THE ASSOCIATION BETWEEN CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE, EVIDENCE FROM THAI LISTED FOOD AND BEVERAGE SECTOR AND INSIGHTS FROM SUGAR MILL COMPANIES

BY

MR. SUPANUT SINBORISUT

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION PROGRAM IN GLOBAL BUSINESS MANAGEMENT

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ABSTRACT

The purpose of this study is to investigate the impact of capital structure on the financial performance of sugar mill companies and the listed food and beverage sector in Thailand. The capital structure of this study includes total short-term and long-term leverage, as well as short-term and long-term non-operating liabilities to total assets. The research examined secondary financial data from 2015 to 2019 of 38 sugar mill businesses and 34 publicly listed food and beverage companies.

By employing multiple regression analysis, both short-term and long-term leverage have a significant negative impact on the financial performance of sugar mill and F&B companies. Similarly, it deteriorates the performance of sugar mill companies. Only the long-term leverage of F&B companies, on the other hand, has a significant impact on firm performance. Further insights show that, while both sugar mill companies' short-term and long-term non-operating liabilities to total assets significantly impact financial performance, the magnitude of the impacts differs. Furthermore, firm size and growth have a significant positive impact on both sugar mills and F&B companies.

Keywords: Capital structure, Financial Performance, Return on Assets, Sugar Mill Companies, F&B sector

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Mr. Supanut Sinborisut

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CHAPTER 1
INTRODUCTION

1.1 Research Overview

Thai food and beverage sector has been a major contributor to the country's economy for decades. It is critical to the country's development, generating not only domestic job opportunities but also Thailand's overall economic movement. The food and beverage business employs over 600,000 Thais in the food processing industry alone (Euromonitor, 2020). In this segment, the sugar industry solely accounts for 21% of agricultural GDP and 48% of food GDP (National food institute, Ministry of Industry). One of the key businesses in F&B sector is the sugar industry. The sugar supply chain is the backbone of the economy, spanning around farmers, millers, and food processing and beverage businesses. Sugar mill companies and its related supply chain generate value to domestic economy for almost $6 billion per year, providing vacancies for more than 1.5 million farmers and related personnel (Bonsucro, 2017).

Due to dynamic business environment nowadays, companies need to manage their resources effectively and efficiently in order to achieve expected satisfactory company financial performance (Fosu, 2013). It is believed that not only a good financial performance of any companies plays a crucial role in the development of company market value, however, it also links directly toward the growth of the industry and overall economy (Banafa, Muturi & Ngugi, 2015). Likewise, firm financial performance is one of the factors that can be taken into consideration by investors and other external stakeholders such as creditors, to analyze investment and company performance based on data provided in a company reports and/or company financial statements. This is because the firm financial performance pinpoints how well a company produces revenues and manages its assets, debts, and the financial interests of its stakeholders. The key objective of measuring financial performance can be applied to measure the success of the company in achieving its targets. Comparably, profit explains the financial gain recognized after deducting the company revenue flow with related expenses, costs, and judicial expense involved in all business activities.

Nevertheless, there is yet any researcher to perform a specific study with regard to Thai sugar industry and its F&B sector on factors determining financial performance. Although there are various dimensions to interpret company's financial performance, this study applies a Return on Assets (ROA) as a measurement.

While determining the appropriate structure that plays a key role of the financial management of executives since its effect to the value of the firm (Paramasivan and Subramanian, 2009), literature review also revealed that there are mixed conclusions on this association. F&B and sugar companies' performance may depend on various internal and external factors (Jarungklin 2012, Bhutta and Hasan, 2013, etc.). One of the obvious determinants affecting company financial performance is its financing decision (Eunju and Soocheong, 2005, Koskei, 2013, Badar and Saeed, 2013, Rehman, 2013, Pestonji and Donkwa, 2018, etc.). In general, corporate funding is derived from two key resources such as external funding from banks or internal funding from shareholders.

As sugar and F&B company managements' key accountability is deciding financing options (Dare and Sola, 2010), empirical studies in various countries show that these decisions are among one of the most important roles due to its effect on the performance of firms (Koskei, 2013, Ur Rehman, 2013 and Badar and Saeed, 2013). Nonetheless, no studies focusing on Thai sugar company and only a few studies focusing on capital structure and financial performance have been explored in Thailand specific sector (Jarungklin, 2012, Darapho and Tongkong, 2020, etc.). As sugar companies depend on the debt financing to service raw materials procurement, continuation of the capacity expansion, and etc., decision regarding financing choices is related directly to firm cash usage as the company requires cash for investment in an expansion, cash used in day-to-day operations etc. These source of fund alternative selection shows the managements and/or company risk profile whether they tend toward risk-averse or risk-lover. Therefore, a trade-off and optimum level of capital structure between debt and equity is crucial for them to make decision, to maximize profit and return to shareholders. However, manufacturing companies seems to have deficient internal financing support to carry out lucrative investments and do not employ company's assets well (Vătavu, 2015). Hence, it is vital to understand the link and impact of this association in Thai sugar companies' context. This paper is focusing

on the capital structure and its relation on financial performance. Other determinants that have an association with financial performance may refer to company liquidity (Pestonji and Donkwa, 2018), firm size (Jarungklin, 2012) and external factors such as inflation (Vătavu, 2015), and etc.

In this study, the financial performance and capital structure data of sugar companies during 2015-2019 were collected. Data of public F&B sector companies were gathered to study an association on the sectorial level. Both private and public sugar companies' data were gathered. Additionally, this research studies extend into the specific items of leverage including non-operating short-term and long-term liabilities component of capital structure to analyses its impact on financial results.

1.2 Problem Statement

The topic regarding factors determining financial performance have been studied from numerous scholars. The high implication of the results has been playing a key decisional part for business stakeholders especially for management decision and effectiveness in making use of company's various source of funding. One of the most vital company decision is the financing judgment (Saeedi and Mahmood, 2006). Despite various importance of the sector, sugar mills companies in Thailand are faced with an increased leverage due to its past financing behavior. Therefore, it is vital to examine the impact of the capital structure on sugar companies. This paper focuses on sugar and F&B sector along with whether the capital structure has an association with the firm financial performance.

There are only a few attempts providing empirical evidence with regards to relationship of capital structure and Thai 'company financial performance especially for the sugar industry and its sector. In this study, the researcher also would like to determine if financial performance of sugar mill corporations in Thailand is affected specifically by the financing decision of capital structure. A comparison of the results between the sugar companies and listed F&B sector will give an additional insight. This is because the public perception that sugar mill companies and listed F&B sector may have more control and efficient management decisions which resulted to higher financial performance. Link between financial performance and capital structure

regarding food and beverage sector is also investigated to find out an association in the sector, where the sugar industry belongs. Moreover, this research will study further to the non-operating items on capital structure to inspect if there is a difference of impact to financial performance.

1.3 Research Objectives

- To determine an influence of capital structure to sugar mill company's financial performance of in Thailand.
- To determine an influence of capital structure to listed Food and Beverage (F&B) sector companies' financial performance of in Thailand.

1.4 Scope

This study is focusing on an association between capital structure and financial performance of sugar mill companies. It also expands into the companies listed in F&B sector of the Stock Exchange of Thailand. To contemplate recent developments of the sugar industry and its sector (F&B) with sufficient period coverage during the past 5 years, the population is taken from the period of 2015-2019 to oversee the past performance of the Thai sugar companies as the sugar sector had experienced both peak and decline in sugar production. As of 2020, there is 569 number of listed companies in the Stock Exchange of Thailand (SET). The Stock Exchange of Thailand determines industry group indices and sector indices, which currently there are 8 industries along with 28 sectors. The sugar companies are categorized in FOOD sector.

The scope of this study includes

(I) population of 55 private and publicly listed sugar mill companies in Thailand between 2015 to 2019.

(II) population of 43 publicly listed companies in food and beverage sector (FOOD) in the Stock Exchange of Thailand between 2015 to 2019.

1.5 Significance of the Study

The impacts of this study will support most of the food and sugar mill companies domestically who are the pillar of the agricultural sector and the country's economy to improve their financial performance. The conclusions of this study would generate a rich understanding not only for the firm's internal management and finance executives in the food and sugar companies, but also beyond their stakeholders such as creditors and investors. The conclusions of this research will provide an insight related to different relationship on capital structure and financial performance between sugar mill companies and its F&B sector on both total liabilities and non-operating liabilities, both short-term and long-term items.

With limited past studies in the area, the company managements can utilize the results for their financial strategy formulations about capital structure and related internal elements through their decision-making process. For investors to invest in specific company, the financial performance of the company is one of the crucial matters to be considered among other firm factors. Investors may find the results as a guideline for investment decision process. Equity analyst make a stock recommendation based on the company periodic financial performance, especially in this sample. Creditors see the performance as a valuable input as they have been using this as a reference for financing proposal in the sugar and F&B sector. They can utilize the determinants to the financial performance to further analyze in the detail of the company operations and the effectiveness of management, financially and operationally.

