



Sustainable Development and its Practical Implications: A Literature Review

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Abstract. This paper undertakes a comprehensive review of the theoretical models and empirical evidence related to sustainable development, with a particular emphasis on sustainable investing and environmental policies. In recent years, a burgeoning body of research has emerged, demonstrating that sustainable investors typically prefer to hold portfolio firms with reduced emissions, reflecting their commitment to environmental stewardship. However, the evidence regarding whether sustainable investors actively engage with their portfolio companies in ways that lead to significant improvements in ESG performance is inconclusive. Some studies suggest proactive involvement, while others find limited impact. On the policy front, previous research has delved into the effectiveness of environmental regulations in driving sustainable practices, along with the potential costs they impose on businesses and economies. Additionally, the role of ESG disclosure standards in promoting transparency and accountability has been thoroughly explored. Overall, sustainable investing and environmental regulations can act as complementary forces, jointly propelling the agenda of sustainable development forward. Nevertheless, numerous challenges persist, including ensuring the efficacy of these initiatives and minimizing unintended negative consequences that could hinder progress.

Keywords: Sustainable Development, Sustainable Investing, Environmental Policy, ESG Disclosure.

1 Introduction

In recent years, the traditional economic model has caused severe environmental and resource issues, with high pollution degrading ecosystems—evident in acid rain and haze—that threaten human survival. People now prioritize equity and long-term well-being, emphasizing intergenerational fairness to leave a sustainable legacy for future generations. Amid global economic integration, nations recognize sustainable development as a shared responsibility, driving international cooperation to address these challenges. Emerging in the 1980s, the concept of sustainable development was first defined in the 1987 UN report *Our Common Future* as the balanced integration of economic growth, social equity, and environmental protection. It seeks to meet current needs while preserving natural resources like air, water, and forests for future use. At its core, it emphasizes development that does not exceed ecological limits, ensuring

economic and social progress coexists with environmental sustainability [1]. This framework highlights the tension between short-term growth and long-term planetary health, urging a shift toward inclusive, resilient development. By fostering global collaboration and responsible resource management, sustainable development aims to create a future where prosperity and ecological stewardship coexist, prioritizing the well-being of both current and future generations.

2 Theoretical Framework

2.1 Sustainable Investing

The core of the economic theoretical framework for sustainable development is to integrate the three dimensions of economic growth, social progress and environmental protection. Among them, the green economy theory emphasizes the win-win situation of economic growth and environmental protection through technological innovation and industrial upgrading. Pastor et al. (2021) develop an equilibrium model, and find that green assets have lower expected returns because they help investors hedge climate risk [2]. When positive shocks impact the ESG factor, which captures alterations in consumers' fondness for green products and investors' penchant for green - oriented assets, green assets tend to perform better than others. In a two - factor pricing model, the ESG factor, together with the market portfolio, contributes to the determination of asset valuations. The ESG investment industry reaches its largest scale when there are the most significant disparities in investors' ESG preferences. Sustainable investing generates positive social impacts by driving companies to become more environmentally friendly and redirecting real investment towards green enterprises. For example, China's 13th Five-Year Plan put forward the concept of green development, by promoting the development of clean energy and energy-efficient industries, economic growth was achieved while reducing carbon emissions. According to the National Energy Administration, the proportion of non-fossil energy consumption in China reached 14.3% in 2019, an increase of 4.6 percentage points from 2015.

2.2 Environmental Policies

Since companies often fail to account for the harmful spillover effects of their CO₂ emissions in their decision - making processes, government action is essential to drive sustainable development forward. Among the various policy tools at the government's disposal, two of the most prevalent approaches to environmental regulation are carbon cap - and - trade systems and carbon taxation. These mechanisms aim to incentivize firms to reduce their emissions by either setting a limit on the total amount of carbon that can be emitted and allowing trading of emission allowances (cap - and - trade) or by imposing a financial cost on each unit of carbon emissions produced (carbon taxes). Carbon cap-and-trade markets establish emissions limits for industries while allowing companies to buy and sell permits, creating financial incentives to reduce emissions. While carbon markets rely on the market price discovery function, carbon taxes directly impose a fee on carbon emissions.

