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Does FinTech Amplify Green Finance? Moderating and Heterogeneous Effects on Financial Development

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A B S T R A C T

Purpose— This study aims to explore the impact of financial technologies (FT) and green finance (GFN) on financial development (FD). The study also examines the moderating effect of FT in enhancing the contribution of GFN to FD in OECD countries.

Study Design/methodology/approach— The study uses principal component analysis (PCA) to create composite indices for GFN and FT. A balanced panel of 26 OECD countries from 2013 to 2022 is analysed. The empirical estimation is conducted by using two steps: System Generalized Method of Moments (GMM), which is suitable for dynamic panel settings having large cross sections and small time periods to address potential endogeneity, unobserved heterogeneity, and persistence in FD.

Findings—The empirical results demonstrate that both GFN and FT positively and significantly enhance FD in OECD countries. Specifically, GFN exerts a significantly positive effect on FD ($\beta = 0.052$, $p < .05$), while FT also shows a significant positive contribution ($\beta = 0.033$, $p < .01$). The comparative magnitude of the coefficients suggests that GFN has a relatively stronger direct impact on FD than FT. Furthermore, the interaction term between FT and GFN is positive and statistically significant ($\beta = 0.010$, $p < .01$), indicating that FT strengthens the effectiveness of GFN in promoting FD. A disaggregated analysis of GFN variables confirms the consistency of the empirical results. The heterogeneity investigation reveals that FT and GFN have a greater impact in low-income economies. Moreover, GFN has a more significant impact on low-GFN-adoption countries, while the impact of FT is more significant on low-FT-adoption countries.

Practical Implications— The study's findings provide policymakers with insight into how GFN, FT, and their interactions drive FD in OECD economies.

Originality/Value— This study contributes to the literature on GFN, FT, and FD by examining their direct and interactive effects in OECD economies. Although previous research has examined the relationships between these constructs, evidence on their combined and moderating effects in a unified panel-data framework is limited. The study builds on previous research by combining GFN and FT in a dynamic panel setting and examining the moderating role of FT across FD. In addition, the introduction of heterogeneity analysis strengthens the policy relevance and contextual understanding of results for the countries in the OECD. The results provide new empirical and policy-relevant evidence on OECD countries and do not provide a new theoretical framework.

Keywords: Financial development, Financial technology, Green finance, Moderation analysis, Sustainable finance, GMM, OECD countries

JEL Classification Codes: G20, Q56, O33, Q01

1 | INTRODUCTION

1.1 | Background

The primary function of a financial system is to efficiently mobilise, allocate, and manage financial resources towards investment projects (Umar et al., 2020). The term "FD" refers to the growth of financial markets and financial institutions, as measured by their depth, access, and efficiency (Svirydzenka, 2016). A well-developed financial system would increase access to financial services, effectively allocate financial resources, and bring economic stability (Stiglitz, 1998). However, increasing climate-related risks and the growing role of digital technologies have transformed the worldwide financial system, making it more environmentally friendly and technologically oriented (George, 2024). Consequently, these transformations have resulted in the emergence of green finance and FT. GFN provides financial resources for environmentally friendly projects, and the FT aims to transform the financial system's infrastructure through the use of advanced digital technologies. The transition to sustainability and digitalization has had a significant impact on the financial systems of advanced economies such as the OECD. The regulatory and innovative financial system of these countries is well established to support global trends. Thus, this study investigates the effect of GFN and FT and their interactive influence on the financial system of OECD economies to implement policies that could support resilient, inclusive and sustainable financial growth.

The evolution of GFN has redirected the capital towards green initiatives that have strategically transformed the trends in the financial system (Van Niekerk, 2024). Environmentally friendly products, such as green bonds and climate-related investments, have emerged as important tools for expanding the portfolio of green investments and actively supporting financial system expansion (Naseer & Bagh, 2024). Furthermore, the implementation of GFN strategies has contributed to the development of a financial system that meets long-term risk assessment requirements, improves credit allocation, and strengthens the current trend of green financing practices. The financial systems established by advanced countries have created the necessary environment for GFN growth, resulting in increased financial sector sustainability (Park & Kim, 2020). Moreover, the importance of GFN in these economies implies a fundamental shift in the distribution of capital that would allow long-term possibilities of low-carbon transitions and the resilience of the economy (Desalegn & Tangl, 2022). Consequently, it can strengthen the long-term growth of financial systems, especially when making financial systems low-carbon and climate-resilient.

Over the last few decades, the growing implementation of FT, especially in OECD countries, has completely transformed the architecture of the financial system (Shkodina et al., 2018). FT has played a significant role in digitalizing the financial system that enhances the efficiency, accessibility, and flexibility of financial services (Lomachynska et al., 2020). FT such as blockchain technologies, big data analytics, and AI have decreased information asymmetries and transaction costs and expanded access to financial resources (Giudici, 2018). FT has the potential to transform the financial system into a more integrated, dynamic, and technologically oriented system to support the rapidly changing needs of modern finance and consumer expectations. FT has played a critical role in transforming and improving the financial system in the well-established digital and regulatory infrastructure that exists in OECD member countries. Thus, FT evolves as

a transformative force within the financial system that facilitates the dynamic reconfiguration of financial architectures to improve the accessibility and effectiveness of the financial ecosystem.

The rapid expansion of FT with the increasing emphasis on investment in GFN is transforming the financial system to support long-term sustainable economic growth. FT, like blockchain technologies, big data, and AI, enables a more accurate assessment of environmental risk, facilitates issuance, monitoring, and verification of green products like green instruments (Chan, 2021). Therefore, such innovations improve investor confidence and attract more participants to GFN. According to Huang et al. (2019), the implementation of digital FT has provided a strategic investment platform for green investments. The evolutions and advancements in FT have enabled the financial system to optimally address the various obstacles to the growth of GFN. Nevertheless, regulations and guidelines need to be established to apply FT to have ethical and transparent financial transactions. This integration has brought a transition towards sustainable development of the financial system of advanced countries, which is strengthening its resilience and inclusivity. Empirical evidence remains limited on the direct effects of GFN and FT on FD, particularly regarding the moderating role of FT in strengthening the association between GFN and FD. This gap is especially relevant in OECD countries with advanced financial systems and high FT adoption.

Therefore, this study addresses the lack of integrated empirical evidence on the effects of GFN and FT, and their interaction, on financial development in OECD economies.

1.2 | Research Gap

Although research on GFN and FT is expanding, their combined and interactive effects on FD remain insufficiently explored. Existing studies primarily examine GFN in relation to environmental outcomes such as green growth and emissions reduction, rather than its direct contribution to FD (Wen et al., 2025; Zakari, 2022). Similarly, FT literature focuses mainly on financial inclusion, efficiency, and innovation, with limited attention to its broader systemic impact on FD (Liang & George, 2025; Rahman et al., 2024; Singh & Kaur, 2026).

