing and one of which is developed—this study may offer businesses a variety of insights that improve their

comprehension of the problem associated with systematic risk. It might help policymakers adjust their plans based on the firm's systematic risk.

1.3. Studies Objectives

This inquiry is undertaken to investigate, from 1997 to 2016, how internal firm-level characteristics influence systematic risk among non-financial businesses operating in different sectors across four ASEAN countries. Furthermore, this study aims to examine the impact of the 1997 Asian financial crisis and the 2008 global financial crisis on systematic risk. There are four main objectives that this research intends to achieve. The following is a list of them:

a) To investigate the company-specific factors affecting systematic risk among non-financial firms in the four ASEAN nations.

b) To analyze how firm-specific attributes contribute to systematic risk among non-financial entities in each ASEAN-4 nation.

c) To explore possible variations across industries in the company-specific factors influencing systematic risk within each of the four ASEAN nations.

d) To identify the influence exerted by the 1997 Asian financial crisis and the 2008 global financial crisis on the systematic risk associated with non-financial firms over selected industries in 4 ASEAN countries.

1.4. Research Questions

The research focuses on answering the following questions:

a) What company-specific factors affect systematic risk among non-financial corporations across the four ASEAN nations?

b) Which internal corporate factors contribute to the systematic risk of non-financial firms within selected ASEAN member states?

c) Are there industry-specific factors within each of the four ASEAN countries that influence the systematic risk of non-financial companies differently?

d) How did the 1997 Asian financial crisis and the 2008 global financial crisis affect the systematic risk of non-financial companies in specific of the 4 ASEAN countries industries?

1.5. The Motivation for this Study

The fact that external risk factors cannot be eliminated or mitigated by diversification serves as the driving force behind this investigation. Since unsystematic risk can be mitigated through portfolio diversification, this is the one form of risk that continues to impact expected returns for firms. To find a way to manage this kind of risk, it is crucial to understand its characteristics and potential sources. This study looks at the firm-specific variables that, between 1997 and 2016, affected systematic risk in non-financial companies in a range of industries in the ASEAN-4 countries. Due to the variations in financial firms' capital structures and rules of practice, this study solely takes into account non-financial firms when determining systematic risk.

The rationale behind the selection of ASEAN-4 countries for the investigation of systematic risk is that ASEAN-4, comprising Malaysia, Indonesia, Thailand, and Singapore, is regarded as a new emerging market. Based on their current and projected performance in the nation, these are the countries with the largest economies in the future. Both developed and developing nations are included in the ASEAN-4, so it's intriguing for this study to determine the variables influencing systematic risk and compare them to gather fresh data and different perspectives.

This study looks at the firm-specific factors that affect systematic risk as well as the effects of the global financial crisis in 2008 and the Asian financial crisis in 1997. This research investigates the effect of financial disruptions on the systematic risk levels of diverse industries in the ASEAN-4 region, recognizing the variation in the timing of these occurrences. The goal of this research is to determine the systematic risk that non-financial companies face in the various industries across the ASEAN-4 countries both in times of prosperity and hardship. In doing so, the study may produce valuable data that helps investors, firm managers, and policymakers assess systematic risk in both normal and crises. Policymakers and firm management can be better equipped to handle future financial crises because they occur in cycles if they have a solid understanding of how a financial crisis impacts systematic risk. Similarly, managers can develop appropriate risk management and corporate strategies by focusing on significant factors found to have affected systematic risk by knowing and understanding the firm-specific factors affecting systematic risk. By doing this, businesses will be more equipped to handle financial crises in the future.

1.6. Scope and Limitations

This research investigates how firm-specific variables and the financial crises (the Asian financial crisis in 1997 and the global financial crisis in 2008) affect market-related risk exposure of non-financial companies in multiple business sectors throughout four ASEAN countries between 1997 and 2016. Thailand, Malaysia, Singapore, and Indonesia were the 4 ASEAN countries. These countries represent Southeast Asia's Tiger Cub Economies members (Chen et al., 2005; Abudalu et al., 2014; Jiranyakul & Opiela, 2010). Since this particular study alone considers Only non-financial listed companies are included; financial firms are deliberately excluded as a result of their differentiated financial structures and the distinct rules governing their accounting practices. In the case of financial firms, for instance, the majority of them—banks and other financial institutions—give loans by requiring assets as collateral; however, non-financial firms finance—a practice known as debt financing—by using their assets as collateral for loans. (Iqbal & Ali Shah, 2012; Ibrahim & Haron, 2016; Nguyen, 2019).

The primary variables that affect systematic risk in this study are firm-specific variables (like liquidity, growth, firm size, profitability, financial leverage, and operating efficiency), as well as financial crises (such as the 1997 Asian financial meltdown and the 2008 worldwide economic downturn). It is believed that the identified variables are independent. Moreover, the analysis treats systematic risk as the outcome variable, with GDP included as a controlling factor.

Contrary to what some previous studies looking at specific industries of interest have suggested, across all industries, the firm-specific indicators considered in this research remain unchanged. For example, some previous research on the airline industry included "safety" among the enterprise-level variables that influence systematic risk (Chee-Wooi et al., 2010). Nevertheless, according to Ibrahim and Haron (2016), this type of variable is not suitable for inclusion across different industries in this study. Instead, it will utilize variables applicable to all industries in general, including factors like financial leverage, liquidity, profitability, company size, growth potential, and operational efficiency. This study uses a single proxy to accomplish its stated goals, although a wide range of proxies can be used to capture firm-specific characteristics and systematic risk (Iqbal & Shah, 2012; Ibrahim & Haron, 2016; Nguyen, 2019; Nizam et al., 2020). As a result, this study will not be centered on comparing various

proxies. The calculation of an asset's beta, for instance, is based on the following ratios: Firm size is assessed using the natural logarithm of total assets; firm growth is determined by the annual percentage change in net income; operating efficiency is evaluated by the ratio of total revenue to total assets; financial leverage is measured by the proportion of total debt to total assets; liquidity is described by the ratio of current assets to current liabilities; and profitability is indicated by the return on assets, calculated as net income divided by total assets.

Time constraints and data availability are the main causes of this study's limitations. The majority of this research relies on secondary data sourced from Thomson Reuters DataStream; panel data analyses were employed to look at the firm's systematic risk. But sometimes, compared to primary data, secondary data cannot be completely accurate. Since data from four different countries were used, some may not be up to date with the most recent year.

This study offers empirical findings by looking at the firm-specific factors influencing systematic risk. For the study's further development in the future, there is still space for improvement. As previously stated, the data used in this study came from Thomson DataStream's publicly traded companies, so the findings are verified and specific to this set of businesses. The study's findings may also be applied to other categories of unlisted businesses, such as small and medium-sized businesses, provided that it is believed that these businesses share the same traits and behave comparably to listed businesses. Any results of this study, aside from those that corroborate its primary goals, depend on the reliability of the data set that was obtained and the research techniques that were applied to the examination of the connection between systematic risk and financial variables.

1.7. Significance of the Study

Numerous research works have investigated the factors unique to each firm that impact the systematic risk of various firms both domestically and globally (Hamada, 1972; William & James, 1975; Bowman, 1979; Mandelker & Rhee, 1984; Borde, 1998; Kim, Gu & Mattila, 2002; Lee & Jang, 2007; Alaghi, 2016; Ibrahim & Haron, 2016; Nawaz et al., 2017; Jung et al., 2018; Nguyen, 2019; Fahad et al., 2020; Nizam et al., 2020). Their results, however, diverge and are unable to identify the primary variables that specifically influence systematic risk. This might result from analyzing the systematic

risk by focusing solely on a specific industry and country. As a result, the results of earlier research have only been able to offer a limited amount of knowledge regarding how firm-specific factors affect systematic risk.

Financial crises have an impact on risk, as supported by the findings of earlier research (Maroney et al., 2004, Choudhry et al., 2010, Loviscek & Riley, 2013, Abubakr et al., 2020). There aren't many studies to back up the claim that systematic risk and the financial crisis have a substantial relationship. Furthermore, these studies only look at one financial crisis, making it impossible to compare the results to those of another financial crisis. This might not offer fresh data and in-depth insights to improve our understanding of how various financial crises affect systemic risk.

Based on earlier research, this study has determined that certain aspects of the systematic risk that affect various firms in various industries globally have not been examined. Examples of these aspects include the lack of comparison between the effects of the global financial crises of 2008 and 1997 and the examination of firms in isolation. These findings may be the reason for the inconsistent results found in earlier research. This study has consequently revealed a research gap that needs to be filled right away. To close this gap, this research examines the influence of firm-specific characteristics on systematic risk among non-financial companies across four ASEAN nations over a 20-year period, spanning from 1997 to 2016. This research looks at firm-specific factors as well as the effects of the global financial crises in 2008 and Asia in 1997 on systematic risk. The results of this study could add to our providing fresh and valuable insights into the characteristics of systematic risk within non-financial companies across industries in the ASEAN-4 region.

As was previously mentioned, there aren't enough studies looking at the particular factors influencing systematic risk by focusing on different industries and nations because there aren't enough comparisons between different industries or countries. It's possible that managers and investors only have a limited awareness of the factors contributing to systematic risk, and they neglect to rank the variables that should worry them most. As a result, this study might offer crucial details that investors and managers could find helpful, improving their comprehension of how firm-specific factors affect systematic risk in a range of ASEAN-4 industries. A thorough understanding of these factors may assist managers and investors in developing the best policies for each factor influencing a firm's performance, which in turn influences

systematic risk.

Managers, investors, and policymakers may all benefit from knowing the origin of systematic risk. This could make it possible for policymakers to customize policies for various industries based on the degree of systematic risk associated with those industries. This could lead to improved corporate governance and increased efficiency in the policymaking process.

1.8. Organization of the Study

An overview of the field under investigation is given in the first chapter. This chapter's first section addresses the nature of investing, which is inherently risky. Systematic risk and unsystematic risk are the two categories of risk. Managers and investors are most concerned about systematic risk because it cannot be mitigated through effective firm diversification, unlike unsystematic risk. The problem statement, which covers the factors influencing systematic risk and the gaps in earlier research, is the second section. The study's objectives, which comprise four primary goals for analyzing systematic risk, research questions, the study's motivation, its scope and limitations, its significance, and its organization are among its other components.

The theoretical framework and the theories underlying the study's examination of the firm-specific variables influencing systematic risk are described in the second chapter. The introduction, capital market and key concepts include portfolio management theory, risk premiums, sources and quantification of risk, beta as a risk indicator, and the CAPM framework, capital structure trade-off model, systematic risk, and capital market theory, MM's propositions, traditional theory approach, agency cost theory, and systematic risk, the Asian financial crisis of 1997 and the global financial crisis of 2008, systematic risk and financial crisis, and concluding remarks were the order in which the discussion was held.

The literature review appears in the third chapter. The introduction, empirical studies that address firm-specific factors influencing systematic risk in various industries and countries, the development of hypotheses, and the concluding remarks comprise the four sections of this chapter. The present investigation formulated conjectures drawing from prior research, which is why prevalent variables encompassing capital structure, short-term solvency, earnings performance, company scale, business expansion, and operational effectiveness are considered to achieve the objective of ascertaining

systematic risk. This section discusses the relationship between each variable and systematic risk.

The research methodology is covered in detail in the fourth chapter. It begins with an introduction, then moves on to data on industry classification in ASEAN-4 countries, the number of non-financial firms in each industry, a summarized table of samples, the period of study, and the analytical techniques used (Pooled OLS, fixed effect, and random effect model). Additionally, there are proxies this includes an analysis of both the independent and dependent variables—systematic risk, financial leverage, liquidity, profitability, operating efficiency, firm size, growth, and the 1997 Asian and 2008 global financial crises—followed by the concluding remarks.

The results are summarized in the fifth chapter. The results derived from the four study objectives are presented in this charter. The first finding shows how firm-specific variables influence systematic risk in ASEAN-4 non-financial enterprises. The second finding relates to how firm-specific characteristics in each of the ASEAN-4 member countries affect systematic risk in non-financial firms. The third finding relates to the firm-specific variables that influence systematic risk in a few chosen industries in the ASEAN-4 countries. The final finding examines the effects of the global financial crisis in 2008 and the Asian financial crisis in 1997 systematic risk exposure of non-financial enterprises in a few of the 4 ASEAN industry sectors. As the final section of the discussion, this chapter also contains the closing remarks.

The findings based on the four primary goals of this study are discussed in the sixth chapter. The findings of the pooled sample analysis are covered in the first section, which is then followed by analyses of specific countries, cross-industry analyses, and the effects of the Asian financial crisis in 1997 and the global financial crisis in 2008.

The conclusion, contributions, and recommendations for additional research are included in the last chapter. The introduction is the first section. The conclusion, which covers the ASEAN-4 countries, individual countries, and a few industries, examines how firm-specific factors and individual financial crises affect the systematic risk of non-financial firms in the second section. The third section provides an explanation of the study's findings to investors, managers, policymakers, and academics. The idea for additional study is the fourth.

CHAPTER II

THEORETICAL FRAMEWORK

2.1. Introduction

The basic theories of systematic risk and areas related to this research will be covered in detail in this chapter. In the first section, portfolios and capital market theories are introduced. The sources of systematic and unsystematic risk, risk premium, risk measurement, and the idea of beta under the CAPM are all covered. This section's conclusion has emphasized the key points of the capital market and portfolio theory: systematic risk, which arises from outside variables that diversification cannot prevent or mitigate, is the only risk that is still influencing a firm's expected return. Therefore, the theory backs up this study on the nature concerning systematic risk, which is the primary factor influencing equity return and, according to this study, the major concern for any investment because it cannot be diversified like unsystematic risk.

The capital structure is covered in the second section along with the trade-off theory, MM Propositions, and conventional theory. According to certain theories of capital structure, debt financing is preferable to equity financing when it comes to maximizing a company's value. Massive debt taken on by businesses, however, would result in high bankruptcy costs and unstable finances. These dire circumstances might also cause the country's economy to contract, which would affect systemic risk. This study, which finds a positive link between financial leverage and systematic risk, is backed by capital structure theory.

The pertinent financial crises include the 1997 Asian financial crisis and the 2008 global financial crisis, as well as systematic risk discovered by certain earlier research, are covered in the third section. The closing remarks will be the final section.

2.2. The CAMP and Portfolio Theory

To develop the model for pricing all risky assets, capital market theory is a development of portfolio theory. Investors can estimate the rate of return they should anticipate for any of their risky assets by using the Capital Asset Pricing Model (CAPM), which is related to the trade-off between risk and returns (Reilly & Brown,

2010; Elbannan, 2015; Antoine et al., 2020).

The concept of a risk-free asset, characterized by having no variance in returns, is presented as a fundamental step in the development of the theory of portfolio and capital markets. In other words, the idea of a risk-free asset is what drives the advancement of Markowitz's portfolio theory into the theory of capital markets. Investors can contribute and distribute their capital between a risk-free asset and more volatile portfolios—such as those lying on the Markowitz efficient frontier—by utilizing borrowing and lending at the risk-free interest rate derive a comprehensive theory of capital asset pricing under uncertain conditions by following the change in the efficient frontier from this point on (Jones, 2007; Reilly & Brown, 2010; Elbannan, 2015).

The earlier studies by Markowitz (1952) and Sharpe (1964) suggest that systematic risk should be utilized to calculate risk. They assume that every rational investor will own fully diversified market portfolios that include high-risk assets. In other words, investors will lend or borrow up to the degree of risk they are comfortable with, thereby eliminating all unsystematic risk. The term "unsystematic risk" refers to the variation in a single asset that is unrelated to market portfolios. When compared to systematic risk, the specific risk that can be mitigated through effective diversification is deemed less significant. The combination of assets in the portfolio that have opposite correlations helps to diversify unsystematic risk because the systematic risk associated with each asset is still present. As a result, the residual risk that persists after diversifying away unsystematic risk represents the portfolio's total exposure to the tendency of individual assets to move in conjunction with overall market risk.

2.2.1. Classification of Risk

Systematic risk and unsystematic risk are the two categories into which risk is divided. Interest rate risk, pricing risk, risks associated with market fluctuations, inflationary pressures, currency exchange variations, and sovereign or country-specific factors (political risk), and other uncontrollable factors can be the source of systematic risk. Risks encompassing operational challenges, liquidity constraints, financial obligations, and credit exposure, and other variables that businesses can control are some of the sources of unsystematic risk.

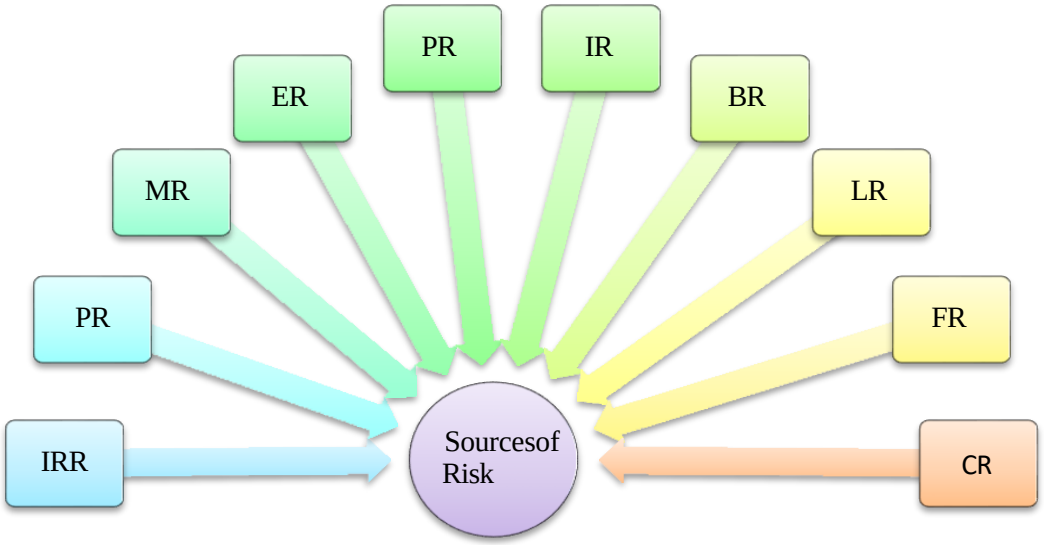


Figure 2.1: Sources of Risk

Source: Investment Analysis and Portfolio Management, Reilly & Brown (2010)

2.2.1.1. Few Sources Of Systematic Risk

a) Interest Rate Risk (IRR)

The term "IRR" refers to the shift in asset values brought about by changes in interest rates before inflation adjustment. A shift pertaining to interest levels carries a risk and may have an impact on changes in the cost of funds. Given that the price of securities varies inversely with interest rates, the IRR has the largest effect on the return on variability in securities (Jones, 2007; Hossin & Rahman, 2020).

b) Price Risk (PR)

The price of an asset will fluctuate following changes in supply and demand, whether those changes are positive or negative. Market conditions play a role in determining how an asset's value changes (Bacha, 2012; Raja et al., 2020).

c) Market Risk (MR)

The market's fluctuation results in a shift in return. Wars, recessions, shifts in customer preferences, and modifications to the economy's structure are examples of external factors that pose a risk to markets. The return on securities will be impacted by each of these risk factors (Jones, 2007, Mehta et al., 2012; Seyfi et al., 2020).

d) Currency/Exchange Rate Risk (C/ER)

An investor's risk is suffering a loss if they have to give up on their foreign exchange trading, whether they are long or short. This is a result of the currency rate fluctuations.

The value stays the same and has no bearing on investors if there is no change in foreign currency when traders close the deal (Reilly & Brown, 2010; Palma, 2019).

e) Country Risk/ Political Risk (CR/PR)

The uncertainty in returns resulting from substantial changes or disruptions in the political or economic landscape of a nation is known as the country risk, also known as political risk. The United States, for instance, has the lowest country risk because its political and economic systems are regarded as stable (Reilly & Brown, 2010; Dziawgo, 2020).

f) Inflation Risk/Purchasing Power Risk (IR)

The inflationary condition's effect on purchasing power results in a loss of purchasing power, which represents a potential return on investment opportunity that will decrease in value over time (Jones, 2007; Magweva & Sibanda, 2020).

2.2.1.2. Few Sources of Unsystematic Risk

A) Business Risk (BR)

It is described as the potentiality for businesses to be unable to continue operating. It's a risk associated with how businesses operate, whether or not they can turn a profit. For instance, there is a big business risk if companies can't produce enough goods to turn a profit (Reilly & Brown, 2010; Gentian, 2019).

B) Liquidity Risk (LR)

The possibility exists that the business won't be able to handle the immediate financial demands or cash flow issues. One possible explanation for this could be a deficiency of easily convertible assets into cash for immediate payment of bills. It happens when a business that owns assets finds it difficult to sell them for market value or when there isn't a buyer when the assets are being sold (Reilly & Brown, 2010).

c) Financial Risk (FR)

It is a risk of bankruptcy because of the incapacity to repay outstanding debts, resulting from a high financial leverage position. It denotes the potential for financial loss and properties as well as the failure to repay debts to creditors. Poor business decisions and operations can cause a company to suffer financial losses, as noted by Reilly and Brown (2010), Kishk (2020), and Dang et al. (2020).

D) Default/Credit Risk (DCR)

This happens when the company doesn't pay back the investment and return, which puts the bond issuer in danger of going bankrupt or experiencing financial difficulties. As a result, the default risk increases (Bacha, 2012; Raja et al., 2020).

2.2.2. Risk Premium

The low rate of return that investors can anticipate on their investments with no risk is known as the "risk-free rate." Rather than investing in these risk-free instruments, investors will make riskier investments when they hope to make a large profit. A risk premium refers to the additional earnings investors expect as compensation for bearing higher levels of risk describes the extra risks or rewards that investors anticipate receiving in exchange for taking on more risk. For instance, a lot of investors purchase common stocks that carry a higher risk because they offer a higher return in exchange for taking on more risk. The risk premium is the portion of an asset's return to the investor that exceeds the risk-free rate of return (Reilly & Brown, 2010; Andersen et al., 2020). Figure 2.1 displays the characteristics of risk and return.

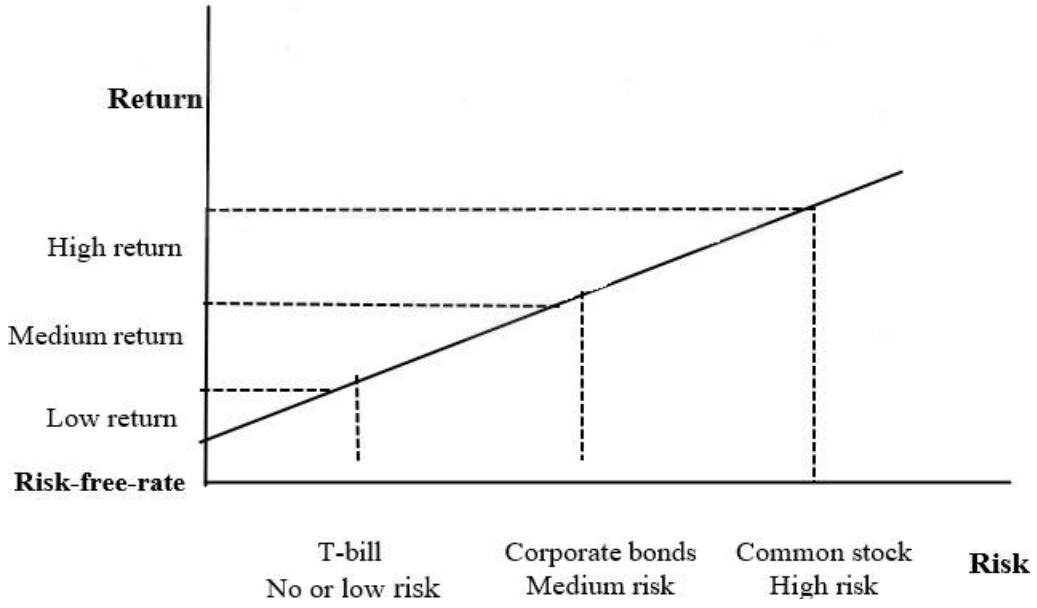


Figure 2.2: Risk and Return
Source: Hirt and Block, 2012

Investors who take on high risk by purchasing corporate bonds and common stock will benefit from an excess return, whereas those who invest in low-risk instruments like Treasury bills (T-bills) will not receive any additional return. The least risky

investment option is T-bills, but only during extremely difficult economic times. There has never been a debt default by the US government.

A risk-free rate plus a risk premium can be used to get the total needed rate of return. The real rate and projected inflation can help derive the risk-free rate (Hirt & Block, 2012). When risk premiums are required, several important sources of uncertainty must be taken into account. This is because the requirement for high-rate returns on investments involves uncertainties and goes beyond the nominal risk-free rate. Operational, liquidity, sovereign, financial, and currency exchange risks represent key factors that are some of the major sources of uncertainty (Reilly & Brown, 2010; Gentian, 2019; Palma, 2019; Dziawgo, 2020; Dang et al., 2020).

2.2.3. Risk Measurements

The fluctuations in a security's returns arise from both systematic and unsystematic risk factors, categorized according to the risk classification, as illustrated below:

$$\sigma_i^2 = \beta_i^2[\sigma_M^2] + \sigma_{ei}^2 \quad \textbf{(2.1)}$$

Where:

σ_i^2 The overall risk associated with a security, measured by the variability in its returns.

$\beta_i^2[\sigma_M^2]$ The relationship between a stock's returns and the overall market's returns, representing systematic risk.

σ_{ei}^2 The component of return variance arising from unpredictable, firm-specific events, representing (unsystematic risk).

While unsystematic risk is irrelevant to investors, as it can be mitigated through portfolio diversification when holding multiple securities, systematic risk is thought to be a significant component of the variance of a security's return because it arises from outside factors that cannot be avoided or eliminated (Jones, 2007; Reilly & Brown, 2010; Bodie, Kane, & Marcus, 2013; Purwanto & Safira, 2020).

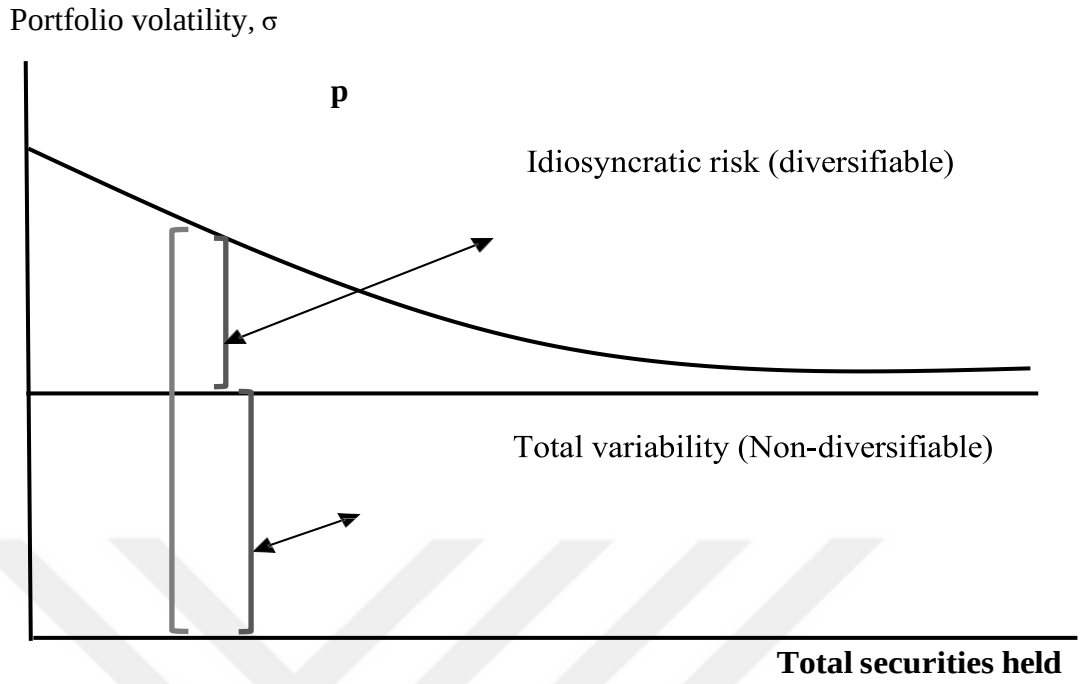


Figure 2.3: Portfolio Categories.

Source: Gitman and Zutter, 2012

2.2.4. An Overview of Beta and the Capital Asset Pricing Model (CAMP)

Since diversification strategies eliminate unsystematic risk, the CAPM only recognizes systematic risk (Hirt & Block, 2012; Nizam et al., 2020). The Capital Asset Pricing Model (CAPM) is a theoretical framework that explains the relationship between systematic risk and the expected return of an asset return are related to each asset. A component of the CAM that illustrates the relationship between risk assessment and the required or expected rate of return for any asset is the security market line. The needed rate of return for a given stock can be calculated Through the combination of the risk-free rate and the risk premium, the total expected return on an asset can be determined (Mandelker & Rhee, 1984).

$E(Ri)$ = Rf + $\beta[E(RM) - Rf]$ (2.2)

Where:

$E(Ri)$ The expected rate of return on equity i

Rf The return on a riskless asset

β The stock's beta value i

$E(RM)$ The return investors expect from a well-diversified market portfolio

An asset's beta is a distinct quantification of non-diversifiable risk based on the Capital Asset Pricing Model. Since beta is related to the measurement of systematic risk, it exhibits a significant portion. The statistical measure reflecting how a stock's return co-moves with the return of the overall market concerning the market's variance is known as the beta measure. The degree to which a stock's return moves in tandem with the market return is determined by its beta. The following formula is displayed:

$$\beta = \frac{COV(R_i, R_m)}{\sigma_m^2} \tag{2.3}$$

Where:

R_i Stock performance gain

R_m Return generated by the broader market

σ_m^2 The variance of market return

The market-related risk associated with a company's equity stock is determined by beta and is defined as the degree to which the return of a stock aligns with fluctuations in the overall market return.

The basic assumptions of the CAPM are:

- Due to their preference for higher expected returns at the expense of greater risk, investors are risk averse.
- Investors are assumed to have unrestricted access to borrowing and lending at the prevailing risk-free interest rate.
- Investors share uniform expectations.
- The investment horizon is limited to a single period.
- There are no restrictions on investment since each security is considered independent.
- No taxes or trading frictions are considered in the analysis.
- Inflation is fully predicted and accounted for in decision-making.
- There is an equilibrium across capital market environments.

In the field of finance and portfolio management, the CAPM is widely used. Nevertheless, applying this model has certain drawbacks, such as making irrational assumptions. A number of the CAPM's assumptions are not at all realistic. For instance, the CAPM assumes that the analysis assumes a perfect capital market characterized by the absence of taxes and transaction costs. Because there are still transaction costs and taxes in place, the capital market is not flawless. Furthermore, betas are not stable in the long run. Although investors used historical data, such as share price and market portfolio data; to estimate beta, beta is a measure of a security's future risk. If historical data is consistent over time, investors can use it to gauge a security's future risk. Nonetheless, nearly all prior research has demonstrated that individual securities' betas are not always stable. This demonstrates that past betas are not very good predictors of future risk associated with stocks (Watson & Head, 2007; Hanif & Bhatti, 2010).

Investors are permitted to estimate systematic risk and expected rate of return under the CAPM's restrictive assumptions, even though some of these assumptions are unmet and contradict reality. Nevertheless, the model can still be used to forecast devices that help investors comprehend how risk and return are related. This is so that risk can be estimated using a rational and quantitative approach that the CAPM offers. In the current study, the model is still regarded as superior to alternative approaches for estimating risk and risk premium (Jones, 2007; Hirschey & Nofsinger, 2010; Afzal & Haiying, 2020).

Since unsystematic risk can be mitigated by diversification, systematic risk is the only risk that still affects stock return in modern finance and is considered a crucial factor in determining a firm's wealth (Iqbal & Shah, 2012; Purwanto & Safira, 2020). Numerous studies have examined the topic of systematic risk, with the primary goal being to identify the variables influencing systematic risk in various sectors and nations (Hamada, 1972; William & James, 1975; Bowman, 1979; Mandelker & Rhee, 1984; Borde, 1998; Kim et al., 2002; Lee & Jang, 2007; Aruna & Warokka, 2013; Kumar, Aleemi, & Ali, 2015; Nguyen, 2019; Fahad et al., 2020; Nizam et al., 2020). Several studies used the CAPM to explain the connection between market-related risk and the anticipated return on an investment, referring to the portfolio theory. Because of its widespread application in finance and portfolio management, the CAPM is regarded as the core of contemporary finance

(Hamada, 1972; Chee-Wooi, Hooy, & Chyn-Hwa, 2010).

2.2.5. Systematic Risk and Beta

Global Public financial institutions possess the capacity to acknowledge that systemic risk constitutes an exogenous variable that cannot be prevented or managed and that it may have a significant impact on economic performance (Prasetyo, 2008; Reilly & Brown, 2010, Qiu et al., 2020).

Systematic risk is sometimes referred to as market-related risk, since a stock's price fluctuations are influenced by overall market volatility or by how responsive its returns are to changes in the market. Effective diversification cannot prevent external factors like interest rates, inflation, war, disasters, recessions, policy issues, and international incidents. An investor faces systematic risk because of economic actions even if the investor owns a portfolio that includes every share available in the market (Gu & Kim, 2002).

The measure of systematic risk used by the CAPM to determine how an asset will perform in relation to the market return is called beta. Due to its relationship to a gauge of market risk, beta exhibits a significant portion. The value of beta indicates how risky a given stock is as an investment. A stock and the market share the same amount of systematic risk when a stock's beta value is one. In the long run, a stock is deemed riskier exhibits greater volatility than the overall market. Conversely, a stock is considered less risky than the market if its beta value is less than 1. A stock with a high beta suggests greater risk but also yields higher returns, whereas a stock with a low beta yields lower returns but less risk (Charles, 2007; Lee, 2020). In the finance industry, beta is considered the most commonly used metric for measuring systematic risk, and it plays a crucial role in the capital asset pricing model (Milionis, 2011; Afzal & Haiying, 2020).

2.2.6. Systematic Risk and Capital Market Theory

Risk is regarded as a crucial component of investments and influences how much a company can expect to make. As such, companies try to detect and address issues before they have an impact on their worth. Risk is divided into two categories according to the capital market theory: systematic risk and unsystematic risk. Non-diversifiable risks that impact the entire market are known as systemic risks. It is the uncontrollable external factors, like environmental influences, market-based

factors, sociopolitical issues, and macro variables. Unsystematic risk, on the other hand, is a specific risk to a given company or industry that results from sporadic occurrences like labor strikes, subpar marketing campaigns, poor management, regulatory changes, and so forth. Effective diversification is one way to manage or lower this kind of risk (Gitman & Zutter, 2012; Parthasarathy, 2019; Zeng & Chen, 2019, Qiu et al., 2020).

A stock has both systematic and unsystematic risk according to the CAPM. The management of systematic risk should be the focus of investment strategies, as unsystematic risk can be diversified in certain ways. It is the primary factor influencing the performance of the stock price (Purwanto & Safira, 2020). Thus, managers and investors must comprehend the characteristics of systematic risk as well as the causes of it.

This research investigates the characteristics and underlying dynamics of systematic risk, which is unavoidable and continues to impact firms' value as the primary factor of any investment, is supported by the theory of portfolio and capital markets. Thus, the primary objective of this research is to investigate the precise parameters influencing systematic risk in non-financial enterprises in ASEAN-4's diverse industries for 20 years, from 1997 to 2016. The theory refers to a stock's beta as the indicator of systematic risk. Beta, also referred to as the fluctuation in a stock's return relative to the market's overall return is a calculated estimate that is calculated by calculating the covariance between a stock's return and the market return to the variance of the market. This study measures the systematic risk of non-financial listed firms in ASEAN-4 countries using β, which is based on the CAPM.

