



Exploring the relationship between innovation and corporate governance

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ABSTRACT

Innovation is a significant factor for business sustainability, and, at the same time, corporate governance plays a key role in defining appropriate directions for firms addressing the challenges it implies. We try to understand which are the relevant contributions, topics, and intellectual framework in the existing research literature exploring the relationship between innovation and corporate governance to advance the research in this arena. To that aim, we use bibliometric methods to analyze 766 articles published in the last three decades. We identify different periods in the research works, showing an evolution in terms of the number of articles, the scope they cover, and the variety of related topics. Also, we identify the intellectual framework that underlays the contributions, discuss the main pillars of the research corpus concerning the core themes, identify gaps in research, and point to new avenues of study in this realm.

1. Introduction

Innovation drove and still drives the attention of politics, business practice, academia, and society in general. A variety of contexts and issues trigger the interest: from social disruption to achieving sustainability, to organizational challenges, to innovation systems, to corporate strategy, or to stakeholders' management. Corporate governance, in turn, has increased its visibility after scandals, in protecting stakeholders' rights, in the provision of resources for the firm, or in addressing and being accountable for the environmental and social impact that follows their policies and action plans. Researchers have studied these phenomena through an increasing number of publications, experiencing significant growth in the last three decades (Durisin and Puzone, 2009; Fagerberg et al., 2012). Also, the combination of innovation and corporate governance as a topic of study plays a key role and, therefore, accounts for a significant number of works, addressing multiple related issues and relying on different theories.

Researchers within the framework of agency theory state the importance of setting various mechanisms to align the interests of principals and agents once the separation of ownership and control is in place (Berle and Means, 1932; Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976). In this context, previous discussions brought the role of external and internal mechanisms. Thus, Stein (1988) stated that the threat of hostile acquisitions may lead managers

to avoid assuming investments in the long term, which could be conceptualized as a Managerial Myopia, and a mechanism of takeover provisions could allow to overcome that situation encouraging innovation. Shleifer and Vishny (1989) also pointed out the potential reduction of research and development investments. Becker-Blease (2011) clarifies that only those provisions that are actively adopted are positively related to innovation. Conversely, Bertrand and Mullainathan (2003) affirmed that the above-mentioned provisions diminish the efforts to carry out long-term innovation projects, conceptualizing the *Quiet Life Hypothesis*. This view can be framed within the agency theory, where those threats are an important element against managerial self-dealing and may lead to the absence of evidence of R&D expenditures (Jensen, 1988). In that sense, it pushes to respond to technological changes by restructuring the firm efficiently (Jensen and Ruback, 1983).

Other authors set the focus on the board from various angles. The board of directors reduces agency costs of managerial opportunism by monitoring managers (Fama and Jensen, 1983) in those situations when they have to make decisions on innovative projects. At the same time, it helps in the provision of resources that are necessary to implement strategies (Pearce and Zahra, 1992), in which innovation can be crucial to reach their goals. In this context, to develop a corporate structure that facilitates innovation to mitigate the myopic behavior of managers, who tend to emphasize short-term manageable performance instead of pursuing long-term and impactful goals (Zhang et al., 2014). The board

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composition may have an impact on innovation, but there has been discussion about the sign of that relationship and how it is produced in the case of board independence (Balsmeier et al., 2017). While some state that a board with independent directors who have experience in the field and skills can limit the aversion to R&D and reduce the misuse of resources by advising in innovation projects properly (Kraft et al., 2024; Li et al., 2019), and in particular contexts it may reduce the investment (Zona, 2016). Recently, Sierra-Morán et al. (2024a) established a positive relationship between board demographic diversity and the enhancing of innovation-related decision-making processes, advocating for the complementarity of the resources and capabilities theory, board capital theory, friendly board theory, and resource dependence theory.

The resource dependence theory (Hillman et al., 2009; Pfeffer, 1972; Pfeffer and Salancik, 1978) was utilized to analyze innovation and corporate governance as well. Based on these grounds, contributors addressed issues like the relationship between board capital and innovation (Chen, 2014; Guldiken and Darendeli, 2016; Kim and Kim, 2015), the antecedents of franchise internationalization (Kretinin et al., 2020), the role of founding board members (Barroso-Castro et al., 2022), the educational background of directors and corporate innovation (Hsieh et al., 2022), interlocking and learning efficiency in R&D (Lin et al., 2022; Sierra-Morán et al., 2024a). Also, authors try to balance this framework with the one provided by the agency theory (Akram and Abrar Ul Haq, 2022; Hermanson et al., 2020; Ngo et al., 2018).

As a relevant governance mechanism, the board of directors reduces agency costs of managerial opportunism by monitoring managers (Fama and Jensen, 1983). At the same time, it helps in the provision of resources that are necessary to implement strategies (Pearce and Zahra, 1992). That is the case, for example of the exploration-exploitation strategies (Walrave et al., 2015). Among other issues, contributions studied the link between interlocked directors and new product development (Mazzola et al., 2016) or board diversity and R&D investment (Alvarado-Vargas et al., 2024; Midavaine et al., 2016). Besides, in more recent works, board diversity is associated with firms' carbon reduction (Konadu et al., 2022) and it has a moderating role between subsidies and green innovation (Xia et al., 2022), board characteristics have an impact on green performance and R&D intensity (Ranasinghe et al., 2022), or the impact of staggered boards on product innovation is analyzed (Chen et al., 2022).

The stakeholder theory (Freeman, 1984; Hill and Jones, 1992; Jones, 1995) has also played a key role in explaining asset specificity issues (Belloc et al., 2016), commitment of firms towards corporate social responsibility (Gangi et al., 2020; Sigurdsson and Candi, 2020), responsible innovation (Scherer and Voegtlin, 2020a), risks and motivations in the context of open innovation in high-tech industry (Shaikh and Randhawa, 2022), or board capital in terms of diversity (Hossain et al., 2020). There is also an integrative view of resource-based view into a new stakeholder theory (McGahan, 2021).

As for the more specific themes, some studies addressed how different ownership structures may have an impact on innovation when dealing with the state or sovereign wealth funds (Sun et al., 2021; Wright et al., 2021), family firms (Gast et al., 2018; Hernández-Lara et al., 2014; Hernández-Lara and Gonzales-Bustos, 2020; Hughes et al., 2018; Scholes et al., 2021a), or institutional ownership (Aghion et al., 2013; Hoskisson et al., 2002a; Rong et al., 2017). Also, the topic has been studied within the entrepreneurial landscape, concerning themes like entrepreneurial ecosystems (Cumming et al., 2019), crowdfunding (Cumming et al., 2019), or entrepreneurial orientation (Arzubiaga et al., 2018). Also, the impact of board diversity on the board (Cumming and Leung, 2021; Li and He, 2021; Torchia et al., 2018) or interlockings (Wincnet et al., 2010) have also been addressed.

Moreover, their studies aim to understand technological opportunities (Tihanyi et al., 2003), the impact on corporate social performance (Johnson and Greening, 1999), the institutional environment (Cumming et al., 2021a; Sun et al., 2021; Wright et al., 2021), or the relationship to

board diversity (Cumming and Leung, 2021). Recently, corporate governance has been angled from a perspective that sees important implications for sustainable development (Scherer and Voegtlin, 2020b) through responsible innovation (Owen et al., 2013; Tihon and Ingham, 2011; Von Schomberg, 2012). In this sense, firm innovation would try to create social value through the development of products and services that avoid harm and improve conditions for people and the planet, as a result of the dialog with stakeholders (Scherer and Palazzo, 2011; Stahl and De Luque, 2014; Voegtlin and Scherer, 2017). Going even further, it has been proposed a framework of *stakeholder governance* as the proper way to pursue responsible innovation, allocating the created economic and social value (Bacq and Aguilera, 2022).

Then, the growing number of publications and the increasing interest in addressing these related matters makes it necessary to identify the way they evolved, the relevant authors, journals, and intellectual frameworks that helped to configure the current corpus of research. This analysis is particularly useful to advance in the maturation of the research, address new related topics, use different theoretical approaches, or ground a proper basis for meta-analyses or exploring boundaries through systematic research works. For that aim, we employ bibliometric techniques (Broadus, 1987; Diodato et al., 1994; Zupic and Cater, 2015) to analyze 766 published articles that spread over the last three decades.