In addition, the moderating role of FT in strengthening the impact of GFN on FD remains largely unexplored, despite theoretical evidence that FT enhances transparency, efficiency, and allocation of green financial resources (Majeed et al., 2025; Zaid et al., 2025). Furthermore, most empirical studies are based on emerging or single-country contexts, limiting generalizability to advanced economies.

OECD countries, characterized by mature financial systems and high GFN and FT adoption, provide a suitable setting to examine these dynamics in a developed financial environment.

Therefore, the key gap is the lack of integrated empirical evidence on the direct and moderating effects of GFN and FT on FD in OECD countries.

1.3 | Research Objectives

RO1: To analyse the impact of green finance (GFN) on the financial development (FD).

RO2: To analyse the impact of financial technology (FT) on the financial development (FD).

RO3: To examine whether financial technology (FT) moderates the impact of green finance (GFN) on financial development (FD).

1.4 | Research Questions

RQ1: What is the impact of green finance (GFN) on financial development (FD) in OECD countries?

RQ2: What is the impact of financial technology (FT) on FD in OECD countries?

RQ3: Does FT moderate the relationship between GFN and FD in OECD countries?

This study has contributed to the existing literature in several ways. First, the growing impact of FT and GFN in the financial dynamics of modern economies highlights the importance of detailed investigation. Second, and most notably, this study explores how FT moderates the association between GFN and the FD. Third, while previous studies have used various proxies to measure GFN, such as renewable energy consumption, expenditure on environmental protection, environmentally related government R&D budget, green credit, total sovereign green bonds issuance, and patents on environmental protection, these indicators represent different dimensions of GFN. Therefore, this study adds to the existing literature by creating a comprehensive GFN index that enables a more holistic assessment of GFN activities. Fourth, the study focuses on investigating the impact of GFN variables and the influence of FT on these variables in relation to FD to ensure the robustness of our empirical findings. Finally, this research performs heterogeneity analysis by using sub-sample estimates using variations in the FT adoption, income level, and GFN intensity, which enhances the reliability and validity of the findings.

2 | LITERATURE REVIEW

2.1 | Theoretical underpinning

This research constructs a cohesive theoretical approach that integrates sustainable finance theory, disruptive innovations theory, and financial intermediation theory in explaining the interconnections between GFN, FT, and FD. The theory of sustainable finance states that incorporating environmental, social, and governance (ESG) aspects into financial decision-making can improve the resilience, efficiency, and inclusiveness of the financial system over the long term (Sachs et al., 2019). In this view, GFN is a structural financial innovation rather than an environmental policy tool that shifts capital to sustainable investment opportunities, enhancing risk-adjusted returns and financial stability. Nonetheless, as the recent research also points out, the integration of ESG can initially raise compliance and financial friction costs in the short-term, especially within less developed financial systems (Naseer et al., 2025). Such conflicting evidence is an indication that the financial implications of GFN are contextual rather than absolute and might need facilitating technological infrastructure.

To address this limitation, disruptive innovation theory (Christensen, 2015) provides an approach by explaining how FT reshapes financial systems through technological transformation. FT innovations such as blockchain, artificial intelligence, and big data analytics reduce transaction costs, improve information processing, and expand access to financial services (Paramesha et al., 2024). There is also empirical evidence supporting that digital finance increases the efficiency of the capital markets and the investment allocation based on ESG, especially in the developed countries (Khan & Shahid, 2025). But contrary results also show that quick FT growth can also amplify systemic cyber-dangers and regulatory arbitrage, which could undermine financial stability unless regulated adequately (Yadav, 2020).

Lastly, the theory of financial intermediation provides an understanding of why FT enhances the efficacy of the financial system in reducing information asymmetry and enhancing the allocation of capital (Allen et al., 2002; Gomber et al., 2017). FT in this regard serves as a performance-improving system as well as a structural facilitator of sustainable finance systems.

The combination of these three theories implies that FD is not only directly impacted by GFN and FT but also affected by an interactive role in which FT enhances the performance of green finance.

2.2 | Effect of GFN on the FD

The strategic role of the financial system has changed to environmental sustainability due to the alarming growth of environmental degradation and the climate challenges observed over the past years (Peeters, 2003; Qadri et al., 2023). GFN can be described as any lending, investment, or financing activities linked to low-carbon, resource-productive, and environmentally green projects (Nhamo & Pophiwa, 2014). The incorporation of GFN into financial systems not only supports the shift of capital towards the green economy but also brings about the structural changes that affect the course of FD (Wang et al., 2021). The GFN innovations and related green policies have expanded the transformative effects of these innovations on the deepening, efficiency, and resilience of the global financial system (Flammer, 2021). The resource-based approach assumes that GFN is a strategic asset that helps direct financial resources into environmentally friendly financial investments. Such an environmentally friendly investment enhances the efficiency of the financial operation and industry benefit, and overall financial growth (Bampatsou et al., 2013).

GFN has become a tactical tool that can ensure that financial systems are in alignment with the goals of environmental sustainability. It can be characterized as financial operations promoting the financial support of low-carbon, resource-efficient, and ecologically sustainable investments (Wang et al., 2024). Theoretically, Sustainable Finance Theory claims that GFN promotes FD by increasing efficiency in capital allocation, fostering ESG-based risk management, and diversifying sustainable investment tools, including green bonds and green credit.

Empirical research has found that there is a positive correlation between GFN and FD, as the research revealed an improvement in financial depth, liquidity, and market diversification (Flammer, 2021; Fu et al., 2023). There is a more subtle picture, however, based on recent evidence. Although GFN enhances the resilience of financial systems in developed economies, the effect might be reduced or slower in systems with poor regulatory frameworks and insufficient ESG standardization (Narayan et al., 2025; OECD, 2025). In addition, the issue of greenwashing and unequal standards of reporting on ESG might decrease investor trust and distort financial performance (OECD, 2023).

