Mapping Post-COVID Firm Innovation Research: A Bibliometric Analysis

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Abstract

This study employs bibliometric methods to examine the intellectual landscape of post-COVID firm innovation research from 2020 to 2026. Based on 4,264 documents published in 624 sources, the study integrates analysis with science-mapping techniques, including Bradford's Law, keyword co-occurrence networks, thematic mapping, trend-topic analysis, and so on. The analysis is organized around three questions: the characterization of the database and its main publication sources; the current thematic configuration and conceptual structure of the field; and the patterns of thematic evolution that inform prospective research directions. In order to provide a clear understanding of topic clusters and their relationships, the study uses a systematic procedure for collecting data and keyword integration. The study offers a systematic review of how Post-COVID innovation research has been structured across fields and how its topic attention has changed over time by combining network-based clustering with centrality–density positions and dynamic topic movements. The findings are intended to support conceptual boundaries and agenda framing for further empirical research.

Keywords: Post-COVID, Firm Innovation, Bibliometric Analysis, Digital Transformation, Co-Occurrence Network

Introduction

The global landscape of firm innovation has undergone a significant transformation since 2020, shifting from immediate crisis management toward deep structural reorganization (Wenzel et al., 2020). Academic focus appears to have mirrored this shift, evolving from early studies on leadership and survival to a broader emphasis on technological reconfiguration and the integration of sustainability, a process frequently described as "dual transformation" (Anthony et al., 2017; Soto-Acosta, 2022). This evolution suggests that innovation in the Post-COVID era is no longer a temporary response to external shocks but a strategically embedded process that acts as a catalyst for permanent change within the enterprise innovation system (Roper & Turner, 2020). Grounded in the Resource-Based View (Barney, 1991) and Dynamic Capabilities theory (Teece, 2018), current research highlights how firms acquire, absorb, and utilize external information to maintain a competitive edge in turbulent environments (Sultana et al., 2022).

Despite the exponential growth of literature in this domain, traditional qualitative reviews often face challenges in providing an objective, comprehensive overview of the thousands of articles published across diverse journals (Donthu et al., 2021). These methods may be limited by researcher subjectivity and are less effective at visualizing the complex knowledge spillover effects and evolving thematic networks within the field (Zupic & Čater, 2015). Consequently, this study utilizes bibliometric analysis and science mapping to examine the research trajectory from 2020 to 2026. The inquiry is guided by three primary questions: What are the main publication sources and productivity patterns? (RQ1) What is the current thematic configuration and knowledge structure? (RQ2) What emerging research directions can be inferred from current patterns? (RQ3)By analyzing a refined corpus of 4,264 articles from the Web of Science Core Collection, this study employs keyword harmonization and thematic mapping to clarify the intellectual boundaries and future potential of Post-COVID innovation research.

Literature Review

Against the backdrop of global sustainable development, green innovation has become a core strategy for enterprises to build competitive advantages (Khanra et al., 2022). In recent years, relevant research has grown exponentially, expanding from a single technology-driven perspective to multidimensional views such as digitalization and Environmental, Social, and Governance (ESG) criteria. This chapter aims to systematically review existing literature, extract core driving mechanisms, and analyze the limitations of traditional reviews, thereby laying a foundation for subsequent bibliometric analysis. Current academic research on the driving mechanisms of corporate green innovation mainly focuses on four dimensions: internal capabilities, strategic orientation, technological empowerment, and external ecosystem.

Knowledge management and intangible capital are the foundations of green innovation. Sahoo et al. (2023) and Shahzad et al. (2020) point out that the acquisition and application of green knowledge can significantly catalyze technological innovation and improve environmental performance. In addition, green intellectual capital often does not take effect directly; instead, it must achieve value conversion through the full mediating role of green innovation (Kraus et al., 2020).

