MODERATING ROLE OF BOARD EFFECTIVENESS ON THE RELATIONSHIP BETWEEN CASH FLOWS, EFFICIENCY RATIOS, AND CORPORATE SUSTAINABLE GROWTH: EVIDENCE FROM COMPANIES LISTED ON THE STOCK EXCHANGE OF THAILAND

SUNANTA PASALAO

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION

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Program	Business Administration
Dissertation Advisor	Assistant Professor Supa Tongkong, Ph.D.
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ABSTRACT

The objectives of this research were to examine the moderating role of board effectiveness on the relationship between cash flows and corporate sustainable growth, and the moderating role of board effectiveness on the relationship between efficiency ratios and corporate sustainable growth.

The samples used in this study consisted of 383 non-financial companies listed on the Stock Exchange of Thailand in 2022. Data were collected from the annual reports, financial reporting, and the SETSMART database. Statistical methods used to analyze the data included multiple linear regression and Hayes's regression-based analysis.

The research results revealed that: 1) CEO duality moderates the effect of cash flow from investing activities on corporate sustainable growth and the effect of cash flow from financing activities on corporate sustainable growth, 2) board gender diversity moderates the effect of cash flow from investing activities on corporate sustainable growth and the effect of free cash flow on corporate sustainable growth, and 3) board independence moderates the effect of net cash flow on corporate sustainable growth. Additionally, it was found that board gender diversity positively moderates the positive effect of total asset turnover ratio on corporate sustainable growth. This study contributes to the literature on cash flows, efficiency ratios, and sustainability by providing a deeper understanding of corporate sustainable growth.

Keywords: cash flow, asset efficiency, board effectiveness, moderating effect, corporate sustainable growth

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List of Abbreviations

SGR	Sustainable Growth Rate
CFO	Cash Flow from Operation
CFI	Cash Flow from Investing
CFF	Cash Flow from Financial
NCF	Net Cash Flows
FCF	Free Cash Flow
FAT	Fixed Asset Turnover
TAT	Total Asset Turnover
BZ	Board Size
BIND	Board Independent
CEODU	CEO Duality
BG	Board Gender Diversity
F_Size	Firm Size
LEV	Leverage
F_Age	Firm Age
Ind1-Ind6	Industry
e	Error

CHAPTER 1
INTRODUCTION

1.1 Background and Statement of the Problem

The goal of every business company is to maximize shareholder wealth. This can be demonstrated by maximizing profits and ensuring sustainable growth for the business. Sustainable growth is the primary interest of every company manager. While the intense competition, economic and political situations change rapidly, sustainable growth is not easy, especially in increasingly complex global situations (Amouzesh, Moeinfar, Mousavi, & Science, 2011).

The importance of sustainable growth is becoming more and more popular. Because it combines the performance and financial aspects of the company together. As a result, it has become a reliable measure of financial performance (Rahim, 2017). Sustainable growth rate (SGR) indicates a company's balanced development path and points to a means to expand without incurring deficits or cash surpluses (Amouzesh et al., 2011). Thus, the financial growth potential of a company plays an important role in evaluating it. Sustainable growth rate is the alignment of a company's growth target in line with financial policies, such as target capital structure, maintaining the dividend policy and issuance of new shares (Higgins, 1977). In addition, as a crucial aim for the long-term survival of the organization, SGR is very appealing to analysts, bankers, and investors. By measuring the sustainable growth rate (SGR), stakeholders whether it is internal (management) or external (customers), can make informed choices by understanding the factors that influence company’s growth (Nor, Ramli, Marzuki, & Rahim, 2020).

The emergence of the COVID-19 pandemic in early 2020 triggered an economic crisis in numerous countries, resulting in a sharp decline in the performance of capital markets and an unprecedented surge in market volatility. Cash represents a pivotal constituent of a company’s asset, with cash flows assuming a paramount role as the vital sustenance that fuels the core operations of the business. In recent year, analysts have favored cash flow analysis above profit analysis. Businesses can determine their SGR to strategically define growth targets, theory aligning them with their financing capabilities

to mitigate any adverse impact on cash flow dynamic (Ashta, 2008). Consequently, cash flow is essential for a business to enable sustainable business growth. The researchers measure corporate sustainable growth using sustainable growth rate.

The cash flow statement assumes heightened relevance in decision-making when contrasted with profit, which serves as a more immediate and pragmatic gauge, thereby enriching the informative nature of the cash flow report (Bernstein, 1993). In addition, during periods of crisis, cash flow assumes a pivotal role as a valuable tool for companies, while growth stands as an essential indicator that elucidates a company's ability to uphold its position amidst prevailing economic circumstances (Foerster, Tsagarelis, & Wang, 2017; Jansen, 2021). According to several experts, cash flow outperforms profit as a more robust measure of performance, bolstered by a multitude of reasons, while the statement of cash flows establishes itself as a more appropriate assessment tool for business performance compared to the income statement. Moreover, cash flow assumes a comprehensive role as a measure that reflects a company's performance, as it considers both investment and financing considerations. The cash flow associated with sustainable growth represents the threshold at which a company sustains its sales through consistent cash flow. Sustainable growth corresponds to the percentage of annual sales growth in accordance with a predefined funding policy (Higgins, 1977). Giacomino and Mielke (1993), state that the utilization of the cash flow ratio as a tool for assessing a company's financial performance enables the determination of its sustainable growth rate, providing insights into its ability to maintain growth. Organizational expansion is primarily based on sustainable growth.

This effectiveness plays a critical role in corporate governance. A competent board can greatly enhance operational performance. This, in turn, ensures better decision-making. Ultimately, such efficiencies turn into more effective capital markets through their governance role and valuable expertise. Boards help management teams maximize opportunities, operate efficiently, and present reliable and timely financial information to investors.

In addition, assets are an important financial factor for businesses. The efficiency of asset utilization directly affects the economic activities of the organization. Given the continued growth and expansion in the business sector, the use of financial

ratios gives an overview of the company; to be a tool for analyzing and managing assets appropriately and efficiently utilizing assets. Additionally, the excess cash left over from investments in working capital and fixed assets can be used by the business to pay dividends to investors. For analysts, benchmarks can provide the information needed to assess a company's capacity for domestic growth and financial liquidity (Jones & Sharma, 2001).

Therefore, the main objective of this study is to empirically analyze the effects of cash flow and efficiency ratios on corporate sustainable growth as well as the moderating roles of board effectiveness on these relationships.

The board of director are most important and responsible for CEO planning and ensuring that the company has to drive sustainable growth over the long term. Therefore, the board of directors is an important variable in cash flow management that is a factor used to evaluate the future ability of the organization. Because today's investors place importance on the sustainable growth of businesses that reflect returns on investment rather than just profits, Growth therefore plays an important role in maximizing the growth rate without the business having to acquire additional funds from external sources.

1.2 Purpose of the Study

The purpose of this study is to examine the moderating roles of board effectiveness on the relationship between cash flows and corporate sustainable growth, and the relationship between efficiency ratios and corporate sustainable growth of listed companies on the Stock Exchange of Thailand. The research objectives are as follows.

1.2.1 To investigate the effect of cash flows on corporate sustainable growth.

1.2.2 To examine the moderating effect of board effectiveness on the relationship between cash flows and corporate sustainable growth.

1.2.3 To investigate the effect of efficiency ratios on corporate sustainable growth.

1.2.4 To examine the moderating effect of board effectiveness on the relationship between efficiency ratios and corporate sustainable growth.

1.3 Research Question

This study aims to answer the research questions as follows.

Research question 1: Does cash flow affect corporate sustainable growth?

Research question 2: Does board effectiveness moderate the effect of cash flows on corporate sustainable growth and how?

Research question 3: Does efficiency ratio affect corporate sustainable growth?

Research question 4: Does board effectiveness moderate the effect of efficiency ratios on corporate sustainable growth and how?

1.4 Research Hypothesis

According to the above research questions and objectives, the following hypothesis are proposed:

Hypotheses 1: Cash flow affects corporate sustainable growth.

H1 a: Cash flow from operation has a positive effect on corporate sustainable growth.

H1 b: Cash flow from investing has a negative effect on corporate sustainable growth.

H1 c: Cash flow from financing has a negative effect on corporate sustainable growth.

H1d: Net cash flows has a positive effect on corporate sustainable growth

H1e: Free cash flow has a positive effect on corporate sustainable growth.

Hypotheses 2 : Board effectiveness moderates the effect of cash flows on corporate sustainable growth.

H2a: Board effectiveness moderates the effect of cash flow from operation on corporate sustainable growth.

H2 a1 : Board size moderates the effect of cash flow from operation on corporate sustainable growth.

H2 a2 : Board independence moderates the effect of cash flow from operation on corporate sustainable growth.

H2a3:CEO Duality moderates the effect of cash flow from operation on corporate sustainable growth.

H2a4:Board gender diversity moderates the effect of cash flow form operation on corporate sustainable growth.

H2b: Board effectiveness moderates the effect of cash flow from investing on corporate sustainable growth.

H2 b1 : Board size moderates the effect of cash flow from investing on corporate sustainable growth.

H2 b2 : Board independence moderates the effect of cash flow from investing on corporate sustainable growth.

H2b3: CEO Duality moderates the effect of cash flow from investing on corporate sustainable growth.

H2b4: Board gender diversity moderates the effect of cash flow from investing on corporate sustainable growth.

H2c: Board effectiveness moderates the effect of cash flow from financing on corporate sustainable growth.

H2c1: Board size moderates the effect of cash flow from financing on corporate sustainable growth.

H2 c2 : Board independence moderates the effect of cash flow financing on corporate sustainable growth.

H2c3: CEO Duality moderates the effect of cash flow financing on corporate sustainable growth.

H2 c4 : Board gender diversity moderates the effect of cash flow from financing on corporate sustainable growth.

H2 d: Board effectiveness moderates the effect of net cash flow on corporate sustainable growth.

H2d1: Board size moderates the effect of net cash flow on corporate sustainable growth.

H2d2: Board independence moderates the effect of net cash flow on corporate sustainable growth.

H2 d3 : CEO Duality moderates the effect of net cash flow on corporate sustainable growth.

H2d4: Board gender diversity moderates the effect of net cash flow on corporate sustainable growth.

H2 e: Board effectiveness moderates the effect of free cash flow on corporate sustainable growth.

H2e1: Board size moderates the effect of free cash flow on corporate sustainable growth.

H2 e2 : Board independence moderates the effect of free cash flow on corporate sustainable growth.

H2 e3 : CEO Duality moderates the effect of free cash flow on corporate sustainable growth.

H2e4: Board gender diversity moderates the effect of free cash flow on corporate sustainable growth.

Hypotheses 3 : Efficiency ratios have positive effects on corporate sustainable growth.

H3 a: Fixed asset turnover has a positive effect on corporate sustainable growth.

H3 b: Total asset turnover has a positive effect on corporate sustainable growth.

Hypotheses 4: Board effectiveness moderates the effect of efficiency ratios on corporate sustainable growth.

H4 a: Board effectiveness moderates the effect of fixed asset turnover on corporate sustainable growth.

H4 a1 : Board size moderates the effect of fixed asset turnover on corporate sustainable growth.

H4 a2 : Board independent moderates the effect of fixed asset turnover on corporate sustainable growth.

H4a3: CEO Duality moderates the effect of fixed asset turnover on corporate sustainable growth.

H4a4: Board gender diversity moderates the effect of fixed asset turnover on corporate sustainable growth.

H4b: Board effectiveness moderates the effect of total asset turnover on corporate sustainable growth.

H4b1: Board size moderates the effect of total asset turnover on corporate sustainable growth.

H4 b2 : Board independent moderates the effect of total asset turnover on corporate sustainable growth.

H4b3: CEO Duality moderates the effect of total asset turnover on corporate sustainable growth.

H4b4: Board gender diversity moderates the effect of total asset turnover on corporate sustainable growth.

1.5 Conceptual Framework

The study conducted research conceptual framework as shown in Figure 1.1.

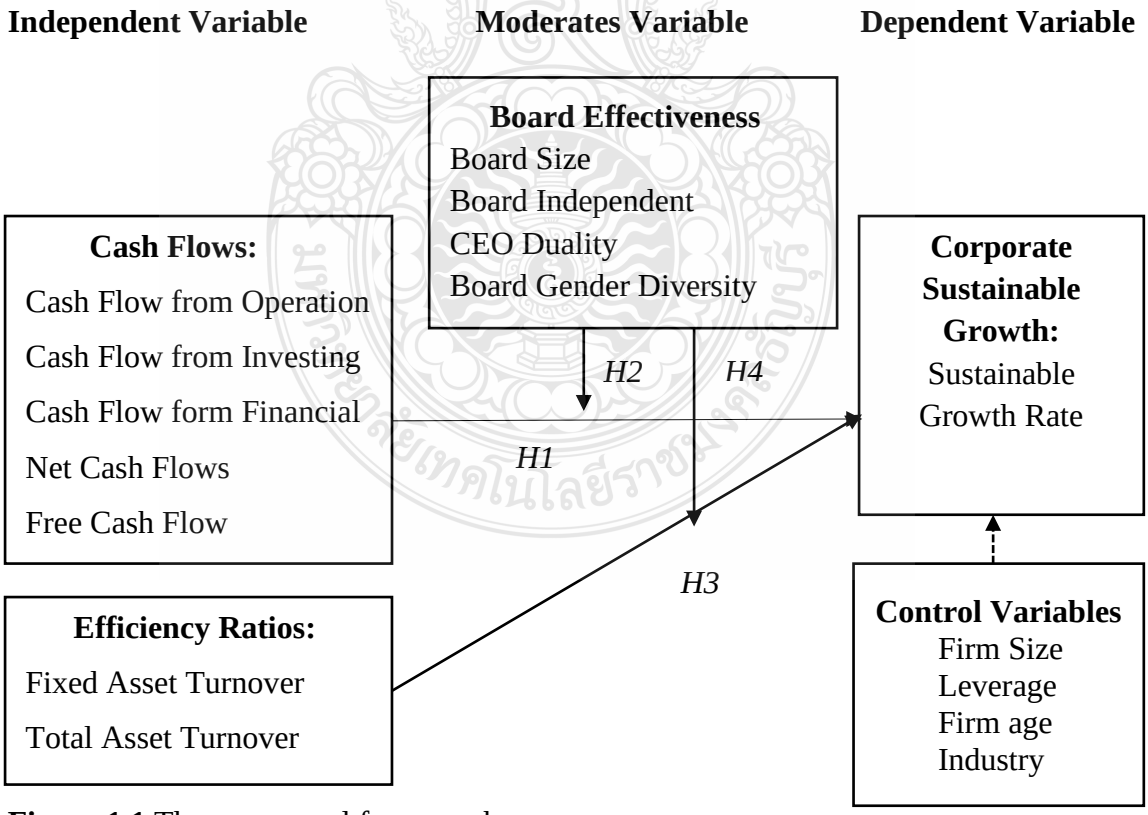

Figure 1.1 The conceptual framework

1.6 Definitions of Key Terms

Corporate Sustainable Growth	refers to the sustainable growth rate of an organization, which represents a company's anticipated growth rate. It can be determined by multiplying the company's earnings retention rate by its return on equity.
Cash Flows	refer to the comprehensive aggregation of cash inflows and outflows within a defined role in a period for a business entity. It encompasses various categories of cash flows, including those from operating activities, investing activities, and financing activities.
Cash Flow from Operating	refers to net cash inflow and outflow from operating activities as shown in the statement of cash flows.
Cash Flow from Investing	refers to net cash inflow and outflow from investing activities as shown in the statement of cash flows.
Cash Flow from Financing	refers to net cash inflow and outflow from financing activities as shown in the statement of cash flows.
Net Cash Flows	refer to the subtotals of total cash flows from operating activities, financing activities and investing activities as shown in the statement of cash flows.
Free Cash Flow	refers to the cash that a company generates after accounting for cash outflows to support operations and maintain its capital assets. It is obtained from deducting operating cash flow with capital expenditures.

Efficiency Ratio	refers to a ratio used to measure a company's ability to use its assets to generate income. This study includes 2 ratios: fixed asset turnover and total asset turnover.
Fixed Asset Turnover	refers to a ratio that compare net sales to net fixed assets to determine the efficiency a company utilized its fixed assets to generate sales.
Total Asset Turnover	refers to a ratio that compare net sales to total assets to determine the efficiency a company utilized its total assets to generate sales.
Board Effectiveness	refers to the board characteristics including: 1) board size, 2) board independence, 3) CEO duality, and 4) board gender diversity.
Board Size	refers to the total number of members serving on the company's board of directors.
Board Independent	refers to the ratio between the number of the independent non-executive directors divided by total number of directors on the board.
CEO Duality	refers to the CEO of the company also serves as the chairman of the board of directors or that the CEO and chairman of the board are the same person.
Board Gender Diversity	refers to the ratio of the number of women directors to the total number of directors on the board.
Firm Size	refers to the natural logarithm of total asset.
Financial Leverage	refers to ratio of total debt to total equity.
Firm Age	refers to the natural logarithm of number of years since the firm is established.
Industry	refers to the industry group dummy variable.

1.7 Scope of the Study

The population used in this study are all listed companies (683 companies) on the Stock Exchange of Thailand (SET) in the year 2022. This study used secondary data and employed a purposive sampling method to select the samples base on the following criteria. Firstly, the study samples include companies from all industry groups except companies from the financial industry and property funds and real estate investment trusts since these companies have different asset divergence and accrual basis compared to other business sectors (Klein, 2002). Secondly, since sampled companies need to have operating profit that demonstrate corporate sustainable growth, hence companies those are experienced operating losses are excluded from the study sample. Thirdly, companies with non-December fiscal year-end were also excluded to achieve the data equalization and comparability. Lastly, rehabilitation companies and some outliers were also excluded. Thus, the total sample in this study includes 383 companies.

1.8 Contribution of the Study

1. The research investigates the role of the sustainable growth rate as a study tool or compass for strategic planning and devising strategies and assist executives in implementing them in their operations and making financial decisions. This is essential for the company's long-term planning and growth analysis to be consistent with its operating results and financial policies. For companies to survive and thrive in today's highly competitive business market, it is vital to engage in comprehensive long-term planning and analysis of their growth, maintaining consistency with their operational results and financial policies.

2. To comprehend cash flow, it is important to recognize the relationship between cash flow and business activities. Analyzing the company's cash inflows and outflows offers valuable insights for better understanding. Sustainable growth of the company administrators makes decisions about the source of cash flow based on evaluating business trends that focus on shifting assets from internal and external sources of funding. The source of cash for all business operations is invested and considered a business opportunity. Fundraising criteria for cash source and operational efficiency affect the sustainable growth of the company. In particular, cash management allows

businesses to be self-sustaining by relying on internal funding sources to grow without having to acquire external funding sources in the long-term Including projections of future free cash flow to assess the growth of the business or industry.

3. To make the effectiveness of the board of directors or CEOs effective of in the relationship between cash flow, efficiency ratios and corporate sustainable growth, they apply this information to cash flow management at the company's suitable level. The company's cash flow at a suitable level is supported by the strategic plan and by making a business decision that creates sustainable growth for the company.

In summary, cash flows and corporate sustainable growth are the most significant information for companies to fulfill their goals and objectives. The cash flow statement includes short-term cash inflows and cash outflows. The cash flow statement compasses immediate cash inflows and outflows, revealing the current state of the company and its capacity to generate future cash flows, indicating both risk and the strength to generate returns. Stakeholders, both internal and external, can assess the company’s growth performance by leveraging the information provided in the cash flow statement.

The relationships between business performance and cash flow capability is complex, as revealed through reciprocal effects, the consistency of spending patterns over time, and the linkages with accounting information. Recognizing the importance of cash flows is paramount. Additionally, companies that effectively and efficiently manage their operational activities can achieve cost reduction and profit improvement. The proper utilization of company assets and strong financial performance are pivotal in determining corporate sustainable growth

This study primarily aims to examine performance-related issues that provide a comprehensive examination of business success from various perspectives. To develop a more accurate understanding of the relationship between growth performance, cash flow, and efficiency ratios, it is vital to consider the insights presented in this study simultaneously.

CHAPTER 2
REVIEW OF THE LITERATURE

This chapter presents a review of previous studies. The review includes concepts and theories. The literature reviews primary references peer-reviewed and academic works, such as journal articles and standard textbooks, as these are the most accurate sources of information available on the topic. The review includes concepts and theoretical extensive research on the cash flows, efficiency ratio, and board effectiveness on corporate sustainable growth.

2.1 Theoretical Foundations

2.1.1 Agency Theory

Agency theory was developed by Jensen and Meckling (1976). Base on the interaction between two entities, namely the principal and the agent, in which the principal deputes authority to the agent and agent may offer benefits for themselves instead of creating value for the company. Managers may create the maximum value for a company when agents offer benefits that benefit both the company and the agent. If the benefits of principal and agent do not conform to the objectives of the company, it may cause the agency problems (Jensen & Meckling, 1976).

The agency problem is one of the factors in determining the amount of the dividend payment. In other words, dividend payments can reduce agent or management corruption by increasing the amount of free cash flow in the company. A decrease in the company's supervision, which is an indication of significant agency problems, can be determined by analyzing the structure of major shareholders. A significant proportion of shareholders are investors, which poses a problem with limited representation and increases the likelihood of lower dividend payments. When the majority of shareholders lack the ability to effectively manage such situations, issues arise with agents that impact dividend payments. This is because excessive cash flow held by executives, can lead to funding unnecessary projects. Moreover, Jensen and Meckling (1976) assert that dividend

acts as monitoring mechanism by reducing the amount of cash under the control of management.

Agency Theory and Free Cash Flow

According to agency theory, the relationship between sales growth and shareholder returns is not always positive. A company's sales growth tends to prioritize the manager's wealth and is strongly associated with executive compensation. The manager often prioritizes their own profits over those of the shareholders (Murphy, 1985). Dechow, Richardson, and Sloan (2008) anticipate that firms characterized by free cash flow would demonstrate a deterioration in future performance (Christie & Zimmerman, 1994). According to the free cash flow hypothesis by Jensen (1986), managers, without proper control mechanisms, have the potential to prioritize their interests over shareholders. They may undertake unprofitable projects as long as those projects provide personal benefits to the managers, resulting in agency costs. Grossman and Hart (1988) further explain that a manager's personal profit is directly linked to the company's investment expenditure. In summary, agency theory and free cash flow are important mechanisms for ensuring benefits between shareholders and executives.

2.1.2 Pecking Order Theory

According to Myers (1984), firms exhibit a clear preference for financing sources based on their cost of capital. First and foremost, firms prioritize internal financing using retained earnings as it represents the most cost-effective option. This approach eliminates the need to incur transaction costs associated with interest payments and securities insurance. Second, in the event that internal financing is insufficient, they opt for external financing through debt. While debt comes with transaction costs, it offers tax advantages through the tax shield. Lastly, the issuance of new shares is considered the least preferred choice due to its high-cost. In particular, new share issuance involves transaction costs and the risk of information asymmetry, potentially leading to underpriced shares.

The pecking order theory is applicable in explaining the sustainable growth rate and emphasizes that firms prioritize internal financing over external financing, particularly to support sales growth. Additionally, this theory asserts that there is a positive correlation between cash and firm size, cash flows and market-to-book ratio.

Conversely, there is a negative relationship between cash and leverage, dividends, capital expenditure, and research & development expenditure (Myers & Majluf, 1984).

This theory proposes that companies do not preserve a specific target cash level, but rather act as a buffer between cash held and investment needs. Furthermore, the sustainable growth rate is in line with the pecking order hypothesis, which states that firms are increasingly looking at internal sources of funding over external alternatives such as debt or equity, considering the lower cost of capital. If the company's internal resources are insufficient and it is unable to get additional debt, the corporation will prefer to issue shares as a last resort (Palombini & Nakamura, 2012).

The summary, the pecking order theory places greater emphasis on internal investment as a priority over external investment, aligning with the concept of sustainable growth rates. According to this theory, firms prioritize utilizing their internal funds, such as retained earnings, to finance investment opportunities rather than relying heavily on external sources like borrowing or issuing new equity. This approach ensures a more stable and controlled growth trajectory, allowing firms to retain ownership and avoid potential risks associated with excessive debt or dilution of ownership.

2.1.3 Stakeholders Theory

Hannan and Freeman (1984) introduced the stakeholder theory, which focuses on the ethical and moral aspects of organization management. They argued that organizations that demonstrate adeptness in managing stakeholder relationships are more likely to endure over time and achieve their objectives more successfully. In addition, the main tenet of the stakeholder theory state that a company's board of directors has the responsibility to act in the best interests of all stakeholders, going beyond the shareholders (Freeman, 1984). In accordance with stakeholder theory, organization have an obligation towards stakeholders owing to their capacity to influence society, whether positively or negatively. Laplume, Sonpar, and Litz (2008) emphasize that organizations should consider the interests of various entities beyond shareholders.

Donaldson and Preston (1995) argue that this theory focuses on managerial decision-making and that the interests of all stakeholders are intrinsically valuable and no interest group is considered dominant over any other.

2.2 The Concepts of Corporate Sustainable Growth

This study investigates the sustainable growth of an organization, which denotes the growth rate in the long-term that a company can maintain. It is determined by multiplying the earning retention rate by the return on equity. Myers (1977) and Kester (1986) provide additional insights into the crucial role of corporate growth in driving improvements in corporate market value.

Sustainable business growth potential analysis is a study to determine the appropriate growth size of a business, which is important for both creditors and shareholders because the value of a business in terms of net worth depends on the growth of future earnings, cash flow, and dividends. Because it determines the ability to pay the financial obligations of the entity. The financial ratios used to assess and evaluate the company's performance during normal operating periods and the business growth potential of the business will help indicate the ability of the business (SET, 2021).

Artiach, Lee, Nelson, and Walker (2010), describe a business and investment strategy that utilizes optimal business practices to fulfill the requirements of present and future shareholders. This strategy encompasses undertaking complex tasks to achieve competitive results in the short term while ensuring the protection of organizational resources for the future.

Raisch and Von Krogh (2007) investigated how a company's competitive growth rates are influenced by its ability to thrive in a competitive landscape alongside industry rivals. The research stressed the importance of achieving growth to ensure short-term survival and efficiency. Escalante, Turvey, and Barry (2009) discovered that the sustainable growth challenge (SGC) model provides insights to financial and operational decision made by firms.

Higgins (1977) developed the concept of sustainable growth rate, which suggests the application of Higgins' model based on consistent accounting data and financial indicators. The aim is to assess the maximum growth rate that a business can achieve using retained earnings and increased internal revenue. Furthermore, the sustainable growth rate (SGR) represents the optimal growth scenario from a financial perspective, assuming a clear financial framework and pre-defined conditions.

Higgin's concept of sustainable growth rate incorporates four factors: profit margin, net asset turnover, debt ratio, and dividend policy. These factors have been discussed in the studies conducted by Altahtamouni et al. (2022), Chang (2012), Lockwood and Prombutr (2010).

g* = P, R, A, T

where:

g* = The sustainable sales growth expressed as a percentage;
P = The profit margin after taxes
R = The retention ratio
A = Sales to assets ratio
T = The assets to equity ratio

The significance of the sustainable growth rate lies in its ability to combine operational aspects (such as profit margin, asset efficiency) with financial aspects (such as capital structure and retention rates) into a comprehensive measure, as emphasized by Amouzesh, Moeinfar, Mousavi, and Science (2011).

