

Impact of Digital Financial Platforms on ESG Investment Decisions

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Abstract. The convergence between digital financial platforms and environmental, social, and governance (ESG) investing has reshaped capital allocation worldwide. This review draws on empirical research, market data and early case evidence to assess the impact of FinTech platforms - the mobile investment app, AI-driven robo-advisor, blockchain-based reporting infrastructure and big-data analytics ecosystem - on investor behaviour, firm ESG performance and market transparency. Major results show that digital finance has a positive and significant effect on corporate ESG performance, that the combination of robo-advisor adoption and ESG-portfolio customisation has the largest positive effect on investor engagement, and that blockchain-based disclosure systems can mitigate greenwashing on a mass scale. The worldwide ESG investing market is expected to reach more than USD 127 trillion by 2034, up from around USD 29.77 trillion in 2024, growing at a CAGR of 17.26% over the forecast period. Policy, data quality, and research gaps are identified and discussed.

Keywords: ESG Investing, Sustainable Finance, Digital Financial Platforms, FinTech, Socially Responsible Investing (SRI), Impact Investing.

1. Introduction: Impact of Digital Financial Platforms on ESG Investment Decisions

ESG investment is no longer an alternative ethical approach but is becoming the dominant investment paradigm. The rate of change depends on gaining access to digital platforms that lower information barriers, democratise portfolio building, and automate screening for ESG investments [1]. On the other hand, ongoing concerns about data homogeneity, inconsistencies among rating organisations, and greenwashing are creating scepticism among investors in ESG-labelled investments [19]. Digital platforms, such as mobile trading apps, AI-driven advice services, and distributed ledger systems, can play an important role in resolving these challenges by alleviating information asymmetry, providing automated ESG scoring, and enabling real-time, auditable data feeds. Nevertheless, the empirical literature remains dispersed across various geographies and methodologies. This paper provides a review of existing literature on: (a) the degree of interrelation between digital finance and ESG investment, (b) the way digital platforms affect investor and firm-level ESG investment decisions, and (c) cutting-edge technological platforms such as blockchain verification and generative AI-based analytics [8] [11] [13].

2. Market Landscape and Growth Trajectory

Table 1: Key ESG Market Metrics (2024). Sources: [2, 3, 4, 6]

Global ESG AUM (2024)	CAGR 2025–2034	ESG Robo-Advisor Market	Europe's ESG Share
USD 29.77 Trillion	~15–19%	USD 8.1 Billion (2024)	~44% of Global AUM



Figure 1: Global ESG Investing Market Size, 2023–2034 (USD Trillion). Solid bars: historical/estimated; light bars: projected. Sources: Fortune Business Insights (2025) [2]; Cervicorn Consulting (2026) [3]; Bloomberg Intelligence (2024) [4].

The global ESG investing market size was valued at around 29.77 trillion USD in 2024 and is expected to grow at a rate (CAGR) of 15–19% for the next 10 years, reaching a size of about 127–181 trillion USD, depending on the methodology of analysis and assumptions considered in the scenarios [2, 3]. Bloomberg Intelligence estimates global ESG assets surpassed USD 30 trillion in 2022, on pace to reach over USD 40 trillion by 2030 and to account for more than 25% of total projected assets under management of USD 140 trillion [4]. The single-region market is dominated by Europe, accounting for approximately 17.18 trillion USD (44%) of the global total in 2025 and propelled by the EU Taxonomy for Sustainable Activities, the Sustainable Finance Disclosure Regulation (SFDR), and the Corporate Sustainability Reporting Directive (CSRD) [2]. ESG assets under management – North America – 2024: North America leads the pack with an estimated 10.87 trillion USD in 2024. Asia-Pacific is also the fastest-growing market and will develop at a CAGR of more than 21% by 2030, as per Table 1 and Figure 1. And 2 [5] [115] [139].

