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Green Finance and its Impact on Debt Financing for a Sustainable Financial System

P Saranya[1*], T Ramachandran[2]

[1] *Full Time Research Scholar, SRM University, saranyap2506@gmail.com*
[2] Professor, *SRM University, ramachat@srmist.edu.in*

***Corresponding Author:** saranyap2506@gmail.com

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ABSTRACT

In order to tackle the urgent problems brought forth by worries about the environment, Many countries have been proactively looking at green finance methods. Green finance is a key motivator that helps environmentally conscious businesses become more economically savvy by strategically pooling funds and regularly sharing critical information. The goal of this research is to improve knowledge of financial effects of green finance and debt financing. connection between corporate debt financing levels and green finance. Our results show that corporate debt financing levels are effectively reduced by green finance, and this conclusion holds up after passing a number of hurdles. According to additional research, green finance accomplishes this by lowering loan barriers and raising top level management pay. The influence of green finance is especially noticeable in Government Owned Corporations (GOC), areas with soft market, advanced construction areas and renewable energy sources. Furthermore, our study demonstrates that green finance has no distinct effect on current liabilities but greatly encourages the decrease of bonds and leasing when regulatory rules are strengthened. The research gives firms looking to achieve sustainable growth in dynamic contexts practical insights by tying debt management to broader corporate objectives.

Keywords: Green Finance, Debt Financing, Sustainability, Government Owned Corporations, Top Level Management Pay

INTRODUCTION

Green financing is now a vital tool for promoting sustainability as a result of the intensifying consequences of the changing climate worldwide, attracting the interest of both public and private organizations everywhere (Wu et.al, 2024 , Wang et.al, 2022). Many nations have been actively investigating green finance strategies in an effort to solve the urgent problems presented by environmental issues. In an attempt to deal with the urgent issues prompted by issues related to the environment, several nations have been aggressively researching green financing techniques. Global programs such as the Green Climate Fund, the Network for Greening the Financial System (NGFS), and the European Union's Sustainable Finance Action Plan highlight how important financial systems are to solving climate issues. These initiatives show how sustainable finance, which aims to balance economic expansion while maintaining stability of the ecosystem over time, is becoming more widely acknowledged as a financial necessity as well as an environmental one (Li & Xu, 2025). An innovative financial paradigm known as "green finance" has emerged as a crucial instrument for addressing climate change, encouraging financial sustainability

, and facilitating environmental conservation.

India, the biggest developing country in the world, offers a special and complex setting for the growth of green finance. First of all, India has serious environmental problems. Heavy industrialization has advanced throughout the years, causing significant ecological harm and environmental contamination. This has made the administration realize how urgent it is to change its economic model in order to choose a more environmentally friendly route. Green finance, which directs funds toward ecologically friendly projects and sectors, is anticipated to be crucial to this shift. India's progress in green finance has attracted a lot of interest and collaboration from other countries. India is actively participating in global green finance partnerships, sharing its experiences of development and supporting the global goal for green financing, notwithstanding the continuing tariff war. This is due to the growing need for green finance around the world. For its green finance projects, this gives India access to a wider global perspective and cooperative prospects. In order for businesses to grow, improve their production capabilities, and satisfy consumer expectations while preserving operational flexibility, debt financing is essential in India (Jikar & Tekade, 2025).

Green fiscal policies are essential guiding tools in the Indian setting, where the government is heavily involved in economic activity. The new analysis provides a more a thorough understanding of the eco-friendly economic structure and its impact on firm financial levearge through the use of green fiscal principles. Additionally, the new work enhances (Guo & Fang, 2024) technique. Given the urgency of addressing climatic change and its pervasive worldwide effects, it is clear that emissions of carbon, which result from air resources' not being able to compete or be excluded, have substantial negative externalities. Market players frequently experience unnecessary equilibrium losses because they are not likely to absorb social expenses on their own that are greater than their private expenses (Liu & Zhu, 2024).

