


Chapter 9

Sustainable Investment Portfolios with AI: Bridging Green Finance and Technological Innovation

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ABSTRACT

This research examines the transformative role of artificial intelligence in advancing green finance by enhancing sustainable portfolio management practices. Through AI-driven data analysis, investors are empowered to prioritize environmentally responsible assets, such as green bonds and renewable energy funds, aligning their portfolios with climate-positive goals. AI algorithms play a critical role in forecasting environmental risks, aligning investments with ESG (Environmental, Social, and Governance) standards, and fostering ethical finance trends. This study explores a range of AI tools that enhance decision-making in green finance, assessing their strengths, limitations, and the societal benefits they can unlock. By aligning AI

DOI: 10.4018/979-8-3373-0350-5.ch009

innovation with green finance objectives, this research advocates for a financial ecosystem that supports global sustainability and ethics.

INTRODUCTION

This research delves into the profound impact of artificial intelligence (AI) on green finance, specifically examining its transformative role in bolstering sustainable portfolio management practices. (Yang et al., 2020) By leveraging AI's advanced data analysis capabilities, investors gain the power to prioritize environmentally responsible assets, such as green bonds and renewable energy funds, aligning their portfolios with climate-positive goals. (Versal & Sholoiko, 2022). The study explores a diverse range of AI tools designed to enhance decision-making in green finance, analyzing their strengths, limitations, (Sun et al., 2022) and the societal benefits they can unlock. The burgeoning field of green finance has emerged as a crucial catalyst for sustainable development, channeling capital towards projects and (Xie et al., 2022) initiatives that mitigate climate change and promote environmental conservation. (Andersen, 2017) Green bonds, for example, provide investors with an avenue to finance projects that contribute to a cleaner, more sustainable future. These bonds have gained significant traction, attracting a diverse range of investors seeking to align their portfolios with environmentally responsible goals. (Moore and Manring, 2009) Renewable energy funds offer another avenue for green finance, directing investments towards projects that generate clean energy from sources such as solar, wind, and geothermal power.

AI plays a pivotal role in advancing green finance by providing investors with the tools and insights needed to make informed, sustainable investment decisions. (Pieroni et al., 2019) AI algorithms can analyze vast amounts of data, identifying trends and patterns that may not be readily apparent to human analysts. This data-driven approach enables investors to:

AI is transforming green finance, offering a powerful toolset for investors seeking to align their portfolios with sustainability goals. (Richardson, 2009) Through advanced algorithms and data analytics, AI helps investors navigate the complexities of environmental, social, and governance (ESG) factors, making it easier to identify opportunities that support a more sustainable and ethical financial ecosystem.

At the core of AI's impact is its ability to assess the environmental consequences of investment decisions. (MacDonald et al., 2019; Rizzello & Kabli, 2020). By prioritizing sustainable projects, AI can forecast potential environmental risks, enabling investors to avoid investments that may pose long-term threats to both the planet and their portfolios. For example, AI algorithms can analyze companies' ESG performance, ensuring that investments are not only profitable but also aligned with

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