2.3. Structure of Corporate Financing

2.3.1 Examining Capital Structure from the Perspective of Conventional Models

Executives in businesses enjoy a strong reputation for constantly coming up with fresh ideas to raise their companies' worth. As a result, their financial choices have a significant impact on how the firm's value changes, whether that change is positive or negative based on the firm's policies. When it comes to making financial decisions, the terms "gearing" and "risk" will come to mind. The amount

of debt financing that a company combines with equity financing is referred to as gearing in the financial context. Risk can take two forms: financial risk and bankruptcy risk. While debt holders are not exposed to both types of risk, shareholders are the ones most impacted by them (Hamada, 1972; Watson & Head, 2007). The conventional method of choosing the best capital structure seeks to maximize firm value while minimizing the total cost of capital. It is the rate at which one is positioned to attain greater returns while taking on the possibility of financial risk or bankruptcy. This sector's perspective aims to demonstrate that applying the conventional method will raise the value of businesses and lower their total cost of capital according to Hamada (1972) and Watson and Head (2007).

2.3.1. Modigliani and Miller's 1958 Framework

Two American economists, Modigliani and Miller (MM), put a lot of effort into their analysis of the capital structure choice. An MM study is acknowledged as a well-liked article that explains investment theory, cost of capital, and corporate finance. According to economists, the way decisions are made affects the wealth of investors by altering the capital structure of businesses, which may result in an unpredictable dividend for shareholders, particularly in the near term. The results of their 1958 study demonstrated that in an ideal market, financial decision-making is unaffected by payback policies. Their research is explained through a discussion of propositions I and II, which relate to how a firm's securities value changes as a result of a variation in capital structure.

2.3.1.1. MM's Proposition I

The value of a firm is not affected by any option in the capital structure in a perfect market, so managers should not worry about how these options will affect the company's value. This is because a company's value is the same whether it takes on mixed debt and equity (Modigliani & Miller, 1958; Brealey et al., 2011; Hanna, 2020).

Investing in a single company starts with its initial capital, also referred to as risk-free debt or unlevelled financing, from which the company will generate income and give it to its shareholders. Although the current operating income can be estimated based on present conditions, future income levels remain uncertain due to fluctuations in economic activity. When managers discover that issuing debt can

result in higher profits after a while, they will want to raise the value of the companies. Businesses will be able to cover interest costs if total operating income surpasses initial operating income; any remaining funds may be given to shareholders as additional dividends. Investors understand that purchasing shares in both leveraged and unleveraged firms yields equivalent returns, assuming they can borrow at the same interest rate and invest in risk-free debt instruments. This principle is rooted in foundational theories by Modigliani and Miller (1958), further supported by analyses such as Brealey et al. (2011), and reinforced by recent studies including Kimbonguila (2020).

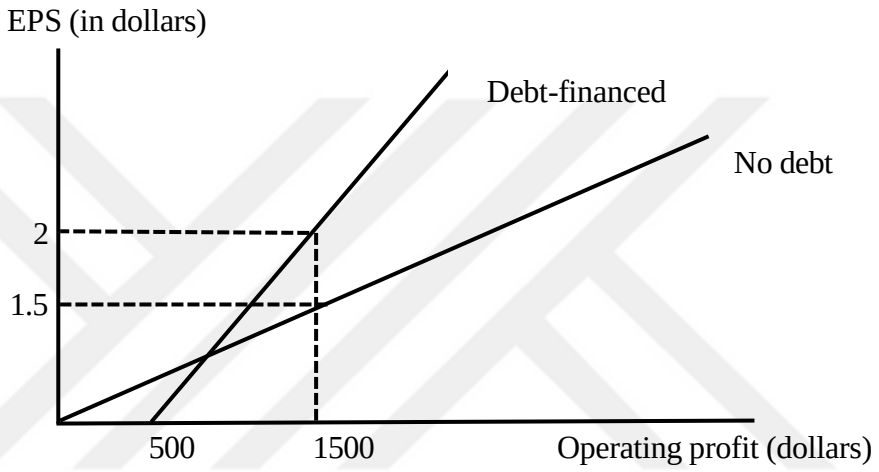


Figure 2.4: Depiction of the Initial Principle Proposed by Modigliani and Miller
Source: Brealey, Myers, and Allen (2011)

Note. The forecasted earnings per share, based on a capital structure comprising both debt and equity, amount to $2.

The anticipated earnings per share, assuming a fully equity-financed capital structure, are estimated at $1.50.

MM's Suggestion To further clarify, I will say that while operating income will not rise, earnings per share (EPS) will. This is because both debt and equity contribute to the growing rate of EPS. Given that a company must pay the interest rate, this earning is known as the discounted rate.

2.3.1.2. MM’s Proposition II

Financial decision-making is unaffected by the expected return on the firm's assets, operating income, or the total market value of the firm's securities, according to

MM's Proposition I. However, according to MM's Proposition II, changes in the debt-to-equity ratio of the company impact the expected rate of return is measured based on prevailing market values. This implies that the amount in the debt-equity ratio (a firm with finance levered) increases when the equity holders anticipate an increase in the rate of return on shares. A company's required rate of return changes when it finances itself by combining debt and equity because of the increased risk involved in taking on more debt. As a result, shareholders will receive an additional profit (risk premium) in exchange for taking on risk. The following formula pertains to the finance-levered firm's cost of equity capital:

$$R_e = R_a + (R_a - R_d)*\underline{D/E} \qquad (2.4)$$

Where,

Re Look forward to a return on equity

Ra Forecast an asset return

Rd Expect a yield on debt

D/E Debt-to-Equity Proportion in Capital Structure

In summary, MM's Proposition states that the same terms apply to both individual and corporate borrowing (unlimited liability). In other words, businesses and private investors will receive the same interest and amount of risk, meaning they are equivalent. In a perfect market, investors are free from taxes and the company is not deemed to be involved during the bankruptcy process. Conversely, the second interpretation of Modigliani and Miller's Proposition II suggests that taxation is accounted for and addressed after the distribution of returns to both debt holders and equity shareholders. Moreover, a company is thought to be at greater risk if it has more debt or higher gearing. As a result, the shareholder will demand higher dividends in exchange for taking on more risk.

In practical terms, Modigliani and Miller’s Proposition II acknowledges the inclusion of taxes, which are accounted for after fulfilling obligations to both creditors and shareholders appear to be at odds with reality. Firms cannot rely exclusively on debt financing without considering the associated implications including equity for a variety of reasons, including legal and taxation (absent

taxes), and no transaction cost changes in a company's capital structure do not affect its total cost of capital or market valuation.

Businesses won't borrow as much as suggested by Modigliani and Miller, but they might be able to. Furthermore, they said that in a perfect market, businesses would not have to worry about going bankrupt to finance their investments. Though in reality, it is not possible due to the inherent risk in all investments, particularly systematic risk, which stems from external factors such as political, market-based, environmental, and macro factors and cannot be mitigated by diversification. The ability to pay off the debt may be impacted by the systematic risk, which could also have an impact on operating income. Furthermore, according to Brealey et al. (2011), MM did not raise the issue of agency cost.

2.3.2. Trade-off Theory

Presenting MM's Proposition: A Flawless Capital Market Introduction In terms of taxes and the law, it appears that I am at odds with reality. In a perfect capital market, both firms and investors are assumed to have the ability to borrow funds for investment purposes at an identical interest rate and risk level, without exposure to financial risk because there would be no bankruptcy costs or tax incentives. This assumption is unreal, though, as businesses and investors won't always be profitable from their investments because of fluctuations in the economy.

Modigliani and Miller's Proposition II posits that firms and investors can enhance their value through the use of debt or a combination of debt and equity; however, they must also consider the associated financial and operational risks, which may lead to potential losses or bankruptcy. Businesses and investors can maximize returns in an imperfect capital market by taking on the risk they choose. By taking on debt and equity, businesses and investors can now take advantage of an imperfect capital market to achieve an ideal, value-maximizing outcome. The trade-off theory of capital structure emerges as an alternative perspective, accounting for imperfect capital markets and balancing the advantages and disadvantages associated with debt.

Although one of Modigliani and Miller's foundational assumptions excludes the presence of taxes, the trade-off theory emerged as an extension of their framework,

placing greater emphasis on the effects of taxation and the potential costs associated with financial distress or bankruptcy. A lot of theories that propose how businesses should select their capital structure start with the trade-off theory. The optimal capital structure that maximizes a firm's value is based on the static trade-off theory, which states that firms can reach the optimal debt ratio point by weighing the costs and benefits of taking on more debt until the growth in the present value of the debt-related costs is exactly offset by the marginal value of the benefits (Myers, 2001). According to the trade-off theory, companies can achieve the ideal capital structure that raises their value by weighing the tax benefits against the cost of financial distress (Brealey et al. 2012).

Myers (1997) argues that the advantage of debt is that interest payments are deductible from taxes. Thus, using debt is encouraged by the fact that interest payments are tax deductible. However, personal taxes and non-debt tax shields may complicate the beneficial effect (De Angelo & Masulis, 1980). The managers of the company must decide whether to pay the interest rate to debt holders before paying taxes and other costs if the company takes on more debt. In situations where business operations yield minimal profits or losses, available free cash flow is allocated to debt holders as interest payments before covering other expenditures, a process of which shareholders are made aware. By restricting the discretionary use of free cash flow, the introduction of additional debt serves to limit managerial opportunism, thereby mitigating agency conflicts between managers and shareholders. This is considered as an additional advantage of debt to lessen the agency issue in businesses (Jensen & Meckling, 1976).

Businesses that take on debt have both benefits and drawbacks; one advantage is that it can reduce taxes. But companies that take on more debt will also have to deal with financial difficulties. This is due to the fact that principal payments and interest are required. Businesses will not always be successful because of the fluctuations in the economy caused by an imperfect market. Due to intense market competition, there is a significant chance that businesses will file for bankruptcy if they are unable to pay the principal amount of debt plus interest. The cost of financial distress, which can lead to bankruptcy, rises along with debt.

According to the trade-off theory, there is an ideal capital structure that maximizes the firm's value. By weighing the advantages of taxation against the expense of

taking on more debt, businesses can achieve the ideal capital structure. By switching from Unlevered to levered firms, businesses can optimize their value. While taking on debt may yield large returns, it also exposes businesses to significant risk. According to Modigliani and Miller (1963), the costs associated with taking on more debt are those of financial distress, which rise when businesses use excessive debt and are unable to make interest and principal payments.

Theoretical literature (Mandelker & Rhee, 1984; Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan, & Ceschini, 2007; Eldomiaty, 2009; Alaghi, 2013; Chen, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020) indicates a positive relationship between financial leverage and systematic risk, making trade-off and bankruptcy theories pertinent. Furthermore, going overboard with debt beyond what is considered optimal would result in financial hardship or bankruptcy, which raises the firm's overall risk.

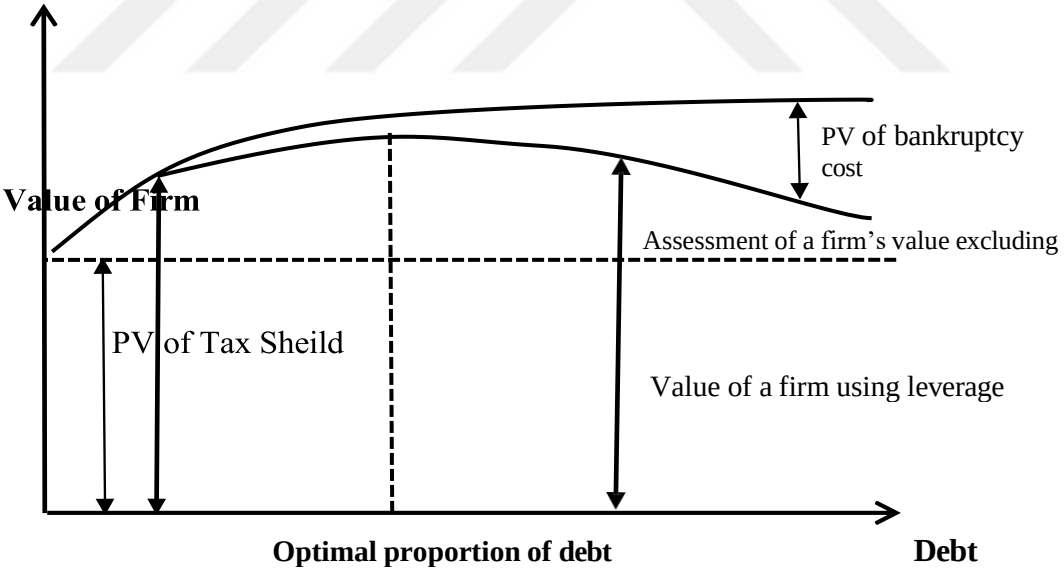


Figure 2.5: Relationship Between Debt and Firm Value in the Static Trade-Off Framework

Source: Ross et al., 2010

The diagram shows how leveraging impacts a company's valuation based on the trade-off theory. The value of unlevered firms does not fluctuate as the value of

levered firms does. To the extent of the ideal debt ratio, businesses issue debt to maximize their value. The firms benefit from tax savings at this point, but the cost of bankruptcy appears to lower the firms' value beyond the optimal debt ratio point. Businesses that take on more debt without taking the economy into account run the risk of losing money and having to file for bankruptcy if they are unable to pay back the principal amount plus interest. This illustration demonstrates that, under the trade-off theory, firms can enhance their value by increasing debt levels up to an optimal threshold, thereby supporting the concept of an optimal capital structure. Businesses will be able to handle principal and interest payments at this point.

2.3.3. Systematic Risk and Capital Structure

An investment's primary source of revenue for a business is its assets. Assumedly, a business issues debt-free shares to finance investments. If the business succeeds and makes more money, this money will cover taxes and be given to shareholders interest-free. This type of business is referred to as an Unlevered company (equity financing). However, a company will become a levered company (debt financing) if it uses debt to finance investments rather than issuing shares to raise capital. In contrast to the first case, this one involves companies having to pay interest rate changes to debt holders before they can pay taxes. Many businesses also use both forms of financing, sometimes referred to as mixed finance between debt and equity, to raise capital.

The term "capital structure" describes how various financial resources are used by businesses to support their operations and expansion. It combines debt and equity financing; loans and bond issues are examples of debt financing, and preferred stock and common stock are examples of equity (Hillier, Ross, Westrfield, & Jordan, 2013). This section examines the fundamental concepts and reasoning underlying each capital structure theory, as well as the behavior and decision-making of corporate finance. Several theories have been developed to determine the most suitable approach for obtaining the ideal capital structure to maximize the value of businesses. When businesses reach the ideal capital structure, debt financing can be profitable. One advantage of financing with debt is the tax deduction that businesses will receive after paying debt holders' interest. However, if businesses take on more debt than is prudent, they may be more vulnerable to

bankruptcy and financial distress as a result of interest payments and unstable earnings. Additionally, the unsound financial standing of businesses may exacerbate the country's economic downturn and raise the degree of systematic risk. This study on the positive association between financial leverage and systematic risk is supported by the theory of capital structure.

2.4. The Agency Problem and Systematic Risk

An agency relationship exists between company managers and shareholders. When shareholders appoint firm managers to represent their interests, a relationship of this kind is created. Nonetheless, a conflict of interest between company managers and shareholders is a possibility. An agency problem is what is called in such a conflict. When management and shareholders disagree on the course of action the company should take, an agency problem occurs. For example, managers might favor a project or business that will benefit them over one that will maximize the value for the shareholders, while shareholders might favor a company that will maximize their value and pay them a large dividend at the end of the year (Gitman & Zutter, 2012).

Agency costs refer to the expenditures shareholders incur to monitor and control the behavior of company managers, aiming to minimize conflicts of interest and ensure that managers' goals align more closely with those of the shareholders. The expenses borne by shareholders as a result of the conflict of interest are also included in agency costs. Both direct and indirect costs are possible. An opportunity lost is an indirect agency cost. Conflicts of interest can arise, for instance, when a new project or investment becomes available. The company's owners may wish to participate in this new venture to boost the value of the company's shares or stock. However, because of business uncertainty or their fear of losing their jobs in the long run, the management is unwilling to move forward with taking on a new project or investment. To put it succinctly, if stockholders and management cannot agree on a new project or investment, they will miss out on an opportunity.

Conversely, direct agency costs can be thought of as cooperative expenses that benefit management rather than stockholders. An additional direct agency cost is the cost of paying the auditor's fee for reviewing the company's financial statement

information and for management activities.

Managers are generally more likely to have some cooperative control over the company's resources. In certain cases, they will pay a premium to acquire a company to increase the size of their own business to maximize the firm's wealth and value. It demonstrates that the investors are not benefiting from this, and as a result, there will be disagreements between the managers and investors of the company. This suggests that the management's primary objective is to further their interests and independence from other stockholders. The company's risk may rise when resources are used under managers' interests. It is expensive if managers make the incorrect choice. Instead of making money, the companies would lose money (Ross et al., 2015).

In the context of this study, agency cost results from managers of the firms using free cash flows at their discretion. Jensen (1986) posits that companies with elevated liquidity may face challenges related to the agency cost of free cash flow, thereby increasing the likelihood of inefficient utilization of cash assets. Managers may be motivated differently to take on projects that don't have a positive net present value, which could jeopardize the goal of maximizing shareholder wealth. They might be driven to invest in expensive, high-risk ventures like new acquisitions to expand their empire and boost their reputation, authority, and status. Due to a lack of management competency within the company, the new acquisitions might not produce better business outcomes than continuing with current business activities (Mann & Sicherman, 1991). This suggests that they are unable to use the money for other lucrative alternatives that could boost the cash flows of the companies and the wealth of their shareholders. Firms' systematic risk may increase in this situation. This study on the positive relationship between liquidity and systematic risk was supported by the agency cost theory.

2.5. The Financial Crisis

This chapter's earlier section covered the importance of systematic risk and capital structure. This section discusses the Asian financial crisis of 1997 and the global financial crisis of 2008, covering the causes, effects, and relationship between systematic risk and financial crises.

2.5.1. Asian Financial Crisis in 1997

2.5.1.1. Singapore

A major hub for tourism in the Asia-Pacific area, Singapore is a rapidly expanding economy in the continent. Nonetheless, it was impacted by its neighbors in 1997 during the Asian financial crisis, which resulted in fewer visitors from the Asia Pacific Area. Due to the direct impact of economic forces on tourism, foreign exchange depreciated against the Singapore dollar, making Singapore an expensive travel destination for its neighbors, particularly Indonesia and Japan (Cave, 1999).

Singapore is a small Asian country, and as a result, its elderly population has grown recently, creating a labor shortage. Thus, to maintain its economic foundation and ensure continued growth—even at a moderate annual rate of 6 to 8 percent—the government should facilitate the inflow of labor and skills that contribute to economic development (Kalirajan & Shantakumar, 1998). The labor resources of capitalism are a major factor in the culture that Singapore has created, and this is one of the reasons for the country's economic growth, which attracts more foreign investors who have faith in both the country's leadership and its people (Haley & Low, 1998).

2.5.1.2. Malaysia

The neighboring country of Malaysia is Thailand, with which there is extensive trade. Thus, it's plausible that the Malaysian ringgit would be impacted by Thailand's July 1997 floating baht. When the ringgit held steady while the Thai baht declined, traders began targeting the Malaysian ringgit as a result of the decline in Thai currency. This caused the rate to rapidly fluctuate from 8% to 40% in a single night, which further increased investor mistrust of the currency and stock markets. The Malaysian ringgit depreciated, and the Kuala Lumpur Stock Exchange (KLSE) lost over 50% as a result of the rating downgrade. This issue states that by halting international trade in local currency, the Malaysian government endeavored to peg the local currency to the US dollar (Corsetti et al., 1999; Radelet & Sachs, 1998; Michie & Jonh Grieve-Smith, 2003).

2.5.1.3. Indonesia

Before July 1997, Thailand's economy was doing better than Indonesia's due to

low inflation, a trade surplus, and substantial foreign exchange reserves. Nearly every investor in this country has relied on US dollars (or has borrowed money in US dollars), and at the same time, their currency has appreciated relative to the US dollar. Due to the increase in the value of local currency, investments in Indonesia were stable. Financial expenses and debt reduction result from this.

Due to a decline in the value of local currency, the situation in Indonesia changed in July 1997. the widening Rupiah exchange rate band following the devaluation of the Thai Baht, which resulted in a depreciation of the Rupiah's value. The country with the worst currency depreciation was Indonesia. Even with the support of the IMF, their issues remain unresolved. When they wanted to pay back the loan, the value of the currency was very low (the rupiah was depreciating while the US dollar was appreciating), so there was a huge and costly demand for the US dollar. As a result, during this crisis, the Jakarta stock exchange also saw a historic low (Radelet & Sachs, 1998; Michie & Jonh Grieve-Smith, 2003).

2.5.1.4. Thailand

Thailand's economy grew at the fastest rate in the world in 1995 because of the country's exceptionally strong economy at the time. The country's foreign exchange reserves and reasonable inflation had both seen record highs. Thailand unexpectedly joined the global development set and gained widespread recognition. The state of the Thai economy took a turn for the worse in 1997. While the rest of the world saw Thailand as posing a serious threat to the financial system in Southeast and East Asia, the currency crisis caused an economic downturn. The result of political and economic unrest was the impact on millions of people. Due to these detrimental effects, countries like the USA and Australia began to worry about exporting goods to East Asia, and Japanese banks began to fear large-scale loan defaults (Warr, 2000).

Moreover, the Thai economy was thought to have been the most impacted by the financial crisis between 1998 and 1999. The Thai economy grew negatively as a direct result of this problem, and the government was running a deficit. In the end, Thailand asked for standby credit from the International Monetary Fund (IMF) to address domestic issues while restructuring the financial sector. However, Thailand's export activity surged during the crisis as the Baht depreciated their

value. This is because Thai goods are both more affordable and of higher quality than those from other nations. During the economic downturn, the country's economy recovered thanks in part to increased export activity (Julian, 2000).

The current account deficit and the fixed exchange rate's tendency to make people overlook risk are the primary causes of Thailand's financial crisis. Most of them believed that they would benefit from investing or borrowing money from abroad and depositing it into their accounts. In comparison to the domestic rate, the foreign interest rate was lower. This led to a significant increase in cash inflow, a rise in external debt, and an expansion of the current account. The financial sector in Thailand was uncontrollably run, which led to mismatched and misallocated problems. The majority of the investments were made in real estate; while instantaneous, limitless loans from outside sources seemed ideal, there were a lot of problems. Due to competition that drove down prices (supply over demand), the companies were unable to sell their real estate, leaving them with unsold assets and insufficient cash flow to pay off their debt. In the end, the businesses failed. Thus, the collapse of the private sector was the root cause of this nation's financial crisis. Furthermore, the degree of administrative proficiency and political unpredictability also contributed significantly to the financial collapse (Lauridsen, 1998).

2.5.2. Global Financial Crisis in 2008

The Global Financial Stability Report (GFSR, 2007) details how market volatility raises credit and market risk, which directly impacts several industries and sectors, including securities firms, commercial and investment banks, entities such as insurance firms, hedge funds, equity and futures markets, and credit rating organizations, among others. The volatility that results in low purchasing power is a measure of the high risk. During the global financial crisis, governments made large financial commitments that were out of proportion to a sharp decline in economic activity. This contributed to the collapse of land property values, which in turn caused businesses to fail and consumer wealth to decline (Connolly & Wall, 2014).

Jones (2009) claims that the US experienced the initial onset of the global financial crisis following the Federal Reserve's (Fed) decision to lower interest rates to boost

investment and the country's economy. From 2002 to 2004, the Federal Reserve (Fed) pushed a low-interest rate regime, which resulted in a decline in lending rates and a decrease in interest rates overall, making borrowing more appealing or affordable.

The first investment that looked wise at the time was real estate, which has a high rate of return. But as housing costs continued to rise and more people desired to own a home, banks began to offer mortgage loans, not just to those with steady employment and the ability to repay the interest rate, but also to those who could not afford them. Subprime borrowers are individuals with a subpar credit history who received loans from the banks. They think that because people don't want to lose their homes to banks, they will continue to pay the interest that is charged. Many people were persuaded to take out mortgage loans by the banks' lax conditions and lower interest rates. This raised concerns about inflation, prompting the Federal Reserve to decide to raise interest rates from mid-2004 to mid-2006.

The primary cause of default and inability to repay loans was the sharp increase in interest rates; as a result, borrowers were compelled to turn over their properties to the bank. Because no one wanted to take out loans with exorbitant interest rates, the demand for homes also declined at the same time. As a result, the house's price decreased. The default and decline in housing values had a significant effect on many financial institutions, including investment banks. In other words, they were dealing with too much leverage from the mortgage loan, which is unsolvable because they were unable to convert the properties into cash quickly enough. Many of them finally crumbled. Due to the intricate network of loans, insurance agreements, and securities linking these sectors, the collapse of financial institutions and investment banks precipitated widespread disruptions across multiple other industries. The tendency toward excessive risk, fueled by this issue, was a factor in the 2008 financial collapse, raising the unemployment rate, driving up inflation, decreasing import and export, and lowering purchasing power.

Due to economic instability, the US dollar experienced an immediate decline. The financial environment was severely constrained, leading to unprecedented stress on numerous financial institutions, including Citi Group, Hypo Real Estate in Continental Europe, and HBOS and RBS in the UK, along with Dexia, Lehman Brothers, and Merrill Lynch in the United States failed or required government

bailouts during the crisis (Erkens, Hung, & Matos, 2012). However, the primary cause of the financial crisis's impact on businesses is thought to be a macro factor like loose monetary policy (Taylor, 2009). The 2008 financial crisis impacted every nation, but those that traded, borrowed from, or had deposits in US banks were particularly hard hit.

2.5.3. Systematic Risk and Financial Crises

The capital structure related to systematic risk was covered in the previous section. As a result of their debt obligations and income volatility, high-debt businesses run the risk of going bankrupt and experiencing financial distress. Additionally, the weak performance of these businesses may contribute to the slowdown of the overall economy. The connection between systematic risk and the financial crisis will be covered in this section.

The 2008 global financial crisis and the 1997 Asian financial crisis were discussed, and the problems and effects may differ each year, making no two financial crises the same. Furthermore, it has also occurred in other countries, such as Thailand during the 1997 Asian financial crisis and the United States during the 2008 global financial crisis. Despite starting in these two nations, the financial crisis had an impact on other nations as well. Previous research indicated that the Asian financial crisis of 1997 had an impact on the industrial sectors and Asian firms' systematic risk. The 1997 Asian financial crisis altered market dynamics; assets were worth less than their market value, businesses took on more debt, and their profits were low, putting them in financial jeopardy and raising the level of systematic risk according to Maroney et al. (2004) and Choudhry et al. (2010), Abubakr et al. (2020) highlighted the significant impact of the 2007–2009 global financial crisis on systematic risk within the U.S. oil and gas industry, in addition to the effects observed during the 1997 Asian financial crisis. That is to say, the global financial crisis that began in 2007 had a role in the US economic recession, which was characterized by a high unemployment rate, decreased purchasing power, and businesses that lost money rather than made money as a result of a decline in real estate prices. Additionally, because these businesses performed poorly financially, they were unable to obtain external funding to support their operations, which increased the systematic risk of those businesses.

There aren't many studies that link systematic risk and the financial crisis, despite some finding that it does. This could result in a lack of information that would improve knowledge of systematic risk and the financial crisis. As a result, this study broadens its focus to include macro variables like financial crises in addition to firm-specific variables to identify systematic risk affecting non-financial companies over various industries within the 4 ASEAN countries. Getting information on firm-specific factors as well as financial crises (the Asian financial crisis in 1997 and the global financial crisis in 2008) can aid in estimating systematic risk across a range of industries and ASEAN-4 countries. This information can then be used by investors, firm managers, and policymakers to develop new strategies for addressing systematic risk exposure in both normal and crises.

2.6. Concluding Remarks

While there are many different kinds of risk, there are essentially two types: systematic risk and unsystematic risk. Since unsystematic risk can be eliminated through diversification, systematic risk is the only risk that still affects stock return Within the framework of the Capital Asset Pricing Model (CAPM), systematic risk emerges as a primary concern for both investors and corporate managers. In addition to the CAPM, the conventional method and trade-off theory also demonstrated the link between risk and financial leverage. They suggested that taking on excessive debt would increase a company's risk of bankruptcy because the company might not be able to pay the interest rate it is charged, which would impact systemic risk. Therefore, this study on the nature of systematic risk and some of its sources, like financial leverage, was supported by the theories of capital structure and CAPM.

Unlike unsystematic risk, which can be avoided or reduced through effective diversification, systemic risk is a result of external factors such as macroeconomic, political, market-based, and environmental factors. As a result, this risk is crucial in figuring out what firms' expected returns will be. The covariance between a stock's return and the market return divided by the variance of the market is known as β, and it is the basis for the CAPM's measurement of systematic risk. β is another metric used in this study to quantify systematic risk in non-financial companies in ASEAN-4 countries' diverse industries.

According to earlier research, financial crises can also be sources of systematic risk in a variety of sectors and nations. Financial crises have been linked to economic downturns, which have a direct impact on systematic risk behavior. Because of their close trading relationships, it can be argued that financial crises have an impact on both the local and global economies. For example, the Asian financial crisis (1997), which originated with the devaluation of the Thai baht in Thailand, eventually extended to neighboring countries like Malaysia, Singapore, and Indonesia. Similarly, the global financial crisis (2008) was brought on by the Federal Reserve's change in interest rates, which occurred in the United States. Any market in the world is affected by this crisis, but new emerging markets like the ASEAN-4 countries are particularly hard hit.

The literature review, which examined empirical research on the factors influencing systematic risk in various sectors and nations, will be in the following chapter. In the following chapter, the development of the hypotheses will also be covered.

CHAPTER III

LITERATURE REVIEW

3.1. Introduction

The research examines the firm-specific factors that impact systematic risk in different industries within the ASEAN-4 countries between 1997 and 2016. The empirical research on the factors that influence systematic risk in various sectors and nations will be reviewed in this chapter. This study has identified research gaps or things that have not been done on the determinants of systematic risk, by reviewing previous studies. This study must be aware of any gaps in the literature from earlier research to close those gaps and add to our understanding of the factors unique to individual firms that influence systematic risk. This review focuses on how systematic risk is affected by macro-factors (the Asian and global financial crises of 1997 and 2008) as well as firm-specific factors (including trading on equity, profitability, liquidity, operational efficiency, company size, and growth).

3.2. Empirical Studies

Systematic risk is quantified by a stock's beta, as defined within the Capital Asset Pricing Model (CAPM), systematic risk is the sole factor affecting return on equity, as unsystematic risk can be effectively minimized through portfolio diversification (Mandelker & Rhee, 1984; Gu & Kim, 2002; Lee & Jang, 2007; Zutter, 2012; Ibrahim & Haron, 2016; Gitman & Nizam et al., 2020). Previous research, including Vo and Pham (2017), also used the CAPM to estimate the systematic risk of equity in the ASEAN energy sector. They discovered that, whereas Thailand, the Philippines, and Vietnam had lower betas than the market betas, Singapore and Malaysia's energy industries had higher betas.

Singapore is regarded as a developed country in Southeast Asia, although certain of its industries, like transport, still carry a high level of systematic risk. The transport sector's return has decreased due to a high level of systematic risk. This could be attributed to fluctuations in the price of oil, which are influenced by

interest rates and exchange rates (Lu & Chen, 2010). According to Purwanto and Safira (2020), systematic risk harmed Indonesian financial firms' stock prices; that is, a rise in systematic risk could result in a fall in stock prices. Thus, to have a safe investment, prudent and risk-averse investors should steer clear of a stock with a high systematic risk.

According to Muijsson and Satchell (2019), decisions made about the capital structure of Australian financial firms have the potential to raise systematic risk. Excessive leverage appears to be the primary factor contributing to high systematic risk, which can lower stock prices. According to Nizam et al. (2020), leverage is the primary factor influencing systematic risk in Malaysian listed firms that adhere to Shariah. Operating efficiency has a negligible relationship to systematic risk, whereas other financial variables like liquidity, profitability, firm size, and firm growth were found to be significantly affecting the risk in addition to leverage. Tan et al. (2015) contended, however, that while earlier research had discovered a strong correlation between systematic risk and financial leverage, this relationship was not always true for non-monetary entities listed companies on the Philippine regulated exchange.

Mandelker and Rhee (1984) investigated how the manufacturing industry's systematic risk was affected by the two levels of leverage. An intriguing observation drawn from their research is the strong correlation that exists between systematic risk and the degrees of leverage (financial and operating). Consequently, the study identified operating and financial leverage as major contributors to changes in systematic risk. The relationship between the degree of leverage and systematic risk was also studied by Huffman (1989). His findings supported a positive relationship between the degree of financial leverage and systematic risk, but not between the degree of operating leverage and systematic risk.

Similarly, Ahmad et al. (2011) investigated how systematic risk in Pakistan's cement industry was impacted by the corporate tax rate. They discovered a relationship between systematic risk and the corporate tax rate through leverage, indicating a relationship between systematic risk and the corporate tax rate. Higher systematic risk and lower tax payments are caused by rising leverage.

Alouj, Nia, and Amiri (2012) investigated the connection between systematic risk in the Tehran Stock Exchange and the cost of capital determinant. They discovered that systematic risk was significantly impacted by the weighted average cost of capital, indicating that an increase in a firm's cost of capital is likely to lead to a higher level of systematic risk (beta). Additionally, they discovered a positive relationship between its determinant (cost of equity, cost of debt, and equity of financing) and the weighted average cost of capital. This indicates that the cost of capital will rise in response to increases in three of its determinants.

From 1992 to 1995, Borde (1998) looked at how 52 publicly traded restaurants' systematic risk was affected by firm-specific financial characteristics. At the one percent significant level, the findings indicated a positive relationship between growth and liquidity and systematic risk. Meanwhile, systematic risk has a factor influencing the restaurant's systematic risk were examined by Gu and Kim (2002). From 1996 to 1999, 74 publicly traded restaurant companies in the United States were included in the sample. They discovered that while operating efficiency and systematic risk are negatively correlated, liquidity and systematic risk are positively correlated. On the other hand, other firm-specific variables like profitability, dividend payout, leverage, and firm size are unrelated to systematic risk.

Tandelilin (1997) assessed systematic risk in Indonesian companies using macro and financial accounting variables. Using sixty non-financial listed companies from the Jakarta Stock Exchange between 1990 and 1994, they found that while liquidity decreased systematic risk, accounting factors like leverage, size, and profitability strongly and positively correlated with it. They did discover, however, that there is no statistically significant correlation between systematic risk and macro variables like GDP, inflation rate, and interest rate.

In the US airline industry, Lee and Jang (2007) examine the firm-specific factors influencing systematic risk. They demonstrated that firm-specific factors including profitability, operating efficiency, safety, firm size, and growth also significantly and positively influenced systematic risk in addition to financial leverage (Firm size is positively related to systematic risk while other variables are inversely correlated with systematic risk). It has been discovered, nevertheless, that liquidity has little bearing on how much systematic risk US airline companies face.