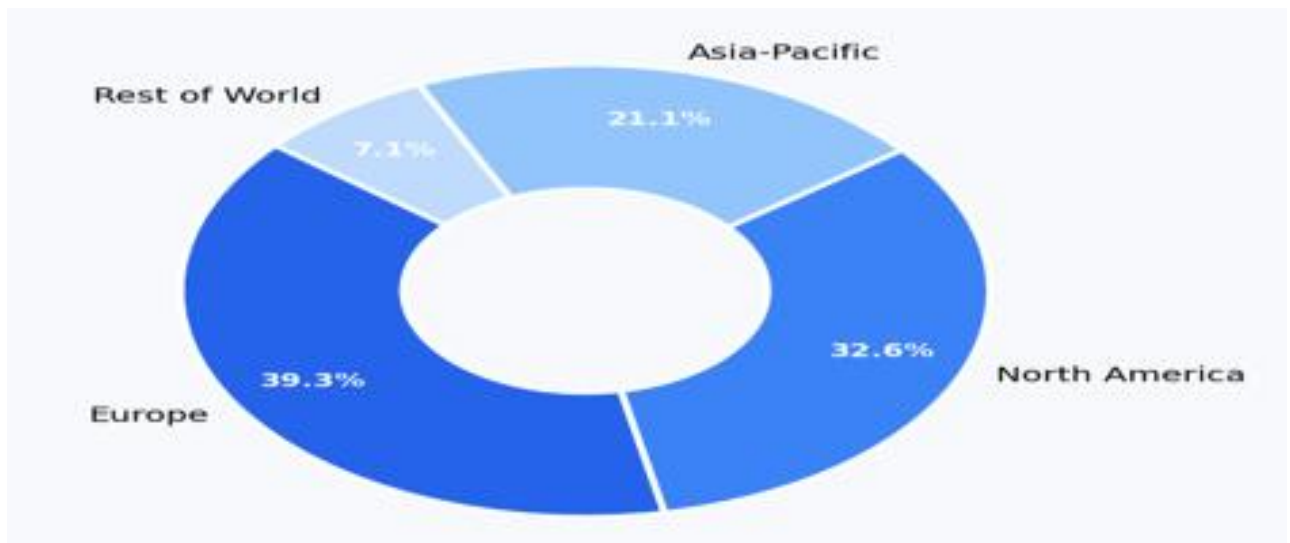


Figure 2: Regional Distribution of Global ESG Assets Under Management (2024). Sources: Fortune Business Insights (2025) [2]; Cervicorn Consulting (2026) [3].

3. Digital Financial Platforms: Taxonomy and ESG Relevance

3.1 Mobile and Retail Investment Platform

No-fee and mobile-first investment apps have made ESG exchange-traded funds (ETFs), green bonds, and impact investing funds available to retail investors who have long been underserved by traditional wealth management [1]. ESG-centric FinTech marketplaces for curated sustainable products are emerging, as well as educational FinTech platforms that help investors become more financially literate in sustainability considerations. The volume of sustainability-linked bond issuances reached a record high of more than USD 160 billion in 2023, a remarkable leap from USD 10 billion in 2019, which indicates the increasing popularity of sustainable financial products [112] [23]

[129].

3.2 AI-Powered Robo-Advisors

The global ESG-focused robo-advisor market was valued at USD 8.1 billion in 2024, of which North America held a share worth nearly USD 3.6 billion and Europe 2.4 billion [6]. Over 55% of platforms introduced ESG-based robo-advisory models to tap socially-conscious investors, and about 45% of platforms now offer ESG portfolios [6]. At the 2024 launch of the Vanguard ESG robo-advisor, 36% of new users chose the ESG model, with segment sign-ups rising 31% in the first half of 2024, as per the figure. 3[6] [36] [46] [55].