In a similar fashion, one of the benefits assessing company financial performance internally is to enable executives to make a distinctive verdict when making new capital expenditure investment. Ultimately, new business developer in food sector would be able to utilize the findings in their favor when setting up company which requires the decision of the usage of funds and targeted financial performance to achieve.

CHAPTER 2
REVIEW OF LITERATURE

2.1 Background of the Study

2.1.1 Importance of Food and beverage (F&B) sector in Thailand

Thai food and beverage sector has been performing a foremost role in the country's economy. The food industry in Thailand provided more than 20% of the country's GDP (Euromonitor, 2020). The country is also one of the biggest net food exporters globally (UNCTAD, 2017). The country beverages segment is also recognized as a key industry in which the total market, excluding alcoholic beverage, was worth roughly USD 7.9 billion and an export value of USD 1.1 billion in 2016 (Euromonitor and Thai Customs, 2017). Thailand's renowned F&B sector has been named "kitchen of the world" with the total value of its exports at USD33 billion in 2019. The country is one of the largest exporters of rice, rubber, and tuna. Also, one of the major exporters of sugar, canned pineapple etc. (Ministry of Commerce). The largest export destinations of Thailand are ASEAN countries including CLMV countries. As a result, Thailand has been the only net food exporter among Asian countries which produces about US$10 billion each year from this sector. The strategic location in the center of Southeast Asia renders the country as a geographical export platform.

The capability of the country in the industry is the result from low cost of production and logistical proximity to high-consumption and a close attachment to the large markets such as China and Indonesia. The industry has been appreciating abundant natural resources, relatively lower labor costs comparing to the region and a year-round growing season in many focal economic crops. This is also enhanced by sourcing local raw material for usage in food industry which comes with competitive cost.

Thailand, as the world's leading agricultural and food exporter, has one of the most advanced food processing activities in the region, allowing the country to compete in international markets and add value to food products. According to the

National Food Institute, the value of Thai food trade will be around US$34.9 billion in 2020, up 5.4 percent from 2019. According to Statista data, Thailand's food manufacturing industry has grown rapidly and is now one of the most established in South East Asia, with over 10,000 players in the space.

2.1.2 Importance of Sugar industry in Thailand

One of the vital industries in Thailand which plays substantial role to food and beverage sector is the sugar industry. There is a strong domestic and global demand for sugar, such as the usage as additive or seasoning in food, beverages, processed dairy products, etc. In 2019, sugar was accounted for more than two third of all sweeteners consumed worldwide and placing the country as the 2nd largest exporter, about 10% market share.

In the past, Thailand sugarcane production used to stand roughly above 100.0 million tons per year (2011/2012-2014/2015 crop period) while sugar output was more than 10.0 million tons per year. During the past 5 years, the country industry production, however, experienced both low production level and peak production level since a low crop in 2015/16 to 2019/20. Still, Thailand remains the world's second-largest sugar exporter and the major export markets are in Asia.

The unremitting growth of economy in Asian countries, especially China, India, and ASEAN countries, led to elevated sugar consumption and production of the region. Currently, Asia's sugar production is more than 70 million tons per year while the necessitate for imports is at more than 20.0 million tons each year. Even though the sector has undergone more than 40% deterioration in sales values due to the worldwide decrease in the sugar price during the last five years, the sugar exports alone generate approximately USD 2.66 billion. Meanwhile Thai sugar export in the world's market share reached the highest level of 19% in 2019, rising from 17%, 11.9% and 13.1% from the year before, respectively.

The Thai sugar sector appreciates several advantages that enable it to compete effectively on both region and world stages. Compared to other crops such as rice, which has always been one of the crucial crops in both domestic and international agricultural segment. This sector expands to rubber, sugarcane, cassava, and other major crops. Remarkably, the production volume of sugarcane in Thai sugar industry was the highest among other major crops in 2018. Given Thailand's ability to influence

the global sugar market, the sugar sector has benefitted from policies that has helped the industry thrive, such as granting of (i) very limited milling licenses, (ii) distance restriction between individual mills, (iii) domestic sugar market prices trading at a premium comparing to global prices, and (iv) subsidized financing rates, amongst other key policies.

Sugar mills in Thailand have been operating under sugar mill groups. Thai sugar mill companies refer to the sugar mill factories which registered as a company in Thailand. Some of the mills may partly or mostly belong to the same groups of owners, however, they operate as a different entity with different characteristic. In this case, they have different operating profile such as location, cane crushing capacity, management etc. In total, according to Office of the Cane and Sugar Board (OCSB), the domestic sugar mill industry consists of 57 companies, inclusive of 4 public companies.

2.1.3 Financial performance of F&B sector and sugar mill companies in Thailand

Nevertheless, the sugar industry has currently experienced a numerous of challenges which develop into an effect in financial performance. Movement of publicly listed sugar companies in Thailand seem to have to been fluctuating and not promising during the past 5 years. Several internal and external factors may be attributed to this circumstance. Internal determinants may include how the company managements decide in financing, new investment, project development, and it may also include how the executives manage their day-to-day business operations. External factors may involve relevance government policies, climate change and even demand for food and beverage both domestically and internationally.

Table 2.1

Return on Asset (ROA) on Thai listed sugar companies during 2015- 2019

Company name	**2019**	**2018**	**2017**	**2016**	**2015**
Buriram Sugar	-1.00%	6.79%	9.70%	4.42%	6.68%
Khonburi Sugar	2.17%	3.76%	-3.85%	-0.73%	-1.34%
Khon Kean Sugar Industry	1.09%	-0.28%	7.40%	3.09%	5.16%
Kaset Thai International Sugar Corporation	3.12%	3.02%	4.54%	3.26%	5.06%

Source: retrieved from CORPUS

Financial performance of sugar mill companies now has become one of the most controversial topics in the business overall among the firms' stakeholders concerning the investors, farmers, employees, government administration and most importantly, the creditors. To access the instability of the company financial performance in the industry, there is a need to investigate the capital structures' differences in relation to the performance.

One of the obvious factors may include underprivileged financing management because of poor financing decision. Not only the sugar companies rely on the debt financing and equity financing due to its high level of cash needed in order to make a smooth raw materials sugarcane procurement operation, but the industry has also been (most sugar processors) continuing to invest in capacity expansion. To elaborate, in every crop season yearly, sugar mill companies also acted as mediators by obtaining loans from several commercial banks to provide pre-season credit to cane growers to facilitate and secure their raw materials purchase. In other words, the factories provide loans or other kinds of financial support to sugarcane farmers and/or sugarcane co-operatives as working capital to plant sugarcane crop (advanced credit), thereby reserving the sugarcane which is the core raw material for the sugar mill company to be able to use in manufacturing process. Such liabilities which the sugar mill companies used their own capital to finance sugarcane credit may adversely affect the company's operations financially.

Additionally, the continuation of capacity expansion of various sugar mill companies requires finance executives to find the suitable funding options and optimize

capital structure. After 2010, officials (under The Sugarcane and Sugar Act of 1984) have issued permits for new mills twice. Before this, there were the first new permits announced since 1989 and the number of sugar processing plants was boosted up from 46 in 2010 to 54 in 2017. Recently, there have been massive expansions continuing from other permits, in which at least 10 sugar mill factories will start operating commercially by 2021. This incident often becomes the company executives' duty to plan on their capital structures. There are several ways to consider the financing decision options, including short-term and long-term debt from bank, bond issuance or even equity raise. It would be common for some questions to rise such as at which level should the company be financed by debt? which level should be financed by equity? what are the benefits and what is cost of funding? as in the end these decisions might affect company financial performance.

2.2 Financial performance indicator

As firm can generate profits based on the assets, sources of funds deployed, and investment financed, ultimately, financial performance can be measured by, mainly, Return on Assets (ROA), Return on Equity (ROE) (Omesa, 2015). Some scholars utilized Economic Value Added to calculate company financial performance (Mursalim et al., 2017). Price per book value, margin ratios and Tobin's Q are also employed to study firm's financial performance (Nirajini and Priya ,2013, Ur Rehman, 2013, etc.). There are several important points to the company itself and its stakeholders, to look at the company financial performance. Public investors, stock analysts, company officers, and other relevant parties have been examining company financial performance on a daily basis.

With regard to financial performance, one of the most broadly implemented methods of company financial performance is Return on Assets (ROA). Return on Assets has been considered reflecting overall company performance (Johnson and Johnson, 1989). Although the income statement could help estimating how profitable a firm is in absolute conditions, it is vital that we determine the profitability of the firm in comparison terms or percentage returns (Damodaran, 2014). This ratio shows how profitable a company is in relative way to the company's total assets, which elaborate

how efficient management is at generating profits relatively. Gitman, Joehnnk and Smart (2011) indicated that Return on Assets reveals management's success in generating profits from the assets it has available. There are considerable studies which focused on ROA as financial performance, including the work from Ullah (2019), Ahmad et al. (2015), Vatavu (2015), Xu (2015), Thi Doan (2019), Badar and Saeed (2013), Rehman (2013), Eitokpa (2015), etc.