The effects of accounting variables, or company-level factors influencing systematic risk in the Australian listed firms were examined by Brimble and Hodgson (2007). The study examined several factors categorized under operating risk—such as accounting beta, fluctuations in earnings, the direction of earnings, cash flow, dividend distribution, operating leverage, and liquidity. It also considered financial risk variables like financial leverage and interest coverage ratios, as well as growth risk indicators including growth rate, firm size, and the market-to-book value ratio. The results showed that systematic risk was significantly impacted by accounting variables. Systematic risk is positively correlated with including size, earnings volatility, cost structure sensitivity, profitability signals, debt-servicing capacity, and growth potential, but negatively correlated with cash flow and liquidity. These results support the findings of Bowman (1979), who also discovered a significant relationship between certain financial (accounting) firm-level attributes and their relationship to systematic risk. This relationship is particularly useful for projecting future risk.

In their 2012 study, Iqbal and Shah looked at the correlation between systematic risk in Pakistani firms and financial variables such as liquidity, leverage, profitability, operating efficiency, firm size, and growth. through monitoring 93 non-financial companies listed on the Karachi Stock Exchange between 2005 and 2009. They discovered that while leverage and growth are negligible, liquidity and operating efficiency are strongly and negatively correlated with systematic risk. Furthermore, there is a strong and positive correlation between systematic risk and profitability as well as firm size.

In a study conducted by Alaghi (2013), the relationship between systematic risk and financial factors—such as liquidity, leverage, profitability, firm size, and operational performance—was explored within Iranian companies. Results from 457 non-financial listed companies on the Tehran Stock Exchange between 2001 and 2011 indicated that operating efficiency and liquidity had a negative correlation with systematic risk, while leverage and profitability had a significant and positive influence. It is discovered that firm size is unimportant aside from these factors. Overall, the results showed that a significant part of the systematic risk is determined by the chosen financial variables.

Biase and D'Apolito (2012) used profitability, liquidity, bank size, and financial

leverage to analyze the systematic risk of the Italian banking system. The results of 388 financial companies that were listed on the Milan Stock Exchange between 1992 and 2011 showed that systematic risk was positively correlated with bank size, but profitability and liquidity had a negative correlation with systematic risk. This implies that a bank's systematic risk will decrease as profitability and liquidity rise, providing greater opportunities for diversification and implicit public protection against failure. Furthermore, compared to small banks, large banks typically had higher exposure to systematic risk. They also discovered that systematic risk was unaffected by financial leverage.

Ibrahim and Haron (2016) identified a significant positive association between financial leverage and systematic risk, based on an analysis of firm-specific determinants of systematic risk across 824 non-financial listed companies in Malaysia from 2000 to 2013. Nevertheless, it is not discovered that other firm-specific factors like liquidity, size, growth, profitability, and operating efficiency are substantially correlated with systematic risk.

The study conducted by Nawaz et al. (2017) examined the correlation between 29 cement industries in Pakistan between 2008 and 2013 in terms of systematic risk and financial variables. According to their findings, there is no discernible relationship between systematic risk and financial leverage or liquidity. In other words, systematic risk remains unaffected by changes in financial leverage. Additional financial indicators, including profitability, operating efficiency, and industry size, are acknowledged as important contributors to systematic risk, even though these two variables are found to be insignificant (profitability and operating efficiency are positive, while industry size is negatively related to systematic risk).

Nguyen (2019) researched Vietnam's systematic risk determinants. They found that, while firm size is positively correlated with systematic risk, financial leverage, profitability, operating efficiency, inflation rate, and economic growth rate significantly and negatively correlate with it. They used data from 532 non-financial listed firms from 2008 to 2017. Liquidity and firm growth were not significantly correlated with systematic risk aside from these variables.

Aruna and Warokka (2013) used accounting variables to examine the systematic risk of 15 companies in the manufacturing sector of Indonesia between 2005 and

2007. They discovered that, in the Indonesian manufacturing sector, there is no discernible correlation between accounting variables and systematic risk, indicating that accounting variables do not play a major role in influencing systematic risk. This result is associated with investor behavior, whereby investors used technical analysis to estimate systematic risk rather than accounting variables.

Maroney et al. (2004) examined the shifting risk, return, and financial leverage for six Asian equity markets during the 1997 Asian financial crisis, in addition to financial and accounting variables (Indonesia, Korea, the Philippines, Malaysia, Taiwan, and Thailand). They discovered that during the Asian financial crisis of 1997, the systematic risk of every national equity market increased by looking at the weekly data.

In a similar vein, Choudhry et al. (2010) examined how the Asian financial crisis of 1997 affected the systematic risk in Taiwan, South Korea, Singapore, Indonesia, and the chemical, finance, and retail industries. They showed that the 1997 Asian financial crisis had an impact on the beta of these countries' four industrial sectors, and investors anticipated a high rate of return in exchange for taking on more risk. This suggested that the high volatility of stock returns during the crisis was the cause of the increase in beta.

According to Abubakr et al. (2020), who examined the effect of uncertainties in energy commodities on the systematic risk faced by industries in the United States from 2007 to 2016, the global financial crisis of 2008 had a major impact on the systematic risk of the oil and gas industry.

Both the financial and non-financial sectors were greatly impacted by the financial crisis. In the worst-case scenario, the effects resulted in a recession and a liquidity crisis. For instance, during the global financial crisis, the value of many US stocks fell sharply as a result of the stock's unappealingness to investors and the willingness of stockholders to sell their holdings (Loviscek & Riley, 2013). Due to borrowers' inability to repay their debt, financial crises have also increased the risk of default, which has a compounding effect (Huang & Xin, 2015). The market's behavior is hindered by the financial crisis because it raises the systematic risk, which is undiversified. The market price of stocks is impacted by systematic

risk (Sharp, 1964; Choudhry et al., 2010; Abubakr et al., 2020).

This study has identified a research gap in the determinants of systematic risk based on the review of previous literature. The results of earlier research were inconsistent, making it impossible to identify the key variables that specifically influence systematic risk. Since they looked at the firm-specific factors affecting systematic risk separately (observing only a specific industry in a country), their conclusions have tended to diverge. In addition to this gap, the study discovered that there aren't many studies on how the financial crisis affects systematic risk, and those that have been done haven't looked into how various financial crises affect different industries within a single nation. This could result in a lack of knowledge about systematic risk and the financial crisis.

This study closes gaps in the literature by investigating the impact of firm-specific variables on systematic risk in 20 years, from 1997 to 2016, across a range of industries in Malaysia, Singapore, Indonesia, and Thailand. Additionally, this research looks into how systemic risk has been affected by the global financial crises of 2008 and 1997 in several ASEAN-4 industries.

The study's conclusions may show how the study investigates the influence of firm-specific traits on systematic risk among non-financial companies across four ASEAN countries, analyzed separately within each nation member states, and across diverse industries operating within these nations. In addition to providing evidence of firm-specific factors and systematic risk, additionally, it may reveal how the financial crises of 1997 and 2008 impacted industry performance and non-financial enterprises in the ASEAN-4 region.

This study specifically focuses on how macro- and firm-specific factors affect systematic risk. Financial leverage, operational effectiveness, profitability, liquidity, firm growth, and firm size are the chosen firm-specific variables. The economic shocks of the 1997 Asian crisis and the 2008 global financial collapse are the two macro variables. The purpose of this section is to develop the study's hypotheses by consulting pertinent theoretical and empirical literature. As the following section illustrates, the study has eight developed hypotheses.

3.3. Formulation of Hypotheses

3.3.1. Financial Leverage

Leverage refers to the extent of funds borrowed by firms from financial institutions to finance their assets. This implies that a rise in debt corresponds to a rise in leverage (Alaghi, 2013). If the combined effects of book value, dividends, and earnings on the stock price are positive (negative), the company's sales are growing this year and it made more money the year before. Systematic risk is impacted positively or negatively by the total leverage, which is the sum of the operating and financial leverage (Chiou & Su, 2007). Debt ratios are the leverage ratios obtained by dividing the total asset's book value by the debt's book value (Zhang & Shi, 2017).

Debt will always result in higher interest costs, claim Ahmad et al. (2011). This may influence the change in income for equity holders and impact the fixed expense incurred beyond the predetermined period. Both equity holders and creditors will have issues as a result of this. To address these challenges, firms initiated new investment projects characterized by higher risk, with the expectation of generating greater returns to be distributed among equity shareholders. This behavior underscores the positive relationship between increased debt levels and systematic risk. In this context, leverage is measured by the ratio of total debt to the market value of equity.

Leverage is thought to be the primary factor influencing systematic risk during a recession; systematic risk escalates when investors assume debt obligations beyond their capacity for timely repayment (Rowe & Kim, 2010). Firms employ leverage as a means to enhance returns on their assets; however, the use of leverage does not inherently ensure successful outcomes.

When a business decides to use debt financing to fund its assets, this is referred to as financial leverage. This happens when the business is unable to raise enough money to meet its needs. It is challenging for a business to raise additional funds to cover operating expenses by issuing shares on the open market. When a business believes that its higher return will be sufficient to pay off the debt, it will take on debt because it is less expensive to issue debt than equity (Alaghi, 2012).

Financial leverage and systematic risk are significantly and favorably correlated,

as demonstrated by Huffman (1989). In a similar vein, certain research found a relationship between systematic risk and leverage, i.e., a relationship between systematic risk and corporate tax rate. Accordingly, increasing leverage results in lower tax payments and higher systemic risk (Ahmad et al., 2011). Furthermore, several studies have discovered a significant and positive correlation between systematic risk and financial leverage (Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan, & Ceschini, 2007; Eldomiaty, 2009; Alaghi, 2013; Chen, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020). Several studies (Borde et al., 1994; Iqbal & Shah, 2012; Lee & Hooy, 2012; Riaz, 2019; Nguyen, 2019) indicate that financial leverage has an inverse relationship with systematic risk, which contradicts previous findings. The first hypothesis of this investigation is based on the majority findings of earlier research here:

H1 There is a positive relationship between financial leverage and systematic risk.

3.3.2. Liquidity

Liquidity refers to a firm’s capacity to meet its short-term liabilities as they come due (Reschiwati et al., 2020). Aruna and Warokka (2013) conceptualized liquidity measurement through two formulas, the first of which is the current ratio, defined as the quotient of current assets divided by current liabilities. The second formula, known as a quick ratio, is the sum of cash, marketable securities, and account receivables divided by current liabilities. They said that a business is seen as having strong financial ability if it has a high quick ratio. In a similar vein, Hillier et al. (2013) defined liquidity as a company's capacity to settle debt; one way to gauge this capacity is through the use of the current ratio. This ratio reflects a firm’s capacity to meet its short-term debt obligations, with a higher value indicating greater liquidity. The first formula was previously used as a proxy for liquidity in numerous studies (Logue & Merville, 1972; Gu & Kim, 1998; Kim, Gu & Mattila, 2002; Kim, Ryan & Ceschini, 2007).

It can be said that investors can check the health of the financial condition of an individual firm by looking at liquidity as an indicator. According to Gu and Kim's (2002) research, a firm's liquidity is the most crucial factor to consider when it faces a high level of systematic risk. Liquidity and systematic risk are positively correlated. Likewise, Borde's (1998) study demonstrated that liquidity and systematic risk were positively correlated. He emphasized that having a lot of

liquidity could increase a company's agency costs and that having free cash flow could encourage managers to take on multiple projects based on their interests without consulting shareholders. This could result in a conflict of interest between shareholders and managers, raising the level of systematic risk and creating an agency cost problem. Additionally, Jensen (1986) and Frutig and Das (2020) discovered a positive correlation between liquidity and systematic risk.

However, other Previous investigations by Tandelilin (1997), Biase and Apolito (2012), Iqbal and Shah (2012), Alaghi (2013), Khasawneh and Dasouqi (2017), Parthasarathy (2019), Nizam et al. (2020), and Fahad et al. (2020) have addressed this subject identified an inverse relationship between liquidity and systematic risk. Nguyen (2019) demonstrated that, in contrast to these investigations, there is little correlation between systematic risk and liquidity in Vietnamese listed companies.

The second hypothesis, which is based on earlier research that showed a positive correlation between liquidity and agency theory, is as follows:

H2 There is a direct relationship between liquidity and systematic risk.

3.3.3. Profitability

The term profitability describes how effectively a business turns its assets into revenue that is greater than its running costs. The return on assets or net income divided by total assets, and the return on investment, or income before extraordinary items over total invested capital, are the two formulas used in the finance literature to measure profitability (Aruna & Warokka, 2013; Borde, 1998; Kim et al., 2007; Lee & Jang, 2007).

Chun and Ramasamy (1989) assert that a key factor in assessing the common stock's systematic risk is the profitability ratio. According to Eldomiaty et al. (2007), the manager of the company should take profitability into account when making decisions about debt financing. This is because one of the variables that may affect the firm's systematic risk is profitability. Lower profits would make it harder for businesses to pay their debts and other expenses, which would increase systematic risk.

According to Logue and Merville (1972), more profitable companies are thought to have less systematic risk. Businesses with strong and steady financial

performance are better equipped to control operating expenses and pay interest on time. decreased the cost of bankruptcy or financial distress, which is the primary source of systematic risk. On the other hand, Tandelilin (1997) identified a positive relationship between profitability and systematic risk, suggesting that firms with greater profitability tend to exhibit higher levels of systematic risk. This is based on the premise that the additional returns earned by such firms serve as compensation for assuming greater risk. This demonstrates that high-profit stocks typically involve higher levels of systematic risk.

Profitability and systematic risk are negatively correlated in numerous studies, indicating that higher profitability reduces systematic risk (Logue & Merville, 1972; Scherrer & Mathison, 1996; Borde, 1998; Gu & Kim, 2002; Lee & Jang, 2007; Rowe & Kim, 2010; Nizam et al., 2020). Profitability and systematic risk, however, have been found to positively correlate in certain research (Melicher, 1974; Tandelilin 1997; Iqbal & Ali Shah, 2012; Alaghi, 2013; Dang et al., 2020). A different perspective was presented by Riaz et al. (2019) in a prior study, which found no correlation between systematic risk and profitability in the Japanese shipping sector. The third study hypothesis, which is based on the justifications of earlier research, is:

H3 Profitability shows a negative correlation with systematic risk.

3.3.4. Firm Size

Many studies have examined the link between firm size and systematic risk (Logue and Merville, 1972; Lerner, 1973; Daves et al., 2000; Gu and Kim, 2002; Kim et al., 2007; Iqbal and Shah, 2012; Alaghi, 2013; Chen, 2013; Angel et al., 2017; Nawaz et al., 2017; Nguyen, 2019; Ma et al. 2020; Nizam et al., 2020; Fahad et al., 2020). Nguyen (2019) discovered a positive correlation between systematic risk and firm size. Compared to small businesses, large businesses are more likely to face higher risk. Because their economic activity is more diverse than that of small businesses, larger companies need larger amounts of capital to finance their operations. Large companies make more money than small companies, but they also incur greater costs and have more debt. They are thus more impacted by unfavorable economic conditions than are small businesses. Systematic risk increases in this situation as well. Furthermore, intense competition and market

saturation may result from the quick growth of businesses among themselves, which would lower stock prices and raise systematic risk. Iqbal and Shah (2012), Daves et al. (2000), Lee and Jang (2007), Rowe and Kim (2010), Angel et al. (2017), and Ma et al. (2020) all support the finding.

Conversely, various studies have reported a negative relationship between firm size and systematic risk. Larger firms are generally associated with lower levels of systematic risk compared to smaller firms, primarily due to their enhanced capacity to absorb economic fluctuations, thereby reducing their exposure to financial distress and the associated costs of bankruptcy. These studies include Logue and Merville (1972), Lerner (1973), Gu and Kim (2002), Chen (2013), Nawaz et al. (2017), Nizam et al. (2020), and Fahad et al. (2020). Few studies, however, have found no correlation between firm size and systematic risk (Kim et al., 2007; Chee-Wooi et al., 2010; Alaghi, 2013). The natural logarithm of total assets is used to calculate the size of the company (Hussain et al., 2018). Although previous research produced inconsistent findings, this study opts to forecast a positive correlation between firm size and systematic risk, which could be because of market saturation and intense competition among big businesses. This study's fourth hypothesis is:

H4 The relationship between firm size and systematic risk is directly proportional.

3.3.5. Firm Growth

Several scholars have evaluated growth by examining annual changes in earnings before interest and taxes (EBIT), as noted by Borde (1998), Gu and Kim (2002), Kim et al. (2007), Lee and Jang (2007), Chee-Wooi et al. (2010), and Nguyen (2019), Aruna and Warokka (2013) instead consider it as the percentage change in a firm’s total assets over time.

According to Borde (1998), a restaurant's rapid expansion increases systematic risk because there aren't enough resources to meet all of the needs of the patrons. Past research has consistently demonstrated a strong association between firm growth and rising levels of systematic risk. This relationship has been supported by numerous studies over time, including those by Logue and Merville (1972), Borde (1998), Roh (2002), Kim et al. (2002), Biase and Apolito (2012), and more

recently, Nizam et al. (2020).

Some studies found no significant relationship between the variables (Kim et al., 2007; Iqbal & Ali Shah, 2012; Ibrahim & Haron, 2016; Nguyen, 2019), while others reported a negative and significant association with systematic risk (Alnajjar & Riahi-Belkaoui, 1999; Lee & Jang, 2007). This study aligns with earlier research suggesting a positive correlation, as rapid business growth may strain resources, reduce output quality, and increase customer dissatisfaction—raising systematic risk. Therefore, the study's fifth hypothesis is:

H5 There is a positive relationship between a company's growth and its level of systematic risk.

3.3.6. Efficiency of Operations

According to Alaghi (2013), a firm's operating efficiency—commonly evaluated through the asset turnover ratio—demonstrates how well it converts its total assets into sales. Research shows a negative correlation between operating efficiency and systematic risk (Iqbal & Shah, 2012), suggesting that efficient firms are better at managing costs and avoiding losses, thereby reducing their exposure to systematic risk. This view is supported by Eldomiaty (2009), Alaghi (2013), and Nguyen (2019).

In the US airline industry, research has shown no significant link between systematic risk and operating efficiency. Similar results have been observed in studies focusing on Malaysian Shariah-compliant listed companies and the Chinese hotel sector, where operating efficiency and systematic risk appeared unrelated or only weakly connected. Building on these insights, this study anticipates an inverse relationship, suggesting that firms with higher operating efficiency tend to manage costs more effectively and generate greater profits, thereby lowering their exposure to systematic risk. Accordingly, the study's sixth proposed hypothesis states:

H6 There is an inverse relationship between operating efficiency and systematic risk.

3.3.7. The Major Financial Collapses of 1997 and 2008

Southeast Asia's economy has expanded significantly over the past decade. Compared to the less developed ones, the growth rate as a percentage seemed higher. The economic boom at the time made the Southeast Asian stock market more alluring to

foreign investors. However, during the Asian financial crisis of 1997, their economies started to contract.

The 1997 Asian financial crisis influenced the systematic risk faced by businesses. During such crises, market behavior tends to change, often leading to asset values falling below their market prices. Companies typically increase their debt levels and experience reduced profitability, which can create financial difficulties and elevate their exposure to systematic risk. Research has also identified a clear positive link between the crisis and heightened systematic risk.

Abubakr and colleagues (2020) found that the 2008 global financial crisis, along with the 1997 Asian economic crisis, significantly impacted systematic risk. However, Hooy and Lee (2010) reported that neither the 2008 global crisis nor the 1997 Asian crisis had a noticeable effect on systematic risk. Based on these contrasting findings, the last two hypotheses are formulated as follows:

H7 Systematic risk levels were heavily affected by the Asian financial crisis in 1997

H8 The global financial crisis of 2008 had a major effect on systematic risk.

3.3.8. Gross Domestic Product (GDP)

It appears that every country's economic situation has had a significant impact on economic expansion. This is caused by the state of the economy, which may reflect both economic activity and the average person's income. Economic performance is often measured using various indicators, one of which is GDP growth (Hussain, Muhammad, & Shah, 2018). Gross Domestic Product represents the annual market value of all final goods and services produced within a nation's borders, utilizing its labor force and resources (Hyman, 1999).

Several studies have explored the impact of macroeconomic factors on downside systematic risk. Hussain, Muhammad, and Shah (2018) observed that higher GDP levels are generally associated with lower downside systematic risk. Similarly, Bouchouicha and Vieider (2019) analyzed macroeconomic indicators and noted an inverse relationship between GDP and individuals' willingness to take risks. Venanzi (2020) also found a strong negative association between GDP and the systematic risk faced by banks. In contrast, Tandelilin (1997) did not find any significant link between GDP and systematic risk.

3.3.9. The Conceptual Framework

The eight hypotheses that form the basis of this study's conceptual framework are taken from the pertinent theoretical and empirical literature. Portfolio theory and the capital asset pricing model (CAPM) each highlight how a company's unique attributes are linked to broader market risk. These theoretical frameworks emphasize the inherent and unavoidable nature of systematic risk, highlighting its persistent influence on firm valuation and its central role in investment decision-making. Consequently, this study seeks to identify the underlying factors or potential influences responsible for fluctuations in systematic risk. The capital structure theory is pertinent to financial leverage, and the agency theory is pertinent to liquidity.

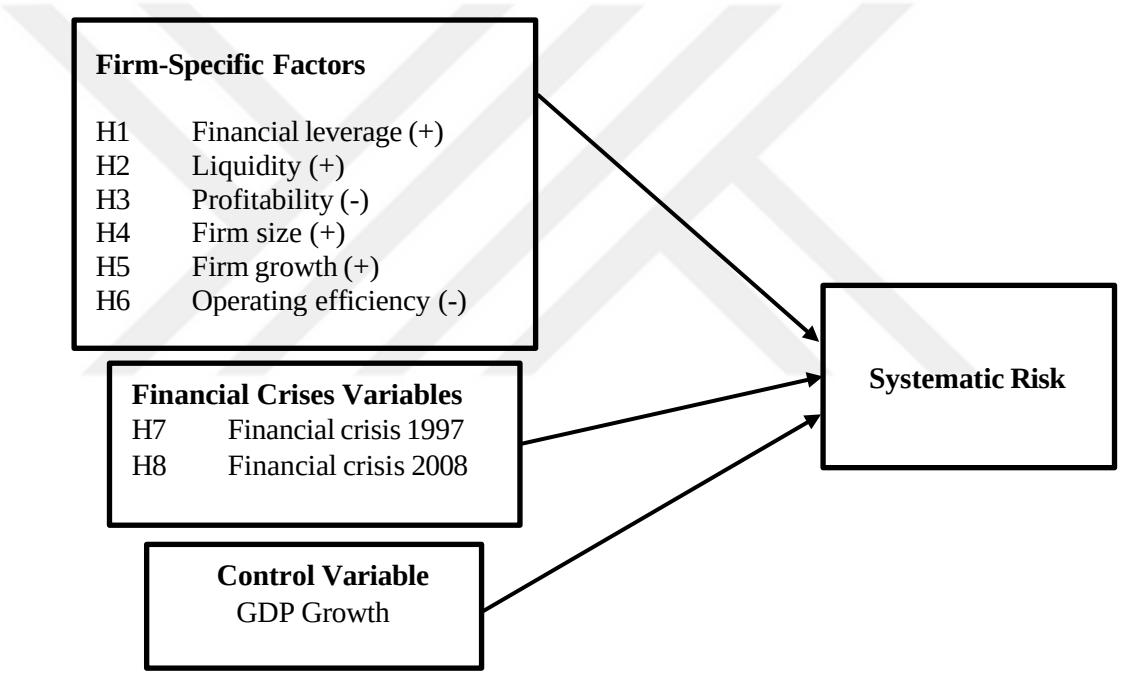


Figure 3.1: The Conceptual Framework of This Study

Source: Developed by the researcher based on Milionis (2011) and related literature.

3.4. Concluding Remarks

This chapter's discussion focuses more on earlier research that looked at the connection between firm-specific variables and systematic risk (beta). In a particular industry and nation, they discovered both positive and negative relationships between the firm-specific variable and beta. However, since they came to a different conclusion, their results cannot be used to confirm which

variable most affects systematic risk. This study aims to fill an existing research gap by examining how firm-level factors influence systematic risk in non-financial companies within four ASEAN nations, covering a 20-year span from 1997 to 2016. To achieve the research goals, several hypotheses based on earlier research have been developed. These include the claims that operating profitability and efficiency are negatively correlated with systematic risk, while financial leverage, liquidity, firm size, and growth are positively correlated with systematic risk. Furthermore, this study also explores how financial crises influence systematic risk. Each crisis is analyzed individually within the hypothesis framework; for instance, both the 2008 global financial crisis and the 1997 Asian financial crisis significantly affected systematic risk.

The next chapter will discuss the research methodology, which comprises the following sections: an introduction; the study's data and sample; the analytical approach (panel data, diagnostic test to choose the best model, and model for systematic risk determinants); the measurement of systematic risk; the measurement of independent variables; and, lastly, the concluding remarks.

CHAPTER IV

RESEARCH METHODOLOGY

4.1. Introduction

This study explores how firm-specific characteristics influence systematic risk in non-financial companies across four ASEAN nations. Utilizing a panel data approach due to the inclusion of both time-series and cross-sectional data, the chapter outlines the dataset, analytical methods, and the panel regression models employed—namely pooled OLS, fixed effects, and random effects. It also describes the model selection process using the Chow test, Breusch-Pagan LM test, and Hausman test. The analysis focuses on identifying the factors that determine systematic risk, incorporating variables such as firm-level attributes and major economic crises, including the 1997 Asian financial crisis and the 2008 global financial downturn. The chapter concludes with a summary of key insights.

4.2. Data and Sample

This research is based on secondary data from Thomson Reuters DataStream is used in this study. ASEAN consists of four countries: Thailand, Malaysia, Indonesia, and Singapore. Financial firms are not included in this study because of variations in their capital structure or because their accounting and regulatory practices differ from those of non-financial firms. Financial firms should therefore not be included in the sample in proper to produce a representative of the entire market.

DataStream offers helpful information on companies worldwide in a variety of industries. The statutory corporate accounts are sourced directly from listed firms and subsequently verified against filings submitted to the respective stock exchanges or corporate registries, in accordance with relevant regulations. This verification process enhances the reliability of the data. Additionally, the accounting information adheres to standardized formats and structures, incorporating commonly accepted data definitions. To assess the independent variables—namely financial leverage, profitability, liquidity, Information on

operational performance, company scale, and expansion indicators was obtained from Thomson Reuters DataStream. The dataset featured variables like overall debt, asset totals, short- and long-term liabilities, current asset levels, earnings before interest and taxes (EBIT), net earnings, and total revenue.

Thomson Reuters' financial data service, Eikon, which divided industries into nine sectors— industrials, consumer staples, consumer discretionary, basic materials, information technology, and energy. utilities, telecommunications services, and healthcare—serves as the basis for the industry classification used in this study. The study focuses on firms from seven distinct sectors: industrials, consumer staples, consumer discretionary, basic materials, information technology, energy, and other industries—are taken into account in this study. This is due to the small number of businesses in the final three industries, which are combined and labelled as "other industries" in this study. The following is a list of the study's chosen industries:

a) Industrial: Manufacturing and business services, industrial products, logistics, and diversified industrial enterprises.

b) Consumer non-cyclical: Consumer goods and services, including food and drink, personal care items, household essentials, and retail sectors focused on groceries and pharmaceuticals.

c) Consumer cyclical: Vehicles and automotive components, consumer goods and services with cyclical demand, and retail businesses.

d) Energy: Conventional fossil fuel energy and sustainable renewable power sources.

e) Basic material: Extracted minerals, processed materials, and chemical substances.

f) Technology: Software solutions, information technology services, and tech hardware.

g) Others: Essential services include power, natural gas, water services, and integrated utility providers; telecommunications covering both fixed-line and mobile networks; and the healthcare sector encompassing medical services, equipment, pharmaceuticals, and

research.

Table 4.1 presents the count of publicly traded non-financial companies across the ASEAN-4 nations.

Table 4.1: The Industry-Wise Distribution of Listed Non-Financial Companies in the ASEAN-4 Region.

Industry	Malaysia Firms	The Singapore Firms	Thailand Firms	Indonesia Firms
Production Industry	147	143	85	60
Consumer staples Industry	129	76	88	78
Consumer discretionary Industry	239	171	183	104
Raw materials sector	47	32	40	58
Tech	117	112	49	29
Infrastructure				
Utilities	24	36	18	10
Unlisted items	45	38	52	25
Total	748	608	515	364

Source: Thomson Reuter DataStream

Throughout 20 years, from 1997 to 2016, 2,235 non-financial listed firms are included in the sample. Due to the high systematic risk and detrimental effects on the economies of the affected countries, this study also looked at how the global financial crisis of 2008 and the Asian financial crisis of 1997 affected firm systematic risk. Even though a financial crisis is typically limited to one country or region, it has the potential to swiftly expand to nearby nations or areas. For

instance, the global financial crisis of 2008 began in the American market and swiftly extended to all local markets worldwide.

This study uses unbalanced panel data because data has been unavailable for some years. In certain years, data for some companies is missing because they were not publicly listed on the stock exchange during those periods. Such gaps in datasets are common, reflecting the inherent limitations of relying on secondary data sources. Thus, this will result in an imbalance in the data. Using the full unbalanced dataset tends to be more effective than balancing the data by removing unnecessary information (Baltagi & Chang, 1994; Zhang & Shi, 2017; Haron et al., 2020). For this study, only firms listed since at least 2014 with a minimum of three consecutive yearly observations were included, with the final firm-year data point from 2016. According to Table 4.3, there are 17 firms from Malaysia, 25 from Singapore, 29 from Thailand, and 27 from Indonesia that meet this criterion. While panel data analysis generally requires firms to have observations ranging between two to twenty years, this research set the minimum at three years, consistent with previous studies like Manoel et al. (2018) and Haron et al. (2020).

4.3. Analytical Method

In order to examine the impact of firm-specific variables on the systematic risk of non-financial firms in ASEAN-4, this study used Stata 12 statistical software. The panel data analysis uses three models: the Random Effect Model (REM), the Fixed Effect Model (FEM), and the Pooled Ordinary Least Square (POLS). Tests including Chow, Hausman, and the Breusch-Pagan Lagrange Multiplier (BP-LM) are the diagnostic tests that are used to choose the statistical model.

Table 4.2: Framework for Analyzing Panel Datasets

Number of Annual Observation in each firm	Malaysian		Singaporean		Thai		Indonesian	
	No. of RE	No. of OB	No. of RE	No. of OB	No. of RE	No. of OB	No. of RE	No. of OB
3	17	51	25	75	29	87	27	81

4	9	36	17	68	28	112	24	96
5	17	85	14	70	29	145	20	100
6	27	162	17	102	41	246	21	126
7	25	175	26	182	16	112	16	112
8	11	88	20	160	14	112	11	88
9	21	189	38	342	10	90	24	216
10	19	190	32	320	9	90	12	120
11	40	440	28	308	26	286	7	77
12	71	852	38	456	24	288	8	96
13	54	702	44	572	30	390	7	91
14	45	630	46	644	34	476	3	42
15	64	960	20	300	18	270	14	210
16	74	1184	36	576	17	272	16	256
17	70	1190	70	1190	38	646	33	561
18	12	216	19	342	2	36	20	360
19	4	76	1	19	0	0	2	38
20	165	3300	114	2280	147	2940	96	1920
Total	748	10526	608	8006	515	6598	364	4590

Note. No. of RE is represented as the number of records on each firm

No. of OB is represented as the number of observations.

4.3.1. Panel Data

In alignment with the study's objective, the study considers panel data as the optimal method to examine how firm-specific variables relate to systematic risk within non-financial companies across the four ASEAN nations. We can create and investigate more intricate behavior hypotheses by employing the panel data analysis approach because it enables us to examine intricate events, in-depth problems, and related issues. The panel data technique can capture the variations in firm-specific factors that impact a firm's systematic risk over time and across industries, given the 20-year sample period.

With panel data, we can combine a cross-section and a time series, with firm countries (i) representing the cross-sectional part and years given (t) representing the time series part. The integration of both time series and cross-sectional dimensions offers more comprehensive insights than could be obtained from either dimension alone. This helpful evidence adds another degree of freedom and might lower the standard errors of the coefficients in regression. As a result, this method enhances the accuracy of estimating an efficient economy (Hsiao, 2007). Numerous studies have employed panel data techniques to explore systematic risk, such as those by Ahmad et al. (2011), Houmes et al. (2013), Ibrahim and Haron (2016), Lee and Hooy (2012), Mehrara et al. (2014), and Nizam et al. (2020).

There are two categories of panel data: balanced panels and unbalanced panels. The unbalanced panel denotes a missing number for each year, while the balanced panel indicates complete data with no missing figures for each year. This is how the panel data model is displayed:

$$y_{it} = \alpha + \beta x_{it} + \varepsilon_{it} \qquad (4.1)$$

In which:

i = 1, 2, 3, 4, 5……N N: the cross-sections' number.

t = 1, 2, …, T, in which T refers to the time period count.

In the expression $u_{it} = \mu_i + v_{it}$, μ_i denotes the intercept specific to each individual cross-section, capturing the individual differences among observational entities.

$u_{it} = \lambda_t + v_{it}$ indicates time-period-specific effects through a distinct intercept coefficient.

v_{it} is independently and uniformly distributed, having an average value of zero and a fixed variance, denoted as iid $(0, \sigma v^2)$.

The research utilized both fixed-effects and random-effects methodologies, depending on the treatment of μ_i or λ_t, as these parameters are based on differing assumptions. Consequently, the selection of the appropriate model was necessary to obtain unbiased estimates of the coefficients.

In the fixed effects approach, μ_i is treated as a fixed parameter to be estimated, while the exogenous explanatory variables x_{it} are assumed to be independent of the error term v_{it} across time periods or cross-sectional units. The fixed effects model is often considered appropriate for many accounting research studies, particularly when the focus is on a specific set of firms and the findings are intended to apply solely to that defined group.

In the random effects model, μ_i is treated as a random variable, assumed to be independent of the idiosyncratic error term v_{it}. which is independently and identically distributed with a mean of zero and constant variance, denoted as IID $(0,\sigma^2)$. Additionally, the total error term is assumed to be independent of the exogenous explanatory variables across both time and cross-sectional dimensions. According to Jager (2008), this approach is suitable for randomly drawing from a large population, which in turn affects the interpretation of its underlying characteristics.

4.3.1.1. Combined Ordinary Least Squares and Fixed Effects Approach

Since more firms are participating in the micro panel than there are periods in the observation, it is thought that this study will use this large data set with multiple firms. One of the three options considered in this study is the pooled model, which consists of data on various firms combined without accounting for the differences between the firms, resulting in varying coefficients. At the time, the least-square estimator required the pooled model—also referred to as pooled least squares. The following PLS

presumptions need to be requested:

- There is no correlation between errors linked to the same firms.
- The error terms across different firms are assumed to be uncorrelated.
- Homoscedasticity implies that the variance of the error term remains constant across all levels of the dependent variable.
- The error terms are assumed to be independent of the variance of the explanatory variables.

Two approaches are available for determining a being of firms' characteristics in panel data: first, allowing errors made by firms at different times to be associated with, and second, relaxing the presumption that all firms possess the same model parameters. This results in the following model extension:

$$\gamma it = \beta 1i + \beta\ 2i\ X2it + \beta\ 3iX3i + eit \qquad (4.2)$$

Adding the subscript 'i' to each beta coefficient signifies that β1, β2, and β3 can differ between firms, representing parameters that are specific to each company. for every company. While the model is generally considered appropriate for panel data, it becomes less suitable in the context of wide and short panels. Although the intercepts (β1\beta_1β1) may be valid under such conditions, the slope coefficients (β2\beta_2β2 and β3\beta_3β3), which are assumed to be constant across firms, actually exhibit variation across different firms, thereby challenging the assumption of parameter homogeneity.