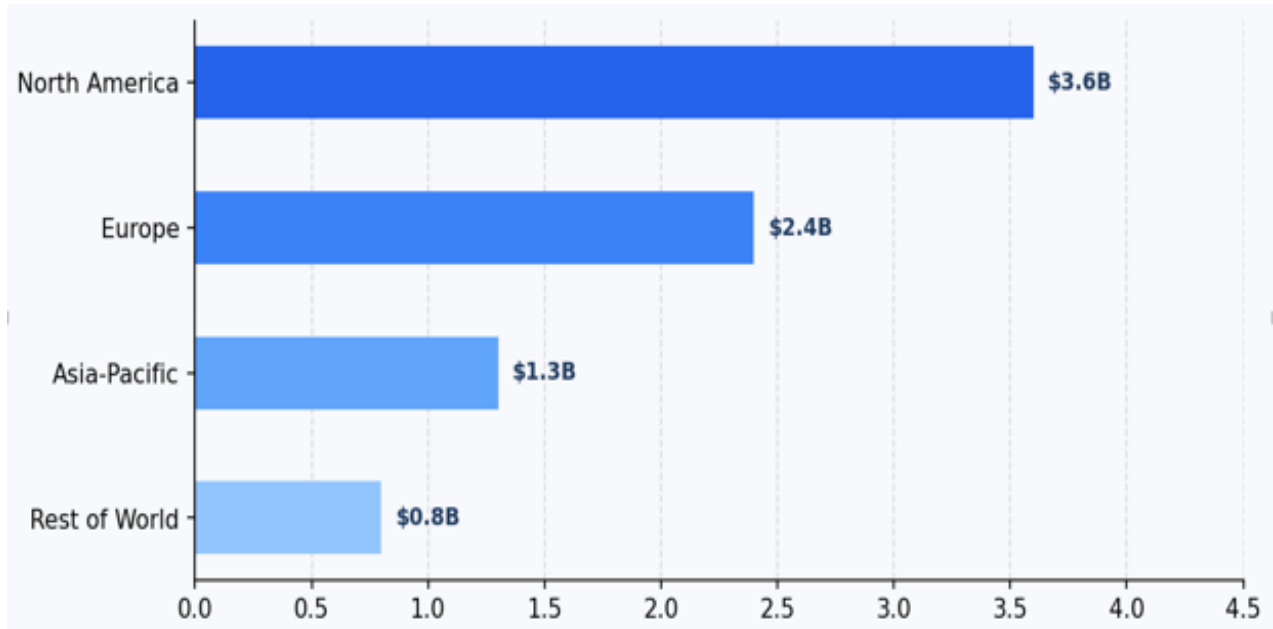


Figure 3: ESG-Focused Robo-Advisor Market Size by Region, 2024 (USD Billion). Source: DataIntel (2025) [6]; Global Growth Insights (2026) [6].

A survey of 393 investors in China in 2024 using the PLS-SEM approach revealed that perceived ease of use and perceived usefulness of digital financial platforms are positively influenced by the use of robo-advisors and awareness of ESG factors, and ESG portfolio personalisation has a positive direct effect on three outcome constructs, namely behavioural intention to invest sustainably [7]. A Significant moderating role of perceived trust was confirmed, implying that trust in the platform and transparency of data are the prerequisites for changing behaviour [117] [79] [80] [88] [93].

3.3 Big Data and AI Analytics Ecosystems Machine learning and AI-based products are being leveraged more and more to predict and evaluate ESG risks in industries, to help automate compliance with ESG regulations, and to identify greenwashing by matching disclosed statements with third-party data signals [1, 8]. UK Financial Conduct Authority – uses AI to systematically triage sustainability disclosures and identify typical greenwashing (by comparing company text within reports and with external signals) [8]. The global ESG Investment Analytics market size is expected to grow from USD 51.28 billion in 2024 to USD 173.36 billion by 2034, at a CAGR of 12.95% during the forecast period as per figure: 4 [99] [103] [107].

