

Green Finance as a Source of Capital: Impact on Financial Performance and Sustainability of Firms

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ABSTRACT

Green finance has been garnering the world's attention as a crucial way to support sustainable corporate growth, amid intensifying issues such as climate change and environmental destruction. This research investigates the nexus of green finance adoption and firm performance/sustainability, while exploring if (or not) sustainability performance serves as a mediating effect. We draw on the Stakeholder Theory of Sackman, but also incorporate both RBV (Resource-Based View) and TBL (Triple Bottom Line) approaches as a framework for green finance requirements for strategic endowment to create economic and environmental value. The research adopted a quantitative cross-sectional research design by selecting data from 400 managers of manufacturing, energy, financial and IT organisations in India. Statistical analysis was conducted using SPSS v27, such as reliability test, correlation, multiple regression analysis and mediation analysis by PROCESS macro (Model 4; 5,000 bootstraps). The results show that green finance adoption has a positive and significant influence on financial performance (R1): $\beta = 0.46$, $p < 0.001$; sustainability performance (R2): $\beta = 0.58$, $p < 0.001$. Moreover, sustainability performance partially mediates the relationship between green finance and financial performance ($\beta = 0.19$, 95% CI [0.13, 0.27]). The inference would be that green finance adopting companies not only are more profitable, but they also drive sustainability & reputational capital. The result makes a theoretical contribution by providing clear evidence that sustainability is a mediator and a practical implication in the addition of environmental criteria for financing decisions. It is recommended that policy-levers strive to retain an incentive-based approach to enhance the inflow of green capital and better governance. On a macroscopic level, the research situates green finance as an instrument aimed at enhancing competitive advantage and longevity of corporate existence, therefore underlining its binary functionalities for monetisation and sustainability in developing nations.

Keywords: Green Finance, Sustainability Performance, Financial Performance, Triple Bottom Line, Sustainable Investment

1. Introduction

1.1 Background of the Study

Increasing recognition around the world of global climate change, species loss and environmental decay has profoundly altered the shape and priorities of the modern financial system. Traditional finance driven by greed to earn as much as possible, coupled with "the best" outthinking actuarial sciences, is rapidly being turned into thoughtful funds partnering with (and underwritten by) sustainability, societal and environmental wellness societal and environmental ethics aligned with long-term planet health. This paradigm shift is, at least in part, fuelled by a growing recognition of the degree to which economic decisions have implications for ecological and social systems, and sustainable finance is being considered as a linchpin of global economic governance (Linnenluecke et al., 2020). In this context, green finance is a strong means of balance between the latter two pillars.

Green finance is identified as one type of financial activity, and it is concerned with the reallocation and transaction of these funds to support green projects such as renewable energy, clean technology, energy-efficient infrastructure, and sustainability-linked investment (Zhang & Wang, 2022). It offers significant potential for decarbonising economies while enabling reaching United Nations Sustainable Development Goals (SDGs) such as clean energy production, sustainable consumption and production, as well as mitigating climate change (UNEP 2020). In order to build systemic resilience, governments, investors and financial institutions are increasingly incorporating environmental risk, carbon accounting and ESG (Environmental Social Governance) principles into their lending and investment frameworks (Nguyen et al., 2023; Liu et al., 2023).

This involves corporations shifting from profits for shareholders to sustainability for stakeholders; it is where the results of economics and the realities of ecology converge. Nonetheless, dirtier methods allow companies to access concessional capital with different levels of exposure to green finance mechanisms (green bonds, sustainability-linked loans and ESG funds) while also potentially enhancing sales, market share, and reputation (Azhgaliyeva et al., 2022; Rao & Gupta,). In that way, green finance has already entrenched in the global financial landscape – not simply as a competitive advantage - but as a sustainable transformation driver; to put it differently: Green finance is no longer an option.

1.2 Concept of Green Finance

Green finance includes a range of financial instruments and market mechanisms intended to channel investment to environmentally sustainable and climate-resilient projects. It comprises green bonds, green loans, sustainability-linked loan products, ESG funds and climate-focused investment portfolios to mitigate environmental risks as well as to drive low-carbon economic growth (UNEP 2020). Mainstreaming environmental issues into financial decision-making with green finance. The process includes the internalisation of environmental externalities so that businesses can express sustainability in numerical terms, as add-ons to traditional financial analysis. These mechanisms improve firms' cost and availability of better-quality capital as well as strengthen their good corporate standing and stakeholder trust, especially for ESG-sensitive investors (Karpf & Mandel, 2018; Friede et al., 2015).

Internationally, the bond market has seen an explosive expansion , more than USD 2 trillion in green bonds will have been issued (Climate Bonds Initiative), indicating that the necessity for sustainable financial instruments is met with growing demand from investors. Advanced economies, including the European Union and Japan, have enshrined green taxonomies and disclosure regimes to normalise green flows. Also, many developing countries such as China, Brazil and South Korea have incorporated sustainability elements into banking regulations so that green lending is promoted (Yoshino & Taghizadeh-Hesary, 2019).

Policy impetus has been particularly robust in an Indian context. Enactment of SEBI's Green Bond Framework (2017), the Sovereign Green Bond Guidelines (2023) and strategic policy actions such as the National Green Hydrogen Mission (2023) have substantially bolstered the institutional architecture of sustainable finance (Rao & Gupta). These reforms will bring India's capital markets in line with international ESG practices and mobilise private investment into clean energy, transportation, and waste management. In this way, India has emerged as one of the most prominent developing markets of the Asia-Pacific region, promoting green finance into national development planning (Liu et al., 2023; Azhgaliyeva et al., 2022).

1.3 Green Finance and Financial Performance

The empirical literature increasingly supports the argument that green finance uptake can offer long-term benefits through reduced operational and environmentally-related risk, increased resource use efficiency, and lower overall capital costs, ultimately improving financial performance over the long term (Yoshino & Taghizadeh-Hesary, 2019). Well-managed firms with a proactive approach toward incorporating environmental goals into financing and investment policies realise improved financial stability and superior profitability, especially as their capital structure is better reflected in lower energy expenditures, innovation-based productivity and improved risk management, all of which will ultimately lead to an increase in the long-term shareholder value. For instance, various empirical studies reveal that companies conducting green credit lines, sustainability-linked bonds, and ESG-driven investment practices generate significantly higher ROA, ROE, and Tobin's Q ratios, signifying a more robust level of investor confidence and market valuation for these firms (Azhgaliyeva et al., 2022; Nguyen et al., 2023).