Corporate Social Responsibility (CSR) and ESG are not merely compliance requirements but also catalysts for internal innovation. Studies show that CSR and ESG indirectly enhance corporate value mostly through mediating variables like environmental strategy or non-linear mechanisms (Kraus et al., 2020; Broadstock et al., 2020). Meanwhile, independent third-party ESG ratings can significantly alleviate financing constraints and promote green patent output (Wang et al., 2023).

Technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and big data can significantly increase innovation investment, improve governance, and reshape business models (Babina et al., 2024; Tang et al., 2021). However, Usai et al. (2021) also issue a warning: over-reliance on common digital technologies may deplete relational capital, and continuous, substantial Research and Development (R&D) investment remains the most reliable guarantee for innovation.

Furthermore, policy and financial environments exert a push-pull effect on green innovation. The relationship between government subsidies and green innovation exhibits a U-shape moderated by executive characteristics (Xia et al., 2022). Simultaneously, market-based regulations such as carbon trading can effectively stimulate innovation vitality (Hu et al., 2020), while substantive innovation is the key for enterprises to cross green credit thresholds and prevent "greenwashing" (Xing et al., 2021).

In summary, corporate green innovation is a complex system driven synergistically by multiple internal and external factors. However, faced with an exponentially growing and highly interdisciplinary volume of literature, traditional qualitative reviews struggle to provide comprehensive coverage. They are highly susceptible to researchers' subjective preferences and fail to intuitively present knowledge spillover effects and co-citation networks among subfields.

To overcome the limitations of traditional reviews in sample size and structural insights, it is necessary to introduce bibliometric methods into this study. By conducting quantitative and visual analysis on the full-sample data using scientific knowledge mapping, this study can not only objectively verify the theoretical clusters but also accurately identify high-impact authors, evolutionary trajectories, and future research gaps, thereby providing a solid basis for the empirical design in the next chapter.

Methodology
Research Design
This study adopts a bibliometric analysis research methodology to systematically examine the intellectual structure and evolutionary trajectory of Post-COVID firm innovation. Bibliometric analysis is particularly suitable for this inquiry as it facilitates the quantitative representation of large volumes of literature while ensuring methodological transparency (Donthu et al., 2021). By employing science mapping techniques, this approach allows for the discovery of central themes and the visualization of how the research field has shifted in response to global disruptions (Zupic & Čater, 2015). The analytical framework is developed to maintain both structural and temporal views through co-word analysis, thematic mapping, and trend analysis, providing a rigorous foundation for addressing the research questions regarding publication sources, knowledge structure, and emerging directions (Cobo et al., 2011).

Data Collection and Search Strategy
The data for this study were retrieved from the Web of Science (WOS) Core Collection, a database recognized for its comprehensive coverage of high-impact journals in business, economics, and management (Birkle et al., 2020). The search was conducted on February 21, 2026, utilizing a Boolean search string within the Title (TI) field: ((Firm* OR Enterprise* OR Company OR Corporate) AND (Innovation)). This search string was designed to maintain a balance between the breadth and depth of the concepts while focusing specifically on firm-level innovation. The initial search yielded 10,376 records. To refine the sample and align with the research focus on the Post-COVID era, several inclusion and exclusion criteria were applied.

Sample Refinement and Data Cleaning

The refinement process involved multiple stages to ensure the quality and relevance of the final dataset. First, the temporal scope was restricted to the period from 2020 to 2026, resulting in 6,035 records. Second, the sample was limited to English-language journal articles, excluding book chapters and conference proceedings to maintain scholarly rigor, which narrowed the dataset to 5,783 records. Finally, to improve disciplinary focus, the search was restricted to specific WOS categories, including Management, Business, Economics, and Business Finance. This final filtration resulted in a sample of 4,264 articles. Before analysis, the records were uploaded into the Biblioshiny platform for organized data cleaning (Aria & Cuccurullo, 2017). This process included keyword harmonization to unify synonymous terms and singular/plural variations, thereby reducing semantic fragmentation and ensuring a more stable thematic outcome.