Consequently, the main intention of this study is to measure the relationship between financial performance and the factors affecting its performance, of the selected companies. In this context, firm's financial performance focuses on Return on Asset (ROA).

2.3 Past Studies

2.3.1 Capital structure and financial performance

Investigations regarding financing decision and its impact on the company financial performance have been studied by number of researchers related to the corporate finance field. Although, this relationship has been researched in numerous contexts and countries since the founding effort of Modigliani and Miller (1958), so called M&M theorem, which used to understand that there is no impact on capital structure to firm value, the later work of Miller (1963) also explained that interest expenses are tax deductible, and that consequently, the value of the firm should increase with higher leverage. According to the previous researches on the capital structure, many variables were found by the researchers. However, it is not until now that Thai sugar mill and F&B sector is explored even though it was mentioned as one of the backbones of Thai economy in financing decisions and financial performance.

In general, there are several findings supporting the link between capital structure and the firm financial performance. However, different results from past studies can be discovered in various contexts and industries.

Various past studies show similar empirical evidence across the different industries such as energy, manufacturing, and agricultural industries. The study on the agricultural business-related companies by Habib Ullah (2019) employed 5 fertilizer companies using regression analysis. The objective of this research is to

study the impact of financial leverage on the firm's profitability that belongs to fertilizer sector of Pakistan. Financial leverage has a significant negative impact on the Return on Asset (ROA). There were similar results reported by Ahmad et al. (2015) where there was a negative correlation between debt to total assets ratio and net profit to total assets ratio. This study employed Pakistan manufacturers (cement) listed on KSE from 2005 to 2010. The sample size for 18 firms for 6 years.

Manufacturing companies listed on the Indonesia Stock Exchange study shows parallel results. Nini, Patrisia and Nurofik (2020) used total leverage, long-term leverage, and short-term leverage as capital structure while company's financial performance is measured by Return on Equity and Price per Book Value. Obviously, capital structure has negative and significant effect on the company's financial performance. Sorana Vătavu (2014) also aims to establish the relationship between capital structure and financial performance in listed Romanian manufacturing companies. The results of regressions also proved that the ROE and ROA are better when firms avoid debt and operate based on equity. Capital structure indicators refer to long-term debt, short-term debt, total debt and total equity. In this study, the determinants performed as control variable includes Asset Tangibility (fixed assets to total assets), Tax (tax to earnings before interest and tax), Business Risk (standard deviation of earnings before interest and tax to total assets), Liquidity (current assets to current liabilities), and Inflation rate. The study also concluded that there are positive impact of tax and annual inflation rate on ROA but negative relationship of Asset Tangibility. Liquidity is also positively related to ROE.

Likewise, the work of Darapho and Tongkong (2020) on firm profitability of 42 listed companies in energy and utilities concluded that capital structure has negative impact on firm profitability while company size has statistically positive impact on firm profitability of ROA. However, it is important to note that total asset turnover ratio, liquidity and asset tangibility have no impact on financial performance.

However, positive association between capital structure and financial performance can be seen from various researches in the context of not only agricultural industry but publicly listed enterprises in Thailand, Indonesia, Malaysia etc. Masavi, Kiweu and Kinyili (2017) studied the link between capital structure and financial

performance of agricultural companies listed in Nairobi. The study applied pearson's correlation coefficient and multivariate regression analysis. They concluded that an increase in leverage will lead to a rise in financial performance.

In addition, a research by Nirajini and Priya (2013) among listed trading companies in Sri Lanka. The research discovered that, there is positive relationship between capital structure and financial performance. Debt to asset ratio, Debt to equity ratio and Long-term debt correlated with Gross profit margin, Net profit margin, Return on Capital Employed (ROCE), Return on Asset (ROA) and Return on Equity (ROE).

More recent research from Mursalim, Mallisa M., Kusuma H. (2017) in the context of Thailand, Indonesia and Malaysia revealed that the capital structure of listed firms was significantly related to the firm performance. The result shows positive association in Thailand's perspective comparing leverage and economic value added. Firm performance in this case was referred to as Economic Value Added (EVA).

Additionally, significant negative connection between leverage and firm performance of Return on Asset (ROA) can also be found in Shanghai Stock Exchange and Ho Chi Minh Stock Exchange. The study of Mou Xu (2015), who studied the listed firm in Shanghai Stock Exchange 50 utilizing multiple regression which resulted in negative and significant relationship between leverage and firm performance of Return on Asset (ROA) and Return on Equity (ROE). Independent variables including liquidity as measured by current ratio, asset utilization as measured by total asset turnover ratio, leverage as measured by debt ratio, and a dummy variable is firm size. Assets utilization has positive and significant effects on firms' financial performance

As well as in Vietnam's perspective, study from Thi Doan (2019) gave first empirical evidence on the impact of financing judgment on performance in exploiting 102 non-financial companies listed on Ho Chi Minh Stock Exchange (HOSE) in the period during 2008-2018. Financing decision here is measured by: total debt to total assets, long-term debt to total assets, and short-term debt to total asset. Furthermore, firm size, economic growth and inflation rate are also used as control variables. As a result of the analysis, firm performance is significantly correlated with financing decision, such as increase of debt reduces the firm performance (negative

association). Additionally, there is a positive effect of inflation rate on financial development. ROA is utilized to measure firm performance in this study.

In Thailand, the Stock exchange of Thailand has organized the companies into different indexes and markets. Conflicted conclusions can also be identified in SET100 and MAI. A study by Wongsorntham (2016), who used multiple regression to assess the relationship between capital structure and firm performance, resulted in a noteworthy link on the SET100 firm's performance. Even though capital structure has a significant relationship on the SET 100 firm's performance, there was no impact of it on a firm's performance for companies listed in MAI (Thailand). However, there is no sugar company listed in the MAI market of Thailand. Likewise, recent work from Phetkong and Yupabhorn (2019) analyzing an effect of capital structure on firm value and profitability by observing 125 firms listed in Market for Alternative Investment (MAI) between 2012 and 2016 statistically proved that debt-to-assets ratio has a positive effect on the firm value, but affects the profitability negatively. When a company performs lower returns than its financial costs and operating expenses; its profitability is decreased. Moreover, there is positive impact of firm size on financial performance. However, there is negative impact of firm growth (calculated by sales growth) on financial performance.

2.3.2 Capital structure and financial performance in Food and Beverage sector and Sugar mill companies

Several past studies regarding the link between financial performance and financing decision of listed food companies showed a variety of linkages between the variable's outcomes. One important note from the study, of effects of firm-specific influences on food-sector company profitability by Bhutta and Hassan (2013), is that the debt-to-equity ratio, tangibility, firm growth, and food inflation are all found to be insignificantly and positively linked to profitability. There is, however, a strong negative correlation between size and profitability. Eunju and Soocheong (2005) used data from 1998 to 2003 in their assessment of the relationship between profitability, financial leverage, and firm size in the food restaurant business. The ratio of long-term debt to total assets was used to determine capital structure, and total assets were used to calculate firm size. The research concluded that restaurant companies with large

assets were more successful than small businesses. Unsurprisingly, firms with higher debt performed worse financially (negative association).

Furthermore, a study conducted by Pestonji and Donkwa (2018) on the profitability and liquidity of the Food and Beverage Sector in Thailand Stock Exchange revealed that a higher liquidity ratio and a shorter cash conversion period will improve profitability. ROE, ROA, and operation margin were used to measure profitability. It is critical to note that the average profitability of the food and beverage businesses listed on the Thai Stock Exchange was not very high, but it is expected to rise in the future. Jarungklin (2012) discovered that company size had a positive impact on profitability (net profit margin) of 17 listed food and beverage companies between 2006 and 2010, but staff productivity seemed to have a negative influence on profitability. However, raw material costs, liquidity, work efficiency, and capital strength (debt to equity) had no implications on F&B's financial performance. Literatures about factors which influence sugar company financial performance specifically have been studied by many scholars around the world. Once Again, various results were concluded. It is critical to note that short-term debt portion, however, is believed by scholars such as Nicholas Kipkoech Koskei (2013) and Badar and Saeed (2013) to have negative influence on sugar mill company financial accomplishment. With regard to capital structure and performance of private sugar manufacturing companies in Keynya, Nicholas Kipkoech Koskei (2013) statistically proved that there are an association between capital structure variables and firm performance. The study incorporated moderating factor of firm size which also hold an impact on financial performance. The statistics discoveries concluded that debt equity ratio, debt ratio and long-term debt to asset ratio plays a key role in improving the financial performance of the organization, while short term debt financing has negative effect on profitability (ROE).

The study examined the impact of firm's capital structure components and leverage on firm's performance in Karachi stock exchange from Badar and Saeed (2013) convinced that there is a significant positive impact of long-term debts on firm's performance. However, it is essential to note that there is a significant negative impact of short-term debts on firm's performance. In Pakistan sugar sector, the work of Ur Rehman (2013) on relationship between financial leverage and performance gave

diversified results. The conclusion of this paper shows that there are the positive relationships of debt equity ratio with ROA and sales growth. Yet, there is a negative relationship of debt equity ratio with EPS, net profit margin and ROE.