The sustainable growth rate (SGR) is a financial indicator utilized to exemplify the development and expansion of sales. Assets and equity should be related. Most companies predict growth by using sales. In the years leading up to this year, management has set an important goal of profitability, but a key factor in its success is growth. However, in recent years, there are growing signs that management is facing the fact that unrestricted growth may not be in line with monetary policy (Kijewska, A. 2016). In addition, In Firer (1995) investigation of 26 contemporary finance textbooks, it was discovered that 73% of these textbooks included discussions on sustainable growth rate models. This research clearly demonstrates the importance and practicality of the sustainable growth rate concept in the field to modern corporate finance studies, Furthermore, for companies seeking success, skillfully managing the limitations and restrictions imposed by their leverage and dividend policies is vital when planning for future growth. However, Higgins (1977) explains that the sustainable growth rate corresponds to the maximum growth rate attainable by a business without increasing its financial leverage.

Fatefully, the sustainable growth rate is crucial as it reflects a balanced path for a company's development, enabling growth without facing deficits or cash surpluses (Amouzesh et al., 2011). Higgins (1977) asserts that the growth rate of sale essentially represents the growth rate of equity, reflecting the company's sustainable growth potential. According to Higgins, that growth rate of sale is in fact, equivalent to the growth rate of equity, which is regarded as the sustainable growth rate. The sustainable growth rate (SGR) encompasses both operation and financial factors. The application of Higgin's SGR model is essential as it allows managers to reconcile a company's financial objectives with its operational performance, thus determining the optimal level of growth. Moreover, the policy direction process offered by this model equips regulators with the tools to foster sustainable growth within a targeted industry (Momčilović, Begović, Tomašević, & Ercegovac, 2015).

Sustainable growth rate (SGR) has been widely accepted as a concept that can be applied in contemporary financial management, providing strategic planning and control capabilities to organizations (Fonseka, Ramos, and Tian, 2012). L. Arora, Kumar, and Verma, (2018) posit it as a valuable resource for managers seeking to align operational and financial strategies.

The foundational premises of the sustainable growth rate model are established on two fundamental assumptions, as stated by Higgins (1977). The first assumption posits that a company's sales growth is inherently tied to the growth of its asset base. Additionally, Myers (1984) introduces the 'Pecking Order Theory,' suggesting that as equity expands, debt can expand proportionally to uphold a steady debt-equity ratio.

In their analysis, Fonseka, Ramos, and Tian (2012) compared the Higgins and Van Horne models to determine their effectiveness in calculating the sustainable growth rate. The study found that the Higgins model produces a higher sustainable growth rate for profitable firms, while the Van Horne model provides a better estimation for firms with significant leverage.

Based on previous studies by Amouzesh et al. (2011), sustainable growth rates are determined by the interplay of operational and financial components such as profit margin, asset efficiency, capital structure, and retention rate. Therefore, it is crucial to

closely monitor corporate performance, including financial leverage, liquidity, asset efficiency, size, and tax, to assess the company's potential for sustainable growth.

The sustainable growth rate (SGR) framework was developed by Higgins (1977). According to Amouzesh et al. (2011), the SGR of a firm is determined by its retention rate (R) and return on equity (SGR = R x ROE), Hence, calculation the SGR involves multiplying the retention ratio by the returns on equity.

The calculation of sustainable growth rate (SGR) involves the multiplication of the company's return on equity (ROE) by the proportion of retained earnings (R).

$$SGR = \frac{\text{Change in Equity}}{\text{Equity at the beginning of period}}$$

$$= \frac{R * \text{Earnings}}{\text{Equity at the beginning of period}}$$

$$= R * ROE$$

Where

R represents the retention rate of the firm.

R = Retention Rate

= 1 - Dividend payout ratio

According to Pinto (2020), the sustainable growth rate is defined as the rate which dividends (and earnings) can grow, assuming a constant capital structure and no issuance of additional common stock. The formula to calculate the sustainable growth rate is:

$$g = b \times ROE$$

where

g = dividend growth rate

b = earnings retention = (1 - Dividend payout ratio)

ROE = return on equity

According to Ashta (2008), the calculation of the sustainable growth rate (SGR) entails the utilization of return on equity (ROE) and retention rate as quantitative indicators.

$$\text{Sustainable Growth Rate (SGR)} = \frac{R \times ROE}{(1 - (ROE \times \text{retention rate}))}$$

Thus, the development of the company's sustainable growth rate relies on two factors: the rate at which it retains earnings and the financial performance of its the equity (or return on equity: ROE)

Following Cornett Marcia (2012), the retention rate measures the proportion of a company's net profit that remains after satisfying dividend obligations to shareholders. It is computed by dividing the residual income, following dividend disbursements, by the net income. Retained earnings are vital for prospective investments like acquiring new assets and expanding current operations. The retention rate is a crucial factor in determining sustainable growth rates. In the last decade, scholars, including L. Arora, Kumar, and Verma (2018), have extensively studied the relationship between the components of return on equity (ROE) and the sustainable growth rate (SGR). The sustainable growth rate, often known as the maximum growth rate a business can maintain without increasing its financial capacity, is a key focus of this research.

The following factors determine the sustainable growth rate of the business.

1) The number of financial resources remaining within the business that can be reinvested earnings.

2) The rate of return received from the remaining financial resources and reinvested.

Thus, the growth rate of profit attributable to shareholders comes from two main factors: 1) retain the profit margin and bring it back to invest in the business; if the profit is brought back to invest in a large proportion, the greater the company's long-term growth potential; 2) return on Equity (ROE): a higher ROE corresponds to a higher long-term growth rate for the business (SET, 2021). It can be calculated as follows:

$$g = R \times ROE$$

where

g = Sustainable growth rate,

R = Retention Rate,

ROE = Return on Equity

Calculating the retention rate is done as follows:

Retention rate = 1 - Dividend payout ratio

= 1 - (Dividends per share / Earnings per share)

The retention rate is decided by the board of directors and approved by the shareholders' meeting, which depends on the existing investment opportunities of the business. The theory states that an entity should retain its profits and reinvest them provided that the expected return on investment is higher than the cost of the business.

In summary, the growth rate of the business will be high as a result of the following data:

1) The high retention rate to reinvest existing funds into businesses that create added value for the business,

2) The high net profit margin,

3) The high turnover rate of total assets,

4) Increasing financial obligations and risks by providing a proportion of financing through more financial leverage.

The concept of sustainable growth rate is used. Investors will need to anticipate changes in the financial ratios that are constituents of the including the projection of the retention rate of the business for reinvestment in the long-term.

The plethora of empirical literature on the relevance and importance of growth to companies has long impacted managers' and investors' perspectives. Almost all types of growth are considered as a desirable, unique aspect of a company's performance. Some researchers use a variety of metrics to illustrate the scale of the company's growth, such as asset growth that represents meaningful company expansion (Constantinou, Karali, & Papanastasopoulos, 2017).

According to Chen, Gupta, Lee, and Lee (2013), their study delved into the relationship between investment decisions that seek to achieve optimal growth and the policies regarding dividend payments. In their research, they extended Higgins' sustainable growth model. They emphasized the significance of the covariance between profitability and growth rate as a determinant of dividend payment policies and highlighted how the interplay between the risk of unprofitability and growth rate can lead to a complete cessation of dividend payments for a particular enterprise.

Olson and Pagano (2005) conducted a research study on mergers involving publicly traded US bank-holding companies between 1987 and 2000. Their findings indicated that the sustainable growth rate of the acquiring firm plays a vital role in determining the long-term operating and stock performance of the merged entity. They emphasized that the bank's dividend payout ratio, changes in growth rate post-merger, and the bank's expected sustainable growth rate before the merger are the most significant economic factors influencing the merging bank's remarkable stock return performance.

The sustainable growth rate is considered the highest possible rate of growth that an organization can achieve, given its financial, operational, and managerial conditions and strategies (Fonseka et al., 2012).

In summary, most of the research found that measuring the growth of a company is based on percentage changes in sales, percentage changes in total assets, and percentage changes in net profit. Therefore, the main aim of this research is to determine if the cash flows and efficiency ratios of the analyzed companies are influencing corporate sustainable growth. This research used Amouzesh et al. (2011); (SET, 2021), method of measuring sustainable growth rate from Higgin's development.

2.3 Cash Flows

The Accounting Standard No.7 Statement of Cash Flows

The International Accounting Standards (IAS), specifically IAS 7 – Statement of Cash Flows, these standards are accordance with the accounting standards followed in Thailand. In order to enhance the usefulness of financial reporting, accounting standard setters have adopted various new accounting standards over the past several decades.

The function of a cash flow statement is to provide a detailed breakdown of a company's cash transactions during a designated period, referred to as the accounting period. By tracking the inflow and outflow of cash, the statement assesses the organization's ability to sustain its operations in both the short and long term. It encompasses three key activities.

1) Cash flow from operation
2) Cash flow from investing
3) Cash flow from financing

The cash flow statement divides the cash flow of a company into three components operating activity, investing activity, and financing activity, which can be explained as follows:

Cash flow from operating activities signifies the cash generated or utilized by company's typical operations. It showcases the company's consistent ability to generate positive cash flow from its operational activities.

Cash flow from investing activities category details the cash flow related to the purchase and sale of long-term assets, illustrating the cash used or provided in these transactions.

The cash flow statement's financing activities section quantifies the cash flow exchanged between a company, its owners, and creditors. Negative values can indicate debt repayment, as well as payments, changes in non-cash current assets, and current liabilities other than short-term borrowing.

The adjustments to net income include the following items:

1) Non-cash expenses, such as depreciation and amortization, are costs that do not involve actual cash outflows.

2) Reclassifications include gains or losses from the sale of long-term assets and the retirement of debt.

3) Accrual to cash adjustment account for the conversion of accrued expenses or revenues into cash flows.

4) Equity earnings or losses represent the financial gains or losses derived from investments in other companies.

Objectives of Cash Flow Statement

The purpose of cash flow statements is to generate information concerning the timing, magnitude, and predictability of future cash flows. They are flexible in predicting future certainty and play a crucial role in budgeting. Additionally, they offer insights into a company's cash inflows and outflows from various activities (Bhandari & Iyer, 2013).

A cash flow statement serves as a direct measure of profitability and can be used to make informed decisions (Bernstein, 1993). However, capital markets tend to place too much emphasis on earnings, neglecting the valuable information provided by cash flow components. As a result, investors tend to overreact to earnings, even though their impact is slightly lower than actual earnings. The investment community tends to place a high value on earnings (Sloan, 1996). Among the strategies used by companies, cost leadership has a significant impact on positive cash flow generation, while differentiation strategies have a long-term impact on investment and contribute to cash flow stability and liquidity.

The Importance of Cash Flow

Cash flow is a tool for assessing a company's stability, resilience, and potential to produce cash flows in the future; however, it is important to focus on the actual activity and ignore the non-cash fees. One of the most important tools investors use to evaluate a firm is cash flow and cash flows provide the finest window for investment (Amuzu, 2010). Furthermore, entrepreneurs reach profitable economic resolutions founded on an assessment of the firm's capacity to generate cash and cash equivalents, as well as the timing and predictability of the generation of these cash flows (Kousenidis, 2006). Since the adoption of the accrual accounting system for the recording and reporting of corporate transactions, balance sheets, and income statements, it has become a primary source of information for researchers, analysts, and investors. Although cash flow is apparent, it was not until textbook authors and accounting regulators began to clearly emphasize the importance statement of cash flows. In today's society, the adage "Cash is King" is well known (Bhandari & Iyer, 2013). Previous accounting research focused on the ability of specific elements on the balance sheet to predict future stock returns.

In a study conducted by Barua and Saha (2015), the comparison between traditional ratios and cash flow-based ratios as performance indicators were explored. It was discovered that both the cash flow and accrual components of earnings could

effectively predict the future cash flows of listed companies in Bangladesh, with cash flows exhibiting superior predictive power over traditional ratios. Furthermore, Farshadfar, Ng, and Brimble (2008) focused on the comparative ability of earnings and cash flow data to forecast future cash flow for Australian companies. The study revealed that CFOs outperformed earnings and traditional measures in predicting future cash flows. This underscores the explanatory power inherent in cash flow data. Moreover, cash flow is one indicator for assessing a company's stability, resilience, and potential to produce cash flows in the future, however it is helpful to concentrate on real activities and omit non-cash charges. Cash flow is regarded as one of the foremost metrics used by investors to ascertain the worth of a company, presenting an optimal view of investment possibilities (Amuzu, 2010). In their findings, Opler, Pinkowitz, Stulz, and Williamson (1999) suggest that growth companies often accumulate more cash than expected based on the static trade-off model, which assumes managers strive to maximize shareholder value.

According to Wickramasinghe and Gunawardana (2017), this research aims to analyze the impact of risk management practices on sustainable financial performance in Sri Lanka and offer recommendations for businesses to manage their risks effectively. The study involved 65 listed companies, and data from Colombo Stock Exchange (CSE) Sri Lanka annual reports were used as a secondary source. The results demonstrate a negative correlation between risk management practices in operating cash flow and sustainable financial performance. Additionally, the study found no significant correlation between risk management practices in investment cash flow and sustainable financial performance.

Mukherjee and Sen (2018) examined the empirical relationship between liquidity (measured by the cash flow ratio), profitability, leverage, and sustainable growth rate of the firm. The research analyzes a sample of 115 companies listed on the National Stock Exchange of India Limited (NSE). Over a five-year period, the research examines how liquidity (cash flow ratio), profitability, and leverage are related to the firm's sustainable growth rate. The results indicate a positive influence of the cash flow ratio on sustainable growth rates. The cash flow ratio measures the firm's liquidity, suggesting that higher liquidity (reflected by a higher cash flow ratio) leads to faster growth.

Furthermore, Rahman and Sharma (2020), aimed to analyze the influence of cash flow from operations (CFOs) on the financial performance of insurance and manufacturing companies in Saudi Arabia. The results indicated a noteworthy positive association between financial performance and cash flow from operation CFOs.

Afrifa (2016) investigated the link between cash flows and firm performance. The research included a sample of 6,926 non-financial small and medium enterprises in the UK from 2004 to 2013. The findings indicated that companies with adequate cash flows should allocate more investments to working capital, whereas companies with lower cash flows should reduce their investments in order to achieve the desired performance level. Jia and Li (2022) also found evidence supporting the notion that firms' sustainability performance is linked to increased future earnings and cash flows.

Percy and Munasinghe (2015) examined the relationship between cash flows and firm performance in Sri Lankan firms. The research focused on cash flow data from the manufacturing sector during the period of 2011-2013. The study suggests that decisions regarding cash flow statements have diverse implications and are not seen as a definitive indicator of a firm's performance, which is influenced by various factors and ultimately impacts the firm's value. The most notable finding from this study is that there is no correlation between operating cash flow and business performance.

In summary, cash flow analysis is crucial for businesses as it helps assess their ability to meet financial obligations, invest in growth opportunities, and distribute dividends to shareholders. Positive cash flow is generally desirable, as it ensures a company has enough liquidity to cover its expenses and growth invest in future initiatives.

Consequently, this study aims to investigate the relationship between cash flows and corporate sustainable growth. Therefore, this research has the following hypotheses referring to this issue.

Hypotheses 1: Cash flow affects corporate sustainable growth.

Table 2.1 Summary of studies on cash flows and corporate sustainable growth

Researchers and Research Title	Data	Statistics	Independent Variable	Dependent Variable	Result
Wickramasinghe and Gunawardana (2017) Cash flow risk management practices on sustainable financial performance in Sri Lanka	-65 sample companies -2011 to 2015 -Colombo Stock Exchange (CSE) Sri Lanka.	Regression	1. Operating cash flow 2. Investment cash flow 3. Financial cash flow 4. Operating cash flow to shareholder's equity 5. Cash flow modelling corporate hedging cash flow ration/Mathematical tool	Sustainable financial performances Sustainable Growth rate (SGR)	CFO + CFI – CFF no correlation CFO/SE sig correlation

Table 2.1 Summary of studies on cash flows and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistics	Independent Variable	Dependent Variable	Result
Arinović-Barac (2011) Predicting Sustainable Financial Performance Using Cashflow ratio: A comparison between LDA and DNN Method	-	Linear discriminant analysis	1.Liquidity ratio 2.Profitability ratio 3.Solvency ratios. 4. Investment efficiency ratio	Sustainable Financial performance: -Sustainable non-Sustainable Good, Bad	Cash flow ratio significantly different between sustainable and non-sustainable financial performance.
Mukherjee and Sen (2018) Sustainable growth rate and Its Determinants: A Study on some selected companies in India .	2010-11 to 2014-2015 5 year 115 companies listed in NSE	Regression STATA	1. Net operating cash flow 2. Return on capital employed 3.Debt equity ratio	SGR	1.Net operating cash flow has positive effects on sustainable growth rate. 2. Debt ratio has positive on sustainable growth rate.

Table 2.1 Summary of studies on cash flows and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistics	Independent Variable	Dependent Variable	Result
			3.Debt equity ratio =long term debt/ Shareholder's fund.		
Rahman and Sharma (2020) Cash flows and financial performance in the industrial sector of Saudi Arabia: With special reference to Insurance and Manufacturing Sectors	2015-2018 Insurance industry 2014-2018 Manufacturing	Regression	1. Net cash flow from operating 2. Firm Size 3. Leverage 4. Industrial Dummy	ROA ROE	1.Operating cash flows have a positive on firm performance. 2. Firm size and leverage have a negative on firm performance.

Table 2.1 Summary of studies on cash flows and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistics	Independent Variable	Dependent Variable	Result
Percy and Munasinghe (2015) The cash flows and firm performance: Some Evidence from the Sri Lankan Firms Cash Flow	Manufacturing sector For period 2011-2013	Regression	Cash flow: 1.Cash flow from operating 2.Cash flow from Investing 3.Cash flow from financing 4. Overall Cash flows	Frim Performance: ROA ROE	1. There are insignificant the cash flow from investing and cash flow from financing on return on equity. 2. There is cash flow from operating insignificant positively on return on equity. 3. These is net cash flow have a not significantly positively on frim performance.

2.4 Free Cash Flows

Free cash flow (FCF) serves as a measurement of a company's revenue generation capability. Jensen (1986) is credited with pioneering the concepts of free cash flow (FCF) and idle cash flow. Jensen (1986) defined free cash flow as "the amount of cash flow over the amount required to finance a project with a positive net present value (NPV)". Even in cases where the net present value is negative, management may be inclined to expand the company beyond its optimal size by pursuing new activities. Therefore, ensuring effective cash management is important in such situations. In addition, companies with excess cash flow but limited growth prospects tend to rely more on debt financing (Jensen, 1986).

Richardson (2006) defines free cash flow as the excess cash flow remaining after expected asset maintenance and reinvestment have been paid, and defines free cash flow as the net cash generated by a company from operating activities, then adjusted by deducting development expenses, adding research and development expenses, and deducting capital expenditures for new initiatives.

Free cash flow is also recognized as excess cash over the capital needed to fund projects that have a positive net present value in the company. This excess cash flow is usually distributed to shareholders to maintain long-term performance. However, this form of payment can reduce the resources under the control of managers (Jensen, 1986).

Gul and Tsui (1997) explored the connection between the agency problem and the issue of business growth concerning free cash flow. They observed that companies with substantial free cash flow but low growth experienced agency problems. However, Brush et al. (2000) found that firm growth is positively influenced by cash flow, but negatively affected by free cash flow. As a result, an excessive amount of cash flow, specifically free cash flow, reduces the firm’s value. Moreover, free cash flow (FCF) represents the surplus operating cash that remains with a company after fulfilling its capital expenditures and dividend payments. It enables the company to capitalize on opportunities that enhance shareholder value. Initiatives such as product development, debt repayment, stock buybacks, and overall growth in free cash flow contribute to long-term sustainability. Jensen (1986), examined the free cash flow hypothesis proposes a negative impact of free cash flow on firms' performance. Jensen (1986) presents this hypothesis as a solution to the agency problem. Ali and Yousaf (2013), propose that businesses tend to generate and retain more cash flows, even when perceived growth prospects are scarce.

Hackel, Livnat, and Rai (2000) provide two definitions of free cash flow: the traditional approach subtracts a firm's investments from its operating cash flow, while the more recent

approach considers discretionary cash expenses and discretionary capital expenses alongside the traditional calculation.

Financial analysts recognize the importance of the operating cash flows presented on the cash flow statement as they offer valuable insights into the firm's ability to generate future cash flows. These cash flows serve two key purposes: firstly, using the funds to acquire new fixed assets to maintain the firm's operating activities and earnings at the same level in the future, and secondly, considering them for dividends or stock repurchases. The free cash flow calculation formula is as follows:

Free Cash Flow (FCF) = EBIT (1- Corporate tax) + Depreciation
+/- Change in Working Capital – Capital Expenditure

However, cash flow in the business and investment world is of paramount importance. Securities of a company with a strong financial flow indicate that the company possesses good money management abilities. Free cash flow can serve as a proxy for the capacity to service debt on a cash flow basis. (Jensen, 1986) defined FCF as follow.

Free Cash Flow (FCF) = Cash Flow from Operation – Capital Expenditure

where

Cash Flow from Operation = Net cash flow from operations

Capital Expenditure = Net change in fixed asset

In order for a company to experience growth, it is essential for them to maintain sufficient cash reserves for reinvestment purposes. Consequently, free cash flow is often considered an indicator of a company's growth potential. Even profitable companies can face financial difficulties if they lack the necessary cash to meet their obligations. On the other hand, a company that generates excess cash does not automatically guarantee that it will be utilized to benefit shareholders. However, enhancing free cash flows serves as a reliable predictor for reinvesting in the business and transforming surplus cash into returns and growth (Scatizzi, 2009).

According to Parsian, D., & Koloukhi, A. S. (2014), the impact of free cash flow on dividend payout ratio was examined in a study conducted in the Tehran Stock Exchange. It was found the negative relationship between free cash flow and the dividend payout ratio.

Brush, Bromiley, and Hendrickx (2000) discovered that there was a negative association between free cash flow and performance.

Park and Jang (2013) conducted a research study on the Korean restaurant industry and found compelling evidence that free cash flow has a direct negative impact on company performance. The presence of excessive free cash flow leads to investments in unnecessary projects, leading to overinvestment problems and subsequent deterioration in company performance.

According to Baba (2009); (Ranti, 2013) state that base on the free cash flow theory, growing companies are more likely to invest more in the future than pay dividends.

Yuan and Wang (2008) investigated how the proportion of the largest shareholders influences the sensitivity of companies' sales growth. The study revealed a negative correlation between free cash flow and the sensitivity of sales growth. Specifically, companies with higher free cash flow exhibited lower sensitivity to sales growth. Furthermore, an increase in the proportion of the largest shareholders was associated with a higher sensitivity to sales growth.

Sapuan, Wahab, Fauzi, and Omonov (2021) investigated the relationship between free cash flow, agency costs, and firm performance in the context of publicly listed companies in Malaysia. The findings highlighted a significant and positive impact of free cash flow on firm performance.

Wen (2017) examine to between free cash flow and firm performance. The result show that consistent agency theory, it has been shown that companies with free cash flow have worse performance in terms of revenue growth than companies without free cash flow.

In summary, the consideration of free cash flow holds great significance in the formulation of financial management strategies and decisions. These issues raise important questions about how free cash flow affects the sustainable growth of a company. Therefore, the hypothesis has been developed as follows:

H1e: Free cash flow has a positive effect on corporate sustainable growth.

Table 2.2 Summary of free cash flows and corporate sustainable growth

Researchers and Research Title	Data	Statistics	Independent Variable	Dependent Variable	Result
Brush &et al (2000), Relationship between free cash flow and firm performance	The S&P BSE 500 index from 2006 to 2016	Regression	1.free cash flow FCF = Operating Income + Depreciation – Interest Expense - Income taxes – Expected loan – Dividends.	Return on equity (ROE).	The relationship between free cash flow (FCF) and firm performance, as measured by return on equity (ROE), is significantly positive and strong.
Sapuan, N. M., Wahab, N. A., Fauzi, M. A., & Omonov, A. (2021) Analysing the Impacts of Free cash flow, Agency cost and firm performance in Public Listed Companies in Malaysia	350 public listed companies in Malaysia 2005-2015	Regression	1.FCF=Cash flow operating activities – capital expenditure 2. TAT -Total asset turnover. OER = Operating expenses ratio.	ROA ROE	Free cash flow has a significant positive effect on the performance of firm.

Table 2.2 Summary of free cash flows and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Ali, M. R. P., & Hosseini, S. L. (2015). A Study of the Relationship of Free Cash Flow to Growth Opportunities.	Cochran formula, 110 companies during 2008-2012, i.e. 550 companies-year	STATA regression	1.Free cash flow 2.Company size 3.Book value of Stockholder 4. Dividend 5. Net Income 6. ROA 7. Deb ratio	Growth opportunity	There is a relationship between free cash flow and growth opportunities.
Wang, G. Y. (2010). The impacts of free cash flows and agency costs on firm performance. Journal of service science and management	2002-2007 505 companies. Taiwan Stock des Exchange	Regression	1.FCF 2.Agency cost: Assts -Operating expense ratio -Administrative expense ratio - Advertising and R&D expense ratio	Operation performance: ROE, ROA 1.Frim Value 2.Stock Return	Free cash flow has a significant positively operation performance (ROE)

Table 2.2 Summary of free cash flows and corporate sustainable growth (Cont.)

Researchers and Research Title	**Data**	**Statistic**	**Independent Variable**	**Dependent Variable**	**Result**
Sapuan et al. (2021) Analyzing the impacts of free cash flow and agency cost towards frim performance in the public listed companies in Malaysia	-350 public listed companies. - 2005 to 2015	Regression	1.Free cash flow 2.Agency cost: Total asset turnover operating expenses	1. Performance -Return on Equity -Return on Asset.	Free cash flow is significant positive impact on firm performance.
Wen (2017) Free Cash Flow, CEO ability and Firm performance	From 2006 - 2016. 46247 firm-year observation	Regression	1.Free cash flow 2.CEO ability. 3.Firm size 4.Revenue growth 5.Debt-to-Asset-Ratio	ROE Tobin'Q	- Free cash flow tends to underperform in revenue growth relative to firms lacking free cash flow.

2.5 Efficiency Ratio

Efficiency ratios provide a means to measure a company's effectiveness in utilizing its assets and liabilities to drive sales. A highly efficient company reduces net asset investment, resulting in lower capital and debt requirements. Asset-based efficiency ratios compare a group of assets to sales or the cost of products sold. Liabilities are evaluated using a primary efficiency ratio that examines payables relative to total supplier purchases. Performance assessment often involves comparing these ratios to industry peers, and they are recognized as efficiency ratios. (SET, 2021).

According to financial ratio analysis, the ratios related to asset management are the most prominent. It evaluates how well a corporation manages its resources and uses them, as well as how effectively it uses those resources. The turnover ratio, which refers to the asset that has been converted or converted into sales, is a measure of how effectively a company manages its assets and generates profits rapidly (Alawneh, 2022). Thus, the company can easily measure the value of assets because of this ratio. It entails of assets and sales. The turnover rate refers to the efficiency of management in order to achieve sales success or efficiency. The company uses its assets heavily to generate sales (Ross, Westerfield, & Jordan, 2019). Furthermore, the sale's profit increases the business owners' fortune. The primary goal of corporate asset utilization is to increase profit because doing so raises the company's market value. The effectiveness of a company's asset management can be seen in how it uses more resources. However, a company's assets should be used as effectively and efficiently as possible because they generate the most profit for the business. Better planning, controlling the usage of corporate assets, including current assets and fixed assets, and having the right amount of funding provided for each asset piece is necessary for better asset utilization (Rahayu, 2019).

The increase in profit from sales contributes to the wealth of the company's owners, making it imperative for the company to strive for higher profitability and enhance its market value through efficient asset utilization. Efficient asset management serves as a measure of how effectively a company utilizes its assets. Furthermore, the assets of the business form the material basis for its profitability. As a result, asset quality is crucial for businesses to achieve sustainable development (Yang & Gan, 2019).