Bibliometric Techniques and Tools

The analysis was performed using the R-package Bibliometrix (specifically the Biblioshiny web interface), which executes all essential steps of science mapping, including network construction and visualization (Aria & Cuccurullo, 2017). The study employs several advanced bibliometric techniques to investigate the research questions. Descriptive analysis is used to determine main publishing sources and production characteristics (RQ1). Co-occurrence network analysis is used to map the existing theme configuration and intellectual structure, indicating how different research topics interact (RQ2). Furthermore, thematic evolution and trend analysis are utilized to determine new research topics based on trends in keyword development over time (RQ3) (Cobo et al., 2011). This comprehensive approach to analysis provides a complete understanding of the area's present situation and future direction.4 Results

Main Information

A summary of the database characteristics for 2020–2026 is shown in Figure 1. The collection consists of 4,264 documents with 139,636 cited references that are published in 624 sources. A small number of 315 single-authored papers were included in the 8,667 writers who contributed to this area overall, indicating a highly collaborative field. A significant amount of global cooperation appears from the average of 3.06 coauthors per document and the 32.69% of documents that involve international co-authorship. The data set is up to date (mean age 2.6 years) and has already received 19.97 citations per document.

Timespan	Sources	Documents	Annual Growth Rate
2020:2026	624	4264	-4.25 %
Authors	**Authors of single-authored docs**	**International Co-Authorship**	**Co-Authors per Doc**
8667	315	32.69 %	3.06
Author's Keywords (DE)	**References**	**Document Average Age**	**Average citations per doc**
8819	139636	2.6	19.97

Figure 1. Main information

Core Sources by Bradford's Law

Figure 2 shows the center of the core–periphery pattern A through D, which correspond to core journals (inside the innermost circle) as defined by Bradford's Law. A relatively small number of sources make up the core body of knowledge, but larger periphery circles distribute related work across fields. Core outlets include Finance Research Letters, Technological Forecasting and Social Change, Journal of Business Research, Technovation, Business Strategy and the Environment, Technology Analysis & Strategic Management, Emerging Markets Finance and Trade, IEEE Transactions on Engineering Management, European Journal of Innovation Management, and Corporate Social Responsibility and Environmental Management.
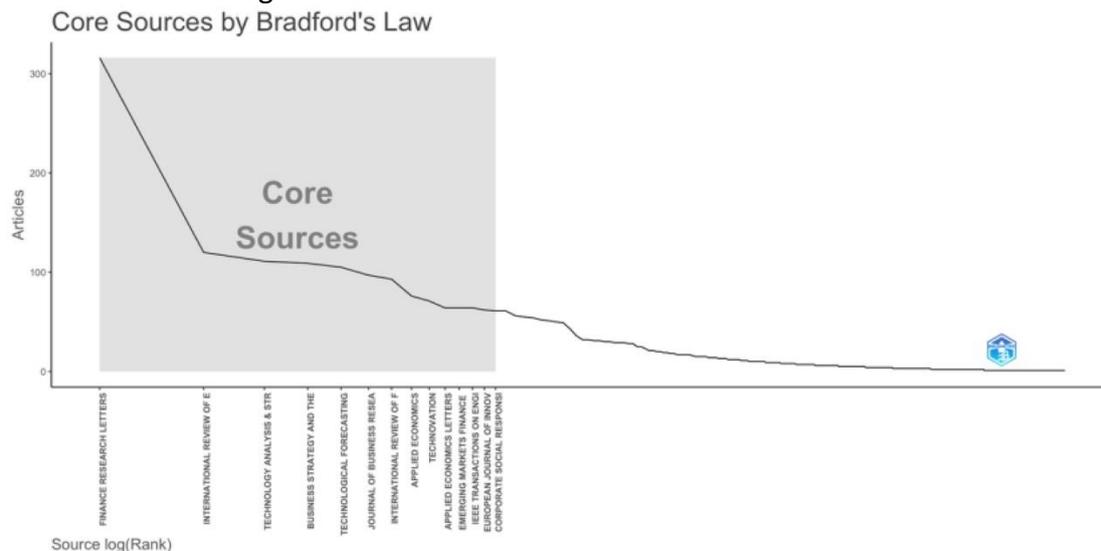