Worldwide studies further validate that green finance leads to improved valuation and stability on an economic level. Liu et al. (2015) Sustainability-linked investments had significantly lower financing volatility and provided better access to institutional funding in Asia, according to a study by Amann et al. Similarly, Friede et al. Based on over 2,000 empirical cases, an analysis showed that ESG integration is positively related to financial returns in the long run. In fact, at the investor's end, green financial instruments substantiate diversification of the portfolio while lowering exposure to environmental liabilities and solidifying firms' reputations in the capital market (Karpf & Mandel, 2018).

Yet, this correlation does not hold across the board. As Wang et al. As observed by Patel et al. (2023), organisations in heavily capital-intensive sectors like manufacturing, infrastructure, and mining typically experience near-term expense pressures related to the adoption of clean technologies, disclosure mandates and sustainability examinations. The transitional costs associated can weigh on margins for the briefest period, before environmental efficiency begins returning financial dividends. On the other hand, service-oriented and technology-oriented companies often achieve rapid returns from green investments with small restructuring of assets and high innovation elasticity (Taghizadeh-Hesary & Yoshino, 2020). In conclusion, while the short-term financial returns of green finance are variable depending on sector and time frame, evidence suggests that green finance provides a net positive value creation opportunity over the long term within a range of economic contexts.

1.4 Green Finance and Corporate Sustainability

In addition to profitability and TBL, green finance is also an important building block of TBL (Elkington 1998). It's an example that also suggests business success is increasingly defined as much by the positive (environmental and social) impact an organisation can create alongside its financial return. Green and sustainable financial instruments (e.g., sustainability-linked bonds, green MFs and climate credit facilities) are drivers of eco-innovation, energy efficiency, inclusive growth which allows firms to contribute to the UN's SDGs—particularly SDG 7 (affordable and clean energy), SDG 9 (industry, innovation and infrastructure), SG 12 (responsible consumption) and SDG 13 (climate change) by aligning with these goals (Linnenluecke et al., 2020; UNEP, 2020).

Empirical evidence indicates that greener financing, which involves financing more sustainable investments, is among companies with better environmental performance, lower carbon footprint, and improved resource utilisation (Azhghiye Illegal et al., 2022). Moreover, these companies are better able to withstand the shock of new regulations and climate risk. High transparency and disclosure of ESG information also add to higher stakeholder trust and investor loyalty. Enterprises

with strong ESG ratings also tend to attract long-term institutional investors and have a lower cost of capital as well as higher firm value (Friede et al., 2015; Zhang & Wang, 2022).

Green finance also sets off a virtuous cycle where, on the one hand, the green reputation attracts investments from green capital, and on the other, leads to further enhancement in both financial and non-financial performance of the firms. This way, green finance does not merely contribute towards fulfilling the compliance and CSR obligations of firms but acts as a strategic driver of competitive differentiation on a global scale. Thus, the incorporation of green finance into the matrices of corporate and national policy showcases an approach to sustainable development which encapsulates the synergetic relationship between capital growth and ecological sustainability (Nguyen et al, 2023; Rao & Gupta).

1.5 Problem Statement

Empirical evidence establishes the financial and sustainability aspects of green finance, which is available but limited in the case of the Indian corporate context, especially through primary quantitative studies applying firm-level data analysis using SPSS. Limited research has used individual-level data directly collected for the purpose of studying poverty consequences of a disaster (CIDE, 2019); most studies use secondary data or compare countries (Taghizadeh-Hesary & Yoshino, 2020; Liu et al., 2023). This research aims to fill the gap by examining the impact of green finance adoption on the financial performance and environmental sustainability of Indian firms.

1.6 Significance of the Study

This research contributes to the international and Indian discourse on sustainable finance by offering firm-level primary data-based strong empirical evidence from a developing economy context, namely India, an emerging market where its sustainability transitions are both critical as well as complex. By adding entity-level information and employing quantitative analysis performed in an SPSS environment, this study contributes insights into the relationships between green finance uptake and sustainability, as well as financial performance in practical business settings.

The findings are actionable for various stakeholders, and this paper presents the practical implications that make this actionable. The results have important policy implications and highlight the need to develop incentive-compatible mechanisms (e.g. tax breaks, concessional green credit lines, clear ESG reporting norms) to accelerate the push of sustainable finance to the mainstream. For investors, the results highlight green finance as an opportunity for portfolio optimisation, to build long-term resilience to systemic risks, and to avoid investments inconsistent with the global sustainable agenda. The study further reminds company executives that more work needs to be done at introducing green finance tools, integrating them into the basic corporate business planning and strategies, while aiming for operational efficiency and market competitiveness, fostering credibility with stakeholder groups and acting as a force for good to help achieve the United Nations Sustainable Development Goals (SDGs).

In sum, this analysis also builds on theory and empirical literature by the conceptualisation of green finance not as an instrumental financial innovation but strategic mechanism for sustainable and inclusive growth. It fills the void between public policy and corporate practice; the proof that the business case for being environmentally sound and profitable can merge, with sustainability positioned as a business financial strategy.

2. Review of Literature

2.1 Concept and Evolution of Green Finance

The green finance revolution is a radical subversion of the global financial system - from one largely driven by profit motives to one that serves eco-friendly, low-carbon and sustainable development. All financial transactions, such as investments, loans and credit lines, which lead to an increased environmental sustainability--among others by preserving the natural environment or preventing GHG emissions, or contributing towards the preservation of natural resources, or we try) conduct that balance under green finance (UNEP, 2020). It brings the management of environment and climate risk and objectives into the main business of finance to steer economic activity towards long-term resilience and/or prosperity on a carbon-constrained, resource-constrained world.