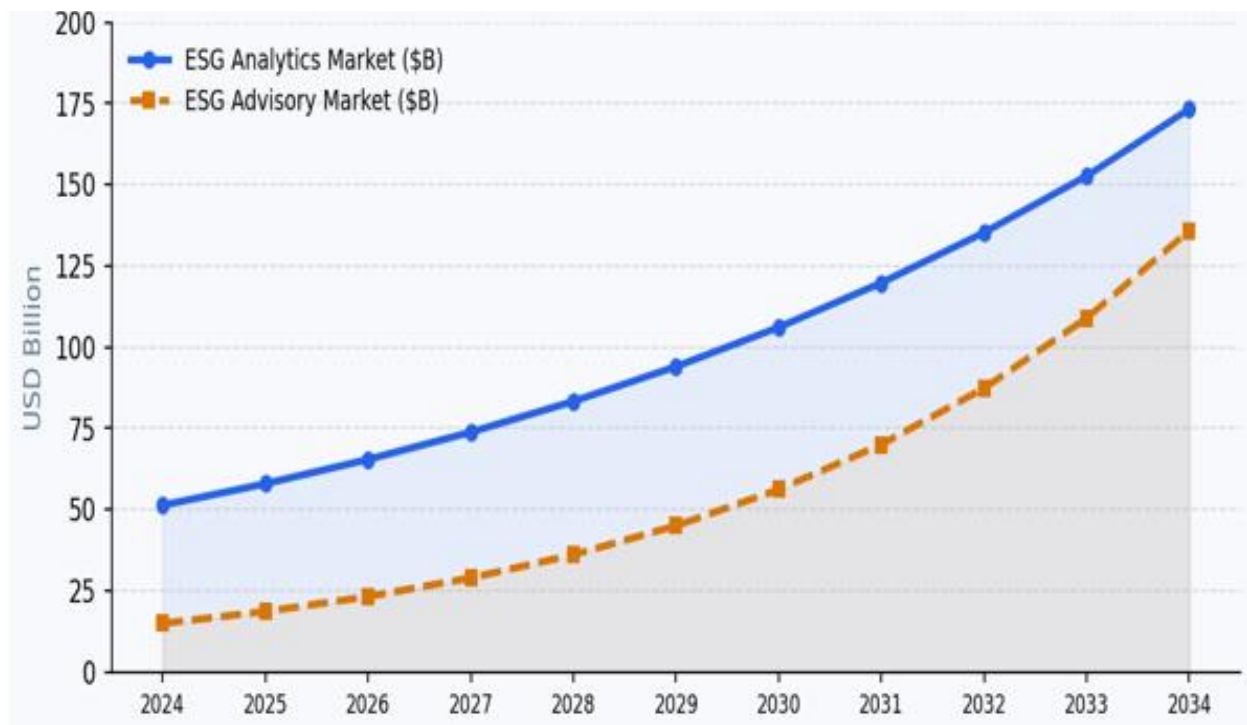


Figure 4 (Figure 5 in full dataset): ESG Analytics & Advisory Market Growth, 2024–2034 (USD Billion). Sources: Market Research Future (2025) [9]; Markets and Markets (2024) [17]; Polaris Market Research (2025) [20].

4. Mechanisms Linking Digital Finance to ESG Investment Decisions

4.1 Easing Financing Constraints and Enabling Green Innovation

Based on panel data of A-share listed firms on the Shanghai and Shenzhen stock exchanges during 2011–2022, they demonstrate that digital finance has a positive effect on corporate ESG performance, among which financing constraints and digital transformation act as partial mediators [10]. The pathway is via two channels: (1) digital finance lowers the financing threshold of green innovation projects and encourages investment in environmental protection-related R&D, supporting green technological innovation; and (2) by alleviating financing constraints and lowering corporate debt default risk, digital finance facilitates firm investment in CSR(s) associated with environmental protection [10]. Another paper that exploits a staggered difference-in-differences (DID) identification strategy and employs Bartik instrumental variables for causal inference documents substantial influences of digital finance on the environmental and governance components of ESG performance, and discovers that digital transformation and green technological innovation as "dual engines" further empower the beneficial impacts of digital finance when they come into play [111] [113] [116].

4.2 Reducing Information Asymmetry

Digital finance eschews heuristic-based decisions by providing managers with relatively easy access to more and broader information and thus inhibits corporate ESG decoupling — the divergence between ESG disclosures and actual practices [12]. Based on data from Shanghai and Shenzhen A-share listed companies (2016–2022), a recent study reveals that digital finance restrains information-based ESG decoupling at the 1% significance level, with a more substantial effect in industries where the credit market discriminates against polluting enterprises that suffer from financing pressure, which motivates the practice of disclosure manipulation [112] [114] [120].