Figure 2. Core Sources by Bradford's Law

Word Cloud

Figure 3 illustrates that the most prominent keywords are "performance" and "research and development," showing that Post-COVID firm innovation research is most likely anchored on (i) the performance implications of innovation, and (ii) R&D as a key input. The inclusion of two other major words, "impact" and "management," indicates the importance of managerial information controls and measurable outcomes. The frequency of terms related to knowledge and capability (such as knowledge, dynamic capacities, and absorptive capacity) suggests that a significant amount of the literature examines post-shock innovation from the perspective of resource reconfiguration and learning.

Figure 3. Word cloud

Keyword Co-Occurrence Network

Figure 4 is an interpretive group summary of the three clusters and the high-frequency words that belong to them. First, governance–constraints–policy cluster (e.g., corporate governance, ownership, policy, competition, financial constraints) focuses on resource constraint and institutional factors. Second, a capabilities–knowledge–digital transformation cluster (e.g. absorptive capacity, dynamic capabilities, digital transformation, collaboration, entrepreneurship) represents the rebuilding of capabilities and digital transformation. Third, a sustainability/green innovation cluster (e.g., green innovation, eco-innovation, CSR) links innovation with sustainability transition agendas. Among the clusters "performance," is also an important co-occurrence node for the whole cluster, whereas "research and development" is the one that ties investment-led explanations to governance as well as performance explanations, suggesting a multi-mechanisms arrangement in the after-pandemic literature.

Figure 4. Keyword co-occurrence network

Thematic Map

Themes are arranged in Figure 5 based on density and centrality. Motor themes (e.g., firm performance, innovation performance, open innovation) are associated with topics that are both well developed and central to the field of research. Basic themes include digital transformation, corporate social responsibility, and green innovation—all of which are actually closely related but relatively fragmented internally. Niche themes (e.g. radical innovation, exploratory innovation, firm size) are cohesive within subcommunities but less central to the broader structure. Emerging or declining themes are technological innovation, R&D, and digital innovation, their future development needs temporal verification, which is provided by the next section.
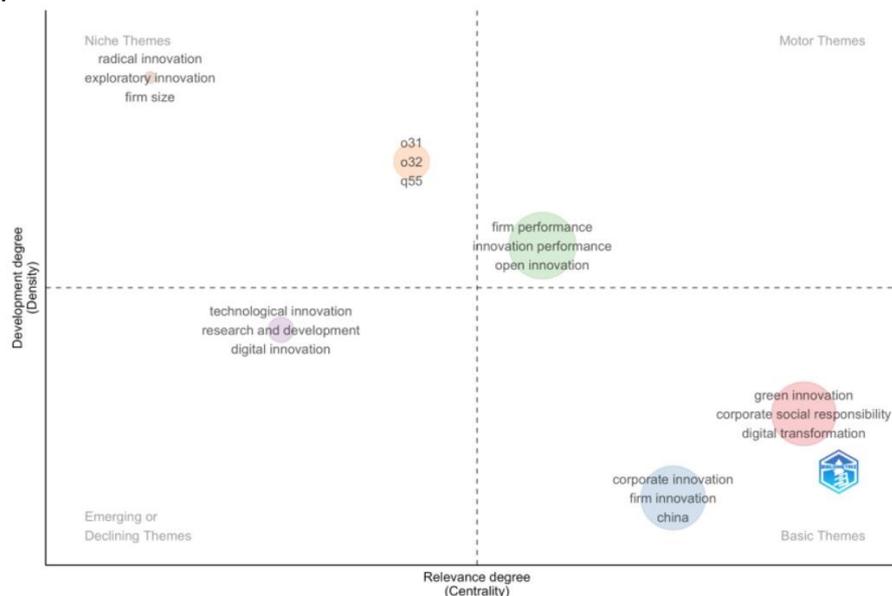

