Guest editorial: Green and sustainable corporate finance: past, present and future

1. Introduction

Sustainability as a phenomenon is rapidly entering the economic and the financial literature. Initially, the concept was introduced in the environmental interpretation during United Nations conferences in the 1970s and 1980s. This special issue (SI) treats sustainable corporate finance as a multi-attribute approach in which financial, social and environmental elements are interrelated and integrated. The key concept of sustainability is that an explicit connection should be made between present and future generations. Because of its discounting capacity, the character of finance is specifically suited to store present and future developments. A major problem, however, is the relevance of the assumptions on the behavior of economic agents. Whereas capital market theories can be analyzed as positive theories based on strictly rational human behavior, financial management cannot be value-free because of the consequences of the choices of economic agents.

In present times of technological progress, the worldwide economy is undermined from three major challenges: environmental change, vitality limitations and money related emergency. Green finance has emerged as the solution for accomplishing contract between the economy and nature. Green finance is considered the monetary help for green development, which decreases ozone depleting substance discharges and air contamination emanations altogether. Green fund in horticulture, green structures, green security and other green activities should increase for the monetary improvement of the global economy.

Green and sustainable corporate finance are more important nowadays that even before. They are gaining increasing worldwide attention from financial markets, political actors and the broader public alike. Their objective is to consider environmental, social or governance criteria when making financial decisions and designing financial services, thus expanding the benefit beyond investors to the whole society. Academics and practitioners are questioning the role that green and sustainable finance plays, which goes beyond the primary function of finance as funding the economy.

Aware of the importance of extra-financial issues, the investment community has noted a shift in focus from shareholders to stakeholders' values. A new approach of finance is thus needed to answer questions related to green and sustainable finance. Financial markets, corporate finance and corporate governance have to integrate extra-financial aspects into financial decision-making processes.

Sustainable finance is a work stream to support the channeling of private investment to the transition to a climate-neutral economy. Green finance is important as it promotes and supports the flow of financial instruments and related services towards the development and implementation of sustainable business models, investments, trade, economic, environmental and social projects and policies. As the financial sector plays a key role through its intermediary functions and risk management in advancing sustainable economic development while

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directing investment to the real economy, the intertwinement of these two is crucial. Moreover, based on the lessons learned from the global financial crisis in 2006–2009, the availing of the global warming and the need for more sustainable business practices, green finance initiatives have also been addressing the 2030 Sustainable Development Goals (SDGs)' Agenda by emphasizing the shift of focus from shareholders' value creation (economic) to the generation of stakeholders' value (economic, environmental and social).Green finance represents the future of the financial sector through innovative financial mechanisms and by supporting the investments in projects with positive and sustainable externalities.

Many issues remain unresolved and questions unanswered: how to allocate funds optimally in terms of financial and non-financial performance, how to finance the economy and satisfy a variety of objectives of stakeholders (firms, investors and society) from a more global point of view? What are the consequences of this fund allocation in terms of risk management for corporations and investors? Which asset pricing methods can be proposed to value these innovative financial instruments? What is the role of policy makers in developing green and sustainable finance?

This SI aims to answer these questions and address the theoretical and empirical issues related to recent developments and new directions in green and sustainable finance. It will advance our understanding of how financial products support investments in projects that benefit the environment and promote a carbon-free economy. It will also contribute to the development of a more comprehensive analysis of the role of green and sustainable finance in shaping firm and investor decisions. Papers will draw on recent theoretical and empirical research that explores the reasons, importance and implications of business ethics, corporate social responsibility and socially responsible investing. These will be of interest and relevance to academics, practitioners and policymakers, and this is what which motivated me to embark on this task and set the theme of this SI titled "*Green and sustainable corporate finance*".

The SI consists of seven papers:

In the first paper, DasGupta *et al.* (2022) examined whether firms' level of internationalization has a deterministic role for their engagement with SDGs and also whether country- and industry-specific moderation affects the relationship. Using a negative binomial regression model along with the fixed effects for industry and time in the empirical estimation, the study found that MNEs' internationalization is associated with their higher engagement in SDGs. Additionally, the country-level results suggest that this positive relation is stronger in countries with weak legal environment, countries with weak investor protection and in countries with higher SDG index scores whereas industry-level results indicate that the positive relation between MNE internationalization and their SDG engagement is weaker in industries facing more competition and industries exposed to negative externalities.