In addition, according to Rahayu (2019), the efficiency in managing current assets, fixed assets, and total assets are in the form of assets turnover ratios, which are ratios that measure the efficiency of an organization's operations. This indicates how effectively a company leverages its assets to finance sales and achieve enhanced profitability. More efficient utilization of assets drives sales, resulting in higher profits. Studies have revealed a substantial and favorable impact of asset utilization on financial performance. Therefore, organizational managers should consider insights into the effectiveness and efficiency of asset utilization when making strategic decisions concerning the company's operations.

It also supports the notion of Friedman (1957), the company's allocation of assets for its operating entity is driven by its expectations of future profits. Achieving the anticipated future profits is often dependent on making investments that yield higher profitability. The growth of the organization has a direct impact on its market value. Profits contribute to enriching the wealth of the company's future owners. Mihaiu, Opreana, and Cristescu (2010) studied the effect of efficiency on the economically effective use of resources to achieve certain goals. This results in the sustainable growth of national economies.

Higgins (1977) describes that the impact of dividend policy, leverage policy, and asset utilization policy on sustainable growth. Companies that effectively utilize their assets can decrease asset requirements, resulting in lower costs and ultimately higher sustainable growth. According to Jones and Sharma (2001), the result of an investment in working capital and fixed assets, there is a cash surplus that can be distributed among investors. Analysts can use the benchmark to get the data they need to assess a company's capacity for domestic growth and financial elasticity. The efficient and effective utilization of company assets signifies the competence of the organization in asset management, resulting in reduced costs, increased profits, and a substantial enhancement in the wealth of company owners. Asset turnover is a quantitative indicator of an asset's effectiveness in usage.

Therefore, this research will help understand the role of asset efficiency utilization of fixed asset turnover and total asset turnover in considering an organization's growth.

2.5.1 Total Asset Turnover

The effectiveness of utilizing total assets to generate revenue is assessed using this ratio. It is derived by dividing sales by the average total assets, resulting in the total asset turnover ratio (SET, 2021).

Asset turnover measures a company's ability to generate revenue from its assets, while profit margin measures a company's ability to control the costs it incurs to generate revenue. Asset turnover reflects a company's use of its assets, while profit margin reflects a company's operating efficiency (Fairfield & Yohn, 2001).

To assess the efficiency of generating income from total assets, the total asset turnover is computed by dividing sales by average total assets.

Total assets turnover is calculated as follows:

Total Asset Turnover = Sale / Total asset

Rahim (2017) studied the sales-to-assets ratio which measures asset efficiency, plays a positive role in the sustainable growth rate of Malaysian firms between 2005 and 2015. The research indicates that an upsurge in the total asset turnover ratio contributes to sustainable growth by increasing sales per asset and reducing the reliance on asset utilization.

Mumu, Susanto, and Gainau (2019) found a relationship between asset efficiency and the sustainable growth rate of companies listed on the Indonesia Stock Exchange. And Mamilla (2019) found that significant adverse effect of the sustainable growth rate on firm survival.

Platt, Platt, and Chen (1995) state that sales and assets of a company might increase even if it doesn't issue any additional shares and must maintain its capital structure. Asiri and Hameed (2014) studied the impact of financial ratios on the value of companies listed on the Bahrain Bourse over the period of 1995 to 2013 and found that total asset turnover ratio significantly impacts firm value.

Alarussi and Alhaderi (2018) found a significant positive relationship between asset turnover ratio and profitability (ROE) in their examination of factors influencing profitability in Malaysian-listed companies. These results hold practical value for external

decision-makers and support both resource-based theory and trade-off theory. In addition, the higher the asset turnover, the higher the sustainable growth rate.

Nugroho (2020) examined sustainable growth rate model in Indonesia Manufacturing. The result showed that asset turnover, return on asset, and total asset growth and financial leverage has no significant effect on sustainable growth rate.

Hafid (2016) studied the relationship between the sustainable growth rate of distributors and trade companies with profit margin, total assets, and asset turnover. Notably, the findings revealed that asset turnover had a substantial impact on the company's sustainable growth rate, with a strong correlation of 0.780.

2.5.2 Fixed Asset Turnover

This ratio is used to assess the efficiency of using long-term assets to generate income. If fixed asset turnover ratio is high, it indicates that the firm has good long-term asset management efficiency. The majority of non-current assets consist of property plants and equipment along with intangible assets, including other operating assets used in the operation.

Fixed asset turnover ratio examines assets over time and contrasts its ratio with that of rivals. This provides the investor with insight into the management of a company's use of fixed assets. It is a rough indicator of how productive a company's fixed assets are at producing sales. Better results are achieved with a higher turnover rate (SET, 2021). However, if the company mismanages its fixed assets, it will not be able to increase sales.

According to the resource-based approach, businesses that own fixed assets may employ their strategic resources to boost profits and expand their firm's capabilities. How effectively a corporation uses its fixed assets to produce revenues is shown by the fixed asset turnover ratio (Hillier, 2013).

Rahayu (2019) found that asset utilization plays a crucial role in influencing financial performance in a positive manner. Hence, organizational managers should prioritize insights on the effectiveness and efficiency of asset utilization when making strategic decisions related to the company's operations.

According to pharmaceutical companies in Indonesia, Sunjoko and Arilyn (2016) found that efficiency ratio (measure by fixed asset turnover) has a significant positive relationship with profitability.

Fixed assets turnover ratio is calculated as follows:

Fixed Asset Turnover = Sale / Fixed Total Asset

An investment in fixed assets is one that is made with the expectation of future returns. The more profitable the business is, the more money it will make. Therefore, the efficiency of the company's working capital will be improved, which will raise the investment in fixed assets and increase profitability (Wijana & Adnyana, 2022).

Rahim (2017) investigated the relationship between financial leverage, liquidity, and asset efficiency with the sustainable growth rate, and found a significant association between the debt ratio, equity ratio, total asset turnover (asset efficiency), and firm size with sustainable growth rate.

Alawneh (2022) investigated the influence of asset management efficiency ratios on earnings per share of industrial companies listed on the Amman Stock Exchange between 2005 and 2019. The findings indicated a strong and positive relationship between the asset turnover ratio and earnings per share, as well as a substantial and the fixed asset turnover ratio has a positive effect on profitability.

In summary, asset efficiency ratios are utilized to assess how effectively assets contribute to business growth. The fixed asset turnover ratio and total asset turnover ratio act as indicators of a company's ability to leverage its fixed assets for sales generation, demonstrate efficient asset utilization. The focus of this study is to examine the efficiency of companies in Thailand by analyzing the prevalent financial ratios and determining their correlation with sustainable corporate growth. The findings from this research will provide valuable insights for various stakeholders, such as management, shareholders, financial analysts, and investors. Therefore, the hypothesis has been developed as follows:

Hypotheses 3: Efficiency ratios have positive effects on corporate sustainable growth.

Table 2.3 Summary of efficiency ratio and corporate sustainable growth

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Rahim and Badrul Munir (2018) The Sustainable growth rate of firm in Malaysia: A panel data analysis	2005 until 2015 (4,917 observations)	Regressions	1. Debt to Equity Ratio. 2. Dividend payout ratio. 3. Profit margin 4. Asset turnover ratio. 5. Firm Size	SGR	The debt-to-equity ratio, total asset turnover, and firm size exhibit a positive relationship with sustainable growth rates.
Nastiti, Atahau, and Supramono (2019) Working capital management and its influence on profitability and sustainable growth	2010-2017 The Indonesian Stock Exchange	Regression	1.Cash conversion cycle 2. Return on asset (Mediating) 3. Sales growth 4.Firm Size 5. Leverage 6. Total assets turnover	SGR	The direct impact of working capital management on sustainable growth is not significant, but it does have a notable indirect influence on the profitability of the company.

Table 2.3 Summary of efficiency ratio and corporate sustainable growth (Cont.)

Researchers and Research Title	**Data**	**Statistic**	**Independent Variable**	**Dependent Variable**	**Result**
Voulgaris, Asteriou, and Agiomirgianakis (2002) Capital structure, asset utilization, profitability and growth in the Greek manufacturing sector.	75 large manufacturing firms in Greece	Regression	1. Solvency (a) Short-term liquidity (b) Long-term liquidity 2.Asset equity structure: (a) Net fixed total asset (b) Net worth to long term capital	Growth: 1.Sales 2. Total asset 3. Net profit	There is a positively affect by total assets turnover (asset productivity) and total assets growth

Table 2.3 Summary of efficiency ratio and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent	Result
Mamilla (2019) A study on sustainable growth rate for firm survival	2007-2017	Linear Regression Method	1.Financial leverage = Debt/Total Equity 2.Liquidity Current Ratio = Current asset/ Current liabilities. 3. Total asset turnover 4. Firm size 5. Tax rate	Sustainable Growth Rate: SGR = ROE (1-DPR) ROE= Return on equity, DPR = Dividend payout ratio	There is a total asset turnover, leverage and firm size negative sustainable growth rate.
Yang and Gan (2019). Can asset quality promote the sustainable development of enterprises?	The listed manufacturing enterprises in China .2010 to 2017	Regression model	Asset Quality: 1.Ratio of Real Asset. 2.Inventory turnover 3.Receivable turnover	SGR	There is the asset quality (Total asset turnover, Fixed asset turnover) has a positive effect on the sustainable growth rate.

Table 2.3 Summary of efficiency ratio and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
(Conts)			4. Current asset turnover 5.Fixed asset turnover 6.Total asset turnover 7.ROA		
Rahim (2017) Sustainable growth rate and firm performance: A case study in Malaysia	226 companies period from 2005 until 2015	Regression analysis	1.debt ratio 2. liquidity (current ratio) 3. equity ratio assets efficiency (total asset turnover) 4.size	Sustainable Growth Rate	There are significant relationships between the debt ratio, equity ratio, total asset turnover, firm size, and sustainable growth rate.

Table 2.3 Summary of efficiency ratio and corporate sustainable growth (Cont)

Researchers and Research Title	**Data**	**Statistic**	**Independent Variable**	**Dependent Variable**	**Result**
Nor, Ramli, Marzuki, and Rahim (2020) Corporate sustainable growth rate: The potential impact of covid-19 on Malaysian companies.	-181 companies. 2007-216 Shariah compliant companies in Malaysia Shariah	Regression models STATA	1.Capital structure 2. dividend policy 3. profitability 4. asset efficiency 4.Firm size	Sustainable growth rate. ROE*Retaliation Amouzesh et al. (2011)	There is asset efficiency found that positively significantly related to SGR
Altahtamouni et al. (2022) Sustainable growth rate and ROE Analysis: An applied study on Saudi Banks Using the PART Model	period of 2010–2019 110 observation Saudi banks	Regression analyses	1. P= Profit margin 2.R = Retention Rate 3.A = Asset turnover 4.T = Financial leverage 5.ROE = Return on Equity	SGR =Return on Equity × Retention Rate	There is profit margin, asset turn over, financing and leverage effect of the sustainable growth rate.

Table 2.3 Summary of efficiency ratio and corporate sustainable growth (Cont)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Hafid (2016) The effect of margin profit and total assets towards sustainable growth rate of the distributor and trade company	Period 2010-2014	Regression	1. Profit margin 2. Total asset turnover	SGR	There is profit margin and total asset turnover a significant effect of sustainable growth rate.

2.6 Board Effectiveness

The board of directors is the person who is selected by the shareholders to take over the role of corporate governance, which is of sustainable importance. The important question is whether the work of that committee is effective (SET, 2022a). The board of directors, according to Fama and Jensen (1983) is one of several crucial structures that regulate and monitor managers and contributes significantly to an organization's management approach. The moderate variables in the research study are boards effectiveness impact of cash flows, assets efficiency, and sustainable growth. Therefore, this study focuses on boards' effectiveness in four key areas as follows:

2.6.1 Board Size

Jensen (1993) suggests that larger boards are associated with lower effectiveness and increased CEO control, while overcrowded boards tend to lack cohesiveness (Lipton & Lorsch, 1992). The concept of agency theory argues that when a board of directors becomes larger, it incurs agency costs such as higher communication expenses between board members (Yermack, 1996).

Previous researches, the inclusion of more directors with diverse backgrounds, talents, skills, and professional experiences in larger boards is thought to enhance the boards' planning and decision-making processes, ultimately benefiting the performance of the businesses. Mukherjee and Sen (2019a) investigated the influence of corporate governance on the sustainable growth of 139 non-financial companies listed on the National Stock Exchange (NSE) in India over a five-year period and found that having a larger board size and a restricted number of independent members positively affected company performance and sustainable growth.

Bathula (2008) studied board characteristics and firm performance: evidence from New Zealand. The study found that board size is positively associated with firm performance, indicating the value of a larger board for the firm. Board size was also found to be positively associated with firm age and firm size. The study utilized board size as a moderating variable to assess the impact of other board characteristics on firm performance, while considering the company's age and size. Interestingly, the results indicated that board size positively moderated the relationship between board characteristics and firm performance.

A. Arora and Sharma (2016) discovered compelling evidence indicating a noteworthy positive correlation between board size and corporate performance. Additionally, Ghosh (2006) examined 127 non-financial listed manufacturing firms in 2003 and found that board size had a detrimental effect on corporate performance, irrespective of accounting and market-based criteria.

In contrast, the study conducted by Li, Lu, Mittoo, and Zhang (2015) examined the impact of board features on the sustainable growth of listed firms in China, revealing a negative link between board size and sustainable growth. Ahsan, Mirza, Al-Gamrh, and Bin-Feng (2020) found that board size has a significant negative impact on sustainable growth, and this impact is magnified in the context of Economic Policy Uncertainty. The composition of larger boards and the potential for conflicting member opinions may result in a fragmentation of the decision-making process.

Therefore, this study hypothesizes that board size moderates the effect of cash flow on corporate sustainable growth.

2.6.2 Board Independent

Independent directors are responsible for safeguarding shareholders' interests by making objective decisions and closely overseeing the governance process. Their contribution in terms of skills and knowledge is invaluable to the organization (Kamardin, 2011). Fama and Jensen (1983) suggests that the board's independence plays a vital role in carrying out these functions optimally, and an important aspect of this independence is the presence of diverse perspectives. The effectiveness of the board is positively influenced by board independence, as indicated by various studies, highlighting its crucial role in fostering strong oversight, particularly in businesses with notable agency costs.

According to Hermalin and Weisbach (1998), the effectiveness of a board is contingent upon its independence, which is influenced by the interactions and negotiations between the board and the CEO. A larger board strengthens the board's ability to negotiate with the CEO, thereby enhancing its effectiveness in overseeing the management.

Thus, this study proposes that board independence moderates the effect of cash flow on corporate sustainable growth**.**

2.6.3 CEO Duality

The chief executive officer (CEO) oversees management, whereas thechairman of the board of directors oversees the board. The CEO and chairman are one and the same, which is a reference to dualism. According to the agency theory, duality reduces a board's power to effectively oversee its management gap. Decision-making by those concurrently holding two positions can undermine the efficiency of management and the board's ability to conduct thorough evaluations (Fama & Jensen, 1983). CEO should be independent of the chairman to provide checks and balances and check for abuse of power.

Jensen (1986) emphasizes the importance of separating the roles of chairman and CEO to ensure the board's effectiveness in monitoring cash flows, as combining these positions can lead to conflicts of interest and increased agency costs (Ehikioya, 2009). The CEO's holding of multiple roles is regarded as a significant element of the board's control framework (Bathula, 2008).

Luo, Xiang, and Huang (2017) used empirical data to support the concept that gender diversity on boards aids in regulating Chinese listed businesses by reducing managers' actual manipulative actions.

Thus, this study proposes that CEO duality moderates the effect of cash flow on corporate sustainable growth**.**

2.6.4 Board Gender Diversity

The literature on gender diversity supports the notion that greater gender representation on boards leads to improved effectiveness. The agency theory framework backs up the advantages of having more women on boards. Gender diversity can therefore be a tool for managing agency problems.

Ain, Yuan, Javaid, and Naeem (2022) revealed a positive association between the inclusion of female directors on corporate boards and the mitigation of agency costs, indicating a decrease in conflicts of interest. Furthermore, in state-owned enterprises with more serious agency problems, boards with greater gender diversity are more effective. In addition, women directors are better at providing checks and balances. Finally, compared with nominal participation, boards with more women directors tend to reduce agency costs. Overall, the results support the sustainability of agency theory.

Daily and Dalton (2003) and Hillman, Cannella Jr, and Harris (2002) provide evidence supporting the human capital theory, indicating that female directors' diverse backgrounds give rise to unique perspectives, experiences, and work methods that differentiate them from male directors.

Consequently, Lucas-Pérez, Mínguez-Vera, Baixauli-Soler, Martín-Ugedo, and Sánchez-Marín (2015) revealed that the inclusion of female directors can improve board decision-making by promoting a participative and process-oriented approach. Moreover, Carter, D'Souza, Simkins, and Simpson (2010) and Tariverdi, Amanolahi, and Faal (2014) suggest that women have qualifications that are comparable to those of men, and it is further proposed that the presence of gender diversity can have a favorable effect on board effectiveness, leveraging the diverse and distinctive human capital possessed by women.

According to behavior theory, the belief that women exhibit higher risk aversion compared to men has led to the notion that companies with boards predominantly comprising women may experience weaker performance, leading to lower dividend payments. This unfavorable perspective may offset the anticipated benefits of gender diversity on dividend policies in companies with substantial free cash flows, resulting in a minimal correlation between the presence of women on the board and the distribution of dividends (Al-dhamari, Ku Ismail, Al-Gamrh, & Control, 2016).

According to previous research, there have been studies on women directors with multiple perspectives besides firm performance, including earnings management (Harakeh, El-Gammal, & Matar, 2019), account quality and dividend payout (Chen, Leung, & Goergen, 2017), sustainability disclosure (Zahid et al., 2020), corporate social responsibility (Gulzar, Cherian, Hwang, Jiang, & Sial, 2019) etc.

The inclusion of women on boards is consistent with tenets of agency theory, which postulates that gender diversity reduces conflicts of interest between managers and shareholders. This view is supported by Bujaki and McConomy (2010), as well as Hillman et al. (2002); but Rose (2007) argues that female directors, who often come from non-business backgrounds, are less likely to collaborate with insiders to seek benefits from outside investors.

Ain et al. (2022) present empirical evidence supporting a positive relationship between female directors and a company's sustainable growth rate, offering a new perspective within the gender diversity literature and enhancing our understanding of the role of female directors. Additionally, the presence of female directors on the board positively impacts investment efficiency by ensuring robust oversight and mitigating agency concerns (Safdar, Chaudhry, Mirza, & Yu, 2019).

Kılıç and Kuzey (2016) indicated a prevailing gender imbalance in the boards of Turkish companies, characterized by male dominance. Additionally, the study establishes a positive link between the presence of female directors and the financial performance of firms, as evidenced by higher return on assets, return on equity, and return on sales. Additionally, Mirza, Majeed, and Ahsan (2020) found that including female directors on boards improves investment performance by effectively monitoring performance and reducing agency problems.

In Thailand in 2021, the number of female directors was 16.2% higher than average, but compared to neighboring countries, the proportion was lower than Vietnam, Malaysia, Singapore, and the Philippines. And in Thailand, continuous promotion of women directors enhances the role of women. The assessment criteria for evaluating the corporate governance structure of listed companies in 2023 include the stipulation that companies must have a minimum of 2 female directors or maintain a board composition where they constitute at least 30% of the total members (SET, 2022). Also, improving board effectiveness according to the OECD Corporate Governance Factbook 2021, women are prudent, be independent and not influenced by the opinions of the majority (groupthink), and also enhances the monitoring function of the board of directors (SET, 2022b). In addition, as board of directors' ability varies, their management method and usage of cash flows should differ.

Therefore, this study aims to investigate the moderating effects of board effectiveness on cash flows and corporate sustainable growth as well as the moderating effects of board effectiveness on asset efficiency and corporate sustainable growth. Thus, the following hypotheses are proposed.

Hypotheses 2: Board effectiveness moderates the effect of cash flows on corporate sustainable growth.

Hypotheses 4: Board effectiveness moderates the effect of efficiency ratios on corporate sustainable growth.

Table 2.4 Summary of board effectiveness and corporate sustainable growth

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Mukherjee and Sen (2019a). Impact of corporate governance on corporate sustainable growth	139 company. Non-financial company listed in NSE	Regression	1. Board size 2. Proportion of women directors on board. 3. CEO Duality 4. Board education 5. Board independent 6. Family affiliation on board.	Sustainable Growth Rate (SGR)	There is board size and board independent has an effect of corporate sustainable growth.
Latif (2020) The influence of board diversity on environmental disclosures and sustainability performance in Malaysia			1. Board size 2. Board independent 3. Board diversity 4. Profitability 5. Growth market to book value	SG=ROE * retention rate (RR)	-Board diversity have a significant -Board size and board independence were not significant

Table 2.4 Summary of board effectiveness and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Mukherjee and Sen (2022). Impact of CEO attributes on corporate reputation, financial performance, and corporate sustainable growth: evidence from India	138 NSE listed top non-financial Indian companies. from 2010 to 2017	Regression	1.Board size 2.Women director 3.CEO duality 4.Board Education 5.Board Independent 6. Family on the board	Corporate sustainable growth	There is board size and board independent has an influence on corporate sustainable growth

Table 2.4 Summary of board effectiveness and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Adebayo, Onikoyi, Kareem, and Lamidi (2021) Influence of board characteristics and ownership concentration on corporate sustainability growth among listed manufacturing companies in Nigeria	Data from 2011-2020	Regression	1. Board size 2. Board composition 3. Ownership concentration. 4. Board independence. 5. Firm size 6. leverage	SGR	There is board size, board composition, ownership concentration, board independence, and firm size has a positive sustainability growth. There is leverage has a negative sustainability growth.

Table 2.4 Summary of board effectiveness and corporate sustainable growth (Cont.)

Researchers and Research Title	Data	Statistic	Independent Variable	Dependent Variable	Result
Ain, Yuan, Javaid, Usman, and Haris (2020) Board gender diversity and sustainable growth rate: Chinese evidence	Data from 2006 to 2017	Regression	1.Gender diversity 2.Corporate governance 3.Firm characteristics	Sustainable growth rate	Board gender diversity affect to firm's sustainable growth.
Kılıç and Kuzey (2016). The effect of board gender diversity on firm performance: evidence from Turkey	Data from 2008-2012	Regression	1.Women on board 2.Women directors 3.Gender diversity 4.Size on Board 5.Independent director. 6.Size 7.Lerverage	Frim performance	The impact women on board, women director, Gender diversity significantly and positive impact firm performance

2.7 Control Variable

To address the influence of alternative factors on our dependent variable, corporate sustainable growth, we have controlled for specific firm-related variables based on the findings of previous research. Several variables that could affect corporate sustainable growth were controlled for in the study. These control variables encompassed firm size, leverage, firm age, and type of industry.

2.7.1 Firm Size

According to Murphy (1985), the measurement of firm size is represented by the natural logarithm of total assets. Large businesses tend to have a larger market share than their competitors, which makes them more efficient. Therefore, firm size is incorporated into the model to control for the effects of large-firm management. As revenues increase, executives are more confident in retaining them and can anticipate increases in salary due to the increased responsibility that comes with overseeing a larger organization. Furthermore, Fama and French (2001) note that the dividend policies of mature firms differ from those of beginners. Mature firms tend to pay higher dividends because of their limited investment opportunities and larger accumulated assets, while beginners with fewer assets and more growth opportunities tend to pay lower dividends.

Research conducted by Adebayo et al. (2021) confirmed a positive association between firm size and corporate sustainable growth. Conversely, Vuković, Tica, and Jakšić (2022) show a negative relationship between firm size and sustainable growth rate, indicating that larger firms have lower sustainable growth rates. However, firm size plays a positive role in increasing investment efficiency. The effectiveness of the board in its monitoring function is hindered by the presence of large boards, leading to communication and decision-making challenges. As a result, CEOs gain enhanced control over these boards due to the additional costs incurred as a result of their size (Yermack, 1996).

According to Vuković, Tica, and Jakšić (2022), the natural logarithm of total assets, used as a measure of size, demonstrates a positive but statistically insignificant association with the sustainable growth rate.

According to Rahim (2017) and (Platt et al., 1995), validated the presence of a statistically significant positive association between company size and the sustainable

growth rate. Adebayo et al. (2021) revealed a positive association between firm size and sustainable corporate growth among listed manufacturing companies in Nigeria.

Wang, Dai, and Ding (2019) found a positive relationship between the sustainable growth rate and the size of the company, using the natural logarithm of total company assets as an indicator of firm size. Nevertheless, Xu and Wang (2018) identified a significant and positive association between firm size and sustainable growth rate. Moreover, Mukherjee and Sen (2019b), firm's size was found to have a noteworthy positive effect on corporate sustainable growth. On the other hand, indicated a significant negative correlation between firm size and sustainable growth rate. According to Carp, Păvăloaia, Toma, Georgescu, and Afrăsinei (2020), revealed the correlation between company size and the ability to implement policies conducive to sustainable growth.

2.7.2 Leverage

In periods of economic growth, levered firms showcase enhanced stability and profitability compared to unlevered firms. Conversely, during economic recessions, these levered firms become more prone to risks and experience decreased profitability. Thus, their profitability is closely tied to favorable economic conditions. Furthermore, Ilie and Olaru (2013) emphasize that leverage amplifies the impact of both losses and gains in business activities.

In periods of economic prosperity, leverage serves as an enabler of gains and contributes to economic growth. Therefore, both governments and firms employ leverage on a large scale. Conversely, during challenging periods, governments and firms engage in deleveraging efforts. The prevalence of financial crises often arises from excessive leverage, prompting the need for deleveraging. This allows firms to mitigate risk, enhance financial stability, and foster sustainable growth rates (Nor et al., 2020). Therefore, the utilization of leverage is instrumental in fostering sustainable growth for companies. Given the unpredictable nature of listed firms, their ability to meet financial obligations and effectively utilize their operational capabilities becomes a paramount factor in ensuring their survival and advancement.

In the view of Hanafi and Halim (2007), a company with a high debt ratio signifies a considerable level of financial leverage. Conversely, a higher debt ratio raises

concerns about shareholders' ability to achieve desired returns. Nevertheless, when employed strategically, financial leverage can increase shareholder returns.

According to Mukherjee and Sen (2018), the examination of 115 Indian companies from five sectors listed on the NSE in India demonstrated a positive correlation between leverage and the sustainable growth rate of companies. In contrast , Mamilla (2019) found that financial leverage (debt-equity ratio) had significant negative relationship with sustainable growth rate. Hinaya and Ellili (2021) and Mumu et al. (2019), leverage negatively influences the sustainable growth rate. Ross (1977) examined the growth of a company is positively influenced by debt leverage, which aligns with the signaling theory. Furthermore, Rahim (2017) and Fonseka et al. (2012) suggest that the debt ratio or leverage has a meaningfully positive influence on the sustainable growth rate. (Abdullah & Valentine, 2009).

This study employed the debt ratio formula to calculate leverage, which is derived by dividing total debt by total assets.

2.7.3 Firm Age

Firm age is anticipated to play a role in sustainable business practices, with older companies being more inclined to operate independently without relying on external funds (Mukherjee & Sen, 2019b). Furthermore, the age of the company was considered under the assumption that the learning curve and experience may have a positive impact on the sustainable growth of the organization. Due to the impact of learning and experience, businesses can achieve economies of scale and have a cost advantage.

2.7.4 Industry

As for an industry dummy to represent different industries, the industry type in which the company operates is a significant factor under consideration. The data collected and analyzed in this study encompass companies from diverse industries (Rahman and Sharma (2020).

CHAPTER 3
RESEARCH METHODOLOGY

According to the research framework demonstrated in Chapter 2, this study aims to investigate the effects of cash flows and asset efficiency on sustainable growth rate as well as the moderating roles of board effectiveness on these relationships. This chapter reports on the research methodology. The organization of this chapter consists of 5 sections: section 3.1 population and sample, section 3.2 research variables and measurements, section 3.3 data collection, section 3.4 data analysis, and section 3.5 hypotheses and statistical models.

