Journal of
Risk and Financial Management

MDPI

Article

Does Sustainable Finance Work on Banking Sector in ASEAN?: The Effect of Sustainable Finance and Capital on Firm Value with Institutional Ownership as a Moderating Variable

Mochamad Roland Perdana *, Achmad Sudiro, Kusuma Ratnawati and Rofiaty Rofiaty

Management Department, Faculty of Economics and Business, Universitas Brawijaya, Kota Malang 65145, Indonesia
* Correspondence: rolandperdana@student.ub.ac.id

Abstract: Management in the banking industry is not solely focused on financial performance but also on the sustainability of their portfolios. To achieve this, banks need to incorporate sustainable finance into their balance sheet. In addition, a global phenomenon has emerged where investors have demanded the inclusion of sustainable finance in portfolios. This financial instrument served to support the global agreement on climate change, which they were committed to making a reality. The impact of sustainable finance on firm value remains a question. Therefore, this study aimed to examine the effect of sustainable finance and capital on firm value within the banking industry, focusing on entities listed on the ASEAN stock market from 2015 to 2021. To assess investor demand for involvement in sustainable finance, a moderating variable was included in the model. Furthermore, this study used a quantitative design and a purposive sampling technique with panel data regression analysis for the hypothesis testing. The results showed that sustainable finance and capital had a significant effect on firm value. Institutional ownership moderated the relationship between sustainable finance and firm value, although it did not moderate the link between capital and firm value. This indicated that banks prioritized sustainable finance due to its positive impact on their operations, ultimately leading to an improvement in firm value. Furthermore, institutional ownership influenced the relationship between sustainable finance and firm value, as banks strived to comply with international society or enhance firm value. This study incorporated profitability ratios and firm size as the control variables.

Keywords: sustainable finance; firm's value; institutional ownership

Citation: Perdana, Mochamad Roland, Achmad Sudiro, Kusuma Ratnawati, and Rofiaty Rofiaty. 2023. Does Sustainable Finance Work on Banking Sector in ASEAN?: The Effect of Sustainable Finance and Capital on Firm Value with Institutional Ownership as a Moderating Variable. *Journal of Risk and Financial Management* 16: 449. https://doi.org/10.3390/jrfm16100449

Academic Editors: Ştefan Cristian Gherghina and Shigeyuki Hamori

Received: 13 July 2023
Revised: 3 October 2023
Accepted: 8 October 2023
Published: 18 October 2023

1. Introduction

The current state of climate change is a threat to various aspects that impact global life, spanning economic, social, and environmental realms. In this context, a milestone achieved by the international community, which significantly influenced efforts to mitigate climate change, was the Kyoto Protocol (1998). This protocol is in accordance with the principles of the United Nations Framework on Climate Change, which urged industrialized countries and transitioning world economic actors to reduce greenhouse emissions according to their individual commitments and targets.

After the Kyoto Protocol, the Paris Agreement (2015) emerged as a significant successor. This agreement holds international recognition in addressing climate change. Fundamentally, the Paris Agreement commits its participants to restrain the increase in global average temperature to well below 2 °C above pre-industrial levels, with a striving ambition to cap the increase at 1.5 °C. The agreement took effect and became binding on 4 November 2016.

Malaysian Sustainable Finance Initiative (2020) noted that Several ASEAN Member States (AMS) have taken part in several international efforts relating to sustainable finance on a regional level. This displays a desire to advance the growth of sustainable finance in accordance with global standards. The Task Force on Climate-related Financial Disclosures

(TCFD) is a group of organizations that includes the Securities Commission of Malaysia (SC), Bursa Malaysia, the Monetary Authority of Singapore, and Singapore Exchange Limited. The group's goal is to develop voluntary, standardized disclosures for companies to use regarding climate-related financial risk. The Network of Central Banks and Supervisors for Greening the Financial System (NGFS), which has the goal of enhancing the role of the financial system to better manage risks and mobilize capital for green and low-carbon investments, includes central banks from the four AMS: Indonesia, Malaysia, Singapore, and Thailand.

In relation to the global climate change initiative, Indonesia has introduced regulatory policies through its Financial Service Authority (OJK) in 2015. The Sustainability Finance Roadmap Phase I (2015–2019) was established as a framework incorporating sustainable finance goals and principles, along with a comprehensive work plan. Subsequently, the Sustainable Finance Roadmap Phase II (2021–2025) outlines distinct categories within sustainable finance, offers intricate details in its development, and expounds on matters pertaining to climate change. As a form of commitment from the Indonesian government, the Financial Services Authority (OJK) enacted Regulation No. 51/POJK/03/2017 in 2017. This regulation governs the Implementation of Sustainable Finance for Financial Institutions, Issuers, and Public Companies.

In the meanwhile, in 2020, the Monetary Authority of Singapore (MAS) developed a framework named the Green Finance Action Plan (2020). This finance framework aims to support a sustainable Singapore and facilitate Asia's transition to support a sustainable future. Furthermore, it aims to (1) strengthen financial sector resilience to environmental risk; (2) develop markets and solutions for a sustainable economy; (3) harness technology to enable trusted and efficient sustainable financial flows; (4) build knowledge and capabilities in sustainable finance. In 2017, the Securities Commission of Malaysia (SC) issued the Guideline on Sustainable and Responsible Investment Fund (2017) to facilitate and encourage the growth of SRI funds in Malaysia. Moreover, the SRI Guidelines is a five-year roadmap that encompasses five overarching strategies, known as the 5i-Strategy. The strategies aim to (1) broaden the selection of SRI instruments, expanding the SRI investor base; (2) establish a strong SRI issuer base; (3) instill a robust internal governance culture; (4) design information architecture in the SRI ecosystem.

These initiatives from ASEAN financial authorities showed a huge commitment to developing sustainable activities. These activities must be supported by dedicated financial instruments to finance the development of sustainability activities. The financial instrument to finance these is so-called sustainable finance or green credit. Nandy and Lodh (2012) explained that green credit is a type of financial product that emerged from sustainable or environmental financing, focusing on environmental protection and sustainable development of the financial sector. Twidell and Cabot (2003) described the following two functions of sustainable finance. One is to offer advisory and financial support for sustainable business ventures. It offers investment advisory services to clients on sustainable projects by designing sustainable financing policies. Second, the bank employs a variety of loan-placement strategies from the market's perspective, market development, and regulation to stimulate sustainable development. This is achieved by utilizing its information advantages. Therefore, sustainable projects supported by green credit or sustainable instruments would result in success in sustainable activities.

Sustainable activities take the form of reports issued by financial institutions, issuers, and public or private companies that voluntarily disclose sustainable information. Some authors (Berthelot et al. 2012) affirmed that sustainable reports included a range of information regarding past, present, and future corporate activities linked to environmental and social matters, alongside the financial implications stemming from management decisions and environment-related endeavors. Others (Manisa et al. 2017) also asserted that sustainability reporting embodied the accountability of a firm to consumers, employees, shareholders, communities, and the environment across all aspects of its operations.

For banks, sustainability reports play a crucial role in disclosing their business activities involving economic, social, and environmental aspects. According to the International Monetary Fund (IMF), the primary role of banking is to receive and allocate public funds for financing individuals in need. Among the sustainability activities reported by banks, sustainable financing holds a prominent place.

Sustainable finance constitutes a sustainable product or service with sustainable performance. Some authors (Xi et al. 2021) showed that State-Owned Banks (SOEs) in China were the main agents in the implementation of this form of finance. This reflected its essential role in national economic development from the perspective of the government. In Indonesia, sustainable finance is comprehensively supported by the financial services sector to foster economic growth while harmonizing economic, social, and environmental interests, as stipulated in OJK Regulation No. 51.

Drawing on signaling theory, it is proposed that firms engaging in sustainable activities are more likely to garner recognition from investors, resulting in higher valuations in the capital market (Swarnapali 2020).

An investigation on the relationship between sustainable performance, firm value, and the role of green innovation (Chouaibi et al. 2020) ascertained a significant positive relationship between the level of green innovation intensity within sustainable-performing firms and their financial performance. According to (Chouaibi et al. 2020), a superior level of green innovation intensity can facilitate better access to financial resources and higher firm value.