Figure 5. Thematic map

Trend Topics

Figure 6 displays a staged development of current attention. Research concentrated on the immediate crisis and value-related matters (e.g., capturing value, public research, CEO characteristics) around 2020. From 2021 to 2022, the focus shifted to crisis framing and the innovation process (e.g., economic crisis, innovation process, technological change). By 2023, R&D, knowledge, and growth emerged as focal topics, signalling a return towards investment and learning mechanisms. The performance, impact, and management domains are expected to remain dominant in 2024, indicating a focus on quantitative findings and managerial levers. Frontier-oriented topics, in particular digital transformation, corporate green innovation, and patent capital, gained significance in 2025–2026, indicating that the development of digital capabilities and sustainability transition is taking shape.
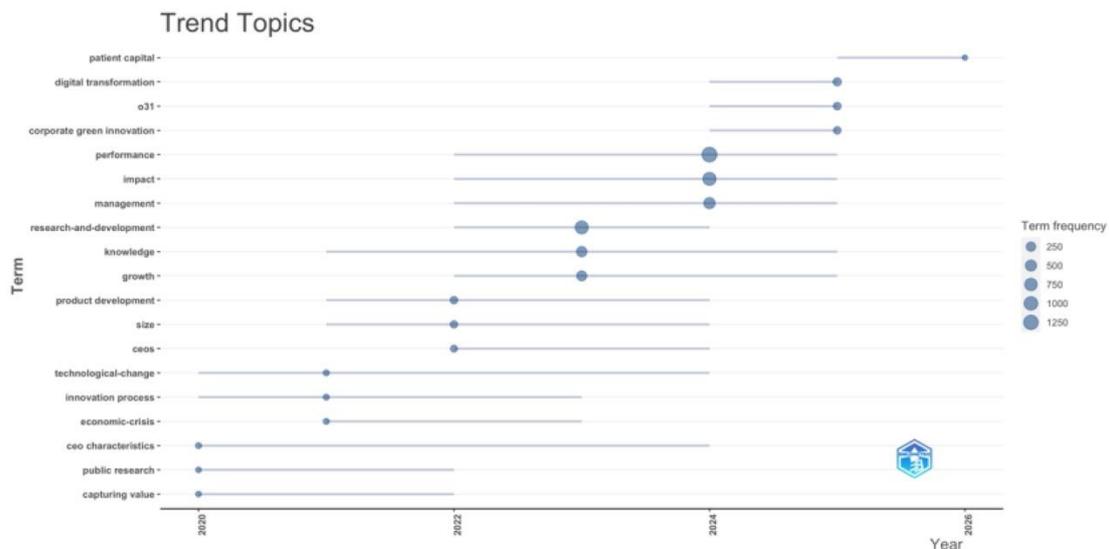
Figure 6. Trend topics

Factorial (MCA) Map

Figure 7 presents the MCA factorial map of the author keywords, and the distance between keywords represents how often two words co-occur within documents. The first two dimensions explain a large part of the variation (Dim 1 = 25.08%, Dim 2 = 23.11%), indicating a meaningful conceptual separation in the corpus. Along Dim 1, traditional forms of innovation (process innovation, product innovation) seem somewhat isolated from the much denser right-hand section, which is populated with more applied treatments of firm innovation. With respect to Dim 2, as a significant component of a substream that focuses on combining innovation with sustainability transition and strategic renewal, the top-right portion integrates transformation-oriented topics, such as ESG/ESG performance, green innovation, and digital transformation. The bottom-right part correlates with a cluster of concepts related to measurement such as R&D and patents, showing interests in the inputs and formal outputs of innovation. The core of innovation is enveloped by innovation capability, open innovation, and radical innovation, creating an integrative core that connects capabilities, contexts, and emergent agendas.