3.1 Population and Sample

The population used in this study are all listed companies (683 companies) on the Stock Exchange of Thailand (SET) in the year 2022. The population of 683 companies listed on the SET are classified into eight industry groups: 1) Argo & Food Industry, 2) Consumer Products, 3) Financial, 4) Industrials, 5) Property & Construction, 6) Resource, 7) Services, and 8) Technology. Table 3.1 presents the population of listed companies on SET in the year 2022.

This study used secondary data and employed a purposive sampling method to select the samples based on the following criteria. Firstly, the study samples include companies from all industry groups except companies from the financial industry and property funds and real estate investment trusts since these companies have different asset divergence and accrual basis compared to other business sectors (Klein, 2002). Secondly, since sampled companies need to have operating profit that demonstrate corporate sustainable growth, hence companies those are experienced operating losses are excluded from the study sample. Thirdly, companies with non-December fiscal year-end were also excluded to achieve the data equalization and comparability. Lastly, rehabilitation companies and some outliers were also excluded. Thus, the total samples in this study includes 383 companies as shown in Table 3.2.

Table 3.1 Classification of industries and sectors of listed companies on the SET

Industry	**Sector**		**Company Number**
Argo & Food Industry (AGRO)	AGRI	-Agribusiness	69
	FOOD	- Food & Beverage	
Consumer Products (CONSUMP)	FASHIN	-Fashion	43
	HOME	-Home	
	PERSON	-Home & Office Products -Personal Products & Pharmaceuticals	
Financials (FINCIAL)	BANK	-Banking	42
	FIN	-Finance& Securities	
	INSUR	-Insurance	
Industrials (INDUS)	AUTO	-Automotive	92
	IMM	-Industrial Materials & Machine	
	PAPER	-Packaging	
	PETRO	-Paper& Printing Materials	
	PKG	-Petrochemicals & Chemicals	
	STEEL	-Steel	
Property & Construction (PROPCON)	CONMAT	-Construction Materials	168
	CONS	-Construction Services	
	PF&REITs	-Property Fund &Real Estate Investment Trusts	
Services (SERVICE)	COMM	-Commerce	42
	HELTH	-Health Care Services	
	MEDIA	-Media & Publishing	
	PROF	-Professional Services	
	TOURISM	-Tourism & Logistics	
	TRSNS	-Transportation & Logistics	

Table 3.1 Classification of industries and sectors of listed companies on the SET (Cont.)

Industry	Sector		Company Number
Resources	ENERG	-Energy & Utilities	68
(RESOURC)	MINE	-Mining	
Technology	ETRON	-Electronic Components	42
(TECH)	ICT	-Information & Communication Technology	
Total			683

Source: (SET, 2023) accessed on 20th Mar, 2023.

Table 3.2 Summary of sample companies used in this study

Description	Number of Companies
Total companies listed on the SET	683
Excluding:	
-Financial industry & Funds of real estate and other funds.	(142)
-Company under rehabilitation	(3)
- Companies with losses	(123)
-Non-December fiscal year-end companies	(23)
-Outlier	(9)
Final Sample	383

A summary of sample companies classified by industry is presented in Table 3.3.

Table 3.3 Sample companies classified by industry

Industry	Sample	Percentage
Argo & Food Industry	55	14.6
Consumer Products	31	8.09
Industrials	58	15.14
Property & Construction	69	18.02
Resources	48	12.53
Services	92	24.03
Technology	30	7.83
Total	383	100

3.2 Research Variables and Measurements

Variables in this study comprised: 1) dependent variable: sustainable growth rate, 2) independent variable: cash flows, and efficiency ratio, 3) moderating variable: board effectiveness, and 4) control variable: firm size, leverage, firm age, industry, respectively.

3.2.1 Dependent Variable: Corporate Sustainable Growth

In this study, the interesting variable is corporate sustainable growth. Sustainable growth rate (SGR) is used as a measure of corporate sustainable growth. The abbreviation and measurement are shown in Table 3.4.

Table 3.4 Abbreviation and measurement of dependent variable: corporate sustainable growth

Dependent Variable: Corporate Sustainable Growth	Abbreviation	Measurement
Sustainable Growth Rate	SGR	ROE x Retention rate; where, ROE stands for return on equity; and retention rate = (1 – dividend payout ratio)

3.2.2 Independent Variables: Cash Flows and Efficiency Ratios

The independent variables in the study are cash flows and efficiency ratios. The abbreviations and measurements of these variables are presented in Table 3.5.

Table 3.5 Abbreviations and measurements of the independent variable: cash flows and efficiency ratios

Independent Variable	Abbreviations	Measurements
Cash flows:		
Cash Flow from Operation	CFO	Net cash flow from operation divided by total assets
Cash Flow from Investing	CFI	Net cash flow from investing divided by total assets
Cash Flow from Financial	CFF	Net cash flow from financial divided by total assets

Table 3.5 Abbreviations and measurements of the independent variable: cash flows and efficiency ratios (Cont.)

Independent Variable	Abbreviations	Measurements
Net Cash Flows	NCF	Net cash flows divided by total assets
Free Cash Flow	FCF	Operating cash flow minus capital expenditures
Efficiency Ratios:		
Fixed Asset Turnover	FAT	Sales divided by average total fixed assets
Total Asset Turnover	TAT	Sales divided by average total assets

3.2.3 Moderating Variable: Board Effectiveness

The moderating variables on the relationship between cash flows and efficiency ratios with corporate sustainable growth in this study included: board size, board independence, CEO duality, and board gender diversity. Abbreviations and measurements of board effectiveness used in this study are shown in Table 3.6.

Table 3.6 Abbreviations and measurements of the moderating variable: board effectiveness

Moderating Variable	Abbreviations	Measurements
Board Size	BZ	Total number of directors on the company board
Board Independence	BIND	Number of the independent non-executive directors divided by total number of directors on the board
CEO Duality	CEODU	A dummy variable, coded “1”, if the chairman and the chief executive officer (CEO) are the same person; and coded “0” otherwise
Board Gender Diversity	BG	The ratio of a number of female directors to the total number of directors on the board

3.2.4 Control Variable

From previous studies, factors found to explain corporate sustainable growth include firm size, leverage, firm age, and industry type. Therefore, these factors were used as control variables in this study, and abbreviations and measurements are shown in Table 3.7.

Table 3.7 Abbreviations and measurements of control variable in this study

Control Variables	Abbreviations	Measurements
Firm Size	F_Size	Logarithm of total assets
Leverage	LEV	The ratio of total debt divided by equity
Firm Age	F_Age	Logarithm of the number of years since the company's established until the year of the study
Industry Type	Ind1- Ind6	Dummy variable; all 7 industrial groups were measured with 6 dummy variables (number of dummy variables = K-1; K = number of industry groups by dummy variable); each item is assigned a value of 1 in each industry group. If not used, the value will be 0, while Industry Group 1 will have a value of 0 in all 6 dummy variables (Alcalde, 2016; Bishara, Andrikopoulos, & Eldomiaty, 2020)

3.3 Data Collection

This study used quantitative research methods. The data used in the study is secondary data collected from the sample companies' financial statements and annual reports (56-1 One Report) for the year 2022, including information from online database of the Securities and Exchange Commission (SEC) and the SET Market Analysis and Reporting Tool (SETSMART).

3.4 Data Analysis

3.4.1 Descriptive Statistics

Descriptive statistics are used to summarize the characteristics of preliminary data of variables such as mean, median, standard deviation, minimum, and maximum values of the data; and to provide a general overview of the data and the nature of the basic statistical distribution.

3.4.2 Inferential Statistics

The inferential statistics used to analyze the data are as follows.

1. Pearson correlation coefficient is used to test the relationship between variables.

2. Multivariate hierarchical regression analysis based on the concept of Baron and Kenny (1986) in conjunction with the PROCESS macro for SPSS written by Hayes (2018) was used to test the hypotheses. All independent variables were transformed to their mean-centered to avoid the multicollinearity issue (Aiken et al., 1991). Multiple regression analysis is used to test hypothesis 1: the effect of FCF on SGR as well as hypothesis 3: the effects of efficiency ratios on SGR. PROCESS is used to calculate the interaction effects estimated by the best-fitting OLS regression model and probe the interaction effects. The PROCESS procedure for SPSS model template 1 is applied to test the moderating effects of board effectiveness on these relationships which are proposed in hypothesis 2 and hypothesis 4. Furthermore, the pick-a-point approach is employed to demonstrate the interaction effects.

3.4.3 Tests for the Regression Assumptions

The researcher assesses the appropriateness of the data for analysis by testing the regression assumptions as follows:

1) Checking for data abnormalities (outliers). Using the Mahala Nobis Distance method, considering if the p-value must not be less than 0.001 ($p < 0.001$), the data is considered not abnormal (Ghorbani, 2019). This technique results in deleting 9 companies from the dataset. Then, no dataset has p-value of less than 0.001 indicates that this set of data has no abnormalities and can be further analyzed.

2) To alleviate the problem of multicollinearity, it is necessary to ensure that there is no relationship between the independent variables, which can be assessed by

statistical analysis of tolerance and Variance Inflation Factor (VIF) if all the independent variables have tolerance greater than 0.1 and VIF values are less than 10 (Hair, 2010). It indicates the absence of multicollinearity issues (Bowerman et al., 2003).

Moreover, the presence of multicollinearity problem is also demonstrated by examining the linear relationship between the independent variables using the Pearson Correlation Coefficient method. Hinkle's (1998) criterion was applied to calculate the correlation coefficient, focusing on investigating issues related to the relationship and multicollinearity as follows.

When analyzing the correlation coefficient (r):

$r < 0.20$ indicates an extremely low correlation between variables.

$0.21 < r \leq 0.40$, the correlation between variables is viewed as low.

$0.41 < r \leq 0.60$, the correlation between variables is regarded as moderate.

$0.61 < r \leq 0.80$, the correlation between variables is seen as high.

$r > 0.80$ signifies a very high correlation between variables.

3.5 Hypotheses and Models Specifications

1) Model Test: Do cash flows affect corporate sustainable growth?

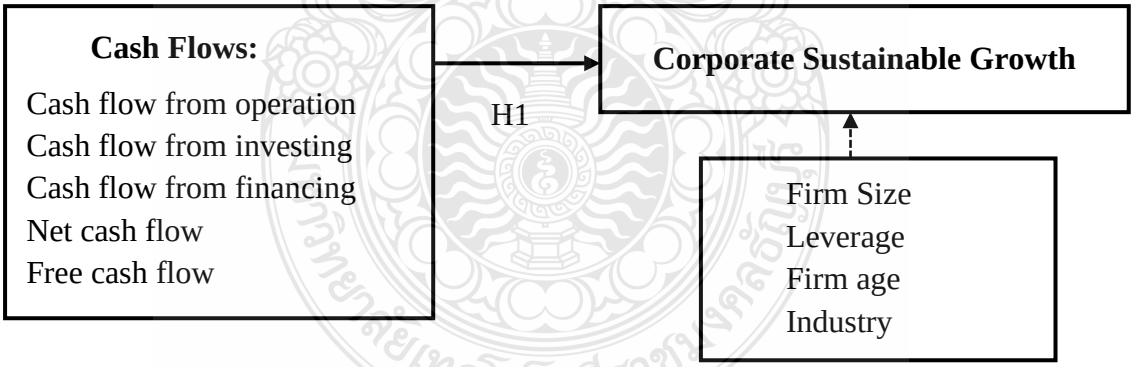

Figure 3.1 The effects of cash flows on corporate sustainable growth

This study proposes the first hypothesis that cash flow affects corporate sustainable growth.

Hypotheses 1: Cash flow affects corporate sustainable growth.

H1a: Cash flow from operation has a positive effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFO + \beta 2\ F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta 5\ IND + e$$

H1b: Cash flow from investing has a negative effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFI + \beta 2\ F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta 5\ IND + e$$

H1c: Cash flow from financing has a negative effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFF + \beta 2\ F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta 5\ IND + e$$

H1d: Net cash flows has a positive effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 NCF + \beta 2\ F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta 5\ IND + e$$

H1e: Free cash flow has a positive effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FCF + \beta 2\ F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta 5\ IND + e$$

2) Model Test: Does board effectiveness moderate the effect of cash flows on corporate sustainable growth?

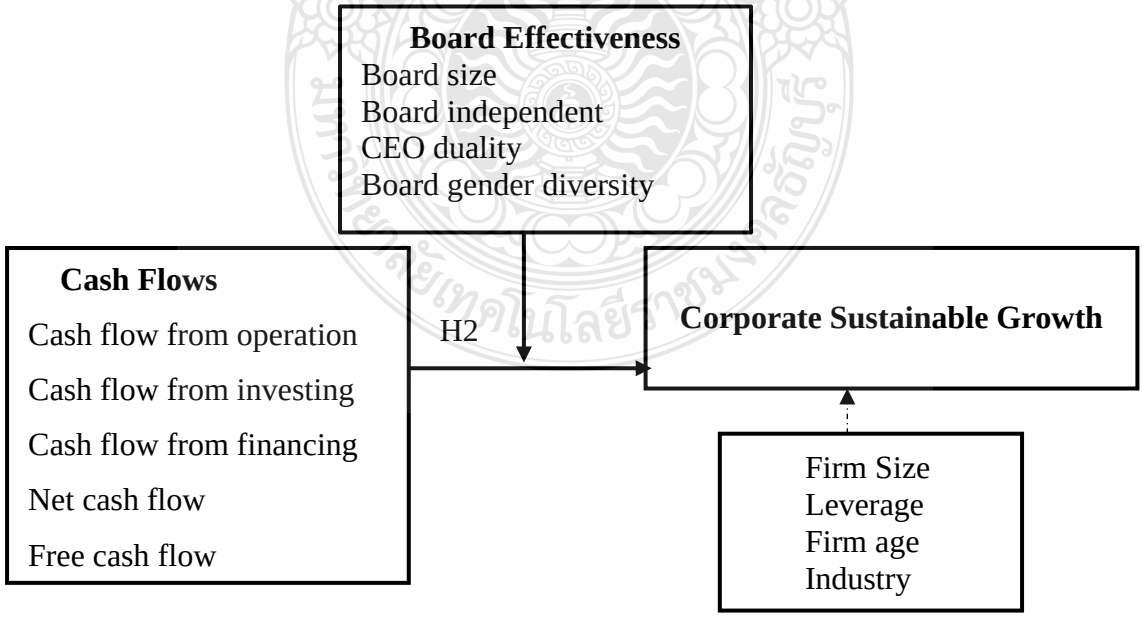

Figure 3.2 Moderating role of board effectiveness on the effect of cash flows on corporate sustainable growth

This study proposes the seconds hypothesis that board effectiveness moderates the effect of cash flows on corporate sustainable growth.

Hypotheses 2: Board effectiveness moderates the effect of cash flows on corporate sustainable growth.

H2a: Board effectiveness moderates the effect of cash flow from operation on corporate sustainable growth.

H2a1: Board size moderates the effect of cash flow from operation on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1\, CFO + \beta_2\, BZ + \beta_3 CF0*BZ + \beta_4\, F\_SIZE + \beta_5\, LEV + \beta_6\, F\_AGE + B_7\, IND + e$$

H2a2: Board independence moderates the effect of cash flow from operation on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1\, CFO + \beta_2\, BIND + \beta_3\, CF0*BIND + \beta_4\, F\_SIZE + \beta_5\, LEV + \beta_6\, F\_AGE + \beta_7 IND + e$$

H2a3: CEO Duality moderates the effect of cash flow from operation on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1\, CFO + \beta_2\, CEODU + \beta_3\, CF0*CEODU + \beta_4\, F\_SIZE + \beta_5\, LEV + \beta_6\, F\_AGE + \beta_7 IND + e$$

H2a4: Board gender diversity moderates the effect of cash flow form operation on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1\, CFO + \beta_2\, BG + \beta_3\, CF0*BG + \beta_4\, F\_SIZE + \beta_5\, LEV + \beta_6\, F\_AGE + \beta_7 IND + e$$

H2b: Board effectiveness moderates the effect of cash flow from investing on corporate sustainable growth.

H2b1: Board size moderates the effect of cash flow from investing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1\, CFI + \beta_2\, BZ + \beta_2 3CFI*BZ + \beta 4\, F\_SIZE + \beta_5\, LEV + \beta_6\, F\_AGE + B_7\, IND + e$$

H2b2: Board independence moderates the effect of cash flow from investing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFI + \beta_2 BIND + \beta_3 CFI*BIND + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2b3: CEO Duality moderates the effect of cash flow from investing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFI + \beta_2 CEODU + \beta_3 CFI*CEODU + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2b4: Board gender diversity moderates the effect of cash flow from investing on corporate sustainable growth**.**

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFI + \beta_2 BG + \beta_3 CFI*BG + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2c: Board effectiveness moderates the effect of cash flow from financing on corporate sustainable growth.

H2c1: Board size moderates the effect of cash flow from financing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFF + \beta_2 BZ + \beta_2 3CFF*BZ + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + B_7 IND + e$$

H2c2: Board independence moderates the effect of cash flow financing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFF + \beta_2 BIND + \beta_3 CFF*BIND + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2c3: CEO Duality moderates the effect of cash flow financing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFF + \beta_2 CEODU + \beta_3 CFF*CEODU + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2c4: Board gender diversity moderates the effect of cash flow from financing on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 CFF + \beta_2 BG + \beta_3 CFF*BG + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + B_7 IND + e$$

H2d: Board effectiveness moderates the effect of net cash flow on corporate sustainable growth.

H2d1: Board size moderates the effect of net cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 NCF + \beta_2 BZ + \beta_3 NCF*BZ + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2d2: Board independence moderates the effect of net cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 NCF + \beta_2 BIND + \beta_3 NCF*BIND + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2d3: CEO Duality moderates the effect of net cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 NCF + \beta_2 CEODU + \beta_3 NCF*CEODU + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2d4: Board gender diversity moderates the effect of net cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 NCF + \beta_2 BG + \beta_3 NCF*BG + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2e: Board effectiveness moderates the effect of free cash flow on corporate sustainable growth.

H2e1: Board size moderates the effect of free cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FCF + \beta_2 BZ + \beta_3 FCF*BZ + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2e2: Board independence moderates the effect of free cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FCF + \beta_2 BIND + \beta_3 FCF*BIND + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2e3: CEO Duality moderates the effect of free cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FCF + \beta_2 CEODU + \beta_3 FCF*CEODU + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H2e4: Board gender diversity moderates the effect of free cash flow on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FCF + \beta_2 BG + \beta_3 FCF*BG + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

3) Model Test: Do efficiency ratios affect corporate sustainable growth?

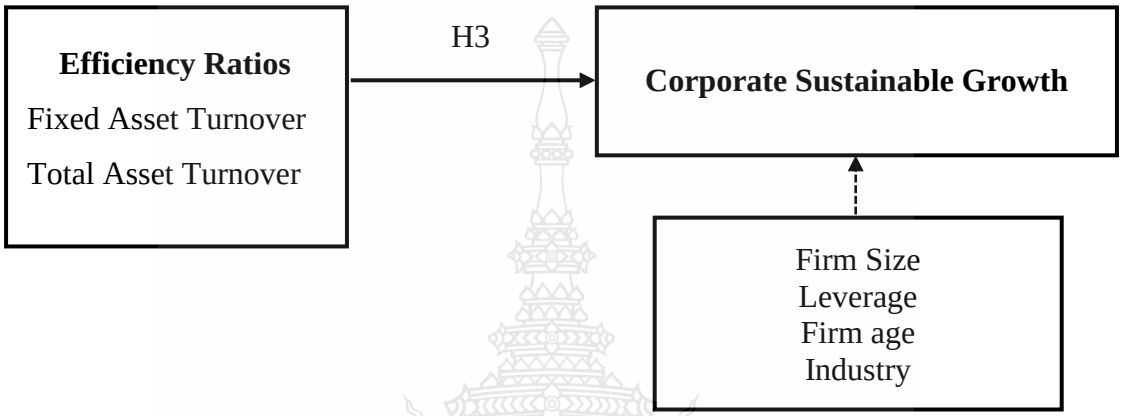

Figure 3.3 The effect of efficiency ratio on corporate sustainable growth

This study proposes the third hypothesis that the efficiency ratios affect corporate sustainable growth.

Hypotheses 3: Efficiency ratios have positive effects on corporate sustainable growth.

H3a: Fixed asset turnover has a positive effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FAT + \beta_2 F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta_5 IND + e$$

H3b: Total asset turnover has a positive effect on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 TAT + \beta_2 F\_SIZE + \beta_3 LEV + \beta_4 F\_AGE + \beta_5 IND + e$$

4) Model Test: Does board effectiveness moderate the effect of efficiency ratios on corporate sustainable growth?

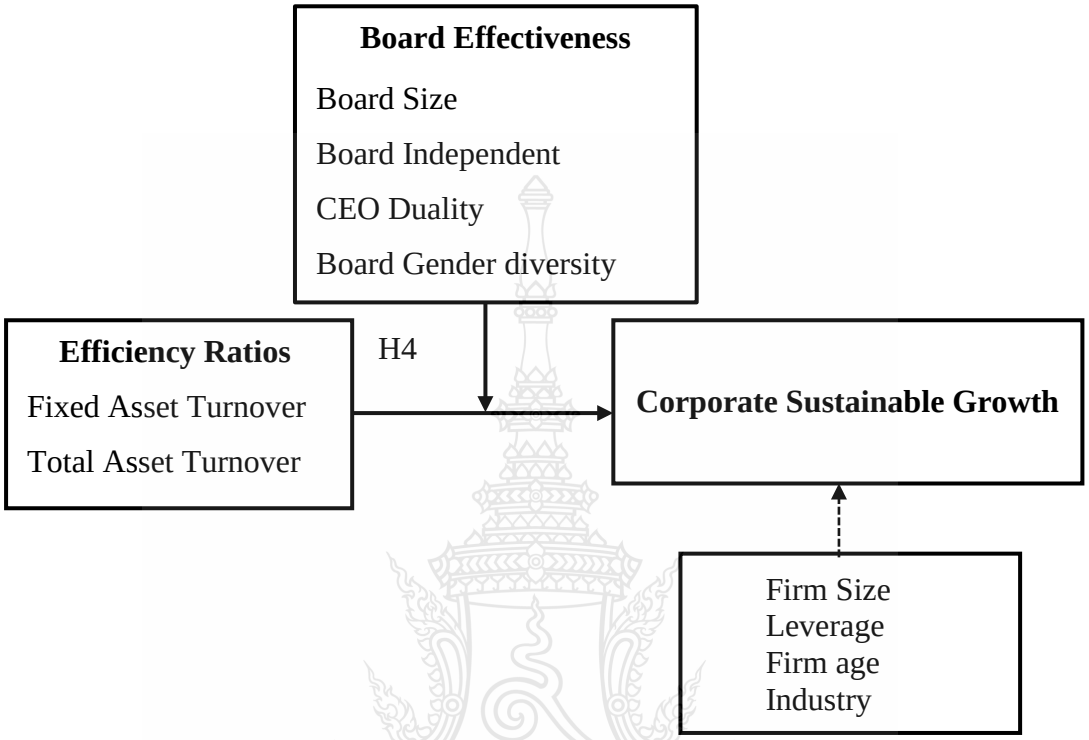

Figure 3.4 Moderating role of board effectiveness on the effect of efficiency ratios on corporate sustainable growth

This study proposes the fourth hypothesis that board effectiveness moderates the effect of efficiency ratios on corporate sustainable growth.

Hypotheses 4: Board effectiveness moderates the effect of efficiency ratios on corporate sustainable growth.

H4a: Board effectiveness moderates the effect of fixed asset turnover on corporate sustainable growth.

H4a1: Board size moderates the effect of fixed asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FAT + \beta_2 BZ + \beta_3 FAT*BZ + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4a2: Board independent moderates the effect of fixed asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FAT + \beta_2 BIND + \beta_3 FAT*BIND + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4a3: CEO Duality moderates the effect of fixed asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FAT + \beta_2 CEODU + \beta_3 FAT*CEODU + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4a4: Board gender diversity moderates the effect of fixed asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 FAT + \beta_2 BG + \beta_3 FAT*BG + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4b: Board effectiveness moderates the effect of total asset turnover on corporate sustainable growth.

H4b1: Board size moderates the effect of total asset turnover on corporate sustainable growth .

$$\boldsymbol{SGR} = \beta_0 + \beta_1 TAT + \beta_2 BZ + \beta_3 TAT*BZ + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4b2: Board independent moderates the effect of total asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 TAT + \beta_2 BIND + \beta_3 TAT*BIND + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4b3: CEO Duality moderates the effect of total asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 TAT + \beta_2 CEODU + \beta_3 TAT*CEODU + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

H4b4: Board gender diversity moderates the effect of total asset turnover on corporate sustainable growth.

$$\boldsymbol{SGR} = \beta_0 + \beta_1 TAT + \beta_2 BG + \beta_3 TAT*BG + \beta_4 F\_SIZE + \beta_5 LEV + \beta_6 F\_AGE + \beta_7 IND + e$$

CHAPTER 4
RESEARCH RESULTS

The purpose of this chapter is to present the research results, which consists of two main sections. The first section is descriptive statistics of the variables used in the study. The last section presents the results of the hypothesis testing using multiple regression analysis and moderation effects by the PROCESS macro for SPSS.

4.1 Descriptive Statistics

Descriptive statistics were used to describe and analyze the main features and characteristics of the variables studied in this research. It contains the minimum, maximum, mean, and standard deviation values of the total sample of 383 companies. This study collected data from a large enough sample to assume that they followed the rule of normal distribution. The descriptive statistics for all variables in this study: independent, moderating and dependent variables are presented in Table 4.1.

Table 4.1 Descriptive statistics for all variables in this study

Variable		Min	Max	Mean	S.D.
SGR	Percent	-.26.240	56.030	6.358	8.436
CFO	Ratio	-298.960	441.930	74.146	94.501
CFI	Ratio	- 379.540	297.220	- 40.070	72.551
CFF	Ratio	- 347.420	471.220	- 21.450	101.279
NCF	Ratio	- 316.360	418.950	12.627	71.139
FCF	Million baht	- 5.432	81.362	2.501	8.760
FAT	Ratio	0.119	111.884	5.907	11.564
TAT	Percent	0.037	4.677	0.890	0.710
BZ	Ratio	6.000	18.000	10.068	2.320
BIND	Ratio	0.250	0.710	0.435	0.097
CEODU	Dummy	0.000	1.000	0.091	0.289
BG	Ratio	0.000	0.670	0.216	0.146
F_Size	Million Baht	466.366	926,987.180	37,677.592	108,110.088
Ln_Fsize	Natural log	6.145	13.740	9.078	1.536
LEV	Ratio	0.014	6.417	0.975	0.897
F_Age	year	0.000	47.000	18.110	12.463
Ln_FAge	Natural log	0.000	3.850	2.490	1.089
Observations = 383					

Note: 1.SGR: Sustainable Growth Rate, 2) CFO: Cash flow from operation, 3) CFI: Cash flow from investing, 4) CFF: Cash flow from financing, 5) NCF: Net Cash Flows, 6) FCF: Free Cash Flow, 7) FAT: Fixed Asset turnover, 8) TAT: Total Asset Turnover, 9) BZ: Board Size, 10) BIND: Board Independent, 11) CEODU: CEO Duality, 12) BG: Board Gender Diversity, 13) F_Size: Frim Size, 14) LEV: Leverage, and 15) F_Age: Firm Age.

Table 4.2 shows the descriptive statistics of variables as follows. Dependent variable, corporate sustainable growth (SGR) has the mean value of 6.359% with minimum values of -26.240% and the maximum value of 56.030%, along with the standard deviation of 8.436%.