GFN is one of the main forces of financial transformation despite these obstacles. The given study is therefore based on the following hypothesis:

H1: *There is a significantly positive impact of green finance (GFN) on financial development (FD).*

2.3 | Effect of FT on the FD

FD is a significant component for economic progress, and a well-functioning and mature financial system fosters economic prosperity within a country (Malarvizhi et al., 2019). The traditional financial system cannot

effectively facilitate the dynamic expansion of economic activities or fulfil the changing expectations of society. FT is the use of technological innovation in the infrastructure and delivery of financial services and goods to customers (Zhang et al., 2019). Therefore, FT can be introduced to restructure and upgrade the traditional financial system that meets the ever-changing expectations of stakeholders. The implementation of innovative technologies enhances the performance of the financial services offered by financial institutions and financial markets (Nazir et al., 2021). examined the impact of FT on the financial sector in 31 provinces and 290 cities in China between 2011 and 2018. The findings suggest a favourable association between FT and FD by employing the 2SLS instrumental variable regression method. The findings also indicate that FT facilitates the expansion of the financial sector through enhancing access (loans), depth (deposits), and savings within these Chinese financial institutions.

FT is the use of innovative digital technology in financial services, such as mobile banking, blockchain, artificial intelligence, and digital payment systems (Zhang et al., 2019). According to the financial intermediation theory, FT enhances FD by lowering transaction costs, boosting financial inclusion, and reducing the information asymmetry (Allen et al., 2002). FT usage enhances access to credit, financial sophistication, and mobilisation of savings, especially in the developing and emerging economies (Aduba Jr et al., 2022; Muganyi et al., 2021). The literature indicates that digital financial ecosystems can contribute to a much greater market efficiency and financial innovation within both developed and developing markets (IMF, 2024).

Moreover, the application of FT also presents social challenges, such as the issue of privacy, cybercrime, economic instabilities, reducing economic inequality, and regulatory complexities (Naz et al., 2024). These conflicting findings indicate that the impact of FT on FD does not follow a purely linear form but rather is contextualised. According to such theoretical and practical arguments:

H2: *There is a significantly positive impact of financial technology (FT) on financial development (FD).*

2.4 | The moderating Effect of FT on GFN

Modern economies are based on finance, and without the existence of a strong financial system, no nation can survive. The traditional financial system cannot support the complex economic system to address the challenges of the modern economy. Consequently, technological innovation has played a critical role in facilitating financial systems to provide more accessible and efficient financial goods and services to clients (Zhang et al., 2019). Therefore, FT may be used to reform and improve the financial system that protects the environment and sustainable development of the economy. Wan et al. (2023) explored the role of FT in fostering the expansion of GFN by using data from 59 Chinese banks from 2011 to 2020. The findings of the study urged that FT innovation can accelerate the expansion of GFN. Furthermore, the study proposed that FT enhances banks' operational and risk management capacities, hence promoting the expansion of green financing. FT enhances access to new sources of capital and investment. Therefore, it can mobilise green financing prospectively (Dorfleitner & Braun, 2019). GFN and FT interaction is a phenomenon gradually becoming recognized as an essential mechanism in the modern financial world. GFN offers capital allocation

to sustainable projects, whereas FT increases the speed, transparency, and scalability of such financial flows. Based on disruptive innovation theory, FT provides a facilitating infrastructure that enhances the performance of GFN through converting conventional financial delivery systems into digital ecosystems (Christensen, 2015; El Khoury et al., 2025). Green bonds with blockchain, AI-based ESG scoring, digital crowdfunding, and other technologies enhance monitoring, control fraud, and improve the confidence of investors in green financial offerings (Joseph et al., 2025).

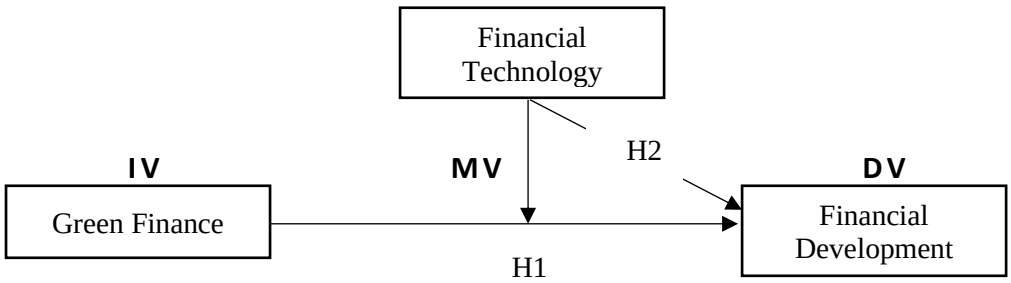
The literature indicates that FT can considerably enhance the effects of GFN on the performance of a financial system through enhanced mobilisation of capital and efficiency of investment (Liu & Sander, 2026; Wan et al., 2023). Similarly, Ali et al. (2026) empirically investigated the impact of GFN and FT and the moderating role of FT in the expansion of GF in the financial institutions' development within OECD countries. Their findings also indicated that GFN and FT have a significant positive impact on financial institutions, with FT significantly improving the effectiveness of GFN in strengthening financial institutions, thereby supporting overall FD. Nevertheless, there is also contradictory evidence that, in the case of weak regulations, FT can increase volatility in the financial system and decrease the impact of GFN because of governance gaps (Bollaert et al., 2021).

Thus, FT is conceptualised as a moderating catalyst, whose effect determines the magnitude of GFN's contribution to FD. The study hypothesises:

H3: *There is a significantly positive moderating the impact of green finance (GFN) on FD.*

Figure 1

Conceptual Framework of the direct and moderating effect of GF and FT on the FD.



3 | METHODOLOGY & DESIGN

3.1 | Data and Model Estimation

The study selected data between 2013 and 2022 from twenty-six OECD countries based on data availability. Table A1 in the appendix section displayed the list of countries. The study used the FD index created by Svirydzenka (2016) as a dependent variable. The used indices for the GFN and FT and their constructions are reported in the preceding section of the study. Control variables in the study included trade openness, foreign direct investment, and economic growth. Table 1 illustrates the study variables and their corresponding data sources.

Table 1

Variables' Descriptions, Symbols, and Sources of Data

Variables Definitions and Units	Symbol	Data Source
Financial Development	FD	IMF
Expenditure on environmental protection (Per cent of GDP)	EEP	IMF
Renewable energy consumption (% of total final energy consumption)	RE	WDI
Total sovereign green bonds issuance (billion US$)	GB	WDI
Green credit to the private sector (% of GDP)	GC	WDI
Environmentally related government R&D budget (% total government R&D)	ERD	OECD
Patent on environmental protection (% of technologies)	PAT	OECD
Automated teller machines (per 100,000 adults)	ATM	WDI
Mobile cellular subscriptions (percentage of population)	MOB	WDI
Individuals using the Internet (percentage of population)	INT	WDI
Fixed broadband subscriptions (percentage of population)	FBB	WDI
Trade openness (% of GDP)	TO	WDI
Economic growth (GDP constant in 2015 US dollars)	GDP	WDI
Foreign direct investment, net inflows (% of GDP)	FDI	WDI