The use of bibliometric techniques to address innovation as a field of research (Fagerberg et al., 2012) or in related topics (Diez-Vial and Montoro-Sanchez, 2017) is not new. Likewise, corporate governance has been also studied using these lenses (Huang and Ho, 2011; Kent Baker et al., 2020; Singh et al., 2021; Zhao et al., 2023). There are some previous studies have employed approaches such as theoretical reviews, systematic literature, reviews, meta-analytical reviews surveys, among others. But in many cases, most of them partially deal with the interplay between innovation and corporate governance. Also, there are some articles that partially deal with the interplay between innovation and corporate governance. Thus, Asensio-López et al. (2019), Gonzales-Bustos and Beatriz Hernández-Lara (2016), and Sierra-Morán et al. (2024b) explored the relationship between three elements of corporate governance (the board of directors, its structural or demographic diversity, and the ownership structure) and innovation efforts and its results. Concerning technological innovation, Belloc (2012) addressed the ownership structure, financial contexts (stock markets, takeovers), employee behavior (unions, participation, adaption), business systems, and institutional complementarities. Scherer and Voegtlin (2020a, 2020b) analyze the relationship between some corporate governance models and responsible innovation. Kurzhals et al. (2020) review the relationship between strategic leadership and technological innovation. Teixeira and Carvalho (2024) focuses on the impact of corporate governance mechanisms and SMEs' innovation performance. But, to our knowledge, there is no study analyzing both, innovation and corporate governance, as a topic in research production, and providing a clear view of core contributions, relevant topics, and its intellectual grounds based on bibliometric methods. Therefore, we aim to answer the following questions: Which are the relevant journals, contributions, and authors linking innovation and corporate governance? What are the prominent research themes in this realm? Which are the relevant intellectual pillars in the research corpus? What directions could future studies take?

Although the link between innovation and corporate governance has been approached from various perspectives, we will show that there is a lack of development of sustainability issues. Changes from the current mainstream theoretical framework, which is based on the Agency Theory, to other theories might be helpful. In this sense, an interesting angle to frame those studies could come from the above-mentioned concept of stakeholder governance (Bacq and Aguilera, 2022), which draws on the foundations of the stakeholder theory and value-based strategy and develops a framework with mechanisms for value allocation. This approach is highlighted in the case of open innovation in Shaikh and

Randhawa (2022), where the stakeholder governance approach is posed to be the perfect grounding to align internal stakeholders in the pursuit of an innovation framework that disseminates benefits in society, making it more sustainable. This is obtained due to the specific advantages of relying on agents' motivation, rewards, controls, and business objectives.

Hence, our paper has the following structure. Next to this introduction, we present the methods to be used. Then, there is a section devoted to showing and discussing the results we obtained. Finally, we state some conclusions and suggest directions and lines for future research.

2. Methodology

The bibliometric techniques are configured as a set of tools using mathematical and statistical components to analyze data referred to publications (Diodato et al., 1994; Groos and Pritchard, 1969). These techniques have been widely employed to explore disciplines (Alexander and Mabry, 1994; Charvet et al., 2008; Culnan et al., 1990; Fernandez-Alles and Ramos-Rodríguez, 2009; Merigó et al., 2015; Nerur et al., 2008; Pilkington and Liston-Heyes, 1999; Pilkington and Meredith, 2009; Ramos-Rodríguez and Ruiz-Navarro, 2004; Tahai and Meyer, 1999), specific topics or subfields (Casillas and Acedo, 2007; Danvila-del-Valle et al., 2019; De Bakker et al., 2005; Estevez-Mendoza, 2022; Etemad and Lee, 2003; Landström et al., 2012; Schaltegger et al., 2013; Schildt et al., 2006), or theories (Acedo et al., 2006; Martins et al., 2010; Vogel and Güttel, 2013; Weerakkody et al., 2009).

2.1. Unit of analysis

The unit of analysis is the article published in specialized journals. Since it follows a qualification process, it secures the reliability of the contents (Callon et al., 1993; Ramos-Rodríguez and Ruiz-Navarro, 2004). By computing frequencies of citations (Culnan, 1987) and impact indicators (Egghe, 2006; Hirsch, 2005), it is feasible to detect influential works, authors, and journals. An additional look into the relational structure of the documents leads to identifying clusters of themes, authors, and intellectual frameworks (Pilkington and Liston-Heyes, 1999; Ramos-Rodríguez and Ruiz-Navarro, 2004). To help the process of analyzing and visualizing these structures, we employ maps that reflect the different configurations of the research (Cobo et al., 2011b) by computing data from the documents in VOSviewer software (Van Eck and Waltman, 2014), SCImat (Cobo et al., 2012), and biblioshiny R package (Aria and Cuccurullo, 2017).

2.2. Methodological process

We configured a process to follow the different steps these methods demand. They include the retrieval and cleaning of data, the computation of descriptive and relational elements, and the visualization and analysis of the results (Zupic and Cater, 2015). Fig. 1 shows them in perspective.

In the first step, reliable databases of publications serve to source the sample by employing meaningful terms and categories in the search process. We utilized the Main Collection database of the Web of Science (WoS) which is widely considered a reliable source (Merigó et al., 2015). We searched articles which included the terms “innovation”, “innovative companies”, “innovative firms”, or “innovative capabilities” in

addition to “corporate governance”, “board of directors”, or “boardroom”. The 1379 documents we obtained were then filtered by the following categories of WoS Ethics, Operations Research Management Science, Multidisciplinary Sciences, Management, Business, Economics, and Business Finance. Also, for homogenization purposes, we took out documents in early access stage and those with final publishing year in 2023.¹ The resulting 796 documents were reviewed to secure that they belonged to the topic, and we finally obtained the registers of 766 articles.

In the analysis step, descriptive and relational tools for the proposed aim are set. Then, the frequency of publications draws the evolution of the literature and its potential stages. Impact indicator applied in the case of journals and authors help to analyze their relevance in forming the research corpus. By mapping co-occurrences, the analysis of relational aspects is introduced when it comes to identify the evolution of topics and the structure of the intellectual framework.

Specifically, in order to identify the relevant topics and their evolution over the different periods, we process keywords in each document, create co-occurrence networks, apply a clustering algorithm and analyze their configuration (Cobo et al., 2011a, 2012). The analysis is helped by two basic elements: the strategic diagram (Callon et al., 1991) and the thematic network (Bailón-Moreno et al., 2005; Cobo et al., 2011a; López-Herrera et al., 2009). The strategic diagram shows the algorithmically identified clusters mapped according to the computed Callon's density and centrality measures. Mapping allows to classify themes as ‘motor themes’ if they have high density and centrality; ‘basic’, if they have high centrality and low density; ‘highly developed or isolated’, if they have high density and low centrality; or ‘emerging/declining’, if they have low density and centrality, depending on their evolution across periods (Callon et al., 1991). The picture shows an example of how they might appear in the diagram. Besides, each one of the themes has an associated network of keywords reflecting their relationship in some of the documents of the sample (Fig. 2).

The clusters of themes allow to visualize and assess the evolution of the different topics. This process is initially depicted in a summary of the evolution areas and the stability of words between periods (See the example in Fig. 3). The number included in each circle shows the number of words that were considered for the analysis; the number over the arrow that links them, the number of words which stay between periods; the number of the outer arrow, the words no longer considered; and number of the incoming arrow, the number of new words for that period.

3. Results and discussion

3.1. Research evolution

The documents of the sample we analyzed cover the period between 1994 and 2022. The documents, mostly articles, were elaborated by 1765 authors, published in 248 different sources, and employed 35,769 references. The evolution of the publications may be observed in the Fig. 4.

We might set three periods for the analyses: 1994–2004, 2005–2012, and 2013–2022. The first period has an average of 3 documents published each year, the second 14, and the last 62. This pattern would suggest a seeding stage, a growing stage, and a maturation stage in research contributions. In fact, the average citation per article in the first

¹ Search in WoS as of May 2023: (TS = ((innovation OR “innovative companies” OR “innovative firms” OR “innovative capabilities”) AND (“corporate governance” OR “board of directors” OR “boardroom”))) AND ((TASCA = (“ETHICS” OR “OPERATIONS RESEARCH MANAGEMENT SCIENCE” OR “MULTIDISCIPLINARY SCIENCES” OR “MANAGEMENT” OR “BUSINESS” OR “ECONOMICS” OR “BUSINESS FINANCE”) AND DT = (“ARTICLE”)) NOT (DT = (“EARLY ACCESS”) OR PY = (“2023”))) NOT FPY = (“2023”).