Another significant green activity within banking is sustainable finance; Xi et al. (2021) explained that several firms prioritized a green economy in the event of environmental constraints. This event traces back to 1974 when The Federal Republic of Germany established the Ecological Bank. Subsequently, a group of banks and financial institutions, including IFC, ABN, and Amro, introduced The Equator Principles in 2002. The topic has consistently been on the agenda at G20 conferences up to the most recent one in 2022. Describing green credit as a financial instrument stemming from environmental financing of sustainable finance, Nandy and Lodh (2012) emphasized its role in promoting sustainable development by focusing on environmental protection. This instrument has gained substantial traction in Asian financial markets. In addition, (Lin 2022) reported that sustainable funds available to Asian investors experienced steady inflows throughout 2021, amassing a total of USD 16 billion in new assets and contributing to an aggregate size of sustainable investment products of around USD 14.4 trillion. Regarding the index, (Lin 2022) noted that the Asia ex-Japan ESG index consistently outperformed the broad-based regional index by an average of 1.59% annually between 2017 and 2021. The Morningstar Asia Pacific Index demonstrated the most significant outperformance in 2021, surpassing its non-ESG equivalent by 1.74%.

Green credit is not solely confined to project financing but also includes activities that comply with environment (E), social (S), and governance (G) aspects. It specifically necessitates adherence to environmental and ecological activities that prevent nature from project-related harm. Despite its substantial environmental focus, (Xi et al. 2021) asserted that green credit was not only about environmental protection but was also related to the economic benefits of the banks. This consequently broadens the terminology of sustainable financing since it entails not only green instruments but also ESG activities and the economic value of projects. This concept has transcended globally, spreading from Europe to the ASEAN region. In ASEAN countries, where fossil fuel consumption is particularly higher and environmental risks are more pronounced compared to other developed nations, studies in this field are intriguing. Banks, as the main source of funds, are at the center of the economy, distributing funds to these firms. This disbursement is facilitated through instruments like the Sustainable Linked Loan (SLL). According to the Loan Syndication and Trading Association (2023), the SLL includes various loan instruments and contingent facilities (such as bonding lines, guarantees, or letters of credit) that provide incentives for borrowers to achieve ambitious, predetermined sustainability performance objectives. Moreover, borrowers implementing this instrument are required to meet sustainability

performance targets, track the performance, and provide corresponding reports. Banks typically disclose information about this instrument in their sustainability reports or other separate regular publications. Meanwhile, capital market instruments such as green and sustainable bonds have primary choices, and the SLL market has rapidly grown to over USD 332 billion (Bloomberg). Sustainalytics in 2021 explained that ING and Philips were among the first to issue this instrument, and these loans now aim to bolster sustainability development within corporate entities by linking loan terms to overall sustainability performance. In the ASEAN markets, the issuance of these instruments has reached a total of USD 12.8 billion. This comprised Indonesia (USD 5.5 billion), Singapore (USD 11.9 billion), Malaysia (2.6 billion), the Philippines (USD 4.9 billion), Myanmar (USD 44 million), Thailand (USD 3.86 billion), and Vietnam (USD 484 million) (CBI 2020). Despite the spread of COVID-19 to ASEAN countries, sustainable finance instruments performed strongly in 2020, with Singapore taking the lead, followed by other countries.

Reports related to sustainable finance can be accessed through sustainable reports that adhere to the Global Reporting Initiative (GRI 201-1, GRI 201-3). In addition to sustainable financing, an important component in assessing banking sustainability is capital. The capital structure of the banks is one of the sources of funds where sustainable finance can be disbursed. It is a very highly regulated component by the financial authority or central banks where the banks are operated. Banking capital is disclosed within the Annual Report. The capital adequacy ratio is presented in the form of the Capital Adequacy Ratio (CAR), which (Brastama and Yadnya 2020) emphasized as the ability of the bank to mitigate risks stemming from losses in order to support operational activities. Fordian (2017) established that the CAR influenced banking stock prices, while (Khan et al. 2020) demonstrated its influence on banking profitability. This prompted a significant interest in re-examining the effect of the CAR on firm value.

The current study introduced a model to examine whether institutional ownership could strengthen or weaken the impact of sustainable financing on firm value. Institutional ownership was incorporated into the model as a moderating variable. In agency theory, institutional ownership represents a principal entity that influences the decisions made by agents or management. Consequently, it is perceived as a potential influencer, and the inclusion as a moderating variable was drawn from the work of (Velte 2020), who analyzed the relationship between sustainable and financial performance by incorporating CEO power as a moderator. The study indicated a positive correlation between both variables, particularly in the presence of the CEO power index.

Previous studies on sustainability products and services have predominantly focused on industries within the technology and energy sectors. In the banking sector, sustainable products such as sustainable finance are relatively new. Therefore, its inclusion as one of the independent variables was a novelty in this study, particularly when examining its correlation with firm value. There is also a significant need to investigate the influence of the variable on firm value, a topic that has not been previously explored.

This study aimed to investigate the impact of sustainable finance and capital on firm value within the ASEAN banking sector. The moderating effect of institutional ownership was assessed in the relationship between sustainable finance, capital, and firm value. The following are the objectives of this study:

- Analyze the impact of sustainable finance and capital on firm value;
- Evaluate the effect of institutional ownership on the relationship between sustainable finance, capital, and firm value.

This study employed both base and interaction models. The base model primarily examined the relationship between sustainable finance, capital, and firm value. On the other hand, the interaction model evaluated the same relationship by introducing institutional ownership as a moderator.

The results provided valuable benefits to both stakeholders and investors. From a stakeholder perspective, this study offered insights into the implementation of sustainable finance in the banking of ASEAN markets. Meanwhile, for investors, the results indi-

cated the impact of including banks with sustainable finance in portfolios and how their capital influenced investment decisions. The results demonstrated the significant role of institutional ownership in the relationship between variables.

The subsequent sections are organized as follows: Section 2 comprises the literature review and hypothesis development, Section 3 covers the research methodology and data, Section 4 presents the results, Section 5 explains the discussion, and Section 6 outlines the conclusion.

2. Literature Review and Hypothesis Development

The literature review of this paper was categorized into four parts: the first was related to the impact of sustainable finance on firm value; the second was associated with the issue of bank capital adequacy on firm value; the third was related to the influence of institutional ownership on the relationship between sustainable finance and bank capital adequacy on firm value; the forth covered the control variables.

2.1. Sustainable Finance on Firm Value

One of the significant milestones in promoting green finance was the Paris Agreement of 2015. According to (Desalegn et al. 2022), the adoption of the agreement marked the inception of growing interest in green finance. Sutherland (2020) defined this form of finance as a mechanism involving various financial institutions, both public and private, along with diverse asset categories such as green bonds, loans, funds, and others. All these instruments needed to adhere to environmentally friendly principles. Some authors (Xi et al. 2021), in addressing the relevant concepts within green finance, emphasize that environmental finance is a specific instrument intended to support environmental quality and manage environmental risk (White and Labatt 2002). Conversely, sustainable finance is a type of financial instrument that integrates considerations of environmental, social, and governance factors into investment decisions (Xi et al. 2021). This approach emphasizes long-term focus, directing more funding and investment toward sustainability-oriented projects and activities. Other studies related to sustainable finance, including the work of Xi et al. (2021), underscored its crucial role in advancing the objectives of the European Green Deal, with the aim of supporting green initiatives. Some authors (Desalegn et al. 2022) mentioned that the requirement of financing will range from USD 1.6 to 3.8 trillion annually until 2050. Addressing the gap to achieve sustainability goals, an estimated USD 2.5 trillion per year is needed (Monasterolo 2020). This gap can be potentially bridged through green instruments such as green loans, credits, and bonds. In the context of green bonds (Zenno and Aruga 2022) reported an increasing trend in green bond issuances since 2016. The study showed a greenium level of 0.47% in China, indicating its attractiveness within the financial market. The term "greenium" refers to the yield difference between green and conventional bonds (Zenno and Aruga 2022). However, (Deschryver and Mariz 2020) observed that the green bond market was exceeding demand and encountering a supply–demand imbalance. Some authors (Ehlers and Packer 2017) investigated the concept of greenium with green bond certificates in global capital markets, while (Lebelle et al. 2020) examined the market reactions to announcements of green bonds in various markets.