At a global level, the 2015 Paris Climate Agreement was a breakthrough as it recognised finance as an essential catalyst for climate action. Institutional mechanisms for the mobilisation of CNG funds. Growing acknowledgement of the GCF and entities such as TCFD have also established institutional mechanisms to facilitate carbon-neutral development (Linnenluecke et al., 2020). Moreover, the European Union Green Deal and Sustainable Finance Disclosure Regulation (SFDR) have set international standards through their demand for transparency and accountability in sustainability-related financial transactions Climate Bonds Initiative). These models have opened the door to ESG (Environmental, Social and Governance) as an approach woven into investment strategies and how finance can be used as a way to promote sustainability.

Growth of green finance has been led by public policy and multilateral cooperation, especially in developing economies -- including Asia. In China, it made green banking standards mandatory and established a national green bond market that is now one of the world's largest, involving close to one-third of global issuances (Yoshino & Taghizadeh-Hesary 2019). In Indonesia, Malaysia and South Korea, too, an integration of sustainability laws can also be found at the national financial regulation level, where the bank as well as capital markets are obliged to finance renewable energy, waste management and biodiversity projects (Azhgaliyeva et al., 2022).

Green finance regimes: Policy and regulatory institutions such as the Reserve Bank of India (RBI) and the Securities and Exchange Board of India (SEBI) in India have played a key role in establishing a green finance regime. Green Bond Guidelines (2017), Sovereign Green Bond Framework (2023) and Sustainability Disclosure Norms (2023) are such strategic initiatives that collectively represent the direction in which India is moving towards a low-carbon financial system through development (Rao & Gupta). These are complemented sectorally by (e.g.) the National Green Hydrogen Mission (2023) and the REC [Renewable Energy Development Agency] programmes that channel funds to sustainable energy and green infrastructure. These have heightened the extent of investor attention and policy-induced incentives by linking environmental targets closely with quantifiable financial implications (Zhang & Wang, 2022; Nguyen et al., 2023).

Secondly, the maturation of green finance mirrors the rise of the 'financial-ecological nexus', where profit-seeking is increasingly intertwined with environmental responsibility. Factors related to physical climate and sustainability disclosure now serve as key drivers for investment decisions by investors, especially institutional and ESG-focused funds (Friede, Busch, & Bassen, 2015). As such, green finance has become a niche policy idea transformed into the mainstream financial ideal and can promote systemic transition toward sustainable growth patterns in which economic efficiency, environmental integrity, and social inclusiveness are harmonised.

2.2 Theoretical Foundations

In this section, we introduce three overarching schools of thought to explain the nexus between green finance, firm performance and sustainability.

Stakeholder Theory (Freeman, 1984) demonstrates that through taking FMAs into consideration as stakeholders' expectations (e.g., investors', government's, community's), organisations could gain legitimacy and long-term survival by implementing FMAs to align financial performance with the stakeholders' interests. Green funding indicates social responsibility and influences trust and brand value (Clarkson et al., 2011).

Second, the Resource-Based View (RBV) (Barney 1991) claims that green investment can generate idiosyncratic resources such as eco-innovation capability, environmental knowledge and sustainability-driven efficiency, which bring about competitive advantage (Hart and Dowell 2011).

Third, the Triple Bottom Line (TBL) concept (Elkington, 1998) emphasises interrelation among economic, social and environmental performance. The underlying claim is that sustainable finance enhances not only profit but also ecological and social value creation, thereby enhancing a first mover's strategic resilience (Linnenluecke et al., 2020).

2.3 Green Finance and Financial Performance

The literature of empirical work increasingly shows that green finance is conducive to firm-level financial performance. Insurance companies provide green bonds and sustainability-linked loans impact on firms' cost of capital and also better long-term profitability; they increase investor trust and environmental risk management (Nguyen et al., 2023). Green credit policy boosts the profitability and capital efficiency of small and medium enterprises (SMEs), as confirmed by Yoshino, I. and Taghizadeh-Hesary (2019). Similarly, Azhgaliyeva et al. (2017) found that companies in the renewable-energy sector that issued green bonds had significantly higher ROA and better stock performance because they had lower risk, lower.

Other research has also found possible short-term trade-offs. Wang et al. (2023) concluded that the implementation of green financial tools causes compliance costs and 42 reporting costs to rise in the short run. These costs are ultimately more than offset over time by innovation-driven efficiency gains. This dynamic response is consistent with the information that the financial gains of green finance depend on firm size, industry sector, and market development (Taghizadeh-Hesary & Yoshino, 2020).

2.4 Green Finance and Sustainable Performance

By combining the relationship between finance and environment and society, green finance is in favour of the sustainable development of enterprises. For example, Friede, Busch and Bassen (2015) have shown that these firms are substantially more long-run robust and risk-adjusted in terms of performance. Linnenluecke et al. (2020), investment in the sustainable-linked triggers eco-innovation and resource efficiency, which are impactful on the environmental and social performance.

For example, it is possible that in the less developed countries, green finance can support firms with harnessing resource constraints or with the adoption of clean technologies, which can improve their sustainable competitive advantage (Liu et al., 2023). Indian firms having green bonds or using sustainability-linked credit lines also have a significantly higher level of disclosure on the environmental front and are better engaged. It also advances the Sustainable Development Goals (SDGs), in particular SDG 7 (clean and affordable energy) and SDG 13 (climate actions) (UNEP, 2020).

2.5 Mediating Effect of Sustainability on Financial Results

Green finance and corporate performance are also mediated by sustainability (Sriket et al., 2019; Zhongyang et al., 2012). Such funds in green financial instruments can be more efficiently invested into innovation that is more sustainable, which does not necessarily make a profit the soonest and will lose some portion of market shares, but it gains a reputation (Clarkson et al., 2011; Azhgaliyeva et al., 2022). Sustainability-related activities, such as reduction of carbon, waste and use of energy from renewable sources, also have the potential to affect financial performance by enhancing operational efficiency and reducing investment risk (Nguyen et al., 2013).

Moreover, the use of ESG regulations affects firm efficiency in an indirect way because they create transparency, decrease environmental risks and attract ethically motivated investors that may encourage better financial results (Friede et al., 2015). Liu et al. (2023) subsequently identified the mediating role in Chinese firms and demonstrated that sustainability performance contributes greatly to the explanatory power of the green financing–profitability relationship. Consistent with the preceding, the incorporation of sustainability-motivated criteria in the financial decision process not only improves short-term performance but also firm value in the long run.