1. Independent variable:

1.1 cash flow from operation (CFO) has the mean value of 74.146 with minimum value of -298.960, the maximum value of 441.930, and the standard deviation of 94.501;

1.2 cash flow from investing (CFI) has the mean value of -40.070 with minimum value of -379.540, the maximum value of 297.220, and the standard deviation of 72.551;

1.3 cash flow from financial (CFF) has the mean value of -21.450 with minimum value of -347.420, the maximum value of 471.220, and the standard deviation of 101.279;

1.4 net cash flow (NCF) has the mean value of 12.627 with minimum value of -316.360, the maximum value of 418.950, and the standard deviation of 71.139;

1.5 free cash flow (FCF) has the mean value of 2.501while the minimum, maximum and the standard deviation values of -5.432, 81.362, 8.760, respectively;

1.6 efficiency ratios which are proxied by fixed asset turnover (FAT) has the mean value of 5.907, the minimum value of 0.119, the maximum value of 111.884, and the standard deviation of 11.564 while the other proxy of efficiency ratio is total asset turnover (TAT) that has the mean value of 0.890, the minimum, maximum, and standard deviation values of 0.037, 4.677, and 0.710, respectively.

2. Moderating variable: board effectiveness which are proxied as:

2.1 board size (BZ) has the mean value of 10.068, the minimum, maximum, and standard deviation values of 6.00, 18.00, and 2.320, respectively;

2.2 board independent (BIND) has the mean value of 0.435, the minimum, maximum, and standard deviation values of 0.250, 0.710, and 0.097, respectively;

2.3 CEO duality (CEODU) has the mean value of 0.102, the minimum value of 0, the maximum value of 1 and standard deviation values of 0.091, 0, 1, and .289, respectively;

2.4 Board gender diversity (BG) has the mean value of 0.216, the minimum, maximum, and standard deviation values of 0.00, 0.670, and 0.146, respectively.

3. Control variable

3.1 Firm size (F_Size) shows the mean value of 37,677.592 million baht, the minimum, maximum, and standard deviation values of 466.366; 926,987.180; and 108,110.008 million baht, respectively. While the mean value of Ln_Fsize is 9.078, the minimum, maximum, and standard deviation values are 6.145, 13.740, and 1.536, respectively.

3.2 Leverage (LEV) has the mean value of 0.975, the minimum, maximum and standard deviation values of 0.014, 6.417, and 0.897, respectively.

3.3 Firm age (F_Age) shows the mean value of 18.110 years, the minimum, maximum, and the standard deviation values of 0.000, 47.000, and 12.463 years, respectively. While the mean value of Ln_Fage is 2.490, the minimum, maximum and standard deviation values of 0.000, 3.850, and 1.089, respectively.

4.2 Result of Correlation Analysis

4.2.1 Test of Multiple Regression Analysis Assumption

The research model is to study cash flows and efficiency ratios as independent variables, corporate sustainable growth as dependent variable, and board effectiveness as moderating variable. The study used multiple linear regression analysis to determine the effects of the predictors on outcome variable and moderation analysis by PROCESS macro for SPSS to explain how the predictor variable affected the outcome via the moderating variable. Before testing the hypothesis, the study needs to examine the multicollinearity problem of the predictor variable along with the control variable. Table 4.2 shows the results of the variance inflation factor (VIF) and tolerance values, which indicates the absence of multicollinearity problem since the results are corresponding to the criteria suggests by Hair (2010) which indicates the absence of multicollinearity issues if all independent variables have tolerance values above 0.1 and VIF values below 10 (Miles & Shevlin, 2001). Moreover, this study also applied the Pearson correlation coefficient to confirm that whether there is no multicollinearity problem and the results

are shown in Table 4.3, which illustrates a correlation matrix among all the control variable, independent variable and moderator variable. The result of the correlation matrix analysis shows that there is no correlation coefficient higher than 0.80 (Kumari, 2008), which means that all the variables are not related at a higher level than acceptable. Therefore, it is absence of multicollinearity problem.

Table 4.2 Tolerance and VIF collinearity statistics of variables in the study

Variable	Collinearity Statistics	
	Tolerance	**VIF**
CFO	.684	1.461
CFI	.750	1.334
CFF	.791	1.265
NCF	.695	1.440
FCF	.684	1.461
FAT	.883	1.132
TAT	.834	1.199
BZ	.646	1.549
BIND	.857	1.166
CEODU	.927	1.079
BG	.934	1.071
F_Size	.515	1.940
LEV	.790	1.266
F_Age	.822	1.217

Table 4.3 Correlation coefficient between variables

	CFO	CFI	CFF	NCF	FCF	FAT	TAT	BZ	BIND	CEODU	BG	Ln_Fsize	LEV	LnFage	SGR
CFO	1														
CFI	-.305**	1													
CFF	-.589**	-.267**	1												
NCF	.178**	.234**	.368**	1											
FCF	.173**	-0.076	-.120*	-0.019	1										
FAT	-.143**	0.093	0.046	-0.029	-0.075	1									
TAT	.159**	-0.048	-0.094	0.029	-0.034	.267**	1								
BZ	0.067	0.028	-0.084	-0.003	.309**	-0.067	-.133**	1							
BIND	-.143**	-0.027	.130*	-0.034	-0.061	0.004	-0.054	-.278**	1						
CEODU	0.032	0.018	-0.084	-0.059	-0.034	0.030	-0.034	-.156**	0.012	1					
BG	.123*	-0.043	-0.042	0.060	-0.087	-0.026	-0.059	-0.011	-0.071	0.044	1				
Ln_Fsize	-0.066	0.047	0.016	-0.017	.501**	0.003	-.106*	.475**	0.012	-0.020	-.138**	1			
LEV	-.186**	-0.037	.179**	-0.029	.148**	0.090	0.054	0.076	0.062	-0.039	0.005	.368**	1		
Ln_FAge	0.040	.141**	-.293**	-.220**	0.088	-0.008	-0.100	.121*	-.149**	.162**	-0.061	0.094	0.030	1	
SGR	.301**	-.189**	0.064	.298**	.162**	0.057	.241**	-0.053	0.031	-0.033	0.055	.126*	0.061	-.218**	1

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Note: 1) SGR: sustainable growth rate, 2) CFO: Cash flow from operation, 3) CFI: Cash flow from investing, 4) CFF: Cash flow from financing, 5) NCF: Net Cash Flows, 6) FCF: Free Cash flow, 7) FAT: Fixed Asset turnover, 8) TAT: Total Asset Turnover, 9) BZ: Board Size, 10) BIND: Board Independent, 11) CEODU: CEO Duality, 12) BG: Board Gender Diversity, 13) F_size: Firm Size, 14) LEV: Leverage, and 15) F_Age: Firm Age

4.3 Hypothesis Testing

Hierarchical multiple regression, Ordinary Least Square (OLS), and PROCESS macro for SPSS were used to test the effect of cash flows, efficiency ratios and control variables on SGR and the moderating effect of board effectiveness on the relationships. The results are shown in the following tables. Table 4.4 shows the main effect of CFO on SGR and the moderating effects of board effectiveness on this relationship. Table 4.5 shows the main effect of CFI on SGR and the moderating effects of board effectiveness on this relationship. Table 4.8 shows the main effect of CFF on SGR and the moderating effects of board effectiveness on this relationship. Table 4.10 shows the main effect of NCF on SGR and the moderating effects of board effectiveness on this relationship. Table 4.12 shows the main effect of FCF on SGR and the moderating effects of board effectiveness on this relationship. Table 4.14 shows the main effect of FAT on SGR and the moderating effects of board effectiveness on this relationship.

Table 4.15 shows the main effect of TAT on SGR and the moderating effects of board effectiveness on this relationship.

Table 4.4 Results examining the main effect of CFO on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		CFO	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	2.720	.564	4.796	4.898	4.907
	(1.908)*	(.987)	(.184)	(1.760)*	(1.793)*	(1.774)*
Control Variables						
F_Size	2.010	.615	1.099	.619	.599	.619
	(2.137)**	(2.006)**	(3.313)***	(2.115)**	(2.043)*	(2.091)**
LEV	.362	.745	.633	.738	.746	.730
	(.710)	(1.530)	(1.307)	(-1.516)	(1.529)	(1.487)
F_Age	-1.243	-1.383	.299	-1.335	-1.371	-1.391
	(-3.297)***	(-4.597)***	(-4.325)***	(-4.390)***	(-4.502)***	(-4.598)***
Ind1	-3.817	-2.638	-2.465	-2.568	-2.725	-2.673
	(-2.053)**	(-1.488)	(-1.401)	(-1.449)	(-1.534)	(-1.502)
Ind2	-4.014	-3.038	-3.356	-3.088	-3.063	-3.013
	(-2.582)***	(-2.043)**	(-2.280)**	(-2.080)**	(-2.062)**	(-2.016)**
Ind3	-4.153	-2.007	-2.349	-2.354	-1.928	-1.953
	(-2.744)***	(-.092)	(-1.604)	(-1.582)	(-1.306)	(-1.311)
Ind4	-1.531	.031	-.353	-.460	.111	.000
	(-.933)	(.020)	(-.226)	(-.286)	(-.070)	(-.001)

Table 4.4 Results examining the main effect of CFO on SGR and the moderating effects of board effectiveness on this relationship (Cont .)

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		CFO	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Ind5		-1.498	-1.534	-1.354	-1.592	-1.533
		(-1.077)	(-1.163)	(-1.035)	(-1.207)	(-1.161)
Ind 6		-2.933	-1.038	-1.829	-1.186	-1.019
		(-1.566)	(-.577)	(-1.009)	(-.659)	(-.566)
Main Effect						
CFO		.029	.029	.029	.029	.029
		(6.543)***	(6.358)***	(6.423)***	(6.556)***	(6.419)***
BZ			-.603			
			(-3.017)***			
BIND				2.383		
				(.564)		
CEODU					-.598	
					(-.426)	
BG						.623
						(.220)
Interaction Effect						
CFOxBZ			.000			
			(-0.871)			
CFOxBIND				-.069		
				(-1.380)		
CFOxCEODU					.016	
					(1.055)	
CFOxBG						-.013
						(-0.462)
R	.315	.438	.460	.444	.441	.439
R^2	.099	.192	.212	.197	.195	.192
R^2 change		.093	.000	.004	.002	.000
F	4.566***	8.837***	8.274***	7.577***	7.447***	7.350***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

Hypotheses 1: Cash flow affects corporate sustainable growth.

H1a: Cash flow from operation has a positive effect on corporate sustainable growth.

$$\boldsymbol{SGR} = 2.720 + .029\ CFO + .615\ F\_SIZE + .745\ LEV - 1.383\ F\_AGE - 2.638\ Ind1 - 3.038\ Ind2 - 2.007\ Ind3 + .031\ Ind4 - 1.498\ Ind5 - 2.933\ Ind6$$

H2a: Board effectiveness moderates the effect of cash flow from operation on corporate sustainable growth.

H2a1: Board size moderates the effect of cash flow from operation on corporate sustainable growth.

$$\boldsymbol{SGR} = .564 + .029\ CFO - .603\ BZ + .000\ CFO*BZ + 1.099\ F\_SIZE + .633\ LEV + .299\ F\_AGE - 2.465\ Ind1 - 3.356\ Ind2 - 2.349\ Ind3 - .353\ Ind4 - 1.354\ Ind5 - 1.038\ Ind6$$

H2a2: Board independence moderates the effect of cash flow from operation on corporate sustainable growth.

$$\boldsymbol{SGR} = 4.796 + .029\ CFO + 2.383\ BIND - .069\ CFO*BIND + .619\ F\_SIZE + .738\ LEV - 1.335\ F\_AGE - 2.568\ Ind1 - 3.088\ Ind2 - 2.345\ Ind3 - .460\ Ind4 - 1.354\ Ind5 - 1.829\ Ind6$$

H2a3: CEO Duality moderates the effect of cash flow from operation on corporate sustainable growth.

$$\boldsymbol{SGR} = 4.898 + .029CFO - ..598\ CEODU + .016\ CFO*CEODU + .599\ F\_SIZE + .746\ LEV - 1.371\ F\_AGE - 2.725\ Ind1 - 3.063\ Ind2 - 1.928\ Ind3 - .111\ Ind4 - 1.592\ Ind5 - 1.186\ Ind6$$

H2a4: Board gender diversity moderates the effect of cash flow form operation on corporate sustainable growth.

$$\boldsymbol{SGR} = 4.907 + .029\ CFO + .623\ BG - .013\ CFO*BG + .619\ F\_SIZE + .730\ LEV - 1.391\ F\_AGE - 2.673\ Ind1 - 3.013\ Ind2 - 1.953\ Ind3 + .000\ Ind4 - 1.533\ Ind5 - 1.019\ Ind6$$

According to Table 4.4, the main effect model (Model 0) revealed that CFO had a positive effect on SGR at a statistically significant level of .01 (B = .029, p <.01). Thus, H1a: Cash flow from operation has a positive effect on corporate sustainable growth, is supported. Additionally, the control variables: firm size (F_size) had statistically significant positive effect on SGR, and firm age (F_Age) demonstrated a significant negative effect on SGR, whereas leverage (LEV) had no statistically significant effect on SGR. All control variables account for 9.90% of the variance in support for SGR, whereas both CFO and all control variables account for 19.20% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are found and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality

(CEODU) and board gender diversity (BG) on the effect of CFO on SGR, to test the four hypotheses.

Model 1 is designed to test H2a1: Board size (BZ) moderates the effect of cash flow from operation on corporate sustainable growth. This model is designed with CFO as the main effect and board size as the moderating effect. The analysis shows that CFO had a statistically significant positive effect on SGR (B = .029, p <.01), while board size had a statistically significant negative impact on SGR (B = -.603, p <.01). Moreover, it is also shown that the interaction effect of CFO and BZ on SGR was statistically insignificant. Hence, BZ cannot moderate the effect of CFO on SGR. Thus, H2a1 is not supported.

Model 2 is designed to test H2a2: Board independence (BIND) moderates the effect of cash flow from operation on corporate sustainable growth. This model is designed with CFO as the main effect and BIND as the moderating effect. The analysis shows that CFO had a statistically significant positive effect on SGR (B = .029, p <.01), while BIND has no significant impact on SGR (B = 2.383, p >.10). Additionally, the study shows that the interaction effect of CFO and BIND on SGR was statistically insignificant. Hence, BIND cannot moderate the effect of CFO on SGR. Thus, H2a2 is not supported.

Model 3 is designed to test H2a3: CEO duality (CEODU) moderates the effect of cash flow from operation on corporate sustainable growth. This model is designed with CFO as the main effect and CEODU as the moderating effect. The analysis shows that CFO had a statistically significant positive effect on SGR (B = .029, p <.01), while CEODU has no significant impact on SGR (B = -.598, p >.10). Additionally, the study shows that the interaction effect of CFO and CEODU on SGR was statistically insignificant. Hence, CEODU cannot moderate the effect of CFO on SGR. Thus, H2a3 is not supported.

Model 4 is designed to test H2a4: Board gender diversity (BG) moderates the effect of cash flow from operation on corporate sustainable growth. This model is designed with CFO as the main effect and BG as the moderating effect. The analysis shows that CFO had a statistically significant positive effect on SGR (B = .029, p <.01), while BG has no significant impact on SGR (B = .623, p >.10). Additionally, the study shows that the interaction effect of CFO and BG on SGR was statistically insignificant. Hence, BG cannot moderate the effect of CFO on SGR. Thus, H2a4 is not supported.

Table 4.5 Results examining the main effect of CFI on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		CFI	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	4.101	.869	4.929	4.464	4.344
	(1.908)*	(-1.422)	(0.271)	(1.719)*	(1.573)	(1.515)
Control Variables						
F_Size	2.010	0.701	1.138	.684	.114	.748
	(2.137)**	(-2.290)**	(3.278)***	(2.225)**	(2.651)***	(2.440)**
LEV	.362	.221	.124	.215	.325	.233
	(.710)	(.436)	(.246)	(.423)	(.642)	(.460)
F_Age	-1.243	-1.132	-1.046	-1.114	-1.129	-1.177
	(-3.297)***	(-3.582)***	(-3.314)***	(-3.478)***	(-3.553)***	(-3.734)***
Ind1	-3.817	-3.277	-3.143	-3.271	-3.257	-3.327
	(-2.053)**	(-1.770)*	(-1.710)*	(-1.764)*	(-1.771)*	(-1.805)*
Ind2	-4.014	-3.850	-4.149	-3.834	-3.750	-3.605
	(-2.582)***	(-2.498)**	(-2.702)***	(-2.475)**	(-2.448)**	(-2.335)**
Ind3	-4.153	-3.579	-3.929	-3.633	-3.556	-3.368
	(-2.744)***	(-2.367)**	(-2.604)***	(-2.382)**	(-2.366)**	(-2.210)**
Ind4	-1.531	-1.190	-1.551	-1.194	-1.088	-1.164
	(-.933)	(-.730)	(-.954)	(-.721)	(-.671)	(-.707)
Ind5	-1.498	-1.792	-1.686	-1.840	-1.651	-1.603
	(-1.077)	(-1.297)	(-1.153)	(-1.329)	(-1.202)	(-1.164)
Ind6	-2.933	-2.407	-3.256	-2.447	-2.340	-2.015
	(-1.566)	(-1.291)	(-1.732)*	(-1.309)	(-1.264)	(-1.082)
Main Effect						
CFI		-.017	-.018	-.017	-.015	-.016
		(-2.863)***	(-2.818)***	(-2.917)***	(-2.576)***	(-2.666)***
BZ			-.0543			
			(-2.595)***			
BIND				-.078		
				(.018)		
CEODU					-.105	
					(.077)	
BG						2.016
						(.690)
Interaction Effect						
CFIxBZ			-.002			
			(-.557)			
CFIxBIND				.045		
				(.817)		
CFIxCEODU					.057	
					(2.651)***	
CFIxBG						.100
						(2.266)**
R	.315	.344	.368	.347	.368	.363
R^2	.099	.119	.135	.120	.135	.132
R^2 change		0.02	.001	.002	.016	.012
F	4.566***	5.008***	4.816***	4.214***	4.820***	4.691***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

H1b: Cash flow from investing has a negative effect on corporate sustainable growth.

SGR = 4.101 – 0.017CFI + 0.701 F_SIZE + 0.221 LEV - 1.132 F_AGE
-3.277 Ind1- 3.850 Ind2 – 3.579 Ind3 -1.190 Ind4 -1.792 Ind5
- 2.407 Ind6

H2b1: Board size moderates the effect of cash flow from investing on corporate sustainable growth.

$\boldsymbol{SGR}$ = .869 - .018 CFI + -.543 BZ - .002CFI*BZ + 1.138 F_SIZE
+ .124 LEV -1.046 F_AGE -3.143 Ind1- 4.149 Ind2
– 3.929 Ind3 -1.551 Ind4 -1.686 Ind5 - 3.256 Ind6

H2b2: Board independence moderates the effect of cash flow from investing on corporate sustainable growth

$\boldsymbol{SGR}$ = 4.929 - .017 CFI - .078 BIND + .045 CFI*BIND
+ .684 F_SIZE +.215 LEV -1.114 F_AGE -3.271 Ind1
- 3.384 Ind2- 3.633 Ind3 -1.194 Ind4 -1.840 Ind5 -2.447 Ind6

H2b3: CEO Duality moderates the effect of cash flow from investing on corporate sustainable growth

$\boldsymbol{SGR}$ = 4.464 - .015 CFI -.105 CEODU + .057 CFI*CEODU
+ .114 F_SIZE + .325 LEV - 1.129 F_AGE - 3.257 Ind1
- 3.750 Ind2 - 3.556 Ind3 -1.088 Ind4 -1.651 Ind5
-2.340 Ind6

H2b4: Board gender diversity moderates the effect of cash flow from investing on corporate sustainable growth**.**

$\boldsymbol{SGR}$ = 4.344 - .016 CFI + 2.0165 BG + .100 CFI*BG
+ .748 F_SIZE + .233 LEV -1.177F_AGE -3.327Ind1
- 3.605 Ind2- 3.368 Ind3 -1.164 Ind4 -1.603 Ind5-2.015Ind6

According to Table 4.5, the main effect model (Model 0) revealed that CFI had a negative effect on SGR at a statistically significant level of .01 (B = -.017, p <.01). Thus, H2a: Cash flow from investing has a positive effect on corporate sustainable growth, is supported. Additionally, the control variables: firm size (F_size) had statistically significant positive effect on SGR, and firm age (F_Age) demonstrated a significant

negative effect on SGR, whereas leverage (LEV) had no statistically significant effect on SGR. All control variables account for 9.90% of the variance in support for SGR, whereas both CFI and all control variables account for 11.90% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are analyzed and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality (CEODU) and board gender diversity (BG) on the effect of CFI on SGR, to test the four hypotheses.

Model 1 is designed to test H2b1: Board size (BZ) moderates the effect of cash flow from investing on corporate sustainable growth. This model is designed with CFI as the main effect and board size as the moderating effect. The analysis shows that both the CFI and BZ had a statistically significant negative effect on SGR with the coefficients of (B = -.018, p <.01), and (B = -.543, p <.01), respectively. Moreover, it is also shown that the interaction effect of CFI and BZ on SGR was statistically insignificant. Hence, BZ cannot moderate the effect of CFI on SGR. Thus, H2b1 is not supported.

Model 2 is designed to test H2b2: Board independence (BIND) moderates the effect of cash flow from investing on corporate sustainable growth. This model is designed with CFI as the main effect and BIND as the moderating effect. The analysis shows that CFI had a statistically significant negative effect on SGR (B = -.017, p <.01), while BIND has no significant impact on SGR (B = -.078, p >.10). Additionally, the study shows that the interaction effect of CFI and BIND on SGR was statistically insignificant. Hence, BIND cannot moderate the effect of CFI on SGR. Thus, H2b2 is not supported.

Model 3 is designed to test H2b3: CEO duality (CEODU) moderates the effect of cash flow from investing on corporate sustainable growth. This model is designed with CFI as the main effect and CEODU as the moderating effect. The analysis shows that CFI had a statistically significant positive effect on SGR (B = -.015, p <.01), while CEODU has no significant impact on SGR (B = -.105, p >.10). Interestingly, the regression coefficient for the product of CFI and CEODU is positive and statistically significant (B = .057, p < 0.01), and accounts for approximately 1.60% of incremental variance in support for SGR (above the main effects of CFI, CEODU, and the interaction effect). The results indicate that CEODU moderates the effect of CFI on SGR, which means that the effect of CFI on SGR depends on CEODU. Thus, H2b3 is supported.

Model 4 is designed to test H2b4: Board gender diversity (BG) moderates the effect of cash flow from investing on corporate sustainable growth. This model is designed with CFI as the main effect and BG as the moderating effect. The analysis shows that CFI had a statistically significant negative effect on SGR (B = -.016, p <.01), while BG has no significant impact on SGR (B = 2.016, p >.10). Interestingly, the regression coefficient for the product of CFI and BG is positive and statistically significant (B = .100, p < 0.05), and accounts for approximately 1.20% of incremental variance in support for SGR (above the main effects of CFI, BG, and the interaction effect). The results indicate that BG moderates the effect of CFI on SGR, which means that the effect of CFI on SGR depends on BG. Thus, H2b4 is supported.

According to the results in Table 4.5, Model 3: the effect of CFI on SGR depends on CEODU and Model 4: the effect of CFI on SGR depends on BG, further analysis proceeds on: how CEODU affects the relationship between the CFI on SGR, and how BG affects the relationship between the CFI on SGR. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of CFI on SGR at different value of moderators: CEODU and BG are shown in Table 4.6 and Table 4.7, and the graphs are plotted as shown in Figure 4.1 and Figure 4.2, respectively.

Table 4.6 Model summary and condition effects of CFI on SGR at values of CEODU as the moderators

Model Summary						
R	R2	MSE	F	df1	df2	p
.368	.135	63.548	4.820	12.000	370.000	.000
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2	p	
X*W	.016	7.028	1	370	.0008	
Focal predict: CFI (X), Mod var: CEODU (W)						
CEODU	Effect	se	t	p	LLCI	ULCI
-.102	-.021	.006	-3.461	.001	-.033	-.009
.898	.036	.021	1.729	.085	-.005	.077

Table 4.6 shows that when CEODU is at -.102 (non-CEO duality), the conditional effect of CFI on SGR is negative and statistically significant at a level of .01 (B = -.021, *p* = .001), while when CEODU is at .898 (CEO duality), the conditional effect of CFI on SGR is positive and statistically significant level of .10 (B = .036, *p* = .085).

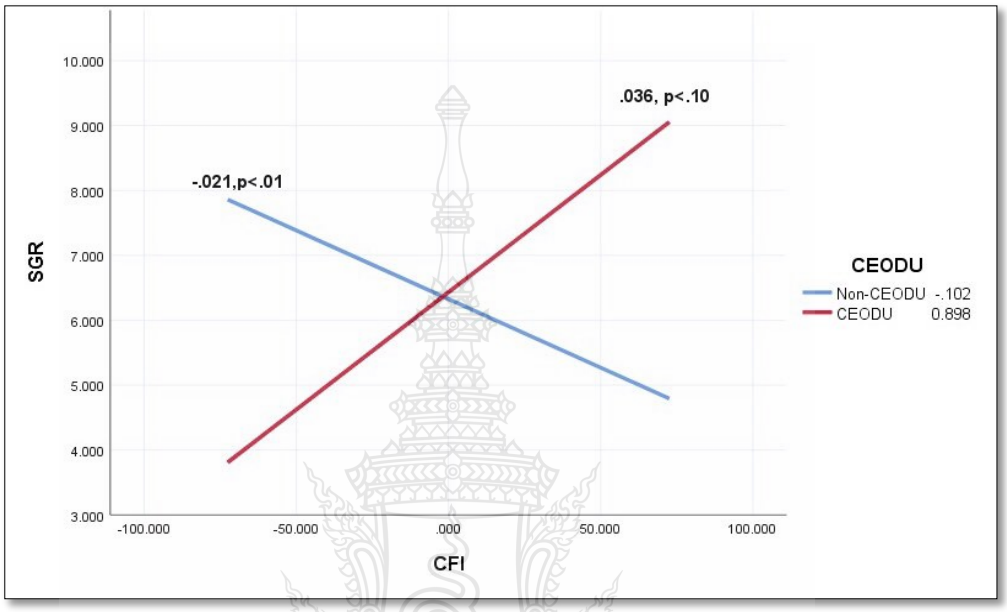

Figure 4.1 A visual representation of the moderating effect of CEODU on the relationship between CFI and SGR when CEODU = -.102 (non-CEO duality); and CEODU = .898 (CEO duality)

Figure 4.1 presents the graph to illustrate the conditional effects of CFI on SGR at the value of moderator, namely CEODU = -.102 (non-CEO duality) and CEODU =.898 (CEO duality). The blue line represents the effect of CFI on SGR when the company has non-CEO duality (CEODU = -.102). This line shows the statistically significant negative effect of CFI on SGR at a level of .01, as seen by the negative slope or the conditional effect of -.021, *p* =.001. A higher CFI would diminish SGR when the company has non-CEO duality. Additionally, the red line represents the effect of CFI on SGR when the company has CEO duality (CEODU =.898). This line shows a statistically significant positive effect of CFI on SGR at a level of .10, as seen by the positive slope or the conditional effect of .036, *p* = .085. A higher CFI would increase SGR when the company has CEO duality or the chairman and CEO of the company are the same person.