Figure 7. Factorial (MCA) map

Discussion

Descriptive Characteristics and Core Publication Sources

The indications are that Post-COVID firm innovation investigation has recently crystallized into a strong, globally networked strand. Collaboration is also extensively evident, with researchers sharing access to international data as well as specialized knowledge. When it comes to publication sources, the discipline has a recognizable core–periphery pattern. A narrow core of journals monopolizes the accumulation of knowledge, whereas a wide periphery carries similar work into neighboring fields. This cross-disciplinary core confirms that Post-COVID firm innovation is not only innovation management, but also involves questions of resource allocation and constraints in finance and economics, and strategic transformation in sustainability-focused outlets. This is consistent with established arguments that R&D and innovation are sensitive to financing frictions and capital market imperfections (Xu, 2020), and that financial and governance considerations are central, not peripheral, to innovation research (Xiang et al., 2022; Xia et al., 2022).

Current Thematic Configuration and Knowledge Structure

Post-COVID era firm innovation studies. Contemporary Post-COVID strong firm innovation studies are organized thematically around three interrelated domains of explanation: governance and institutional arrangements (e.g., policy orientation, ownership structures), capabilities and knowledge reconfiguration (e.g., absorptive and dynamic capabilities); and sustainable-oriented innovation (e.g., green innovation, CSR/ESG constructs). The co-presence of these factors indicates a shift from single-mechanism explanations to multi-mechanism explanations, which consider how limitations, organizational learning, and external transition pressures affect innovation trajectories.

The theoretical coherence of this pattern stems from two classic capability-related ideas. First, firms differ in their capacity to acquire, absorb, and utilize external information, leading to varying degrees of success in innovation (Sahoo et al., 2023). Second, especially in turbulent environments, companies need dynamic capabilities to sense change, seize opportunities and reconfigure resources rapidly (Ferreira et al., 2020). Sustainability concerns align with known theory, since environmental regulations and pressures drive innovation rather than cost increases (Hu et al., 2020; Li et al., 2023). In addition, CSR/ESG policies may represent a form of reputational and trust capital that insulates against shocks and helps maintain stakeholder support, particularly that of investors, customers, and regulators (Broadstock et al., 2020; Wang et al., 2023). The literature suggests that Post-COVID innovation is strategically integrated, with governance and finance defining what firms may do (Soto-Acosta, 2020), capabilities determining adaptation and efficiency (Shahzad et al., 2020), and sustainability pressures promoting innovation (Kraus et al., 2020).

RQ3: Emerging themes and future research directions

The most recent research focuses beyond the short-term COVID implications and increasingly examines dual transformation, which are digital transformation and green innovation, through performance and value measurements. This transition suggests three research streams. First, examine digital transformation as a set of capabilities that enables firms to reconfigure innovation in ways that are moderated by governance and resources (Wen et al., 2022; Usai et al., 2021). Second, integrate sustainability constraints from regulations and stakeholders to company capabilities. Evaluate innovation value and effect (Khanra et al., 2022). Third, improve measurement by attaching financing and governance to the value of innovation through patents and other intangible indicators, rather than depending on just one proxy (Babina et al., 2024). In general, the field shares fundamental constructs but is diversifying by context, innovation type, and measurement options (Ghasemaghaei & Calic, 2020).

Conclusion

This paper describes the knowledge structure of Post-COVID firm innovation research (2020–2026) by applying complementary science-mapping techniques, including descriptive indicators, Bradford's Law, keyword co-occurrence, thematic mapping, trend topics, and Multiple Correspondence Analysis. This methodological approach is consistent with prior bibliometric work (Khanra et al., 2022) and takes advantage of reproducible tools to assess performance and to depict the conceptual structure.

The period 2020–2026 witnessed the rapid consolidation of Post-COVID firm innovation research into a sizeable and markedly internationalized stream. Rather than attributing this pattern solely to a transient "topic surge," the evidence is more consistent with the proposition that post-COVID innovation questions possess strong cross-national comparability. This comparability, in turn, incentivizes internationally networked scholarship, as researchers pool complementary data access, contextual knowledge, and methodological capabilities to produce generalizable insights across institutional settings.