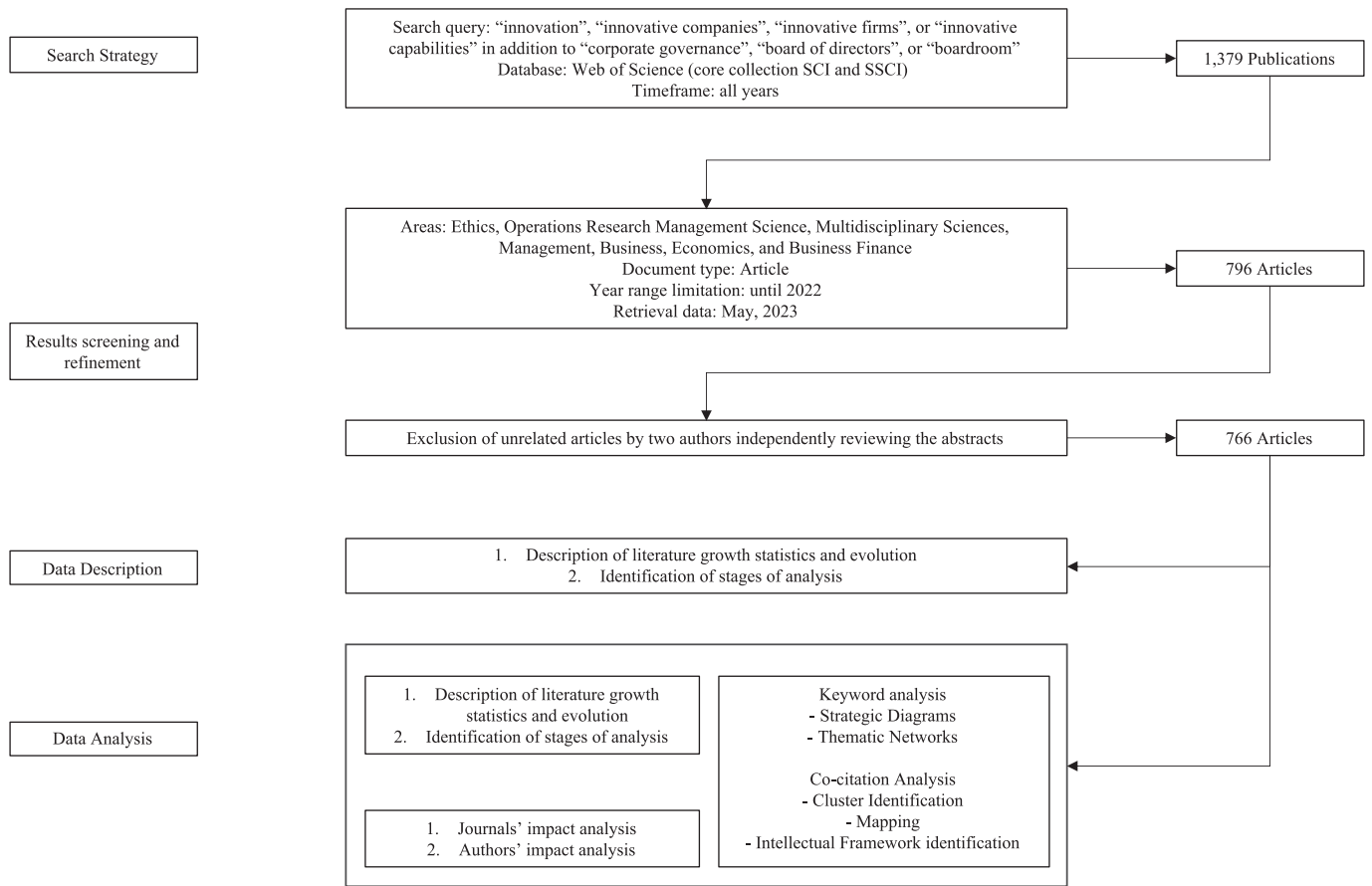


Fig. 1. Methodological steps.

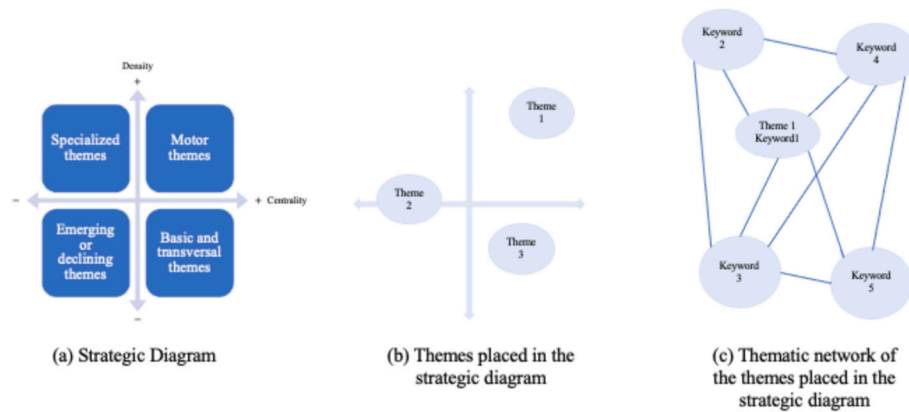


Fig. 2. Strategic diagram and thematic networks layouts examples. Source: adapted from (Cobo et al., 2012)

period (114.24) shows the establishment of foundations, whereas the sharp decrease in the second (76.03) implies the setting of avenues of investigation, which is confirmed in the last period (31.67).

3.2. Journals' impact

While in the first of the identified periods there are just a few journals publishing contributions on the topic, the other periods show a sharp increase in the number of sources involved and the number of articles published. As it is foreseeable, journals whose specific scope is devoted to research and management (e.g., *Academy of Management Journal*, *Journal of Business Research*, *Research Policy*, *Technological Forecasting*

and *Social Change*, *Strategic Management Journal*, *Journal of International Business Studies*, *Management Decision*), finance (e.g., *Journal of Corporate Finance*, *Journal of Financial Economics*), ethics (e.g., *Journal of Business Ethics*), and to corporate governance (e.g., *Corporate Governance – An international Review*) have a key role in the pattern. But, at the same presence, we observed a significant variety of angles according to the number of different sources. This is confirmed by the Bradford's Law, depicted in Fig. 5, since it includes 19 journals among the core sources.

To assess the relevance of the various sources, we computed several impact indicators: h-index, g-index and m-index (Table 1.A). Besides, we also ranked sources by the total citation (Table 1.B). That allows to find commonalities and also specific journals developing the topic but still

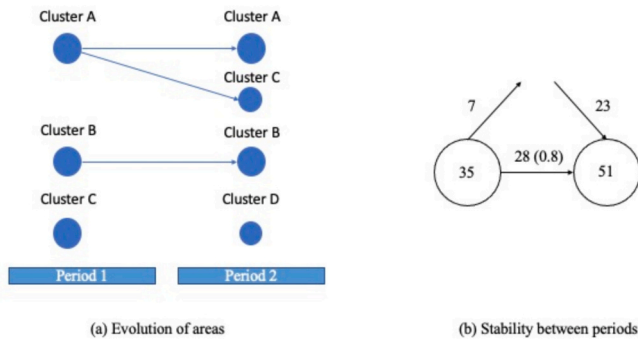


Fig. 3. Evolution of areas and stability between periods. Examples. Source: Adapted from [Cobo et al., 2012](#)

not relevant across the related issues. Both classifications show at the top a common group of sources having a major impact in contributions to the topic.

3.3. Authors' relevance

By contributing to the topic and being cited, authors help building a research corpus on the topic. To assess the relevance, we computed some impact indicators and number of citations. Ranking according to both may not coincidental since an author may address different topics and be acknowledge for that, or an author may contribute with a small but remarkable number of works. Thus, we ranked the top 30 authors according to h-index ([Table 2.A](#)) and total citations ([Table 2.B](#)).

Articles led by Cumming contribute in the realm of context and investor-shareholder side, such as the institutional environment ([Cumming et al., 2021a, 2021b](#)), venture capitalism in entrepreneurial ecosystems linked to technology ([Cumming et al., 2019](#)), crowdfunding ([Cumming et al., 2019](#)), public-to-private buyouts effect on innovation results ([Cumming et al., 2020](#)), the research of different issues linking CG and innovation in China ([Cumming et al., 2021a, 2021b](#)), or the regional demographics and industry context when considering board

diversity and corporate innovation ([Cumming and Leung, 2021](#)).

Wright and Filatotchev collaboration brings methodological issues on CG ([Filatotchev and Wright, 2017](#)), and agency perspectives on CG of MNEs ([Filatotchev and Wright, 2011](#)). Besides, they address the need of innovation in CG ([Filatotchev et al., 2020](#)). Wright in association with other authors also addresses international institutional contexts affecting innovation ([Sun et al., 2021; Wright et al., 2021](#)), and CG effects on the innovation strategy followed by family firms ([Scholes et al., 2021b](#)).