All in all, there are mixed results regarding the effect of financial. Not only capital structures that have impact company financial performance, external factors such as economic and inflation also statistically have an association to company financial performance. Many studies set the scope of the research as the whole capital market not a specific sector. Some focuses on the sugar sector but not in Thailand listed company framework. However, there were limited attempt on the study related to food sector and sugar mill industry. Only a few analyzes on Thai food and beverage sector. This study might be one of the first that provides both insights on the financial performance.

Furthermore, empirical evidence demonstrates that, different forms or structures of companies may reflect the association between capital structure and financial performance in a different way. Result from Sayeed (2011) indicated that the capital structure and company management have significant relations to capital structure and company management. From the stakeholder's point of view, private sugar mills have proved to be more effective financially than cooperative sugar factories in India, (Gupta and Randhawa, 2018). The medium-sized companies also operate better financially than larger companies, at least in the group of private companies not listed companies (Pastusiaka et al, 2016). While both short-term and long-term hold negative impact to listed and non-listed sample companies in the Netherlands, the leverage of private firms is more sensitive to firm profitability (Kopyakova, 2017).

Table 2.2

Literature review in various industries regarding capital structure and company financial performance

Authors	Industry	Response variable	Independent variables (IV) and Control variables (CV)														
			Total debts to Assets	Total debts to Equity	Long-term debts to total assets	Short-term debts to total assets	Firm size	Liquidity	Asset utilization	Asset Tangibility	Firm growth	Cost of raw materials	Work efficiency	Economic Growth	Inflation rate	Tax	Business Risk
Nirajini, Priya (2013)	Trading	GPM, NPM, ROCE, ROE, and ROA	IV	IV	IV												
Ahmad, Salman, Shamsi (2015)	Manufacturing	ROA	IV														
Vătavu (2015)	Manufacturing	ROE and ROA	IV		IV	IV		CV		CV					CV	CV	CV
Masavi, Kiweu, Kinyili (2017)	Agricultural	ROE	IV	IV													
Ullah (2019)	Fertilizer	ROA	IV														
Nini, Dina Patrisia, Nurofik (2020)	Manufacturing	ROA and PBV	IV		IV	IV	CV				CV						

Authors	Industry	Response variable	Independent variables (IV) and Control variables (CV)														
			Total debts to Assets	Total debts to Equity	Long-term debts to total assets	Short-term debts to total assets	Firm size	Liquidity	Asset utilization	Asset Tangibility	Firm growth	Cost of raw materials	Work efficiency	Economic Growth	Inflation rate	Tax	Business Risk
Darapho and Tongkong (2020)	Energy and Utilities	ROE and ROA	IV		IV		CV	CV	CV								

Table 2.3

Literature review in capital market regarding capital structure and company financial performance

Authors	Industry	Response variable	Independent variables (IV) and Control variables (CV)														
			Total debts to Assets	Total debts to Equity	Long-term debts to total assets	Short-term debts to total assets	Firm size	Liquidity	Asset utilization	Asset Tangibility	Firm growth	Cost of raw materials	Work efficiency	Economic Growth	Inflation rate	Tax	Business Risk
Xu (2015)	Various	ROE and ROA	IV				IV	IV	IV								
Thi Doan (2019)	Various	ROA	IV		IV	IV	CV							CV	CV		
Wongsorntham (2016)	Various	ROE, ROA and NPM	IV	IV													
Phetkong and Yupabhorn (2019)	Various	ROA and TOBINQ	IV		IV	IV	CV				CV*						
Mursalim et al. (2017)	Various	EVA	IV														

* Phetkong and Yupabhorn (2019) utilized Sales Growth to study Firm growth

Table 2.4

Literature review in F&B and sugar companies regarding capital structure and company financial performance

Authors	Industry	Response variable	Independent variables (IV) and Control variables (CV)														
			Total debts to Assets	**Total debts to Equity**	**Long-term debts to total assets**	**Short-term debts to total assets**	**Firm size**	**Liquidity**	**Asset utilization**	**Asset Tangibility**	**Firm growth**	**Cost of raw materials**	**Work efficiency**	**Economic Growth**	**Inflation rate**	**Tax**	**Business Risk**
Bhutta and Hasan (2013)	F&B	NPM		IV			IV			IV	IV				CV		
Eunju and Soocheong (2005)	F&B	ROE	IV				IV										
Pestonji and Donkwa (2018)	F&B	ROA, ROE and OPM						IV									
Jarungklin (2012)	F&B	NPM		IV			IV	IV				IV	IV				
Koskei (2013)	Sugar	ROE	IV	IV	IV	IV	CV										

Authors	Industry	Response variable	Independent variables (IV) and Control variables (CV)														
			Total debts to Assets	Total debts to Equity	Long-term debts to total assets	Short-term debts to total assets	Firm size	Liquidity	Asset utilization	Asset Tangibility	Firm growth	Cost of raw materials	Work efficiency	Economic Growth	Inflation rate	Tax	Business Risk
Ur Rehman (2013)	Sugar	EPS, NPM, ROA, ROE, SALESGROWTH		IV													
Badar and Saeed (2013)	Sugar	ROA		IV	IV	IV			IV								

Table 2.5

Calculation methodology

Factors	**Calculations**
Firm size	Natural Logarithm of Total assets
Liquidity	Current Assets to Current Liabilities Liquidity
Asset Utilization	Sales to Average Total Assets
Asset Tangibility	Fixed Assets to Total Assets
Firm growth	Total Assets Growth
Cost of raw materials	Cost of Goods Sold to Total Expenses
Work efficiency	Operating Expenses to Total Revenue
Business Risk	Standard Deviation of Earnings Before Interest and Tax to Total Assets
Tax	Tax to Earnings Before Interest and Tax

Source: various articles

2.4 Research Hypothesis

Firstly, the following hypothesizes are examined to access an effect of capital structure on financial performance of sugar mill companies.

- **Hypothesis 1A:** There is a significant negative association of capital structure measured by Total Short-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA).
- **Hypothesis 1B:** There is a significant negative association of capital structure measured by Total Long-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA).

Additionally, to understand an impact of capital structure on financial performance on F&B sector, following hypothesizes are examined.

- **Hypothesis 2A:** There is a significant positive association of capital structure measured by Total Short-Term Liabilities to Total Assets on listed Food and beverage sector's companies' financial performance (ROA).
- **Hypothesis 2B:** There is a significant positive association of capital structure measured by Total Long-Term Liabilities to Total Assets on listed Food and beverage sector's companies' financial performance (ROA).

To be able to obtain more considerable insights on the sugar industry, this research study further into the composition of total short-term liabilities and total long-term liabilities compared to total assets. As total debts are a combination between both short-term and long-term funds from financial institutions, which are a key resource utilized by the company's operation and investment activities. As both short-term liabilities and long-term liabilities can be categorized into non-operating items and operating items. Operating liabilities come from business day-to-day operations and working capital management which is not focused on this research's section.

To understand the funds used in investment activities, only non-operating liabilities items are considered. This is to identify capital structure decisions based on

the external financing that related to investment activities, funding's from financial institutions and interest-bearing items.

Non-operating short-term liabilities are debt that bears interest for less than one year, incurring interest expense. This includes short-term loans from financial institutions and current portion of long-term loans. Non-operating long-term liabilities are also debt that bears interest for more than one year, incurring interest expense. This contains long-term loans from financial institutions. The following hypothesize are accessed.

- **Hypothesis 3A:** There is a significant negative association of capital structure measured by Non-operating Short-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA).
- **Hypothesis 3B:** There is a significant negative association of capital structure measured by Non-operating Long-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA).

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Sample and data collection

The study employed panel data from secondary financial data of historical financial statements as in Table 3.1 and 3.2 taken from CORPUS business database (www.corpus.bol.co.th). Listed companies in the F&B sector and sugar mill companies (public and private) are selected as a sample between 2015 and 2019. The firms that lack financial data during the studied period are taken out. Companies under the rehabilitation process are taken out of the study. This results in a total of 72 companies in the study ("F&B sector and sugar mill companies"), including a sample of 34 listed companies in Food & Beverage ("F&B sector companies") and a sample of 38 sugar mill companies, both listed and private ("sugar mill companies"). Panel data with 380 observations are produced as a result of the previous benchmarks.