The model looks like this:

$$\gamma_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3i} + e_{it}, \qquad (4.3)$$

Firm heterogeneity, which is defined as the varying performance of firms, is taken to be taken by the intercept. To account for firm-specific and time-invariant factors, the firm's intercepts are included. These characteristics are modelled using a fixed effects model, in which the intercepts are expressed as fixed effects.

The least squares dummy variable estimator and the fixed effects estimator are the two methods used for estimation. While the computations are different, employing both approaches will yield similar estimates (Hill, Griffiths, & Lim, 2012).

4.3.1.2. Randomized Effects Estimation Model

The random effects approach is based on the assumption that the firms are selected randomly from a larger population, and any firm-specific variation is considered random instead of constant. In this sense, it reflects a different assumption compared to the fixed effects model. Because the total error consists of two components—one related to firm-specific effects and the other to the regression disturbance—the random effects model inherently incorporates this dual-source error structure.

$$v_{it} = u_i + e_{it} \quad (4.4)$$

The form of the random effects model is given by:

$$\gamma_{it} = \beta_{1i} + \beta_2 X_{2it} + \beta_3 X_{3i} + e_{it} \quad (4.5)$$

$$\gamma_{it} = (\beta_1 + u_i) + \beta_2 X_{2it} + \beta_3 X_{3i} + e_{it} \quad (4.6)$$

$$\gamma_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3i} + (e_{it} + u_i) \quad (4.7)$$

$$\gamma_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3i} + v_{it} \quad (4.8)$$

With β_{1i} representing the intercept term, incorporating firm-specific variation (u_i) captures the fixed effects component within the model. It is comparable to the term for random error. One possible assumption is that all firms have the same variance and a zero mean that is not corrected σ_u^2 (Hill et al.,2012).

4.3.2. Diagnostic Test

The multicollinearity, heteroskedastic, and autocorrelation tests are part of the diagnostic test, which is the test conducted before choosing the best model for this investigation. This study looked at the correlation matrix and the variance inflation factor (VIF) values to investigate the multicollinearity problems among the independent variables. The trend relationship between the variables was shown in the correlation matrix. There won't be a collinearity problem if every coefficient is less than 0.80 (Gujarati & Porter, 2009; Aslam & Haron, 2020; Ur Rehman et al., 2021). If an independent variable in the model has a VIF value greater than or equal to 10, the VIF is calculated to identify the presence of multicollinearity. This indicates that the model has an issue with multicollinearity (Wooldridge, 2005; Carvalho et al., 2020).

The Modified Wald test is employed to detect groupwise heteroskedasticity within the fixed effects regression model is commonly associated with testing for

heteroskedasticity. The null hypothesis (H0: homoskedastic) and the alternative hypothesis (H1: heteroskedastic) are the two hypotheses. The outcome is based on the P-value; if the P-value is less than 0.05, there is strong evidence of heteroskedasticity and the null hypothesis is rejected (Heteroskedastic issue exit).

The Wooldridge test is referred to in the auto-correlation test. The outcome is determined by the P-value in the output; if the P-value is less than 0.05, there is an autocorrelation issue. Additionally, if the auto-correlation and heteroskedastic problems disappear. The Robust standard error was used in this study to find a solution (Hoechle, 2007; Aslam & Haron, 2020).

To determine whether the model was flawed, this study performed diagnostic tests before choosing the best model. But if there are any problems with the model, like heteroskedastic and auto-correlation problems, they will be resolved either after the optimal estimator model is chosen or after the optimal estimator model is obtained by using the robust standard error.

4.3.3. Choosing the Appropriate Model

There are three models—Fixed Effect, Random Effect, and Pooled OLS—based on panel data analysis. This is for the suitable the best model for analyzing systematic risk in the different industries in the ASEAN-4 countries over 20 years, three tests must be carried out: the F-test (Chow test); the Breusch and Pagan-Lagrange Multiplier (BP-LM) test; and the Hausman test.

The Chow test and the Breusch-Pagan Lagrange Multiplier (BP-LM) test are employed to evaluate whether the dataset exhibits homogeneity or heterogeneity. If both tests indicate heterogeneity, the Hausman test is subsequently conducted to assess the appropriateness of the fixed effects model versus the random effects model, thereby identifying the more robust specification. Conversely, if the results of the Chow and BP-LM tests suggest that the data is homogeneous, the pooled Ordinary Least Squares (OLS) method will be adopted as the most suitable estimator for analyzing systematic risk in this study.

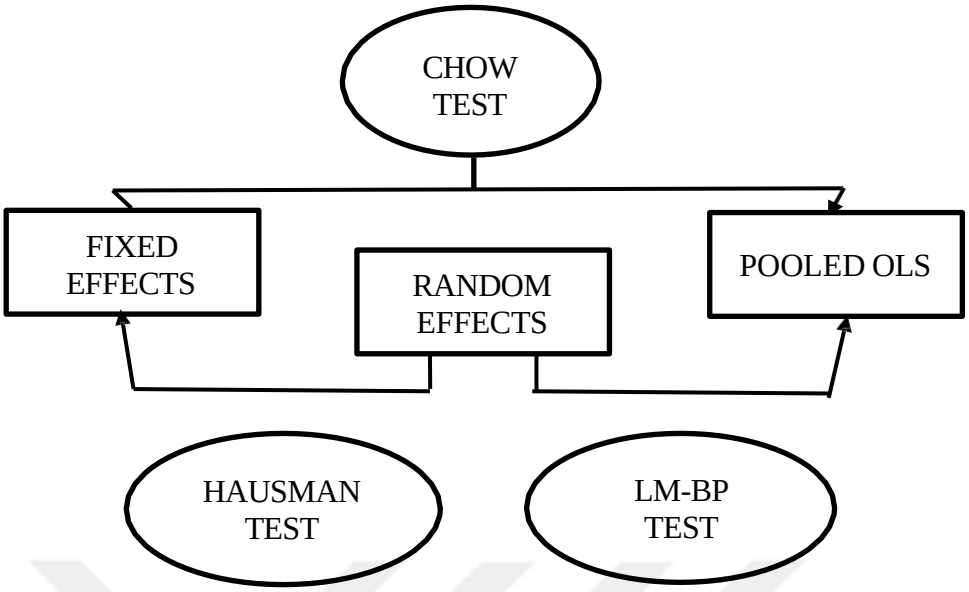


Figure 4.1: Selecting the Robust Model

Source: Developed by the researcher based on Gujarati (2009), Baltagi (2008), and Wooldridge (2010).

The Chow test compares the fixed effect model and pooled OLS to Identify the model considered most suitable for the specific study. The opposing hypothesis suggests that the fixed effect model outperforms pooled OLS—is accepted if the fixed effect model's P-value is less than 5% of the significant value.

The pooled OLS and random effect models are compared using the BP-LM test to determine which model is superior. This can be accomplished by performing the BM-LM test and then looking at the chibar2. The alternative hypothesis (random effect model is superior to pooled OLS) is accepted and the null hypothesis is discarded when the chi-square statistic and its corresponding p-value fall below 5% of the significant level. The Hausman test, which contrasts the random effect and fixed effect models, is the final test. The chi 2 value obtained from the Hausman fixed test must be examined the suitable to determine which of these two models is the better one. The fixed effect model is regarded as the best estimator model, and the alternative hypothesis is accepted if the chi-square statistic and its corresponding p-value are below the 5% significance threshold, the null hypothesis should be rejected.

4.3.4. Framework for Identifying the Drivers of Systematic Risk

Financial leverage, profitability, liquidity, firm size, operating efficiency, growth, the Asian financial crisis of 1997, and the global financial crisis of 2008 are the independent variables in this study. Systematic risk (beta) was the dependent variable in this study, GDP growth functioned as the variable controlled for in the analysis. The following is the study's regression model:

$$Y_{i,t} = \beta_0 + \beta_1 financial\ leverage_{i,\ t} + \beta_2 liquidity_{i,\ t} + \beta_3 profitability_{i,t} - \beta_4 firm\ size_{i,\ t} + \beta_5 firm\ growth_{i,\ t} + \beta_6 operating\ efficiency_{i,\ t} - \beta_7 financial\ crisis\ in\ 1997_t - \beta_8 financial\ crisis\ in\ 2008_t - \beta_9 GDP_t - \varepsilon_{it}$$

This study seeks to uncover the company-specific factors influencing systematic risk for non-financial firms across the four ASEAN nations, addressing research objectives 2 and 3 and to examine whether these determinants vary across different industries within each country. There will be a distinct regression for every country and industry. This study anticipates that the primary firm-specific factors influencing systematic risk will differ in each nation and industry. Based on these differences, it can be said that different firm-specific factors influence systematic risk in different nations and industries.

4.4. The Measurement of Systematic Risk

Systematic risk is also referred to as non-diversifiable risk since it is by definition a risk that cannot be eliminated by diversification. The market model's beta coefficient is the most widely accepted method of quantifying systematic risk (Blume, 1971; Klemkosky & Martin, 1975). In the finance literature, systematic risk is commonly assessed using the beta coefficient, which quantifies the fluctuation of a stock in comparison to the broader market performance (Babock, 1972). Over time, the idea of systematic risk has drawn significant attention from researchers, who are constantly working to develop methods for measuring systematic risk, or beta, with various goals. For instance, calculating systematic risk for future investment by examining past performance reviews, examining systematic risk concerning the anticipated return on investment, and so forth.

In the past, the majority of research has focused on two areas: This section examines the origins and implications of systematic risk. Initially, it emphasizes the crucial role

that systematic risk plays in predicting anticipated investment returns. Following that, it investigates various factors that may influence systematic risk levels. The analysis aims to illustrate a direct, proportional connection between securities' expected returns and their systematic risk within the context of market equilibrium frameworks, a model based on a single factor, often called a capital asset pricing model, was used to estimate the expected return for an investment (Sharp, 1964). A few years later, systematic risk (beta) measurement and modelling emerged to create a simpler tool for temporal data forecasting applying the three-factor model (TFM) to high-frequency data within the framework of asset pricing models. Only systematic risk is taken into consideration for pricing from a pricing standpoint (Bollerslev & Zhang, 2003). Fama and French developed the three-factor model between 1992 and 1996, and it is widely used in financial management and other studies to estimate return towards beta by utilizing two extra factors.

However, because the two added factors contribute only demonstrated the portfolio return and its underlying factors did not differ significantly, indicating that the application of the three-factor model (TFM) remained ineffective in explaining the connection between economic performance and systematic risk remains uncertain (Milionis, 2011). Several researchers attempted to investigate and rectify the standard capital asset pricing model due to some errors in the three-factor model. Assuming that both the market risk premium and beta vary over time Chen (1991) developed the CAPM standard. However, there was still an issue with CAPM conditional, which was caused by the presence of conditional variables and the absence of a theoretical framework to guide the analysis of their correlation with beta present a methodological challenge.

According to Braun, Nelson, and Sunier (1995), the ARCH model's ability to extend to time-varying CAPM beta and multi-factor loadings drives asset pricing and the portfolio's expected return. A wide range of research has investigated the link between returns and beta through the use of asset pricing models, which offers a lower pricing error and maybe a better explanation than a traditional model (Christiansen, Ranaldo, & Soderlind 2012). Furthermore, estimating the return on investment in the time-variety CAPM aspect of betas across multiple stock markets was not included in a traditional model introduced by Sharpe (1964).

To evaluate systematic risk across shifts in the airline industry, Chuang, Lu, and Chen

(2006) applied time-sensitive modeling approaches, encompassing both domestic and Multinational markets, including the multivariate GARCH model, the Kalman filter algorithm model, and the Schwert and Seguin model. To capture systematic risk, Brooks et al. (2002) also used three time-vary models; the findings demonstrated evidence of the time-vary aspect of beta across multiple markets. Considering the link between local and global capital markets, it seems that international capital markets have become increasingly interconnected. The three time-vary beta models have been proposed by numerous studies as the most effective methods for capturing systematic risk; however, it is unclear which model is the best for estimating systematic risk because of the varying results that have been reported in the literature.

As previously stated, a great deal of research has been conducted on creating the model developed to analyze how beta influences the anticipated return on an investment has been extensively studied in the literature, with numerous studies exploring the underlying factors that contribute to systematic risk. In particular, a substantial body of research has concentrated on firm-specific determinants, using various accounting and financial variables to explain variations in systematic risk (Beaver & Kettler, 1970; Gahlon, 1981; Mandelker & Rhee, 1984; Chun & Ramasamy, 1989; Several studies have explored this area, including those by Borde (1998), Gu and Kim (2002), Lee and Jang (2007), and Chee-Wooi et al. (2010), all contributing to the understanding of the subject from different perspectives; Ahmad et al., 2011; Iqbal & Ali Shah, 2012; Biase & D‘Apolito, 2012; Aruna & Warokka, 2013; Jung et al., 2018; Nizam et al., 2020). This section primarily focuses on identifying the specific determinants of systematic risk and examining how certain factors influence its behavior. Unlike the preceding section, which emphasized the role of systematic risk in estimating expected investment returns, the current discussion offers a deeper understanding of the nature and characteristics of systematic risk through the use of targeted elements like financial indicators or company-specific characteristics, to clarify its variation. The key elements that could affect the behaviors of systematic risk are covered in greater detail in the second section. In the past, several studies have employed beta, the traditional metric for evaluating systematic risk, represents the extent to which a stock's returns move in relation to overall market returns, capturing market-related volatility by examining historical estimation or past performance evaluation (Beaver et al., 1970; Chun & Ramasamy, 1989; Gu & Kim, 2002; Biase & D'Apolito, 2012; Nguyen, 2019).

The utilizing firm-specific variables that were discussed in the second section is one method of gaining a thorough grasp of the characteristics and underlying dynamics of systematic risk: the factors influencing systematic risk. As a result, this research also examined the origins of systematic risk by examining historical estimation or performance evaluation data from 1997 to 2016. Among non-financial firms across various industries in four ASEAN countries, the primary influences on systematic risk stem from either financial metrics or company-specific characteristics.

The standard measure of systematic risk used to accomplish the goals of this study is beta, which is displayed in equation (4.9) below. Beta has consistently been identified as the key indicator in numerous studies for tracking the evolution of systematic risk over time and uncovering its primary determinants (see Bradfield, 2003; Lee & Jang, 2007; Iqbal & Ali Shah, 2012; Nayab & Cheema, 2016; Nguyen, 2019).

Systematic risk, represented by beta, is measured as follows:

$$\beta = \frac{COV(R_{it}, R_{mt})}{var(R_{mt})} \qquad (4.9)$$

Where:

Rit Stock performance

Rmt Profit from the market

$var(Rmt)$ The variability of market returns

The monthly stock prices of publicly traded non-financial firms in Thailand, Malaysia, Singapore, and Indonesia are used to estimate the return on each company stock. To establish the performance benchmark and monthly market returns (Rm), this study employed key indices from regional stock exchanges, specifically the SET Index (Thailand), JKSE (Indonesia), STI (Singapore), and FTSE Bursa Malaysia KLCI (Malaysia). Each company's market and stock return values are calculated using the following formulas (Spaulding, 2002; Campbell et al., 2012; Tan et al., 2015):

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \qquad (4.10)$$

Where:

R_{it} Monthly stock return for the company (i) at the time (t)

P_{it} The current stock price for company (i) at the time (t)

P_{it-1} indicates the stock price of firm i one period prior to time t

$$R_{mt} = \frac{I_{mt} - I_{mt-1}}{I_{mt-1}} \quad (4.11)$$

Where:

R_{mt} Monthly market return at the time (t)

I_{mt} Current monthly price index at the time (t)

I_{mt-1} Previous monthly price index at the time (t)

The following formulas are used to calculate the variance of market return and the covariance of stock return and market return (Gitman & Zutter, 2012; Ross et al, 2015):

$$COV(R_i, R_m) = \frac{\sum(R_{it} - \bar{R}_t)(R_{mt} - R_{mt})}{n-1} \quad (4.12)$$

Where:

$\bar{R}it$ The mean value of the stock return (Monthly)

$\bar{R}mt$ The mean value of the market return (Monthly)

n The number of observations (Monthly)

$$Var(R_m) = \frac{\sum(R_{mt} - R_{mt})^2}{n-1} \quad (4.13)$$

Where:

$\bar{R}_{mt}$ = The mean value of the market return (Monthly)

n = The number of observations (Monthly)

The stock return, market return, variance of market return, covariance of stock return and market return, and systematic risk (Beta) are all calculated in this study using Microsoft Excel.

4.5. The Measurement of Independent Variables

4.5.1. Financial Leverage

Financial leverage, which is connected to a company's financial operations and capital structure choice, was the main focus of this study. The debt-to-equity ratio, sometimes referred to as the debt-to-asset ratio, represents in financial literature, the most commonly applied method for measuring financial leverage is the ratio of total debt to total assets (Gu & Kim, 2002; Lee & Jang, 2007; Alaghi, 2013; Aruna & Warokka, 2013; Haron et al., 2020; Ibrahim & Haron, 2016).

4.5.2. Liquidity

The current ratio and quick ratio are the most widely used formulas in the finance literature to measure the liquidity position of a business (Aruna & Warokka, 2013). (Gu & Kim, 1998; Kim, Gu & Mattila, 2002; Kim, Ryan & Ceschini, 2007; Ibrahim & Haron, 2016; Nguyen, 2019; Fahad et al., 2020) The current ratio is also frequently used to gauge a company's liquidity. The current ratio is calculated by dividing current liabilities by current assets. At the same time, the quick ratio is calculated by dividing current liabilities by the total of cash, marketable securities, and account receivables. Strong financial capabilities are exhibited by companies with higher quick ratios. Furthermore, a greater current ratio suggests a solid capacity to settle immediate debts. The current ratio was used in this study to measure the firm's liquidity.

4.5.3. Profitability

The most popular metric for assessing a company's profitability is the return on assets. According to Kim et al. (2007) and Haron et al. (2020), the return on investment is calculated by dividing the net income by the total amount of assets (Borde, 1998; Lee & Jang, 2007; Aruna & Warokka, 2013; Zhou et al., 2018; Nguyen, 2019; Nizam et al., 2020), or the income before extraordinary items and income before extraordinary items over total invested capital. As a stand-in for profitability, this study employed return on asset, which is calculated by dividing net income by total assets.

4.5.4. Firm Size

Similar to studies by Lee and Jang (2007), Rowe and Kim (2010), Iqbal and Ali Shah (2012), Zhou et al. (2018), Nguyen, 2019; Haron et al. (2020), and Dang et al. (2020), this study represented the firm size using the natural logarithm of total assets.

4.5.5. Firm Growth

The annual percentage change in earnings before interest and income taxes is used as a proxy for firm growth (Chee-Wooi et al., 2010; Ibrahim & Haron, 2016; Nguyen, 2019; Fahad et al., 2020; Nizam et al., 2020). The annual percentage change in EBIT was used as a growth measurement in this study.

4.5.6. Operating Efficiency

The asset turnover ratio, which is calculated by dividing total revenue by total assets, was previously used in numerous studies to gauge operating efficiency (Borde, 1998; Lee & Jang, 2007; Chee-Wooi et al., 2010; Iqbal & Shah, 2012; Nguyen, 2019; Fahad et al., 2020; Nizam et al., 2020). Therefore, the asset turnover ratio was also employed in this study as a stand-in for operating efficiency.

4.5.7. Gross Domestic Product (GDP)

The GDP is a significant variable that has been used as a control variable in several studies, including one by Adachi-Sato and Vithessonthi (2015). Their control variable for influencing bank systemic risk in the US was GDP. Furthermore, GDP was employed by Li et al. (2013) as a control variable that might have an impact on corporate risk-taking. The GDP data reflects the economic growth rates of the ASEAN-4 nations and is derived from figures published by the World Bank.

4.5.8. Financial Crisis in 1997 and 2008

Between 1997 and 2016, the world experienced two significant financial crises: the Asian financial crisis in 1997 and the global financial crisis in 2008. These events had a profound effect on the global economy. Therefore, this study made an effort to look into how each financial crisis affected the firm's systematic risk. The 1997 Asian financial crisis and the 2008 global financial crisis were represented in this study by dummy variables (Hooy & Lee, 2010). A dummy variable accepts values between 0 and 1, where the value denotes whether something is present or not. Two dummy variables are used in this study; each one has a value of 0 when the financial crisis does not affect its category and a value of 1 when it does.

Table 4.3: Examination of Independent Variable Assessment

No	Variable Identifier	Assessment	Information source

1	Leverage	Sum of debts compared to aggregate assets	(Haron et al., 2020)
2	Liquidity	Current assets over current liabilities	(Fahad et al., 2020)
3	Profitability	Net income over total assets	(Nizam et al., 2020)
4	Firm size	Natural logarithm of total asset	(Dang et al., 2020)
5	Firm Growth	Yearly percentage variation in earnings	(Nguyen, 2019)
6	Operating efficiency	The ratio of total revenue to total assets	(Fahad et al., 2020)
7	GDP	The progression of GDP over time	(Hussain et al., 2018)
8	Financial crisis	Year-specific flag variable for 1997	(Press& Review, 2018)
9	Financial crisis	Binary indicator for the year 2008	(Press& Review, 2018)

4.6. Concluding Remarks

An investigation was conducted into how firm-specific factors modify the effect of systematic risk on non-financial sector companies in four ASEAN countries. Financial institutions are omitted from the study due to their unique regulatory frameworks and varying capital structures. The panel data approach is the most suitable method employed in this investigation. Because it enables this study to integrate both time series and cross-section, the panel data approach is suitable for investigating the way the independent factors relate to the dependent outcome, offering improved information and dependability. In addition to an analysis method, this study makes use of many proxies of the independent and dependent variables that were obtained from earlier research. Each industry in Thailand, Singapore, Indonesia, and Malaysia will use the same proxies for these variables; that is, the independent variables and the measure of systematic risk are the same for all industries. This study did not take into account comparing various proxies of the explanatory and response variables. The results of the study, with an emphasis on the panel data regression analysis, will be

presented in the following chapter.

CHAPTER V

RESULTS AND DISCUSSIONS

5.1. Introduction

The chapter before this one describes the research techniques implemented throughout the study. To analyze the impact of company-level factors and economic downturns on the overall risk profile within different sectors across Indonesia, Malaysia, Singapore, and Thailand over the two decades spanning 1997 to 2016, this study used panel data analysis. The findings and analysis of the unit root test, descriptive statistics, and the factors influencing systematic risk are presented in this chapter. Based on the selected panel data model— the Fixed Effects Model (FEM), Random Effects Model (REM), or Pooled Ordinary Least Squares (POLS) method— descriptive statistics and unit root test come first, followed by diagnostic tests (multicollinearity, heteroscedasticity, and autocorrelation) and the empirical findings of this study analyzes how company-specific elements relate to systematic risk, with the Fixed Effects Model (FEM) identified as the most suitable method for estimating their impact on non-financial firms ASEAN-4 countries based on the diagnostic test of this study. Additionally, FEM is chosen as the best approach for assessing company-specific variables influencing system-wide risk affecting firms outside the financial sector in each country, whereas the Random Effects Model (REM) serves as the optimal method for examining non-financial firms in Malaysia and POLS is the best model for non-financial firms in Singapore, Thailand, and Indonesia.

5.2. Descriptive Statistic

Four sections, representing the four countries, comprise the discussion of the mean value of the variables in this study. Each section presents the mean value according to the industries. The ASEAN-4 countries' descriptive statistics are compiled in Tables 5.1, 5.2, 5.3, and 5.4.

5.2.1. The Mean Value of Variables in Singaporean Industries

Descriptive data outlining the variables of non-financial businesses in Singapore's different industries are shown in Table 5.1. The energy sector has the lowest mean

value of beta (0.957), while the other sector has the highest value (0.966). Energy companies with lower systematic risk would also have more liquidity, profitability, and financial leverage. In addition, out of the seven industries, the technology sector showed the lowest levels of profitability and financial leverage. It's interesting to note that this industry lost money over two decades. Despite having less debt than other industries, the average level of systematic risk is still high. Stocks in the technology sector are riskier than those in other sectors.

Table 5.1: The Mean Value of Variable in Singaporean Industries (1997-2016)

Variables	Industrial	Consumer staples Industry	Consumer discretionary Industry	Raw Material Sector	Tech Infrastructure	Utilities	Unlisted Items
Beta	0.960	0.960	0.959	0.959	0.960	0.957	0.966
Leverage	22.888	24.650	26.494	25.008	18.948	89.647	24.057
Liquidity	2.705	2.617	2.266	3.112	2.866	3.797	2.419
Profitability	3.768	6.531	0.796	0.667	-0.839	130.35	5.358
Firm size	12.293	13.122	11.982	12.236	11.485	12.299	12.719
Firm growth	0.880	-1.544	-0.101	3.014	-0.828	0.833	0.105
Efficiency	0.883	0.950	0.888	0.929	1.135	1.266	0.797
GDP	5.324	5.237	5.225	5.223	5.404	5.097	5.259

5.2.2. The Mean Value of Variables in Malaysian Industries

The descriptive statistics of variables in non-financial firms across different industries in Malaysia are displayed in Table 5.2. The basic material industry is said to have a higher mean beta value (0.974) than other industries, while the other industry displays the lowest beta value (0.939). It's interesting to note that in the basic material and other industries, the mean values of beta and firm growth are pointing in the opposite direction; in other words, firms with slower growth are riskier than those with faster

growth.

Additionally, this study found that while operating efficiency is lower in other industries, the mean profitability value is higher in other industries. In Malaysia, the average beta value for all industries is less than one. This indicates that compared to the market, the stocks of these industries are less hazardous.

Table 5.2: The Mean Value of Variables in Malaysian Industries (1997-2016)

Variables	Industrial	Consumer staples Industry	Consumer discretionary Industry	Raw Material sector	Tech Infrastructure	Utilities	Unlisted Items
Beta	0.968	0.957	0.969	0.974	0.970	0.944	0.939
Leverage	25.206	20.762	23.335	17.715	15.545	28.98	27.89
Liquidity	2.421	4.473	2.692	3.143	4.857	4.054	2.654
Profitability	4.159	5.666	3.287	3.052	-1.907	4.395	5.667
Firm size	12.612	12.662	12.741	12.395	11.433	13.74	13.59
Firm growth	-0.028	0.374	-0.234	-0.715	-0.674	0.437	0.873
Efficiency	0.752	0.842	0.725	0.776	0.766	0.819	0.624
GDP	4.842	4.851	4.855	4.788	4.930	4.914	4.837

5.2.3. The Mean Value of Variables in Indonesian Industries

The descriptive statistics of variables in Table 5.3 present data from non-financial companies operating within different industries throughout Indonesia. As can be observed, the 20-year sample's mean systematic risk or beta value falls between 0.975 and 0.998. The energy sector has the highest mean value of financial leverage (41.957) and beta (0.998) out of the seven industries, while profitability (3.006) and operating efficiency (0.6996) have the lowest mean values. This study also found that, outside of the energy sector, the basic material had the lowest mean values for both firm growth and systematic risk.

Table 5.3: The Mean Value of Variables in Indonesian Industries (1997-2016)

Variables	Industrial	Consumer non-cyclical	Consume Cyclical	Basic Material	Tech-nology	Energy	Others
Beta	0.993	0.994	0.976	0.975	0.982	0.998	0.982
Leverage	41.431	37.351	36.181	38.333	32.647	41.957	26.720
Liquidity	3.433	4.009	1.714	2.619	5.146	3.159	2.245
Profitability	4.662	8.568	5.330	4.148	4.346	3.006	9.009
Firm size	20.504	20.877	20.856	21.216	20.385	21.665	21.669
Firm growth	0.891	0.176	-0.715	-1.210	7.563	0.163	0.858
Efficiency	0.982	1.088	1.082	0.792	1.422	0.659	1.076
GDP	4.812	4.765	4.851	4.732	4.810	4.679	5.105

5.2.4. The Mean Value of Variables in Thailand Industries

The mean values of systematic risk (0.918) and liquidity (4.038) in consumer non-cyclical are higher than those in other industries, according to the descriptive statistics of variables in Thai industries, as shown in Table 5.4. The findings also revealed that, compared to consumer non-cyclical, the energy sector has the highest mean values for firm size, firm growth, and operating efficiency, but the lowest mean value for beta. Of the seven industries, the technology sector has demonstrated the lowest mean value of beta and firm growth, except for the energy sector. Compared to other industries, the consumer cyclical used more debt. But this sector also made more money, and its beta value isn't higher than the market's.

Table 5.4: Average Value of Company-Specific Factors in the Thai Sector (1997-2016)

Variables	Industrial	Consumer Non-Cyclical	Consumer Cyclical	Basic Material	Technology	Energy	Others
Beta	0.903	0.918	0.902	0.900	0.892	0.909	0.904
Leverage	29.725	32.078	34.403	31.688	23.622	29.361	21.216
Liquidity	3.342	4.038	2.016	1.948	2.352	3.446	1.661
Profitability	7.242	7.796	8.584	6.751	7.560	7.349	6.877
Firm size	14.602	14.449	14.918	14.889	15.250	16.367	15.258
Firm growth	0.180	-0.318	-0.831	-0.523	-1.317	4.164	-0.177
Efficiency	1.019	1.154	0.915	1.168	0.951	2.066	0.759
GDP	3.484	3.332	3.430	3.257	3.398	3.523	3.349

5.3. Unit Root Examination for Data from 4 ASEAN Countries

As outlined in the methodology section, this research utilized secondary data obtained from Thomson DataStream. It is evident from the data available in ASEAN-4 that the dataset was unbalanced due to missing values. In this study, the Fisher-type test was employed to examine the presence of unit roots in the unbalanced panel data. As explained by Frutig (2020), these tests help determine whether a time series is stationary or not. Table 5.5 presents the results of the Fisher-type panel unit root test, indicating that all transformed time series are stationary at the 1% significance level, meaning all variables exhibit stationarity.

Table 5.5: Shows the Results of the Panel Unit Root Test For both the Dependent and Independent Variables Across 4 ASEAN Nations.

Variable	Malaysia (Level)	Singapore (Level)	Thailand (Level)	Indonesia (Level)

Systematic risk	151.26	125.37	125.22	130.1
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Financial leverage	23.16	29.99	32.30	17.51
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Profitability	59.98	57.42	74.25	42.47
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Liquidity	43.54	33.05	19.79	38.15
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Operating efficiency	28.20	33.22	21.90	19.79
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm growth	145.12	114.53	108.69	95.96
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm size	12.22	30.44	16.23	9.56
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GDP	225.27	115.94	115.42	47.54
	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Note. The p-values for the Fisher-type panel unit root test are derived based on tending toward calculations

The chi-square distribution is indicated within the parentheses.

5.4. Diagnostic Tests

5.4.1. Multicollinearity

For the purpose of looking into multicollinearity issues among the independent variables, this study examines the correlation matrix and the variance inflation factor (VIF) values.

5.4.1.1. Correlation Matrix

The trend relationship between the variables is displayed in the correlation matrix. Table 5.6 shows that financial leverage and firm size have the highest correlation (0.0232), while firm size and growth have the lowest correlation (0.0005). All of the coefficients are obviously below 0.80. Accordingly, there isn't a problem with collinearity (Gujarati & Porter 2009; Aslam & Haron, 2020; Ur Rehman et al., 2021).

Table 5.6: Correlations between Independent Variables of ASEAN-4 Countries.

	Beta	Leverage	Liquidity	Profitability	Firm size	Firm growth	Operating efficiency
Beta	1						
Leverage	0.004**	1					
Liquidity	-0.007**	-0.02***	1				
Profitability	-0.001	-0.0078	-0.0016*	1			
Firm size	0.0063	0.023***	-0.034***	-0.006**	1		
Firm growth	-0.006*	-0.0024*	-0.0024*	-0.0042**	0.0005	1	
Operating efficiency	0.0103*	0.0029*	-0.0270***	-0.0003*	-0.38***	0.0024	1

Note. *, **, *** indicates significant at 10%, 5%, and 1% respectively.

5.4.1.2. The Variance Inflation Factor

If an independent variable in the model has a variance inflation factor (VIF) value greater than or equal to 10, multicollinearity is detected. This indicates that the model has an issue with multicollinearity (Wooldridge, 2005; Carvalho et al., 2020). Table 5.7 indicates that the model's mean VIF in this investigation is less than 10. Multicollinearity is therefore not a problem, meaning that all variables—including financial leverage, profitability, operating efficiency, firm size, firm growth, liquidity, and GDP—are appropriate for the analysis and to meet the study's objectives.

Table 5.7: The Mean Value of the Variance Inflation Factors (VIF)

Variable	VIF	1/VIF
Leverage	1	0.998768
Liquidity	1	0.99634
Profitability	1	0.999833
Firm size	1.18	0.846605
Firm growth	1	0.999896
Operating efficiency	1.18	0.849957
Dummy1997	1	0.997723
Dummy2008	1.01	0.991883
GDP	1.01	0.990343
Mean VIF	1.04	

5.4.2. Heteroskedastic and Auto-Correlation

The final two tests in the diagnostic test are auto-correlation and heteroskedastic. The Wooldridge test is used to detect autocorrelation in panel data, whereas the adjusted Wald test evaluates group-specific heteroskedasticity in the context of a fixed effects

regression model. According to the evidence provided by the two tests, the model has autocorrelated and heteroskedastic issues (see Appendix I). To address these issues, this study used the Robust standard error (Hoechle, 2007; Aslam & Haron, 2020). This indicates that this study resolved both problems by using the Robust standard error to improve the results after determining the most effective predictive model for non-financial companies across the ASEAN-4 nations.

5.5. The Effect Of Firm-Specific Factors On Systematic Risk

As stated in the previous chapter on research methodology, Over the 20-year span from 1997 to 2016, this research analyzed how firm-level characteristics influenced the systematic risk among non-financial enterprises spanning multiple sectors within the four ASEAN countries. countries using panel data analysis. Since some firms are not observed at all times, the research makes use of unbalanced secondary data derived from Thomson DataStream.

5.5.1. The Factors Influencing Systematic Risk in Non-Financial Companies Across the ASEAN-4 Nations.

The central goal of the research is to explore how firm-specific characteristics affect systematic risk among non-financial enterprises in the four ASEAN member states, encompassing a total of 2,223 companies. Malaysia, Thailand, Singapore, and Indonesia are the four nations that make up ASEAN-4's non-financial firms. The findings of the study on how firm-specific factors affect systematic risk in ASEAN-4 non-financial firms are presented in this section. The three models—the Pool OLS, Fixed effect, and Random effect models of ASEAN-4 non-financial firms—are compiled in Table 5.8. The results are shown in Table 5.7 (a), (b), and (c) [Appendix B].

Table 5.8: Three Frameworks for Identifying the Drivers of Systematic Risk in ASEAN-4 (1997–2016).