Investigations on green credit or sustainable finance remain relatively limited. Central banks, as regulators, are required to establish regulations pertaining to green credit in order to stimulate the adoption of this instrument. Some authors (Khudyakova and Urumov 2021) recommended that central banks and other non-bank financial regulators play a significant role in building foundational regulations supporting green finance. Other authors (Criscuolo and Menon 2015) asserted that the development of green financing required a continuous approach within the financial and monetary framework. This approach should enable environmental solutions through global solidarity and democratic economic governance to promote green financing.

Several studies utilized green credit as a proxy for financial instruments promoting sustainable development goals and environmental protection. These studies consistently

found a positive correlation between green credit and financial performance. Moreover, engagement in green credit activities fosters a favorable reputation for banks within the market. Sustainable finance is an integral aspect of ESG activities for firms that are typically listed in sustainability reports. One author (Buallay 2019) emphasized that sustainability reporting provided a contemporary perspective on developing future value related to business policies. Other authors (Melinda and Wardhani 2020) also discovered a significant correlation between the ESG performance of firms in the Asia region and firm value. This indicated that firms with stronger ESG tended to possess higher corporate value. Moreover, sustainable finance could contribute to the green innovation of the financial sector.

Caracuel and Ortiz de Mandojana (2013) demonstrated that green innovation had a correlation with firm financial performance. Sustainable finance is intrinsically linked to the sustainable performance of firms. Alareeni and Hamdan (2020) investigated the impact of sustainable performance on the financial market performance (Tobin Q) of firms listed on the US S&P 500. Their study showed that disclosure of sustainable performance as a whole, along with its individual components, positively affected enterprise market performance. Consequently, higher disclosure of sustainable performance led to better assessment by investors. Some authors (Chouaibi et al. 2020) found that sustainable performance had a positive influence on firm market performance, as proxied by Tobin Q. This further indicated that strong, sustainable performance enhanced firm value, and the subcomponent, including environmental, social, and governance aspects, positively affected firm value.

Studies relating sustainable finance to firm value in academic literature are limited. The current study employed an interaction model as a moderating variable. Institutional ownership played a significant role in this relationship, as it greatly influenced the firm direction in managing sustainable finance within the corporation. One author (Velte 2020), in investigating a similar topic, revealed the impact of sustainable performance on financial performance, with CEO power as a moderating variable. The results showed that the positive relationship between both variables was more prominent with the CEO power index. A strong CEO on the management board (considered to have a better influence on performance and (non) financial disclosure) could also strengthen the relationship. Sustainable financing was based on the annual report or sustainability reporting of the bank, which followed the GRI (Global Reporting Initiative) or other international reporting standards. Sustainable financing in this study was in the form of a financial portfolio, measured by comparing the amount of credit disbursed for business activities with the total credited by the bank. With regard to the above, the following hypothesis was formulated:

H1. *Sustainable financing has an impact on firm value.*

2.2. Bank Capital Adequacy Ratio on Firm Value

Several studies have examined the drivers of bank profitability, with (Oino 2017) specifically identifying two approaches for their exploration, namely the Structure–Conduct–Performance paradigm (SCP) and Persistence of Profit (POP). The SCP approach assumes that profitability is determined by market structural features such as concentration, the economics of scale, and entry and exit barriers (Slater and Olson 2002). POP, on the other hand, focuses on the time series behavior of profitability, suggesting that any temporary deviation of firm profitability from the market average quickly adjusts through entry and exit effects (John et al. 2004). Both approaches show entry and exit as key drivers of profitability. In the banking sector, there is a substantial barrier for both determinants due to the minimum capital and regulatory requirements of the company (Oino 2017), significantly affecting firm performance.

Petty and Gutherie (2020), investigating bank intellectual capital, identified it as one of the approaches for assessing and measuring intangible assets. Some other studies demonstrated that intellectual capital plays a crucial role in increasing firm values. Its effective management can enable firms to enhance financial performance (Khalique et al. 2015; Chowdhury et al. 2019). In terms of financial capital or the capital structure of banks,

Fraisse et al. (2017) posited that the BASEL II regulatory framework caused capital requirements to differ across banks and firms. Banks that increased the capital requirement ratio by 1 percentage point experienced a 10 percentage point reduction in lending (Fraisse et al. 2017). This indicated that when banks raise capital and regulatory requirements, they become susceptible to decreasing lending portfolios, impacting their performance negatively. In relation to firm value, specifically within the banking sector, capital is a key determinant of success in enhancing value. The Capital Adequacy Ratio (CAR) is employed by banking regulators to maintain an adequate level and assess the stability of the banking system against potential losses in bank management (Nazneen and Aspal 2014). Fordian (2017) discovered that the CAR influenced the price of banking stocks, while (Khan et al. 2020) demonstrated its impact on banking profitability. Moreover, (Mendy et al. 2023), investigating economic policy, capital adequacy, and profitability, found that banks could mitigate the impact of policy uncertainty on their economic performance and operations.

Capital, involving both financial and intellectual aspects, is a regulatory concern for regulators, as it holds significant systemic implications for the financial system. In the banking industry, this concept is captured by the term "capital adequacy ratio," a result of restructuring the existing capital structure to enhance resilience against widespread distress (Chioma et al. 2021). Regulators set minimum capital requirements to ensure banks can withstand financial distress. Sari et al. (2018) discovered that tier-1 capital had a negative impact on profitability while having no effect on firm performance. This indicated that banks maintaining and increasing tier-1 capital could limit loan portfolio expansion, subsequently impacting firm performance. These results signified that the market valued banks with strong capital structures to handle financial crises, as evident by high capital adequacy ratios or minimum capital requirements. Therefore, banks should continually review capital adequacy ratios to strengthen their capital structures for resilience during crises and in accordance with current economic conditions as prescribed by regulatory authorities (Chioma et al. 2021).

Studies have revealed that apart from enhancing bank performance, capital plays a crucial role in maintaining bank stability, particularly during crises. Some authors (Yakubu and Bunyaminu 2021), during the 2007–2009 crisis, revealed a positively significant impact of capital requirements on bank stability. However, the study showed that the effect of capital on stability was conditional under the current institutional quality. It also concluded that the stringent implementation of capital regulations was essential to ensure a healthy and stable banking sector in Sub-Saharan Africa. There was a crucial need to explore this variable in the ASEAN banking market, particularly among those engaging in sustainable finance rooted in environmental, social, and governance activities requiring substantial capital. The second hypothesis was formulated as follows.

H2. *CAR has an impact on firm value.*

2.3. Moderate Effect of Institutional Ownership of Sustainable Finance and Capital on Firm Value

Shareholders play a significant role in guiding management to achieve the vision and mission of the firm through the general annual meeting. After the Paris Agreement in 2015, shareholders directed the focus of management toward fulfilling commitments to combat climate change. To exert influence, shareholders require power during the annual meeting. Institutional ownership wields strong voting power to guide management in adhering to the commitments of the Paris Agreement. One author (Velte 2020), investigating a related domain, analyzed the impact of sustainable performance on financial performance by incorporating CEO power as a moderator. The results showed that the positive relationship between sustainable and financial performance was more prominent with a higher CEO power index. Moreover, a strong CEO within the management board (possessing greater influence on performance and (non)financial disclosure) enhanced the relationship between both variables.

Some authors (Mallorquí and Santana-Martín 2010) showed a direct and negative relationship between institutional ownership and firm value. Similarly, (Zhao et al. 2022) demonstrated that temporary institutional ownership tended to hinder green innovation within firms. This effect extended to financial and social benefits, often serving as a means to mitigate short-term risks. Internal shareholders and managers had a significant effect on sustainable performance (McCahery et al. 2016). Sustainable and responsible investment (SRI) has historically evolved into a mainstream investing strategy. Recent studies examined the relationship between institutional ownership and corporate sustainable performance, revealing two opposing views of the relationship. Although institutional ownership can improve firm performance by monitoring motivation, it can also cause a hindrance due to myopia motivations, particularly in terms of ESG corporate performance (Jia et al. 2022).