LITERATURE REVIEW

In order to enable the best possible resource allocation, the involvement of the government which acts as the market's governing body for carbon emissions—becomes essential. Green financing is one of the most important market-oriented environmental strategies among the many policy instruments at our disposal. Green finance offers a way to direct money toward investments and projects that are ecologically friendly, like the creation of clean technologies, renewable energy sources, and environmentally sustainable infrastructure.Corporate finance has placed a lot of emphasis on debt management tactics, as many studies have shown how important they are for promoting company expansion. To maintain financial stability while financing development plans, researchers have underlined the need of structured debt management.From a macroeconomic perspective, it has been demonstrated that the creation and growth of green finance systems successfully lowers the energy content in the surrounding and local areas. (An et al., 2023) improves eco-friendly efficiency (Xu and Xu, 2022), and mitigates pollution from urban smog (Zeng et al., 2022). The decrease of carbon dioxide and greenhouse gas emissions is greatly aided by these cumulative effects (Zhan et al., 2022).Green finance adds to global value growth in addition to increasing the economic worth of individual locations (Li et al., 2023). In terms of the decrease in carbon emissions in East Asia, green finance is having a positive effect while in the southern asia and yuxi circle green finance had a negative effect on diminution of carbon dioxide (Sun, 2023). Interestingly, middle-to high-income areas see the strongest effects of green finance on company innovation (Wang et al., 2022). According to Ren et al. (2020), green innovation in these highly polluting businesses is significantly slowed down by stricter environmental regulations

Green investments and green lending facilities can help a green economy expand (Shan et al. (2021). To be more precise, according to Bai et al. (2022), the world's rising energy demand and costs since the COVID-19 epidemic have brought attention to the pressing need for green finance to avert future crises.Green finance policies, as viewed from the perspective of financial incentives and expenses related to environmental protection, include the consequences of environmental damage throughout the manufacturing process and into corporate processes (Pan et al., 2020). In order to secure better financing with a potentially longer payback period, traditional heavy polluters are encouraged to incur additional expenses, such as buying environmental apparatus and creating environment friendly technologies, under green finance regulations (Falcone, P. M., 2020). Accordingly, green finance worsens financial restrictions by having a detrimental effect on polluting enterprises' cash flow, balance sheet, and financial expenses (Scholtens, B. 2017). Businesses must ensure that their operations and activities meet the requirements for resource efficiency and environmental improvement if they want to receive additional funding through the green finance market system (Flammer, C. 2021). Green finance, therefore, alters the target company's external financing environment and integrates the requirement for access to funding for the company's own operations

The dynamic nature of the external environment was highlighted by Liu (2023) and Yu et al. (2021), who contended that a company's financial leverage decisions can be greatly impacted by changes in the economy, the market, and policy. For example, when the economy is doing well, businesses may be encouraged to take on more

debt in order to finance expansion, but when the economy is doing poorly, they may be prompted to take on less debt in order to decrease risk.

The current literature has offered a thorough examination of a number of subjects, providing insightful theoretical analysis of the topic at hand. There is still a gap in the conversation, nevertheless, regarding how green financing affects the amount of corporate debt. This study attempts to close that gap by providing a fresh viewpoint that contributes to the corpus of existing knowledge. Previous studies have examined a wide range of factors, such as governance systems, policy events, and external environmental factors, that affect corporate debt levels. The precise effects of green finance on this facet of corporate finance, however, have not gotten much attention. Corporate debt levels are anticipated to be significantly impacted by green finance, which includes environmentally friendly financing strategies and considerations when making financial decisions. This influence may show up as changes to a company's debt issuance tactics, debt costs, or even its overall financial risk profile. This study intends to add empirical information on the possible advantages and difficulties of green financing techniques by investigating the relationship between corporate debt levels and green finance. The anticipated results could guide corporate strategy, financial decision-making, and legislative suggestions meant to advance environmentally conscious and sustainable finance.

Theoretical Analysis and Research Assumptions

This study makes the case that corporate debt financing will become less expensive as green finance grows regionally. This conclusion is supported by a number of arguments and empirical data. First, specific green financial goods and services are usually made available when green finance expands at the regional level. These include green investment funds and green lending, all of which are intended to fund environmentally friendly initiatives. With the increasing popularity of these products, businesses now have access to more flexible and frequently less expensive financing options than traditional debt finance. Second, better environmental risk management procedures among businesses may result from regional governments and financial institutions promoting green funding.An efficient distribution of green funds is achieved by the regulation of green finance, which makes it easier for money to move from environmentally inefficient businesses to ecologically efficient ones (Huang et al., 2021).

Thirdly, businesses have been able to embrace more environmentally conscious and sustainable business practices because to the growth and significance of green finance, which has helped to encourage transparency and disclosure among them. Businesses frequently operated with little awareness of their environmental effects prior to the implementation of particular green finance regulations, which made it difficult for stakeholders and investors to assess their sustainability certifications. However, businesses are being forced to reveal more information about their environmental waste management strategies, as green finance gets traction. Businesses must ensure that their operations and activities meet the requirements for resource efficiency and environmental improvement if they want to receive additional funding through the green finance market system (Flammer, C. 2021). Green finance, therefore, alters the target company's external financing environment and integrates the requirement for access to funding for the company's internal operations.