Various Firm-Level Effects The positive effects of digital finance on ESG performance are more significant for small, high-tech and non-polluting enterprises, but the effect on environmental performance (the "E" aspect) is limited compared to social performance and corporate governance enhancement in most company classifications [10]. This heterogeneity matters significantly for the design of policy: sectoral policies may be needed to guarantee that the benefits of digital finance are also accessible to incumbents of heavy industry, who confront the daunting task of structural decarbonisation as per figure :5 [121][139][151].

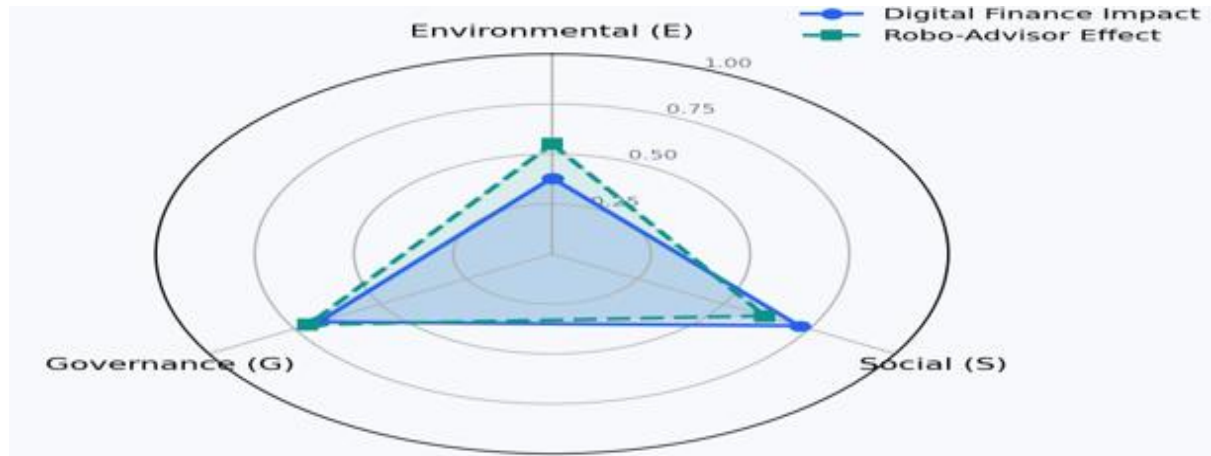


Figure 5:Relative Importance of Digital Finance Over Robo-Advisory for Sub-Dimensions of ESG Factors (Composite Score, 0-1 Scale). Larger scores reflect more pronounced evidence. References: MDPI (2025) [10, 11]; Nature Scientific Reports (2025) [27].

5. Blockchain Technology and ESG Data Integrity

One of the most discussed aspects of ESG investments is the correctness and verifiability of data. The structure of blockchain, with its data integrity and transparency, along with smart contracts, could be one of the components of this problem [13, 14]. The application of studies involving Knowledge Discovery from Data (KDD) analysis proved that blockchain technology ensured significantly higher data integrity levels in comparison with traditional systems with real-time updates and increased transparency; however, there are still difficulties regarding scalability issues and expenses related to regulatory compliance, which are draconian [15]. The blockchain system, with automatic data collection and validation while tracking carbon emissions throughout the supply chain, increased reporting accuracy through data immutability and an automated validation process, enabling companies to make better decisions regarding climate change [13]. According to RepRisk's report, greenwashing cases decreased by 12% annually in 2024. One of the reasons for such a decrease is the high efficiency of digital monitoring and verifying systems [16]. With AI and blockchain, reporting becomes easier, and data becomes more accurate, with a favourable effect on business performance [77] [89] [91][149].

6. Investor Behaviour: Evidence and Mechanisms

Table 2: Empirical Evidence on Platform-Mediated Determinants of ESG Investor Behaviour. Sources: [7, 17, 18]

Factor	Observed Effect	Source
Robo-advisor usage	↑ Perceived usefulness; ↑ ease of use	Nature Sci. Reports (2025)
ESG portfolio personalisation	↑ Perceived usefulness; ↑ behavioural intention	Nature Sci. Reports (2025)
Perceived platform trust	Moderates adoption intention (positive)	Nature Sci. Reports (2025) [7]
Robo-advisor automation	↓ 22% excess trading; ↑ after-fee returns	Das & Banerjee (2023) [17]
AI reinforcement learning	Superior risk-adjusted returns vs heuristics	Huang et al. (2024) [18]
ESG rating disclosure on platforms	↑ Robo-advisor ESG adoption intent	Sun et al. (2023) [18]