An area of existing literature that uses agency theory to examine the connection between institutional ownership and sustainable or ESG performance comes to conflicting conclusions. Investigating whether institutional ownership enhances sustainable finance and other sustainable components, such as capital structure, is crucial, particularly in the banking sector (Jia et al. 2022). Furthermore, the study mentioned that institutional ownership exhibited a strong ability to gather information and effectively monitor corporate governance, influencing decision making through members' resources and expertise. Therefore, the following hypotheses were formulated:

H3. *Institutional ownership moderates the effect of sustainable finance on firm value.*

H4. *Institutional ownership moderates the effect of capital adequacy on firm value.*

2.4. Conceptual Framework

The following conceptual framework was developed to illustrate our study. In constructing this framework, firm value was adopted as the dependent variable. The initial independent variable employed was sustainable finance (SR), which measured the quantity of the finance in a bank portfolio. The Capital Adequacy Ratio (CAR) was the second independent variable, while institutional ownership served a moderating role. The three variables of profitability, employed ROE (Return on Equity), ROA (Return on Assets), and banking size, were used to re-examine their impact on firm value. Below Figure 1 is the model which visually represents the concept.

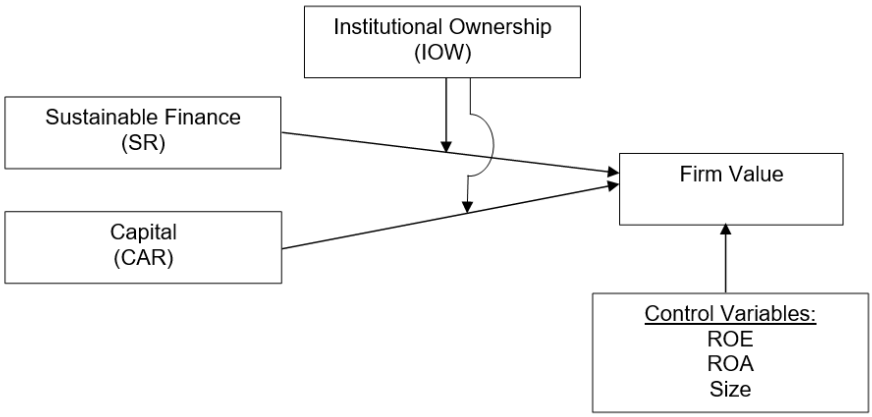

Figure 1. Conceptual framework. Source: Constructed by the authors.

3. Materials and Methods

3.1. Data

This study was based on secondary data collected during the period 2015–2021. The selected timeframe was of particular interest due to a significant event, namely the COVID-19 outbreak. The analysis employed secondary data, comprising financial data sourced from financial and audited sustainability reports published by firms, as well as stock prices extracted from Yahoo Finance database. The financial and sustainability reports were

accessed through stock exchange and other relevant platforms. A concise description of each variable of concern is presented in Table 1 below.

Table 1. List of variables.

SN	Variables	Type	Code	Definition	Cititations
1	Firm Value	DV	FV	Market value of the company's assets divided by replacement cost of the company's assets (Tobin's Q)	(Fiakas 2005)
2	Sustainable Finance	IV	SF	Credit disbursed for sustainable business activities divided by the total credit disbursed by the bank	(GRI n.d.)
3	Institutional Ownership	IV	IOW	Percentage of institutional ownership	(Siew et al. 2016)
4	SFXIOW	MV	SFXIOW	-	
5	CAR	IV	CAR	The capital (Tier 1,2) of the bank divided by risk-weighted assets	(Basel Committee on Banking Regulation 2011)
6	CARXIOW	MV	CARXIOW	-	
7	ROE	CV	ROE	Net income divided by total equity	(Ross et al. 2016)
8	ROA	CV	ROA	Net income divided by total assets	(Ross et al. 2016)
9	SIZE	CV	SIZE	Log of firm size	(Melinda and Wardhani 2020)

Source: constructed by the authors.

3.2. Methods/Methodology

This study adopted an explanatory approach through a quantitative method. A non-probability sampling approach was employed, and purposive sampling was specifically used to gather relevant data samples. Purposive sampling entails the deliberate selection of sampling units within a population segment with the most pertinent information on the characteristics of interest (Guarte and Barrios 2006). The secondary data collected from the period 2015–2021 served as the basis for this study.

Based on predetermined selection criteria, a balanced panel data set was compiled for 12 banks spanning the years 2015–2021 (Table 2). These commercial banks were situated in Indonesia, Malaysia, the Philippines, Singapore, and Thailand (Table 3). The finalized sample size that met the criteria for seven consecutive years was 84. The data subsequently underwent panel and assumption classic tests before being subjected to regression analysis. Data processing and calculations were conducted on the sample using Microsoft Excel and Eviews 10.

Table 2. Selection of study samples.

No.	Criteria of Sample	Total
1	Banks listed on the stock exchange in ASEAN countries in the period 2015–2021.	121
2	Banks with no consistent sustainability score from the Bloomberg website in the period 2015–2021.	−87
3	Banks with no sustainable green financing in the period 2015–2021.	−22
	Total sample (Perusahaan)	12
	Total sample (years)	7
	Total sample (12 × 7)	84

Source: constructed by the authors.

Data selection

Table 3. Company list data selection.

No	Code	Bank Name	Country
1	BNI	PT. Bank Negara Indonesia Tbk	Indonesia
2	BCA	PT. Bank Central Asia Tbk	Indonesia
3	BRI	PT. Bank Rakyat Indonesia Tbk	Indonesia
4	BMRI	PT. Bank Mandiri Tbk	Indonesia
5	BDMN	PT. Bank Danamon Indonesia Tbk	Indonesia
6	CIMB	CIMB Group Holdings	Malaysia
7	BDO	BDO Unibank Inc	Philippines
8	BPI	Bank of The Philippines Islands	Philippines
9	PNB	Philippines National Bank	Philippines
10	DBS	DBS Group Holdings	Singapore
11	BAY	Bank Ayudhya	Thailand
12	KBANK	Kasikorn Bank	Thailand

Source: constructed by the authors.

3.3. Model Specification

A panel data model (PDM) was used to facilitate the analysis conducted. Panel data analysis possesses attributes of both cross-sectional and time-series (Baltagi 2008). PDM offers a broader dataset for investigation compared to other cross-sectional or time-series analyses (Agarwal et al. 2023).

The model specifications are presented as follows:

Model 1.

$$FV = \alpha + \beta_1 SF_{it} + \beta_2 SF * IOW_{it} + \beta_3 ROE_{it} + \beta_4 ROA + \beta_5 Size + \varepsilon$$

Model 2.

$$FV = \alpha + \beta_1\ CAR_{it} + \beta_2 CAR * IOW_t + \beta_3 ROE_{it} + \beta_4 ROA + \beta_5 Size + \varepsilon$$

where FV denotes fair value and is a dependent variable, and α represents constant term. SF denotes sustainable finance, and CAR stands for capital adequacy ratio, both of which are independent variables. $SF * IOW$ and $CAR * IOW_t$ represent the interaction term, where IOW as institutional ownership is considered a moderating variable. The other terms in this model include ROE, ROA, and Size as control variables. Lastly, ε is denoted as an error term.

4. Results

4.1. Descriptive Analysis and Correlation

Descriptive statistics and correlational values of the variables applied in the study are presented in Tables 4 and 5, respectively. FV had an average value of 104.28 and a standard deviation of 16.52. The mean value of SF was 9.93, accompanied by a standard deviation of 13.82, indicating relatively low expenditures on sustainable financing aspects. The mean value of IOW was 71.12, with a standard deviation of 17.94, indicating a high institutional ownership composition within each bank. SFXIOW had a mean and standard deviation of 6.65 and 8.95, respectively.

Table 4. Descriptive statistics.

Variables	Mean	Standard Deviation	Min	Max
FV	104.28	16.52	87.75	168.61
SF	9.93	13.82	0	65.1
IOW	71.12	17.94	43.2	97.33
SFXIOW	6.65	8.95	0	36.26
CAR	18.34	3.48	12.4	26.7
CARXIOW	13	3.92	6.84	24.69
ROE	10.76	4.27	1.21	22.66
ROA	1.47	0.71	0.2	3.13
SIZE	3056	317	2684	3508

Note: Mean, standard deviation, minimum and maximum value.

Table 5. Correlation matrix table.