Controlled variables	Pooled OLS	Fixed Effect	Random Effect
Gearing level	0.000006	0.0000047	0.0000065
	(0.71)	(0.48)	(0.71)

Cash flow flexibility	-0.000131	-0.00027**	-0.0001313
	(-1.14)	(-2.07)	(-1.14)
Profit-generating ability	-0.000001	0.0000000	-0.0000007
	(-0.19)	(0.01)	-(0.19)
Operational size of the company	0.00079**	-0.00761***	0.00079**
	(2.35)	(-4.38)	(2.35)
Expansion of firm activities	-0.000005	-0.0000193	-0.0000049
	(-0.12)	(-0.44)	(-0.12)
Operational effectiveness	0.00121**	-0.0000429	0.00121**
	(2.45)	(-0.02)	(2.45)
1997 fiscal upheaval	0.03516***	0.02735***	0.03516***
	(4.24)	(3.25)	(4.24)
Economic upheaval of 2008	0.01623***	0.01230**	0.01623***
	(3.34)	(2.52)	(3.34)
GDP	0.00206***	0.0005230	0.00206***
	(5.81)	(1.43)	(5.81)
Constant	0.9309933	1.0588930	0.9309933
	(168.44)	(42.08)	(168.44)
R-sq	0.0022	0.0015	0.0613
F-stat	7.61***	5.01***	

Wald Chi2	68.53***

Note. *, **, *** signifies statistical importance at 10%, 5%, and 1%, respectively.

Values of the t-statistics appear inside brackets.

According to the study reveals that the fixed effects model is inconsistent with the pool OLS and random effect models' independent variable coefficients (direction) and significance levels.

Two variables— the Asian financial turmoil of 1997 and the global economic crisis in 2008——showed comparatively consistent results in terms of their sign and significance levels, despite the inconsistencies that emerged among the three models. Tests are required to determine the best model for estimating market-wide risk affecting non-financial companies within ASEAN -4 spanning two decades, between 1997 and 2016, due to variations in coefficient values and significance levels across models, three diagnostic tests—the Chow test, the Hausman test, and the Breusch-Pagan Lagrangian Multiplier (BP-LM) test—are employed to identify the most suitable model for estimating systematic risk issues, according to panel data analysis. The following section contains the three tests' results and explanations.

5.5.1.1. Selecting the Panel Data Model

To determine the best model for analyzing the particular factors influencing the projected systemic risk faced by non-financial companies in the ASEAN-4 region over the upcoming two decades, this study employs the Chow test, the Hausman test, and the Breusch and Pagan Lagrangian Multiplier test (BP-LM). Table 5.9 presents the findings and discussion.

Table 5.9 summarizes the results of the three tests, demonstrating that the fixed effects model best captures the influence of firm-specific variables on the systematic risk of non-financial companies within the four ASEAN nations. Tables 5.15 (a) and 5.15 (b) display the report details for the Hausman test and the BP-LM test, respectively [see Appendix I]. This study used the Robust standard error to solve the auto-correlation and heteroskedasticity problems after determining the best model (Hoechle, 2007; Aslam & Haron, 2020).

Table 5.9: Conclusions from Conducting Three Panel-Based Statistical Tests

Chow Test	BP-LM test	Hausman Test
Reject H_0	Do not reject H_0	Reject H_0
FEM is better than Pooled OLS	Pooled OLS better than REM	FEM is better than REM
F-state 5.01***	chibar2 = 0	Chi2 = 587.34***

5.5.1.2. The Determinants of Firm Systematic Risk: Full Sample Analysis and Using Fixed Effect Model

Based on the results of the three panel data analysis tests, the fixed effects model has been identified as the most appropriate approach for analyzing the 4 ASEAN datasets, as it best captures the impact of firm-specific factors on systematic risk. The hypotheses underpinning this study, previously discussed in detail in the literature review, are presented in Table 5.10 below.

Table 5.10: Hypotheses Concerning the Factors that Influence Systematic Risk

	Hypotheses
H1	There is a positive relationship between financial leverage and systematic risk.
H2	There is a direct relationship between liquidity and systematic risk.
H3	Profitability shows a negative correlation with systematic risk.
H4	The relationship between firm size and systematic risk is directly proportional.
H5	There is a positive relationship between a Company's growth and its level of systematic risk.
H6	There is an inverse relationship between operating efficiency and systematic risk.
H7	Systematic risk levels were heavily affected by the Asian financial crisis in 1997.
H8	The global financial crisis of 2008 had a major effect on systematic risk.

Table 5.11 presents the complete sample was analyzed using the fixed effects model. Based on the findings from the study's findings, systematic risk and financial leverage have a positive and significant relationship. This result supports past research that emphasized the significance of capital structure in terms of financing and decision-making strategies to address firms' systematic risk. Hamada (1972) was the pioneer in exploring the relationship between a firm's capital structure and its systematic risk. Further contributions to this research field were made by Mandelker as noted by Rhee (1984) and further supported by Ahmad et al. (2011), Alaghi (2013), and Ibrahim and Haron (2016) in their subsequent studies, and Nizam et al. (2020) are just a few of the numerous studies that have consistently looked at the relationship between financial leverage and systematic risk and discovered that it is positive. The results of ASEAN-4's non-financial firms validated the study's first hypothesis, this suggests a positive relationship between financial leverage and systematic risk, aligning with the main focus of the study, which is outlined in the first chapter's explanation of the research objective.

Apart from firm-specific factors, the findings on the relationship between the financial crisis variables and systematic risk support hypotheses seven and eight of this study, namely that the 1997 Asian financial turmoil and the 2008 worldwide economic downturn influenced the systemic risk levels among non-financial companies within the ASEAN-4 nations. This research also revealed a significant negative relationship between firm size and systematic risk at the 1% level. However, this outcome contradicts the expectation outlined in Hypothesis Four. Despite the unexpected direction, the findings align with previous studies, such as those by Maroney et al. (2004) and Abubakr et al. (2020), which identified a connection between systematic risk and financial crises. The study's other hypotheses (H2, H3, H5, and H6) are not supported by the fact that aside from the crisis dummy variables, GDP and firm size have a negative relationship with systematic risk, while other variables like liquidity, profitability, firm growth, and operating efficiency are not significant.

Table 5.11: Model with Fixed Effects for the Factors Influencing Systematic Risk: Full Sample (ASEAN-4: 1997-2016)

Independent Variable	Coefficient	Robust Std. Error	T-statistic	Prob.
Financial Leverage	0.0000759	0.0000351	2.16	0.0310
Liquidity	-0.0000049	0.0001064	-0.05	0.9640
Profitability	-0.0000097	0.0000177	-0.55	0.5860
Firm size	-0.0036160	0.0011653	-3.10	0.0020
Firm growth	0.0000046	0.0000197	0.23	0.8160
Operating efficiency	0.0003709	0.0010212	0.36	0.7160
Financial crisis 1997	0.0258593	0.0019964	12.95	0.0000
Financial crisis 2008	0.0235372	0.0013454	17.50	0.0000
GDP	-0.0006201	0.0001433	-4.33	0.0000
Constant	1.0204680	0.0165145	61.79	0.0000
R-sq	0.0032			
F-stat	47.32			
Prob. (F-stat)	0.0000			

Note. *, **, *** Significance is indicated at the 10%, 5%, and 1% levels, respectively. Corresponding t-statistic values are provided within parentheses.

5.5.2. The Determinants of Systematic Risk in Non-financial Firms in the Individual Country of ASEAN-4.

The second aim of this study is to investigate how internal factors within non-financial companies have impacted systematic risk in 4 ASEAN nations over the two-decade period from 1997 to 2016. The results of the non-financial companies in Malaysia, Singapore, Indonesia, and Thailand are compiled in this section.

For Malaysia, the model with random effects is the most suitable for estimating the influence of company-specific factors on systematic risk. On the other hand, the fixed effects model is the most appropriate for Singapore, followed by the pooled OLS model as the preferred approach, Thailand, and Indonesia, according to the results of the model selection test [see Appendices J, K, L, M, and N]. By using robust standard error, this study has resolved the autocorrelation and heteroskedasticity issues (Hoechle, 2007; Aslam & Haron, 2020). The full sample of each ASEAN-4 country is summarized and provided in Table 5.12. The findings indicate that at least one particular variable affects systematic risk in every nation. At a one percent significant level, the Malaysian study found a positive correlation between systematic risk and financial leverage, the Asian financial crisis of 1997, and the global financial crisis of 2008. Additionally, at a five percent significant level, the findings indicate a positive link between liquidity and systematic risk. At the one percent significant level, systematic risk is negatively correlated with GDP and profitability. Thus, H1, H2, H3, H7, and H8 are supported by these findings.

In addition to Malaysia, Singapore's results indicate that, at a one percent significant level, systematic risk is positively correlated with the Asian financial crisis of 1997 and the global financial crisis of 2008. Thus, this lends credence to hypotheses seven and eight. Systematic risk and firm size are positively correlated, although not statistically significant. At the ten percent significant level, systematic risk is negatively correlated with firm size, profitability, and firm growth; at the one percent significant level, systematic risk is negatively correlated with GDP.

Table 5.12: The Determinants of Systematic Risk in Non-Financial Firms of Each Country in ASEAN-4 (1997-2016)

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	0.000097***	-0.000021	0.00042***	0.000027**
	(3.25)	-(1.10)	(5.58)	(2.26)
Liquidity	0.000204**	0.000262	0.000612*	-0.000022

	(2.33)	(1.63)	(1.70)	-(0.47)
Profitability	-0.000309***	-0.000056*	0.000013	-0.000029
	-(6.09)	-(1.82)	(0.21)	-(1.25)
Operational size of the company	0.000507	0.000743*	0.00396**	0.000340
	(0.95)	(1.94)	(2.37)	(0.34)
Expansion of firm activities	-0.000008	-0.000030*	0.000056	0.000002
	-(0.32)	-(1.74)	(1.63)	(0.16)
Operational effectiveness	0.000460	0.000444	0.01341***	0.000225
	(0.32)	(0.53)	(4.67)	(0.64)
1997 fiscal upheaval	0.018229***	0.015865***	0.10748***	0.001988
	(9.85)	(9.63)	(20.82)	(0.54)
Economic upheaval of 2008	0.012458***	0.008336***	0.08696***	0.004171**
	(7.31)	(4.79)	(21.17)	(2.96)
GDP	-0.001478***	-0.000793***	0.00409***	-0.000107
	-(6.93)	-(4.27)	(7.78)	-(0.73)
Model	REM	Pool OLS	Pool OLS	Pool OLS
R-sq	0.0074	0.0036	0.0150	0.0012
F-stat		12***	82.09***	1.69*
Wald Chi2	138.65***			

Note. *, **, *** signifies statistical importance at 10%, 5%, and 1%, respectively. Values of the T-statistics are shown inside brackets. Table 5.9 (a) through (e) [Appendix C] presents the complete dataset covering industries from Thailand,

Indonesia, Singapore, and Malaysia, respectively.

Looking at Thailand's results, it is evident that, at a significant one percent level, there is a direct relationship between systematic risk and financial leverage, operating efficiency, The 1997 Asian financial crisis, the 2008 global financial crisis, and GDP. Furthermore, at the 5% significance level, there is a positive correlation between firm size and systematic risk. Although it is not statistically significant, liquidity and systematic risk are positively correlated. The results on operating efficiency, however, contradict hypothesis six, which states that it raises systematic risk.

Hypotheses one and eight are supported by the findings for Indonesia, which show a positive correlation between systematic risk and financial leverage and the global financial crisis of 2008 at a five percent significant level. for the ASEAN-4 countries' final results. Although not statistically significant, financial leverage and firm size also have a positive correlation with systematic risk. At the ten percent significant level, systematic risk has a negative relationship with profitability. The results on operating efficiency, however, contradict hypothesis six, which states that it raises systematic risk.

5.5.3. The Determinants of Systematic Risk across Industries in ASEAN-4 Countries

Determining systematic risk across different industries in each of the ASEAN-4 countries over a 20-year period, from 1997 to 2016, is the third objective of this study. In order to examine possible variations in the impact of firm-specific factors on systematic risk, this study included seven industries. The analysis's findings are shown in the sections that follow.

5.5.3.1. Industrial

Every country's industrial sector is vital. This industry encompasses a wide range of business sectors, including transportation, industrial conglomerates, industrial and commercial services, and industrial goods. Table 5.13 provides a summary of the industrial sector findings for each of the ASEAN-4 countries.

The study's first and second hypotheses are supported by the fact that, in the Thai industrial sector, financial leverage and liquidity have a positive relationship with systematic risk at the five percent significant level. Additionally, at the one percent significant level, there is a positive correlation between systematic risk and the Asian

financial crisis of 1997 and the global financial crisis of 2008. These results lend credence to hypotheses seven and eight.

At the one percent significant level, systematic risk has a negative relationship with profitability in the Malaysian industrial sector. Furthermore, there is a positive correlation between systematic risk and the Asian financial crisis of 1997 and the global financial crisis of 2008; the first is statistically significant at the 1% threshold, whereas the second achieves significance at the 5% level. At the five percent significant level, systematic risk and GDP are negatively correlated.

Going on to the Indonesian industrial sector, at a ten percent significant level, there is a positive correlation between systematic risk and liquidity and operating efficiency. However, this study's hypothesis is not supported by a positive correlation between operating efficiency and systematic risk. Furthermore, at the five percent significant level, the 1997 Asian financial crisis has a positive and significant relationship with systematic risk, whereas, at the ten percent significant level, GDP has a negative relationship with systematic risk.

Financial leverage has a negative correlation with systematic risk in the Singaporean industrial sector at a five percent significant level; however, the direction of this relationship does not support the study's hypothesis. In addition to firm-specific factors, systematic risk and the 1997 Asian financial crisis have a positive relationship at the ten percent significant level, while systematic risk and GDP have a negative relationship at the one percent significant level.

Table 5.13: The Determinants of Systematic Risk in the Industrial Sector.

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	-0.000010	-0.00032**	0.00044**	0.000004
	(-0.13)	(-2.41)	(2.95)	(0.22)
Liquidity	0.000718	0.000102	0.00161**	0.000021*
	(1.45)	(0.63)	(2.20)	(1.87)

Profitability	-0.00072***	-0.000183	0.000008	-0.000188
	(-3.40)	(-1.61)	(0.03)	(-1.50)
Firm Size	0.001101	0.000573	0.002308	-0.001137
	(0.94)	(0.95)	(0.49)	(-1.13)
Firm growth	-0.000026	-0.000027	0.000895	-0.000015
	(-0.38)	(-0.55)	(1.33)	(-0.15)
Operating efficiency	-0.003354	-0.002150	0.010923	0.00223*
	(-0.86)	(-1.27)	(1.21)	(2.00)
Financial crisis 1997	0.01648***	0.00960*	0.09339***	0.00767**
	(4.18)	(1.83)	(6.35)	(2.58)
Financial crisis 2008	0.01058**	0.002690	0.07616***	0.003224
	(2.54)	(0.81)	(7.40)	(0.76)
GDP	-0.00115**	-0.00088***	0.002287	-0.000479*
	(-2.41)	(-2.77)	(1.41)	(-1.89)

Note. *, **, *** signifies statistical importance at 10%, 5%, and 1%, respectively. Values of the T-statistics are shown inside brackets. The complete industry samples for Thailand, Indonesia, Singapore, and Malaysia are presented in Tables 5.10(a) in Appendix D, 5.11(a) in Appendix E, 5.12(a) in Appendix F, 5.13(a) in Appendix G, and 5.14(a) in Appendix H, in that order.

5.5.3.2. Consumer Non-Cyclical

A number of business sectors, including food and beverage, food and drug retailing, personal and household, and products and services, are included in the consumer non-cyclical industry. Table 5.14 provides a summary of the consumer non-cyclical findings for each of the ASEAN-4 countries.

Table 5.14: The Determinants of Systematic Risk in the Consumer Non-Cyclical Industry

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	0.000124	-0.000119	0.00051***	-0.000017
	(1.36)	(-1.14)	(5.35)	(-1.13)
Liquidity	0.000264	0.000369	-0.000035	0.000012
	(1.32)	(0.89)	(-0.15)	(1.20)
Profitability	-0.00028*	-0.000023	0.000103	0.000015
	(-1.85)	(-0.32)	(0.82)	(0.53)
Firm Size	0.00276*	0.000128	0.002807	-0.000193
	(1.90)	(0.25)	(0.79)	(-0.47)
Firm growth	0.000028	-0.000026	0.000265	0.000044
	(1.26)	(-1.14)	(0.56)	(0.37)
Operating efficiency	0.001815	0.000257	0.012687	-0.000027
	(0.54)	(0.12)	(1.41)	(-0.04)
Financial crisis 1997	0.02078***	0.01292***	0.06594***	0.09953***
	(5.84)	(4.30)	(7.62)	(33.98)
Financial crisis 2008	0.01543***	0.005603	0.05950***	0.000148
	(3.37)	(1.39)	(9.89)	(0.07)
GDP	-0.00127**	-0.000375	0.00221**	-0.000108

	(-2.41)	(-0.82)	(2.20)	(-1.15)

Note. *, **, *** Significance is denoted at the 10%, 5%, and 1% levels, respectively. Values of the T-statistics are shown inside brackets. The complete dataset for the consumer non-cyclical industry in Thailand, Indonesia, Malaysia, and Singapore is presented in Tables 5.10(b) from Appendix D, 5.11(b) from Appendix E, and 5.12(b) from Appendix F, and, correspondingly, Table 5.13(b) located in Appendix G.

The data outcomes indicate a positive correlation between systematic risk and financial leverage, GDP (Thailand), firm size (Malaysia), and operating efficiency. However, at the ten percent level, operating efficiency and firm size are only slightly significant.

In the Malaysian consumer non-cyclical industry, both GDP and profitability exhibit an inverse relationship with systematic risk; however, at the ten percent level, profitability is only marginally significant. The GDP outcome contrasts with the non-cyclical consumer sector in Thailand, where it reduces systematic risk.

The 1997 Asian financial crisis had a direct positive relationship with systematic risk across all four ASEAN nations. However, aside from the Asian financial crisis of 1997, the global financial crisis of 2008 has a positive correlation with systematic risk at a significant level of one percent in the non-cyclical consumer non-business sector in Malaysia and Thailand.

5.5.3.3. Consumer Cyclical

The consumer cyclical sector encompasses automobiles and auto parts, consumer durables, consumer services, and retail businesses. A summary of the findings related to this sector across the 4 ASEAN countries is provided in Table 5.15.

Table 5.15: The Determinants of Systematic Risk in the Consumer Cyclical Industry

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	0.000047	0.00000033	0.000438***	0.000031
	(1.23)	(0.04)	(3.65)	(1.31)

Liquidity	0.00048**	-0.000304	0.001976	-0.000171
	(2.07)	(-0.36)	(1.40)	(-0.15)
Profitability	-0.00044***	-0.000047	0.000019	-0.000131
	(-3.64)	(-1.41)	(0.29)	(-1.53)
Firm Size	0.000322	0.001075	0.004590	-0.001574
	(0.40)	(1.16)	(1.43)	(-1.19)
Firm growth	0.000045	-0.000015	-0.00042**	-0.000060
	(0.44)	(-0.57)	(-2.91)	(-1.14)
Operating efficiency	-0.003362	-0.000759	0.008722	0.000542
	(-1.37)	(-0.34)	(1.10)	(0.74)
Financial crisis 1997	0.02019***	0.017001***	0.115856***	0.004244
	(6.35)	(5.85)	(11.64)	(1.45)
Financial crisis 2008	0.01547***	0.010969***	0.103218***	0.00597**
	(5.98)	(3.24)	(13.37)	(2.18)
GDP	-0.00125***	-0.000559	0.005064***	-0.000178
	(-3.73)	(-1.62)	(5.01)	(-0.60)

Note. *, **, *** Statistical significance is marked at the 10%, 5%, and 1% levels, respectively, with T-statistics provided in parentheses. The complete dataset for the consumer cyclical industry in Thailand, Indonesia, Malaysia, and Singapore is detailed in Table 5.10(c) [Appendix D], Table 5.11(c) [Appendix E], Table 5.12(c) [Appendix F], and Table 5.13(c) [Appendix G], accordingly.

At the one percent significant level, systematic risk has a negative relationship with GDP and profitability in Malaysia's consumer cyclical industry. At the five percent

significant level, liquidity and systematic risk are positively correlated.

Financial leverage and GDP have a one percent positive and significant Connection to systematic risk within Thailand's consumer cyclical sector, whereas firm growth has a ten percent significant relationship with systematic risk. In contrast, there are no firm-specific factors that influence systematic risk in the consumer cyclical industries of Indonesia and Singapore.

Both the Asian financial crisis of 1997 and the worldwide financial crisis of 2008, excluding firm-specific factors, have a positive correlation with systematic risk at a significant level of one percent in the consumer cyclical industries of Malaysia, Singapore, and Thailand. However, the 2008 global financial crisis exerted a significant and positive influence on the Indonesian consumer cyclical industry, while only the 1997 Asian financial crisis is found to be significant at the five percent level.

5.5.3.4. Basic Material

Chemicals, applied resources, and mineral resources are all part of the basic material industry. Table 5.16 provides an overview of the basic material findings in each of the ASEAN-4 countries.

Table 5.16: The Determinants of Systematic Risk in the Basic Material Industry

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	0.00020**	0.000053	0.000154	0.00008**
	(2.52)	(0.27)	(0.49)	(2.02)
Liquidity	0.000559**	0.000465	0.010441**	-0.000910
	(2.48)	(1.40)	(2.59)	(-0.86)
Profitability	-0.00047***	-0.000170	0.000087	0.000072
	(-2.50)	(-0.93)	(0.10)	(0.76)
Firm Size	0.000676	0.003031*	0.006625	0.000361

	(0.49)	(1.71)	(1.55)	(0.36)
Firm growth	-0.000053	-0.001407	0.00355*	0.000078
	(-0.54)	(-1.30)	(1.80)	(1.27)
Operating efficiency	-0.001568	0.014709**	0.011060	0.004472
	(-0.58)	(2.48)	(1.63)	(1.31)
Financial crisis 1997	0.012497**	0.024073**	0.074937**	-0.000425
	(3.13)	(3.35)	(3.21)	(-0.08)
Financial crisis 2008	0.006960**	0.013493*	0.043563**	0.003960*
	(2.12)	(1.72)	(2.88)	(1.81)
GDP	-0.001020**	0.000131	0.000533	0.000642
	(-2.29)	(0.10)	(0.36)	(1.24)

Note. *, **, *** Significance levels of 10%, 5%, and 1% are indicated, with t-statistics displayed in parentheses. The complete datasets for the basic materials industries in Thailand, Indonesia, Malaysia, and Singapore can be found in Table 5.10(d) [Appendix D], Table 5.11(d) [Appendix E], Table 5.12(d) [Appendix F], and Table 5.13(d) [Appendix G], accordingly.

At a five percent significant level, financial leverage and liquidity have a positive correlation with systematic risk in Malaysia's basic materials sector. At the one percent significant level, systematic risk also has a negative relationship with GDP and profitability. In Indonesia's basic material industry, financial leverage has also been found to have a positive relationship with systematic risk.

Only the sign of firm size is consistent with the expected relationship of this study, but both firm size and, in Singapore's basic materials sector, higher operating efficiency have been found to correspond with an increase in systematic risk. Furthermore, this study discovered that, in the Thai basic material industry, systematic risk is positively correlated with both firm growth and liquidity, while firm

growth is only marginally significant at the ten percent level.

The consumer cyclical industries in Singapore and Thailand, like the Malaysian basic material industry, demonstrated a positive correlation between systematic risk and both the 1997 Asian financial crisis and the 2008 global financial crisis. However, the 2008 global financial crisis had a marginally significant impact on the Singaporean basic material industry at the ten percent level. The results regarding the basic material industry in Indonesia are comparable to this.

5.5.3.5. Technology

IT services, software, and equipment are all part of the technology sector. Table 5.17 gives an overview of the technological developments in each of the ASEAN-4 countries.

Table 5.17: The Determinants of Systematic Risk in the Technology Industry

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	0.000067*	0.000005	0.000159	-0.000142
	(1.72)	(0.07)	(0.33)	(-1.25)
Liquidity	-0.000025	-0.000082	0.001626	-0.000079
	(-0.18)	(-0.36)	(0.69)	(-0.72)
Profitability	-0.000141**	-0.000074	-0.003043**	0.000057
	(-2.59)	(-1.25)	(-3.08)	(0.77)
Firm Size	-0.001834	0.002928**	0.004259	0.003961
	(-1.62)	(2.26)	(0.87)	(1.42)
Firm growth	-0.000221**	-0.000126	0.000076	0.000071*
	-(2.61)	-(1.11)	(0.08)	(1.79)

Operating efficiency	0.002516	-0.000144	0.012258	0.002655**
	(1.35)	(-0.08)	(0.82)	(2.15)
Financial crisis 1997	0.015126***	0.010026***	0.104766***	0.008422
	(4.35)	(4.08)	(4.12)	(0.70)
Financial crisis 2008	0.006164**	0.009270***	0.059875***	-0.001610
	(2.33)	(3.59)	(3.79)	-(0.18)
GDP	-0.000715	-0.000184	0.005615**	-0.001045
	(-1.35)	(-0.53)	(3.03)	(-1.10)

Notes. *, **, *** Significance levels of 10%, 5%, and 1% are indicated, with T-statistics shown in parentheses. The complete dataset for the technology industries in Thailand, Indonesia, Malaysia, and Singapore can be found in Tables 5.10(e) in Appendix D, 5.11(e) in Appendix E, 5.12(e) in Appendix F, and 5.13(e) in Appendix G, accordingly.

Considering the outcomes, financial leverage has a positive relationship with systematic risk at the ten percent significant level, profitability and firm growth show a significant negative relationship with systematic risk at the 5% significance level in the Malaysian technology industry. Profitability is also found to be strongly impacted by systematic risk in the Thai technology sector.

In the Singaporean technology sector, firm size has a positive and significant relationship with systematic risk at the five percent level, in addition to the Malaysian and Thai technology sectors. In the Indonesian technology sector, systematic risk is positively correlated with firm growth and operating efficiency. Nevertheless, firm growth demonstrates only a weak level of significance at the 10% threshold, and the direction of operating efficiency contradicts the expected outcome proposed in the hypothesis.

Similar to the findings on the consumer cyclical industry, systematic risk in the

technology sectors of Malaysia, Singapore, and Thailand is positively and significantly correlated with The Asian financial crisis of 1997 and the global financial downturn of 2008, excluding firm-specific factors. None of the firm-specific factors are substantially correlated with systematic risk in the technology sector, although every nation has discovered a relationship between firm-specific factors and systematic risk. Additionally, this study found that, in the technology sector, only Thailand showed a significant positive correlation between GDP and systematic risk at the five percent level.

5.5.3.6. The Energy

Fossil and renewable energy make up the energy sector. Table 5.18 summarizes the energy-related findings for each of the ASEAN-4 nations.

Table 5.18: The Determinants of Systematic Risk in the Energy Industry

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	-0.002231	-0.000040	0.001059*	0.000124
	(-1.61)	(-0.46)	(2.03)	(1.03)
Liquidity	0.000639**	0.000233*	0.000811	-0.000352
	(2.49)	(1.75)	(2.26)	(-0.86)
Profitability	-0.002636**	-0.000114	0.001025	0.000754
	(-2.44)	(-0.89)	(1.11)	(0.97)
Firm Size	0.021716**	0.004530**	-0.006401	-0.005430
	(2.44)	(2.01)	(-1.61)	(-0.94)
Firm growth	-0.000263	-0.000108*	-0.002191	0.000714
	(-1.05)	(-1.67)	(-1.29)	(0.63)

Operating efficiency	0.015025	0.001690	-0.003265	-0.015668
	(1.15)	(1.27)	(-0.93)	-(0.95)
Financial crisis 1997	0.031469	0.016112**	0.098515**	-0.554559
	(1.02)	(2.33)	(3.72)	(-1.23)
Financial crisis 2008	0.005631	0.005227	0.075677***	0.103873
	(0.14)	(0.47)	(4.49)	(0.99)
GDP	-0.007862**	0.000194	0.004797**	-0.000521
	(-2.06)	(0.23)	(2.18)	(-0.17)

Note. *, **, *** Significance levels are marked at 10%, 5%, and 1%, respectively, with t-statistics in parentheses. The complete dataset for the energy sectors in the details for Indonesia, Singapore, Thailand, and Malaysia are provided as presented in Tables 5.10(f) through 5.14(f) located in Appendices D to H, accordingly.

Several factors, including profitability, liquidity, firm size, and GDP, are reported to significantly determine the systematic risk in the Malaysian energy sector and support the study's hypothesis. It is evident that, like the Malaysian energy sector, the Singaporean energy sector's firm size and liquidity were found to be positively correlated with systematic risk. At the ten percent level, liquidity is only slightly significant, though. At a ten percent significance level, firm growth is inversely correlated with systematic risk, aside from liquidity, but its direction deviates from the study's hypothesis.

Liquidity and profitability in the Singaporean energy sector are closely linked to systematic risk. Furthermore, the Asian financial crisis of 1997 had a big effect on systematic risk. This is how the results on the energy sector in Singapore are shown.

Systematic risk in Thailand's energy sector is positively correlated with both GDP and financial leverage, although financial leverage is only slightly significant at the ten percent level. Furthermore, systematic risk has a positive and significant

relationship with both the global financial crisis of 2008 and the Asian financial crisis of 1997. Remarkably, systematic risk in the Indonesian energy sector is not substantially correlated with firm-specific factors or either of the financial crises.

5.5.3.6.1. Other Industry

There are numerous other industries, including utilities (gas, water, electricity, and multi-utilities), telecommunications services (mobile and fixed-line), and healthcare (pharmacies, medical research, and healthcare services and equipment). The findings are summarized in Table 5.19.

Table 5.19: The Determinants of Systematic Risk in the Others Industry

Independent variable	Malaysia	Singapore	Thailand	Indonesia
Financial Leverage	-0.000018	-0.000057	-0.000608**	-0.000171
	(-0.12)	(-0.48)	(-2.58)	(-1.04)
Liquidity	0.000778	-0.000808	0.006117**	-0.001686
	(0.61)	(-0.92)	(2.28)	(-0.83)
Profitability	-0.001374**	-0.000056	-0.001285**	0.000449
	(-2.93)	(-0.70)	(-2.10)	(1.51)
Firm Size	0.003038*	-0.001454	0.010548**	0.001083
	(1.73)	(-1.13)	(2.82)	(0.68)
Firm growth	0.000294	-0.000051	0.001040	-0.000995
	(1.17)	(-0.12)	(1.51)	(-0.66)
Operating efficiency	-0.017973	-0.003169	0.021826***	0.002034
	(-1.47)	(-0.57)	(3.40)	(0.55)

Financial crisis 1997	0.040803***	0.019413**	0.077028***	0.019089
	(4.19)	(3.05)	(4.12)	(1.45)
Financial crisis 2008	0.001478	-0.003664	0.052437***	0.001686
	(0.09)	(-0.51)	(4.86)	(0.24)
GDP	-0.003727**	-0.002175**	0.003838**	-0.000638
	(-3.12)	(-2.54)	(2.37)	(-0.81)

Note: Significant at 10%, 5%, and 1% are indicated by the symbols *, **, and ***. T-statistics are displayed in brackets. Refer to Table 5.10(g) in Appendix D, Table 5.11(g) in Appendix E, Table 5.12(g) in Appendix F, Table 5.13(g) in Appendix G, and Table 5.14(g) in Appendix H] contain the complete sample of Malaysian, Singaporean, Thai, and Indonesian other industries, respectively.

At a five percent significance level, systematic risk in Malaysia's other industry is negatively correlated with GDP and profitability, whereas firm size is positively correlated with systematic risk at a ten percent significance level. Furthermore, at the one percent level, the 1997 Asian financial crisis had a major effect on systematic risk. The GDP and the Asian financial crisis (1997) in Singapore's other industry are also found to be substantially similar to those in Malaysia's other industry.

At a five percent significance level, financial leverage and profitability are inversely correlated with systematic risk in Thailand's other industries. The financial leverage sign, however, contradicts the study's hypothesis. Additionally, at a five percent significance level, there is a positive correlation between systematic risk and other variables, including GDP, firm size, and liquidity. Hypotheses seven and eight are supported by the fact that the global financial crisis of 2008 and the Asian financial crisis of 1997 have a one percent significant positive correlation with systematic risk.

But Similar to the findings on Thailand's other industries, systematic risk is positively and significantly correlated with firm size and liquidity in Thailand's other industries. As a result, it validated hypotheses two and four. Furthermore, this study discovered that systematic risk in Indonesia's other industry is not substantially correlated with firm-specific factors or the financial crises of 1997 (the Asian financial crisis) or 2008

(the global financial crisis). The results in the Indonesian energy sector are comparable to this.

5.6. Concluding Remarks

This chapter essentially summarizes the outcomes of non-financial companies in ASEAN-4 countries across a range of industries. Before deciding on the best model to investigate in analyzing the association between firm-level variables and systematic risk, multiple tests were conducted in this study, including the unit root test and diagnostic tests (autocorrelation, heteroskedasticity, and multicollinearity). The findings showed that there was no multicollinearity issue and that the data had a normal distribution (stationary panels). Heteroskedastic and autocorrelated problems are still present in some data sets, though. Thus, the robust standard error has been used in this study to solve these issues.

In addition to diagnostic and unit root tests, the Chow, BP-LM, and Hausman tests are used to determine which models are best suited for each set of data. There is a strong and positive relationship between systematic risk and the use of financial leverage and both the Asian financial crisis of 1997 and the global financial crisis of 2008. This is demonstrated by the full sample of non-financial companies operating within the four major ASEAN countries.

Mixed results from the non-financial firms in each of the ASEAN-4 countries showed the various factors influencing systematic risk. Singapore (profitability, firm size, both financial crises, and GDP), Malaysia (financial leverage, liquidity, profitability, both financial crises, and GDP), Thailand (financial leverage, liquidity, firm size, both financial crises, and GDP), and Indonesia (financial leverage and the global financial crisis of 2008) are a few examples. Other variables, such as firm growth of Singaporean firms and operating efficiency of the Thailand firms, it also influences systematic risk, although its direction does not align with the hypothesis proposed in this study.

Mixed results were also obtained from the findings across various industries within non-financial companies, alongside the results observed in non-financial firms within individual countries. However, only Malaysia's profitability was impacted by Thailand's two financial crises (the 1997 Asian financial crisis and the 2008 global financial crisis), which had an impact on systematic risk across all industries. The

results of the pool sample analysis, the individual country analysis, the cross-industry analysis, and the effect of both financial instability analyses which were related to the four study objectives will be discussed in the following chapter.

CHAPTER VI

DISCUSSION

6.1. Introduction

The study regarding the connection and the relationship between company-level factors and market-wide risk among non-financial firms operating in multiple sectors within the four ASEAN countries was presented in the previous chapter. This chapter reviews the results in relation to the hypotheses of the study, theoretical foundations, and existing empirical data. There are four sections to the discussion of systematic risk and firm-specific factors. The initial section discusses the results concerning how Company-level characteristics influence the market risk of non-financial enterprises throughout the four ASEAN nations. The results regarding the impact of firm-specific factors on systematic risk in each of the ASEAN-4 countries are covered in the second section. The findings are discussed in the third section with regard to the variations in firm-specific factors that influence systematic risk in each of the ASEAN-4 countries' seven industries. The impact of the Asian financial crisis of 1997 and the global financial crisis of 2008 regarding systematic risk within non-financial companies across the 4 ASEAN nations, individual nations, and across the seven industries in each nation is discussed in the concluding sections.