Source: IMF, WDI, OECD

3.2 | Construction of Indices

The PCA technique is used to create an index for GFN, which includes renewable energy consumption (Qadri et al., 2023); total sovereign green bonds issuance (Belgacem et al., 2023); expenditure on environmental protection (Udeagha & Ngepah, 2023); green credit (Rauf et al., 2024; Sadiq et al., 2024); environmentally related government research and development budget (Oanh, 2024); and patents on environmental protection (Sampene et al., 2023). The dataset satisfies the basic requirements for principal component analysis. Bartlett's test of sphericity is statistically significant ($\chi^2 = 122.276$, $p < 0.001$), indicating that the variables are sufficiently intercorrelated to justify the application of data reduction techniques. The determinant of the correlation matrix (0.620) suggests that multicollinearity is not a concern. In addition, the Kaiser–Meyer–Olkin measure of sampling adequacy (0.670) indicates a moderate and acceptable level of adequacy, reflecting a satisfactory degree of shared variance among the variables. Overall, the results support the application of principal component analysis, with the extracted components expected to provide a reasonably robust representation of the underlying data structure. The PCA results for the GFN index in Table 2, retained three components with eigenvalues greater than 1, which together account for 67.3% of the total variance, in accordance with the Kaiser criterion (Kaiser, 1960).

Table 2

Principal Component Analysis (PCA) Diagnostics for GFN Index

Component	Eigenvalue	Difference	Proportion	Variable Dominance (Loading Pattern)	Cumulative
Comp 1	1.5583	0.3363	0.2597	LRE (0.6366), EEP (-0.6378)	0.2597
Comp 2	1.2219	0.1597	0.2037	LPAT (0.5533), LGC (0.6484)	0.4634
Comp 3	1.0623	0.1167	0.1770	LGBB (0.8419 rotated)	0.6404
Comp 4	0.9456	0.2368	0.1576	LERD (0.4808 rotated)	0.7980
Comp 5	0.7088	0.2056	0.1181	LPAT / LGC mixed structure	0.9161
Comp 6	0.5032	—	0.0839	LRE (0.5354), residual structure	1.0000

Source: Authors' own work

Furthermore, the FT index is also constructed using the PCA technique from variables such as fixed broadband subscriptions, ATMs, internet users, and mobile cellular subscriptions (Awais et al., 2023; Emara, 2023). The dataset satisfies the basic requirements for principal component analysis. Bartlett's test of sphericity is statistically significant ($\chi^2 = 208.779$, $p < 0.001$), indicating that the variables are sufficiently intercorrelated to justify the application of data reduction techniques. The determinant of the correlation matrix (0.444) suggests that multicollinearity is not a concern. In addition, the Kaiser–Meyer–Olkin measure of sampling adequacy (0.692) indicates a moderate and acceptable level of adequacy, reflecting a satisfactory degree of shared variance among the variables. Overall, the results support the application of principal component analysis, with the extracted components expected to provide a reasonably robust representation of the underlying data structure. Two components with eigenvalues greater than one were retained in the PCA, as shown in Table 3, which accounted for 75.5% of the overall variance.

Table 3

Principal Component Analysis (PCA) Diagnostics for FT Indicators

Component	Eigenvalue	Difference	Proportion	Variable Dominance (Loading Pattern)	Cumulative
Comp 1	1.8691	0.7255	0.4673	LMOB (0.7720 rotated dominant), LFBB (0.6403 initial loading)	0.4673
Comp 2	1.1436	0.4597	0.2859	LATM (-0.7533 rotated dominant)	0.7532
Comp 3	0.6838	0.3804	0.1710	LINT (0.6877 rotated dominant)	0.9241
Comp 4	0.3035	—	0.0759	LFBB (-0.7080 rotated dominant)	1.0000

Source: Authors' own work

Considering the previously mentioned theoretical and literature discussion, the study proposes the following regression equation while considering all control variables, which are analysed using regression equation (1).

$$LnFD_{i,t} = \beta_0 + \beta_1 LnGFN_{i,t} + \beta_2 LnFT_{i,t} + \beta_3 LnGDP_{i,t} + \beta_4 LnFDI_{i,t} + \beta_5 LnTO_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad \ldots\ldots \mathbf{1}$$

In the above equations, FD stands for Financial Development, green finance is represented by GFN, and FT denotes Financial Technologies. The terms μ_i and $\lambda_t$capture the panel data dynamics. The control variables, economic development, trade openness, and foreign direct investment are represented as GDP, TO, and FDI, respectively. The unexplained variance in the models is represented by $\varepsilon_{i,t}$. The intercept is denoted by β_0, whereas β_1,β_2, β_3, β_4, β_5, and β_6 correspond to the anticipated coefficients for the explanatory variables. Ln represents natural log to normalize the data and reduce the heteroscedasticity (Nguyen et al., 2020).

Additionally, the moderating effect of FT on GFN is symbolized as FTGFN, presented in equation (2).

$$LnFTGFN_{i,t} = LnGFN_{i,t} \text{ x } LnFT_{i,t} \quad \text{.....2}$$

Subsequently, equation (2) is incorporated into our baseline model equation (1), as shown in equation 3. The moderating effect is captured by FTGFN, and the other variables are already defined. This will provide an empirical analysis to examine how FT moderates the connection between GFN and FD.

$$LnFD_{i,t} = \beta_0 + \beta_1 LnGFN_{i,t} + \beta_2 LnFT_{i,t} + \beta_3 LnFTGFN_{i,t} + \beta_4 LnGDP_{i,t} + \beta_5 LnFDI_{i,t} + \beta_6 LnTO_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad \text{.....3}$$

3.3 | Econometric Estimation

The study employs panel data that represents a blend of cross-sectional and time-series data, giving different advantages that individual time series or cross-sectional analysis cannot achieve. This increases the number of observations, which gives more valuable, flexible, and more efficient estimation results. Panel data estimation uses a variety of estimation techniques, including pooled OLS, random effect, fixed effect, 2SLS, and GMM. Pooled OLS represents the primary estimation technique in panel data estimation. Pooled OLS ignores the time series and cross-sectional observations by integrating data into a single data set (Gujarati, 2012). Fixed and random effect models are the most appropriate techniques to deal with heterogeneity, but these models cannot tackle endogeneity in the data set. These models, as proposed by Wooldridge (2010), may address the issue of heterogeneity; however, these models fail to address the problem of endogeneity that causes the results of estimation to be biased. The most common causes of endogeneity are omitted variables, reverse causality, or measurement error (Wooldridge, 2010).