Variables	FV	SF	SFXIOW	CAR	CARXIOW	ROE	ROA	SIZE
FV	1							
SF	0.272	1						
SFXIO	0.182	0.958	1					
CAR	0.589	0.397	0.391	1				
CARXIO	0.031	0.092	0.243	0.533	1			
ROE	0.59	0.046	−0.005	0.259	−0.14	1		
ROA	0.749	0.186	0.135	0.563	−0.003	0.759	1	
SIZE	0.599	0.504	0.517	0.754	0.261	0.45	0.687	1

Note: 0.05 represents a significant correlation coefficient.

A mean value of 18.34 was recorded for CAR, accompanied by a standard deviation of 3.48. CARXIOW had a mean and standard deviation of 13.00 and 12.40, respectively.

In the correlation matrix, significant correlations were indicated by values below 0.80. Multicollinearity was addressed within all significant variable pairs.

Table 6 shows that all the variables have values lower than 0.10, indicating the absence of multicollinearity issues. The correlation matrix revealed crucial relationships between the main variables.

Table 6. Variance in the inflation factor value.

Variable	VIF	Variable	VIF
SF	1.097	CAR	1.009
SFXIO	1.212	CARXIO	1.334
ROE	4.228	ROE	4.394
ROA	4.152	ROA	4.197

4.2. Normality Test

Figures 2 and 3, respectively, show probability values of 0.42 and 0.15, both exceeding 0.5. This suggested the data distribution was normal.

4.3. Heteroskedasticity Test

Tables 7 and 8 show the results of tests conducted, revealing significance values of >0.05 for all variables. This indicated the regression model no longer contains symptoms of heteroskedasticity.

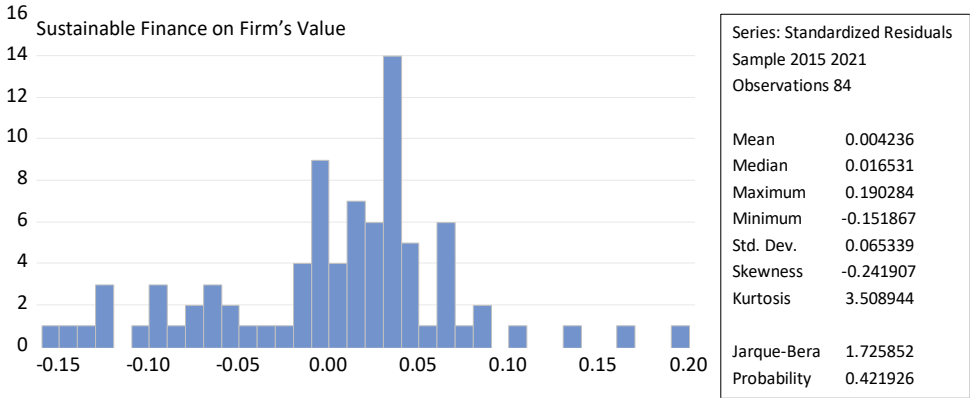

Figure 2. Normality test of the effect of sustainable finance on firm value.

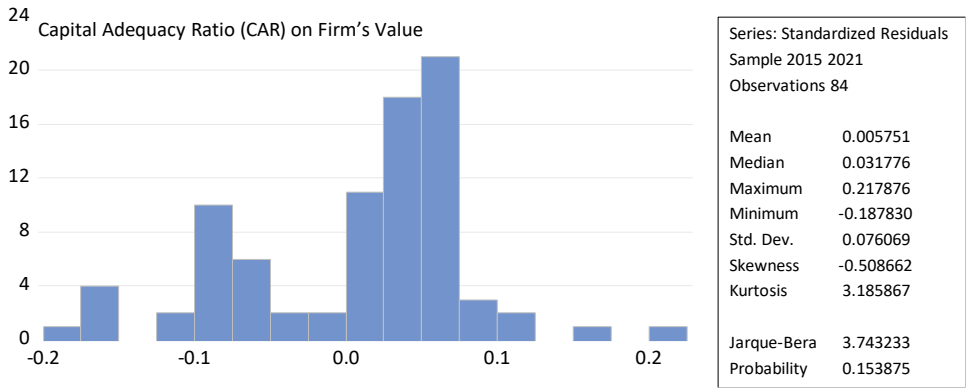

Figure 3. Normality test of the effect of Capital Adequacy Ratio (CAR) on firm value.

Table 7. Heteroscedasticity test results of sustainable finance and firm value using institutional ownership as a moderating variable.

Variable	Coefficient	*p* Value
C	−5.588838	0.439
SF	0.001718	0.9857
SFXIOW	−0.11373	0.4357
ROE	0.147344	0.5336
ROA	−1.64465	0.3264
SIZE	0.003795	0.1505

Note: represent at 0.05 a significant correlation coefficient.

Table 8. Heteroscedasticity test results comparing CAR and firm value using institutional ownership as a moderating variable.

Variable	Coefficient	*p* Value
C	−1.319057	0.9014
CAR	−0.046124	0.925
CARXIOW	−0.230766	0.2658
ROE	−0.263343	0.4439
ROA	−0.751682	0.802
SIZE	0.005413	0.1777

Note: 0.05 represents a significant correlation coefficient.

4.4. Estimation Selection Test

The estimation selection tests were conducted using the Chow and Hausman tests (Yaffee 2003). Both tests for independent variables yielded a probability value of 0.000. This indicated that the Fixed Effect Model was the most appropriate for this study.

4.5. Regression (Result of Models 1 and 2)

Regression analysis of panel data includes a structure known as panel data. Typically, parameter estimation in regression analysis with cross-sectional data is achieved using the Ordinary Least Square (OLS) method. The result of estimation is referred to as the Best Linear Unbiased Estimation (BLUE) in panel data regression. After conducting classical assumption tests, the obtained results indicated normal data distribution, absence of autocorrelation, multicollinearity, and heteroscedasticity symptoms.

The relationship between FV (dependent variable) and SF (explanatory variable) was examined in model 1, as shown in Table 8. Both Chow and Hausman tests were conducted to determine the most suitable estimation test. These tests yielded significant results with values less than 0.05, indicating compatibility with the fixed effect model.

Table 9 shows that the R2-adjusted value was 0.73 or 73%. This indicated the independent variable could explain 73% of the variance in the dependent variable, while the remaining 27% was accounted for by variables beyond the scope of this study. The Prob (F-statistic) test showed a value of 0.000, which was <0.5 (5%), indicating the independent variables collectively had a significant impact on the dependent variable. This confirmed the feasibility of the study model for testing hypotheses. The t test revealed that sustainable financing exhibited a positive coefficient value and a probability value of 0.000, indicating its significance at the 5% level. This was in accordance with (Chouaibi et al. 2020), demonstrating that a higher level of green innovation intensity led to improved access to financial resources and enhanced market performance. Therefore, sustainable finance was one of the most proactive approaches for boosting firm value, signifying the acceptance of H1. SFXIOW showed a negative coefficient and a probability value of 0.0000. This indicated that institutional ownership moderated the effect of sustainable financing on firm value, in line with (Calza et al. 2016) and (Velte 2020), signifying the acceptance of H3. Institutional ownership weakened the effect of sustainable finance on firm value.

Table 9. Regression results of sustainable finance and firm value using institutional ownership as a moderating variable.

Variable	Coefficient	*p* Value
C	46.93172	0.0001
SF	0.671225	0.0000 **
SFXIOW	−0.991779	0.0000 **
ROE	−0.566035	0.0089 **
ROA	14.18658	0.0000 **
SIZE	0.013899	0.0008 **
N	84	
R^2 Adjusted	0.738804	
Prob(F-statistic)	0.0000	

Note: 0.05 represents a significant correlation coefficient ($p < 0.05$) **.