The work of Hoskisson, Tihanyi, and Johnson bridges the topic to corporate strategy. Thus, effects of board of director on technological opportunities ([Tihanyi et al., 2003](#)) or the role of the managerial incentives when dealing with technological competence ([Tihanyi et al., 2009](#)) are angled in the contexts of international diversification. Hoskisson led also works with other author linking family firm R&D investments and the Behavioral Agency Model ([Gomez-Mejia et al., 2014](#)). Johnson and Greening address the effects of CG and different institutional ownership types on corporate social performance, where the innovation takes part in the product quality dimension of the later ([Johnson and Greening, 1999](#)).

In the research led by Zona, innovation investments are linked to board composition and characteristics for Italian firms ([Zona, 2014](#)), following a contingency model of board of directors which has an impact in firm innovation ([Zona et al., 2013](#)), and poses Behavioral Agency Model to frame corporate investing or the effect of CG traits ([Zona and Zamarian, 2022](#)).

Torchia, Huse, and Calabrò consider the effect of tokenism or critical mass on firm innovation ([Torchia et al., 2011](#)). Calabrò faces governance and innovation in post-pandemic economy in the case of family MNEs ([Calabrò et al., 2022](#)). Other authors approach the boards effects on innovation ([Gonzales-Bustos et al., 2020; Hernández-Lara and Gonzales-Bustos, 2019](#)), the relationship between women directors and innovation ([Hernández-Lara and Gonzales-Bustos, 2020](#)), or board impact on entrepreneurial orientation and innovation in family SME ([Arzubiaga et al., 2018](#)).

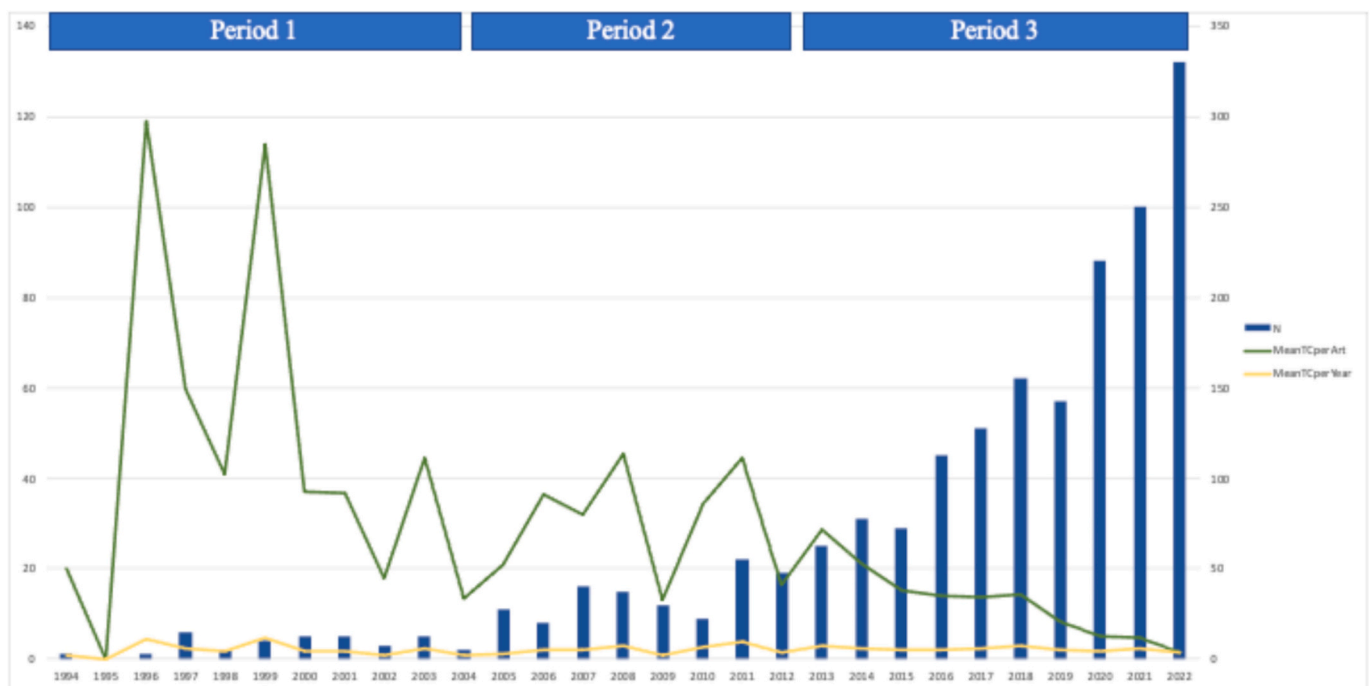


Fig. 4. Evolution of published articles. Source: Own elaboration from biblioshiny (bibliometrix).

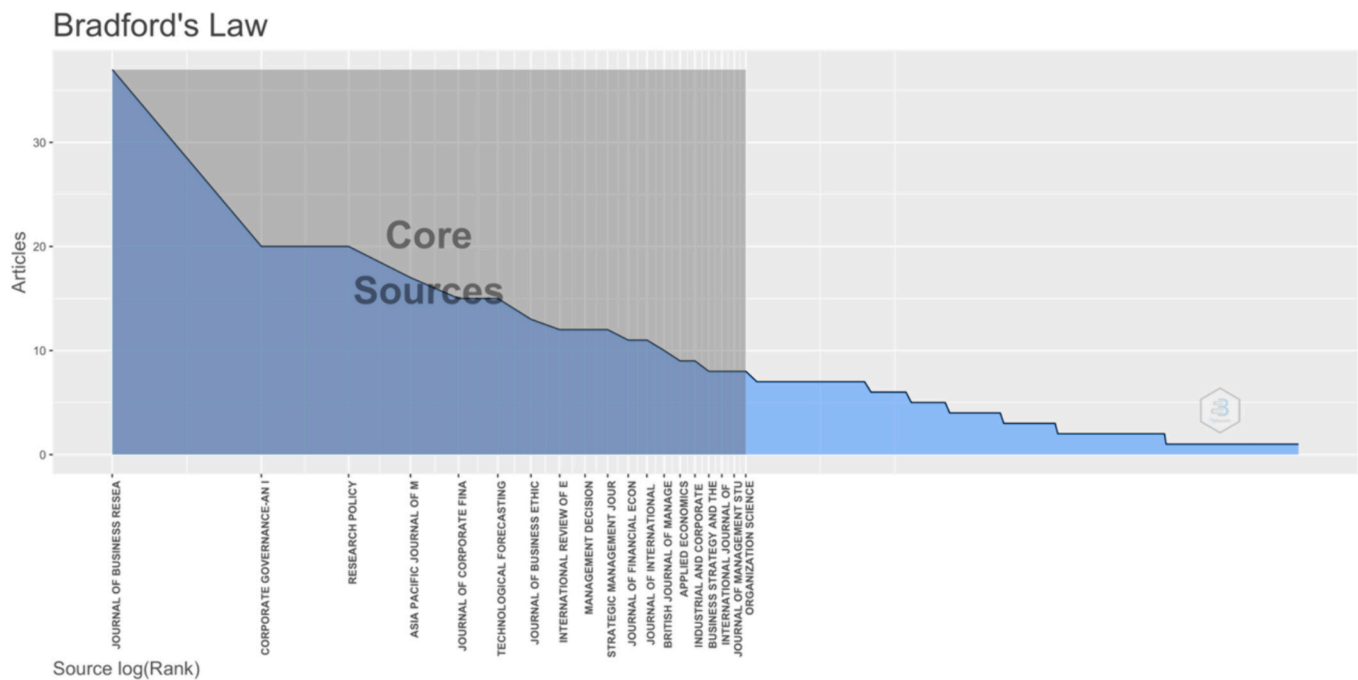


Fig. 5. Bradford's Law – Core Sources.
Source: Own elaboration with SCImat

3.4. Thematic and intellectual framework evolution

According to the three observed periods, we split the analysis of the themes and the intellectual framework into three periods. The Fig. 5 shows how the clusters of themes evolved across them. The number of key themes and their size increase over time (Fig. 6.A). Also, the maturation process of themes is built upon the contributions elaborated in previous periods, since they are interrelated, and they add new ones while keeping some that were approached in the past (Fig. 6.B). Thus, period 2 includes all the keywords of period 1 and period 3 keeps 98 % of them, and there is a substantial increase in the terms utilized to categorize the articles both in period 2 and 3.