The application of GMM estimation remains appropriate in this study due to the dynamic specification of the model to address potential endogeneity, reverse causality, and unobserved heterogeneity (Arellano & Bover, 1995; Blundell & Bond, 1998). Prior literature also suggests that System GMM is suitable for dynamic panel estimations involving endogenous regressors when instruments are appropriately controlled (Roodman, 2009).

Given the relatively small sample size (N=26, T=10), particular attention was paid to the issue of instrument proliferation, which may weaken the reliability of GMM estimators and overfit endogenous variables (Roodman, 2009). To mitigate this concern, the study employs collapsed instruments and restricted lag lengths, ensuring that the number of instruments remains lower than the number of cross-sectional groups.

Furthermore, model adequacy was evaluated using the Hansen test for overidentifying restrictions and the Arellano–Bond AR (2) test for second-order serial correlation (Arellano & Bond, 1991). The insignificant Hansen and AR (2) statistics indicate instrument validity and the absence of serial correlation, supporting the robustness and consistency of the estimated models.

4 | RESULTS AND DISCUSSION

4.1 | Cross-Sectional Dependence Test

The Pesaran CD test results reported in Table 4 show an insignificant test statistic (CD = 1.072, $p > 0.05$), indicating the absence of significant cross-sectional dependence among OECD countries. Therefore, the null hypothesis of cross-sectional independence is rejected, supporting the suitability of the selected panel estimation techniques.

Table 4

Pesaran Cross-Sectional Dependence Test

Test	Statistic	p-value	Decision
Pesaran CD Test	1.072	0.2836	Fail to Reject H_0

Source: Authors' own work

4.2 | Unit-Root Test

This study employed the Levin-Lin-Chu (LLC) unit root test to assess the stationarity of the data series. Table 5 displays the results of the LLC unit root test, which show that all of the variables are stationary at the level under both specifications, i.e., with a trend and without a trend. This suggests that the models are fit, and the results are appropriate for further analysis.

Table 5

Stationarity Test

Variables	At Level	
	with trend	without trend
*Ln*FD	-6.96***	-9.59***
*Ln*GFN	-10.11***	-6.32***
*Ln*FT	-13.59***	-6.39***
*Ln*GDP	-7.49***	-3.25***
*Ln*FDI	-11.90***	-2.42***
*Ln*TO	-8.08***	-1.38*

*Note: Ln*FD = Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness
Source (s): Author's own work
Standard errors in parentheses
***p < .01, **p < .05, *p < .10.

Panel cointegration tests are appropriate only when variables are non-stationary and integrated of order one, I (1), to examine the existence of a long-run equilibrium relationship (Engle & Granger, 1987; Pedroni, 1999). However, the Levin–Lin–Chu (LLC) test confirms that all variables in this study are stationary at

levels, I (0), under both trend and non-trend specifications. Since cointegration analysis is not applicable for I (0) variables, and the risk of spurious regression is already mitigated, panel cointegration tests are not required. Accordingly, the analysis proceeds directly with the level-stationary panel estimation framework.

4.3 | Pairwise Correlation

The correlation matrix is employed to determine the intensity and direction of a linear association between variables. If the variables correlate with each other, it can lead to a problem such as multicollinearity. Consequently, the regression can be biased and provide deceptive results of estimation (Zhao et al., 2020). The results provided in Table 6 are used to support the finding that no problem exists regarding multicollinearity in our models.

Table 6

The Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) *Ln*FD	1.000					
(2) *Ln*GF	0.244	1.000				
	(0.000)					
(3) *Ln*FT	-0.245	-0.256	1.000			
	(0.000)	(0.000)				
(4) *Ln*GDP	0.729	0.249	-0.163	1.000		
	(0.000)	(0.000)	(0.008)			
(5) *Ln*TO	-0.188	0.006	0.046	-0.497	1.000	
	(0.002)	(0.922)	(0.457)	(0.000)		
(6) *Ln*FDI	0.586	0.124	-0.156	0.587	0.062	1.000
	(0.000)	(0.046)	(0.012)	(0.000)	(0.323)	

*Note: Ln*FD = Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness
Source: Authors' own work

The results of VIF are presented in Table 7. According to (Gujarati & Porter, 2009), the maximum value of the VIF is less than 10, thereby confirming no issue of multicollinearity in the data.

Table 7

The Variance Inflation Factor (VIF)

	VIF	1/VIF
LGF	1.173	.853
LFT	1.092	.916
LGDP	2.955	.338
LTO	1.854	.539
LFDI	2.095	.477
Mean VIF	1.834	.

Note: *Ln*FD = Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness
Source: Authors' own work

4.4 | Heteroskedasticity Test

The findings of the Breusch–Pagan / Cook–Weisberg test presented in Table 8 confirm the presence of heteroskedasticity in the model ($\chi^2 = 64.74$, $p < 0.01$), indicating that the variance of the error terms is not constant across observations.

Table 8

Breusch–Pagan/Cook–Weisberg Test for Heteroskedasticity

Test	χ^2 (df)	p-value	Interpretation
Breusch–Pagan / Cook–Weisberg	64.74 (1)	< .001	Heteroskedasticity present

Note. χ^2 = chi-square statistic; df = degrees of freedom.
Source: Authors' own work