Table 4.7 Model summary and condition effects of CFI on SGR at different values of BG as the moderators

Model Summary						
R	R2	MSE	F	df1	df2	p
.363	.132	63.778	4.691	12.000	370.000	.000
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2	p	
X*W	.012	5.133	1.000	370.000	.024	
Focal predict: CFI (X), Mod var: BG (W)						
BG	Effect	se	t	p	LLCI	ULCI
-.145	-.030	.008	-3.638	.000	-.047	-.014
.000	-.016	.006	-2.666	.008	-.028	-.004
.145	-.001	.009	-.150	.881	-.019	.017

Table 4.7 shows the conditional effects of CFI on SGR at different levels of BG: (1) when BG (-.145) is at a low level (one standard deviation lower than the mean), the conditional effect is negative and statistically significant at a level of .01 (B = -.030, *p* = .000); (2) when BG (.000) is at an average level (the mean value), the conditional effect is negative and statistically significant at a level of .01 (B = -.016, *p* = .008); and (3) when BG (.145) is at a high level (one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = -.001, *p* = .881).

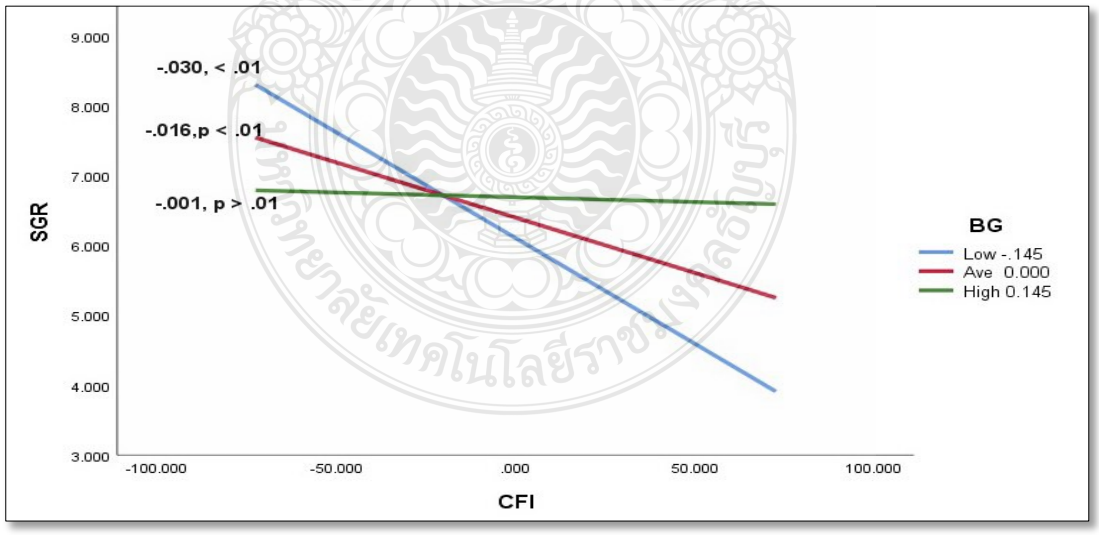

Figure 4.2 A visual representation of the moderating effect of BG on the relationship between CFI and SGR when BG = -.145 (Low); BG = .000 (Ave); and BG = .145 (High)

Figure 4.2 illustrates the conditional effects of CFI on SGR at the value of moderator: BG = -.145 (low), BG = .000 (average) and BG =.145 (high). The blue line represents the effect of CFI on SGR when the company has low BG (BG = -.145). This line shows the statistically significant negative effect of CFI on SGR at a level of .01, as seen by the negative slope or the conditional effect of -.030. The red line represents the effect of CFI on SGR when the company has average BG (BG = .0000). This line shows the statistical significance negative effect of CFI on SGR at a level of .01, as seen by the negative slope or the conditional effect of -.016. Therefore, higher CFI reduces SGR when firm has a low or an average board gender diversity. But the impact of CFI on lower SGR is greater in firm with a low level of BG than in firm with an average BG. Moreover, the green line represents the conditional effect of CFI on SGR when the company has high BG (BG = .145). This line shows a statistically insignificant effect of CFI on SGR. The findings indicate that when the board gender diversity of the company is at a low level or an average level, higher CFI would decrease company sustainable growth rate (SGR).

Table 4.8 Results examining the main effect of CFF on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		CFF	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	5.483	1.549	5.463	5.307	5.103
	(1.908)*	(1.905)*	(.478)	(1.886)*	(1.845)*	(1.744)*
Control Variables						
F_Size	2.010	.659	1.104	.660	.647	.327
	(2.137)**	(-.041)	(3.158)***	(2.128)**	(2.067)**	(2.213)**
LEV	.362	0.365	.252	.364	.436	.691
	(.710)	(.705)	(.488)	(.700)	(.846)	(.627)
F_Age	-1.243	-1.247	-1.159	-1.237	-1.194	-1.230
	(-3.297)***	(-3.760)***	(-3.071)***	(-3.665)***	(-3.563)***	(-3.694)***
Ind1	-3.817	-3.816	-3.794	-3.816	-3.904	-3.921
	(-2.053)**	(-2.050)**	(-2.045)**	(-2.043)**	(-2.104)**	(-2.096)**
Ind2	-4.014	-4.013	-4.327	-4.029	-4.078	-3.851
	(-2.582)***	(-2.578)***	(-2.793)***	(-2.573)**	(-2.628)***	(-2.451)**
Ind3	-4.153	-4.15	-4.489	-4.166	-4.144	-3.981
	(-2.744)***	(-2.736)***	(-2.971)***	(-2.720)***	(-2.741)***	(-2.587)***
Ind4	-1.531	-1.526	-1.915	-1.550	-1.302	-1.450
	(-0.933)	(-0.926)	(-1.167)	(-.920)	(-.790)	(-.877)
Ind5	-1.498	-1.500	-1.299	-1.499	-1.439	-1.443
	(-1.077)	(-1.077)	(-.978)	(-1.073)	(-1.036)	(-1.032)

Table 4.8 Results examining the main effect of CFF on SGR and the moderating effects of board effectiveness on this relationship (Cont.)

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		CFF	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Ind6	-2.933	-2.928	-3.711	-2.937	-2.992	-2.842
	(-1.566)	(-1.559)	(-1.967)**	(-1.558)	(-1.598)	(-1.508)
Main Effect						
CFF		.000	.001	.000	.000	.000
		(-.041)	(.158)	(-.039)	(.076)	(.059)
BZ			-.538			
			(-2.524)**			
BIND				.679		
				(.153)		
CEODU					-.314	
					(-.221)	
BG						2.138
						(.715)
Interaction Effect						
CFFxBZ			.002			
			(.858)			
CFFxBIND				-.003		
				(-.080)		
CFFxCEODU					-.028	
					(-2.168)**	
CFFxBG						-.013
						(-.380)
R	.315	.315	.344	.315	.333	.318
R^2	.099	.099	.118	.099	.111	.101
R^2 change		.000	.002	.000	.016	.000
F	4.566***	4.098***	4.125***	3.399***	3.837***	3.463***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

H1c: Cash flow from financing has a negative effect on corporate sustainable growth.

SGR = 5.483 + .000CFF + .659 F_SIZE + .365 LEV – 1.247 F_AGE

-3.816Ind1- 4.013 Ind2 - 4.150 Ind3 -1.526 Ind4 -1.500 Ind5

- 2.928 Ind6

H2c: Board effectiveness moderates the effect of cash flow from financing on corporate sustainable growth.

H2c1: Board size moderates the effect of cash flow from financing on corporate sustainable growth.

$$\boldsymbol{SGR} = 1.549 + .001\ CFF - .538\ BZ + .002CFF*BZ + 1.104\ F\_SIZE + .252\ LEV - 1.159\ F\_AGE - 3.794\ Ind1 - 4.327\ Ind2 - 4.489\ Ind3 - 1.915\ Ind4 - 1.299\ Ind5 - 3.711\ Ind6$$

H2c2: Board independence moderates the effect of cash flow financing on corporate sustainable growth.

$$\boldsymbol{SGR} = 5.463 + .000\ CFF + .679\ BIND - .003CFF*BIND + .660\ F\_SIZE + .364\ LEV - 1.237\ F\_AGE - 3816\ Ind1 - 4.029\ Ind2 - 4.166\ Ind3 - 1.550\ Ind4 - 1.499\ Ind5 - 2.937\ Ind6$$

H2c3: CEO Duality moderates the effect of cash flow financing on corporate sustainable growth.

$$\boldsymbol{SGR} = 5.307 + .000\ CFF - .314\ CEODU - .028\ CFF*CEODU + .647\ F\_SIZE + .436\ LEV - 1.194\ F\_AGE - 3.904\ Ind1 - 4.078\ Ind2 - 4.144\ Ind3 - 1.302\ Ind4 - 1.438Ind5 - 2.992\ Ind6$$

H2c4: Board gender diversity moderates the effect of cash flow from financing on corporate sustainable growth.

$$\boldsymbol{SGR} = 5.103 + .000CFF + 2.138\ BG - .013CFF*BG + .327\ F\_SIZE + .691\ LEV - 1.230\ F\_AGE - 3.921\ Ind1 - 3.581\ Ind2 - 3.981\ Ind3 - 1.450\ Ind4 - 1.443\ Ind5 - 2.842\ Ind6$$

According to Table 4.8, the main effect model (Model 0) revealed that CFF had no statistically significant effect on SGR. Thus, H1c: Cash flow from financing had no effect on corporate sustainable growth, is not supported. Additionally, the control variables: firm size (F_size) had no statistically significant effect on SGR, and leverage (LEV) demonstrated no significant effect on SGR, whereas firm age (F_Age) had a statistically significant negative effect on SGR. All control variables account for 9.90% of the variance in support for SGR, whereas both CFF and all control variables account for 9.90% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are found and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality

(CEODU) and board gender diversity (BG) on the effect of CFF on SGR, to test the four hypotheses.

Model 1 is designed to test H2c1: Board size (BZ) moderates the effect of cash flow from financing on corporate sustainable growth. This model is designed with CFF as the main effect and board size as the moderating effect. The analysis shows that CFF had no statistically significant positive on SGR (B = .001, p >.10), while board size had a statistically significant negative impact on SGR (B = -.583, p <.05). Moreover, it is also shown that the interaction effect of CFF and BZ on SGR was statistically insignificant. Hence, BZ cannot moderate the effect of CFF on SGR. Thus, H2c1 is not supported.

Model 2 is designed to test H2c2: Board independence (BIND) moderates the effect of cash flow from financing on corporate sustainable growth. This model is designed with CFF as the main effect and BIND as the moderating effect. The analysis shows that CFF had no statistically significant effect on SGR (B = .000, p >.10), while BIND has no significant impact on SGR (B = .679, p >.10). Additionally, the study shows that the interaction effect of CFF and BIND on SGR was statistically insignificant. Hence, BIND cannot moderate the effect of CFF on SGR. Thus, H2c2 is not supported.

Model 3 is designed to test H2c3: CEO duality (CEODU) moderates the effect of cash flow from financing on corporate sustainable growth. This model is designed with CFF as the main effect and CEODU as the moderating effect. The analysis shows that CFF had no statistically significant effect on SGR (B = .000, p >.10), while CEODU has no significant impact on SGR (B = -.314, p >.10). Interestingly, the regression coefficient for the product of CFF and CEODU is negative and statistically significant (B = -.028, p < .05), and accounts for approximately 11.10% of incremental variance in support for SGR (above the main effects of CFF, CEODU, and the interaction effect). The results indicate that CEODU moderates the effect of CFF on SGR, which means that the effect of CFF on SGR depends on CEODU. Thus, H2c3 is supported.

Model 4 is designed to test H2c4: Board gender diversity (BG) moderates the effect of cash flow from financing on corporate sustainable growth. This model is designed with CFF as the main effect and BG as the moderating effect. The analysis shows that CFF had no statistically significant effect on SGR (B = .000, p >.10), while BG has no significant impact on SGR (B = 2.138, p >.10). Additionally, the study shows that the

interaction effect of CFF and BG on SGR was statistically insignificant. Hence, BG cannot moderate the effect of CFF on SGR. Thus, H2c4 is not supported.

According to the results in Table 4.8, Model 3: the effect of CFF on SGR depends on CEODU, further analysis proceeds on: how CEODU affects the relationship between the CFF on SGR. This study employed the PROCESS macro for SPSS by Hayes (2022) and the results of model summary and conditional effects of CFF on SGR at different value of moderators: CEODU shown in Table 4.9, and the graphs are plotted as shown in Figure 4.3, respectively.

Table 4.9 Model summary and condition effects of CFF on SGR at different values of CEODU as the moderators

Model Summary						
R	R2	MSE	F	df1	df2	p
.333	.111	65.350	3.837	12.000	370.000	.000
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2	p	
X*W	.011	4.700	1.000	370.000	.031	
Focal predict: CFF (X), Mod var: CEODU (W)						
CEODU	Effect	se	t	p	LLCI	ULCI
-.102	.003	.005	.683	.495	-.006	.012
.898	-.025	.012	-2.034	.043	-.049	-.001

Table 4.6 shows that when CEODU is at -.102 (non-CEO duality), the conditional effect of CFF on SGR no statistically significant at a level of .05 (B = .003, p = .495), while when CEODU is at .898 (CEO duality), the conditional effect of CFF on SGR is negative and statistically significant level of .05 (B = -.025, p = .043).

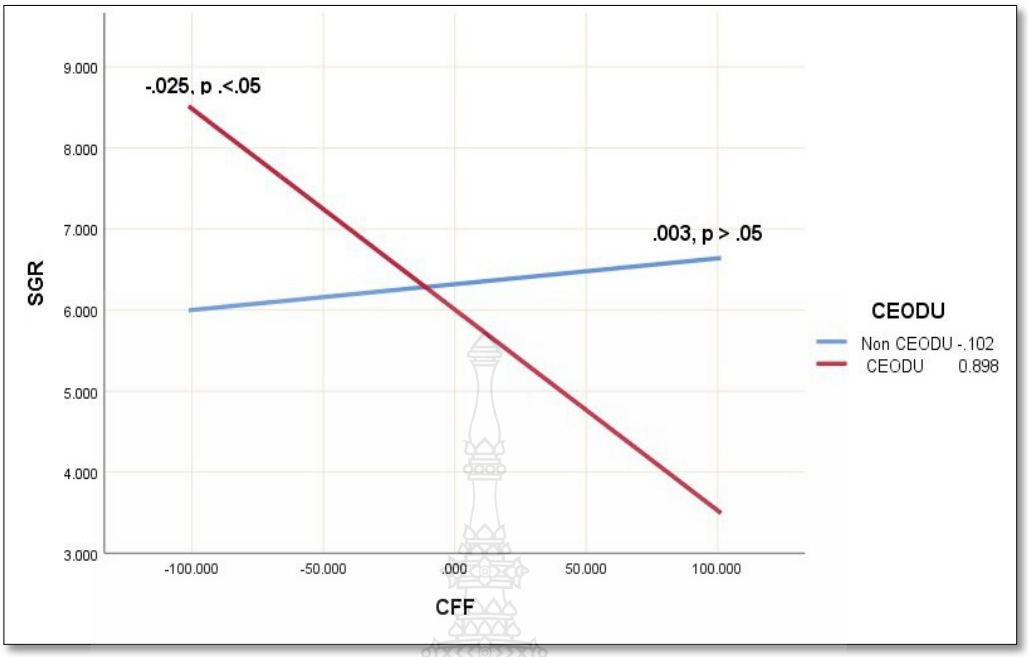

Figure 4.3 A visual representation of the moderating effect of CEODU on the relationship between CFF and SGR when CEODU = -.102 (non-CEO duality); and CEODU = .898 (CEO duality)

Figure 4.3 presents the graph to illustrate the conditional effects of CFF on SGR at the value of moderator, namely CEODU = -.102 (non-CEO duality) and CEODU =.898 (CEO duality). The blue line represents the effect of CFF on SGR when the company has non-CEO duality (CEODU = -.102). This line shows the statistically significant no effect of CFF on SGR at a level of .05, as seen by the slope or the conditional effect of .003, $p >$ .05. Additionally, the red line represents the effect of CFF on SGR when the company has CEO duality (CEODU =.898). This line shows a statistically significant negative effect of CFF on SGR at a level of .05, as seen by the negative slope or the conditional effect of -.025, p = .043. A higher CFF would decrease SGR when the company has CEO duality or the chairman and CEO of the company are the same person.

Table 4.10 Results examining the main effect of NCF on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		NCF	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	3.924	-.073	3.774	4.327	3.990
	(1.908)*	(1.407)	(-.023)	(1.335)	(1.550)	(1.414)
Control Variables						
F_Size	2.010	.644	1.129	.678	.647	.671
	(2.137)**	(2.158)**	(3.354)***	(2.274)**	(2.163)**	(2.226)**
LEV	.362	.407	.290	.436	.413	.376
	(.710)	(.825)	(.593)	(.885)	(.835)	(.759)
F_Age	-1.243	-0.915	-.789	-.827	-.933	-.906
	(-3.297)***	(-2.931)***	(-2.519)**	(-2.660)***	(2.940)***	(-2.893)***
Ind1	-3.817	-3.612	-3.483	-3.575	-3.608	-3.576
	(-2.053)**	(-2.010)**	(-1.955)**	(-1.992)**	(-2.002)**	(-1.973)**
Ind2	-4.014	-3.406	-3.838	-3.379	-3.422	-3.309
	(-2.582)***	(-2.260)**	(-2.508)**	(-2.239)**	(-2.264)**	(-2.178)**
Ind3	-4.153	-3.419	-3.838	-3.471	-3.431	-3.296
	(-2.744)***	(-2.327)**	(-2.626)***	(-2.355)**	(-2.321)**	(-2.211)**
Ind4	-1.531	-1.369	-1.924	-1.443	-1.389	-1.296
	(-0.933)	(-0.863)	(-1.213)	(-.898)	(-.873)	(-.814)
Ind5	-1.498	-.694	-.495	-.697	-.698	-.638
	(-1.077)	(-.513)	(-.399)	(-.509)	(-.514)	(-.469)
Ind6	-2.933	-2.698	-3.646	-2.684	-2.684	-2.590
	(-1.566)	(-1.490)	(-2.004)**	(-1.484)	(-1.476)	(-1.423)
Main Effect						
NCF		.031	.033	.030	.031	.030
		(5.231)***	(5.321)***	(5.140)***	(5.146)***	(5.167)***
BZ			-.576			
			(-2.828)***			
BIND				2.059		
				(.483)		
CEODU					.504	
					(.365)	
BG						1.733
						(.603)
Interaction Effect						
NCFxBZ			.003			
			(.849)			
NCFxBIND				-.111		
				(-1.737)*		
NCFxCEODU					.001	
					(.022)	
NCFxBG						.018
						(.445)
R	.315	.337	.426	.410	.402	.403
R^2	.099	.113	.182	.168	.161	.162
R^2 change		.014	.002	.007	.000	.000
F	4.566***	4.756***	6.846***	6.243***	5.928***	5.968***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

H1d: Net cash flows has a positive effect on corporate sustainable growth.

SGR = 3.924+ .031 NCF + .644 F_SIZE + .407 LEV – .915 F_AGE
-3.612Ind1- 3.406 Ind2 – 3.419 Ind3 -1.369 Ind4 -.694 Ind5
- 2.698 Ind6

H2d1: Board size moderates the effect of net cash flow on corporate sustainable growth.

SGR = -.073 + .033NCF -.576 BZ + .003NCF*BZ + 1.129 F_SIZE
+ .290 LEV - .789 F_AGE – 3.483 Ind1- 3.838 Ind2
– -3.838 Ind3-1.924 Ind4 -.495 Ind5 – 3.646 Ind6

H2d2: Board independence moderates the effect of net cash flow on corporate sustainable growth.

SGR = 3.774 + .030 NCF + 2.059 BIND - .111 NCF*BIND
+ .678 F_SIZE + .436 LEV -.827 F_AGE - 3.575 Ind1
- 3.379 Ind2 -3.471 Ind3-1.443 Ind4 - .697 Ind5 – 2.684 Ind6

H2d3: CEO Duality moderates the effect of net cash flow on corporate sustainable growth.

SGR = 4.327 + .031 NCF + .504 CEODU - .001 NCF*CEODU
+ .647 F_SIZE + .413 LEV - .933 F_AGE - 3.608 Ind1
- 3.422 Ind2 -3.431 Ind3-1.389 Ind4 - .698 Ind5 – 2.684 Ind6

H2d4: Board gender diversity moderates the effect of net cash flow on corporate sustainable growth.

SGR = 3.990 + .030 NCF + 1.733 BG + .018 NCF*BG
+ .671 F_SIZE + .376 LEV -.906 F_AGE - 3.576 Ind1
- 3.309 Ind2 -3.296 Ind3-1.296 Ind4 - .638 Ind5 – 2.590 Ind6

According to Table 4.10, the main effect model (Model 0) revealed that NCF had a positive effect on SGR at a statistically significant level of .01 (B = .031, p <.01). Thus, H2d: Net cash flow has a positive effect on corporate sustainable growth, is supported. Additionally, the control variables: firm size (F_size) had statistically significant positive effect on SGR, and firm age (F_Age) demonstrated a significant negative effect on SGR,

whereas leverage (LEV) had no statistically significant effect on SGR. All control variables account for 9.90% of the variance in support for SGR, whereas both NCF and all control variables account for 11.30% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are analyzed and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality (CEODU) and board gender diversity (BG) on the effect of NCF on SGR, to test the four hypotheses.

Model 1 is designed to test H2d1: Board size (BZ) moderates the effect of net cash flow on corporate sustainable growth. This model is designed with NCF as the main effect and board size as the moderating effect. The analysis shows that NCF had a statistically significant positive effect on SGR with the coefficients of (B = 0.33, p <.01), and BZ had a statistically significant negative effect on SGR with the coefficients of (B = -.576, p <.01). Moreover, it is also shown that the interaction effect of NCF and BZ on SGR was statistically insignificant. Hence, BZ cannot moderate the effect of NCF on SGR. Thus, H2d1 is not supported.

Model 2 is designed to test H2d2: Board independence (BIND) moderates the effect of net cash flow on corporate sustainable growth. This model is designed with NCF as the main effect and BIND as the moderating effect. The analysis shows that NCF had a statistically significant positive effect on SGR (B = .030, p <.01), while BIND has no significant impact on SGR (B = 2.059, p >.10). Additionally, the study shows that the interaction effect of NCF and BIND on SGR was statistically significant negative effect on SGR (B = -.111, p <.10). Hence, BIND can the moderate effect of NCF on SGR. Thus, H2d2 is supported.

Model 3 is designed to test H2d3: CEO duality (CEODU) moderates the effect of net cash flow on corporate sustainable growth. This model is designed with NCF as the main effect and CEODU as the moderating effect. The analysis shows that NCF had a statistically significant positive effect on SGR (B = .031, p <.01), while CEODU has no significant impact on SGR (B = .504, p >.10). Additionally, the study shows that the interaction effect of NCF and CEODU on SGR was statistically insignificant (B = .001, p >.10). Hence, CEODU cannot moderate the effect of NCF on SGR. Thus, H2d3 is not supported.

Model 4 is designed to test H2d4: Board gender diversity (BG) moderates the effect of net cash flow on corporate sustainable growth. This model is designed with NCF as the main effect and BG as the moderating effect. The analysis shows that NCF had a statistically significant positive effect on SGR (B = .030, p <.01), while BG has no significant impact on SGR (B = 1.733, p >.10). Additionally, the study shows that the interaction effect of NCF and BG on SGR was statistically insignificant (B = .018, p >.10). Hence, BG cannot moderate the effect of NCF on SGR. Thus, H2d4 is not supported.

According to the results in Table 4.10, Model 2: the effect of NCF on SGR depends on BIND, further analysis proceeds on: how BIND affects the relationship between the NCF on SGR, and how BIND affects the relationship between the NCF on SGR. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of NCF on SGR at different value of moderators: BIND shown in Table 4.11, and the graphs are plotted as shown in Figure 4.4.

Table 4.11 Model summary and condition effects of NCF on SGR at different values of BIND as the moderators

Model Summary						
R	R2	MSE	F	df1	df2	p
.403	.168	61.110	6.243	12.000	370.000	.000
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2	p	
X*W	.007	3.017	1.000	370.000	.083	
Focal predict: NCF (X), Mod var: BIND (W)						
BIND	Effect	se	t	p	LLCI	ULCI
-.098	.041	.008	4.946	.000	.025	.057
.000	.030	.006	5.140	.000	.019	.042
.098	.019	.009	2.177	.030	.002	.037

Table 4.11 shows that when BIND was at -.098 (mean - 1SD), the conditional effect (B = .041, p = .000) of NCF on SGR was positive at a statistically significant level of .01, along with when BIND was at .000 (mean), the conditional effect (B = .030, p = .001) of NCF on SGR was positive at a statistically significant level of .01. and when BIND was at .098 the conditional effect (B = .019, p = .030) of NCF on SGR was positive at a statistically significant level of .05.

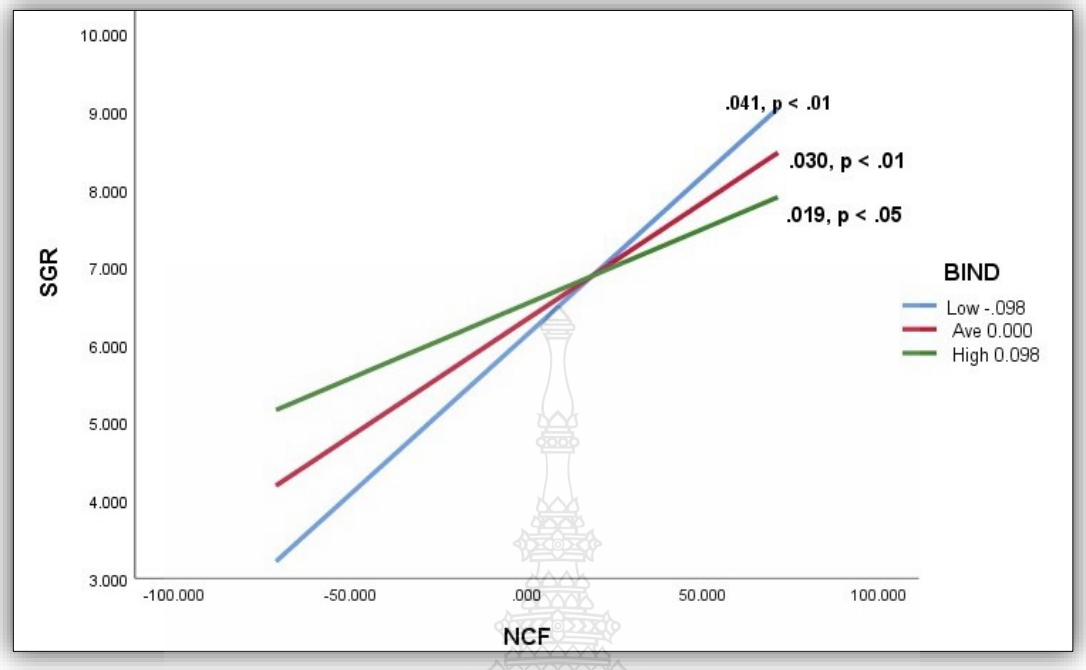

Figure 4.4 A visual representation of the moderating effect of BG on the relationship between NCF and SGR when BIND = -.098 (Low); BG = .000 (Ave); and BG = .098 (High)

Figure 4.4 illustrates the conditional effects of NCF on SGR at the value of moderator: BIND= -.098 (low), BG = .000 (average) and BIND =.098 (high). The blue line represents the effect of NCF on SGR when the company has low BIND (BIND = .041). This line shows the statistically significant positive effect of NCF on SGR at a level of .01, as seen by the positive slope or the conditional effect of .041, p <.001. The red line represents the effect of NCF on SGR when the company has average BIND (BIND = .000). This line shows the statistical significance positive effect of NCF on SGR at a level of .01, as seen by the positive slope or the conditional effect of .030. Moreover, the green line represents the conditional effect of NCF on SGR when the company has high BG (BG = .145). This line shows the statistically significant positive effect of NCF on SGR at a level of .05, as seen by the positive slope or the conditional effect of .019. Therefore, higher NCF increase SGR when firm has a low, an average, or high level of board independent. The findings indicate that when the board gender independent of the company is at a low level, an average level, or higher CFI would increase company sustainable growth rate (SGR).