2.6 Empirical Studies in the Indian Context

In India, conversation on green finance has received a significant boost since the issuance of SEBI's Green Bond Framework (2017), the first regulatory framework that sets out guidelines to raise funds dedicated to enabling environmentally responsible projects. In the wake of this development, there has been a growing body of literature that studies the relationship between green financial products with corporate sustainability and its impact on firm-level financial performance. Early research (Banga, 2019) traced India's first step in the green bond market and indicated that Indian corporate giants in energy, infrastructure and manufacturing are some of the earliest to adopt sustainability-linked financial instruments. Later evidence also confirms the positive influence of policy reforms, voluntary ESG disclosure and institutional merging on the adoption of green finance among listed firms (Rao & Gupta).

However, the spread of green finance practices is still uneven among sectors. Businesses with higher capital intensity are more likely to adopt financing linked to sustainability as they face more stringent regulations and demands from investors. Meanwhile, the micro, small and medium enterprises (MSMEs) and service firms still face constraints like lack of knowledge, financial illiteracy and insufficient regulatory support (Chauhan & Mehta, 2023). Empirical studies have found that the high cost of ESG compliance and the lack of a standardised sustainability reporting framework discourage small firms from being granted green credit lines (see Joshi & Dey, 2022).

Indian studies of late have started trying to monetise the green and ESG investments. Joshi and Dey (2022) found a significantly positive relationship that prevails between ESG investment and firm reputation, suggesting that sustainability improves stakeholder trust and brand equity; however, they only had limited gains in short to medium-term return on equity. Likewise, Goyal and Kumar (2023) reveal how openness over ESG activities leads to a positive long-term impact on firm valuation as well as investor confidence, even though transitional costs may momentarily depress profitability. Patra and Prakash have demonstrated the measurable market size increase in green bond issue companies, and also confirmed financing risk reduction due to the presence of sustainable finance policies among Indian capital markets.

Nonetheless, significant research gaps persist. Most of the Indian literature is based on secondary data sources (e.g., CMIE Prowess or BSE-ESG indices) and cross-country comparison scans, with little

primary quantitative evidence at the firm level. Much less is known about what the micro-level behavioural drivers and adoption mechanisms sober how green finance impacts upon sustainability and, indeed, financial performance across a wide range of sectors.

To fill these gaps, we use a first/second stage SPSS-oriented approach in the current study to investigate the impact of green finance adoption on sustainability and financial performance measures among firms operating in India. This study presents one of the early few firm-level evidences on the green-finance–performance nexus in the Indian setting, contributing to the international literature and yielding grounded implications for policy-makers, institutional investors and corporate strategists who seek increased sustainability to become a part and parcel of mainstream finance.

2.7 Research Gap

Although global studies are proving the importance of green finance, three gaps remain:

- It is the absence of firm-level primary evidence on the association between green financing and sustainability/profitability in emerging economies such as India.
- Inadequate investigation of mediating mechanisms (sustainability as a mediator) by which green finance influences financial outcomes.
- The few studies that have used quantitative analysis and SPSS-based testing of direct and indirect effects are few.

The paper fills in these gaps by developing a structured model, which is empirically tested based on the green finance-company performance-sustainable growth hypothesis using firm-specific data from India.

3. Research Objectives, Hypotheses, and Conceptual Framework

3.1 Research Objectives

Based on the reviewed literature, the study seeks to empirically investigate the influence of green finance adoption on firms' financial and sustainability performance. The specific objectives are:

- To examine the impact of green finance adoption on firms' financial performance.
- To analyse the influence of green finance adoption on firms' sustainability performance.
- To test the mediating role of sustainability performance in the relationship between green finance adoption and financial performance.
- To identify managerial and policy implications for promoting green finance in corporate financial strategies.

3.2 Hypotheses Development

- H1: Green finance access has a positive effect on the financial performance of firms.
- H2: Green finance usage has a positive and significant impact on the sustainability performance of firms.
- H3: There is a significant positive relationship between sustainability performance and the financial performance of the firms.
- H4: Sustainability performance acts as a mediator on the link between green finance adoption and financial performance.

4. Research Methodology

4.1 Research Design

The current study adopts a quantitative and explanatory cross-sectional approach to empirically investigate the direct relationship between green finance adoption, sustainability performance, and financial performance of organisations. The method is explanatory because the research explores the

cause-and-effect relationship between the independent variable and mediating and dependent variables by running statistical tests through SPSS version 27. The structured nature of our model allows us to test the hypotheses (H₁–H₄) derived by integrating Stakeholder Theory, Resource-Based View and Triple Bottom-Line framework.

4.2 Population and Sampling

The population of interest is corporate entities in India that have implemented or expressed intention to implement green finance instruments such as green loans, ESG funds and Green bonds. TMT firms from the manufacturing, energy and financial services sectors are more likely to be affected by sustainability regulations and environmental disclosures. Representation of different strata was achieved through stratified random sampling. The sample frame comprises companies listed under SEBI's Business Responsibility and Sustainability Reporting (BRSR) guidelines. Five hundred valid questionnaires were collected through the study, and 400 were finally kept after data filtration. Survey responses have been received from corporate financial managers, sustainability officers and CSR executives overseeing corporate financial planning and sustainability at the company level.

4.3 Data Collection Procedure

Using a structured questionnaire, primary data were obtained through both electronic and physical means. The tool was developed using validated scales from previous studies (Azhgaliyeva et al., 2022; Friede et al., 2015; Nguyen et al., 2023). Responses were measured using a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree).

The survey was divided into three main sections:

- Section A: Demographics (industry, company size, ownership and age).
- Section B: Indicators of adoption of green finance.
- Section C: Sustainability measures and financial performance indicators.

A pilot with 30 firms was implemented to ensure the reliability and clarity of items, leading to slight amendments of wording.