Thus, Green financing is a driving force behind environmental stewardship and financial innovation, encouraging businesses to take more business models that are ethical and sustainable. Businesses that are dedicated to green finance are more likely to disclose comprehensive details about their sustainability objectives, components of environmental, social and governance. Because of the increased confidence between businesses and investors, capital is allocated more effectively and financing costs are reduced. Furthermore, the general stability and robustness of the financial markets can be improved by incorporating green finance into local financial systems. Green finance can reduce the financial risks connected to climate change and other environmental issues by encouraging sustainable investing and controlling environmental risks.

The following is the study's primary hypothesis.

H1: The green financial development suppresses the ability of heavy polluting companies to finance their transformation while boosting the ability of green businesses to finance their debt.

Table 1: Indexing System of Green Finance Development Level

Indicators	Indicator layer	Definition
Green Fund	Percentage of green funds	Total Market value of green funds
Green Rights	Depth of green rights development	The total value of energy, carbon, and emission trading

Green Support	Spending on environmental protection in the budget	General Budget spending
Green Credit	Percentage of green corporate credit volume	

Table 2: Definition of Variables

Type	Variable	Symbol	Measurement
Dependent Variable	Cost of Corporate Debt Financing	DDebt	Total assets at the start of the time frame
Independent Variable	Green Finance	Green	Subset of sustainable finance
Control Variables	Company Size	Size	raw logarithm of the company's total assets
	Age of enterprise	Age	The number of years the company has been in existence
	Board Size	Size	The number of board members on a natural logarithmic scale
	Proportion of independent directors	Indep	Total number of board members
	Proportion of women in management	Female	The percentage of female directors, managers, and senior executives
	Average age of management	TMTAge	The mean age of all the company's directors, managers, and top executives
	Return on Assets	RoA	Net Profit / Total Assets
	Cash ratio	Cash flow	Liquid assets balance at the end of period
	Business Growth	Growth	Growth in operational income year over year
	Asset structure	Fixed	Net Fixed Asset

Data Sources

Since India's implementation of international financial reporting standards and subsequent significant financial reforms have an effect on corporate financial data, we have chosen Indian publicly traded companies for this analysis. The 1% level has been applied to all continuous variables in order To mitigate the impact of excessive values on the results of our study. Clustering is done in this study at the level of individual companies. NDAP databases has been used for enterprise-related data in order to collect pertinent information.In order to ensure data completeness, samples with significant missing variable values were eliminated and missing data was filled in using median interpolation. Table 3 displays the findings of the data's descriptive statistics. There were 14532 people in the sample overall.

Table.3 Descriptive Data

Variable	N	Mean	SD	p50	Min	Max
DDebt	152.53	1.431	0.373	0.531	11.418	1.0321
Green	154.52	0.238	0.505	11.254	1.521	3.321
Size	154.34	34.601	0.474	22.521	0	4.643
Age	154.27	11.421	1.302	6.331	0.432	11.280
Size	154.12	1.045	0.821	0.421	1.603	2.478
Indep	154.47	0.501	0.723	11.821	22.421	1.023
Female	154.36	11.506	0.641	3.205	0.484	0.462
TMTAge	154.79	3.381	1.432	2.531	1.760	5.353
RoA	154.81	2.103	0.220	5.432	0	7.303
Cash flow	154.62	0.103	0.842	3.021	35.242	5.421
Growth	154.71	3.021	0.932	0.420	11.279	22.521
Fixed	154.24	0.621	1.402	1.736	4.632	3.432

Table.4 Benchmark Regression Test

Variables	Debt (1)	Debt (2)
Green	-0.218 (-4.169)	-0.182 (-2.521)
Size		-0.424*** (-14.403)
Age		0.005*** (12.25)
Size		0.002*** (-1.521)
Indep		0.113*** (-2.45)
Female		-0.000*** (-1.40)
TMTAge		0.167*** (-1.033)
RoA		2.439.*** (-5.14)
Cash flow		0.283*** (-1.296)
Growth		5.003*** (-2.52)
Fixed		-2.86*** (-3.224)
Observations	10.501	10.483

RESULTS AND DISCUSSION

This section presents the primary empirical findings from the study. In order to shed light on the preliminary outcomes of our investigation, we first examine the baseline regression results. Second, we move on to analyze the mechanisms underlying executive compensation and financial limitations, evaluating both their separate and combined effects on the final outcomes.