Table 3.1

Study sample of sugar mill companies

no.	Sugar mill companies	no.	Sugar mill companies
1	United Farmer & Industry	20	New Kwang Soonlee Sugar Factory
2	Ban Pong Sugar	21	Phitsanulok Sugar
3	Buriram Sugar	22	Prachuap Sugar Industry
4	Eastern Sugar & Cane	23	Rajburi Sugar
5	Erawan Sugar	24	Rayong Sugar
6	E-Saan Sugar Industry	25	Saraburi Sugar
7	Kampang Petch Sugar	26	Singburi Sugar
8	Kaset Phol Sugar	27	Surin Sugar
9	Kaset Thai International Sugar Corporation	28	T.N. Sugar Industry
10	Khon Kaen Sugar Industry	29	Tamaka Sugar Industry
11	Khonburi Sugar	30	Thai Multi-Sugar Industry
12	Korach Industry	31	Thai Roong Ruang Industry
13	The Kumphawapi Sugar	32	Thai Sugar Industry
14	Mitr Kalasin Sugar	33	Thai Sugar Mill

no.	Sugar mill companies	no.	Sugar mill companies
15	Mitr Kasetr Industry	34	Thai Udonthani Sugar Mill
16	Mitr Kasetr Uthaithani	35	The Saha Ruang
17	Mitr Phol Sugar Corporation	36	The Suphanburi Sugar Industry
18	Nakornphet Sugar	37	Thip Sugar Kamphaengphet
19	New Krung Thai Sugar Factory	38	Thip Sugar Sukhothai

Table 3.2

Study sample of listed F&B companies

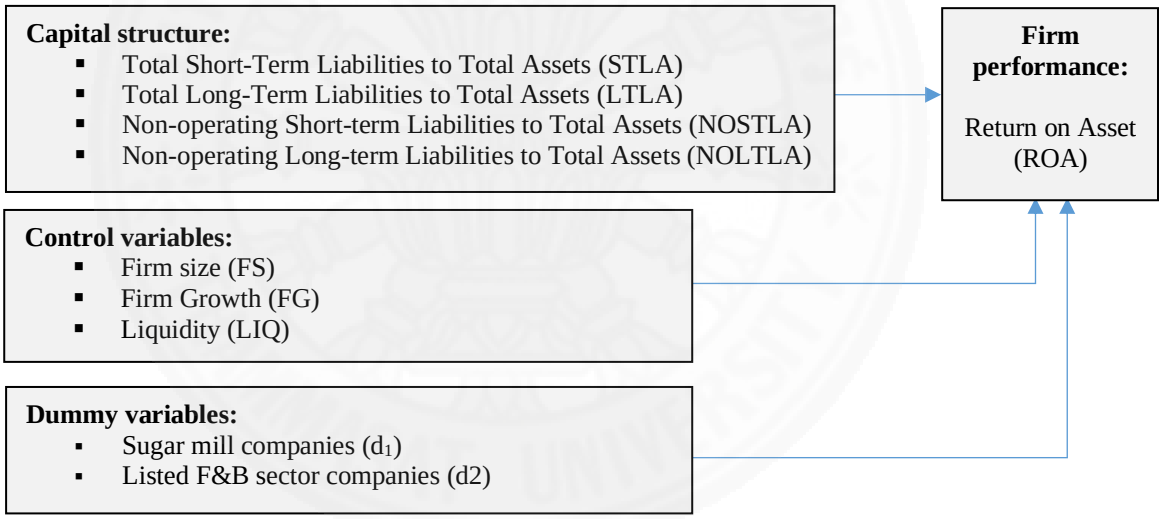
no.	listed F&B companies	no.	listed F&B companies
1	Agripure Holdings	18	President Bakery
2	Asian Sea Corporation	19	Premier Marketing
3	Bangkok Ranch	20	Patum Rice Mill and Granary
4	Carabao Group	21	Sappe
5	Seafresh Industry	22	Thai Theparos
6	Kiang Huat Sea Gull Trading	23	Siam Food Products
7	Chiangmai Frozen Foods	24	S & P Syndicate
8	Charoen Pokphand Foods	25	S. Khonkaen Foods
9	Chumporn Palm Oil Industry	26	Sermsuk
10	Food and Drinks	27	Surapon Foods
11	Haad Thip	28	Sub Sri Thai
12	Ichitan Group	29	Tropical Canning (Thailand)
13	Lam Soon (Thailand)	30	Thaifoods Group
14	Mk Restaurant Group	31	Tipco Foods
15	Malee Group	32	Taokaenoi Food & Marketing
16	Minor International	33	Thai Union Group
17	Oishi Group	34	Thai Vegetable Oil

3.2 Conceptual model and variables

The study composes of two sections of the quantitative analysis. This research employs Return on Assets (ROA) as an indicator (dependent variables) of firm financial performance as the acceptance among literature review in the past. Meanwhile, independents variables include Total Short-Term Liabilities to Total Assets

and Total Long-Term Liabilities to Total Assets. Control variables include Firm size (FS), Firm Growth (FG) and Liquidity (LIQ) to avoid omitted variables problem. Firstly, the Hypothesis 1 and Hypothesis 2 will be examined in Section I. Secondly, Hypothesis 3 will be examined in Section II. Additionally, to understand the different effect and size of impact of capital structure between sugar mill companies and the F&B sector, dummy variables are included in the model.

- **d_1:** The dummy variable uses the value of 1 if the firm is sugar mill companies. Otherwise, it takes the value of 0.
- **d_2:** The dummy variable uses the value of 1 if the firm is listed in the F&B sector. Otherwise, it takes the value of 0.



Figures 3.1 Conceptual model (source: Author)

Table 3.3

Variables used in the research model (source: Author)

Variables	Measures	Previous examples of related research
	Dependent variable	
Firm financial performance (ROA)	Net profit / Total assets	Ullah (2019), Ahmad et al. (2015), Vatavu (2015), Xu (2015), Thi Doan (2019), Badar and Saeed (2013), Rehman (2013), Eitokpa (2015), Vithessonthi and Tongurai (2015), Detthamrong et al. (2017), Darapho and Tongkong (2020) and Phetkon and Yupabhorn (2019).
	Independent variables	
Total Short-Term Liabilities to Total Assets (STLA)	Total short-term liabilities / Total assets	Badar and Saeed (2013), Ur Rehman (2013), Ahmad et al. (2015), Vătavu (2015), Xu (2015), Wongsorntham (2016), Masavi et al. (2017), Pestonji and Donkwa (2018), Ullah (2019), Thi Doan (2019), Phetkong and Yupabhorn (2019), Darapho and Tongkong (2020)
Total Long-Term Liabilities to Total Assets (LTLA)	Total long-term liabilities / Total assets	Eunju and Soocheong (2005), Koskei (2013), Vătavu (2015), Thi Doan (2019), Phetkong and Yupabhorn (2019), Nini et al. (2020), Darapho and Tongkong (2020)
Non-operating Short-Term Liabilities to Total Assets (NOSTLA)	Non-operating short-term liabilities / Total assets	Non-operating short-term debt is part of Total short-term debt and only includes overdraft from financial institutions, current portion of long-term loans and short-terms loans.
Non-operating Long-Term Liabilities to Total Assets (NOSTLA)	Non-operating long-term liabilities / Total assets	Non-operating long-term debt is part of Total long-term debt includes long-term loans from financial institutions.
	Control variables	
Firm Size (FS)	ln (Total assets)	Jarungklin (2012), Bhutta and Hasan (2013), Xu (2015), Mursalim et al. (2017), Thi Doan (2019), Phetkong and Yupabhorn (2019), Darapho and Tongkong (2020), Nini et al. (2020)

Firm Growth (FG)	Growth ratio of sales	Phetkong and Yupabhorn (2019)
Liquidity (LIQ)	Current assets / current liabilities	Jarungklin (2012), Xu (2015), Vătavu (2015), Pestonji and Donkwa (2018)
	Dummy variables	
Dummy Variables	▪ All sugar mill companies (d_1=1) and else (d_1=0) ▪ Listed F&B companies (d_2=1) and else (d_2=0)	

3.3 Regression model

The quantitative study includes Descriptive Statistics, Correlation Analysis and Multiple Regression Analysis. The study follows the below models to investigate the relation between the dependent variable, independent variables, control variables and dummy variables. The empirical data is examined using the Statistical Package for Social Sciences (SPSS).

Section I:

Model 1.0: The model objective is to provide empirical insight into the listed F&B sector and all sugar mill companies' capital structure impact on financial performance.

$$ROA_{i,t} = \beta_0 + \beta_1(STLA_{i,t}) + \beta_2(LTLA_{i,t}) + \beta_3(FS_{i,t}) + \beta_4(FG_{i,t}) + \beta_5(LIQ_{i,t}) + \mu_{i,t}$$

Model 1.1: The model objective is to test Hypothesis 1 and Hypothesis 2.

$$ROA_{i,t} = \beta_{0'} + \beta_{1a}d_1(STLA_{i,t}) + \beta_{2b}d_1(LTLA_{i,t}) + \beta_{1a}d_2(STLA_{i,t}) + \beta_{2b}d_2(LTLA_{i,t}) + \beta_{3'}(FS_{i,t}) + \beta_{4'}(FG_{i,t}) + \beta_{5'}(LIQ_{i,t}) + \mu_{i,t}$$

Section II:

Model 2.0: The model objective is to provide empirical evidence of both the listed F&B sector and all sugar mill companies' non-operating liabilities of capital structure impact on financial performance.

$$ROA_{i,t} = \beta_0 + \beta_1(NOSTLA_{i,t}) + \beta_2(NOLTLA_{i,t}) + \beta_3(FS_{i,t}) + \beta_4(FG_{i,t}) + \beta_5(LIQ_{i,t}) + \mu_{i,t}$$

Model 2.1: The model objective is to test Hypothesis 3.

$$ROA_{i,t} = \beta_{0'} + \beta_{1'}d_1(NOSTLA_{i,t}) + \beta_{2'}d_1(NOLTLA_{i,t}) + \beta_{3'}(FS_{i,t}) + \beta_{4'}(FG_{i,t}) + \beta_{5'}(LIQ_{i,t}) + \mu_{i,t}$$

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Data Descriptive Statistics

This research implements annual historical financial data from 2015 to 2019 to conclude the below descriptive statistics of the studied variables. Variables in the study include firm financial performance (Return on Assets) as a dependent variable, Total short-term liabilities to total assets, Total long-term liabilities to total assets, Non-Operating Short-Term Liabilities to Total Assets and Non-Operating Long-Term Liabilities to Total Assets as an independent variable. Also, control variables include Firm size, Firm growth, and liquidity. These descriptive statistics comprise the number of data, average, standard deviation, and minimum-maximum value of each variable.