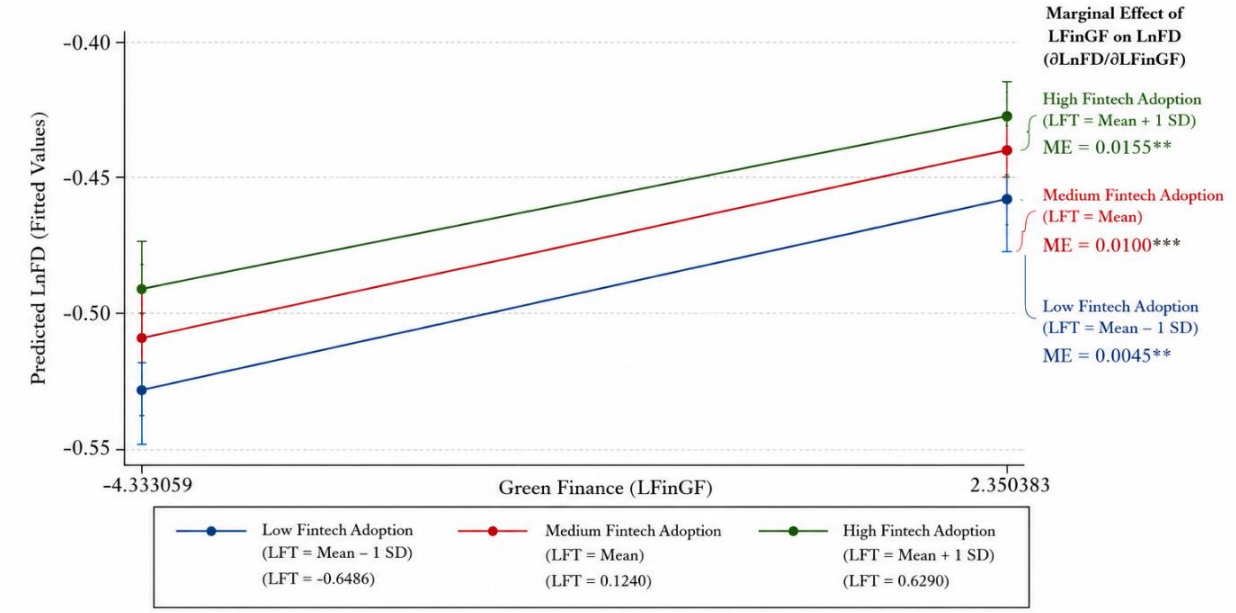
4.5 | Results of GMM Regression

This study focused on the roles of GFN and FT and the moderating role played by FT in supporting GFN in FD. The results presented in Table 9 demonstrate the findings of individual impacts of GFN and FT in Model 1 and the interaction term in Model 2. The L. *Ln*FD positively affects the dependent variable with coefficients of 0.941and 1.044 at the significant level of 1% across both models, indicating that L. *Ln*FD has a positive, robust effect on the outcome being studied. Model 1 of the study shows a significantly positive effect on the FD with a coefficient of 0.052, suggesting that a 1% increase in green finance is associated with only a 0.05% increase in financial development. This suggests that GFN facilitates the flow of capital towards environmentally conscious investment projects, which is supported by the previous empirical findings of Zheng et al. (2021). Moreover, the significant positive coefficient of FT value 0.033 highlights the importance of FT in the financial system. These results are also consistent with those of Chhaidar et al. (2023). This indicates that 1% increase in FT development is associated with a 0.03% increase in FD, holding other factors constant.

The significant positive coefficient value of 0.010 for the interaction term (*Ln*FTGFN = *Ln*GFN × *Ln*FT) indicates that a 1% joint increase in GFN and FT interaction is associated with a 0.01% additional increase in FD. This suggests that FT effective moderate the role of GFN in the FD. This implies that digitalization of the financial system improves the transparency, inclusivity, and expansion of GFN by providing real-time, transparent information. Figure 1 presents the interaction plot illustrating the moderating role of FT on the relationship between GFN FD across different levels of FT adoption. The figure indicates that the positive effect of GF on FD strengthens as FT adoption increases, confirming a complementary moderation effect.

Figure 2

Interaction Plot: Marginal Effect of Green Finance (LFinGF), on Financial Development (LnFD) at Different Levels of Fintech Adoption (LFT)



Note. The lines show the predicted values of financial development (LnFD) at different levels of fintech adoption (LFT). The marginal effect (ME) represents the change in LnFD for a one-unit increase in green finance (LFinGF) at each level of fintech adoption.
**** p < .001. ** p < .01. * p < .05.*

The negative effect of GDP on FD can be explained by the financial maturity hypothesis, which suggests that in advanced economies, financial systems are already highly developed, so additional income growth does not necessarily deepen the financial system (Rajan & Zingales, 2003). The negative coefficient of trade openness may reflect the substitution effect, where greater integration with global markets reduces reliance on domestic financial systems and shifts financing abroad (Baltagi et al., 2009). The weak effect of FDI is consistent with the limited spillover hypothesis, indicating that FDI contributes to FD only when strong financial institutions and absorptive capacity exist, which may already be saturated in OECD economies (Alfaro et al., 2004).

Several diagnostic tests are employed to ensure that endogeneity is properly addressed, and the results are consistent and valid. The diagnostic tests, such as AR (Autoregressive) and the Hansen test, give information on the serial correlation of residuals and the validity of the instruments employed in the study. The insignificant values of AR (2) (0.244 and 0.407) at 5% across both models indicate no second-order autocorrelation in the residuals. Moreover, the Hansen test values of 0.381 and 0.443 show that the instruments employed are valid, and thus the results obtained are reliable and valid.

The empirical results validate the study's hypotheses (H1–H3) and are consistent with the underlying theoretical framework. The findings indicate that GFN and FT enhance innovation, efficiency, and sustainability of the financial system. The Sustainable Finance theory integrates the ESG factors into the financial system, which encourages the development of green financial instruments, attracting responsible investors, and supports the flow of capital towards environmentally friendly investments. Moreover, the Disruptive Innovation theory highlights the importance of FT in restructuring the financial system by bringing

cost-efficient digital platforms that enhance accessibility and transparency of financial assets. Such strategic developments towards resilience and digitalization facilitate the issuance and trading of green financing instruments, which ultimately expedite the growth of the financial system. Collectively, the interaction between GFN and FT develops a more resilient and digitalized financial ecosystem.

Table 9

The impact of GFN and FT on FD: Direct and Moderating Effects

Variables	Model 1 LnFD	Model 2 LnFD
L. *Ln*FD	.941***	1.044***
	(.042)	(.011)
*Ln*GFN	.052**	.005**
	(.019)	(.002)
*Ln*FT	.033***	.017***
	(.007)	(.003)
*Ln*FTGFN		.01***
		(.003)
*Ln*GDP	-.015	-.009***
	(.012)	(.003)
*Ln*TO	-.04**	-.015***
	(.015)	(.003)
*Ln*FDI	.02***	0.001
	(.007)	(.001)
_cons	.084	.317***
	(.365)	(.096)
Observations	234	208
AR (2)	0.244	0.407
Hansen test	0.381	0.443
No. of groups	26	26
No of instruments	18	22

Note: *Ln*FD = Financial Development, L. *Ln*FD = Lagged Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, LnFTGFN = Financial Technologies*Green Finance, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness
Source (s): Author's own work
Standard errors in parentheses
***p < .01, **p < .05, *p < .10.

4.6 | Robustness Test

To validate the reliability of the empirical results, this study used the Generalized Method of Moments methodology to investigate the effect of the individual component of the GFN index (Hailiang et al., 2023). The findings reported in Table 10a reveal that all key variables, i.e., green credit, Renewable energy consumption, environmentally related government R&D budget, Patent on environmental protection, expenditure on environmental protection, and Total sovereign green bonds issuance, significantly and positively influence the financial development. These findings confirm that, in addition to the GFN index, the components of GFN have a significant effect on the FD in terms of sign and significance.