3.4.1. Thematic and intellectual framework 1994–2004

The first period of the analysis shows a seeding stage in terms of the contributions. There are two main clusters in the strategic diagram: the first is centered in the incentives and the second in the investments. Whereas the former can't be qualified by its centrality and density, the last shows as a clear motor thematic cluster (Fig. 7).

The 'incentives' cluster, relates topics around markets, investors, and the active counterpart in the firm represented by the boards of directors. The 'investments' cluster centers the relationship among innovation, firm performance and, in the corporate governance realm, the ownership structure of the firm (Fig. 8). Therefore, the contributions of this period are centered in setting the grounds of the determinants and reasons behind the innovation in forms under the scope of corporate governance. It is convenient that that kind of investment yields positive performance for the firm, and the ruling parts on both sides are relevant: investors in the market side and boards in the firm, where ownership structure might play a key role.

Following the structure of the themes analyzed, the intellectual framework of the period 1994–2004 might be analyzed through clusters of co-cited references (See Fig. 9 for the map of top-ranked co-cited references in the period).

The pillar (with nodes in red color) combines the ownership structure, the investors and the main corporate governance matters put under the perspective of firm innovation. It is built upon the contributions

dealing with the Agency Theory in terms of the separation of ownership and control (Fama and Jensen, 1983), which is also at the core of references, the causes and consequences of that ownership structure (Demsetz and Lehn, 1985), dealing with corporate governance control matters such as takeovers (Pound, 1992), antitakeover amendments to bylaws (Brickley et al., 1988) or shareholder activism (Davis and Thompson, 1994), the diversification strategy and R&D intensity (Baysinger and Hoskisson, 1989), institutional investors (Hansen and Hill, 1991; Useem, 1996) and their relation with board composition (Gilson and Kraakman, 1991) and firm innovation (Kochhar and David, 1996), failure at corporate governance (Daily and Dalton, 1994),

A second pillar links Agency Theory to the institutional context for the firm innovation. Thus, it provides theoretical foundation around the Agency Theory (Eisenhardt, 1989), the agency costs, and the ownership structure (Jensen and Meckling, 1976), considering institutional investors (Chaganti and Damanpour, 1991) which play in a financial system which need a proper strategic management alignment (Allen, 1993). In this context, profiting from technological innovation (Teece, 1986), is key in sourcing of resources to sustain the competitive advantage (Barney, 1991), given the innovation system (Nelson, 1993), and the institutions of the economic system (Williamson, 1986), which gives an alternative, if not complementary, supporting theory. This suggests a change or comparison of different frameworks in the research.

The third pillar refers to incentives setting in context. References deal with the failure of internal control and the alignment of incentives (Boyd, 1994; Jensen, 1993; Jensen and Murphy, 1990), in the context of agency costs (Jensen, 1986) and organizational changes (Aghion and Tirole, 1995) in current market competition (Nickell, 1996). This topic is still relevant in research literature (Manso, 2017) and is related to firms' culture and rewards structuration. Besides, dynamic methodological support is provided (Arellano and Bond, 1991; Blundell et al., 1995).

3.4.2. Thematic and intellectual framework 2005–2012

In the second period there is a sharp increase in the number of thematic clusters up to nine of them. The clusters of topics centered on boards and innovation are transversal, whereas institutions and SME remain in an early stage. Incentives keep being an increasing theme.

Table 1
Relevance of sources. Top 30 journals ranked by impact indicators and citations.

A			B		
Source	h-index	g-index	m-index	Source	TC
Journal Of Business Research	18	30	1.00	Academy Of Management Journal	1790
Research Policy	14	19	0.64	Research Policy	1551
Strategic Management Journal	12	12	0.43	Journal Of Financial Economics	1521
Corporate Governance-An International Review	12	19	0.52	Journal Of International Business Studies	1233
Asia Pacific Journal Of Management	11	17	0.73	Journal Of Business Ethics	1059
Journal Of Financial Economics	10	11	0.63	Journal Of Business Research	957
Journal Of Business Ethics	10	13	0.59	Journal Of Financial And Quantitative Analysis	858
Journal Of Corporate Finance	10	15	0.77	Organization Science	801
Journal Of International Business Studies	9	11	0.39	American Economic Review	749
Technological Forecasting And Social Change	9	14	0.56	Strategic Management Journal	698
Organization Science	8	8	0.32	Corporate Governance-An International Review	655
British Journal Of Management	8	10	0.42	Asia Pacific Journal Of Management	603
Management Decision	8	12	0.62	Family Business Review	600
Academy Of Management Journal	7	7	0.28	Journal Of Business Venturing	513
Journal Of Management Studies	7	8	0.44	Journal Of Corporate Finance	488
Industrial And Corporate Change	7	9	0.37	British Journal Of Management	482
Journal Of Financial And Quantitative Analysis	6	6	0.46	Journal Of Management Studies	464
Journal Of World Business	6	7	0.43	Accounting Review	442
Small Business Economics	6	7	0.75	European Economic Review	391
Business Strategy And The Environment	5	8	0.50	Management Decision	325

Source: Own elaboration with bibliometrix

Overall, firm performance and the ownership structure are motor themes in the period (Fig. 10).

The innovation cluster embeds the situation of change among shareholders, such as in the case of takeovers, family firms, or privatization processes. The ownership structure is angled from the agency perspective and faces impact in terms of risks and financial performance. Corporate governance theme includes internal ties in the managerial incentives as well as external boundaries established by law. The firm performance is directly linked to top management teams and boards. Besides, the themes on incentives are approached from the agency perspective as well, considering links towards R&D, their risks, and corporative strategic movements like acquisitions. Smaller themes specify the role of disclosure, the institutional investors, upper echelons theory, and special cases for markets of SMEs. The associated thematic networks are shown in Fig. 11.

Table 2
Authors' relevance. Top 30 ranked by impact (A) and by total citations (B).

A			B		
Author	h-index	g-index	m-index	Author	TC
Wright M	8	8	0.348	Johnson Ra	1263
De Massis A	6	6	1	Greening Dw	953
Cumming D	6	8	0.75	Van Reenen J	847
Kraus S	4	4	0.5	Aghion P	815
Filatotchev I	4	4	0.235	Zingales L	749
Zhang Bh	4	4	0.364	Calabro A	620
Zona F	4	4	0.333	Huse M	616
Yoshikawa T	4	4	0.235	Torchia M	616
Chen J	4	4	0.4	Naldi L	589
Tylecote A	4	6	0.2	Nordqvist M	589
Wu J	4	5	0.4	Sjoberg K	589
Liu Y	4	7	0.333	Wiklund J	589
Hernandez-Lara Ab	4	4	0.4	David P	571
Johnson Ra	3	3	0.12	Hitt Ma	570
Hoskisson Re	3	3	0.143	Kim H	568
Oriani R	3	3	0.167	Hoskisson Re	567
Tihanyi L	3	3	0.143	Faleye O	497
Balsmeier B	3	3	0.3	Kraus S	443
Tian X	3	3	0.429	Ittner Cd	424
Lazonick W	3	3	0.158	Larcker Df	424
Markman Gd	3	3	0.188	Rajan Mv	424
Voegtlin C	3	3	0.375	Filatotchev I	421
Buck T	3	3	0.13	Oriani R	393
Chang Ml	3	3	0.375	Wright M	392
Kotlar J	3	3	0.5	Tihanyi L	373
Chizema A	3	3	0.188	Lien Yc	372
Zhang J	3	3	0.333	Fernandez Z	360
Buchwald A	3	3	0.3	Nieto Mj	360
Wu Hl	3	3	0.176	Martin G	345
Wang Lc	3	3	0.429	Hoitash R	344

Source: own elaboration with biblioshiny

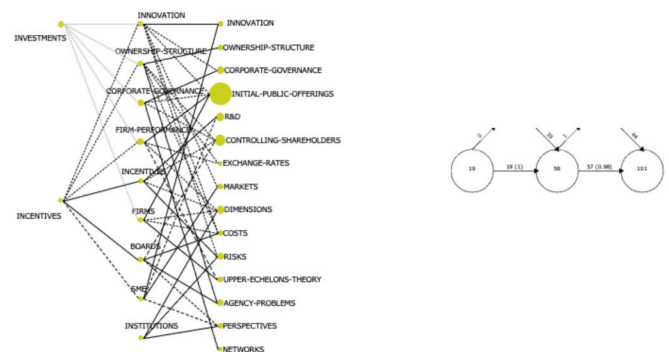


Fig. 6. Evolution of areas and stability between periods.
Source: own elaboration with SCImat

This period shows a change in the structure of the intellectual framework from the initial stage of the analysis. After clustering co-cited references, we found four main pillars (Fig. 12).