The following data represents descriptive statistics of studied samples, with Return on Assets (ROA) as a dependent variable, Total Short-Term Liabilities to Total Assets (STLA) as an independent variable, and Total Long-Term Liabilities to Total Assets (LTLA) as an independent variable. The following descriptive statistics of Model 1.0 and 2.0 from the study show the number of study samples, minimum value, maximum value, mean value, and standard deviation.

Table 4.1

Descriptive statistics result

	Dependent variable	***Section I*** **Independent variables**		***Section II*** **Independent variables**	
	ROA	STLA	LTLA	NOSTLA	NOLTLA
N	380	380	380	380	380
Minimum	-0.39	0	0	0	0
Maximum	0.5	3.09	3.83	0.9	3.8
Mean	0.0385	0.3126	0.1883	0.156	0.1374

	Dependent variable	***Section I*** **Independent variables**		***Section II*** **Independent variables**	
	ROA	STLA	LTLA	NOSTLA	NOLTLA
Std. Deviation	0.0918	0.2423	0.3266	0.1801	0.3143
t-Test: P(T<=t) two-tail		0.0000*		0.3055**	

*Since the p – value is less than alpha 0.05, at a 95% confidence level, there is no significant difference in the means of each sample.

**Since the p – value is more than alpha 0.05, at a 95% confidence level, there is significant difference in the means of each sample.

The statistics from 380 samples in table 4.1 show that the average Return on Assets (ROA) of sugar mill and F&B sector companies was 3.85%, with the highest ROA at 50% and the worst company performance posting a ROA of negative 39% between 2015 and 2019. In addition, the standard deviation was 9.18%. According to these findings, the financial performance of sugar mill and F&B sector companies as measured by ROA varies considerably.

Considering capital structure independent variables of section I in the F&B sector and all sugar mill companies (STLA and LTLA), the statistics show that the average of Total Short-Term Liabilities to Assets was 31.26%. In comparison, the Long-term portion was only 18.83%. It is essential to note from the descriptive statistics that sugar mill companies tend to Total Short-term Liabilities of about 309%. However, the F&B sector companies Long-term Liabilities to Total Assets is at 383% on average.

As the capital structure for section II, the study employs Non-Operating Short-Term and Non-Operating Long-Term Liabilities to Total Assets. When both sugar mills and the F&B sector were considered, the average Non-Operating Short-Term Liabilities to Total Assets (NOSLTA) was 15.6%, with the highest value being 90%. On the other hand, the average Non-Operating Long-Term Liabilities to Total Assets (NOLTLA) was significantly lower at 13.74%, with the highest value of 380%. Similarly, sugar mill companies had the highest ratios of Short-Term and Long-Term Non-Operating Liabilities to Total Assets.

When Total Short-Term Liabilities to Total Assets and Long-Term Liabilities to Total Assets are considered, the analysis indicates that the majority of the sector's long-term liabilities are non-operating long-term liabilities. The current portion, on the other hand, is used for day-to-day operations. However, the standard deviation of Non-Operating Long-Term Liabilities to Total Assets (NOLTLA) was 31.43%, nearly double the standard deviation of Non-Operating Short-Term Liabilities Total Assets (NOLTLA). This means that the companies in this study use Non-Operating Long-Term Liabilities more comprehensively than the Short-Term. Finally, some companies in the food and beverage and sugar industries do not use any non-operating leverage.

4.2 Pearson Correlation

In the models of this study, Pearson correlation between independent variables is evaluated to retrieve initial correlation between variables and access multicollinearity statistical problem. Figures from table 4.2 to 4.3 of section I (models 1.0 and 1.1) show that capital structure independent variables and control variables for all models are not highly correlated, based on a low correlation of less than 0.8, demonstrating that the models have no multicollinearity issues.

Preliminary correlation findings suggest that the Total Short-term Liabilities to Total Assets (STLA) and Total Long-term Liabilities to Total Assets (LTLA) of both sugar mill companies, and F&B sector companies have a significant negative impact on their ROA. Furthermore, beginning with Model 1.1, sugar mill companies' Total Short-term Liabilities to Total Assets (STLA) and Total Long-term Liabilities to Total Assets (LTLA) have a significant negative impact on their ROA. Model 1.1 correlation, on the other hand, reveals that only F&B sector companies' Total Short-term Liabilities to Total Assets (STLA) have a significant positive impact on their ROA. Additionally, financial performance is positively influenced by all control variables, including firm size, firm growth, and liquidity.

Table 4.2

Model 1.0 correlation result

	ROA	STLA	LTLA	FS	FG	LIQ
ROA	1.000					
STLA	-0.362*	1.000				
LTLA	-0.298*	0.187	1.000			
FS	0.090*	-0.079	0.108*	1.000		
FG	0.067	-0.002	0.007	-0.026	1.000	
LIQ	0.083	-0.278*	-0.090*	-0.157*	0.025	1.000

*Significant at the 5% level

Table 4.3

Model 1.1 correlation result

	ROA	d_1STLA	d_1LTLA	d_2STLA	d_2LTLA	FS	FG	LIQ
ROA	1.000							
d_1STLA	-0.426*	1.000						
d_1LTLA	-0.316*	0.362*	1.000					
d_2STLA	0.194*	-0.419*	-0.213*	1.000				
d_2LTLA	0.027	-0.329*	-0.126*	0.439*	1.000			
FS	0.090*	-0.062	-0.050	0.096*	0.518*	1.000		
FG	0.067	0.026	0.020	-0.066	-0.039	-0.026	1.000	
LIQ	0.083	-0.177*	-0.074	-0.143*	-0.066	-0.157*	0.025	1.000

*Significant at the 5% level

Tables 4.4 to 4.5 of Section II (model 2.0 and model 2.1) show that capital structure independent variables and control variables are not highly correlated, with correlations less than 0.8, demonstrating that there is no multicollinearity problem.

Preliminary correlation results indicate that both sugar mill companies and F&B sector companies' Non-operating Total Short-term Liabilities to Total Assets (NOSTLA) and Non-operating Total Long-term Liabilities to Total Assets (NOLTLA) have a significant negative impact on its ROA. Similar effect also founds on sugar mill

companies' Non-operating Total Short-term Liabilities to Total Assets (d_1NOSTLA) and Non-operating Total Long-term Liabilities to Total Assets (d_1NOLTLA). Every control variable has a positive impact on financial performance.

Table 4.4

Model 2.0 correlation result

	ROA	NOSTLA	NOLTLA	FS	FG	LIQ
ROA	1.000					
NOSTLA	-0.428*	1.000				
NOLTLA	-0.301*	0.189*	1.000			
FS	0.090*	0.007	0.018	1.000		
FG	0.067	0.009	0.050	-0.026	1.000	
LIQ	0.083	-0.161*	-0.073	-0.157*	0.025	1.000

*Significant at the 5% level

Table 4.5

Model 2.1 correlation result

	ROA	d_1NOSTLA	d_1NOLTLA	FS	FG	LIQ
ROA	1.000					
d_1NOSTLA	-0.403*	1.000				
d_1NOLTLA	-0.299*	0.282*	1.000			
FS	0.090*	0.048	-0.041	1.000		
FG	0.067	0.026	0.055	-0.026	1.000	
LIQ	0.083	-0.114*	-0.052	-0.157*	0.025	1.000

*Significant at the 5% level

4.3 Multiple Regression Analysis

From the Multiple Regression Analysis of the models below, the regression results show in table 4.6 and 4.7 can be interpreted as follows.