Biais and Landier (2022) find that if firms anticipate caps, they invest in green technologies [3]. These investments generate positive externalities, reducing the overall cost of emission abatement for all companies. As a result, the government becomes

more inclined to implement emission caps. Conversely, when firms expect no such regulatory constraints, they refrain from investing in green technologies. In turn, the government deems the implementation of emission caps prohibitively expensive. However, a sizable investment fund that actively collaborates with corporate management to promote investment in green technologies can shift the balance and make the adoption of emission caps a more viable and attractive policy option. For example, the European Union encourages companies to reduce their carbon emissions by implementing an emissions trading system. Since its launch in 2005, the system has reduced EU emissions by about 20 percent.

Aghion et al. (2016) provide evidence that higher tax-inclusive fuel prices significantly encourage firms to innovate more in clean technologies relative to dirty ones, using data from the auto industry [4]. The paper identifies path dependence in innovation both from broader industry spillovers and from firms' own innovation histories, and stimulate the level of carbon taxes needed to ensure transition from dirty to clean technologies. According to the International Environmental Protection Organization (IPE), more than 50 countries around the world have implemented carbon tax policies.

3 Empirical Evidence

3.1 Effect of Sustainable Investing on Corporate Performance

A strand of empirical studies examines how sustainable investing influences corporate performance, particularly regarding environmental outcomes. Many of them documents a positive effect of sustainable investors on their portfolio firms. Azar et al. (2021) finds that the "Big Three" asset managers—BlackRock, Vanguard, and State Street Global Advisors—strategically focus their engagement efforts on large, high-emission firms where they hold significant stakes [5]. Among the components of the MSCI index, when the ownership stake held by the Big Three (asset management firms) increases, it results in a subsequent decrease in carbon emissions. This association becomes even more pronounced in the latter part of the sample period. This heightened effect can be attributed to the fact that the Big Three made public pledges regarding ESG matters during this time, which likely amplified their influence on companies to reduce emissions. Complementing this evidence, Pawliczek et al. (2021) find that following the release of BlackRock's annual "Dear CEO" letters, portfolio firms significantly adjust their disclosure practices to align with the environmental and regulatory topics highlighted by BlackRock [6]. BlackRock further reward these firms that improve their disclosures by more frequently supporting management in shareholder votes. These findings suggest that large institutional investors can exert meaningful influence on corporate environmental performance.

However, it remains inconclusive whether sustainable investing makes economically meaningful impact. Kim and Yoon (2023) analyze the behavior of active U.S. mutual funds after they sign the United Nations Principles for Responsible Investment (PRI). While PRI signatories experience substantial inflows of capital, there is no meaningful improvements in fund-level ESG scores or fund returns [7]. Similarly, Health et al. (2023) assess whether socially responsible investment (SRI) funds actively drive

changes in firm behavior. They show that SRI funds select firms with superior environmental and social practices, but do not significantly influence firms' subsequent behavior [8]. These findings suggest that while ESG funds allocate capital to better-behaving firms, they may lack of active engagements in pushing their portfolio firms to improve their ESG performance.

On the side of private firms, Barber et al. (2021) find that impact investors willingly sacrifice financial returns to achieve social and environmental objectives [9]. Using venture capital data, they document that impact funds earn internal rates of return (IRRs) that are 4.7 percentage points lower than those of traditional VC funds *ex post*. Utilizing willingness - to - pay models, the researchers calculate that, prior to investment, investors are prepared to tolerate internal rates of return (IRRs) that are 2.5 to 3.7 percentage points lower for investments centered on generating social or environmental impact.