The first pillar (nodes colored in red) relates innovation with the main corporate governance and innovation theories. The works of La Porta frame the regulatory and financial in which the corporations structure their ownership shape and configure their governance (La Porta et al., 1998; La Porta et al., 1999a; La Porta et al., 1999b), and protect investors (La Porta et al., 2000). In the situation of separation of ownership and control (Claessens et al., 2000; Demsetz and Lehn, 1985), the relationship between Agency costs and innovation (Francis and Smith, 1995; Holmström, 1989) is considered under Agency Theory and compared to Stakeholder Theory (Lee and O'neill, 2003). Also, Absorptive Capacity is referred to in this pillar (Cohen and Levinthal, 1990).

The second pillar (nodes in yellow) links the board and ownership structure to the strategy oriented to innovation. Hence, the main co-

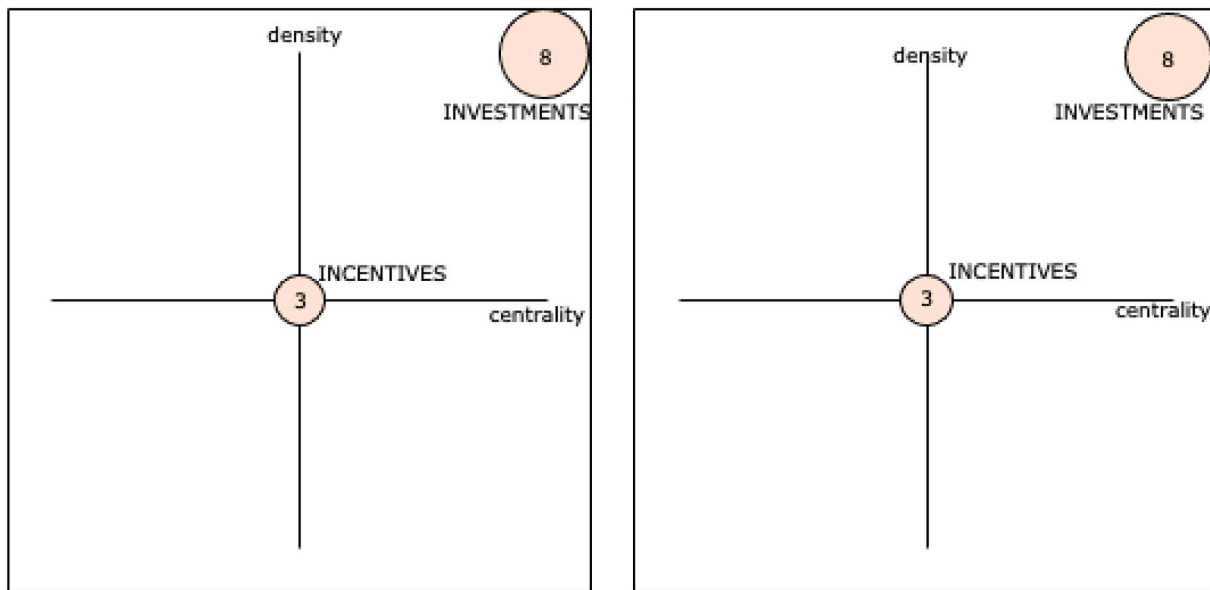


Fig. 7. Strategic diagram 1994–2004. Number of documents and h-index. Source: Own elaboration with SCImat

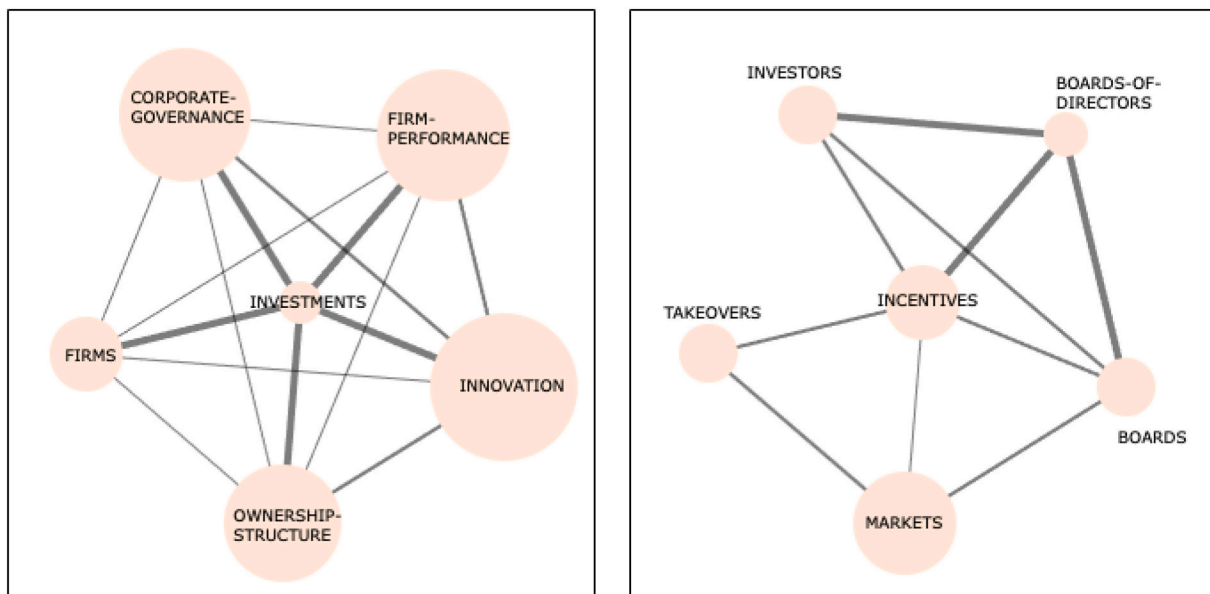


Fig. 8. Thematic networks 1994–2004. Source: Own elaboration with SCImat

cited references approach the board and ownership structure on corporate innovation (Hoskisson et al., 2002b), technological opportunity (Carpenter and Westphal, 2001; Tihanyi et al., 2003), and R&D strategy (Baysinger et al., 1991; Baysinger and Hoskisson, 1990; Carpenter and Westphal, 2001), investors in technology-driven industries (Hansen and Hill, 1991) and their relationship with firm innovation (Kochhar and David, 1996).

The third pillar (nodes in green) is centered on the Agency Theory and the technological opportunities. On one hand, there is a core group of references on agency, e.g., where a longstanding view of the corporate firm (Berle and Means, 1932) is subject to agency cost and new ownership structure (Jensen and Meckling, 1976), the separation of ownership and control (Fama and Jensen, 1983), failing in internal controls (Jensen, 1993), but it can be open to integrative views with resource dependence theory (Hillman and Dalziel, 2003). On the other

hand, this governance framework is placed in the context of industrial technological opportunities (Zahra, 1996).

The fourth pillar (nodes in blue) is built through the blending of Agency Theory with Resources Dependence Theory and IT within the international landscape of corporate governance. Thus, references point to the situation of corporate governance (Shleifer and Vishny, 1997) under a revised view of the Agency Theory (Eisenhardt, 1989) that joins the approach of a resource dependence organization (Pfeffer and Salancik, 1978), and institutional isomorphism (DiMaggio and Powell, 1983), shaping the strategic change (Westphal and Fredrickson, 2001), in an international landscape of corporate governance systems (Aguilera and Cuervo-Cazurra, 2004; Aguilera and Jackson, 2003).

3.4.3. Thematic and intellectual framework 2013–2022

The last period of the analysis experiences a sharp growth in the

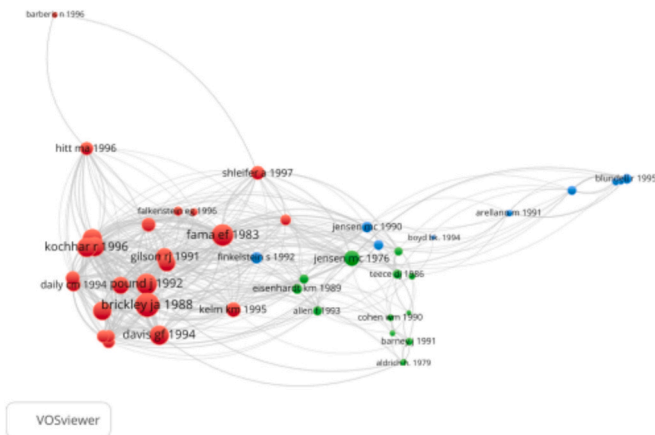


Fig. 9. Intellectual framework 1994–2004. Co-citation map. Source: own elaboration with R-biblioshiny and VOSviewer

number of thematic clusters as we identified 15 different ones. Some previous themes split, some change the topics they are related to, and some other are new to the landscape (Fig. 13).