4.4 Variables and Measurement Scales

Construct	Type	Indicators	Source
Green Finance Adoption (GFA)	Independent	Use of green bonds, ESG-linked loans, renewable investment policies, and environmental credit programs	Adapted from Yoshino & Taghizadeh-Hesary (2019); Liu et al. (2023)
Sustainability Performance (SP)	Mediating	Environmental initiatives, social responsibility, corporate governance, and sustainability disclosures	Adapted from Friede et al. (2015); Linnenluecke et al. (2020)
Financial Performance (FP)	Dependent	Profit growth, ROA, ROE, market share improvement	Adapted from Nguyen et al. (2023); Wang et al. (2023)
Control Variables	Control	Firm size, age, and sector	Custom

Each construct was measured with 4–6 items based on the literature, ensuring internal consistency and construct validity.

4.5 Data Analysis Tools and Techniques

The data were analysed using SPSS version 27. The analytical steps included:

- Preliminaries: Screening Data and Checking Normality. Missing data and outliers were eliminated. The test for normality was performed using skewness and kurtosis values.

- Reliability Analysis: Cronbach's Alpha Coefficient of $\alpha = 0.70$ was used as a measure to assess the internal consistency for each one of the constructs (Nunnally, 1978).
- Results: Descriptive statistics, Mean and SD were calculated for the central tendency and variability of their responses.
- Correlation: We used Pearson's correlation coefficient to check the linear relationship between variables.
- Analytical Strategy: Multiple regression was used to test direct (H1–H3).
- Mediation Analysis: The method of Baron and Kenny (1986) was used to conduct a mediation test, with SPSS PROCESS Macro (Model 4) employed for hypothesis H4.
- Multicollinearity Assessment: No multicollinearity problems were observed, as indicated by VIF scores.

4.6 Reliability and Validity

- Content Validity: Was established through expert review of the academic and industry experts within the fields of finance and sustainability.
- Construct Validity: It was obtained when factor loadings were > 0.60 in the exploratory factor analysis (EFA).
- Reliability Cronbach's Alpha of constructs for all the GM and GN, which were between 0.78 and 0.89, respectively, indicating that internal consistency was present in each item construct.
- Convergent and Discriminant Validity: Average variance extracted (AVE) above 0.50, composite reliability (CR) above 0.70 supported the convergence validity criteria.

4.7 Ethical Considerations

The study followed ethical guidelines of confidentiality, informed consent and volunteerism. The respondents were assured that the data would be for pure academic research and that no firm-sensitive data would be provided. Permission from the institutional review committee was obtained before the data collection. The methodology is to deliver solid empirical evidence on the conceptual model using quantitative analysis based on SPSS. There is a systematic method that ensures the statistical reliability, theoretical consistency and practical relevance for policy and managerial implications.

5. Data Analysis and Results

5.1 Data Screening & Assumptions

- Missing values: $<1\%$; handled by listwise deletion (final $n = 400$).
- Normality: $|\text{skew}| \leq 0.64$, $|\text{kurtosis}| \leq 0.71$ (acceptable).
- Homoscedasticity & linearity: visual checks satisfactory.
- Multicollinearity: VIF 1.12–1.98 (well below 5).
- Independence: Durbin–Watson = 1.92.

5.2 Sample Profile (Abridged)

Attribute	Category	n	%
Sector	Manufacturing	148	37.0
	Energy/Utilities	86	21.5
	Financial Services	92	23.0
	IT/Services	74	18.5
Firm Size (employees)	<250	136	34.0
	250–999	171	42.8
	≥ 1000	93	23.2

Firm Age	<10 years	118	29.5
	10–24 years	192	48.0
	≥25 years	90	22.5

The demographic characteristics of these firms are presented in Table 5.2. The sample is drawn from various sectors contributing significantly to green funding in India. 37% of the valid answers). Companies in the category Manufacturing are represented most often in this data set. This dominance may reflect that manufacturing are trailblazers in greening financial instruments, given their larger environmental impact and market-led characteristics. Energy & utilities (21.5%) and finance (23%) are also significant which demonstrates that these sectors are engaging in more sustainable investment and lending. While IT & service sector (18.5%) are the firms that focus more on indirect environmental sustainability such as energy efficiency, digital revolution and low carbon operations.

In terms of firm size, most respondents (42.8%) come from medium-sized firms (250–999 employees), smaller firms (<250 employees) reach 34% of the sample and large corporations (≥1000 employee's) represent 23.2%. This spread shows that midsized firms constitute the main users of environmental finance instrument, most likely because they can easily incorporate sustainability and are not bound by too much bureaucracy as large companies. Small firms, while gaining awareness, may continue to be limited financially and in information access to green capital.

As to firm age, the youngest firms (<10 years) are represented by a share of 29.5% of respondents, mid-aged firms (10–24 years) account for almost half (47.7%) and established firms (≥25 years) account for 22.5%. Mid-aged firms The high presence of mid aged firms in our sample supports the argument that if a firm has been operating for more than a decade, it is strategically mature enough to start seeking new and innovative ways to raise finance such as green finance. That of younger firms' involvement, because it reflects the rise of sustainability-oriented start-ups; and that of older firms, because shows the move from traditional financing to less sustainable ones.

In summary, the sample of firms included in is heterogeneous in sector and structure terms, providing a balanced set of observations for empirical investigation. The diversity in firm size and age also helps increase the generalisability of findings, such that the statistical results provide a comprehensive account of the varied dynamics across India's corporate sector as it embraces green finance.

5.3 Reliability & Factorability

Scales (items reduced via EFA; loadings ≥ .60):

Construct	Items (kept)	Cronbach's α
Green Finance Adoption (GFA)	5	0.88
Sustainability Performance (SP)	6	0.90
Financial Performance (FP)	4	0.86

KMO = **0.89**; Bartlett's $\chi^2(231) = 2895.4$, $p < .001 \rightarrow$ data suitable for factor analysis.

The reliability and validity statistics of the three key constructs in this study, such as Green Finance Adoption (GFA), Sustainability Performance (SP) and Financial Performance (FP), are presented in Table 5.3. Reliability testing was conducted by calculating Cronbach's α , and sampling adequacy as well as factorability were measured by the Kaiser–Meyer–Olkin (KMO) method and Bartlett's Test of Sphericity.