Table 10a

Detailed effect of GFN variables: Robustness Check

Variables	*Ln*FD	*Ln*FD	*Ln*FD	*Ln*FD	*Ln*FD	*Ln*FD
L. *Ln*FD	.982***	1.027***	1.354***	1.001***	.589***	1.028***
	(.01)	(.008)	(.116)	(.013)	(.196)	(.01)
*Ln*RE	.013**					
	(.005)					
*Ln*ERD		.013***				
		(.004)				
*Ln*PAT			.223***			
			(.086)			
*Ln*EEP				.024**		
				(.011)		
*Ln*GC					.18**	
					(.084)	
*Ln*GB						.033**
						(.015)
*Ln*FT	.004**	.01**	.029***	-.001	-.09**	.004***
	(.002)	(.004)	(.011)	(.003)	(.041)	(.001)
*Ln*GDP	-.002	-.006*	-.033*	.017***	.057*	-.007*
	(.005)	(.004)	(.02)	(.005)	(.031)	(.004)
*Ln*TO	-.024***	.001	.042	.017***	.072*	-.008
	(.004)	(.007)	(.028)	(.003)	(.04)	(.005)
*Ln*FDI	.02***	.003*	-.036**	-.023***	.002	-.004**
	(.003)	(.002)	(.015)	(.003)	(.009)	(.002)
_cons	-.354**	.082	1.156*	.008	-2.66*	.244**
	(.16)	(.09)	(.602)	(.102)	(1.395)	(.117)
Observations	234	182	234	234	234	130
AR (2)	0.472	0.426	0.842	0.968	0.648	0.596
Hansen test	0.260	0.120	0.274	0.338	0.831	0.368
No. of groups	26	26	26	26	26	26
No of instruments	26	16	13	22	13	24

Note: *Ln*FD = Financial Development, L. *Ln*FD = Lagged Financial Development, *Ln*RE = Renewable Energy consumption, *Ln*ERD = Environmentally related government R&D budget, *Ln*PAT = Patent on environmental protection, *Ln*EEP = Expenditure on environmental protection, *Ln*GC = Green credit, *Ln*GB = Total sovereign green bonds issuance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness
Source (s): Author's own work
Standard errors in parentheses
***p < .01, **p < .05, *p < .10.

This study additionally estimates the moderating role of FT on these variables in FD. The results reported in Table 10b suggest that FT has significantly positively moderated the role of GFN variables in the FD. This integration of FT and GFN variables highlights the effectiveness of FT in maximizing the influence of GFN variables through efficiency, transparency, and accessibility.

Table 10b

Detailed effect of GFN variables and FT interaction: Robustness Check

Variables	*Ln*FD	*Ln*FD	*Ln*FD	*Ln*FD	*Ln*FD	*Ln*FD
L. *Ln*FD	.945***	.767***	.987***	.428***	.156***	.523***
	(.037)	(.145)	(.024)	(.025)	(.046)	(.022)
*Ln*RE	.044**					
	(.018)					
*Ln*FTRE	.139***					
	(.025)					
*Ln*ERD		.019**				
		(.009)				
*Ln*FTERD		.022*				
		(.011)				
*Ln*PAT			.002***			
			(0)			
*Ln*FTPAT			.018*			
			(.009)			
*Ln*EEP				-.023***		
				(.009)		
*Ln*FTEEP				.047***		
				(.009)		
*Ln*GC					.011***	
					(.003)	
*Ln*FTGC					.02***	
					(.002)	
*Ln*GB						-.013*
						(.007)
*Ln*FTGB						.035***
						(.012)
*Ln*FT	-.409***	-.067**	-.05**	.025***	.003	-.115***
	(.082)	(.032)	(.023)	(.004)	(.007)	(.036)
*Ln*GDP	.041**	.061*	.019**	.021***	.128***	.007*
	(.016)	(.034)	(.008)	(.005)	(.029)	(.004)
*Ln*TO	-.021*	-.049*	.012	.007	-.181***	.007
	(.01)	(.027)	(.009)	(.008)	(.036)	(.006)
*Ln*FDI	.016***	-.01	-.011*	.004**	-.007*	-.004**
	(.003)	(.008)	(.006)	(.002)	(.004)	(.002)
_cons	-1.573***	-1.38	-.338*	.154	-3.111***	.823***
	(.471)	(.832)	(.189)	(.142)	(.827)	(.149)
Observations	234	234	234	234	234	234
AR(2)	0.167	0.773	0.796	0.566	0.716	0.562
Hansen test	0.338	0.754	0.336	0.210	0.346	0.682
No. of groups	26	26	26	26	26	26
No of instruments	26	17	24	25	23	22

Note: *Ln*FD = Financial Development, L. *Ln*FD = Lagged Financial Development, *Ln*RE = Renewable Energy consumption, *Ln*FTRE = Financial Technologies*Renewable Energy consumption, *Ln*ERD = Environmentally related government R&D budget, *Ln*FTERD = Financial Technologies*Environmentally related government R&D budget *Ln*PAT = Patent on environmental protection, *Ln*FTPAT = Financial Technologies*Patent on environmental protection, *Ln*EEP = Expenditure on environmental protection, *Ln*FTEEP = Financial Technologies*Expenditure on environmental protection, *Ln*GC = Green credit, *Ln*FTGC = Financial Technologies* Green credit, *Ln*GB = Total sovereign green bonds issuance, *Ln*FTGB = Financial Technologies* Total sovereign green bonds issuance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness

Source (s): Author's own work

Standard errors in parentheses

***p < .01, **p < .05, *p < .10.

4.7 | Further Analysis

4.7.1. Heterogeneity Analysis A: The Impact of Income Level

The study also investigated how the level of GFN adoption and FT implementation affects the financial systems of high- and low-income OECD countries differentiated by median GDP. As illustrated in Table 11a, the impact of GFN and FT is marginally more pronounced in relatively low-income countries than in high-income countries. The results indicate that both GFN and FT benefits are more significant for relatively low-income countries, as their financial systems are still in the process of development and thus are more sensitive to innovations as compared to high income countries, which have a well-developed financial system. At the institutional level, cross-country heterogeneity arises from financial depth and regulatory quality, as well as technological capacity; while the institutional development theory argues that the gains from financial innovation diminish with the maturity of financial systems and institutional quality.