Innovation theme is linked to ecosystems, specific technologies such as blockchain and SMEs. The ownership structure addresses new angles. IPO becomes a specific theme where investments and resources combine under the scope of achieving performance. R&D is linked to obtaining patents, the product innovation, and the investment decisions, angled from the corporate innovation. Agency costs again support views on the role of institutional investors, risk-taking, and emerging markets surrounding the key subject of controlling shareholders. Some of the perils of internationalization when managing technological innovations and foreign direct investment are centered in the exchange rates as their own theme (Figs. 14 and 15).

The analysis of the intellectual framework for this period also brings new pillar which evolves from the previous stages. In this case, we computed the co-cited references and clusterization process produced three new pillars (Fig. 16).

The first pillar (nodes in red) concentrates the main theories, and it is related to innovation strategy. Hence, references address the Agency

Theory (Eisenhardt, 1989), agency costs, ownership structure, and internal controls (Jensen, 1993; Jensen and Meckling, 1976; Shleifer and Vishny, 1986), separation of ownership and control (Fama and Jensen, 1983), Resource Dependence Theory-Agency Theory integration (Hillman and Dalziel, 2003), Upper Echelons Theory (Hambrick and Mason, 1984), and Resource-Based view (Barney, 1991). This context frames the relationship between corporate governance and corporate innovation (Hoskisson et al., 2002b), and R&D investment strategies (Baysinger et al., 1991; Bushee, 1998; Kor, 2006). This is partially congruent with the study of Kurzhals et al. (2020) for a close and related scope.

The second pillar (nodes in green) is centered in innovation, and it links it to several corporate governance issues. From motivating the fundamentals of competition and innovation (Aghion et al., 2005) to the fact of innovation (Manso, 2011) and its agency costs (Holmström, 1989), to the way it is related to institutional ownership (Aghion et al., 2013), the key elements in corporate governance (Bebchuk et al., 2009), and its performance (Gompers et al., 2003). Also, it is related to financial development (Hsu et al., 2014), innovation financing (Hall, 2005), market perception (He and Tian, 2013), and tolerance towards failure (Tian and Wang, 2014). Also, the aim of reconciling innovation, especially when is radical or in cases of *Discovery-Incubation-Acceleration*, is also developed in this period (Shaikh and Colarelli O'Connor, 2020).

The third pillar (nodes in blue) provides grounding on the relationship between innovation, corporate governance, and family-owned firms. Relevant co-cited works refer to innovation (Duran et al., 2016), socioemotional wealth (Berrone et al., 2012; Gomez-Mejia et al., 2007), R&D investments (Chrisman and Patel, 2012) are studied in family-controlled firms. On the corporate governance side, these firms are addressed by linking corporate governance elements and the pursuit of the competitive advantage (Carney, 2005), board independence and R&D investments (Chen and Hsu, 2009), or R&D investment (Munari et al., 2010).

The summary of the evolution of themes and intellectual framework pillars in each stage of the analysis is shown in Table 3.

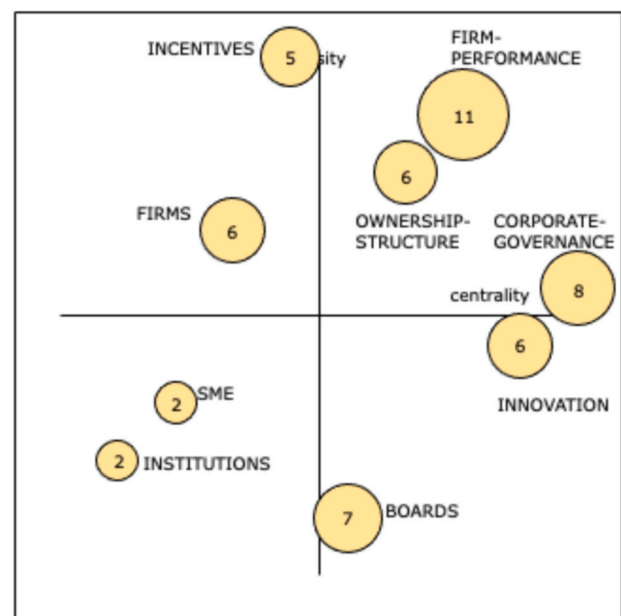
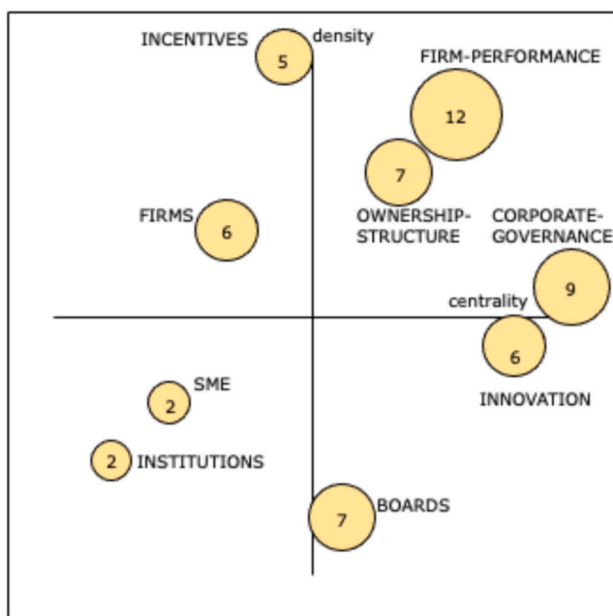


Fig. 10. Strategic diagram 2005–2012. Number of documents and h-index. Source: Own elaboration with SCImat