Cronbach's alphas of constructs are all above 0.70, the cut-off point for minimum acceptable internal consistency (Nunnally, 1978). The GFA ($\alpha = 0.88$), SP ($\alpha = 0.90$), and FP (Sub-constructs The GFA, SP $\alpha = 0.86$) all have very high reliability and Δ reveals that measurement of each construct is strongly related and tends to capture the intended theory. This consistency also supports that the data is appropriate for advanced multivariate analysis (e.g., regression and mediation testing).

The value of 0.89 KMO reassures that the sample size is adequate and there are bigger correlations among variables for factor analysis. Consistent with Kaiser's (1974) guidelines, KMO values in excess of 0.80 are classed as "meritorious" sampling adequacy levels. For factor analysis, Bartlett's Test of Sphericity was used ($\chi^2 = 2895.4$, $p < .001$ and $p\text{-value} < .001$) is significant, revealing that the correlation matrix is not an identity matrix and that the variables are highly correlated, which indicates the suitability of this data for factor analysis.

Considered collectively, the results offer very good assurance that these data are reliable, valid and factorable and provide strong evidence of robust measurement quality for further analyses. The high reliability coefficients and excellent KMO–Bartlett indices give confidence in the empirical base of constructs, providing support for the strength of subsequent regression results and mediations.

5.4 Descriptive Statistics & Correlations

Variable	Mean	SD	1	2	3
1. GFA	3.62	0.69	—		
2. SP	3.74	0.66	.58*	—	
3. FP	3.58	0.71	.54*	.62*	—

p < .001 for all bold coefficients.

Table 5.4 presents the mean scores, standard deviations and Pearson correlation coefficients for three major constructs—Green Finance Adoption (GFA), Sustainability Performance (SP) and Financial Performance (FP)—for 400 sampled firms. The average values of 3.62 (GFA), 3.74 (SP), and 3.58 (FP) on the dependent variable suggest that firms in the sample have a moderate to high level of involvement in green financial practices, sustainability motivations, and financial performance. Diminishing standard deviations (0.66–0.71) indicate consistent responses and a common perception of sustainability and financial performance of their firms among the respondents.

There are strong and statistically significant positive relationships as evidenced by correlation coefficients ($p < .001$) in all variable pairs. The relationship of GFA with SP ($r = .58$) suggests that the sustainability performance of firms is more likely to be better when employing green finance instruments, further supporting the claim around how green capital results in environmental and social outcomes. Additionally, GFA was strongly correlated with FP ($r = .54$) report that sustainable investing enhances firm profitability and market performance. The highest correlation, SP compared to FP ($r = .62$) notes that companies with better sustainability results also report higher financial returns. This result does support the theorised connection established through the TBL model that goes on to explain that environmental and social stewardship lead to economic success over time.

Collectively, these findings offer initial empirical evidence for the postulated links and support the notion that adopting green finance not only directly but also indirectly enhances financial performance via increased sustainability outcomes. The high positive intercorrelations further support moving forward with regression and mediation analyses to test the hypothesised model relationships in more detail.

5.5 Regression Results (Direct Effects: H₁–H₃)

Model specification: Controls (firm size, age, sector dummies) entered first; predictors entered hierarchically. DV = FP.

Model	Predictors	B	t	VIF
M1 (Controls)	Firm size	0.19*	3.98	1.42
	Firm age	0.07	1.53	1.18
	Sector (Energy=1)	0.09 [†]	1.91	1.27
	Sector (Finance=1)	0.05	1.09	1.26
	Sector (IT=1)	0.03	0.71	1.22
	R² / ΔR²	0.12	—	—
M2 (+ GFA)	GFA	0.46*	10.54	1.63
	R² / ΔR²	0.38 / 0.26*	—	—
M3 (+ SP)	SP	0.39*	8.57	1.98
	GFA	0.28*	6.30	1.74
	R² / ΔR²	0.47 / 0.09*	—	—

[†]p < .10, *p < .05, **p < .01, ***p < .001.

Table 5.5: Hierarchical multiple regression analyses. The direct effects of Green Finance Adoption (GFA) and Sustainability Performance (SP) on Financial Performance (FP), after controlling for firm characteristics, e.g., size, age, sector, are presented in Table 5.5.

Control variables were entered in Model 1. The model accounts for 12% of variance ($R^2 = 0.12$) in financial performance and indicates that there are some factors at the firm level that moderately influence performance outcomes. Of these, firm size ($\beta = 0.19$, $p < 0.05$) has a significantly positive effect, which means that larger firms have better financial performance due to the availability of resources and the ability of stronger market presence. The other control variables – firm age and sectoral dummies – did not have statistically significant effects, except a marginally significant effect of the energy sector ($\beta = 0.09$, $p < 0.10$), which could be due to there being more profitable opportunities when it comes to facilitating energy transition projects.

After adding Green Finance Adoption (GFA) in Model 2, the model's variance explanation grew significantly to $R^2 = 0.38$, $\Delta R^2 = 0.26$ ($p < 0.001$). Such a high change in R^2 indicates that GFA makes a substantial contribution to explaining financial performance over and above firm-specific characteristics. GFA yields a positive coefficient ($\beta = 0.46$, $t = 10.54$, $p < 0.001$) that is highly significant, which supports H₁ – a stronger adoption of GFM's will lead to better firms' financial performance. This result corroborates previous evidence (Nguyen et al., 2023; Azhgaliyeva et al., 2022) on the fact that Environmentally Responsible Financing is associated with reduced capital costs, enhanced investor confidence and profitability.

Sustainability Performance (SP) is introduced in Model 3 to explore its incremental effects. The model's explanatory variance was also enhanced to $R^2 = 0.47$ ($\Delta R^2 = 0.09$, $p < 0.001$), indicating that sustainability aspects account for only further +9% of the variances in financial results. Both SP ($\beta = 0.39$, $t = 8.57$, $p < 0.001$) and GFA ($\beta = 0.28$, $t = 6.30$, $p < 0.001$) are still significant predictors controlling for each other's effects: The reduction in GFA's beta by including SP, from 0.46 to 0.28, indicates that partial mediation was the case (as later verified using PROCESS mediation analysis).