6.2. Firm-Specific Factors and Systematic Risk

From 1997 to 2016, this study looked at company-specific factors influencing the exposure to systematic risk experienced by non-financial firms operating in diverse sectors within four ASEAN nations. The hypotheses for the study were formulated based on existing literature; leverage, liquidity, profitability, operating efficiency, Previous research often considers firm growth and firm size as key firm-specific variables for assessing systematic risk. This research examined the impact of the global financial crisis in 2008 and the Asian financial crisis in 1997 on the systematic risk in ASEAN-4 countries in addition to firm-specific factors. The results of the pooled sample analysis, which pertains to the study's initial goal, are discussed at the beginning of this section.

6.2.1. Pooled Sample Analysis

According to this study, 4 systematic risks in ASEAN-4 non-financial firms is financial leverage. According to the trade-off theory of capital structure, firms with excessive leverage may cause financial distress and bankruptcy costs, which in turn affects the level of systematic risk (Modigliani & Miller, 1963; Jensen & Meckling, 1976; Abeywardhana, 2017). In particular, higher financial leverage raises the level of systematic risk. Additionally, the CAPM states that systematic risk—which refers to outside variables outside of a firm's control—plays a significant role in determining the expected return of businesses and influencing the market price. However, according to the theory, the only market risk that cannot be mitigated by diversification is systematic risk. This study demonstrated that a firm's level of systematic risk could be influenced by the amount of debt it has taken on. This indicates that by effectively managing their financial leverage, businesses can exert some control over the systematic risk to which they are exposed. This result is consistent with the conclusions of previous studies, including those according to Hamada (1972) and subsequent research by Mandelker & Rhee (1984), Ahmad et al. (2011), Alaghi (2013), and Ibrahim and Haron (2016), and Nizam et al. (2020). The study's first hypothesis is supported by the positive correlation found between financial leverage and systematic risk in ASEAN-4 firms.

According to reports, systematic risk has a negative and significant impact on GDP in addition to firm-specific variables. This finding is consistent with the portfolio and capital market theory, which holds that external factors like macroeconomic, socio-political, market-based, and environmental factors are the cause of systematic risk (Gitman & Zutter, 2012; Parthasarathy, 2019; Zeng & Chen, 2019; Qiu et al., 2020). According to the findings, firms can mitigate systematic risk by controlling the level of their debt, even though they cannot completely eliminate the external factors that influence it. Additionally, since a decline in economic growth is cyclical, businesses must generally develop corporate and risk management strategies to strengthen their resilience against the negative effects of the decline, which could raise their systematic risk.

The findings discussed in this section are derived from a collective observation of the four nations. Table 5.8 [see Appendix B] displays the results and conclusion covered in this section. The following section looks at the firm-specific factors that influence

systematic risk, with a particular emphasis on Malaysia, Singapore, Thailand, and Indonesia.

6.2.2. Individual Country Analysis

The analysis's first section examines how firm-specific characteristics affect systematic risk in a sample of non-financial companies in ASEAN-4 countries between 1997 and 2016. In relation to the study's second goal, this section examines the findings for the samples of each country—Malaysia, Singapore, Thailand, and Indonesia.

6.2.2.1. Malaysia

The findings indicate that the primary firm-specific factors affecting systematic risk in Malaysian non-financial firms are financial leverage, profitability, and liquidity. This suggests that the degree of systematic risk may actually be impacted by shifts in financial leverage, profitability, and liquidity. Businesses with a lot of debt, for instance, are more likely to face bankruptcy expenses; as a result, they are assumably to have a significant degree of systematic risk. This result confirms Ong et al. (2020)'s claim that Malaysian companies with high levels of financial leverage also have high levels of systematic risk.

Because they are less likely to experience financial losses and bankruptcy expenses, profitable businesses typically have low systematic risk in addition to financial leverage. This is consistent with a study by Nguyen (2019), who found that businesses have fewer opportunities to experience a loss the more they can use their assets to generate revenue. This is due to the fact that profitable businesses would be able to manage their money problems and continue making investments.

Furthermore, this study found that the agency costs of high-liquidity firms could influence the degree of systematic risk. The firm's managers may be motivated to pursue self-serving endeavors at the expense of shareholders by the free cash flow that is available. In this case, there will be more systematic risk because of the increased agency costs. Jensen (1986) and Borde (1998) found that firms with high liquidity have high agency costs, which can lead to substantial systematic risk. This aligns with their findings. This evidence supported Frutig and Das's (2020) study on hotel REITs, which discovered a positive correlation between systematic risk and liquidity.

To put it simply, systematic risk is a risk that cannot be differentiated. According to this study, firm-specific variables like financial leverage, liquidity, and profitability

can be controlled to manage systematic risk. Along with internal firm variable, this research also discovered a significant inverse association with GDP as a macroeconomic factor and systematic risk in Malaysian non-financial firms. This finding supported the theoretical claim that systematic risk is an inevitable risk resulting from external factors like market forces or macroeconomic factors (Gitman & Zutter, 2012; Parthasarathy, 2019; Zeng & Chen, 2019; Qiu et al., 2020).

6.2.2.2. Singapore

The outcome demonstrated that Singaporean firms' systematic risk is significantly influenced by their profitability. This study also found a negative link between systematic uncertainty and profitability, which corresponds to the findings on Malaysian firms. This implies that by making large profits, Malaysian and Singaporean businesses could shield themselves from a high degree of systematic risk. This finding demonstrated that Malaysian and Singaporean businesses can address the problem of systematic risk by enhancing their financial performance, particularly in terms of profitability.

In Singaporean firms, the inherent risk affecting the entire market is positively associated with the magnitude of a firm in addition to profitability. Systematic risk is typically higher in large firms than in small firms (Lee & Jang, 2007; Nguyen, 2019). Larger businesses need more capital to finance their wider range of economic activities than do small businesses (Chan et al., 2018; Diskulnetivitya, 2020; Khoa & Thai, 2021). Larger businesses make more money than small businesses, but they also incur more costs and debt. As a result, they are more impacted than small businesses by unfavorable economic conditions. Systematic risk also increases in this situation. Furthermore, the quick growth of businesses among businesses can result in intense competition and ultimately market saturation, which lowers stock prices and raises the degree of systematic risk. The impact of firm size and profitability on systematic risk in Singaporean firms is in line with research on the factors influencing systematic risk conducted by Lee and Jang (2007) and Nguyen (2019), which found a significant relationship between systematic risk and firm size and profitability.

This study demonstrated that by effectively managing their financial leverage, Singaporean companies can exert some control over the systematic risk to which they are exposed. Additionally, Singaporean firms' GDP is showed to be negatively

correlated with systematic risk, a finding that is comparable to that of Malaysian firms.

6.2.2.3. Indonesia

High levels of financial leverage in Indonesian firms are associated with high levels of systematic risk, much like in Malaysian and Thai firms. Systematic risk is not substantially correlated with other firm-specific factors like liquidity, profitability, firm size, operating efficiency, and firm growth.

This finding suggested that any shift in debt levels would have an impact on the degree of systematic risk in Indonesian non-financial companies. (Modigliani & Miller, 1963; Jensen & Meckling, 1976; Abeywardhana, 2017; Munawar, 2020) The systematic risk rises with the amount of debt. According to this research, Indonesian businesses can manage the degree of systematic risk by effectively managing their debt load, even though they cannot completely eliminate it.

6.2.2.4. Thailand

Financial leverage and systematic risk are substantially and favorably correlated, according to an analysis of Thai businesses. This result supports the claim made by the capital structure trade-off theory. According to this theory, firms' bankruptcy costs rise in tandem with their borrowing to support value-maximizing activities, thereby increasing systematic risk (Jensen & Meckling, 1976; Modigliani & Miller, 1963; Abeywardhana, 2017).

Subsequently, this study discovered that systematic risk in Thai firms is positively correlated with firm size. The results on Singaporean businesses, which showed that big businesses are riskier than small businesses, are comparable to this (Lee & Jang, 2007; Nguyen, 2019). Additionally, Thai companies with high liquidity also have high levels of systematic risk. This result suggested that managers may pursue self-serving initiatives at the expense of shareholders in companies with greater free cash flow. This could result in a conflict of interest between shareholders and managers, which would raise the level of systematic risk and cause agency cost (Jensen, 1986; Borde, 1998; Frutig and Das, 2020).

Despite being the only risk that still affects the stock price under the CAPM, systematic risk cannot be eliminated or minimized by effective diversification (Gitman & Zutter, 2012; Parthasarathy, 2019; Zeng & Chen, 2019; Qiu et al., 2020). Nonetheless, this

study demonstrated that the systematic risk in Thai businesses can vary based on changes in firm characteristics like size, liquidity, and financial leverage. This indicates that by effectively managing the firm's size, liquidity, and financial leverage, the managers of the company have some control over the systematic risk to which they are exposed.

Table 6.1: Comparative Analysis of Firm-Specific Drivers of Systematic Risk in Non-Financial Industries across ASEAN-4

	Hypotheses	**Malaysia**	**Singapore**	**Thailand**	**Indonesia**
H1	Higher financial leverage tends to increase systematic risk.	Confirmed	Rejected	Confirmed	**Confirmed**
H2	Liquidity is directly associated with systematic risk.	Confirmed	Rejected	Confirmed	Rejected
H3	Profitability is negatively linked to systematic risk.	Confirmed	Confirmed	Rejected	Rejected
H4	Larger firm size is expected to raise systematic risk.	Rejected	Confirmed	Confirmed	Rejected
H5	Business growth contributes positively to systematic risk.	Rejected	Rejected	Rejected	Rejected
H6	Greater operational efficiency reduces systematic risk.	Rejected	Rejected	Rejected	Rejected
	Controlling variables				
	GDP and systematic risk are inversely correlated.	Negatively correlated with systematic risk	Negatively correlated with systematic risk	No significant effect	No significant effect

6.2.3. The Cross-Industries Analysis

The third goal of this research, which seeks to investigate internal business factors influencing systematic risk observed across seven industrial sectors in each of the ASEAN-4 countries over a 20-year period from 1997 to 2016, is covered in this section. The industrial segment, consumer cyclical and non-cyclical, basic materials, technology, energy, and other industrial sectors are among the seven industries.

Transportation, industrial conglomerates, industrial and commercial services, and industrial goods are all included in the industrial segment. Retail sales of food and beverages, household and personal goods, and services are examples of consumer non-cyclicals. Cars and auto parts, cyclical consumer goods, cyclical consumer service, and retailers are all included in the consumer cyclical. Chemicals, applied resources, and mineral resources are examples of basic materials. Technology encompasses software, hardware, and IT services. Both fossil fuels and renewable energy are considered forms of energy. Other industries include telecommunications services (mobile and fixed-line), utilities (gas, water, electricity, and multi-utilities), and healthcare (pharmacies, medical research, and healthcare services and equipment).

The following discussions of systematic risk and firm-specific factors in ASEAN-4 countries are broken down into seven sections based on the various industries. The first section examines how firm-specific factors affect systematic risk in the ASEAN-4 country's industrial segment. This is followed by consumer cyclical and non-cyclical risk, basic materials, technology, energy, and other industries.

6.2.3.1. Industrial Segment

The outcome demonstrates that, in the Malaysian industrial segment, systematic risk is solely determined by profitability. According to this finding, because they are less vulnerable to bankruptcy expenses, Malaysian industrial companies with high profitability have lower systematic risk (Logue & Merville, 1972; Scherrer & Mathison, 1996; Borde, 1998; Gu & Kim, 2002; Lee & Jang, 2007; Rowe & Kim, 2010; Nizam et al., 2020). Therefore, by improving their financial performance in terms of managing the profitability level, Malaysian industrial firms like Amcorp Properties, Kian Joo Can Factory, Bright Packaging IND, Tomypak Holdings, Box-Pak (Malaysia), Globaltec Formation, Master-Pack Group, and others can benefit from lower systematic risk.

Financial leverage and liquidity have a major impact on systematic risk in the Thai industrial sector. Specifically, financial leverage increases as Thai industrial firms borrow more money. Over time, a high level of debt may lead to financial distress and increased systematic risk due to the increased obligations for debt and interest repayment (Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan, & Ceschini, 2007; Eldomiaty, 2009; Alaghi, 2013; Chen, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020).

Furthermore, there is typically more systematic risk associated with high liquidity for Thai industrial firms. This finding suggested that managers may be encouraged to take on new projects based on their interests when free cash flow is available. This will raise the agency cost and the degree of systematic risk by creating a misalignment of objectives between corporate executives and the owners of the firm, as discussed by Jensen (1986; Borde, 1998; Kim et al., 2007; Frutig and Das, 2020). According to this study, as long as financial leverage and liquidity are properly managed, the degree of systematic risk in Thai industrial companies like Bangkok Motorway, BGK Aviation Fuel SVS, Begistics ORS, Airports of Thailand, Thoresen Thai AG, Precious Shipping, and others can be kept under control.

Additionally, Indonesian high-liquidity firms tend to have higher systematic risk, much like Thai industrial firms. This indicates that by effectively managing their liquidity, Indonesian businesses can also exert some control over the systematic risk to which they are exposed. As a result, firm-specific factors have influenced the systematic risk in the industrial segment of certain ASEAN-4 countries exclusively; this could be because of the unique characteristics of each country.

In addition to the firm-specific factors previously discussed, the study's control variable, GDP, is said to have a significant impact on systematic risk in the industrial segments of Malaysia, Singapore, and Indonesia. It is evident that both internal and external factors have an impact on the industrial segments of Malaysia and Indonesia. This indicates that while industrial companies in these two nations are unable to completely prevent systematic risk exposure because of outside influences, they are able to manage it to a certain degree. This can be achieved by guaranteeing the low liquidity of Indonesian industrial firms and the high profitability of Malaysian industrial firms.

6.2.3.2. Consumer Non-Cyclical

Profitability and firm size are the two primary firm-specific factors influencing systematic risk in Malaysia's consumer non-cyclical industry. Because they can control their debt and expenses, Malaysian consumer non-cyclical firms with high profitability would have low systematic risk (Logue & Merville, 1972; Scherrer & Mathison, 1996; Borde, 1998; Gu & Kim, 2002; Lee & Jang, 2007; Rowe & Kim, 2010; Nizam et al., 2020). This means that any change in firm size and profitability could also affect the level of systematic risk.

Furthermore, big businesses in Malaysia's non-cyclical consumer sector typically face greater systematic risk than small businesses. Larger businesses engage in more economic activity than smaller ones, and in order to finance these activities, they would require more capital. Even though they would make more money than the small businesses, they might also have more debt and expenses. They are therefore more impacted than small businesses by unfavorable economic conditions. Systematic risk also increases in this situation. Additionally, the quick growth of businesses among businesses can result in intense competition and ultimately market saturation, which lowers stock prices and raises the degree of systematic risk. As demonstrated by this study, companies operating in Malaysia's consumer non-cyclical sector (such as NPC Resources, MHC Plantations, PWF Consolidated, Huat Lai Resources, Three-A RES, and Oriental Food INDS.HDG) can manage the degree of systematic risk by optimizing their profits and taking firm size into consideration.

The only firm-specific factor influencing systematic risk in Thailand's consumer non-cyclical industry is financial leverage. Systematic risk rises with increased financial leverage. This is consistent with the trade-off theory, which holds that firms are exposed to high levels of systematic risk when they have excessive leverage because of the interest rates and economic conditions (Modigliani & Miller, 1963; Jensen & Meckling, 1976; Abeywardhana, 2017). By reducing their financial leverage, companies in Thailand's consumer non-cyclical sector (such as Thai Vegetable Oil, Siam Food Products, Thai Wah Starch, Thai President Foods, Khonburi Sugar, Charoen Pokphand Foods, and President Rice Products) can also manage the degree of systematic risk, according to this study.

None of these firm-specific factors are found to determine the systematic risk in a

similar industry for Singapore and Indonesia, despite the fact that some firm-related factors affect systematic risk exposure within the consumer non-cyclical sector of Malaysian industries and Thai industries. This outcome is consistent with research by Aruna and Warokka (2013) that looked at how firm-characteristic factors affected systematic risk in manufacturing companies in Indonesia. According to the study, the systematic risk was not significantly impacted by any of their firm-characteristic factors. This indicates that systematic risk in the consumer non-cyclical industry of certain countries has only been impacted by firm-specific factors.

In addition to firm-specific factors, systematic risk is associated with GDP in Malaysia's consumer non-cyclical industry. This indicates that the systematic risk in Malaysian consumer non-cyclical firms is influenced by both internal and external factors. This suggests that while firms may not be able to completely prevent the impact of externally driven systematic risk, they can exert some degree of control over the systematic risk they are exposed to by managing internal factors, such as firm size and profitability.

6.2.3.3. Consumer Cyclical

Liquidity and profitability are the two primary specific factors influencing systematic risk in the Malaysian consumer cyclical industry; low profitability and high firm liquidity raise systematic risk. While high profitability of firms reduced systematic risk (Logue & Merville, 1972; Scherrer & Mathison, 1996; Borde, 1998; Gu & Kim, 2002; Lee & Jang, 2007; Rowe & Kim, 2010; Nizam et al., 2020), firms with high liquidity may face agency conflict between firm managers and shareholders, which increases agency cost and affects systematic risk (Jensen, 1986; Borde, 1998; Kim et al., 2007; and Frutig & Das, 2020). According to this study, Malaysian consumer cyclical companies like Petronas Dagangan, Berjaya, APFT, Malayan United INDS, Boustead Holdings, Atlan Holdings, MESB, and others can manage systematic risk by increasing profits and decreasing liquidity, even though they cannot completely eliminate it.

This indicates that by enhancing their financial performance to generate high profit, Malaysian consumer cyclical companies (such as Phoenix Petroleum, Far Eastern UVTY, Centro Escolar UVTY, Robinsons Retail HDG, SSI Group, and Golden Bria) have some control over the systematic risk to which they are exposed.

Leverage is the only firm-specific factor influencing systematic risk in the Thai consumer cyclical industry. Firms with a high level of financial leverage would have a high level of systematic risk, which is similar to the findings on the non-cyclical Thai consumer industry (Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan, & Ceschini, 2007; Eldomiaty, 2009; Alaghi, 2013; Chen, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020). This study demonstrated that by lowering their debt levels, Thai consumer cyclical companies like Siam Pan Group, Jubilee Enterprise, Saha Pathanapibul, SMC Power, BOUTIQUE New City, Inter Far East ENGR, and others can also prevent intensified systematic risk.

Undiversifiable risk is unaffected by firm-specific factors in the consumer cyclical industries of Indonesia and Singapore. This outcome is comparable to the conclusions drawn from the non-cyclical consumer sector. In addition to firm-specific factors, systematic risk in Malaysia's consumer cyclical industry is correlated with GDP (a macro factor); this indicates that both internal and external factors are significant determinants of systematic risk in Malaysian consumer cyclical firms.

6.2.3.4. Basic Material

The primary specific factors influencing systematic risk in the Malaysian basic material industry are profitability, liquidity, and financial leverage. Higher levels of leverage and liquidity are typically associated with higher levels of systematic risk. However, by being highly profitable, these companies can reduce the amount of systematic risk they face. An increased amount of market risk would also affect them by businesses with low profitability since they would not be able to manage their debt and expenses for an extended period of time (Logue & Merville, 1972; Scherrer & Mathison, 1996; Borde, 1998; Gu & Kim, 2002; Lee & Jang, 2007; Rowe & Kim, 2010; Nizam et al., 2020). As long as they make sure that their debt and liquidity are kept to a minimum and their profit is maximized, this study demonstrated that Malaysian basic material companies, including Ancon, Slp Resources, Luxchem, Central Industrial, Nylex (Malaysia), Fibon, Samchem Holdings, Halex Holding, and others, can avoid a high degree of systematic risk.

(Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan, & Ceschini, 2007; Eldomiaty, 2009; Chen, 2013; Alaghi, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020). Malaysian basic material companies that have a

lot of financial leverage also typically have a lot of systematic risk. This indicates that by managing their financial leverage, Indonesian basic material companies can exert some degree of control over the systematic risk to which they are exposed.

Liquidity and firm growth are key factors in determining systematic risk in the Thai basic material industry. The problem of agent conflict between shareholders and firm managers would arise due to the firm's high liquidity, which raises the level of systematic risk (Jensen, 1986; Borde, 1998; Kim et al., 2007; and Frutig and Das, 2020). Furthermore, rapid company growth may result in a high degree of systematic risk since there may not be enough resources to meet the market's high demand. According to this study, Thai basic material companies (like Unique Mining Service, Banpu, Thai Capital, Asia Green Energy, Tongkah Harbour, and Sahakol Equipment) can reduce the level of systematic risk by controlling internal factors like liquidity and firm growth, even though they cannot completely eliminate systematic risk, which is caused by external factors.

Systematic risk in Singapore's basic materials industry is largely determined by firm size. This indicates that because of their high debt and expenses, large companies are more prone to systematic risk than small ones. Even though they make more money than small businesses, large businesses are more vulnerable to changes in the market, such as a drop in product demand, which could be caused by intense competition among businesses or market saturation. As a result, they face a higher level of systematic risk (Daves & Ehrhardt, 1999; Hasnawati, 2020). According to this study, firm size has an impact on the degree of systematic risk faced by companies in Singapore's basic material sector, including CNMC Goldmine Holding, Sakari Resources (OTC), GEO Energy Resources, Alliance Mineral Assets, Asiaphos, GCCP Resources, Anchor Resources, and others. These businesses should therefore be conscious of this effect. GDP is said to have a major impact on systematic risk in Malaysian basic material firms exclusively, aside from firm-specific factors.

6.2.3.5. Technology

Financial leverage and profitability are firm-specific factors that impact systematic risk in the Malaysian technology sector. Their systematic risk would be high because companies with high debt and low profitability are more likely to experience financial distress or bankruptcy costs (Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan,

& Ceschini, 2007; Eldomiaty, 2009; Chen, 2013; Alaghi, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020). This study demonstrated how Malaysian technology companies can effectively handle systematic risk exposure while managing their debt levels and profitability. Similarly, it is discovered that in the Thai technology sector, profitability has a major impact on systematic risk.

The only firm-specific factor influencing systematic risk in the Singaporean technology sector is firm size. The results regarding the basic material industry in Singapore are comparable to this. In the Indonesian technology sector, systematic risk has a positive correlation with firm growth. High systematic risk is more likely to be present in businesses that grow quickly (Borde, 1998; Kim et al., 2002; Roh, 2002; Biase & Apolito, 2012; Nizam et al., 2020). Rapidly growing businesses would require more resources to sustain their operations; the combination of limited resources and high market demand could result in a shortage of resources, raising the level of systematic risk. This study demonstrated that by managing their company growth, Indonesian technology companies like Metrodata Electronics, Trikomsel OKE, Elang Mahkota Teknologi, Skybee, Tower Bersama INFR, Tiphone Mobile Indonesia, Link Net PT, and others can shield themselves from a high degree of systematic risk.

6.2.3.6. Energy

Liquidity and firm size are firm-specific factors that impact systematic risk in the energy sector of Singapore. Systematic risk would be high for companies with a lot of liquidity (Jensen, 1986; Borde, 1998; Kim et al., 2007; and Frutig and Das, 2020). Furthermore, because they have more debt and expenses, large companies are riskier than small ones. They are therefore more impacted than small businesses by unfavorable economic conditions. Rapid firm-to-firm expansion can also result in intense competition and, ultimately, market saturation, which lowers stock prices. Larger companies would therefore be more prone to systematic risk than smaller ones.

Systematic risk also has a major impact on liquidity and profitability in the Malaysian energy sector. Furthermore, both the findings on the Singaporean energy industry and firm size report a significant impact on systematic risk. In addition to firm-specific factors, systematic risk has a negative relationship with GDP. According to this study, Malaysian energy companies (such as Hibiscus Petroleum, Hengyuan Refining Company, Gas Malaysia, Reach Energy, and Cliq Energy) have some control over the

systematic risk to which they are exposed, namely by lowering their liquidity and making large profits. It also examined the relationship between firm size and systematic risk.

Only financial leverage is thought to be the primary specific factor influencing systematic risk in the Thai energy sector. (Tandelilin, 1997; Brimble & Hodgson, 2007; Kim, Ryan, & Ceschini, 2007; Eldomiaty, 2009; Chen, 2013; Alaghi, 2013; Ibrahim & Haron, 2016; Khasawneh & Dasouqi, 2017; Nizam et al., 2020) Companies with a lot of financial leverage would have a lot of systematic risk. Financial leverage should therefore be properly managed by Thai energy companies like Thai Oil, PTT Exploration and PRDN, Esso Thailand, Siamgas and Petrochem, Susco, Demeter Corporation, Sea Oil, PTG Energy, and others.

Indonesia revealed that firm-specific factors did not significantly determine the systematic risk in the energy industry, despite the fact that every country demonstrated at least one firm-specific factor affecting systematic risk.

6.2.3.7. Other Industry

Profitability and firm size are the firm-specific factors influencing systematic risk in Malaysia's other industries, whereas liquidity, profitability, along with company size, are internal factors that impact systematic risk within Thailand's other industries. It is evident that certain firm-specific characteristics, like firm size and profitability, are constant across Malaysian and Thai industries. (Logue & Merville, 1972; Scherrer & Mathison, 1996; Borde, 1998; Gu & Kim, 2002; Lee & Jang, 2007; Rowe & Kim, 2010; Nizam et al., 2020) Businesses that make a lot of money may also have low levels of systematic risk. On the other hand, according to Jensen (1986), Borde (1998), Kim et al. (2007), and Frutig and Das (2020), large firms typically have higher systematic risk than small firms.

According to this study, Thai and Malaysian businesses in other sectors are able to shield themselves from the high degree of systematic risk. This may be accomplished by improving financial performance to yield significant profits and by gaining insight into the influence of firm size on systematic risk. Furthermore, in Thailand's other industries, liquidity is thought to be the primary specific factor influencing systematic risk. Therefore, Thai companies like TT and T, SYMPHONY Communication, Thai NAKARIN Hospital, Thai Optical Group, THONBIRI Medical Centre, and others

should make sure that liquidity is properly managed in addition to controlling profitability and firm size to address the issue of systematic risk.

Systematic risk and firm-specific factors are unrelated in Singapore's and Indonesia's other industries. The results on the consumer cyclical industries in Indonesia and Singapore are comparable. In addition to firm-specific factors, systematic risk and GDP are strongly correlated in Malaysia's and Singapore's other industries. This suggested that there is little systematic risk associated with the high GDP.

Table 6.2: Comparative Analysis of Company Characteristics Affecting Systematic Risk across Industries in ASEAN-4 Countries

Parameters	**ASEAN-4 Country**			
	Malaysian firms		**Singaporean firms**	
	Variable	**Hypothesis**	**Variable**	**Hypothesis**
Industrial	Profitability GDP	Supported	GDP	Supported
Consumer noncyclical	Profitability Firm size GDP	Supported	All firm Specific Factors	Not supported
Consumer Cyclical	Liquidity Profitability GDP	Supported	All firm Specific Factors	Not supported
Basic Material	Leverage Liquidity Profitability GDP	Supported	Firm Size	Supported
Technology	leverage Profitability	Supported	Firm Size	Supported

Energy	Liquidity Profitability Firm size GDP	Supported	Liquidity Firm size	Supported

Parameters	**Country**			
	Thailand		**Indonesia**	
	Variable	**Hypothesis**	**Variable**	**Hypothesis**
Industrial	Leverage Liquidity	Supported	Liquidity GDP	Supported
Consumer noncyclical	Leverage	Supported	All firm specific factors	Not supported
Consumer Cyclical	Leverage	Supported	All firm specific factors	Not supported
Basic Material	Liquidity Firm growth	Supported	Leverage	Supported
Technology	profitability	Supported	Firm Growth	Supported
Energy	Leverage	Supported	All firm- specific factors	Not supported

Note. "Variable" is the name of firm-specific factors affecting systematic risk "supported/not supported" is the findings support/not support the predicted association between internal firm characteristics and systematic risk examined in this research (Refered to the development of hypothesis, Table 5.11).

6.2.4. The Financial Crises and Systematic Risk

Examining the effects of the Asian financial crisis of 1997 and the global financial crisis of 2008 on this study primarily focuses on the systematic risk faced by non-financial companies within the ASEAN-4 region, with the findings presented in Table 6.3 below.

Table 6.3: Summary of Findings on the Impact of the 1997 Asian Financial Crisis and 2008 Global Financial Crisis on Systematic Risk in Non-Financial Firms Across Selected Industries in ASEAN-4 Countries.

	Malaysia	**Singapore**	**Thailand**	**Indonesia**	**ASEAN-4**
Non-financial firms	Crisis 1997	Crisis 1997	Crisis 1997	-	Crisis 1997
	Crisis 2008	Crisis 2008	Crisis 2008	Crisis 2008	Crisis 2008
Industrial	Crisis 1997	Crisis 1997	Crisis 1997	Crisis 1997	
	Crisis 2008	-	Crisis 2008	-	
Consumer non-cyclical	Crisis 1997	Crisis 1997	Crisis 1997	Crisis 1997	
	Crisis 2008	-	Crisis 2008	-	
Consumer cyclical	Crisis 1997	Crisis 1997	Crisis 1997	-	
	Crisis 2008	Crisis 2008	Crisis 2008	Crisis 2008	

Basic material	Crisis 1997	Crisis 1997	Crisis 1997	-
	Crisis 2008	Crisis 2008	Crisis 2008	Crisis 2008
Technology	Crisis 1997	Crisis 1997	Crisis 1997	-
	Crisis 2008	Crisis 2008	Crisis 2008	-
energy	-	Crisis 1997	Crisis 1997	-
	-	-	Crisis 2008	-
Others	Crisis 1997	Crisis 1997	Crisis 1997	-
	-	-	Crisis 2008	-

Note. Column and row that blank (-) mean there is no impact of the 1997 Asian financial crisis and 2008 global financial crisis on systematic risk. However, if there is an effect of the impact of the 1997 Asian financial crisis and the 2008 global economic collapse on systemic risk, it showed in the column and row of each industry and country as well as overall ASEAN-4 region.

The 1997 Asian financial crisis and the 2008 global financial crisis had a major influence on According to Table 6.3, the systematic risk present in non-financial companies within the ASEAN-4 region, which presents a summary of the findings related to financial crises and systematic risk. In addition to ASEAN-4 companies, Malaysia, Singapore, and Thailand's non-financial firms also showed a strong correlation between systematic risk and the 1997 Asian financial crisis,

whereas Indonesia showed no effect at all. Interestingly, the 1997 Asian financial crisis had a major impact on certain industries in Indonesia even though it had nothing to do with systematic risk in non-financial companies there. This suggests that the Asian financial crisis of 1997 only had an impact on the way systematic risk behaved in a few chosen industries. Results from Indonesian non-financial companies show that rather than generalizing all industries as representing a nation, there is a clear need to give industrial variation more weight. After conducting a general analysis, this study found no impact. However, when specific industries were examined separately, some effects of the crisis were found. For instance, the 1997 Asian financial crisis had an impact on Indonesia's consumer cyclical, consumer non-cyclical, and industrial sectors. Amid the crisis, Indonesia exhibited elevated systemic risk within the industrial and non-cyclical consumer industries. The nation's dependence on imported goods, particularly food items like cereals, wheat, corn, food grains, rice, fruits and vegetables, meat, dairy, and so forth, may be the cause of this. Domestic consumption and food security in Indonesia will be significantly impacted by any shift in the global price of these commodities or a failure in global production (Tambunan, 2010).

The study's seventh hypothesis is supported by the fact that Thailand and Singapore demonstrate a notable influence of the Asian financial crisis (1997) on systematic risk across a range of industries. The results of the crisis dummy variable (1997) show that, despite the fact that firm-specific variables are not consistent across all industries in Singapore and Thailand, all of these industries experienced a high degree of systematic risk during the 1997 Asian financial crisis. Without a doubt, during the 1997 Asian financial crisis, there was a high degree of systematic risk in every Thai industry. This is because Thailand was where the 1997 Asian financial crisis began, so the impact would be more pronounced there. As demonstrated by the 1997 Asian financial crisis, which began in Thailand before spreading to Indonesia, Malaysia, and other ASEAN-4 nations, there may be a significant correlation between systematic risk in certain industries of other nations and the fact that they are integrated as an economic group, meaning that problems in one country may also affect other members of the group (Jeon, 2015; Sayaseng, 2020).

The 2008 worldwide economic downturn had a notable impact on non-financial companies in the ASEAN-4 nations, aside from the 1997 Asian financial crisis. Surprisingly, Thailand's findings showing the global financial turmoil of 2008 altered

systematic risk across the entire range of industries, whereas other nations only found significant relationships in a few specific industries. This result was consistent with some earlier research and supported hypothesis eight of this study (Loviscek & Riley, 2013; Abubakr et al., 2020).

Based on the findings summarized, this study can conclude that, between 1997 and 2016, the existence of each financial crisis had an impact on the behavior of systematic risk in that country alone, within ASEAN-4. This implies that during the financial crisis, not every industry will experience a high degree of systematic risk. Depending on the specifics of each industry, some may continue to function effectively in order to sustain their profitability and control the degree of risk during the financial crisis.

Because it had already gone through a financial crisis prior to the Asian financial crisis in 1997 and the global financial crisis in 2008, Indonesia may be more resilient to the effects of financial crises. As a result, it has taken steps to strengthen its domestic financial system. Exchange rate disruptions had a relatively significant negative impact on Indonesia prior to the crises, resulting in relatively low prices for exports of electronics and a variety of other commodities. By exporting goods, Indonesia was able to significantly reduce its current account deficit without reducing imports, protecting the level of domestic output in the process. Because its financial system was in better shape than other countries', Indonesia fared better during the crises than its neighbors (Noland, 2000).

6.3. Concluding Remarks

Based on the results' discussion in relation to this chapter's primary goals. This study demonstrated that firm-specific factors can also have an impact on systematic risk. However, systematic risk—which arises from external factors like market-based factors, political issues, environmental factors, and macroeconomic factors—cannot be avoided by businesses. However, by controlling their internal factors, businesses can manage systematic risk exposure. According to this study, each ASEAN-4 country has distinct firm-specific factors in each industry, which may be because their business sectors differ. While the majority of Indonesian industries are more resilient to the effects of financial crises, this study also shows how systematic risk was affected by a range of Malaysian industries experienced the effects of the 1997 Asian financial turmoil and the 2008 global economic crisis, Singapore, and Thailand. The conclusion,

contribution, and further research will be covered in the following chapter.

CHAPTER VII

CONCLUSIONS, CONTRIBUTIONS, AND FUTURE RESEARCH

7.1. Introduction

The research background, problem statements, objectives and questions, data analysis, and results are all connected in this chapter, which wraps up the study. It is anticipated that this chapter's insightful conclusions and discussions will give academics and literature, policymakers, business and firm managers, and investors in general relevant information. This chapter is organized into three parts: key contributions, directions for future research, and an overview of the study's results.

7.2. The Summary of The Research Findings

Because unsystematic risk can be eliminated through portfolio diversification, the Capital Asset Pricing Model (CAPM) primarily accounts for systematic risk when assessing expected returns states that systematic risk is the only type of risk that remains inherent in a stock, even after diversification, as it is influenced by broader market factors. This non-diversifiable risk arises from external factors like market-based factors, environmental factors, socio-political issues, and macroeconomic factors. With reference to the findings, this study demonstrates that internal (firm-specific) factors can also affect the behavior of systematic risk in addition to external factors. This is in line with earlier research. (Hamada, 1972; William & James, 1975; Bowman, 1979; Mandelker & Rhee, 1984; Borde, 1998; Kim, Gu & Mattila, 2002; Lee & Jang, 2007; Alaghi, 2013; Ibrahim & Haron, 2016; Nawaz et al., 2017; Jung et al., 2018; Nguyen, 2019; Fahad et al., 2020; Nizam et al., 2020—all support this.