Table 4.6

model 1.0 regression result

	Return on Assets (ROA)			
	Coefficient	Std Error	t-stat	P-Value
(Constant)	-0.066	0.081	-0.815	0.416
STLA	-0.118	0.019	-6.31	0.000*
LTLA	-0.071	0.013	-5.303	0.000*
FS	0.007	0.004	1.93	0.054
FG	0.017	0.011	1.542	0.124
LIQ	0.000	0.000	-0.278	0.781

*Significant at the 5% level

Table 4.7

model 1.1 regression result

	Return on Assets (ROA)			
	Coefficient	Std Error	t-stat	P-Value
(Constant)	-0.239	0.090	-2.657	0.008*
d_1STLA	-0.125	0.017	-7.244	0.000*
d_1LTLA	-0.049	0.013	-3.678	0.000*
d_2STLA	0.061	0.032	1.774	0.078
d_2LTLA	-0.190	0.044	-4.341	0.000*
FS	0.014	0.004	3.488	0.001*
FG	0.020	0.011	1.830	0.068
LIQ	0.000	0.000	0.521	0.602

*Significant at the 5% level

Considering table 4.6 model 1.0, both sugar mill companies and the listed F&B sector in Model 1.0, the regression results suggest that for both Total Short-term and Long-term Liabilities to Total Assets have a significant negative impact on financial performance at 95% confidence level with a coefficient of -11.8% and -7.1% respectively.

Considering Hypothesis 1A, from the regression analysis results in table 4.7 from model 1.1, as expected, Total Short-Term Liabilities to Total Assets (d_1STLA) has a significant negative impact on sugar mill companies' financial performance (ROA) in Thailand with the coefficient of -12.5% at the confidence level of 95%. This regression outcome is consistent with Badar and Saeed (2013) research who investigated the impact of capital structure on empirical performance evidence from Pakistan's sugar sector and concluded that capital structure has a significant negative impact on return on assets or firm performance. Likewise, the conclusion is consistent with Koskei (2013) study, which concluded that short-term debt leverage has a negative effect on profitable which need to be reduced. This finding is also consistent with previous research in other industries conducted by Sorana Vătavu (2014), Ahmad et al. (2015), Habib Ullah (2019), Nini et al. (2020), and Darapho et al (2020). However, the regression result from Ur Rehman (2013) on sugar industry study shows the opposite result. It is possible that as sugar mill companies use more and more short-term liabilities to run their businesses, the interest expense incurred is relatively higher than the return generated on to assets, causing the company's financial performance to suffer. Increased working capital requirements during the crop period may also be one reason sugar mill companies use more short-term debt, resulting in lower profit. Higher Account Payable may also lead to higher leverage in sugar mill companies, reducing raw material purchasing power and increasing the cost of goods sold.

Considering Hypothesis 1B, from the Multiple Regression Analysis results in table 4.7 from model 1.1, Total Long-Term Liabilities to Total Assets (d1LTLA) has a significant negative impact on sugar mill companies' financial performance (ROA) in Thailand with the coefficient of -4.9% at the confidence level of 95%. The result is consistent with the hypothesis. However, the result does not align with Nicholas Kipkoech Koskei (2013), Badar and Saeed (2013) and Ur Rehman (2013) as the sugar mill companies raise long-term debt, the financial performance declines. This outcome

consistent with previous research showed in other industries such as Sorana Vătavu (2014), Ahmad et al. (2015), Habib Ullah (2019), Nini et al. (2020), and Darapho et al. (2020). This may happen when the sugar mill companies desire to utilize long-term loans to fund their investment projects such as factory expansion, cogeneration configuration and heavy machinery upgrade. Still, it creates a lower return than expected by finance executives, which cause a decline in financial performance. Also, as net income is already depreciation-deducted, sugar mill that invests in property, plants and equipment heavily will face a reduction in profit from incremental depreciation.

Furthermore, some sugar mill companies may re-profile their short-term loan into a long-term loan in order to improve their ability to pay the debt. However, this may result in an increase in total interest payments and a decrease in profit. Higher leverage may also result in bankruptcy or financial distress, as several companies in the sugar mill industry are in the process of being rehabilitated.

Comparing model 1.0 and model 1.1 regression outcomes, sugar mill companies' Total Short-term loan to Total Assets (d_1STLA) has a significant negative impact on its ROA of -12.5%, which is more than significant negative impact of listed F&B sector and all sugar mill companies' Total Short-term loan to Total Assets (STLA) on its financial performance of -11.8%. Nonetheless, when it comes to Total Long-term loan to Total Assets, sugar mill companies' Total Long-term loan to Total Assets (d_1LTLA) has a significant negative impact on its ROA of only -4.9%, which is less than the significant negative impact on financial performance of the listed F&B sector and all sugar mill companies' Total Long-term loan to Total Assets (LTLA) of -7.1%.

Looking at Hypothesis 2A, the regression results in table 4.7 from model 1.1 reveal that, Total Short-Term Liabilities to Total Assets (d_2STLA) has an insignificant impact on listed F&B sector's companies' financial performance (ROA) in Thailand at the confidence level of 95%. The outcome refutes the initial hypothesis. According to the regression results, the higher the total short-term debt to total assets of the F&B sector's companies, the better their financial performance. However, the findings differ from Bhutta and Hassan (2013), who discovered an insignificant negative relationship, and Eunju and Soocheong (2005), who concluded that the firm with higher liabilities performed worse financially. However, the impact of Total Short-

Term Liabilities to Total Assets on financial performance (ROA) differs between sugar mill companies and companies in the F&B sector. One reason could be that listed F&B companies are typically more profitable than sugar companies. Furthermore, listed companies may have lower fund costs than sugar mill companies. This results in listed F&B sector companies having more effective management, financial control, and a higher investment return on invested capital, which has a positive impact on profitability. Firms in this industry may benefit from tax shield as the more higher interest-bearing debt, increasing interest and thus lowering tax. Instead of using owned cash or equity, the Trade-off Theory results in higher after-tax profitability.

On Hypothesis 2B, the finding in table 4.7 from model 1.1 shows that Total Long-Term Liabilities to Total Assets (d_2LTLA) has a significant negative impact on listed F&B sector's companies' financial performance (ROA) in Thailand with the coefficient of -19.0% at the confidence level of 95%. The regression result contradicts the hypothesis and does not correspond to the STLA-ROA relationship. The result suggests that the relationship between sugar mill financial performance and total long-term liabilities is in the same direction. Furthermore, this finding contradicts previous research in the field, such as Eunju and Soocheong (2005), Jarungklin (2012), and Bhutta and Hassan (2013). As a result, higher short-term leverage for listed F&B sector companies is as detrimental as sugar mill companies.

Additionally, it is vital to note that F&B sector companies' Total Short-term loan to Total Assets (d_2STLA) has an insignificant impact on their financial performance. In contrast, there is a significant negative impact of listed F&B sector and sugar mill companies' Total Short-term loan to Total Assets (STLA) on its financial performance of -11.8% at the confidence level of 95%.

However, F&B sector companies' Total Long-term Loan to Total Assets (d_2LTLA) has a significant negative impact on its financial performance of +19.2 %, which is higher than the significant negative impact on financial performance of listed F&B sector and all sugar mill companies' Total Long-term Loan to Total Assets (LTLA) of only +7.1 % at the 95 % confidence level. Similarly, the results show that the higher sugar mill companies' long-term leverage (d_1LTLA), the greater the deterioration in their financial performance when compared to F&B sector companies' long-term leverage (d_2LTLA) (-4.9% vs +19.2%). Sugar mill companies are more

volatile than others because they are agricultural businesses that rely heavily on weather, raw materials, and global commodity prices. As a result, the financing cost is higher, resulting in lower profitability due to an increase in both short and long-term liabilities.

From the Multiple Regression Analysis of the models below, the regression outputs show in table 4.8 and 4.9 can be construed as follows.

Table 4.8

model 2.0 regression result

	Return on Assets (ROA)			
	Coefficient	Std Error	t-stat	P-Value
(Constant)	-0.094	0.077	-1.218	0.224
NOSTLA	-0.195	0.024	-8.291	0.000*
NOLTLA	-0.068	0.013	-5.094	0.000*
FS	0.008	0.003	2.234	0.026*
FG	0.021	0.011	1.893	0.058
LIQ	0.000	0.000	0.394	0.694

*Significant at the 5% level

Table 4.9

model 2.1 regression result

	Return on Assets (ROA)			
	Coefficient	Std Error	t-stat	P-Value
(Constant)	-0.119	0.078	-1.513	0.131
d_1NOSTLA	-0.172	0.024	-7.280	0.000*
d_1NOLTLA	-0.058	0.014	-4.169	0.000*
FS	0.008	0.003	2.328	0.020*
FG	0.022	0.011	1.951	0.052
LIQ	0.000	0.000	1.017	0.310

*Significant at the 5% level

Using table 4.8, both sugar mill companies and the listed F&B sector in Model 1.0, the regression results show that Non-operating Short-term Liabilities to

Total Assets have a significant negative impact on financial performance at the 95% confidence level, with correlation coefficient of -19.5% and -6.8%, respectively.