The Baseline Regression Findings

The empirical findings on how green finance affects corporate financial leverage costs are shown in Table 4. Green finance is successful in reducing corporate financial leverage costs, as evidenced by the coefficient linked to it showing statistical significance at the 1% level. This outcome validates Hypothesis 1. The model's baseline regression findings are shown in the table below, which accounts for year and industry fixed effects in both columns. With control variables excluded, column (1) demonstrates negative coefficients at the 1% significance level. Control factors are then included to the regression, and the outcomes, which are shown in Column (2), are consistent with the earlier conclusions. The findings show that, at the 1% level, the core independent variable is still considerably negative. Interestingly, compared to the model without control factors, the adjusted fit greatly improves with the addition of control variables. This emphasizes how crucial it is to take into account the influencing elements that these variables represent since they have an effect on the dynamics of business finance costs.

Overall, the results of the baseline regression offer preliminary proof that green finance is successful in lowering the cost of financing corporate debt. Expanding on these conclusions, we contend that the adoption of policies pertaining to green finance has made it easier to reduce the price of borrowing corporate debt. The financial ramifications of green financing should therefore be carefully considered by governments and financial institutions, and the system should be further developed and improved.

Table.4 Degree of Debt Financing and Green Finance Development

Variables	Debt (1)	Debt (2)
Green	-0.004*** (-2.362)	0.003*** (-1.410)
Size	-0.002*** (-4.713)	-0.006*** (-1.403)
Age	-0.001*** (-7.225)	0.006*** (-2.325)

Size	-0.114*** (-7.382)	0.002*** (-1.521)
Indep	-0.002*** (-2.531)	0.003*** (-3.425)
Female	-0.000*** (-2.327)	-0.000*** (-1.422)
TMTAge	-0.521*** (-2.362)	0.421*** (-1.427)
RoA	-0.748*** (-8.411)	0.634*** (-1.124)
Cash flow	-0.004*** (-2.867)	0.003*** (-1.429)
Growth	-0.004*** (-2.3738)	0.003*** (-3.552)
Fixed	-1.778*** (-2.362)	-4.876*** (-3.224)
Observations	6.284	6.818

*Significance levels: *** p < 0.001; ** p < 0.01;* p < 0.1.*

Robustness Test

Green finance successfully lowers the amount of corporate debt financing, according to the findings. The validity of these results must then be confirmed by modifying the sample duration, variable substitution tests, and exclusion tests that are directly under the union government. The robustness test is shown in table.5.

CONCLUSION

This research offers a sophisticated grasp of of how green finance affects the economy, especially in connection to the amount of corporate debt financing. Our research shows that green finance successfully reduces businesses' debt financing burden, a finding that holds up well under a number of robustness tests. Two main strategies are used to accomplish this mitigation: easing financial restrictions and raising executive compensation.Our analysis further emphasizes how green funding has a diverse impact. Notably, it significantly affects the amount of debt financing in state-owned businesses, as well as in areas with better industrial facilities, less carbon emissions and lower marketization levels. Furthermore, we find that while short-term debt financing is not much impacted, the efficiency of green finance in reducing non-current liability levels is increased by the tightening of external environmental rules.

Table.5 Robustness Test

Variables	**Debt (1)**	**Debt (2)**
Green	-0.005*** (-2.842)	0.002*** (-1.205)
Size	-1.022*** (-1.421)	-0.006*** (-1.403)
Age	-0.001*** (-2.533)	0.006*** (-5.425)
Size	-1.114*** (-6.031)	4.002*** (-1.501)
Indep	-0.002*** (-2.317)	0.003*** (-2.225)
Female	-0.000*** (-2.327)	-0.000*** (-1.422)
TMTAge	-0.521*** (-2.362)	0.421*** (-1.427)
RoA	-0.748*** (-5.461)	0.634*** (-0.154)
Cash flow	-0.004*** (-2.867)	0.003*** (-1.429)
Growth	-1.004*** (-2.3738)	0.471*** (-3.552)
Fixed	-5.728***	-2.666***

	(-2.362)	(-3.224)
Observations	5380	5758
Company	Yes	Yes
Year	Yes	Yes

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