According to this study, the primary firm-specific factor influencing systematic risk in ASEAN-4 non-financial firms is financial leverage. In non-financial companies in Malaysia, Thailand, and Indonesia, financial leverage is also positively correlated with systematic risk. In addition to financial leverage, other firm-specific factors are said to be the primary determinants of systematic risk. For instance, there is a positive correlation between systematic risk and the liquidity of Malaysian and Thai firms, a negative correlation between systematic risk and the profitability of Malaysian and

Singaporean firms, and a positive correlation between systematic risk and the firm size of Singaporean and Thai firms.

This study also shows how firm-specific factors affect systematic risk in seven ASEAN-4 countries' industries. Financial leverage (basic material and technology), liquidity (consumer cyclical, basic material, and energy), profitability (across seven industries), and firm size (consumer non-cyclical, energy, and other industries) are the primary specific factors in Malaysian industries. Liquidity (energy) and firm size (basic material, technology, and energy) are the primary specific factors in Singaporean industries. Financial leverage (industrial, non-cyclical consumer goods, Cyclical consumer goods and energy), liquidity (primary commodities and other industry), profitability (technology and other industry), firm size (other industry), and firm growth (basic material) are the primary specific factors in Thai industries. Financial leverage (basic material), industrial liquidity, and firm growth (technology) are all prevalent in Indonesian industries.

The paragraph above makes clear that the primary specific factors influencing systematic risk vary by ASEAN-4 country and industry. This study comes to the conclusion that firm-specific factors influencing systematic risk may vary depending on the industry in each country. As a result, developing a strategy to address systematic risk may vary depending on the firm-specific elements of each nation and industry. If firms make sure that their firm-specific factors are properly managed, they typically have some control over the systematic risk to which they are exposed.

This study examines the impact of the global 2008 financial crisis and the 1997 Asian financial crisis on systematic risk in non-financial firms in ASEAN-4 nations, Malaysia, Singapore, and Thailand, as well as across seven industries in Thailand, excluding firm-specific factors. Some industries in Malaysia (industrial, consumer noncyclical, consumer cyclical, basic material, and technology) and Singapore (consumer cyclical, basic material, and technology) have also been impacted by both financial crises. Nonetheless, some sectors and nations only show how systematic risk was impacted by the Asian financial crisis of 1997. For instance, the industries of Malaysia and Singapore, the energy and consumer non-cyclical industries of Singapore, the industrial and consumer non-cyclical industries of Indonesia, and the industrial sector of Singapore. In the meantime, Indonesian non-financial companies, Indonesian consumer cyclical industry, and Indonesian basic industry are all affected

by the global financial crisis of 2008.

According to this study, not all industries experienced high levels of systematic risk during the global financial crisis of 2008 or the Asian financial crisis of 1997. This suggests that rather than generalizing all industries to represent a country, there is a strong need to give industrial variation more weight. However, when specific industries were examined separately, some effects of the crisis were found.

7.3. The Contributions

An examination of firm-specific determinants of systematic risk among non-financial companies in the 4 ASEAN industries over a 20-year period, from 1997 to 2016, is the aim of this study. Malaysia, Singapore, Indonesia, and Thailand make up the ASEAN-4, an emerging market. There are four goals objectives for this study. This research mainly aims to explore how internal company characteristics influence systematic risk among non-financial companies operating within the 4 ASEAN countries. A secondary aim is to identify and analyze these factors across the member nations to understand potential differences or similarities in their impact. Examining possible industry variations in the firm-specific elements influencing systematic risk in ASEAN-4 countries is the third objectives. The final objective is to investigate how the global financial crisis of 2008 and the Asian financial crisis of 1997 affected the systematic risk of non-financial companies in a few chosen industries in the ASEAN-4 countries.

Among the seven industries are basic materials, technology, energy, consumer cyclical and non-cyclical, and industrial. Financial leverage, liquidity, profitability, operating efficiency, firm size, and firm growth are the firm-specific factors that are included in this study. Policymakers, firm and business managers, investors, and academics, current literature can all benefit from the empirical results of this study. The section that follows offers a discussion of each contribution.

7.3.1. Academic and Literature

The impact of firm-specific factors on systematic risk has been examined in a number of earlier studies (Hamada, 1972; William & James, 1975; Bowman, 1979; Mandelker & Rhee, 1984; Borde, 1998; Kim, Gu & Mattila, 2002; Lee & Jang, 2007; Alaghi, 2013; Ibrahim & Haron, 2016; Nawaz et al., 2017; Jung et al., 2018; Nguyen, 2019; Fahad et al., 2020; Nizam et al., 2020). These studies discovered a significant

relationship between systematic risk and firm-specific factors. This result implies that firm-specific or internal factors, in addition to external factors, influence systematic risk.

The results of those earlier empirical investigations, however, are not entirely clear. As a result, empirical research in this field is still ongoing. This ambiguous conclusion might result from the method of looking at the systematic risk in a country's specific industry in a single study. This results in a lack of accurate knowledge regarding the origins of systematic risk in different sectors of a given market. High levels of systematic risk can lower a firm's value, according to Gu and Kim (2002). Therefore, in order to better manage their investments, firm managers need to be aware of the sources or determinants of systematic risk, such as firm-specific factors. Businesses might not be able to prioritize which particular variables are crucial for them to be concerned about in the absence of a clear grasp of what drives systematic risk in different industries. As a result, they can't come up with a good plan for handling systematic risk.

In addition to firm-specific factors, previous research has found a significant relationship between systematic risk and the financial crisis. Few studies, nevertheless, have been conducted to explain how the financial crisis affected systematic risk, and those that have been conducted have only looked at one crisis's effects on systematic risk. This could result in a lack of knowledge regarding the impact of a financial crisis on businesses' systematic risk.

As a result, this study has used firm-specific factors and financial crises to identify research gaps in the empirical investigation of the determinants of systematic risk. For instance, previous research only looked at firm-specific factors influencing systematic risk in a nation's specific industry, while a small number of studies looked into how a single financial crisis affected systematic risk. By investigating the firm-specific factors and two financial crises that may have a substantial influence on the systematic risk associated with non-financial firms spanning multiple sectors in the four ASEAN member countries over the 20-year period from 1997 to 2016, this study closes these gaps.

The study's empirical results add to the body of knowledge regarding the systematic risk that, from 1997 to 2016, financial leverage was the primary firm-specific factor

affecting the ASEAN-4 region. ASEAN-4 companies have some control over systematic risks, especially by controlling the amount of debt, even though they cannot be eliminated by diversification. By creating suitable corporate and operational strategies aimed at this factor, managers can exercise control over it. For instance, by keeping their debt levels low, ceteris paribus, businesses can benefit from reduced systematic risk.

Additionally, this study adds to the body of existing finance literature in two ways. First, each country and industry have a different impact on systematic risk due to firm-specific factors. For instance, financial leverage, Malaysia (financial leverage, liquidity, and firm size), Singapore (profitability and firm size), and Thailand (financial leverage, liquidity, and firm size) are firm-specific factors that impact systematic risk in Indonesia.

Furthermore, systematic risk is not influenced by firm-specific factors in the industrial segment, energy and other industries in Indonesia, or the consumer cyclical and non-cyclical industries in Singapore. These results imply that, depending on the characteristics of each industry, systematic risk responds differently to firm-specific factors. Therefore, for any planning and decision-making process, policymakers and firm managers should consider the country variation and the industry variation rather than simplifying and generalizing a market as a whole.

Second, certain industries and countries are affected by systematic risk due to the repercussions of the 1997 Asian financial turmoil and the 2008 global economic crisis. Compared to other ASEAN-4 nations, the majority of Indonesia's industries are more resilient to the effects of financial crises. The financial crises had a negative impact on non-financial companies in Thailand and Singapore in every industry. Additionally, compared to other industries, the energy, technology, and other sectors were less impacted. Policymakers must therefore consider firm-specific factors and local and global economic conditions when managing systematic risk, particularly when the financial crisis is closely linked to the economic cycle. During both normal economic times and times of crisis, firm managers should make sure that the firm-specific factors identified in this study are effectively managed at the firm level.

7.3.2. Policy Makers and Managers

Going on to the study's usefulness, the results are advantageous to business executives

and legislators. First and foremost, this research helps policymakers in each of the ASEAN-4 countries understand the significance of firm-specific factors and their connection to the systematic risk of non-financial firms. Furthermore, since the two elements are the key determinants of systematic risk found in this study, the significance of firm-specific factors is also connected to the Asian financial crisis of 1997 and the global financial crisis of 2008. Therefore, in order to improve resilience against the negative effects of financial crises, policymakers or regulators can offer listed companies' guidelines on how to strengthen their risk management mechanism with regard to firm-specific factors. For instance, during financial crises, they might offer guidelines on the significance of financial leverage and profitability in relation to systematic risk, which businesses can use to make sure that the level of systematic risk won't be too high through effective financial leverage and profitability management.

Second, this study helps managers in ASEAN-4 (global) companies, both local and multinational, gain a better understanding of how firm-specific factors impact systematic risk and how these factors relate to the global financial crisis in 2008 and the Asian financial crisis in 1997. According to their industries, managers of local businesses would be able to determine and rank the primary specific factors influencing systematic risk. This could give them fresh perspectives on how to handle systematic risk and increase the value of their company. For instance, if a firm's systematic risk and financial leverage are positively correlated. Instead of depending primarily on borrowings, which will raise financial leverage and consequently systematic risk, managers should diversify their sources of outside funding. i.e., selecting the appropriate financing mix to minimize financing costs and manage the leverage position at a level that won't jeopardize the firm's systematic risk (Abeywardhana, 2017). Iqbal and Shah (2012) noted that effective management is essential to investment success, allowing businesses to increase their values by lowering some of the risk.

Managers of multinational corporations would be able to identify the firm-specific elements influencing systematic risk in each nation and industry, as well as in the ASEAN-4 region as a whole. In addition to providing them with thorough knowledge of the origins of systematic risk, it would help them create an appropriate plan for their specific companies in each nation to manage the exposure to systematic risk and boost

the firm's future value. Managers of companies with new business expansion projects in ASEAN-4 nations would also benefit from the study's findings since they can see how systematic risk behaves and create a plan for their next investment. If they are aware of how firm-specific factors and financial crises (the Asian financial crisis in 1997 and the global financial crisis in 2008) affect systematic risk, this can help them prevent a loss or business failure. Because systematic risk behaves differently in different nations and sectors, financial managers of multinational corporations must be well-versed in the characteristics of firm-specific factors in each of the ASEAN-4 nations' industries and sectors. Both multinational corporations that are already doing business in one of the ASEAN-4 member nations and those that intend to grow in any of the ASEAN-4 nations will benefit from this knowledge and comprehension.

The results of this study could help deepen insight into the sources of systematic risk. Policymakers and business managers may find it easier to create effective risk management plans to address systematic risk both in times of normalcy and during emergencies if they have a solid grasp of the causes of systematic risk and how financial crises affect it. In order to draw in more investors, this could increase the firms' efficiency and profitability while lowering risk.

7.3.3. Investors

A significant factor in estimating the anticipated return on investments is systematic risk, which is a non-diversifiable risk. Therefore, it is crucial for investors who are making plans for their future investments as well as policymakers and firm managers to comprehend the sources of systematic risk across different industries and nations. This study informs both domestic and foreign investors about the possibility of both internal and external factors influencing systematic risk. This study offers fresh proof that firm-specific factors influencing systematic risk differ by nation and industry by examining differences in industries and nations to ascertain the systematic risk. Furthermore, not every industry was at high systematic risk during the global financial crises of 2008 and Asia in 1997. Investors may find the new information from this study helpful; rather than making an investment based solely on the stock price trend, investors should examine the financial reports of potential investment targets. Finding the firm-specific elements that have a major impact on the firm's systematic risk is the aim of this analysis. These elements include financial leverage, liquidity, profitability, firm size, and firm growth. This could significantly help them make informed

investment choices in both normal and emergency economic times. Before making any decisions or taking any action, investors looking to invest in the ASEAN-4 stock market can use the new information from this study to compare and identify which countries and industries have a high systematic risk during both financial crises and normal economic conditions. This could assist them in making wise investments and avoiding stocks with high systematic risk.

7.4. Suggestions For Future Research

In addition to discussing the effects of the 1997 Asian financial crisis and the 2008 global financial crisis on systematic risk, this research presents empirical evidence and an analysis of the primary determinants influencing systematic risk among non-financial enterprises active in various sectors throughout the four ASEAN nations. However, this study's limitations in terms of variables, study duration, diverse industries, and countries meant that many issues were not yet covered. Larger samples of industries and nations should be included in future research. Comparing Oceania's industries and nations to those in Africa, Europe, the Middle East, and North America is one example.

Future research could expand the analysis by investigating additional firm-specific factors that may affect systematic risk across various industries and countries. Including new variables may yield deeper insights, especially since the current study finds no significant relationship between some anticipated firm-specific factors and systematic risk in certain sectors. This indicates that the variables examined here may not be the primary drivers of systematic risk and that other firm-level characteristics could have a more substantial influence, such as operating leverage, dividend payout, the market value of equity, and so on.

Furthermore, this study recommends that future research explore similar patterns across various industries and geographic regions, particularly focusing on developed European markets, to provide fresh insights into the primary factors influencing systematic risk and the approaches used to manage it. Expanding the existing body of literature in this manner could deepen the understanding of systematic risk. A comprehensive grasp of systematic risk would enable firm managers to devise more effective strategies for mitigating such risks, ultimately enhancing firm value. These improved strategies could assist managers in guiding shareholders toward more

informed investment decisions. Additionally, the study's findings may offer valuable support to investors in making well-founded investment choices.

Since the financial crisis was identified as a significant variable that affected the systematic risk, this study recommends that future research compare and determine whether the financial crisis in 2000 and the most recent year, 2020 (the COVID-19 issue), has an impact on the systematic risk. Instead of employing the same methodology as this study, the researcher recommends implementing new econometric techniques to investigate systematic risk. The institutional factors—such as the money supply, interest rates, foreign exchange rates, inflation rates, and so forth—that might better explain the variation in the behavior of systematic risk in various nations can also be expanded in future research.

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APPENDIXES

APPENDIX A: Descriptive Statistic

Table 5.1 Descriptive Statistic: Indonesia

variable	Disc	Overall	Industrial	Consumer non-cyclical	Consumer cyclical	Basic material	Technology	Energy	Others
Beta	Mean	0.983	0.993	0.994	0.976	0.975	0.982	0.998	**0.982**
	SD	0.135	0.137	0.074	0.174	0.147	0.163	0.157	**0.092**
	Min	-0.304	0.449	-0.003	-0.680	-0.494	-0.798	-0.580	**-0.021**
	Max	1.881	4.130	1.728	1.789	1.624	1.600	1.100	**1.195**
Financial Leverage	Mean	36.374	41.431	37.351	36.181	38.333	32.647	41.957	**26.720**
	SD	40.038	41.984	37.378	46.959	45.242	33.954	45.052	**29.700**
	Min	0.147	0.170	0.000	0.000	0.000	0.190	0.500	**0.170**

	Max	416.130	356.900	458.220	702.050	478.050	335.070	257.340	**325.280**
Liquidity	Mean	3.189	3.433	4.009	1.714	2.619	5.146	3.159	**2.245**
	SD	11.545	20.540	21.157	1.875	5.483	19.137	10.942	**1.684**
	Min	0.019	0.010	0.010	0.010	0.010	0.050	0.030	**0.010**
	Max	199.674	464.980	455.050	42.340	85.410	247.130	90.080	**12.730**
Profitability	Mean	5.581	4.662	8.568	5.330	4.148	4.346	3.006	**9.009**
	SD	19.134	13.158	40.408	21.705	14.375	17.786	11.230	**15.278**
	Min	-119.38	-91.450	-101.440	-157.040	-67.290	-179.360	-80.020	**-159.12**
	Max	309.789	134.100	1210.110	508.710	146.110	100.870	22.300	**46.320**
Fim Size	Mean	21.025	20.504	20.877	20.856	21.216	20.385	21.665	**21.669**
	SD	1.800	1.729	1.594	1.816	1.837	1.485	2.207	**1.934**
	Min	15.896	15.780	13.711	15.205	15.582	15.579	17.405	**18.006**

	Max	25.156	24.866	25.220	26.276	25.299	23.883	24.641	**25.910**
Firm Growth	Mean	1.104	0.891	0.176	-0.715	-1.210	7.563	0.163	**0.858**
	SD	20.844	16.002	2.993	9.971	55.919	47.247	2.909	**10.868**
	Min	-253.14	-9.697	-11.247	-227.571	-1494.26	-11.350	-9.488	**-8.422**
	Max	226.392	385.062	37.381	60.923	357.598	545.450	13.359	**184.967**
Operating Efficiency	Mean	1.015	0.982	1.088	1.082	0.792	1.422	0.659	**1.076**
	SD	1.008	1.284	0.815	1.466	0.498	1.408	0.770	**0.814**
	Min	0.020	0.020	0.010	0.020	0.010	0.010	0.010	**0.060**
	Max	9.710	17.460	6.410	20.810	3.220	12.330	3.930	**3.810**
GDP Growth	Mean	4.822	4.812	4.765	4.851	4.732	4.810	4.679	**5.105**
	SD	2.804	2.778	2.934	2.750	3.071	2.835	3.223	**2.036**
	Min	-13.127	-13.127	-13.127	-13.127	-13.127	-13.127	-13.127	**-13.127**

	Max	**6.345**	**6.345**	**6.345**	**6.345**	**6.345**	**6.345**	**6.345**	**6.345**

Note. Dependent variable is systematic risk (beta). Firm-specific variables are financial leverage, liquidity, profitability, firm size, firm growth, and operating efficiency

Table 5.2: Descriptive Statistic: Malaysia

variable	**Disc**	**Overall**	**Industrial**	**Consumer non-cyclical**	**Consumer cyclical**	**Basic material**	**Technology**	**Energy**	**Others**
Beta	Mean	0.960	0.968	0.957	0.969	0.974	0.970	0.944	**0.939**
	SD	0.175	0.194	0.192	0.164	0.134	0.144	0.192	**0.203**
	Min	-0.931	-3.501	-1.101	-0.130	-0.627	-0.567	-0.213	**-0.376**
	Max	1.982	2.803	1.887	3.569	1.575	1.770	1.014	**1.252**
Financial Leverage	Mean	22.778	25.206	20.762	23.335	17.715	15.545	28.985	**27.898**
	SD	26.914	21.800	18.891	25.995	21.738	21.637	18.384	**59.951**
	Mi	11.0	0.000	0.000	0.000	0.000	0.000	77.6	**0.01**

	n	91						30	**0**
	Max	397.030	367.080	140.680	640.430	277.650	326.020	0.040	**1027.31**
Liquidity	Mean	3.471	2.421	4.473	2.692	3.143	4.857	4.054	**2.654**
	SD	8.134	2.528	11.648	5.541	4.042	9.269	20.671	**3.239**
	Min	0.041	0.020	0.010	0.040	0.030	0.010	0.160	**0.020**
	Max	136.617	28.870	253.030	218.450	31.770	145.960	235.140	**43.100**
Profitability	Mean	3.474	4.159	5.666	3.287	3.052	-1.907	4.395	**5.667**
	SD	19.617	13.295	13.392	19.451	10.723	58.686	12.317	**9.452**
	Min	-352.26	-91.740	-183.27	-189.430	-83.880	-1895.01	40.690	**-63.200**
	Max	222.154	431.880	212.220	771.450	50.220	162.040	-114.80	**42.070**
Firm Si	Mean	12.741	12.612	12.662	12.741	12.395	11.433	13.743	**13.598**
	SD	1.497	1.377	1.276	1.476	1.423	1.362	1.248	**2.315**

ze									
	Min	6.544	17.953	3.258	3.675	2.565	3.738	8.827	**5.793**
	Max	16.226	8.899	16.987	18.452	17.265	15.867	17.407	**18.705**
Firm Growth	Mean	0.005	-0.028	0.374	-0.234	-0.715	-0.674	0.437	**0.873**
	SD	17.308	10.868	17.820	18.686	10.844	7.002	34.977	**20.955**
	Min	-244.72	-123.979	-148.66	-910.771	-168.333	-88.285	-171.11	**-101.95**
	Max	352.354	377.896	512.750	430.764	121.303	107.228	431.778	**484.763**
Operating Efficiency	Mean	0.758	0.752	0.842	0.725	0.776	0.766	0.819	**0.624**
	SD	0.568	0.443	0.612	0.485	0.520	0.562	0.835	**0.520**
	Min	0.009	0.010	0.010	0.010	0.000	0.000	0.020	**0.010**
	Max	4.973	3.920	5.330	5.400	4.980	4.790	5.070	**5.320**
GDP Growth	Mean	4.860	4.842	4.851	4.855	4.788	4.930	4.914	**4.837**
	SD	2.58	2.674	2.687	2.746	2.876	2.306	2.10	**2.67**

		2						5	**7**
	Min	-7.359	-7.359	-7.359	-7.359	-7.359	-7.359	-7.359	**-7.359**
	Max	**8.859**	**8.859**	**8.859**	**8.859**	**8.859**	**8.859**	**8.859**	**8.859**

Note. Dependent variable is systematic risk (beta). Firm-specific variables are financial leverage, liquidity, profitability, firm size, firm growth, and operating efficiency.

Table 5.3: Descriptive Statistic: Singapore

Variable	**Disc**	**Overall**	**Industrial**	**Consumer non-cyclical**	**Consumer cyclical**	**Basic material**	**Technology**	**Energy**	**Others**
Beta	Mean	0.960	0.960	0.960	0.959	0.959	0.960	0.957	**0.966**
	SD	0.189	0.186	0.177	0.188	0.228	0.191	0.189	**0.163**
	Min	-0.542	-0.446	-0.321	-0.380	-2.091	-0.378	-0.072	**-0.105**
	Max	2.021	2.430	1.169	3.494	1.021	2.033	2.222	**1.777**

Financial leverage	Mean	33.099	22.888	24.650	26.494	25.008	18.948	89.647	**24.057**
	SD	176.988	17.111	21.432	70.172	17.790	19.271	1065.860	**27.282**
	Min	0.006	0.000	0.010	0.000	0.020	0.010	0.000	**0.000**
	Max	3608.100	224.870	202.870	3000.070	84.470	314.680	21130.340	**299.400**
Liquidity	Mean	2.826	2.705	2.617	2.266	3.112	2.866	3.797	**2.419**
	SD	5.200	4.335	3.762	2.888	5.467	6.612	10.534	**2.800**
	Min	0.030	0.070	0.010	0.020	0.040	0.010	0.000	**0.060**
	Max	91.404	53.570	75.190	66.090	55.450	179.180	179.320	**31.030**
Profitability	Mean	20.947	3.768	6.531	0.796	0.667	-0.839	130.351	**5.358**
	SD	422.578	15.564	18.441	50.582	24.662	23.538	2779.904	**45.355**
	Min	-444.065	-206.850	-125.940	-1321.490	-205.230	-223.49	-805.860	**-219.60**

	Max	8312.388	265.840	270.770	1420.310	44.420	115.010	55218.600	**851.770**
Firm size	Mean	12.305	12.293	13.122	11.982	12.236	11.485	12.299	**12.719**
	SD	1.873	1.775	2.555	1.668	1.582	1.314	1.962	**2.258**
	Min	6.312	5.994	7.093	5.687	7.503	5.858	4.727	**7.323**
	Max	18.463	20.106	23.990	17.933	16.627	15.333	17.676	**17.573**
Firm Growth	Mean	0.337	0.880	-1.544	-0.101	3.014	-0.828	0.833	**0.105**
	SD	37.099	62.908	32.393	21.758	61.160	20.712	55.151	**5.614**
	Min	-339.861	-294.049	-915.190	-294.048	-51.365	-572.34	-205.600	**-46.435**
	Max	840.821	2708.333	168.830	665.000	1124.200	112.948	1042.833	**63.600**
Operating effici	Mean	0.978	0.883	0.950	0.888	0.929	1.135	1.266	**0.797**
	SD	1.081	0.741	0.625	0.775	1.215	1.031	2.528	**0.652**

ency									
	M in	0.0 04	0.010	0.010	0.000	0.000	0.010	0.0 00	**0.0 00**
	M a x	13. 981	8.570	5.100	11.520	19.38 0	18.04 0	31.4 40	**3.8 20**
GDP	Me an	5.2 53	5.324	5.237	5.225	5.223	5.404	5.0 97	**5.2 59**
	S D	4.0 24	4.055	4.082	4.022	4.066	4.031	3.9 06	**4.0 06**
	M in	- 2.2 25	-2.225	-2.225	-2.225	-2.225	- 2.225	- 2.2 25	**- 2.2 25**
	M a x	**15. 240**	**15.24 0**	**15.240**	**15.240**	**15.24 0**	**15.24 0**	**15.2 40**	**15. 240**

Note. Dependent variable is systematic risk (beta). Firm-specific variables are financial leverage, liquidity, profitability, firm size, firm growth, and operating efficiency.

Table 5.4: Descriptive Statistic: Thailand

variable	**Disc**	**Overall**	**Industrial**	**Consumer non-cyclical**	**Consumer cyclical**	**Basic material**	**Thnology**	**Energy**	**Others**
Beta	Me	0.90	0.903	0.918	0.902	0.900	0.892	0.909	**0.90**

	an	4							**4**
	SD	0.278	0.284	0.256	0.297	0.284	0.287	0.266	**0.277**
	Min	-0.031	-0.022	-0.030	-0.042	-0.049	-0.024	0.001	**-0.051**
	Max	1.791	2.348	1.386	4.099	1.345	1.208	1.065	**1.085**
Financial Leverage	Mean	28.870	29.725	32.078	34.403	31.688	23.622	29.361	**21.216**
	SD	31.127	34.927	37.003	44.029	25.430	20.380	18.843	**37.280**
	Min	0.014	0.010	0.000	0.000	0.060	0.000	0.010	**0.020**
	Max	405.010	584.080	458.470	920.930	158.610	99.560	89.770	**523.650**
Liquidity	Mean	7.451	3.342	4.038	2.016	1.948	2.352	3.446	**1.661**
	SD	28.435	5.773	17.730	5.707	1.838	2.941	10.491	**2.011**
	Min	-107.61	0.020	0.040	0.010	0.090	0.050	0.070	**0.020**
	Max	820.920	64.810	388.680	208.270	19.420	29.200	96.250	**24.030**

Profitability	Mean	1.148	7.242	7.796	8.584	6.751	7.560	7.349	**6.877**
	SD	0.870	45.043	19.039	80.231	9.411	18.035	14.605	**12.678**
	Min	0.021	-81.430	-112.780	-171.160	-45.180	-45.550	-133.630	**-163.58**
	Max	6.657	1367.660	512.010	3289.770	53.750	377.980	92.450	**52.820**
FirmSize	Mean	16.999	14.602	14.449	14.918	14.889	15.250	16.367	**15.258**
	SD	1.934	1.318	1.419	1.542	1.756	2.941	2.585	**1.976**
	Min	7.984	10.894	2.530	10.479	9.962	0.050	10.852	**11.121**
	Max	21.474	19.520	20.177	20.096	19.892	29.200	21.522	**19.910**
FirmGrowth	Mean	0.168	0.180	-0.318	-0.831	-0.523	-1.317	4.164	**-0.177**
	SD	27.952	14.480	10.647	18.006	16.273	28.951	94.957	**12.353**
	Mi	-378.	-68.92	-339.94	-604.50	-363.92	-673.4	-302.0	**-295.**

	n	36	6	6	2	1	3	85	**71**
	Max	285.210	417.034	58.693	107.027	32.061	15.065	1314.910	**51.674**
Operating Efficiency	Mean	2.686	1.019	1.154	0.915	1.168	0.951	2.066	**0.759**
	SD	6.642	0.632	0.544	0.675	0.843	0.613	2.063	**0.720**
	Min	0.043	0.010	0.000	0.010	0.060	0.010	0.030	**0.030**
	Max	118.666	5.000	5.490	7.420	7.280	3.670	12.160	**5.580**
GDP Growth	Mean	3.396	3.484	3.332	3.430	3.257	3.398	3.523	**3.349**
	SD	3.013	2.940	3.271	2.976	3.164	2.988	2.722	**3.029**
	Min	-7.634	-7.634	-7.634	-7.634	-7.634	-7.634	-7.634	**-7.634**
	Max	**7.514**	**7.514**	**7.514**	**7.514**	**7.514**	**7.514**	**7.514**	**7.514**

Note. Dependent variable is systematic risk (beta). Firm-specific variables are financial leverage, liquidity, profitability, firm size, firm growth, and operating efficiency.

APPENDIX B: Pooled Sample Analysis

Table 5.8 (a): Pool OLS Regression Model on Determinants of Systematic Risk. (ASEAN-4 non-financial firms: 1997-2016)

Y	Coefficient	Std. Error	T-statistics	Prob.
X1	0.000006	0.000009	0.71	**0.475**
X2	-0.000131	0.000115	-1.14	**0.254**
X3	-0.000001	0.000004	-0.19	**0.850**
X4	0.000798	0.000339	2.35	**0.019**
X5	-0.000005	0.000042	-0.12	**0.906**
X6	0.001216	0.000496	2.45	**0.014**
X7	0.035166	0.008302	4.24	**0.000**
X8	0.016234	0.004864	3.34	**0.001**
X9	0.002066	0.000355	5.81	**0.000**
_cons	0.930993	0.005527	168.44	**0.000**
R-sq	0.0022			
F-stat	7.61			
Prob.(F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for ASEAN-4 non-financial firms which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$

$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$

$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.8 (b): Fixed Effect Model on Determinants of Systematic Risk. (ASEAN-4 non-financial firms: 1997-2016)

Y	**Coefficient**	**Std. Error**	**T-statistics**	**Prob.**
X1	0.00000471	0.00000986	0.480	**0.633**
X2	-0.00027650	0.00013390	-2.070	**0.039**
X3	0.00000002	0.00000385	0.010	**0.995**
X4	-0.00761300	0.00173730	-4.380	**0.000**
X5	-0.00001930	0.00004380	-0.440	**0.660**

X6	-0.00004290	0.00226080	-0.020	**0.985**
X7	0.02735760	0.00842090	3.250	**0.001**
X8	0.01230990	0.00487730	2.520	**0.012**
X9	0.00052300	0.00036550	1.430	**0.152**
_con	1.05889300	0.02516620	42.080	**0.000**
R-sq	0.0015			
F-stat	5.01			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for ASEAN-4 non-financial firms which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) =

Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.8 (c): Random Effect Model on Determinants of Systematic Risk. (ASEAN-4 non-financial firms: 1997-2016)

Y	**Coefficient**	**Std. Error**	**Z**	**Prob.**
X1	0.0000065	0.0000091	0.71	**0.475**
X2	-0.0001313	0.0001152	-1.14	**0.254**
X3	-0.0000007	0.0000036	-0.19	**0.850**
X4	0.0007976	0.0003393	2.35	**0.019**
X5	-0.0000049	0.0000417	-0.12	**0.906**
X6	0.0012160	0.0004958	2.45	**0.014**
X7	0.0351655	0.0083015	4.24	**0.000**
X8	0.0162336	0.0048642	3.34	**0.001**
X9	0.0020660	0.0003553	5.81	**0.000**
_con	0.9309933	0.0055270	168.44	**0.000**
R-sq	0.0613			
Wald chi2	68.53			
Prob. (Chi2)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for ASEAN-5 non-financial firms which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.8: Fixed Effect Model on Determinant of Systematic Risk: Full Sample (ASEAN-4 non-financial firms: 1997-2016)

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.0000759	0.0000351	2.16	**0.031**
X2	-0.0000049	0.0001064	-0.05	**0.964**
X3	-0.0000097	0.0000177	-0.55	**0.586**
X4	-0.0036160	0.0011653	-3.10	**0.002**

X5	0.0000046	0.0000197	0.23	**0.816**
X6	0.0003709	0.0010212	0.36	**0.716**
X7	0.0258593	0.0019964	12.95	**0.000**
X8	0.0235372	0.0013454	17.50	**0.000**
X9	-0.0006201	0.0001433	-4.33	**0.000**
_con	1.0204680	0.0165145	61.79	**0.000**
R-sq	0.0032			
F-stat	47.32			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for ASEAN-4 non-financial firms which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current

assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

APPENDIX C: Individual Country Analysis

Table 5.9 (a): Random Effect Model on Determinants of Systematic Risk. (Malaysia: 1997-2016)

Y	Coefficient	Robust Std. Error	Z	Prob.
X1	0.0000965	0.0000296	3.25	**0.001**
X2	0.0002038	0.0000874	2.33	**0.020**
X3	-0.0003089	0.0000508	-6.09	**0.000**
X4	0.0005073	0.0005327	0.95	**0.341**
X5	-0.0000078	0.0000245	-0.32	**0.751**
X6	0.0004603	0.0014366	0.32	**0.749**
X7	0.0182289	0.0018502	9.85	**0.000**
X8	0.0124578	0.0017036	7.31	**0.000**
X9	-0.0014780	0.0002131	-6.93	**0.000**
_con	0.9812974	0.0068970	142.28	**0.000**
R-sq	0.0074			
Wald chi2	138.65			
Prob. (Chi2)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Malaysia which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.9 (b): Pool OLS Regression Model on Determinant of Systematic Risk. (Singapore: 1997-2016)

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.000021	0.000019	-1.10	**0.270**
X2	0.000262	0.000160	1.63	**0.103**
X3	-0.000056	0.000031	-1.82	**0.069**
X4	0.000743	0.000382	1.94	**0.052**
X5	-0.000030	0.000017	-1.74	**0.083**
X6	0.000444	0.000846	0.53	**0.600**

X7	0.015865	0.001648	9.63	**0.000**
X8	0.008336	0.001739	4.79	**0.000**
X9	-0.000793	0.000186	-4.27	**0.000**
_con	0.980322	0.005379	182.26	**0.000**
R-sq	0.0036			
F-stat	12			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singapore which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis

1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.9 (c): Pool OLS Regression Model on Determinants of Systematic Risk. (Thailand: 1997-2016)

Y	Coefficient	Robust Std. Error	T-statistics	Prob.
X1	0.000421	0.000075	5.58	**0.000**
X2	0.000612	0.000360	1.7	**0.090**
X3	0.000013	0.000061	0.21	**0.833**
X4	0.003963	0.001669	2.37	**0.018**
X5	0.000056	0.000034	1.63	**0.104**
X6	0.013411	0.002873	4.67	**0.000**
X7	0.107480	0.005163	20.82	**0.000**
X8	0.086961	0.004107	21.17	**0.000**
X9	0.004098	0.000527	7.78	**0.000**
_con	0.812793	0.025810	31.49	**0.000**
R-sq	0.0150			
F-stat	82.09			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thailand which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} +$$

$a_3 profitability_{i,t}$

$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$

$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$

$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.9 (d): Random Effect Model on Determinant of Systematic Risk. (Indonesia: 1997-2016)

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.000027	0.000012	2.26	**0.024**
X2	-0.000022	0.000048	-0.47	**0.642**
X3	-0.000029	0.000023	-1.25	**0.213**
X4	0.000340	0.950000	0.34	**0.342**

X5	0.000002	0.000014	0.16	**0.869**
X6	0.000225	0.000350	0.64	**0.521**
X7	0.001988	0.003695	0.54	**0.591**
X8	0.004171	0.001408	2.96	**0.003**
X9	-0.000107	0.000148	-0.73	**0.467**
_con	0.988180	0.007954	124.24	**0.000**
R-sq	0.0012			
F-stat	1.69			
Prob. (F-stat)	**0.0858**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesia which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current

assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

APPENDIX D: Malaysia Industries Analysis

Table 5.10 (a): Determinants of Systematic Risk in Malaysian Industrial (1997-2016).