Similarly, taking into account Hypothesis 3A, based on the multiple regression analysis results in table 4.9 from model 2.1, Non-operating Short-Term Liabilities to Total Assets (d_1NOSTLA) has a significant negative impact on sugar mill companies' financial performance (ROA) in Thailand, with a coefficient of -17.2% at the 95% confidence level. This discovery is consistent with the hypothesis. The higher the Non-operating Short-Term Liabilities to Total Assets ratio of sugar mill companies, the lower the company's financial performance. Non-operating Short-Term Liabilities often include short-term interest-bearing loans, current maturities of long-term debt and other similar items. It can be seen that even operating short-term liabilities such as account payable and the short-term loan is taken out from the study, the impact of leverage on profitability is the same. As the sugar mill companies employ more and more short-term loans from a financial institution to mainly finance their operating activities, the higher the financing cost.

As well as Hypothesis 3B from the results in table 4.7 from model 2.0, Non-operating Long-Term Liabilities to Total Assets (d_1NOLTLA) has a significant negative impact on sugar mill companies' financial performance (ROA) in Thailand with the coefficient of -5.8% at the confidence level of 95%. This insight supports the hypothesis. As the sugar mill companies employ higher Non-operating Long-Term Liabilities to Total Assets, the lower the company financial performance. Non-operating Long-Term Liabilities to Total Assets often include long-term interest-bearing debt as the essential items. Similarly, as the sugar mill companies engage more and more long-term loans from financial institutions, the lower financial performance. This effect may cause by the higher financing cost and the lower return generating from that borrowings.

Comparing model 2.0 and model 2.1 regression outcomes, sugar mill companies' Non-operating Short-term loan (d_1NOSTLA) to Total Assets has a significant negative impact on its financial performance of -17.2% at the confidence level of 95%, which is less than a significant negative impact of listed F&B sector and sugar mill companies' Non-operating Short-term loan to Total Assets (NOSTLA) on its financial performance of -19.5% at the confidence level of 95%. Correspondingly,

sugar mill companies' Non-operating Long-term loan to Total Assets (d_1NOLTLA) has a significant negative impact on its financial performance of only 5.8% at the confidence level of 95%, which is also less than listed F&B sector and all sugar mill companies' Non-operating Long-term loan to Total Assets a significant negative impact of listed F&B sector and sugar mill companies' Non-operating Short-term loan to Total Assets (NOSTLA) on its financial performance of -19.5% at the confidence level of 95%.

These findings also reveal that the higher a sugar mill company's non-operating short-term leverage (d_1NOSTLA), the greater the deterioration in its financial performance when compared to its non-operating long-term leverage (d_1NOLTLA) (-17.2% vs -5.8%). Furthermore, the impacts on financial performance are the same when comparing sugar mill companies' Total Short-term and Long-term Liabilities to Total Assets and Non-operating Short-term and Long-term Liabilities to Total Assets (negative effect). The impacts on financial performance are greater than the total due to the higher coefficient of Non-operating Short-term and Long-term Liabilities to Total Assets.

Finally, considering control variables, results suggest no significant effect of Liquidity (LIQ) on either sugar mill companies and the F&B sector's financial performance of both Model 1.0, Model 1.1, Model 2.0, and Model 2.1 at a confidential level of 95%. This result is not consistent with Sorana Vătavu (2014) and Pestonji and Donkwa (2018). Firms in this study should not focus much on the company's liquidity to only enhance their financial performance as there is no significant impact of liquidity on financial performance. However, there is a significant positive relationship between Firm Size (FS) and Firm Growth (FG) on the financial performance of both sugar mill and F&B sector companies. The sugar mill and F&B sector companies should consider increasing their size and enhancing growth to generate higher financial performance.

Table 4.10

Hypothesis summary

Hypothesis	Statement	Coefficient	P-Value Significant (P<0.05)	Decision
1A	There is a significant negative association of capital structure measured by Total Short-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA)	-0.125	0.000 (significant)	Accept
1B	There is a significant negative association of capital structure measured by Total Long-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA)	-0.049	0.000 (significant)	Accept
2A	There is a significant positive association of capital structure measured by Total Short-Term Liabilities to Total Assets on listed Food and beverage sector's companies' financial performance (ROA)	0.061	0.077 (insignificant)	Reject
2B	There is a significant positive association of capital structure measured by Total Long-Term Liabilities to Total Assets on listed Food and beverage sector's companies' financial performance (ROA)	-0.190	0.000 (significant)	Reject
3A	There is a significant negative association of capital structure measured by Non-operating Short-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA)	-0.172	0.000 (significant)	Accept
3B	There is a significant negative association of capital structure measured by Non-operating Long-Term Liabilities to Total Assets on sugar mill companies' financial performance (ROA)	-0.058	0.000 (significant)	Accept

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This research objective is to study the impact of capital structure on company financial performance (Return on Assets). Total Short-term Liabilities to Total Assets, Total Long-term Liabilities to Total Assets and Short-term and Long-term Non-operating Liabilities to Total Assets items of capital structure are studied specifically in sugar mill companies and listed F&B sector companies. The study includes (i) 38 sugar mill companies (4 listed companies and 34 private companies) and (ii) 34 listed F&B sector's companies (exclusive of 4 listed sugar mill companies). The secondary financial data are retrieved from the CORPUS database during the study period of 2015-2019 using Regression Analysis.

Descriptive statistics of the data show that, on average, the company financial performance of the sugar mill and F&B sector companies was relatively low in the past and varied among each company during 2015-2019. Sugar mill companies tend to employ more Short-Term and Long-Term Liabilities to Total Assets than the overall F&B sector, but not significantly. However, they tend to significantly employ more Non-Operating Short-Term Liabilities than Non-Operating Long-Term Liabilities to Total Assets. Correspondingly, sugar mill companies utilized the highest leverage compared to the overall F&B sector. Still, several companies in the F&B sector and sugar industry operate based on pure equity (no leverage on capital structure). Correlation results also indicate a mixture of the impact of capital structure on company financial performance. Both Total Short-term Liabilities and Long-term Liabilities to Total Assets have Signiant negative impact on its ROA. For F&B sector companies, only Total Short-term Liabilities to Total Assets has a significant positive impact on its ROA. Additionally, both sugar mill companies and F&B sector companies' Non-operating Total Short-term and Non-operating Total Long-term Liabilities to Total Assets have a significant negative impact on its ROA, as well as sugar mill companies

alone. However, both Firm Size, Firm Growth and Liquidity positively correlate with ROA across sugar mill and F&B sector companies.

As deploying Return on Assets (ROA) to measure company financial performance, overall regression result indicates that capital structure has a significant impact on company financial performance of sugar mill and F&B sector companies. Both Total Short-term and Long-term leverage have a significant negative impact on sugar mill companies' financial performance. When sugar mill companies use higher leverage on their capital structure, they have lower financial performance. This could be due to the benefits of tax shelter from an increase in debt being more petite than lower operating performance, ineffective investment return, higher depreciation from investing heavily, and an increase in loans due to working capital funding during crop season. owever, only the Long-term leverage of F&B sector companies tends to reduce its financial performance significantly. This recommends that listed F&B sector companies employ more Short-term leverage on their capital structure rather than equity portion and Long-term Liabilities which can significantly improve company financial performance. Further regression outcome also suggests that sugar mill company should not employ high Non-operating Short-Term and Long-Term Liabilities as it will significantly reduce firm financial performance. Sugar mill companies that have been already high leveraged may be at risk of insolvency or credit deterioration as their financial performance has been relatively low already.

When the sugar mill companies employ more and more leverage (long-term), the higher deterioration of financial performance compared to the listed F&B sector. This could be because public companies typically have lower funding costs than private companies, which can boost net income and Return on Assets. Furthermore, lower financial performance of sugar mill companies may be associated with lower credit rating, resulting in higher financing costs and lower financial performance when utilizing more and more short-term and long-term debts. Similarly, sugar mill companies must reduce non-operating short-term leverage relative to non-operating long-term leverage in their capital structure. Ideally, the lower the liabilities portion of the capital structure of sugar mill companies, the higher the financial performance, while the higher the short-term liabilities portion of the capital structure of listed F&B sector companies, the higher the financial performance.

Before deciding which companies to invest in, investors can examine a company's capital structure to see how it affects its financial performance. Furthermore, creditors and other stakeholders may interpret an increase in sugar mill companies' leverage as a sign of poor financial performance, lowering the credit rating. Finally, the findings from this study can be used to assist company executives and finance managers in developing an optimal capital structure with lower leverage on both short-term and/or long-term, operating and/or non-operating portions, as it is critical for them to fully recognize the role of financing decisions on corporate performance as Thai sugar mill companies today have.

5.2 Limitations and Recommendations

1. This study excludes external macroeconomic factors such as economic growth, interest rates, and commodity prices, as well as taxes, government support, and other qualitative specific government policies on the sugar sector, all of which may have an impact on the company's financial performance. The above-mentioned factors, as well as financial factors regarding government-related policies in the industry, are suggested for future studies.

2. This study does not use another financial performance matrix of the company, such as Return on Equity (ROE), which could affect the outcome.

3. Future research could focus not only on the Thai sugar industry, but also on countries where the industry has a significant impact on the economy, such as Brazil, India, and Australia.

4. Future research could explore other relevant industries/sectors related to the sugar industry, such as the cassava industry, which is a sugarcane substitute crop, to see how capital structure affects company financial performance.

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