Table 11a

The Impact of Income Level

	Relatively low-income countries	High-income countries
	*Ln*FD	*Ln*FD
L. *Ln*FD	1.029***	.632***
	(.051)	(.087)
*Ln*GFN	.032***	.03**
	(.009)	(.015)
*Ln*FT	.071***	.028**
	(.011)	(.011)
*Ln*GDP	-.006	-.015
	(.053)	(.017)
*Ln*TO	-.055	-.04*
	(.046)	(.022)
*Ln*FDI	.058***	-.017**
	(.017)	(.007)
_cons	-.882	1.948***
	(1.396)	(.426)
Observations	117	117
AR (2)	0.601	0.774
Hansen test	0.256	0.130
No. of groups	13	13
No of instruments	12	13

Note: *Ln*FD = Financial Development, L. *Ln*FD = Lagged Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness

Source (s): Author's own work

Standard errors in parentheses

***p < .01, **p < .05, *p < .10.

4.7.2. Heterogeneity Analysis B: The Impact of Green Finance Adoption Level

This study also pays attention to investigating the influence of GFN in the FD of OECD countries by classifying them as high and low GFN adoption groups based on the median level of the GFN index. The findings presented in Table 11b suggest that GFN has a significantly higher impact in low GFN adoption countries as compared to high GFN adoption countries because even small increases in GFN result in more pronounced improvements, as their financial systems still have capacity in terms of structural and efficiency improvement. From an institutional perspective, it is linked to differences in regulations, integration of ESG considerations, and market maturity for sustainable finance.

Table 11b

The Impact of GFN Adoption Level

	Low GFN adoption countries	High GFN adoption countries
	*Ln*FD	*Ln*FD
L. *Ln*FD	.566***	.073*
	(.154)	(.043)
*Ln*GFN	.47***	.082***
	(.13)	(.023)
*Ln*FT	.14*	.025***
	(.082)	(.008)
*Ln*GDP	.351***	.125***
	(.066)	(.018)
*Ln*TO	-.011	-.036
	(.117)	(.031)
*Ln*FDI	.01	-.003
	(.011)	(.002)
_cons	-10.618***	-2.404***
	(1.994)	(.473)
Observations	108	126
AR (2)	0.993	0.173
Hansen test	0.140	0.153
No. of groups	12	14
No of instruments	11	13

*Note: Ln*FD = Financial Development, L. *Ln*FD = Lagged Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness

Source (s): Author's own work

Standard errors in parentheses

***p < .01, **p < .05, *p < .10.

4.7.3. Heterogeneity Analysis C: The Impact of FT Adoption Level

The study also examined the influence of FT on the FD in countries with high and low levels of FT adoption. The findings presented in Table 11c reveal that the influence of FT in the low FT adoption countries is strong as compared to the high FT adoption countries. The finding indicates that low-FT adoption countries are continuing with the traditional financial strategies, which enable FT to create more noticeable benefits.

This result reflects cross-country differences in digital readiness, financial inclusion structures, and technological absorptive capacity, where technological innovation generates higher marginal gains in less mature institutional environments due to greater scope for structural upgrading.

Table 11c

The Impact of FT Adoption Level

	Low FT Adoption *Ln*FD	High FT Adoption *Ln*FD
L. *Ln*FD	.926***	.39**
	(.117)	(.173)
*Ln*GFN	.074***	.072**
	(.023)	(.031)
*Ln*FT	.135***	.031*
	(.027)	(.018)
*Ln*GDP	.028	.147**
	(.031)	(.07)
*Ln*TO	-.021	-.178***
	(.025)	(.039)
*Ln*FDI	.004	.025
	(.008)	(.024)
_cons	-.75	-3.996***
	(.789)	(1.499)
Observations	117	117
AR (2)	0.332	0.893
Hansen test	0.233	0.520
No. of groups	13	13
No. of instruments	10	13

*Note: Ln*FD = Financial Development, L. *Ln*FD = Lagged Financial Development, *Ln*GFN = Green Finance, *Ln*FT = Financial Technologies, *Ln*GDP = Gross Domestic product, *Ln*FDI = Foreign Direct investment, *Ln*TO = Trade openness
Source (s): Author's own work
Standard errors in parentheses
***p < .01, **p < .05, *p < .10.

5 | CONCLUSION

This study aims to explore the influence of GFN and FT on FD in OECD countries from 2013 to 2022. The results reveal that both GFN and FT have positive effects on FD, and FT has a significant moderating effect, enhancing the positive effect of GFN on FD. The findings are consistent with the literature that highlights the complementary nature of FT in improving the efficiency and scalability of sustainable finance, but inconsistent with the literature that has found that GFN has little or no impact in more traditional financial systems.

The positive interaction effect indicates that the impact of GFN is dependent on the level of FT infrastructure, which means that technologically advanced financial systems can more effectively mobilize and allocate GFN. This is especially important in the OECD context, where better regulatory quality, more robust ESG governance, and advanced digital infrastructure help to make sustainable financial instruments part of mainstream financial markets.

Theoretically, these findings align with the Disruptive Innovation Theory, which posits that technological and financial innovations work together to revolutionize conventional financial systems, enhancing their efficiency, resilience, and flexibility to meet changing economic and environmental needs. Overall, the evidence suggests that the synergy between GFN and FT has a key role in the FD in highly developed institutional environments, like OECD economies.

The above results build on the existing literature on FT and GFN and provide several policy implications for regulators and policymakers. First, specific policy actions, such as fiscal measures, disclosure restrictions, and institutional support of GFN projects, need to be encouraged in low-income and low-adoption countries. Second, increased investment in the infrastructure of FT is necessary and will enhance the impact of GFN on the financial system. Regulators should therefore facilitate access to digital platforms, boost supervisory technology, and foster public–private partnerships to accelerate financial innovation. Third, GFN and FT must be integrated together in the financial system, where digital tools can enhance the efficiency of resource allocation, reach the previously unserved segments of the market, and grow innovative green financial products. At last, in the countries where GFN or FT has already been well established, attention should focus on more efficient, transparent, and quality products for continued growth in the financial system.

5.1 | Limitations and Future Research

The research contributed to the existing literature in several ways. However, there are certain limitations in the present study that need to be overcome in future studies. The findings are constrained by the data, which includes ten years and twenty-six OECD countries. All the OECD countries should be included, and the time frame should be extended in future studies. The FT and GFN indices have measurement limitations due to omitted variables such as green investment, green insurance, and blockchain adoption; despite strong PCA results, they remain imperfect proxies of the constructs. The two-step system GMM can be used to solve endogeneity, but it has limitations, and future research should use other methods, such as bias-corrected fixed effects, panel VAR, and quantile models to account for country differences.

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Appendix A

Table A1

List of Sample Countries

#	Country	#	Country	#	Country
1	Australia	10	Germany	19	New Zealand
2	Austria	11	Greece	20	Norway
3	Belgium	12	Ireland	21	Poland
4	Canada	13	Italy	22	Portugal
5	Chile	14	Japan	23	Spain
6	Colombia	15	Latvia	24	Sweden
7	Denmark	16	Lithuania	25	Switzerland
8	Finland	17	Luxembourg	26	United Kingdom
9	France	18	Netherlands		