Table 10 shows that the R2-adjusted value was 0.72 or 72%. This indicated that the independent variable could explain 72% of the variance of the dependent variable, with the remaining 28% being accounted for by variables beyond the scope of this study. The Prob (F-statistic) test yielded a value of 0.0000, which was <0.5 (5%), confirming the independent variables collectively influenced the dependent variable. These results underscored the feasibility of the study model for testing the hypothesis. The t test revealed that the CAR exhibited a positive coefficient and a probability value of 0.000, indicating its significance at the 5% level. These results were in line with (Nazneen and Aspal 2014), (Fordian 2017), (Khan et al. 2020), and (Brastama and Yadnya 2020), collectively proving that the Capital Adequacy Ratio (CAR) was employed by regulatory bodies to ensure banks maintained adequate capital levels. This was also carried out to assess the soundness of the banking system against potential losses, signifying the acceptance of H2. CARXIOW, on the other hand, showed a probability value of 0.3482, suggesting

institutional ownership did not moderate the effect of the Capital Adequacy Ratio on firm value. While this was not supported by (Guo and Platikanov 2019), it was in line with (Raharjo and Muhyasrsyah 2021), resulting in the rejection of H4. The control variables ROE, ROA, and SIZE showed probabilities of <5%, indicating their effect on firm value.

Table 10. Regression results of CAR and firm value using institutional ownership as a moderating variable.

Variable	Coefficient	*p* Value
C	46.57976	0.0001
CAR	1.170024	0.0028 **
CARXIOW	−0.275292	0.3482
ROE	−0.421481	0.0911
ROA	12.85669	0.0000 **
SIZE	0.008318	0.0469 **
N	84	
R^2 Adjusted	0.721139	
Prob(F-statistic)	0.0000	

Note: 0.05 represents a significant correlation coefficient ($p < 0.05$) **.

4.6. Robustness of the Results

The Wald test was conducted to examine endogeneity in the study. The test yielded significant *p*-values of 0.000 (<0.05). Therefore, the robustness of the results of both models was confirmed, as the tests showed that the null hypothesis of no endogeneity was not rejected.

5. Discussion

The main goal of this study was to assess the implementation of sustainable finance and capital structure to firm value in the banking sector in the ASEAN region. The banking sector, as a financial intermediary, will take the lead in disbursing sustainable finance, whereas this supports sustainable activities in all sectors. Banking aims to implement sustainable finance in alliance with the stakeholder objectives and in compliance with the government's framework principles. Sustainable finance leads to a sustainable portfolio in the long run. Furthermore, the banks that lend credit in this instrument engage in ESG activities in their operation; hence, it improves their image in the market. On the other hand, to be able to finance sustainable financial instruments, banks need to have ample capital. Capital, known as capital regulation, is one of the main financial parameters of the banks, and it is important to manage. It is therefore necessary for management to understand the effect of sustainable finance and capital on firm value.

This study's finding supported the first hypothesis (H1), confirming sustainable finance significantly influenced firm value. It also implied that banks with sustainable finance in their portfolio had an impact on firm value. This could be attributed to the bank's emphasis on both financial and sustainable performance based on ESG principles. Banks were better positioned for long-term sustainability, leading to improved asset value and increased demand for their stocks in the market, ultimately influencing firm value.

The preceding research supporting this study was Lai et al. (2022), which showed that green credit significantly improved new energy companies' economic benefits. Moreover, their study suggested that this impact can last over the long term. The study findings by Chouaibi et al. (2020) also support our findings. These authors explored the relationship between sustainable performance, firm value, and the role of green innovation and identified a significant positive relationship between the intensity of green innovation in firms and both sustainable and financial performance. These results were further supported by (Melinda and Wardhani 2020), who investigated the impact of sustainable activities, proxied by the ESG proxy score, on firm value.

This study indicated that a higher proportion of sustainable finance within a bank portfolio elicited positive responses from investors, leading to an increased firm value. This was in line with signal theory (Spence 1973), wherein firms transmitting positive signals, such as sustainable finance, to investors prompted them to respond by purchasing shares. This action could boost the market and firm values.

Banks in each ASEAN country engaged in sustainable finance practices as part of their commitment to the Paris Agreement (2015), with the aim of reducing global warming by 2 °C. Encouraged by these commitments, banks offered sustainable finance to debtors, guided by principles that were in accordance with environmental, social, and good governance. This underscored the focus of the bank on sustainable finance, contributing to its ongoing operational sustainability and enhanced firm value.

The acceptance of the second hypothesis (H2) demonstrated that the Capital Adequacy Ratio (CAR) significantly influenced firm value. In the banking sector, capital serves as a fundamental source of funding, dictating both financial stability and performance. The proxy for bank capital, the CAR, determines the capacity of the bank in relation to risk assets and current liabilities. A higher CAR signifies stronger financial stability, subsequently impacting firm value. Investors tend to react positively when the CAR surpasses the regulatory threshold, as this indicates the ability of the bank to expand its credit portfolio and withstand risk-weighted assets.

This study was in line with (Nazneen and Aspal 2014), Fordian (2017), (Khan et al. 2020), and Brastama and Yadnya (2020), collectively demonstrating that the CAR was used by banking regulators to establish capital adequacy levels and assess the robustness of the banking system against potential losses in management.

The results were also consistent with banking policies positively implementing capital adequacy in accordance with BASEL III. According to these guidelines, banks were required to maintain a minimum CAR of 8%. This ratio, measuring bank capital in relation to risk-weighted assets, aimed to bolster strong capitalization and enhance the financial resilience of banks worldwide, enabling them to withstand economic and financial shocks, such as the global recession of 2008. A well-capitalized bank is more capable of enduring episodes of financial stress in the broader economy (Basel Committee on Banking Regulation 2011). As a result, banks with robust capital adequacy tend to elicit positive responses from investors. This phenomenon also aligned with the principles of signal theory (Spence 1973), where investors reacted to indications of strong banking capital by increasing the firm value.

The third hypothesis (H3) was supported by the results, as institutional ownership strengthened the relationship between sustainable finance and firm value. This could be attributed to the institutional ownership recognizing the benefit of incorporating sustainable finance in the credit portfolio. As a result, they influenced bank management to increase the proportion of sustainable finance. Several benefits underscored the support of institutional ownership: *Firstly*, it enhanced both financial and operational performance, ensuring long-term sustainability. *Secondly*, it was in accordance with the global agreement to combat climate change and reduce global warming by 2 °C, enhancing the reputation of the bank in the market. *Thirdly*, it complied with the government's regulatory framework focused on sustainability, avoiding potential administration fines. *Fourthly*, it improved the ESG performance of the bank. Finally, by combining these benefits, demand for the bank's shares in the capital market increased, augmenting the firm value.

This study was in line with (Alipour 2013), demonstrating the influence of institutional ownership on firm value. The rationale behind the third hypothesis, where institutional ownership weakened the effect of sustainable finance on firm value, lay in the higher costs associated with distributing sustainable finance compared to commercial finance. Consequently, institutional investors might display less interest in sustainable finance, prompting them to encourage firms to reduce allocation toward this form of finance.

The fourth hypothesis (H4), however, had been rejected, as the results indicated institutional ownership did not enhance the relationship between the CAR and firm value. This signified that the regulation and oversight of capital adequacy was primarily the

responsibility of regulators and central banks. Therefore, institutional ownership might not exert additional influence on bank management, since it is already highly regulated. Regulatory bodies and central banks were well-equipped to monitor and enforce the capital adequacy threshold, alerting the management to take action when their capital fell below the mandated minimum. This regulatory aspect served as both a standard practice for bank operations and a direct key performance indicator. Consequently, institutional ownership might not play a significant moderating role in the relationship between capital and firm value.

According to BASEL III guidelines, the minimum threshold for bank capital was 8%. Should a bank fail to meet this requirement, it was mandated to secure additional capital from its owner. As such, there was little resistance from owners to contribute capital as it was a compulsory condition under BASEL III. In cases where the existing owner lacked the necessary funds, the bank might need new owners/investors to inject capital, potentially reducing the portion of existing ownership. These results were not in line with the results of (Brastama and Yadnya 2020), which established a relationship between CAR and firm value, with financial performance acting as a mediator.

The results from the tested control variables, namely ROA, ROE, and SIZE, showed their significance and impact on firm value. This could be attributed to ROA and ROE reflecting the profitability performance of the bank, where better ROA and ROE values corresponded to increased firm value. The significance of SIZE on firm value could be attributed to the fact that a larger bank size led to higher financial performance and the interest income generated from the larger asset base.