There are no multicollinearity problems present among these models, as evidenced by the low VIFs (< 2) (absent variables omitted on page, inferences about model stability would remain). In summary, these regression results are consistent with the following hypotheses:

- H₁: There is a positive relationship between Green Finance Adoption and Financial Performance — Accepted.
- H₂: Green Finance Adoption has a Positive effect on Sustainability Performance — Supported (based on the mediation model to follow).
- H₃: Influence of Sustainability Performance on Financial Performance — Determination.

Empirical findings of the study indicate that green finance has a direct impact on firm profit and that overall sustainability practices reinforce this financial relationship, confirming the theoretical model of the study based on the Resource-Based View, Triple Bottom Line frameworks.

5.6 Mediation Analysis (PROCESS Model 4; 5,000 bootstraps)

5.6.1 Paths

- **a (GFA → SP):** $\beta = 0.58^*$, SE = 0.05, t = 11.6
- **b (SP → FP | GFA):** $\beta = 0.33^*$, SE = 0.04, t = 8.3
- **c (Total: GFA → FP):** $\beta = 0.46^*$, SE = 0.04, t = 10.5
- **c' (Direct | SP):** $\beta = 0.28^*$, SE = 0.04, t = 6.3

5.6.2 Indirect Effect

Effect	Point	Boot SE	95% BCa CI
GFA → SP → FP	0.19	0.04	[0.13, 0.27]

The sub-section is devoted to testing Hypothesis H₄, which expects Sustainability Performance (SP) to mediate the indirect effect of GFA on Financial Performance (FP). The direct, indirect and total effects were estimated by Model 4 PROCESS Macro in SPSS with 5,000 bootstrap samples.

Direct and Indirect Path Coefficients

The direct path from GFA → SP (path a) is positive and strongly supported ($\beta = 0.58$, t = 11.6, p < 0.001), which means that those firms that implement more green financing practices perform much better in the sustainability aspect by far. The second path, SP → FP controlling for GFA (path b), is also significant as well ($\beta = 0.33$, t = 8.3, p < 0.001), which indicates that better sustainability performance leads to better financial performance.

The total effect (path c) of green finance on financial performance is $\beta = 0.46$ (p < 0.001). When sustainability performance is added to the model, this direct effect (path c') becomes reduced and insignificant $\beta = 0.28$ (p < 0.001). Although small, this is still important and implies that information in the relationship between green finance and financial performance passes indirectly through sustainability performance.

Bootstrapped Indirect Effect

The bias-corrected 95 % confidence interval for the bootstrapped indirect effect of GFA on FP via SP is [0.13, 0.27], with 0 not being included in the interval (Boot SE = 0.04). Such finding elaborate on the fact that a significant partial mediation effect exists. In simple words, around one-third of the overall impact of green finance on economic performance is through sustainability resolution.

The mediating effects, in essence, confirm that the green finance is strategically used as connecting sustainability performance with firm profitability. Enterprises benefiting from green financing do not

only benefit from capital and reduced costs of financing, but also because the funds induce ecovation, resource saving opportunities as well as reputation enhancing. Hypothesis H4 is also empirically supported that strengthens the theoretical integration between RBV and TBL, in conjunction these assertions argue that green financed kin resource environmental capabilities are useful for long term competitive advantage and financial sustainability.

In conclusion, the mediation model demonstrates that green finance has a positive direct and indirect (via the mediation of sustainability performance) effect on financial performance; thus, we can argue that sustainability is a value-creating pathway between green finance and performance.

6. Discussion and Implications

6.1 Overview of Findings

Second, this research is empirical and examines the influence of green finance adoption on FFP, and ultimately its impact on SPM under the mediating role. The results derived from SPSS regression and PROCESS mediation analyses provided strong support for all four hypotheses (H1 –H4). In fact, businesses that utilise green finance products – such as green bonds, ESG-linked loans and sustainability funds – experience significantly stronger financial performance and better sustainability performance. Finally, sustainability performance partially mediates the association, suggesting that financial gain accrues not only to how financing for access but also towards strategic sustainability improvements.

These findings are in line with previous cross-national research (Nguyen et al., 2023; Liu et al., 2023) and provide evidence that the combination of environmental and financial strategies contributes to enhancing firm resilience, trust from stakeholders, and long-term competitiveness. The empirical testing of the model with Indian data provides an additional perspective from that of an emerging economy, given that it also studies green finance deals that are still under construction.

6.2 Theoretical Implications

The present paper contributes to the Stakeholder Theory, showing that there is an increase in financial capital legitimacy (FCL) when firms use greening financing tools in order to face sustainability pressures. This is consistent with the hypothesis that sustainable investing generates social and shareholder value (Clarkson et al., 2011). The findings also provide some indications of the greening of the Resource-Based View (RBV), which would imply that green finance leads to valuable inimitable intangibles—in particular, environmental innovation capability and green reputation. These resources are heavily associated with the competitive advantage and superior financial performance of the firm (Hart & Dowell, 2011). Finally, the study provides support to Tenets posited in the TBL framework (Elkington, 1998) on integration of financial, environmental and social performance leading toward better corporate performance. The positive mediation of sustainability performance indicates that financial success is accomplished through the organisation's ability to integrate sustainability at the level of operations and strategy.

6.3 Managerial Implications

For business leaders, the results offer a useful reminder that although green finance isn't just box-ticking but something to be strategically invested in. Firms that are big issuers of these ESG bonds get a boost to their reputations, and they can draw more socially conscious investors, which over time may help reduce the cost of financing. Firms can incorporate environmental goals in their capital budgeting and risk management systems.

The results also suggest that firms should consider improved sustainability performance as a powerful source of profit. If we can improve environmental management systems, increase transparency on ESG reporting and promote adoption of cleaner production technologies, sustainability to work will be more than a banner lining the pockets of corporate social responsibility – it could become an accelerator of financial performance.” In addition, the BSE’s Business Responsibility and Sustainability Reporting (BRSR) is a strategic communication tool that can help in attracting responsible investors.

6.4 Policy Implications

At a policy level, this research has created awareness that may be used to lobby India for the creation of green finance infrastructure. “We also need to lend support to companies so they can conduct green finance on the supply side by things like tax exceptions, favourable loans and credit ratings for green financing to spread it around more widely. Public-private partnerships will probably be important for mobilising resources for climate investments, as MSMEs face capital constraints.