Table 4.12 Results examining the main effect of FCF on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		FCF	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	9.078	5.981	9.410	8.884	7.963
	(1.908)*	(2.826)***	(1.652)*	(2.801)***	(2.682)***	(2.407)**
Control Variables						
F_Size	2.010	.229	.650	.230	.296	.372
	(2.137)**	(.647)	(1.685)*	(.647)	(.827)	(1.046)
LEV	.362	.377	.268	.374	.317	.422
	(.710)	(.744)	(.509)	(.736)	(.621)	(.832)
F_Age	-1.243	-1.271	-1.199	-1.260	-1.293	-1.306
	(-3.297)***	(-4.041)***	(-3.831)***	(-3.952)***	(-4.054)***	(-4.171)***
Ind1	-3.817	-4.018	-3.812	-4.015	-4.019	-4.211
	(-2.053)**	(-2.172)**	(-2.082)**	(-2.165)**	(-2.173)**	(-2.289)**
Ind2	-4.014	-4.151	-4.366	-4.190	-4.190	-4.057
	(-2.582)***	(-2.686)***	(-2.840)***	(-2.691)***	(-2.708)***	(-2.625)***
Ind3	-4.153	-3.738	-4.045	-3.771	-3.713	-3.658
	(-2.744)***	(-2.470)**	(-2.692)***	(-2.473)**	(-2.451)**	(-2.399)**
Ind4	-1.531	-1.320	-1.694	-1.394	-1.471	-1.586
	(-0.933)	(-0.808)	(-1.012)	(-.839)	(-.898)	(-.972)
Ind5	-1.498	-1.657	-1.562	-1.656	-1.590	-1.674
	(-3.297)***	(-4.041)***	(-3.831)***	(-3.952)***	(-4.054)***	(-4.171)***
Ind6	-2.933	-2.995	-3.973	-3.006	-2.993	-2.748
	(-1.566)	(-1.610)	(-2.108)**	(-1.609)	(-1.608)	(-1.483)
Main Effect						
FCF		.135	.238	.138	.092	-.027
		(2.434)**	(2.640)***	(2.327)**	(1.411)**	(-.314)
BZ			-.593			
			(-2.833)**			
BIND				1.100		
				(.250)		
CEODU					.046	
					(.032)	
BG						.007
						(.002)
Interaction Effect						
FCFxBZ			-.028			
			(-1.337)			
FCFxBIND				.059		
				(.087)		
FCFxCEODU					-.461	
					(1.259)	
FCFxBG						-1.818
						(-2.465)**
R	.315	.337	.370	.337	.343	.360
R^2	.099	.113	.137	.114	.117	.129
R^2 change		.014	.004	.000	.004	.014
F	4.566***	4.756***	4.880***	3.948***	4.101***	4.586***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

H1e: Free cash flow has a positive effect on corporate sustainable growth.

SGR = 9.078 + .135 FCF + .229 F_SIZE + .377 LEV – 1.271 F_AGE
-4.018 Ind1- 4.151 Ind2 – 3.738 Ind3 -1.320 Ind4 -1.657 Ind5
- 2.995 Ind6

H2e: Board effectiveness moderates the effect of free cash flow on corporate sustainable growth**.**

H2e1: Board size moderates the effect of free cash flow on corporate sustainable growth.

$\boldsymbol{SGR}$ = 5.981+ .238 FCF -.593 BZ - .028FCF*BZ + .650 F_SIZE
+ .268 LEV – 1.199 F_AGE – -3.812 Ind1- 4.366 Ind2
– 4.045 Ind3 -1.694 Ind4 - 1.562 Ind5 – 3.973 Ind6

H2e2: Board independence moderates the effect of free cash flow on corporate sustainable growth.

$\boldsymbol{SGR}$ = 9.410 + .138 FCF + 1.100 BIND + .059 FCF*BIND
+ .230 F_SIZE + .374 LEV – 1.260 F_AGE – 4.015 Ind1
- 4.190 Ind2 - 3.771 Ind3-1.394 Ind4 -1.656 Ind5-3.006 Ind6

H2e3: CEO Duality moderates the effect of free cash flow on corporate sustainable growth.

$\boldsymbol{SGR}$ = 8.884 + .092 FCF + .046 CEODU - .461 FCF*CEODU
+ .296 F_SIZE + .317 LEV – 1.293 F_AGE – 4.019 Ind1
- 4.190 Ind2 - 3.713Ind3 - 1.471 Ind4 - 1.590 Ind5 - 2.993 Ind6

H2e4: Board gender diversity moderates the effect of free cash flow on corporate sustainable growth.

$\boldsymbol{SGR}$ = 7.963 - .027 FCF -.007 BG – 1.818 FCF*BG + .372 F_SIZE
+ .422 LEV – 1.306 F_AGE – 4.211 Ind1- 4.057 Ind2
– 3.658 Ind3- 1.586 Ind4 – 1.674 Ind5 – 2.748 Ind6

According to Table 4.12, the main effect model (Model 0) revealed that FCF had a positive effect on SGR at a statistically significant level of .05 (B = .135, p <.05). Thus, H1e: free cash flow has a positive effect on corporate sustainable growth, is supported. Additionally, the control variables: firm size (F_Size) and leverage (LEV) had no

statistically significant effect on SGR. whereas firm age (F_Age) had a statistically significant negative effect on SGR. All control variables account for 9.90% of the variance in support for SGR, whereas both FCF and all control variables account for 11.30% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are analyzed and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality (CEODU) and board gender diversity (BG) on the effect of FCF on SGR, to test the four hypotheses.

Model 1 is designed to test H2e1: Board size (BZ) moderates the effect of free cash flow on corporate sustainable growth. This model is designed with FCF as the main effect and board size as the moderating effect. The analysis shows that the FCF had a statistically significant positive effect on SGR with the coefficients of (B = .238, p <.01), while, BZ had a statistically significant negative effect on SGR with the coefficients of (B = -.593, p <.05). Moreover, it is also shown that the interaction effect of FCF and BZ on SGR was statistically insignificant. Hence, BZ cannot moderate the effect of FCF on SGR. Thus, H2e1 is not supported.

Model 2 is designed to test H2e2: Board independent (BIND) moderates the effect of free cash flow on corporate sustainable growth. This model is designed with FCF as the main effect and board independent as the moderating effect. The analysis shows that the FCF had a statistically significant positive effect on SGR with the coefficients of (B = .138, p <.05), while, BIND had no statistically significant effect on SGR with the coefficients of (B = 1.100, p >.10). Moreover, it is also shown that the interaction effect of FCF and BIND on SGR was statistically insignificant. Hence, BIND cannot moderate the effect of FCF on SGR. Thus, H2e2 is not supported.

Model 3 is designed to test H2e3: CEO duality (CEODU) moderates the effect of free cash flow on corporate sustainable growth. This model is designed with FCF as the main effect and CEODU as the moderating effect. The analysis shows that FCF had a statistically significant positive effect on SGR (B = .092, p <.05), while CEODU has no significant impact on SGR (B = .046 p >.10). Additionally, the study shows that the interaction effect of FCF and CEODU on SGR was statistically insignificant. Hence, CEODU cannot moderate the effect of FCF on SGR. Thus, H2e3 is not supported.

Model 4 is designed to test H2e4: Board gender diversity (BG) moderates the effect of free cash flow on corporate sustainable growth. This model is designed with FCF as the main effect and BG as the moderating effect. The analysis shows that FCF had no statistically significant effect on SGR (B = -.027, p >.01), while BG has no significant impact on SGR (B = .007, p >.10). Interestingly, the regression coefficient for the product of FCF and BG is negative and statistically significant (B = -1.818, p < 0.05), and accounts for approximately 12.90% of incremental variance in support for SGR (above the main effects of FCF, BG, and the interaction effect). The results indicate that BG moderates the effect of FCF on SGR, which means that the effect of FCF on SGR depends on BG. Thus, H2e4 is supported.

According to the results in Table 4.12, Model 4: the effect of CFI on SGR depends on BG, further analysis proceeds on: how BG affects the relationship between the FCF on SGR. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of FCF on SGR at different value of moderators: BG are shown in Table 4.13 the graphs are plotted as shown in Figure 4.5 is following:

Table 4.13 Model summary and condition effects of FCF on SGR at different values of BG as the moderators

Model Summary						
R	R2	MSE	F	df1	df2	p
.360	.129	63.969	4.586	12.000	370.000	.000
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2	p	
X*W	.014	6.076	1.000	370.000	.014	
Focal predict: FCF (X), Mod var: BG (W)						
BG	Effect	se	t	p	LLCI	ULCI
-.145	.237	.068	3.463	.001	.102	.372
.000	-.027	.087	-.314	.754	-.198	.143
.145	-.292	.183	-1.596	.111	-.651	.068

Table 4.13 shows the conditional effects of FCF on SGR at different levels of BG: (1) when BG (-.145) is at a low level (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .01 (B = .237, p = .001); (2) when BG (.000) is at an average level (the mean value), the conditional effect demonstrates no statistically insignificant at a level of .05 (B = -.027, p = .754); and (3)

when BG (.145) is at a high level (one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = -.292, *p* = .111).

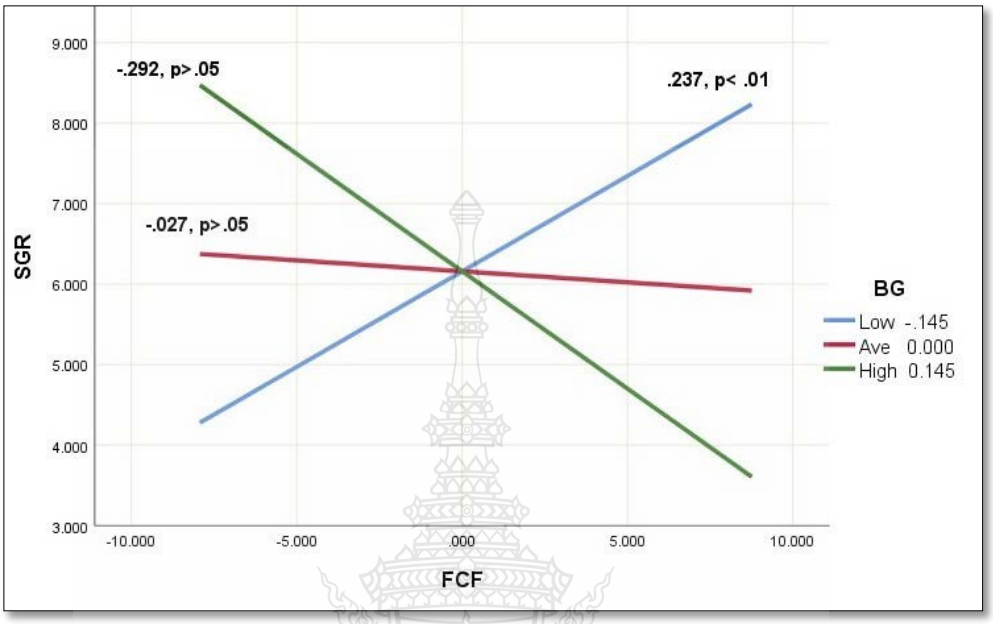

Figure 4.5 A visual representation of the moderating effect of BG on the relationship between FCF and SGR when BG = -.145 (Low); BG = .000 (Ave); and BG = .145 (High)

Figure 4.5 illustrates the conditional effects of FCF on SGR at the value of moderator: BG = -.145 (low), BG = .000 (average) and BG =.145 (high). The blue line represents the effect of FCF on SGR when the company has low BG (BG = -.145). This line shows the statistically significant positive effect of FCF on SGR at a level of .01, as seen by the positive slope or the conditional effect of .237. while, the red line represents the effect of FCF on SGR when the company has average BG (BG = .000). This line shows the statistical insignificance effect of FCF on SGR at a level of .05, as seen by the slope or the conditional effect of -.027. Moreover, the green line represents the conditional effect of FCF on SGR when the company has high BG (BG = .145). This line shows a statistically insignificant effect of FCF on SGR. Therefor, Therefore, higher FCF increase SGR when firm has a low board gender diversity.

Table 4.14 Results examining the main effect of FAT on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		FAT	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	5.117	1.460	5.244	5.495	5.106
	(1.908)*	(1.780)*	(.453)	(1.823)*	(1.910)**	(1.762)*
Control Variables						
F_Size	2.010	.676	1.120	.692	.673	.705
	(2.137)**	(1.510)	(3.202)***	(1.057)**	(2.171)**	(2.267)**
LEV	.362	.321	.222	.361	.337	.291
	(.710)	(.631)	(.438)	(.705)	(.656)	(.568)
F_Age	-1.243	-1.228	-1.142	-1.202	-1.238	-1.216
	(-3.297)***	(-3.883)***	(-3.620)***	(-3.752)***	(-3.854)***	(-3.839)***
Ind1	-3.817	-3.928	-3.775	-3.915	-3.930	-3.930
	(-2.053)**	(-2.115)**	(-2.045)**	(-2.105)**	(-2.110)**	(-2.108)***
Ind2	-4.014	-4.017	-4.301	-3.984	-4.016	-3.852
	(-2.582)***	(-2.589)***	(-2.781)***	(-2.555)**	(-2.585)***	(-2.461)**
Ind3	-4.153	-4.411	-4.750	-4.572	-4.439	-4.224
	(-2.744)***	(-2.901)***	(-3.135)***	(-2.977)***	(-2.907)***	(-2.741)***
Ind4	-1.531	-1.557	-1.972	-1.619	-1.562	-1.520
	(-0.933)	(-0.950)	(-1.207)	(-.973)	(-.950)	(-.924)
Ind5	-1.498	-1.553	-1.387	-1.617	-1.561	-1.520
	(-1.077)	(-1.118)	(-1.004)	(-1.162)	(-1.114)	(-1.096)
Ind6	-2.933	-3.618	-4.366	-3.507	-3.557	-3.470
	(-1.566)	(-1.881)*	(-2.260)**	(-1.806)*	(-1.834)*	(-1.796)*
Main Effect						
FAT		.057	.053	.066	.056	.056
		-1.51	(1.411)	(1.716)*	(1.396)	(1.498)
BZ			-.557			
			(-2.643)***			
BIND				.724		
				(.164)		
CEODU					.229	
					(.164)	
BG						2.367
						(.799)
Interaction Effect						
FATxBZ			-.009			
			(-.551)			
FATxBIND				.442		
				(1.057)		
FATxCEODU					.025	
					(.263)	
FATxBG						-.171
						(-.614)
R	.315	.324	.349	.328	.324	.327
R^2	.099	.105	.122	.107	.105	.107
R^2 change		.006	.001	.002	.000	.001
F	4.566***	4.351***	4.283***	3.713***	3.616***	3.699***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

Hypotheses 3: Efficiency ratios have positive effects on corporate sustainable growth.

H3a: Fixed asset turnover has a positive effect on corporate sustainable growth.

SGR = 5.117 + .057 FAT + .676 F_SIZE + .321 LEV – 1.228 F_AGE
-3.928 Ind1- 4.017 Ind3 -4.017 Ind4 – 4.411 Ind3 -1.557 Ind4
- 1.553 Ind6 - 3.618 Ind6

H4a: Board effectiveness moderates the effect of fixed asset turnover on corporate sustainable growth.

H4a1: Board size moderates the effect of fixed asset turnover on corporate sustainable growth.

$\boldsymbol{SGR}$ = 1.460 + .053 FAT -.557 BZ - .009 FAT*BZ + 1.120 F_SIZE
+ .222 LEV – 1.142 F_AGE – 3.775 Ind1- 4.301 Ind2
– 4.750 Ind3- 1.972 Ind4 – 1.387 Ind5 – 4.366 Ind6

H4a2: Board independent moderates the effect of fixed asset turnover on corporate sustainable growth.

$\boldsymbol{SGR}$ = 5.244 + .066 FAT +.724 BIND +.442 FAT*BIND
+ .692 F_SIZE + .361 LEV – 1.202 F_AGE – 3.915 Ind1
- 3.984 Ind2 – 4.572 Ind3 - 1.619 Ind4 – 1.617 Ind5
- 3.507 Ind6

H4a3: CEO Duality moderates the effect of fixed asset turnover on corporate sustainable growth.

$\boldsymbol{SGR}$ = 5.495 + .056 FAT + .229 CEODU + .025 FAT*CEODU
+ .673 F_SIZE + .337 LEV – 1.238 F_AGE – 3.930 Ind1
- 4.016 Ind2 – 4.439 Ind3- 1.562 Ind4 – 1.561 Ind5
- 3.557 Ind6

H4a4: Board gender diversity moderates the effect of fixed asset turnover on corporate sustainable growth.

$\boldsymbol{SGR}$ = 5.106 + .056 FAT + 2.367 BG - .171 FAT*BG + .705 F_SIZE
+ .291 LEV – 1.216 F_AGE – 3.930 Ind1- 3.852 Ind2
– 4.224 Ind3- 1.520 Ind4 – 1.520 Ind5 – 3.470 Ind6

According to Table 4.14, the main effect model (Model 0) revealed that FAT had no effect on SGR at a statistically significant level of .10 (B = .057, *p* >.10). Thus, H3a: Fixed asset turnover has no effect on corporate sustainable growth, is not supported. Additionally, the control variables: firm size (F_size) has a statistically significant positive effect on SGR (B 2.010 =, *p* <.05. and (F_Age) has a statistically significant negative effect on SGR (B = -1.243, *p* <.01. while, leverage (LEV) had no statistically significant effect on SGR (B = .362, p >.10). All control variables account for 9.90% of the variance in support for SGR, whereas both FAT and all control variables account for 10.50% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are found and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality (CEODU) and board gender diversity (BG) on the effect of FAT on SGR, to test the four hypotheses.

Model 1 is designed to test H3a1: Board size (BZ) moderates the effect of fixed asset turnover on corporate sustainable growth. This model is designed with FAT as the main effect and board size as the moderating effect. The analysis shows that FAT had no statistically significant effect on SGR (B = .053, *p* >.10), while board size had a statistically significant negative impact on SGR (B = -.557, *p* <.01). Moreover, it is also shown that the interaction effect of FAT and BZ on SGR was statistically insignificant. Hence, BZ cannot moderate the effect of FAT on SGR. Thus, H3a1 is not supported.

Model 2 is designed to test H3a2: Board independence (BIND) moderates the effect of fixed asset turnover on corporate sustainable growth. This model is designed with FAT as the main effect and BIND as the moderating effect. The analysis shows that FAT had a statistically significant positive effect on SGR (B = .066, *p* <.10), while BIND has no significant impact on SGR (B = .724, *p* >.10). Additionally, the study shows that the interaction effect of FAT and BIND on SGR was statistically insignificant. Hence, BIND cannot moderate the effect of FAT on SGR. Thus, H3a2 is not supported.

Model 3 is designed to test H3a3: CEO duality (CEODU) moderates the effect of fixed asset turnover on corporate sustainable growth. This model is designed with FAT as the main effect and CEODU as the moderating effect. The analysis shows that FAT had a no statistically significant effect on SGR (B = .056, *p* >.10), while CEODU has no

significant impact on SGR (B = .299, p >.10). Additionally, the study shows that the interaction effect of FAT and CEODU on SGR was statistically insignificant (B = .025, p > .01). Hence, CEODU cannot moderate the effect of FAT on SGR. Thus, H3a3 is not supported.

Model 4 is designed to test H3a4: Board gender diversity (BG) moderates the effect of fixed asset turnover on corporate sustainable growth. This model is designed with FAT as the main effect and BG as the moderating effect. The analysis shows that FAT had no statistically significant effect on SGR (B = .056, p >.01), while BG has no significant impact on SGR (B = 2.367, p >.10). Additionally, the study shows that the interaction effect of FAT and BG on SGR was statistically insignificant (B = -.171, p >.01). Hence, BG cannot moderate the effect of FAT on SGR. Thus, H3a4 is not supported.

Table 4.15 Results examining the main effect of TAT on SGR and the moderating effects of board effectiveness on this relationship

Variable	Model 0		Model 1	Model 2	Model 3	Model 4
	Control Model	Main Effect Model	Moderation Models			
		TAT	BZ	BIND	CEODU	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	5.477	0.660	-.240	3.172	3.438	2.492
	(1.908)*	(.220)	(-.075)	(1.104)	(1.209)	(.866)
Control Variables						
F_Size	2.010	.823	1.201	.811	.799	.863
	(2.137)**	(2.712)***	(3.489)***	(2.650)***	(2.643)***	(2.829)***
LEV	.362	0.045	-.026	.046	.078	-.022
	(.710)	(.089)	(-.051)	(.091)	(.156)	(-.044)
F_Age	-1.243	-1.166	-1.100	-1.127	-1.194	-1.144
	(-3.297)***	(-3.770)***	(-3.560)***	(-3.684)***	(-3.828)***	(-3.711)***
Ind1	-3.817	-2.655	-2.617	-2.676	-2.778	-2.551
	(-2.053)**	(-1.448)	(-1.433)	(-1.456)	(-1.522)	(-1.396)
Ind2	-4.014	-3.260	-3.572	-3.370	-3.322	-2.925
	(-2.582)***	(-2.136)**	(-2.345)**	(-2.194)**	(-2.185)**	(-1.908)*
Ind3	-4.153	-2.084	-2.514	-2.143	-2.037	-1.639
	(-2.744)***	(-1.346)	(-1.622)	(-1.307)	(-1.321	(-1.044)
Ind4	-1.531	-.984	-1.362	-1.076	-1.149	-.591
	(-0.933)	(-.613)	(-.849)	(-.660)	(-.718)	(-.367)
Ind5	-1.498	-.118	-.110	-.157	-.184	.242
	(-1.077)	(-.085)	(-.079)	(-.112)	(-.133)	(.173)
Ind6	-2.933	-2.396	-3.113	-2.390	-2.499	-2.091
	(-1.566)	(-1.309)	(-1.687)*	(-1.302)	(-1.370)	(-1.143)
Main Effect						
TAT		2.734	2.523	2.773	2.883	3.058
		(4.442)***	(3.966)***	(4.479)***	(4.680)***	(4.864)***
BZ			-.495			
			(-2.393)**			
BIND				2.458		
				(.565)		
CEODU					.764	
					(.562)	
BG						3.921
						(1.350)*
Interaction Effect						
TATxBZ			-.156			
			(-.629)			
TATxBIND				3.890		
				(.623)		
TATxCEODU					5.060	
					(2.320)	
TATxBG						8.105
						(1.857)*
R	.315	.380	.398	.382	.396	.396
R^2	.099	.145	.159	.146	.157	.157
R^2 change		.046	.001	.001	.012	.008
F	4.566***	6.288***	5.820***	5.274***	5.746***	5.731***

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 383 for all models; unstandardized coefficients are reported, and t statistics are reported in parentheses

The result can be an equation as follows:

H3b: Total asset turnover has a positive effect on corporate sustainable growth.

SGR = .660 + 2.734 TAT + .823 F_SIZE + .045 LEV – 1.166 F_AGE
-2.655 Ind1- 3.260 Ind2 – 2.084 Ind3 -.984 Ind4 -.118 Ind5
- 2.396 Ind6

H4b: Board effectiveness moderates the effect of total asset turnover on corporate sustainable growth.

H4b1: Board size moderates the effect of total asset turnover on corporate sustainable growth .

SGR = -.240 + 2.523 TAT - .495 BZ - .156 TAT*BZ
+ 1.201 F_SIZE - .026 LEV – 1.100 F_AGE – 2.617 Ind1
- 3.572 Ind2 – 2.514 Ind3- 1.362 Ind4 – .110 Ind5
- 3.113 Ind6

H4b2: Board independent moderates the effect of total asset turnover on corporate sustainable growth.

SGR = 3.172 + 2.773 TAT + 2.458 BIND + 3.890 TAT*BIND
+ .811 F_SIZE + .046 LEV – 1.127 F_AGE – 2.676 Ind1
- 3.370 Ind2 – 2.143 Ind3- 1.076 Ind4 – .157 Ind5
- 2.390 Ind6

H4b3: CEO Duality moderates the effect of total asset turnover on corporate sustainable growth.

SGR = 3.438 + 2.883 TAT +.764 CEODU +5.060 TAT*CEODU
+ .799 F_SIZE + .078 LEV – 1.194 F_AGE – 2.778 Ind1
- 3.322 Ind2 – 2.037 Ind3- 1.149 Ind4 – .184 Ind5 – 2.499 Ind6

H4b4: Board gender diversity moderates the effect of total asset turnover on corporate sustainable growth.

SGR = 2.492 + 3.058 TAT + 3.921 BG + 8.105 TAT*BG
+ .863 F_SIZE -.022 LEV – 1.144 F_AGE – 2.551 Ind1
- 2.925 Ind2 – 1.639 Ind3- .591 Ind4 +.242 Ind5 – 2.091 Ind6

According to Table 4.15, the main effect model (Model 0) revealed that TAT had a positive effect on SGR at a statistically significant level of .01 (B = 2.734, p <.01). Thus, H4a: Total asset turnover has a positive effect on corporate sustainable growth, is supported. Additionally, the control variables: firm size (F_size) had statistically significant positive effect on SGR, and firm age (F_Age) demonstrated a significant negative effect on SGR (B = -1.243, p > .01), whereas leverage (LEV) had no statistically significant effect on SGR. All control variables account for 9.90% of the variance in support for SGR, whereas both TAT and all control variables account for 14.50% of the variance in support for SGR.

The four regression models (Model 1 – Model 4) are analyzed and presented to assess the moderating effect of board size (BZ), board independent (BIND), CEO duality (CEODU) and board gender diversity (BG) on the effect of TAT on SGR, to test the four hypotheses.

Model 1 is designed to test H4b1: Board size (BZ) moderates the effect of total asset turnover on corporate sustainable growth. This model is designed with TAT as the main effect and board size as the moderating effect. The analysis shows that the TAT had a statistically significant positive effect on SGR with the coefficients of (B = 2.523, p <.01). And BZ had a statistically significant negative effect on SGR with the coefficients of (B = (B = -.495, p <.05). Moreover, it is also shown that the interaction effect of TAT and BZ on SGR was statistically insignificant (B = -.156, p >.10). Hence, BZ cannot moderate the effect of TAT on SGR. Thus, H4b1 is not supported.

Model 2 is designed to test H4b2: Board independence (BIND) moderates the effect of total asset turnover on corporate sustainable growth. This model is designed with TAT as the main effect and BIND as the moderating effect. The analysis shows that TAT had a statistically significant negative effect on SGR (B = 2.773, p <.01), while BIND has no significant impact on SGR (B = 2.458, p >.10). Additionally, the study shows that the interaction effect of TAT and BIND on SGR was statistically insignificant (B = 3.890, p >.10). Hence, BIND cannot moderate the effect of TAT on SGR. Thus, H4b2 is not supported.

Model 3 is designed to test H4b3: CEO duality (CEODU) moderates the effect of total asset turnover on corporate sustainable growth. This model is designed with TAT as

the main effect and CEODU as the moderating effect. The analysis shows that TAT had a statistically significant positive effect on SGR (B = 2.883, p <.01), while CEODU has no significant impact on SGR (B = .764, p >.10). Additionally, the study shows that the interaction effect of TAT and CEODU on SGR was statistically insignificant (B = 5.060, p >.10). Hence, CEODU cannot moderate the effect of TAT on SGR. Thus, H4b3 is not supported.