6. Conclusions

In conclusion, this study aimed to investigate the effects of sustainable finance and the Capital Adequacy Ratio (CAR) on firm value in banks listed on the stock exchange in ASEAN for the period 2015–2021. Meanwhile, there have been limited studies in the field of sustainable finance and its impact on firm value; the implementation of sustainable finance has gained prominence in response to the Paris Agreement (2015), emphasizing the commitment of global stakeholders to climate change and various environmental (E), Social (S), and Governance (G) activities. Sustainable finance, in line with this commitment, played a crucial role in achieving targets such as keeping the global temperature rise below 2^0 above its pre-industrial level and even striving for a maximum 1.5 °C increase. Fulfilling these goals required substantial investment in sustainable finance, while investors also demanded profitability in their investments. Consequently, the value of firms was significantly influenced by their engagement in sustainable finance. In order to facilitate disbursement toward this form of finance, management needed to have ample capital on their balance sheet. This resulted in a delicate balance for management as they navigated the dual challenge of fostering sustainable finance and maintaining an optimal capital structure, with corporate performance feeling the impact (Khan et al. 2020). Investors, guided by sustainable principles, played a crucial role in guiding firms toward managing sustainable finance and capital allocation effectively.

The following conclusions were drawn from this study: (1) Sustainable finance significantly affected firm value, indicating the acceptance of the first hypothesis, which was consistent with (Chouaibi et al. 2020). (2) The Capital Adequacy Ratio (CAR) affected firm value, indicating the acceptance of the second hypothesis, which was in line with (Nazneen and Aspal 2014), (Fordian 2017), (Khan et al. 2020), and (Brastama and Yadnya 2020). (3) Institutional ownership moderated the relationship between sustainable finance and firm value, signifying acceptance of the third hypothesis, which was consistent with (Calza et al. 2016) and (Velte 2020), (4) Institutional ownership did not moderate the effect of the Capital Adequacy Ratio (CAR) on firm value, leading to the rejection of the fourth hypothesis, which was not in line with (Guo and Platikanov 2019), but consistent with (Raharjo and Muhyasrsyah 2021). (5) Control variables ROE, ROA, and SIZE all affected firm value.

This study aimed to bridge the knowledge gap by comprehensively understanding the implementation of sustainable finance in the balance sheet of a bank and its impact on firm value. Recognizing that banks required capital to finance their operations necessitated its exploration in enhancing firm value. The results hold great importance as they contribute to the existing literature. This study was further enriched by adopting an interaction model, incorporating institutional ownership as a moderator. Moreover, it offers valuable insights to management, emphasizing the dual imperatives of increasing sustainable finance in the portfolio to augment firm value while also effectively managing capital requirements to facilitate sustainable finance and comply with regulatory standards to increase value. This study contributes novel knowledge concerning the preference for institutional ownership. These results show that investors were keen on imploring management to increase sustainable finance practices, recognizing its potential to elevate firm value. These insights were particularly valuable for fund managers, as they could consider reprofiling portfolios from conventional to sustainable in composition. While this study delved into essential aspects, some limitations are still acknowledged, necessitating the recommendation of future investigations to include more data periods.

Author Contributions: Conceptualization, M.R.P.; formal analysis, R.R.; Methodology, K.R.; writing, M.R.P.; supervision, A.S. All authors have read and agreed to the published version of the manuscript.

Funding: This study received no external funding.

Data Availability Statement: This study uses data from both subscribed and public databases.

Conflicts of Interest: The authors declare no conflict of interest.

References

Agarwal, Bhakti, Rahul Singh Gautam, Pooja Jain, Shailesh Rastogi, Venkata Mrudula Bhimavarapu, and Saumya Singh. 2023. Impact of Environmental, Social, and Governance Activities on the Financial Performance of Indian Health Care Sector Firms: Using Competition as a Moderator. *Journal of Risk and Financial Management* 16: 109. [CrossRef]

Alareeni, Bahaaeddin Ahmed, and Allam Hamdan. 2020. ESG impact on performance of US S&P 500-listed firms. *Corporate Governance* 20: 1409–28.

Alipour, Mohammad. 2013. An investigation of the association between ownership structure and corporate performance: Empirical evidence from Tehran Stock Exchange TSE. *Management Research Review* 11: 1137–66. [CrossRef]

Baltagi, Badi H. 2008. *What Is Econometrics?* Berlin and Heidelberg: Springer, pp. 3–11.

Basel Committee on Banking Regulation. 2011. Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems. Available online: https://www.bis.org/publ/bcbs189.htm (accessed on 10 February 2023).

Berthelot, Sylive, Michel Coulmont, and Vanessa Serret. 2012. Do Investors Value Sustainability Reports? A Canadian Study. *Corporate Social Responsibility and Environmental Management* 19: 355–63. [CrossRef]

Brastama, Reyhan Farras, and I. Putu Yadnya. 2020. The Effect of Capital Adequacy Ratio and Non Performing Loan on Banking Stock Prices with Profitability as Intervening Variable. *American Journal of Humanities and Social Sciences Research AJHSSR* 412: 43–49.

Buallay, Amina. 2019. Is Sustainability Reporting ESG Associated with Performance? Evidence from the European Banking Sector. *Management of Environmental Quality* 30: 98–115. [CrossRef]

Calza, Francesco, Giorgia Profumo, and Ilaria Tutore. 2016. Corporate Ownership and Environmental Proactivity. *Business Strategy and the Environment* 255: 369–89. [CrossRef]

Caracuel, Javier Aguilera, and Natalia Ortiz de Mandojana. 2013. Green Innovation and Financial Performance: An Institutional Approach. *Sage Journals* 26: 365–85.

Chioma, Anetoh Vivian, Nwadialor Eugene Okoye, Anetoh John Chidume, and Okeke Goodfaith Nnenna. 2021. Assessing the effect of Capital Adequacy Ratio and Liquidity Risk Management on Firm Value of Deposit Money Banks in Nigeria. *African Journal of Accounting and Financial Research* 4: 33–49.

Chouaibi, Salim, Jamel Chouaibi, and Matteo Rossi. 2020. ESG and corporate financial performance: The mediating role of green innovation: UK common law versus Germany civil law. *EuroMed Journal of Business* 17: 46–71. [CrossRef]

Chowdhury, Leena Afroz Mostofa, Tarek Rana, and Mohammad Istiaq Azim. 2019. Intellectual capital efficiency and organisational performance: In the context of the pharmaceutical industry in Bangladesh. *Journal of Intellectual Capital* 20: 784–806. [CrossRef]

Climate Bond Initiative (CBI). 2020. Sustainable Debt Global State of the Market 2020. Available online: https://www.climatebonds.net/files/reports/cbi_sd_sotm_2020_04d.pdf (accessed on 10 February 2023).

Criscuolo, Chiara, and Carlo Menon. 2015. Environmental policies and risk finance in the green sector: Cross-country evidence. *Energy Policy* 83: 38–56. [CrossRef]