In the second paper, Karim and Naeem (2022) examine the connectedness among green, Islamic and conventional financial markets from December 2008 to May 2021. Employing time-varying parameter vector autoregressions (TVP-VAR) technique and wavelet coherence analysis, the study finds that Islamic stocks, sustainability index and S&P500 composite index are the net transmitters, whereas Sukuk, commodity index, bond market, clean energy and green bonds are the net recipient of spillovers. Time-varying features of green, Islamic and conventional financial markets are evident in system-wide connectedness.

In the third paper, Jadiyappa and Krishnankutty (2022) examine the impact of green operation (measured using the energy intensity of its operations) on the value of corporate firms in stock markets. Using several univariate and multivariate regression analyses on a panel of all non-financial Indian firms listed on the National Stock Exchange (NSE) from 2010 through 2018, the study found a positive relationship between energy efficiency (firms that consume a lesser amount of energy per unit of sale) and the value of firms in the stock market.

In the fourth paper, Kumari *et al.* (2022) aimed to identify the impact of board characteristics (BCs) on a firm's environmental performance and provides future research directions in the area of

BC impact on environmental disclosures (EDs) in case of India's environmentally sensitive and non-sensitive industries. Using a firm-level data from Prowess and Bloomberg, which cover 1,158 firm-year observations from National Stock Exchange of India (NSE) 500 listed companies from 2015 to 2020 and a dynamic panel regression, the study found that the lagged environment disclosure score is positively and significantly associated with current environmental disclosure scores. The presence of sustainability committee, board size and frequency of meetings has a positive and significant association with EDs for sensitive as well as non-sensitive industry groups.

In the fifth paper, Sisodia *et al.* (2022) explored whether the companies that issue green bonds are valued more by investors or not and further extend the analysis by exploring whether the green image of companies helps to minimize the value erosion during a crisis and enhance the resilience of the stocks? Using the propensity score matching, the study found that green bond firms are valued more by investors compared to brown bonds firms. Hence, green bond issuance acts as a strong signal of a firm's environmental commitment, and it is well recognized by the investors.

In the sixth paper, Rao *et al.* (2022) estimate the connectedness between classes S&P Green Bond Index, S&P GSCI Crude Oil Index, S&P GSCI Gold, MSCI Emerging Markets Index and MSCI World Index and Bitcoin, during the pre-and post-Covid period beginning from August 2011 to July 2021 (10 years). Authors used time-varying parameter vector autoregression and quantile regression methods to understand the impact of events on traditional and upcoming asset classes. The study found these markets are strongly linked, and green bond index shows a greater correlation and shock transmission with gold, whereas Bitcoin can no longer be used as a good hedging instrument, validating the fact that the 21st-century technology assets. The results further opine that under extreme economic consequences with high GPR and GPEU, even gold cannot be considered a safe investment asset.

In the seventh paper, Nugroho intends to select the best-fitting model(s) of equal risk contribution (ERC) portfolios, which is a robust estimation approach in the absence of reasonable expectations about future returns. Nugroho (2022) examined a portfolio consisting of five environmentally friendly exchange-traded funds and operationalized 20 covariance models in portfolio construction, and a portfolio with classic covariance is the benchmark to beat. After using statistical inferences of the model confidence set to find the best fitting model, the author found that ERC can benefit from copula-based covariance and that the outbreak of COVID-19 hugely impacts the portfolio drawdown.

The SI collectively provides policy recommendations for designing optimal green and energy efficiency financing schemes for researchers, policymakers and market players on access to green and sustainable finance.

2. Future research directions

The articles of the SI contribute to the selected themes in terms of methodological development and innovative applications. Future research in the following subtopics of the SI may be interesting and useful:

(1) Environmental risk modelling,

(2) Energy and environmental instruments risk management,

(3) Role of gender in the board on green corporate finance,

(4) Advances in financial markets of energy instruments,

(5) Energy and environmental derivative future tradings and

(6) Risk management for energy derivatives using mathematical modeling.

Authors of the published articles of this SI relied more on the statistical and econometric techniques. Regression and econophysics-based approaches received less attention. Starting from the second half of the previous decade, artificial intelligence and machine and deep learning approaches have got immense importance in almost every field of research. Hence, future studies can also look into these aspects.

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