Model 4 is designed to test H4b4: Board gender diversity (BG) moderates the effect of total asset turnover on corporate sustainable growth. This model is designed with TAT as the main effect and BG as the moderating effect. The analysis shows that TAT had a statistically significant positive effect on SGR (B = 3.058, p <.01), while BG has a significant statistically significant positive effect on SGR (B = 3.921, p <.10). Interestingly, the regression coefficient for the product of TAT and BG is positive and statistically significant (B = 8.105, p < .10), and accounts for approximately 15.70% of incremental variance in support for SGR (above the main effects of TAT, BG, and the interaction effect). The results indicate that BG moderates the effect of TAT on SGR, which means that the effect of TAT on SGR depends on BG. Thus, H4b4 is supported.

According to the results in Table 4.15, Model 4: the effect of TAT on SGR depends on BG. Further analysis proceeds on: how BG affects the relationship between the TAT on SGR, and how BG affects the relationship between the TAT on SGR. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of TAT on SGR at different value of moderators: BG is shown in Table 4.16, and the graphs are plotted as shown in Figure 4.6 following:

Table 4.16 Model summary and condition effects of TAT on SGR at different values of BG as the moderators

Model Summary						
R	R2	MSE	F	df1	df2	p
.396	.157	61.964	5.731	12.000	370.000	.000
Test(s) of highest order unconditional interaction(s):						
	R2-chng	F	df1	df2	p	
X*W	.008	3.414	1.000	370.000	.065	
Focal predict: TAT (X), Mod var: BG (W)						
BG	Effect	se	t	p	LLCI	ULCI
-.145	1.888	.808	2.337	.020	.300	3.476
.000	3.058	.629	4.864	.000	1.822	4.294
.145	4.228	.970	4.360	.000	2.321	6.135

Table 4.16 shows the conditional effects of TAT on SGR at different levels of BG: (1) when BG (-.145) is at a low level (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .01 (B = 1.888, *p* = .020); (2) when BG (.000) is at an average level (the mean value), the conditional effect is positive and statistically significant at a level of .01 (B = 3.058, *p* = .000); and (3) when BG (.145) is at a high level (one standard deviation above the mean), the conditional effect is positive statistically significant (B = 4.228, *p* = .000).

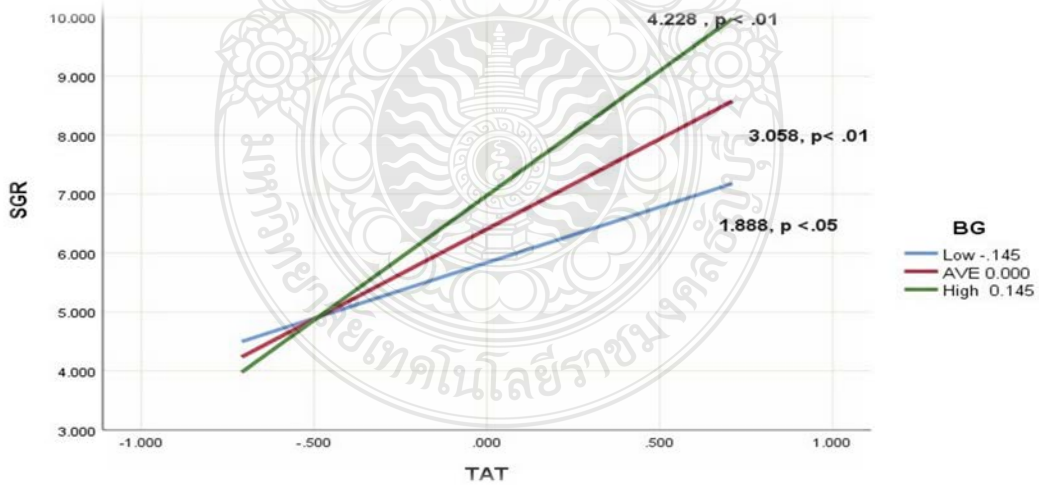

Figure 4.6 A visual representation of the moderating effect of BG on the relationship between TAT and SGR when BG = -.145 (Low); BG = .000 (Ave); and BG = .145 (High)

Figure 4.6 illustrates the conditional effects of TAT on SGR at the value of moderator: BG = -.145 (low), BG = .000 (average) and BG =.145 (high). The blue line represents the effect of TAT on SGR when the company has low BG (BG = -.145). This line shows the statistically significant positive effect of TAT on SGR at a level of .01, as seen by the positive slope or the conditional effect of 1.888. The red line represents the effect of TAT on SGR when the company has average BG (BG = .0000). This line shows the statistically significance positive effect of TAT on SGR at a level of .01, as seen by the positive slope or the conditional effect of 3.058. Moreover, the green line represents the conditional effect of TAT on SGR when the company has high BG (BG = .145). This green line shows a statistically significant positive effect of 4.228. Therefore, the findings indicate that when the board gender diversity of the company is at a low level, an average level, and high level of TAT would increase company sustainable growth rate (SGR).

4.4 Summary of research hypotheses testing

The moderating role of board effectiveness on the effect of cash flows, efficiency ratios on corporate sustainable growth, the hypothesis testing results can be summarized as follows:

Table 4.17 Summary of research question, and results of hypotheses

Research question	Hypotheses	Result
Research Question 1: Does cash flows effect corporate sustainable growth?	**Hypotheses 1**: Cash flow affects corporate sustainable growth.	
	H_1a: Cash flow from operation has a positive effect on corporate sustainable growth.	Supported
	H_1b: Cash flow from investing has a negative effect on corporate sustainable growth.	Supported
	H_1c: Cash flow from financing has a negative effect on corporate sustainable growth.	Not-supported
	H_1d: Net cash flows has a positive effect on corporate sustainable growth	Supported
	H_1e: Free cash flow has a positive effect on corporate sustainable growth.	Supported

Table 4.17 Summary of research question, and results of hypotheses (Cont.)

Research question	Hypotheses	Result
Hypotheses 2: Does board effectiveness moderate the effect of cash flows on corporate sustainable growth and how?	**Hypotheses 2** Board effectiveness moderates the effect of cash flows on corporate sustainable growth.	
	H2a: Board effectiveness moderates the effect of cash flow from operation on corporate sustainable growth.	
	H2a1: Board size moderates the effect of cash flow from operation on corporate sustainable growth.	Not-supported
	H2a2: Board independence moderates the effect of cash flow from operation on corporate sustainable growth.	Not-supported
	H2a3: CEO Duality moderates the effect of cash flow from operation on corporate sustainable growth.	Not-supported
	H2a4: Board gender diversity moderates the effect of cash flow form operation on corporate sustainable growth.	Not-supported
	H2b: Board effectiveness moderates the effect of cash flow from investing on corporate sustainable growth.	
	H2b1: Board size moderates the effect of cash flow from investing on corporate sustainable growth.	Not-supported
	H2b2: Board independence moderates the effect of cash flow from investing on corporate sustainable growth.	Not-supported
	H2b3: CEO Duality moderates the effect of cash flow from investing on corporate sustainable growth.	Supported
	H2b4: Board gender diversity moderates the effect of cash flow from investing on corporate sustainable growth.	Supported

Table 4.17 Summary of research question, and results of hypotheses (Cont.)

Research question	Hypotheses	Result
	H2c: Board effectiveness moderates the effect of cash flow from financing on corporate sustainable growth	
	H2c1: Board size moderates the effect of cash flow from financing on corporate sustainable growth.	Not-supported
	H2c2: Board independence moderates the effect of cash flow financing on corporate sustainable growth.	Not-supported
	H2c3: CEO Duality moderates the effect of cash flow financing on corporate sustainable growth.	Supported
	H2c4: Board gender diversity moderates the effect of cash flow from financing on corporate sustainable growth.	Not-supported
	H2c4: Board gender diversity moderates the effect of cash flow from financing on corporate sustainable growth.	Not-supported
	H2d: Board effectiveness moderates the effect of net cash flow on corporate sustainable growth.	
	H2d1: Board size moderates the effect of net cash flow on corporate sustainable growth.	Not-supported
	H2d2: Board independence moderates the effect of net cash flow on corporate sustainable growth.	Supported
	H2d3: CEO Duality moderates the effect of net cash flow on corporate sustainable growth.	Not-supported
	H2d4: Board gender diversity moderates the effect of net cash flow on corporate sustainable growth.	Not-supported
	H2e: Board effectiveness moderates the effect of free cash flow on corporate sustainable growth.	
	H2e1: Board size moderates the effect of free cash flow on corporate sustainable growth.	Not-supported

Table 4.17 Summary of research question, and results of hypotheses (Cont.)

Research question	Hypotheses	Result
	H2e2: Board independence moderates the effect of free cash flow on corporate sustainable growth.	Not-supported
	H2e3: CEO Duality moderates the effect of free cash flow on corporate sustainable growth.	Not-supported
	H2e4: Board gender diversity moderates the effect of free cash flow on corporate sustainable growth.	Supported
Research question 3: Does efficiency ratio affect corporate sustainable growth?	**Hypotheses 3:** Efficiency ratios have positive effects on corporate sustainable growth.	
	H3a: Fixed asset turnover has a positive effect on corporate sustainable growth.	Not-supported
	H3b: Total asset turnover has a positive effect on corporate sustainable growth.	Supported
Research question 4: Does board effectiveness moderate the effect of efficiency ratios on corporate sustainable growth and how?	**Hypotheses 4:** Board effectiveness moderates the effect of efficiency ratios on corporate sustainable growth.	
	H4a: Board effectiveness moderates the effect of fixed asset turnover on corporate sustainable growth.	
	H4a1: Board size moderates the effect of fixed asset turnover on corporate sustainable growth.	Not-supported
	H4a2: Board independent moderates the effect of fixed asset turnover on corporate sustainable growth.	Not-supported
	H4a3: CEO Duality moderates the effect of fixed asset turnover on corporate sustainable growth.	Not-supported
	H4a4: Board gender diversity moderates the effect of fixed asset turnover on corporate sustainable growth.	Not-supported

Table 4.17 Summary of research question, and results of hypotheses (Cont.)

Research question	Hypotheses	Result
	H4b: Board effectiveness moderates the effect of total asset turnover on corporate sustainable growth.	
	H4b1: Board size moderates the effect of total asset turnover on corporate sustainable growth.	Not-supported
	H4b2: Board independent moderates the effect of total asset turnover on corporate sustainable growth.	Not-supported
	H4b3: CEO Duality moderates the effect of total asset turnover on corporate sustainable growth.	Not-supported
	H4b4: Board gender diversity moderates the effect of total asset turnover on corporate sustainable growth.	Supported

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

The final chapter of this dissertation deals with the conclusion, discussion and recommendations of the study. These include the research questions, objectives, research methodology and a summary of the research findings, a discussion of the results, as well as the theoretical and practical contributions. In addition, the limitations of the study and suggestions for future research are given in this chapter.

5.1 Conclusion

This research aims to examine the moderating roles of board effectiveness: board size, board independence, chief executive officer (CEO) duality and board gender diversity, on the relationships between: (1) cash flows and corporate sustainable growth, and (2) efficiency ratios and corporate sustainable growth. The samples used in the study were companies listed on the Stock Exchange of Thailand (SET) in the year 2022 that have operating profits, excluding those in the financial industry, property funds and real estate investment trusts as well as companies with non-December fiscal year-end. Therefore, the sample group in this study consisted of 383 companies. Statistical methods for data analysis included multiple linear regression and Hayes's regression-based analysis.

This study aimed to answer the following research questions.

Research question 1: Does cash flow affect corporate sustainable growth?

Research question 2: Does board effectiveness moderate the effect of cash flows on corporate sustainable growth and how?

Research question 3: Does efficiency ratio affect corporate sustainable growth?

Research question 4: Does board effectiveness moderate the effect of efficiency ratios on corporate sustainable growth and how?

In order to answer the above questions, the study employed four main objectives.

(1) To investigate the effect of cash flows on corporate sustainable growth.

(2) To examine the moderating effect of board effectiveness on the relationship between cash flows and corporate sustainable growth.

(3) To investigate the effect of efficiency ratios on corporate sustainable growth.

(4) To examine the moderating effect of board effectiveness on the relationship between efficiency ratios and corporate sustainable growth.

Based on the above research questions and objectives, the four hypotheses were proposed as follows.

Hypothesis 1: Cash flow from operation (CFO), cash flow from investing (CFI), cash flow from financing (CFF), net cash flow (NCF) and free cash flow (FCF), affect corporate sustainable growth.

Hypothesis 2: Board size (BZ), board independence (BIND), CEO duality (CEODU) and board gender diversity (BG), moderate the effect of cash flows on corporate sustainable growth.

Hypothesis 3: Fixed assets turnover ratio (FAT) and total assets turnover ratio (TAT), have positive effects on corporate sustainable growth.

Hypothesis 4: Board size (BZ), board independence (BIND), CEO duality (CEODU) and board gender diversity (BG), moderate the effect of efficiency ratios on corporate sustainable growth.

The key findings of this study are as follows.

Impact of cash flows on corporate sustainable growth.

The study results revealed that cash flows, namely CFO, NCF and FCF, had significant positive effect on corporate sustainable growth while CFI had a negative effect on corporate sustainable growth. However, CFF demonstrated insignificant effect on corporate sustainable growth.

Moderating roles of board effectiveness on the relationship of cash flows on corporate sustainable growth

The results of the study were found as follows:

(i) CEO duality moderates the effect of CFI on corporate sustainable growth. That is, the effect of CFI on corporate sustainable growth depends on CEO duality. Specifically, a higher CFI reduces corporate sustainable growth when the company has

non-CEO duality, whereas a higher CFI increases corporate sustainable growth when the company has CEO duality, or the chairman and CEO of the company are the same person.

(ii) BG moderates the effect of CFI on corporate sustainable growth. That is, the effect of CFI on corporate sustainable growth depends on its BG. Specifically, when a firm BG is low or average, a higher CFI reduces corporate sustainable growth.

(iii)CEO duality moderates the effect of CFF on corporate sustainable growth. That is, the effect of CFF on corporate sustainable growth depends on CEO duality. Specifically, a higher CFF reduces corporate sustainable growth when the company has CEO duality, or the chairman and CEO of the company are the same person

(iv) BIND moderates the effect of NCF on corporate sustainable growth. That is, the effect of NCF on corporate sustainable growth depends on BIND. Therefore, BIND positively moderates the positive effect of NCF on SGR. Interestingly, the moderating effect of low BIND led to a more positive NCF on SGR than average BIND and high BIND levels, respectively. For firms with low BIND level, higher NCF values strengthen SGR more than firms with average BIND and firms with high BIND.

(v) BG moderates the effect of FCF on corporate sustainable growth. That is, the effect of FCF on corporate sustainable growth depends on BG. Specifically, higher FCF increases corporate sustainable growth when firm has a low BG.

(1) Impact of efficiency ratios on corporate sustainable growth

The study results indicated that FAT had no statistically significant effect on corporate sustainable growth, while TAT showed a positive impact on corporate sustainable growth. Therefore, more efficient use of total assets enhances corporate sustainable growth.

(2) Moderating effects of board effectiveness on the relationship of efficiency ratios on corporate sustainable growth.

(3) The study results revealed that BG moderates the effect of TAT on corporate sustainable growth. That is, the effect of TAT on corporate sustainable growth depends on BG. Moreover, BG positively moderates the positive effect of TAT on corporate sustainable growth. Interestingly, the moderating effect of high BG led to a more positive effect of TAT on corporate sustainable growth than average BG and low BG levels,

respectively. For firms with a high BG level, TAT enhances corporate sustainable growth more than in firms with average BG and in firms with low BG.

5.2 Discussion

The significant findings and discussion of this study are given as follows:

5.2.1 Effect of Cash Flows and Asset Efficiency on Corporate Sustainable Growth

The study results found that CFO, NCF and FCF had significant positive effects on corporate sustainable growth while CFI had a negative effect on corporate sustainable growth. The findings are congruent with the proposed hypotheses and consistent with the study of Wickramasinghe and Gunawardana (2017) that positive cash flow is generally desirable, as it ensures a company has enough liquidity to cover its expenses and growth investments in future initiatives. Enhancing FCF serves as a reliable predictor for reinvesting in the business and transforming surplus cash into returns and growth (Scatizzi, 2009). This finding is also supported by Giacomino and Mielke (1993), who stated that using cash flow ratios as a tool to evaluate a company financial performance helps determine its SGR by providing insights into its ability in maintaining growth. The findings that CFI had a negative impact on corporate sustainable growth is consistent with the proposed hypothesis and supports the study of Wickramasinghe and Gunawardana (2017) who suggest that when a company allocates a significant portion of its cash flow to investing activities, it may negatively impact its ability to achieve sustainable growth. This could be due to factors such as high capital expenditures, which might reduce the funds available for other sustainable growth initiatives. Conversely, the study found that CFF had no impact on corporate sustainable growth. This contradicts the proposed hypothesis which suggests that CFF has a negative effect on sustainable growth. However, this finding is consistent with the study of Wickramasinghe and Gunawardana (2017).

Moreover, it was also found that asset management efficiency, measured by total assets turnover ratio, had a positive impact on sustainability growth rate. The results support the explanation of Higgins (1977) that companies that effectively utilize their assets can decrease asset requirements, resulting in lower costs and ultimately higher

sustainable growth. Better planning, controlling the usage of corporate assets, including current assets and fixed assets, and having the right amount of funding provided for each asset piece are necessary for better asset utilization (Rahayu, 2019). These findings are also consistent with the previous studies of Amouzesh, Moeinfar, Mousavi, and Science (2011) that found sustainable growth rates are determined by the interplay of operational and financial components such as profit margin, asset efficiency, capital structure, and retention rate; Rahim and Badrul Munir (2018) that found debt-to-equity ratio, total asset turnover, and firm size show a positive relationship with corporate sustainable growth; and Yang and Gan (2019) that found asset quality is crucial for businesses to achieve sustainable development. Moreover, this finding is also consistent with the studies of Altahtamouni, et al., (2022); Hillman, Cannella Jr, & Harris, (2002); Nor, Ramli, Marzuki, & Rahim, (2020); and Sunardi (2021). Therefore, organizational managers should prioritize insights on the effectiveness and efficiency of asset utilization when making strategic decisions related to the business operations.

In summary, it is crucial to closely monitor cash flows management, including CFO, NCF, FCF and CFI, as well as asset management efficiency, in order to assess corporate sustainable growth. Efficiency ratios are utilized to assess how effectively assets contribute to business growth. The total asset turnover indicates the ability of a company to leverage its fixed assets for sales generation, demonstrating efficient asset utilization to sustainable growth.

5.2.2 Moderating Roles of Board Effectiveness on the Relationship of Cash Flows on Corporate Sustainable Growth

The important findings regarding the moderating role of board effectiveness are discussed as follows. Firstly, the findings show that board independence (BIND) positively moderates the positive effect of NCF on corporate sustainable growth. The result indicates that BIND strengthens the positive effect of NCF on corporate sustainable growth. This is consistent with the agency theory, which asserts that a more impartial board of directors will be able to keep a greater focus on the CEO and lessen the motivation for that officer to pursue personal interests, which in turn will increase firm performance and sustainable growth. According to the agency theory framework, Fama and Jensen (1983) suggests that the effectiveness of the board is positively influenced by

board independence, as indicated by various studies, highlighting its crucial role in fostering strong oversight, particularly in businesses with notable agency costs.

Secondly, CEO duality moderates the effects of both cash flow from investing (CFI) and cash flow from financing (CFF) on corporate sustainable growth. In particular, reducing CFI increases corporate sustainability growth when the company chairman and CEO are separate; whereas higher CFI increases corporate sustainability growth when the company chairman and CEO are the same person (CEO duality). Conversely, when the company chairman and CEO are separate individuals, higher CFF increases corporate sustainability growth; whereas when the company has CEO duality, higher CFF results in lower corporate sustainability growth. These findings support the agency theory, which suggests that CEO duality reduces a board's power to effectively oversee its management gap. Decision-making by those concurrently holding two positions can undermine the efficiency of management and the board's ability to conduct thorough evaluations (Fama & Jensen, 1983).

Thirdly, the findings indicate that board gender diversity (BG) moderates the effects of both CFI and FCF on corporate sustainable growth. This is consistent with those of Ain, Yuan, Javaid, and Naeem (2022); and Latif (2020) that there is a positive relationship between women directors and the sustainable growth rate of firms. It is also consistent with Carter, D'Souza, Simkins, and Simpson (2010) who suggest that women have qualifications that are comparable to those of men, and it is further proposed that the presence of gender diversity can have a favorable effect on board effectiveness, leveraging the diverse and distinctive human capital possessed by women. In addition, according to behavior theory, the belief that women exhibit higher risk aversion compared to men has led to the notion that companies with boards predominantly comprising women may experience weaker performance, leading to lower dividend payments (Al-dhamari, Ku Ismail, & Al-Gamrh, 2016).

However, board size (BZ) demonstrates no significant effect on corporate sustainable growth. The finding is consistent with the study of Latif (2020) who found that BZ had no effect on sustainability performance in Malaysia. The findings of the study differ from previous studies of Ahsan, Mirza, Al-Gamrh, and Bin-Feng (2020); and Mukherjee and Sen (2022) who found that BZ had a significant negative impact on

sustainable growth. Jensen (1993) showed that larger boards are associated with lower effectiveness and increased CEO control, while overcrowded boards tend to lack cohesiveness.

5.2.3 Moderating Roles of Board Effectiveness on the Relationship of Asset Efficiency Ratios on Corporate Sustainable Growth

The study results revealed that BG moderates the effect of TAT on corporate sustainable growth. In particular, BG positively moderates the positive effect of TAT on corporate sustainable growth. TAT has a stronger positive effect on sustainable growth in a company with higher BG than in a company with lower BG. Thus, asset efficiency as measured by TAT improves corporate sustainable growth, and with a greater proportion of female board members, the corporate sustainable growth will improve even more. These findings are consistent with the studies of (Ain et al., 2022) who provided empirical evidence supporting a positive relationship between female directors and corporate sustainable growth; Kılıç and Kuzey (2016) who found that the impact of females on the board, female directors and gender diversity have a positive impact on firm performance. In addition, the presence of female directors on the board positively impacts investment efficiency by ensuring robust oversight and mitigating agency concerns (Safdar, Chaudhry, Mirza, & Yu, 2019). This study is consistent with previous studies that found having more women on boards tends to create much more effective performance and corporate sustainable growth.

5.3 Contributions of the study

5.3.1 Theoretical Contribution

This study contributes to the existing literature in several ways. First, the study empirically confirms that CFO, NCF, and FCF have positive effects, while CFI has a negative effect, and CFF shows no impact on corporate sustainable growth. This is supported the sustainable cash flow management that effective cash flow management ensures that company can meet its obligations, invest in growth opportunities, return value to shareholders, and contribute to corporate sustainable growth.

Second, it extends a growing body of research related to the board of directors' effectiveness in cash flows and efficiency ratio decisions. This study examines the

moderating roles of all four dimensions of board effectiveness, which includes BZ, BIND, CEODU and BG, on the relationships of all types of cash flows on corporate sustainable growth. The findings contribute to the literature as follows. Firstly, CEODU moderates the effects of CFI and CFF on corporate sustainable growth. When a company has non-CEO duality, a higher CFI reduces corporate sustainable growth. While for companies with CEO duality, higher CFI increases corporate sustainable growth. On the contrary, when a company has non-CEO duality, higher CFF increases the corporate sustainability growth; whereas when a company has CEO duality, higher CFF results in lower corporate sustainability growth. Secondly, BIND positively moderates the positive effect of NCF on corporate sustainable growth. Thirdly, BG has the moderating effect on the relationships of CFI and FCF on corporate sustainable growth. A higher CFI reduces corporate sustainable growth when the company has a low or average BG level. Higher FCF increases corporate sustainable growth when a firm has low BG. These findings supported the explanation of agency theory. To ensure corporate sustainability, it's vital that managers (agents) are aligned with the interests of shareholders (principals).

Finally, this study provides evidence that asset efficiency as measured by TAT has a direct and positive effect on corporate sustainable growth. Additionally, the positive effect of TAT on corporate sustainable growth is stronger when moderated by BG. As BG increases, the positive effect of TAT on corporate sustainable growth will be even stronger.

In conclusion, the study results indicate that the link among agency theory, cash flows, and corporate sustainability is integral for the effective governance and financial management of a company. By aligning the interests of managers and shareholders through well-designed incentives and robust cash flow management, companies can foster sustainable practices that contribute to long-term success and value creation.

5.3.2 Practical Implication

The results obtained from this study will be useful to the management teams, investors, and regulators as guidelines for analyzing board effectiveness, evaluating the intrinsic value of organizations, and making informed decisions. The significant practical implications are classified by stakeholders as follows.

For Management Teams:

Based on the research findings, cash flows and asset management efficiency largely influence corporate sustainable growth. Therefore, the board of directors should set and monitor cash flow policies to balance cash retention, dividend payments, and investments to maximize shareholder wealth and ensure sustainable growth for the business. Business executives should focus on cash flow analysis and management while increasing total asset management efficiency. This approach balances liquidity and corporate sustainable growth. Additionally, the analysis finds that CEO duality, board independence, and board gender diversity moderate the relationships of cash flows and total asset management efficiency on corporate sustainable growth rate. Therefore, the board of directors is recommended to set the policy dealing to board characteristics and monitor it to retain company wealth.

For Investors:

Effective corporate governance, influenced by CEO duality, board independence, and gender diversity, can support sustainable growth. By ensuring that cash flows are managed responsibly and strategically, companies can achieve sustainable growth and stability, which is attractive to investors looking for sustainable returns. Investors should understand how these governance factors interact with cash flows to gain insights into the company's financial health and efficiency. Effective oversight and diverse perspectives can lead to better investment and financing decisions, positively impacting cash flows and overall financial stability.

For Regulators:

It is essential to understand that strong governance practices enhance investor confidence in the markets. Regulators need to ensure that companies adhere to high standards of governance to maintain market integrity and attract investment. By promoting diversity and independence on boards, regulators can help ensure that companies operate in a fair and equitable manner, which is crucial for maintaining trust and fairness in the marketplace. Therefore, regulators should encourage companies to adopt governance practices that support sustainable growth. By examining the impact of CEO duality, board independence, and gender diversity on cash flows, regulators can promote policies that foster value creation and corporate sustainability.

5.4 Research Limitations and Suggestions for Future Research

5.4.1 Research Limitations

This study has some limitations. First, the study collects data only for the year 2022 from companies listed on the Stock Exchange of Thailand. The use of such a cross-sectional data design for the research methodology may be limited by data not covering the entire business life cycle, as it limits the period of cash flow and sustainable growth rate data to only one year. Second, this study focuses on the sustainable growth of profitable, non-financial companies. Therefore, we still do not see the overall picture of all companies listed on the Stock Exchange of Thailand.

5.4.2 Suggestions for Future Research

From this study and its limitations, future research should focus as follows.

1. Future studies that recommend extending the study period even more,

such as for 3 years, 5 years, or 10 years, could conduct panel data, as extending the study period may reduce the limitations of differences between businesses. This may make the results of the study clearer.

2. This study concentrates on Thai listed companies and it limits the ability to generalize the findings. Therefore, future studies should include more countries and examine certain industries which may be affected by ESG policies and activities such as manufacturers and resource extractors.

3. Board effectiveness is responsible for setting the goals of the organization. Therefore, it is important in decision-making. That will affect the activities of the business to ensure sustainable growth in operations. Therefore, future research may look into the study and consider investment in various forms that will affect the sustainability of the company, such as an audit committee, ownership structure and capital structure.

4. There are practical approaches for conceiving and assessing corporate sustainable growth. Additionally, other sustainable growth indicators can be used, such as ESG performance or Global Reporting Initiative (GRI) based disclosure tools suggesting that future should focus on a specific firm type or industry.

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