At the same time, the field exhibits a coherent triadic thematic architecture that connects governance and institutional constraints (Xia et al., 2022; Xu, 2020), capability and

knowledge reconfiguration (Ferreira et al., 2020; Shahzad et al., 2020), and sustainability-transition pressures (Hu et al., 2020; Li et al., 2023). Significantly, these fields do not work as separate threads; rather, they are systematically connected by a small number of bridge ideas, particularly performance and R&D (Usai et al., 2021), which serve as shared coordinates for theoretical integration and empirical assessment. This coupling indicates an emerging consensus that Post-COVID innovation should be understood as a strategically embedded process shaped jointly by strategic leeway defined by governance and finance (Xiang et al., 2022; Xing et al., 2021), adaptive capacity reflected in the speed and effectiveness of resource reconfiguration, and directional pressures arising from sustainability and regulatory environments (Wang et al., 2023).

Finally, the thematic evolution signals a shift in the research frontier from immediate crisis-response emphases toward a more structured agenda centered on dual transformation. As focus themes, digital transformation (Wen et al., 2022) and sustainability-oriented (green) innovation (Kraus et al., 2020; Rehman et al., 2021) are becoming more and more similar, and their consequences are increasingly being evaluated through value- and performance-oriented perspectives (Broadstock et al., 2020; Sahoo et al., 2023). The firm innovation is no longer viewed as a temporary disruption, but rather as a catalyst that prompts a structural rearrangement of the enterprise's innovation system (Babina et al., 2024).

Contributions

This study adds to the extant literature in two ways on the basis of results derived from the document set of 4264. Theoretically, it articulates a consistent triadic thematic structure of governance, capability reconfiguration, and sustainability. It shows performance and R&D as the key bridging concepts among these streams of research, thus offering a platform for explicating how systemic shocks enable the reconfiguration of firm innovation systems. Contextually, the research offers a baseline for empirical inquiry that captures a swift consolidation and internationalization of the post-pandemic innovation flow in an array of institutional contexts. It captures a clear advance in the research frontier from early crisis response strategies towards an agenda of dual transformation by which digital and green transitions have been reconnected into a strategic agenda for firms over the period 2020–2026.

Implications

The results imply that the Post-COVID firm innovation phenomenon is most accurately theorised as a strategically embedded governance/financial leeway, capability reconfiguration, and sustainability pressures in combination act as the core determinants of innovation trajectories. They further suggest the need to subsume digital transformation and green innovation under one umbrella rather than seeing them as an isolated two streams and also to delineate clearer boundary conditions by types of innovation, institutional context, and extent of constraint.

For managers, the delineated frontier means that innovation in the post-COVID era is increasingly about complementary digital and sustainability strategies, fostered by governance mechanisms that allow for quick reallocation of resources and learning (Ferreira et al., 2020). For policymakers and investors, the findings underscore the increasing

importance of trustworthy innovation-value measures (e.g., patent- and intangible-based measures) and of institutional designs that mitigate frictions that hamper productive R&D and transition-oriented innovation (Tang et al., 2021).

Limitations

Several limitations of the study should be brought to attention when interpreting these findings. First, bibliometric results are affected by source coverage, query formulation, and harmonization of keywords, which can introduce biases such as underrepresentation of certain disciplines or language regions. Second, the citation maturation window for 2020-2026 is short and may therefore cause compression of citation-based signals and entry-acceleration of publications from the early pandemic. Third, co-occurrence and thematic maps represent discursive rather than causal proximity; therefore, thematic maps should be utilized to guide hypothesis generation and not confirm mechanisms. To improve analysis, consider combining across databases, such as Scopus, expanding the time window as literature ages, and combining keyword-based mapping with citational-based techniques to better distinguish between a field's intellectual base and research front.

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