# Chapter 9
# Assessing the Dependence of Sustainability and Market Indices in India: A Copula Approach

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## ABSTRACT

*This chapter delves into a novel exploration of the non-linear interdependence between the conventional market index and selected sustainability indices in India. While socially responsible investing has gained traction globally, its impact on emerging markets like India is less explored. This study assesses the relationship between the market index- Sensex and sustainability indices - ESG, Carbonex, and Greenex through copula models. By scrutinizing the relationship between them, this study breaks new ground in understanding investor preferences and market*

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*dynamics. Results indicate a strong positive association between Sensex and sustainable indices, underscoring investors' growing inclination towards sustainable investments. Moreover, the copula models reveal various degrees of dependency, with Carbonex demonstrating the highest dependency on Sensex. The findings of the study show the popularity of sustainable indices in the Indian landscape and provide insights for investors, companies and policymakers.*

## 1. INTRODUCTION

Socially responsible investing (SRI) is a long-term oriented investment approach which integrates environmental, social, and governance (ESG) factors in the research, analysis and selection process of securities within an investment portfolio (European Sustainable Investment Forum, 2018). In addition to delivering long-term returns for investors, SRI pushes companies towards socially responsible behaviour thus generating a positive societal impact (The Forum for Sustainable and Responsible Investment, 2018). As of the end of 2021, the US SIF Foundation reported $8.4 trillion in total assets under management in the United States, employing sustainable investment strategies. This constitutes 13 percent, or 1 in every 8 dollars, of the overall assets under professional management in the US (US SIF Foundation, 2022). The emergence of sustainability indices reflects a growing awareness and emphasis on incorporating ESG factors into investment decisions (Atz et al., 2023; Fowler & Hope, 2007; HKEX, 2020). However, most of the existing research on SRIs has focused primarily on the performance of socially responsible mutual funds (Kim, 2019; Renneboog et al., 2008; Statman & Glushkov, 2016).

Sustainable indices have not received the same level of attention in academic research, indicating the need for more research specifically dedicated to evaluating the effectiveness and impact of sustainability indices in promoting sustainable investing practices and driving positive environmental, social, and governance outcomes (Fowler & Hope, 2007; Jain et al., 2019; Plastun et al., 2022). These indices aim to reflect the performance of companies that adhere to sustainable practices, providing a benchmark for ESG-oriented investments. While the impact of socially responsible investing is well-documented in developed markets, its influence in emerging economies, such as India, remains underexplored (Jain & Tripathi, 2023; Talan & Sharma, 2019; Widyawati, 2019). This chapter seeks to fill this gap by examining the non-linear interdependence between conventional market indices and sustainability indices in India using a copula approach. The primary objective of this chapter is to assess the dependence between the Sensex and the selected sustainability indices (ESG, Carbonex, and Greenex) using copula models. Copula models offer a flexible and robust framework for analyzing the joint distribution of