3.2 Effect of Environmental Regulations

Environmental regulations, designed to mitigate ecological degradation and promote sustainability, have emerged as a critical driver of change in global financial markets. As governments worldwide started to implement environmental policies to address climate change and resource depletion, these rules are reshaping corporate behaviors.

A growing body of research examines the economic and social impact of environmental regulations, focusing on both their benefits and costs. Deschênes et al. (2017) provide important evidence on the benefits of environmental regulation based on their analysis of the Nitrogen Oxides (NO_x) Budget Program (NBP), a major cap-and-trade initiative targeting air pollution [10]. They find that the NBP led to significant reductions in NO_x emissions and ambient ozone levels, which further translated into declines in pharmaceutical expenditures and mortality rates. Overall, their findings suggest that the health and economic benefits of the NBP substantially exceed its costs. Curtis (2018) provides further evidence on the labor market consequences of NBP that the overall manufacturing employment declined by 1.3%, with losses reaching up to 4.8% in energy-intensive industries [11]. The declines were primarily driven by reduced hiring, and young workers were disproportionately affected.

Under stricter environmental regulations, public firms may respond strategically in ways that do not meaningfully reduce pollution. Duchin et al. (2025) study the asset market for pollutive plants and document that firms divest pollutive assets following environmental risk incidents, but overall pollution levels do not decline as a result [12]. Instead, the buyers of these assets tend to be firms facing weaker environmental scrutiny, often with existing supply chain relationships or joint ventures with the sellers. The collective evidence suggests that divestures can create the appearance of improved sustainability without real improvements in environmental performance from a society perspective.

Another important regulatory development concerns the establishment of ESG disclosure standards. Krueger et al. (2024) examine the effects of mandatory ESG disclosure regulations around the world and find that such mandates significantly improve firms' stock liquidity [13]. The improvements are strongest when disclosures are required by government bodies with strong enforcement mechanisms and when firms initially have weaker information environments. Bochkay et al. (2025) show that the release of voluntary sustainability disclosure standards by the Sustainability

Accounting Standards Board (SASB) help improve firms' communication practices, especially financially material sustainability topics [14]. The effect is more pronounced in industries where there was greater initial uncertainty about which ESG issues mattered most to investors. Together, these findings highlight that both voluntary and mandatory ESG disclosure standards can enhance corporate transparency and benefit capital markets.

4 Conclusion

Sustainable development seeks to reconcile economic growth, social progress, and environmental protection, requiring coordinated action from investors, corporations, and governments. Our review highlights that sustainable investing can influence corporate environmental performance, particularly when large institutional investors are committed to sustainability issues and actively engage with their portfolio firms. However, the empirical evidence on whether sustainable investors drive meaningful improvements remains mixed. Though ESG funds tend to select portfolio firms with lower emissions, there is limited evidence that they engage with portfolio firms to help them improve ESG performance. On the policy side, environmental regulations such as cap-and-trade programs and carbon taxes have demonstrated tangible benefits. They help reduce pollution, encourage innovation in clean technologies, and improve public health. However, they can also impose costs on certain labor markets. In addition, firms may strategically shift their emissions to connected firms that are not subject to regulation. ESG disclosure standards, both voluntary and mandatory, have improved corporate transparency and contributed to more efficient capital markets. While progress has been made, realizing the full potential of sustainable development will require continued efforts to design effective policies, strengthen enforcement mechanisms, and align financial incentives with long-term environmental and social goals.

Existing research also faces limitations. The quality of emissions data and other ESG performance measures is often in doubt. Because much of the information is voluntarily disclosed, leading to missing values and potential selection bias. Moreover, most evidence is based on public firms due to data availability, leaving the role of private firms—significant contributors to climate change—less understood. Future work can address these gaps by leveraging more granular data and more advanced techniques, such as matching geolocated emission data or air quality data to manufacturing plants, parsing information on ESG issues from firms' ESG report. More research is also needed to understand corporate strategies in the face of increasing uncertainties in environmental policies.

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