Desalegn, Goshu, Maria Fekete-Farkas, and Anita Tangl. 2022. The Effect of Monetary Policy and Private Investment on Green Finance: Evidence from Hungary. *Journal of Risk and Financial Management* 15: 117. [CrossRef]
Deschryver, Pauline, and Frederic De Mariz. 2020. What Future for Green Bond Market? How Policymakers, Companies, and Investors Unlock the Potential of the Green Bond Market? *Journal of Risk and Financial Management* 13: 61. [CrossRef]
Ehlers, Torsten, and Frank Packer. 2017. Green bond finance and certification. *BIS Quarterly Review*, September 17.
Fiakas, Debra. 2005. *Tobin'sq: Valuing Small Capitalization Companies*. New York: Cristal Equity Research.
Fordian, Dian. 2017. Pengaruh CAR, LDR, dan EPS terhadap harga saham: Studi pada bank BUMN yang listing di BEI periode 2012–16. *Jurnal Bisnis Darmajaya* 3: 27–38.
Fraisse, Henri, Mathias Le, and David Thesmar. 2017. The real effects of bank capital requirements. *Management Science* 66: 5–23. [CrossRef]
Global Reporting Initiative (GRI). n.d. Available online: https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/ (accessed on 10 May 2023).
Green Finance Action Plan. 2020. Available online: https://www.mas.gov.sg/-/media/MAS/News/Media-Releases/2020/MAS-Green-Finance-Action-Plan.pdf (accessed on 2 October 2023).
Guarte, Jacqueline M., and Erniel B. Barrios. 2006. Estimation under purposive sampling. *Communications in Statistics: Simulation and Computation* 35: 277–84. [CrossRef]
Guideline on Sustainable and Responsible Investment Fund. 2017. Available online: https://www.sc.com.my/api/documentms/download.ashx?id=82073d55-faac-43e6-b43e-45abc234baed (accessed on 10 May 2023).
Guo, Lin, and Stefan Platikanov. 2019. Institutional Ownership and Corporate Governance of Public Companies in China. *Pacific-Basin Finance Journal* 57: 101180. [CrossRef]
Jia, Fang, Yanyin Li, Lihong Cao, Lintong Hu, and Beibei Xu. 2022. Institutional Shareholders and Firm ESG Performance: Evidence from China. *Sustainability* 14: 14674. [CrossRef]
John, Goddard, Phil Molyneux, and John O. S. Wilson. 2004. The profitability of European banks: A cross-sectional and dynamic panel analysis. *The Manchester School* 72: 363–81.
Khalique, Muhammad, Nick Bontis, Jamal Abdul Nassir bin Shaari, and Abu Hassan Md. Isa. 2015. Intellectual capital in small and medium enterprises in Pakistan. *Journal of Intellectual Capital* 16: 224–38. [CrossRef]
Khan, Shoaib, Usman Bashir, and Md. Saiful Islam. 2020. Determinants of capital structure of banks: Evidence from the Kingdom of Saudi Arabia. *International Journal of Islamic and Middle Eastern Finance and Management*, 268–85. [CrossRef]
Khudyakova, Lyudmila S., and Timur R. Urumov. 2021. "Green" Finance in Brics Countries. *Mirovaya Ekonomika I Mezhdunarodnye Otnosheniya* 65: 79–87. [CrossRef]
Kyoto Protocol to the United Nations Framework Convention on Climate Change. 1998. United Nation. Available online: https://unfccc.int/resource/docs/convkp/kpeng.pdf (accessed on 10 May 2023).
Lai, Xiaobing, Shujing Yue, and Hongtao Chen. 2022. Can green credit increase firm value? Evidence from Chinese listed new energy companies. *Environmental Science and Pollution Research* 29: 18702–20. [CrossRef]
Lebelle, Martin, Souad Lajili Jarjir, and Syrine Sassi. 2020. Corporate green bond issuances: An International evidence. *Journal of Risk and Financial Management* 13: 25. [CrossRef]
Lin, Kate. 2022. Asia ESG Indexes Outperform in 2021. Available online: https://www.morningstar.hk/hk/news/219313 (accessed on 10 May 2023).
Loan Syndication and Trading Association. 2023. Sustainable Linked Loan Principles. Available online: https://www.lsta.org/content/sustainability-linked-loan-principles-sllp/ (accessed on 10 May 2023).
Malaysian Sustainable Finance Initiative. 2020. Available online: https://www.msfi.com.my/ (accessed on 10 May 2023).
Mallorquí, María Victoria Ruiz, and Domingo J. Santana-Martín. 2010. Dominant institutional owners and firm value. *Journal of Banking & Finance* 35: 118–29.
Manisa, Dea Eka, F. Defung, and Muhammad Amin Kadafi. 2017. Pengaruh Pengungkapan Sustainability Report terhadap Kinerja Keuangan Perusahaan Infrastruktur yang Terdaftar di Bursa Efek Indonesia. *Jurnal Ekonomi Manajemen dan Akuntansi* 19: 174. [CrossRef]
McCahery, Joseph A., Zacharias Sauther, and Laura T. Starks. 2016. Behind the Scenes: The Corporate Governance Preferences of Institutional Investors. *The Journal of Finance* 71: 2905–32. [CrossRef]
Melinda, Anna, and Ratna Wardhani. 2020. The Effect of Environmental, Social, Governance, and Controversies on Firms' Value: Evidence from Asia. *Advanced Issues in the Economics of Emerging Markets* 27: 147–73.
Mendy, L. Lesse, Sheng Yung Yang, and Wei Zhong Shi. 2023. Economic Policy Uncertainty, Bank Capital Adequacy, and Bank Profitability. *Advances in Pacific Basin Business, Economics and Fiannce* 1: 127–43.
Monasterolo, Irene. 2020. Climate Change and the Financial system. *Annual Review of Resource Economic* 12: 299–320. [CrossRef]
Nandy, Monomita, and Suman Lodh. 2012. Do banks value the eco-friendliness of firms in their corporate lending decision? Some empirical evidence. *International Review of Financial Analysis* 25: 83–93. [CrossRef]
Nazneen, Afroze, and Parvesh Kumar Aspal. 2014. An Empirical Analysis of Capital Adequacy in the Indian Private Sector Banks. *America Journal of Research Communication* 2: 28–42.
Oino, Isaiah. 2017. Impact of regulatory capital on European Banks Financial Performance: A review of post global financial crisis. *Research in International Business and Finance* 44: 309–18. [CrossRef]

Paris Agreement. 2015. United Nations. Available online: https://unfccc.int/sites/default/files/english_paris_agreement.pdf (accessed on 2 October 2023).
Petty, Richard, and James Gutherie. 2020. Intellectual capital literature review: Measurement, reporting and management. *Journal of Intellectual Capital*, 155–76. [CrossRef]
Raharjo, Andhika Agus, and dan Muhyasrsyah. 2021. The Impacts of Institutional Ownership, Leverage and Firm Size to Firm Value with Profitability as a Moderation Variable. *International Journal of Business, Economics and Law* 24: 184–94.
Ross, Stephen, Randolph Westerfield, and Bradford Jordan. 2016. *Fundamentals of Corporate Finance*, 11th ed. New York: Irwin McGraw-Hill.
Sari, Erna, Suhadak, Sri Mangesti Rahayu, and Solimun. 2018. The effects of Tier-1 capital, risk management, and profitability on performance of Indonesian Commercial Banks. *International Journal of Law and Management* 60: 1074–86. [CrossRef]
Siew, Renard, Maria C.A. Balatbat, and David. G. Carmichael. 2016. The impact of ESG disclosures and institutional ownership on market information asymmetry. *Asia-Pacific Journal of Accounting and Economics* 23: 1–17. [CrossRef]
Slater, F. Stanley, and Eric M. Olson. 2002. A fresh look at industry and market analysis. *Business Horizons* 45: 15–22. [CrossRef]
Spence, Michael. 1973. Job Markets Signaling. *Quarterly Journal of Economics* 87: 355–74. [CrossRef]
Sutherland, Brando R. 2020. Financing a Green New Deal. *Joule* 4: 1153–55. [CrossRef]
Swarnapali, R. M. Nayana Chandani. 2020. Consequences of Corporate Sustainability Reporting: Evidence from An Emerging Market. *International Journal of Law and Management* 62: 243–65. [CrossRef]
Twidell, John, and Courtenay Cabot. 2003. Sustainable Finance and Banking–The financial sector and the future of the planet. *Environmental Science and Policy* 6: 191. [CrossRef]
Velte, Patrick. 2020. Does CEO power moderate the link between ESG performance and financial performance? A focus on the German two-tier system. *Management Research Review* 43: 497–520. [CrossRef]
White, Rodney, and Sonia Labatt. 2002. *Environmental Finance: A Guide to Environmental Risk Assessment and Financial Products*. New York: Wiley and Sons.
Xi, Bin, Yaran Wang, and Mingqian Yang. 2021. Green credit, green reputation, and corporate financial performance: Evidence from China. *Environmental Science and Pollution Research* 29: 2401–19. [CrossRef] [PubMed]
Yaffee, Robert. 2003. A primer for panel data analysis. *Connect: Information Technology at NYU* 8: 1–11.
Yakubu, Ibrahmi Nandom, and Alhassan Bunyaminu. 2021. Regulatory capital requirement and bank stability in Sub-Saharan Africa. *Journal of Sustainable Finance & Investment* 13: 450–62.
Zenno, Yoshihiro, and Kentaka Aruga. 2022. Institutional Investors' Willingness to Pay for Green Bonds: A Case for Shanghai. *Journal of Risk and Financial Management* 15: 11. [CrossRef]
Zhao, Jianyu, Jing Qu, Jiang Wei, Hang Yin, and Xi Xi. 2022. The effects of institutional investors on firms' green innovation. *Journal of Production Innovation Management* 40: 195–230. [CrossRef]