There is a need for Banking & Market regulators (RBI & SEBI) to align on a common green taxonomy of disclosure norms to enhance transparency and comparability in sustainability reporting across the sector. It would give an impetus to investor confidence and also stir up a more well-rounded and liquid green finance market in India.

6.5 Societal and Environmental Implications

Other than financial returns, the findings from this analysis demonstrate that green finance generates positive spillovers for society through less-polluting technologies and smaller carbon footprints in projects, with an accompanying increase in community welfare. Sustainability performance mediating suggests that firms using green capital not only uplift firm financial gains but also contribute to accomplishing international sustainability goals, some of these are the country’s Net Zero 2070 target and UNSDG 7, 9, 12, and 13. Therefore, green finance expansion could act as a multiplier theorem that enhances environmental quality, societal welfare and inclusive growth simultaneously.

6.6 Implications for Future Research

This study prioritises a partial mediating variable, the sustainability performance in the relationship between green finance and performance, although it would be interesting to examine other mediators (i.e. innovation potential, quality of ESG disclosure or digital transformation readiness) using different samples and for future research purposes, as one limitation. In addition, long-term study and cross-country comparison will also provide an advanced approach to clarify the picture of green finance influences from longitudinal time settings and across country contexts. Qualitative perspectives of sustainability officers might also increase our knowledge of what motivates and limits managers. This paper also provides concerning contributions to current literature that green finance adoption has continuously improved the firm performance and highlights that sustainability performance is one of the five critical mechanisms through which such financial benefits are realised. Such results contribute to the sustainable finance theory and practice by showing green finance as not only an ethical bet but a profitable strategic imperative that adds value over time.

7. Conclusion, Limitations, and Future Scope

7.1 Conclusion

This article further extends the seminal literature by empirically testing that green finance is a necessity of sustainable capital, and it leads to savvy financial as well as sustainability performance among firms. Drawing on a rigorous quant process and SPSS for statistical computations, the piece effectively finds that firms powered by green finance instruments — in this case, green bonds,

sustainability-linked loans, a certain ESG-focused flavour of funds — are demonstrably more profitable, resource-efficient and trusted among stakeholders than companies' dependent on traditional funding sources. Davies & Glaister 1996). One of the implications would be that, in the case of firms, there do exist trade-offs between them, such as Stakeholder Theory (ST), Resource-Based View (RBV) and Triple Bottom Line (TBL). It is worth noting that hybrids of mixed culture among teams would lead managers to foster new drivers shaping the following outcomes. The partial mediation of sustainability performance in green finance and financial performance contributes good empirical evidence to the idea that economic success derives from environmental behaviour and suggests that sustainability plays a role as a value driver and reputation booster.

In other words, the study frames green finance as an enabler of long-term competitiveness. In developing countries, such as India, the corporate sustainability practices are yet to move beyond a latent stage; green financing can emerge as an instrumental opportunity for company growth stories to converge with national and the global climate narratives.

7.2 Practical and Policy Conclusions

From the managerial perspective, financing economic activities through green finance is morally correct and positively associated with financial performance as supported in this study. Firms with clear intentions around green finance would be best placed to hedge climate risk and attract responsible investors — and they'd also find the cheapest money. We believe boards of directors should mandate the inclusion of sustainability metrics in long-term financial planning and performance assessments.

On the policy front, findings point towards coordination (and uncorking), and compensation mechanisms being very important for promoting green financial instruments in India. At the policy level, advocacy support may be more focused in building capacity for companies and financial institutions, support green credit guarantee system development and establish taxonomies and disclosure guidelines to improve transparency and investor confidence. Used well, these levers should assist in moving India's economy to being low-carbon and to better lining up India's financial system with the United Nations' Sustainable Development Goals (SDGs).

7.3 Limitations of the Study

Despite the significance of the conclusions proposed in this study is important to acknowledge its limitations:

- **Cross-section in Design:** Being a cross-sectional study, it assesses responses at just one point in time making it impossible to infer about the causality relationship of green finance contagion on long-run performance impact.
- **Self-report Data:** The data were from the self-rating scale of the manager, thus may be suffering from perceptual bias/social desirability effects. However, we have incorporated pretest and anonymity methods to minimise such biases.
- **Sectoral Composition:** Although the selection of the sample was made based on larger sectors (manufacturing, energy, finance, IT), it is also suggested that future research include agriculture, transport and construction to improve generalisation.
- **Space restricted:** External factors (Interest rate, policy changes and environmental regulation) were not included in the present SPSS model, although they may have stimulus effects on firm levels.

Acknowledging these limitations will allow more complex, longer-term and sector-specific work to be conducted in the future.

7.4 Directions for Future Research

Based on these findings, the following interesting future directions could be explored:

- Longitudinal review: Exploring the dynamic impact of green-financing adoption which can give an insight to track sustainable financing benefit (sustainability induced) is continuing, pre-determined or transient.
- Comparative and Cross-country Analyses: Comparative research between multiple (emerging) economies, e.g., India, China or Indonesia, may provide insights into contextual conditions affecting the efficacy of green finance.
- Moderator variable incorporation: Digital readiness, and organisational culture, market competition can be tested as potential moderator variables to understand the boundary conditions of relationship between green finance – performance.
- Integration with Advanced Analytical Methods: Future studies could also test the causal paths using SEM or PLS-SEM, as well as machine-learning models to predict firm performance based on ESG factors and financial measures.
- Qualitative Case Studies: Further qualitative investigation through interviews of CFOs, sustainability officers and policy-makers may give a deeper insight into challenges and best practices in implementing green finance.

7.5 Final Reflection

In other words, green finance is not merely a financing tool but a driver of sustainable transformation as the research concludes! Firms utilizing green capital for business strategy integration to gain financial rewards foster good sustainability and well-being in society. As India shifts gears towards Net Zero 2070, such convergence of finance and sustainability would be testimony to as to how competitive our corporate landscape actually is. The integration of green finance into business as usual and policy practice is thus also far from optional – it corresponds to sound strategy for sustainable future development.

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