Y	Coefficient	Robust Std. Error	Z	Prob.
X1	-0.00001	0.00008	-0.13	**0.893**
X2	0.00072	0.00050	1.45	**0.147**
X3	-0.00073	0.00021	-3.40	**0.001**
X4	0.00110	0.00117	0.94	**0.349**
X5	-0.00003	0.00007	-0.38	**0.704**
X6	-0.00335	0.00391	-0.86	**0.391**
X7	0.01648	0.00394	4.18	**0.000**
X8	0.01058	0.00417	2.54	**0.011**
X9	-0.00115	0.00048	-2.41	**0.016**
_con	0.98060	0.01673	58.62	**0.000**
R-sq	0.1147			
Wald chi2	24.66			
Prob. (Chi2)	**0.0034**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Malaysian industrial which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.10 (b): Determinants of Systematic Risk in Malaysian Consumer Non-Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**Z**	**Prob.**
X1	0.00012	0.00009	1.36	**0.175**
X2	0.00026	0.00020	1.32	**0.187**
X3	-0.00029	0.00016	-1.85	**0.064**
X4	0.00277	0.00146	1.90	**0.057**

X5	0.00003	0.00002	1.26	**0.206**
X6	0.00182	0.00336	0.54	**0.589**
X7	0.02078	0.00356	5.84	**0.000**
X8	0.01544	0.00459	3.37	**0.001**
X9	-0.00127	0.00053	-2.41	**0.016**
_con	0.94887	0.02001	47.42	**0.000**
R-sq	0.0286			
Wald chi2	47.62			
Prob. (Chi2)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Malaysian consumer non-cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.10 (c): Determinants of Systematic Risk in Malaysian Consumer Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistic**	**Prob.**
X1	0.00005	0.00004	1.23	**0.217**
X2	0.00048	0.00023	2.07	**0.038**
X3	-0.00045	0.00012	-3.64	**0.000**
X4	0.00032	0.00080	0.40	**0.688**
X5	0.00005	0.00010	0.44	**0.661**
X6	-0.00336	0.00245	-1.37	**0.170**
X7	0.02020	0.00318	6.35	**0.000**
X8	0.01547	0.00259	5.98	**0.000**
X9	-0.00125	0.00034	-3.73	**0.000**
_con	0.98707	0.01097	90.00	**0.000**
R-sq	0.0076			
F-stat	6.89			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Malaysian consumer cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.10 (d): Determinants of Systematic Risk in Malaysian Basic Material Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.00020	0.00008	2.52	**0.012**

X2	0.00056	0.00023	2.48	**0.014**
X3	-0.00047	0.00019	-2.50	**0.013**
X4	0.00068	0.00137	0.49	**0.623**
X5	-0.00005	0.00010	-0.54	**0.589**
X6	-0.00157	0.00268	-0.58	**0.559**
X7	0.01250	0.00400	3.13	**0.002**
X8	0.00696	0.00329	2.12	**0.035**
X9	-0.00102	0.00045	-2.29	**0.023**
_con	0.98537	0.01749	56.34	**0.000**
R-sq	0.0212			
F-stat	1.95			
Prob. (F-stat)	**0.0424**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for the Malaysian basic material industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.10 (e): Determinants of Systematic Risk in Malaysian Technology Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.00007	0.00004	1.72	**0.086**
X2	-0.00003	0.00014	-0.18	**0.861**
X3	-0.00014	0.00005	-2.59	**0.010**
X4	-0.00183	0.00113	-1.62	**0.106**
X5	-0.00022	0.00008	-2.61	**0.009**
X6	0.00252	0.00186	1.35	**0.177**
X7	0.01513	0.00348	4.35	**0.000**
X8	0.00616	0.00265	2.33	**0.020**
X9	-0.00072	0.00053	-1.35	**0.176**

_cons	1.01000	0.01337	75.57	**0.000**
R-sq	0.0079			
F-stat	3.73			
Prob. (F-stat)	**0.0001**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for the Malaysian technology industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP growth).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.10 (f): Determinants of Systematic Risk in the Malaysian Energy Industry. (1997-2016)

Y	Coefficient	Robust Std. Error	Z	Prob.
X1	-0.0022	0.0014	-1.61	**0.107**
X2	0.0006	0.0003	2.49	**0.013**
X3	-0.0026	0.0011	-2.44	**0.015**
X4	0.0217	0.0089	2.44	**0.015**
X5	-0.0003	0.0003	-1.05	**0.293**
X6	0.0150	0.0131	1.15	**0.251**
X7	0.0315	0.0309	1.02	**0.309**
X8	0.0056	0.0412	0.14	**0.891**
X9	-0.0079	0.0038	-2.06	**0.039**
_cons	0.7452	0.1279	5.83	**0.000**
R-sq	0.1601			
Wald chi2	21.23			
Prob. (Chi2)	**0.0117**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Malaysian energy industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.10 (g): Determinants of Systematic Risk in Malaysian Other Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.00002	0.00015	-0.12	**0.905**
X2	0.00078	0.00127	0.61	**0.541**
X3	-0.00137	0.00047	-2.93	**0.003**
X4	0.00304	0.00176	1.73	**0.085**
X5	0.00029	0.00025	1.17	**0.243**
X6	-0.01797	0.01221	-1.47	**0.142**

X7	0.04080	0.00973	4.19	**0.000**
X8	0.00148	0.01691	0.09	**0.930**
X9	-0.00373	0.00119	-3.12	**0.002**
_cons	0.96183	0.02836	33.92	**0.000**
R-sq	0.0311			
F-stat	2.92			
Prob. (F-stat)	**0.0022**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Malaysian other industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis

1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

APPENDIX E: Singaporean Industries Analysis

Table 5.11 (a): Determinants of Systematic Risk in Singaporean Industrial. (1997-2016).

Y	Coefficient	Robust Std. Error	T-statistics	Prob.
X1	-0.00032	0.00013	-2.41	**0.017**
X2	0.00010	0.00016	0.63	**0.532**
X3	-0.00018	0.00011	-1.61	**0.110**
X4	0.00057	0.00060	0.95	**0.345**
X5	-0.00003	0.00005	-0.55	**0.582**
X6	-0.00215	0.00169	-1.27	**0.206**
X7	0.00960	0.00525	1.83	**0.069**
X8	0.00269	0.00333	0.81	**0.420**
X9	-0.00089	0.00032	-2.77	**0.006**
_cons	0.99690	0.00769	129.67	**0.000**
R-sq	0.0126			
F-stat	2.19			
Prob. (F-stat)	**0.0261**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean industrial which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.11 (b): Determinants of Systematic Risk in Singaporean Consumer Non-Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.000119	0.000104	-1.14	**0.257**
X2	0.000369	0.000415	0.89	**0.377**
X3	-0.000023	0.000073	-0.32	**0.752**
X4	0.000128	0.000515	0.25	**0.804**

X5	-0.000026	0.000023	-1.14	**0.257**
X6	0.000257	0.002111	0.12	**0.903**
X7	0.012926	0.003006	4.3	**0.000**
X8	0.005603	0.004024	1.39	**0.168**
X9	-0.000375	0.000455	-0.82	**0.413**
_cons	0.991053	0.008640	114.7	**0.000**
R-sq	0.004			
F-stat	3.76			
Prob. (F-stat)	**0.0006**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean consumer non-cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.11 (c): Determinants of Systematic Risk in Singaporean Consumer Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.0000003	0.0000088	0.04	**0.970**
X2	-0.0003043	0.0008422	-0.36	**0.718**
X3	-0.0000471	0.0000334	-1.41	**0.160**
X4	0.0010751	0.0009304	1.16	**0.250**
X5	-0.0000150	0.0000261	-0.57	**0.567**
X6	-0.0007594	0.0022314	-0.34	**0.734**
X7	0.0170011	0.0029056	5.85	**0.000**
X8	0.0109694	0.0033857	3.24	**0.001**
X9	-0.0005588	0.0003440	-1.62	**0.106**
_cons	0.9758331	0.0137246	71.1	**0.000**
R-sq	0.0030			
F-stat	6.08			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean consumer cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.11 (d): Determinants of Systematic Risk in Singaporean Basic Material Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**

X1	0.00005	0.00020	0.27	**0.790**
X2	0.00046	0.00033	1.40	**0.172**
X3	-0.00017	0.00018	-0.93	**0.357**
X4	0.00303	0.00177	1.71	**0.097**
X5	-0.00141	0.00109	-1.30	**0.204**
X6	0.01471	0.00593	2.48	**0.019**
X7	0.02407	0.00718	3.35	**0.002**
X8	0.01349	0.00786	1.72	**0.096**
X9	0.00013	0.00137	0.10	**0.924**
_cons	0.92762	0.02782	33.35	**0.000**
R-sq	0.0182			
F-stat	3.47			
Prob. (F-stat)	**0.0045**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean basic material industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.11 (e): Determinants of Systematic Risk in Singaporean Technology Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.000005	0.000080	0.07	**0.946**
X2	-0.000082	0.000224	-0.36	**0.716**
X3	-0.000074	0.000059	-1.25	**0.212**
X4	0.002928	0.001296	2.26	**0.026**
X5	-0.000126	0.000114	-1.11	**0.270**
X6	-0.000144	0.001778	-0.08	**0.936**
X7	0.010026	0.002456	4.08	**0.000**
X8	0.009270	0.002581	3.59	**0.000**

X9	-0.000184	0.000349	-0.53	**0.598**
_cons	0.957420	0.015294	62.6	**0.000**
R-sq	0.0047			
F-stat	3.19			
Prob. (F-stat)	**0.0018**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean technology industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current

assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008.

X9(GDP) = Growth rate of GDP.

Table 5.11 (f): Determinants of Systematic Risk in Singaporean Energy Industry (1997-2016).

Y	Coefficient	Robust Std. Error	T-statistics	Prob.
X1	-0.000040	0.000086	-0.46	**0.643**
X2	0.000233	0.000133	1.75	**0.081**
X3	-0.000114	0.000129	-0.89	**0.377**
X4	0.004530	0.002256	2.01	**0.045**
X5	-0.000108	0.000065	-1.67	**0.096**
X6	0.001690	0.001336	1.27	**0.207**
X7	0.016112	0.006903	2.33	**0.020**
X8	0.005227	0.011082	0.47	**0.637**
X9	0.000194	0.000863	0.23	**0.822**
_cons	0.924976	0.031025	29.81	**0.000**
R-sq	0.0198			
F-stat	1.3			
Prob. (F-stat)	**0.0234**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean energy industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.11 (g): Determinants of Systematic Risk in Singaporean other Industry (1997-2016)

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.000057	0.000119	-0.48	**0.631**
X2	-0.000808	0.000880	-0.92	**0.359**
X3	-0.000056	0.000080	-0.7	**0.485**

X4	-0.001454	0.001282	-1.13	**0.257**
X5	-0.000051	0.000418	-0.12	**0.903**
X6	-0.003169	0.005512	-0.57	**0.566**
X7	0.019413	0.006362	3.05	**0.002**
X8	-0.003664	0.007178	-0.51	**0.610**
X9	-0.002175	0.000858	-2.54	**0.012**
_cons	1.024514	0.021340	48.01	**0.000**
R-sq	0.0291			
F-stat	1.76			
Prob. (F-stat)	**0.0072**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Singaporean other industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

APPENDIX F: Thai Industries Analysis

Table 5.12 (a): Determinants of Systematic Risk in Thai Industrial. (1997-2016).

Y	Coefficient	Robust Std. Error	T-statistics	Prob.
X1	0.00045	0.00015	2.95	**0.003**
X2	0.00161	0.00073	2.20	**0.028**
X3	0.00001	0.00032	0.03	**0.979**
X4	0.00231	0.00472	0.49	**0.625**
X5	0.00089	0.00067	1.33	**0.183**
X6	0.01092	0.00904	1.21	**0.227**
X7	0.09340	0.01471	6.35	**0.000**
X8	0.07616	0.01030	7.40	**0.000**
X9	0.00229	0.00162	1.41	**0.159**
_cons	0.85174	0.07482	11.38	**0.000**
R-sq	10.09			
F-stat	0.0136			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai industrial which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.12 (b): Determinant of Systematic Risk in Thai Consumer Non-Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.00052	0.00010	5.35	**0.000**
X2	-0.00004	0.00024	-0.15	**0.882**
X3	0.00010	0.00013	0.82	**0.415**
X4	0.00281	0.00356	0.79	**0.433**
X5	0.00027	0.00047	0.56	**0.576**

X6	0.01269	0.00897	1.41	**0.161**
X7	0.06595	0.00865	7.62	**0.000**
X8	0.05951	0.00602	9.89	**0.000**
X9	0.00222	0.00101	2.20	**0.031**
_cons	0.86130	0.05675	15.18	**0.000**
R-sq	0.0166			
F-stat	17.5			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai consumer non-cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current

assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.12 (c): Determinants of Systematic Risk in Thai Consumer Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.00044	0.00012	3.65	**0.000**
X2	0.00198	0.00141	1.40	**0.163**
X3	0.00002	0.00006	0.29	**0.770**
X4	0.00459	0.00320	1.43	**0.153**
X5	-0.00042	0.00014	-2.91	**0.004**
X6	0.00872	0.00790	1.10	**0.271**
X7	0.11586	0.00995	11.64	**0.000**
X8	0.10322	0.00772	13.37	**0.000**
X9	0.00506	0.00101	5.01	**0.000**
_cons	0.79019	0.05012	15.76	**0.000**
R-sq	0.0160			
F-stat	36.06			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai consumer cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.12 (d): Determinants of Systematic Risk in Thai Basic Material Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.00015	0.00031	0.49	**0.627**
X2	0.01044	0.00403	2.59	**0.014**

X3	0.00009	0.00085	0.10	**0.919**
X4	0.00662	0.00428	1.55	**0.130**
X5	0.00356	0.00198	1.80	**0.080**
X6	0.01106	0.00679	1.63	**0.111**
X7	0.07494	0.02336	3.21	**0.003**
X8	0.04356	0.01513	2.88	**0.006**
X9	0.00053	0.00146	0.36	**0.718**
_cons	0.79962	0.07484	10.68	**0.000**
R-sq	0.0156			
F-stat	4.48			
Prob. (F-stat)	**0.0004**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai basic material industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis

2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.12 (e): Determinants of Systematic Risk in Thai Technology Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.00016	0.00049	0.33	**0.746**
X2	0.00163	0.00235	0.69	**0.493**
X3	-0.00304	0.00099	-3.08	**0.003**
X4	0.00426	0.00490	0.87	**0.389**
X5	0.00008	0.00093	0.08	**0.936**
X6	0.01226	0.01502	0.82	**0.419**
X7	0.10477	0.02544	4.12	**0.000**
X8	0.05987	0.01581	3.79	**0.000**
X9	0.00562	0.00185	3.03	**0.004**
_cons	0.85646	0.07112	12.04	**0.000**
R-sq	0.0260			

F-stat	2.74			
Prob. (F-stat)	**0.0114**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai technology industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.12 (f): Determinants of Systematic Risk in Thai Energy Industry (1997-2016).

Y	**Coefficient**	**Robust Std.**	**T-statistics**	**Prob.**

		Error		
X1	0.00106	0.00052	2.03	**0.059**
X2	0.00081	0.00036	2.26	**0.038**
X3	0.00103	0.00093	1.11	**0.284**
X4	-0.00640	0.00399	-1.61	**0.127**
X5	-0.00219	0.00169	-1.29	**0.213**
X6	-0.00326	0.00352	-0.93	**0.367**
X7	0.09852	0.02648	3.72	**0.002**
X8	0.07568	0.01684	4.49	**0.000**
X9	0.00480	0.00220	2.18	**0.043**
_cons	0.98874	0.05941	16.64	**0.000**
R-sq	0.0265			
F-stat	5.24			
Prob. (F-stat)	**0.0017**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai energy industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.12 (g): Determinants of Systematic Risk in Thai other Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.00061	0.00024	-2.58	**0.010**
X2	0.00612	0.00268	2.28	**0.023**
X3	-0.00128	0.00061	-2.10	**0.036**
X4	0.01055	0.00374	2.82	**0.005**
X5	0.00104	0.00069	1.51	**0.132**
X6	0.02183	0.00641	3.40	**0.001**
X7	0.07703	0.01868	4.12	**0.000**
X8	0.05244	0.01079	4.86	**0.000**

X9	0.00384	0.00162	2.37	**0.018**
_cons	0.76296	0.06146	12.41	**0.000**
R-sq	0.0229			
F-stat	4.17			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Thai other industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

APPENDIX G: Indonesian Industries Analysis

Table 5.13 (a): Determinants of Systematic Risk in Indonesian Industrial (1997-2016).

Y	Coefficient	Robust Std. Error	T-statistics	Prob.
X1	0.000004	0.000018	0.22	**0.823**
X2	0.000021	0.000011	1.87	**0.067**
X3	-0.000188	0.000125	-1.5	**0.138**
X4	-0.001137	0.001009	-1.13	**0.265**
X5	-0.000015	0.000101	-0.15	**0.882**
X6	0.002239	0.001121	2	**0.051**
X7	0.007670	0.002971	2.58	**0.012**
X8	0.003224	0.004244	0.76	**0.451**
X9	-0.000479	0.000253	-1.89	**0.064**
_cons	1.016253	0.021930	46.34	**0.000**
R-sq	0.0082			
F-stat	2.85			
Prob. (F-stat)	**0.0077**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian industrial which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.13 (b): Determinants of Systematic Risk in Indonesian Consumer Non-Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.000017	0.000015	-1.13	**0.257**
X2	0.000012	0.000010	1.2	**0.232**
X3	0.000015	0.000029	0.53	**0.596**
X4	-0.000193	0.000408	-0.47	**0.637**

X5	0.000044	0.000120	0.37	**0.712**
X6	-0.000027	0.000674	-0.04	**0.969**
X7	0.099531	0.002929	33.98	**0.000**
X8	0.000148	0.002005	0.07	**0.941**
X9	-0.000108	0.000094	-1.15	**0.251**
_cons	1.001101	0.008785	113.96	**0.000**
R-sq	0.0404			
F-stat	130.32			
Prob. (F-stat)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian consumer non-cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.13 (c): Determinants of Systematic Risk in Indonesian Consumer Cyclical Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	0.000031	0.000024	1.31	**0.192**
X2	-0.000171	0.001151	-0.15	**0.882**
X3	-0.000131	0.000086	-1.53	**0.129**
X4	-0.001574	0.001319	-1.19	**0.235**
X5	-0.000060	0.000053	-1.14	**0.257**
X6	0.000542	0.000732	0.74	**0.461**
X7	0.004244	0.002919	1.45	**0.149**
X8	0.005979	0.002746	2.18	**0.032**
X9	-0.000178	0.000295	-0.6	**0.548**
_cons	1.027093	0.030241	33.96	**0.000**
R-sq	0.0059			
F-stat	2.55			
Prob. (F-stat)	**0.0109**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian consumer cyclical industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.13 (d): Determinants of Systematic Risk in Indonesian Basic Material Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**

X1	0.000080	0.000040	2.02	**0.044**
X2	-0.000910	0.001056	-0.86	**0.389**
X3	0.000072	0.000096	0.76	**0.449**
X4	0.000361	0.001009	0.36	**0.721**
X5	0.000078	0.000061	1.27	**0.205**
X6	0.004472	0.003401	1.31	**0.189**
X7	-0.000425	0.005669	-0.08	**0.940**
X8	0.003960	0.002193	1.81	**0.071**
X9	0.000642	0.000519	1.24	**0.216**
_cons	0.980061	0.023976	40.88	**0.000**
R-sq	0.0124			
F-stat	1.73			
Prob. (F-stat)	**0.0776**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian basic material industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.13 (e): Determinants of Systematic Risk in Indonesian Technology Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**T-statistics**	**Prob.**
X1	-0.000142	0.000114	-1.25	**0.221**
X2	-0.000079	0.000109	-0.72	**0.477**
X3	0.000057	0.000074	0.77	**0.450**
X4	0.003961	0.002788	1.42	**0.166**
X5	0.000071	0.000040	1.79	**0.085**
X6	0.002655	0.001237	2.15	**0.041**
X7	0.008422	0.012004	0.7	**0.489**
X8	-0.001610	0.008769	-0.18	**0.856**
X9	-0.001045	0.000954	-1.1	**0.283**

_cons	0.916203	0.058805	15.58	**0.000**
R-sq	0.0189			
F-stat	2.27			
Prob. (F-stat)	**0.0471**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian technology industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t} + a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t} + a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t + a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings,

X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.13 (f): Determinants of Systematic Risk in Indonesian Energy Industry (1997-2016).

Y	Coefficient	Robust Std. Error	T-statistics	Prob.
X1	0.00012	0.00012	1.03	**0.307**
X2	-0.00035	0.00041	-0.86	**0.392**
X3	0.00075	0.00077	0.97	**0.332**
X4	-0.00543	0.00575	-0.94	**0.348**
X5	0.00071	0.00113	0.63	**0.529**
X6	-0.01567	0.01643	-0.95	**0.343**
X7	-0.55456	0.45080	-1.23	**0.222**
X8	0.10387	0.10544	0.99	**0.327**
X9	-0.00052	0.00315	-0.17	**0.869**
_cons	1.11569	0.13203	8.45	**0.000**
R-sq	0.3383			
F-stat	0.25			
Prob. (F-stat)	**0.0098**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian energy industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$

$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$

$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$

$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

Table 5.13 (g): Determinants of Systematic Risk in Indonesian other Industry (1997-2016).

Y	**Coefficient**	**Robust Std. Error**	**Z**	**Prob.**
X1	-0.000171	0.000166	-1.04	**0.301**
X2	-0.001686	0.002036	-0.83	**0.407**
X3	0.000449	0.000298	1.51	**0.132**
X4	0.001083	0.001599	0.68	**0.498**

X5	-0.000995	0.001514	-0.66	**0.511**
X6	0.002034	0.003719	0.55	**0.584**
X7	0.019089	0.013187	1.45	**0.148**
X8	0.001686	0.006899	0.24	**0.807**
X9	-0.000638	0.000784	-0.81	**0.416**
_cons	0.975523	0.037494	26.02	**0.000**
R-sq	0.0782			
Wald chi2	38.05			
Prob. (Chi2)	**0.0000**			

Note. ***, **, * denotes significant at 1%, 5%, 10% respectively.

This table shows the regression results of firm-specific variables on systematic risk for Indonesian other industry which estimated from the following equation:

$$Beta_{i,t} = a_0 + a_1 financial\ leverage_{i,t} + a_2 liquidity_{i,t} + a_3 profitability_{i,t}$$
$$+ a_4 size_{i,t} + a_5 firm\ growth_{i,t} + a_6 operating\ efficiency_{i,t}$$
$$+ a_7 financial\ crisis\ 1997_t + a_8 financial\ crisis\ 2008_t$$
$$+ a_9 GDP\ growht_t + \varepsilon_{i,t}$$

Dependent variable

Y (systematic risk or beta)

Independent variables (Firm-specific, dummy, and control variable)

X1(Financial leverage), X2(Liquidity), X3(Profitability), X4(Size), X5(Firm growth), X6(Operating efficiency), X7(Financial crisis 1997), X8(financial crisis 2008), X9(GDP).

Proxy of Firm-Specific Variable

X1(Financial leverage) = Total debt/total asset, X2(Liquidity) = Current

assets/current liabilities, X3(Profitability) = Net income/total assets, X4(Size) = Natural logarithm of total asset, X5(Firm growth) = Annual Percentage Change in earnings, X6(Operating efficiency) = Total revenue/total assets, X7(Financial crisis 1997) = Dummy variable for 1997, X8(financial crisis 2008) = Dummy variable for 2008. X9(GDP) = Growth rate of GDP.

APPENDIX H: Selected Model and Diagnostic Tests (ASEAN-4)

Table 5.14 (a): Hausman Fixed Test in Non-Financial Firms of ASEAN-4 Countries (Fixed effect model versus Random effect model)

---- Coefficients ----

	| | +	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
id1leverage	|	4.71e-06	6.49e-06	-1.78e-06	**3.84e-06**
id2liquit	|	-.000 2765	- .0001313	-.0001452	**.0000682**
id3profit	|	2.48e-08	-6.84e-07	7.09e-07	**1.33e-06**
id4size	|	-.007613	.0007976	-.0084106	**.0017039**
id5growth	|	-.0000193	-4.93e-06	-.0000144	**.0000135**
id6efficie~y	|	-.0000429	.001216	-.0012589	**.0022057**
id7gdp	|	.000523	.002066	-.001543	**.0000854**
dummy1997	|	.0273576	.0351655	-.0078079	**.0014131**
dummy2008	|	**.0123099**	**.0162336**	**-.0039237**	**.0003568**

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 587.34

Prob>chi2 = 0.0000

Table 5.14 (b) Breusch and Pagan Lagrangian Multiplier Test for Random Effects in Non-Financial Firms of ASEAN-4 (Pooled OLS versus Random effect model)

Breusch and Pagan Lagrangian multiplier test for random effects
dvrisk[firm,t] = Xb + u[firm] + e[firm,t]

Estimated results:

| Var | sd = sqrt(Var)

+ ---------- ----------

dvrisk | .0404158 .2010369

e | .0399884 .199971

u | 0 0

Test: Var(u) = 0

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

Multicollinearity (non-financial firms of ASEAN-4)

Variable | VIF | 1/VIF

+ ---------- ----------

id4size | 1.18 0.846605

id6efficie~y | 1.18 0.849957

id7gdp | 1.01 0.990343

dummy2008 | 1.01 0.991883

id2liquit | 1.00 0.996340

dummy1997 | 1.00 0.997723

id1leverage | 1.00 0.998768

id3profit | 1.00 0.999833

id5growth | 1.00 0.999896

\+ ---------- ----------

Mean VIF | 1.04

Heteroskedastic

Modified Wald test for group wise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (2375) = 9.1e+12

Prob>chi2 = 0.0000

Auto-correlated

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation

F(1, 2373) = 745.773

Prob > F = 0.0000

APPENDIX I: Selected Model and Diagnostic Tests (Malaysia)

Table 5.15 (a): Hausman Fixed Test in Non-Financial Firms of Malaysia

(Fixed effect model versus Random effect model)

---- Coefficients ----

	| | +	**(b) fixed**	**(B) random**	**(b-B) Difference**	**sqrt(diag(V_b-V_B)) S.E.**
id1leverage	|	.0001602	.0001317	.0000285	**.0000459**
id2liquit	|	-.0005545	-.0002585	-.000296	**.0001589**
id3profit	|	-.0001979	-.0002424	.0000445	**.0000279**
id4size	|	.0008472	-.0035857	.0044329	**.0029675**
id5growth	|	-.0000622	-.0000294	-.0000328	**.0000281**
id6efficie~y	|	-.0057598	-.0106935	.0049337	**.0051699**
id7gdp	|	-.0021141	-.0021045	-9.53e-06	**.000078**
dummy1997	|	.0257708	.0279115	-.0021407	**.0028439**
dummy2008	|	**.0023915**	**.0022439**	**.0001476**	**.0008569**

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 13.96

Prob>chi2 = 0.1239

Table 5.15 (b) Breusch and Pagan Lagrangian Multiplier Test for Random Effects in Non-Financial Firms of Malaysia (Pooled OLS versus Random effect model)

Breusch and Pagan Lagrangian multiplier test for random effect

dvrisk[firm,t] = Xb + u[firm] + e[firm,t]

Estimated results:

| Var sd = sqrt(Var)

+ ---------- ----------

dvrisk | .0304031 .1743647

e | .0298535 .1727818

u | .000617 .0248385

Test: Var(u) = 0

chibar2(01) = 7.75

Prob > chibar2 = 0.0027

Multicollinearity (non-financial firms in Malaysia)

Variable | VIF 1/VIF

+ ---------- ----------

id4size | 1.07 0.935434

id3profit	1.06	0.946440
id6efficie~y	1.04	0.958975
id2liquit	1.04	0.965390
id1leverage	1.03	0.971027
dummy1997	1.02	0.981153
id7gdp	1.02	0.984234
id5growth	1.00	0.995832
dummy2008	1.00	0.996545
Mean VIF	1.03	

Heteroskedastic

Modified Wald test for groupwise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (745) = 9.9e+09

Prob>chi2 = 0.0000

Auto-correlated

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation

F (1, 744) = 0.031

Prob > F = 0.8595

APPENDIX J: Selected Model and Diagnostic Tests (Singapore)

Table 5.16 (a): Hausman Fixed Test in Non-Financial Firms of Singapore (Fixed effect model versus Random effect model)

		---- Coefficients	----	
	|	(b) fixed	(B) random	(b-B) Difference	**sqrt(diag(V_b-V_B)) S.E.**
id1leverage	+ |	5.63e-06	2.94e-07	5.34e-06	**3.87e-06**
id2liquit	|	-.0004566	-.0004421	-.0000145	**.0002878**
id3profit	|	2.57e-06	5.29e-07	2.04e-06	**1.48e-06**
id4size	|	.0008194	.0012906	-.0004712	**.0027698**
id5growth	|	-3.17e-06	-3.14e-06	-2.67e-08	**.0000195**
id6efficie~y	|	.0063847	.0000865	.0062981	**.0024487**
id7gdp	|	.0011396	.0011766	-.0000371	**.0000926**
dummy1997	|	.0110681	.011403	-.0003349	**.0039204**
dummy2008	**|**	**.0185436**	**.0184456**	**.0000979**	**.0013665**

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 7.94

Prob>chi2 = 0.5397

Table 5.16 (b) Breusch and Pagan Lagrangian Multiplier Test for Random Effects in Non-Financial Firms of Singapore (Pooled OLS versus Random effect model)

Breusch and Pagan Lagrangian multiplier test for random effects

dvrisk[firm,t] = Xb + u[firm] + e[firm,t]

Estimated results:

| Var sd = sqrt(Var)

+ ---------

dvrisk | .0351619 .187515

e | .0354719 .1883398

u | 0 0

Test: Var(u) = 0

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

Multicollinearity (non-financial firms in Singapore)

Variable | VIF 1/VIF

+ ---------- ----------

id7gdp | 1.06 0.947267

dummy2008 | 1.05 0.955514

id4size | 1.03 0.972129

id6efficie~y | 1.03 0.974273

id2liquit	1.01	0.988977
dummy1997	1.01	0.990611
id1leverage	1.00	0.997655
id3profit	1.00	0.998331
id5growth	1.00	0.999799
Mean VIF	1.02	

Heteroskedastic

Modified Wald test for groupwise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i chi2

(605) = 1.6e+12

Prob>chi2 = 0.0000

Auto-correlated

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F (1, 604) = 37.597

Prob > F = 0.0000

APPENDIX K: Selected Model and Diagnostic Tests (Thailand)

Table 5.17 (a): Hausman Fixed Test in Non-Financial Firms of Thailand

(Fixed effect model versus Random effect model)

---- Coefficients ----

	(b)	(B)(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.

id1leverage	+ |	**.0000746**	**.0001491**	**-.0000745**	**.0000837**
id2liquit	|	-.0006639	-.0004269	-.000237	**.0002219**
id3profit	|	-.0000165	9.38e-06	-.0000259	**.0000228**
id4size	|	-.0344441	-.0005124	-.0339317	**.0066021**
id5growth	|	.000075	.0000804	-5.46e-06	**.0000491**
id6efficie~y	|	-.0104517	.000248	-.0106997	**.007438**
id7gdp	|	.004323	.0052131	-.0008901	**.0002882**
dummy1997	|	.0834393	.1176091	-.0341698	**.0062714**
dummy2008	|	**.072304**	**.0819338**	**-.0096298**	**.0036239**

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 46.57

Prob>chi2 = 0.0000

Non-Financial Firms in Thailand

Table 5.17 (b): Breusch and Pagan Lagrangian Multiplier Test for Random Effects in Non-Financial Firms of Thailand (Pooled OLS versus Random effect model)

Breusch and Pagan Lagrangian multiplier test for random effects

dvrisk[firm,t] = Xb + u[firm] + e[firm,t]

Estimated results:

| Var sd = sqrt(Var)

+ ---------

dvrisk | .0790719 .2811973

e | .0807538 .2841721

u | 0 0

Test: Var(u) = 0

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

Multicollinearity (non-financial firms in Thailand)

Variable	VIF	1/VIF
id7gdp	1.13	0.882951
dummy1997	1.12	0.894343
id4size	1.04	0.965017
id6efficie~y	1.03	0.967982
dummy2008	1.03	0.973418
id1leverage	1.03	0.974292
id2liquit	1.02	0.983649
id3profit	1.01	0.993475
id5growth	1.00	0.997184
Mean VIF	1.04	

Heteroskedastic

Modified Wald test for groupwise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (512) = 2.5e+11

Prob>chi2 = 0.0000

Auto-correlated

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation

F (1, 511) = 7.123

Prob > F = 0.0079

APPENDIX L: Selected Model and Diagnostic Tests (Indonesia)

Table 5.18 (a): Hausman Fixed Test in Non-Financial Firms of Indonesia (Fixed effect model versus Random effect model)

---- Coefficients ----

	| | +	**(b) fixed**	**(B) random**	**(b-B) Difference**	**sqrt(diag(V_b-V_B)) S.E.**
id1leverage	|	7.05e-06	.0000882	-.0000811	**.0000525**
id2liquit	|	9.99e-06	-.0000965	.0001065	**.0000633**
id3profit	|	-.00002	-.0000367	.0000168	**.0000305**
id4efficie~y	|	-.002862	-.0003458	-.0025162	**.0029741**
id5growth	|	-.0000957	-.0000796	-.0000161	**.0000258**
id6size	|	-.0063111	-.0003721	-.005939	**.0026521**
gdp	|	-.0000256	-.0001569	.0001313	**.0002111**
dummy1997	|	.0256769	.0294613	-.0037844	**.0035021**
dummy2008	|	**-.0132237**	**-.0121313**	**-.0010923**	**.0009665**

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 11.30

Prob>chi2 = 0.2558

Table 5.18 (b): Breusch and Pagan Lagrangian Multiplier Test for Random Effects in Non-Financial Firms of Indonesia (Pooled OLS versus Random effect model)

Breusch and Pagan Lagrangian multiplier test for random effects

dvrisk[firm,t] = Xb + u[firm] + e[firm,t]

Estimated results:

| Var sd = sqrt(Var)

+ ---------

dvrisk | .0189206 .1375521

e | .0188254 .1372057

u | 0 0

Test: Var(u) = 0

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

Multicollinearity (non-financial firms in Indonesia)

Variable | VIF 1/VIF

+ ---------- ----------

id4efficie~y | 9.67 0.103403

id6size | 9.64 0.103760

gdp | 1.03 0.972242

id1leverage | 1.03 0.972580

id2liquit | 1.02 0.983150

dummy2008 | 1.01 0.988327

dummy1997 | 1.01 0.992666

id3profit | 1.00 0.995164

id5growth | 1.00 0.997420

+ ---------- ----------

Mean VIF | 2.93

Heteroskedastic

Modified Wald test for groupwise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (361) = 3.3e+12

Prob>chi2 = 0.0000

Auto-correlated

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation

F (1, 360) = 0.951

Prob > F = 0.3301