Abstracting from individual research, digital platforms seem to reduce some behavioural biases typical of retail investors such as over-trading, disposition effect, and status-quo bias thanks to automation and personalised nudges, and at the same time allow for expressing ESG preferences with lower transaction costs [17]. These results are in

line with the TAM model [7], suggesting that the most important determinants of technology adoption intention are perceived usefulness and perceived ease of use as per table 2 [145] [66] [69][155].

7. Regulatory Context and Standardisation Pressures

ESG disclosures that align with platform capabilities have become necessary in terms of regulation more and more. For instance, under the corporate sustainability reporting directive (CSRD), valid since 2025 for the largest companies, it is required to conduct comprehensive sustainability reporting following European Sustainability Reporting Standards (ESRS). In addition, stock exchanges of China have issued joint Guidelines for Corporate Sustainability Reporting along with ISSB standards in April 2024; the number of listed firms issuing ESG reports accounted for 42.14% in China by September 2024 [11]. Standardisation of ESG data collection will help lower the costs of gathering ESG data for digital platforms, in addition to making such comparisons easier among reporting firms, and thus leading to the improvement of ESG analytics products' quality. However, there is still a huge divergence in ESG scoring among agencies, thus forming an aspect of structural uncertainty that needs to be handled appropriately by AI-powered technologies — rather than eliminated [19]. Estimated to be worth USD 14.89 billion in 2024 and grow at a CAGR of 24.8%, the ESG Advisory market has been partly fueled by the requirement to comply with regulations, which has become a widely popular web-based solution [120] [118][159].

8. Challenges and Limitations

Despite the achievements made, some key issues prevent the full utilisation of digital technologies in ESG investing:

- Data accuracy and standardisation: Because ESG data is manually collected and checked, discrepancies are inevitable, which cannot be overcome by the most sophisticated AI algorithms without having accurate data sources [157].
- The risk of digital greenwashing: Similarly to the issue at the company level, digital platforms can use ESG branding as a sales strategy while failing to guarantee portfolio integrity [154].
- Overreliance on vendors: Because a small number of providers (MSCI, Sustainalytics, Bloomberg) offer an ESG infrastructure, there is a systemic risk because any problem with a single vendor would affect the entire ESG data ecosystem [159].
- Algorithmic opaqueness: The portfolios of robo-advisors based on ESG tend to be rather opaque, which hampers the process of verifying the legitimacy of their claims [7,8,19].
- Fragmentation of regulatory environments: Varied criteria of national ESG disclosure requirements constitute barriers to compliance in international digital platforms and data compatibility [152].

9. Conclusion and Further Research

Digital financial platforms serve as a structural factor that determines ESG investments made by investors and companies.

1. Three patterns can be observed based on the literature review:
2. Digital finance contributes to improvements in ESG performance due to reduced constraints on financing and increased incentives for green innovation, especially when it comes to governance and social components.
3. Robo-advisors, ESG customisation, and perceived platform credibility affect retail investors' choice of sustainable investment products.
4. Blockchain and AI technologies provide believable routes to minimising ESG data opacity and greenwashing, although there are still significant hurdles to be overcome in application. Future studies should focus on the following priority topics:
 - Longitudinal investigation of investor pace of behavioural change after platform-mediated ESG adoption in different national environments.
 - Developing causal identification strategies for pinpointing digital finance impacts in non-Chinese markets, given the less solid empirical foundation there.
 - Evaluation of AI explainability needs for ESG robo-advisory systems in light of regulatory and investor-protection considerations.
 - Implications for the welfare of the algorithmic homogenization of ESG portfolio construction, especially in times of systemic stress.
 - Designing shared ESG data infrastructure governance to transform transparency and accountability from

being a competitive advantage into a public good. As the global ESG investing market nears and potentially exceeds USD 127 trillion by 2034, the regulation of digital ESG infrastructure will surely become one of the largest questions in sustainable finance policy.

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