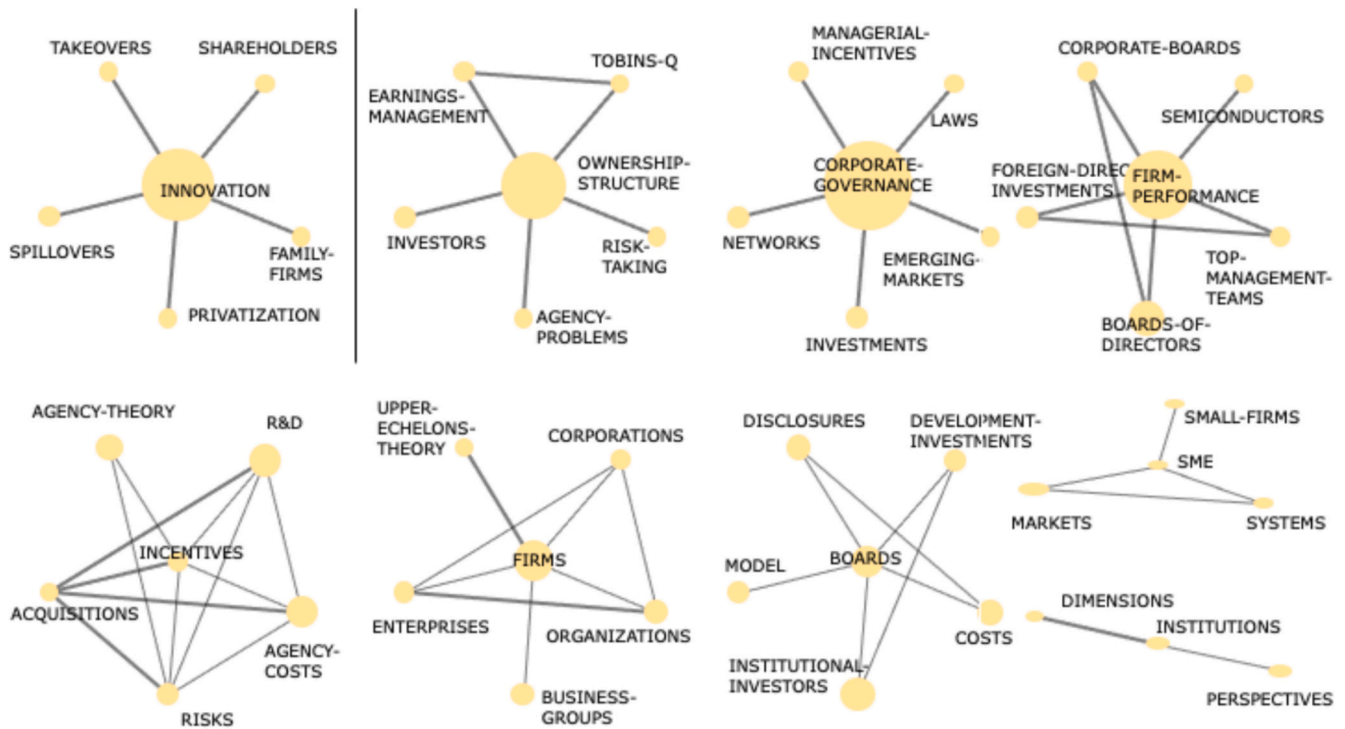


Fig. 11. Thematic networks 2005–2012. Source: Own elaboration with SCImat

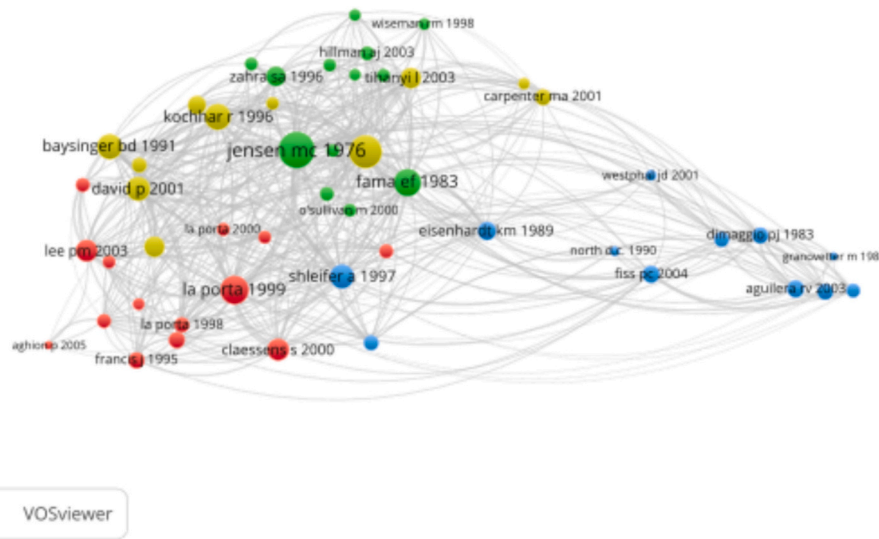


Fig. 12. Intellectual framework 2005–2012. Co-citation map. Source: own elaboration with R-biblioshiny and VOSviewer

4. Conclusions

4.1. Implications and directions for future research

Innovation and corporate governance are relevant topics in the research literature. This study offers a thorough bibliometric analysis of the contributions on the topic, utilizing statistical and visualization software. By selecting 766 works combining these two elements, we identified a pattern of growing publications we addressed for its study in three different stages: seeding, growing, and maturation. The findings reveal a range of theoretical and practical implications for researchers and practitioners, highlighting the need for further investigation in this

area. Consistent with the topic, the most relevant journals perform under the scope of management, research, and corporate governance, and show how they contributed to the observed publication pattern by progressively paying more attention to the relationship.

The relevance of authors like Wright, Filatotchev, Cumming, and Hoskisson among others, has provided the tools for analyzing the topic, by setting the Agency Theory at the theoretical core, defining the importance of the ownership structure, and considering the role of investors (institutional, family-controlled firms, etc.) and ‘traditional’ corporate governance issues when they interact with innovation matters for better or worse. Thus, they address how they face technological opportunities, competencies, and integration within the corporate

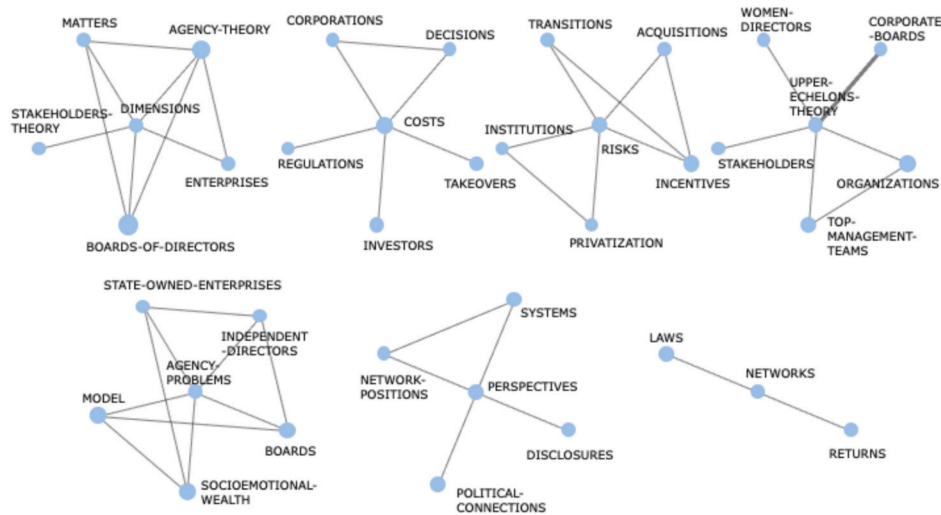


Fig. 15. Thematic networks 2013–2022 (B). Source: Own elaboration with SCImat

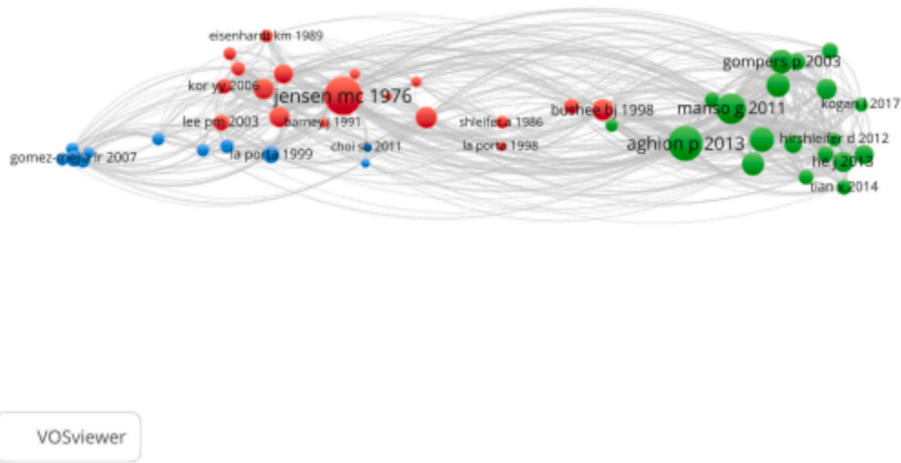


Fig. 16. Intellectual framework 2013–2022. Co-citation map. Source: own elaboration with R-biblioshiny and VOSviewer

pillars progressively. Some matters that are maintained across all periods like the investors, the ownership structure, and incentive alignment, but new ones appear in the landscape. Thus, theories tend to be concentrated in one pillar with the opening to new angles. Other pillars of the intellectual framework become more oriented to depict specific fields of research for the topic. That is the case of the relationship between innovation, corporate governance, and financing; Innovation, corporate governance, and family firms; technological opportunities; corporate governance and innovation systems; or board, ownership structure, and innovation-oriented strategy.

It is noticeable that sustainability is not a relevant factor or pillar in itself among the above-mentioned. Although stakeholder theory, Resource Dependence Theory are there to ground sustainability issues, contributions are still quite recent to become core references for the topic. Despite this situation, emerging contributions address certain topics connecting innovation and corporate governance, such as green innovation. Also, another factor could rely on the lack of a proper framework to develop interesting concepts such as responsible innovation, or to try establishing common grounds for related topics like socially responsible investments, and to bridge towards ESG and corporate social responsibility. In this sense, proposed stakeholder governance might enlighten new ways but also could face certain limitations.

Besides, its ethics, bonded to be identified to the ‘social’ or ‘responsible’ terms, might be missing important fields of decision-making in corporate governance and innovation.

The current bibliometric study shows that the literature on corporate governance and innovation is extremely heterogeneous. And although many issues have been addressed, there are still questions to be proposed and resolved. So, further exploration of emerging themes considering delving deeper into emerging themes identified in the analysis, and international comparative studies exploring the differences in approaches to innovation and corporate governance across different countries and regions, will contribute to the advancement of knowledge in the field, and stimulate meaningful discussions and insights in the realm of innovation and corporate governance.

As a result, we draw a potential collection list of directions for future research. First, it might be useful to explore the integration and evolution of the intellectual frameworks starting from a systematic review, which might lead to proposing alternatives or modifications to extant theoretical foundations. Taking the agency theory as a clear starting point, incentives in control mechanisms formed in both exploration and exploitation of innovation activities might be seriously challenged and, actually, are frequently contested and referred to. Along this line, it would be very remarkable to check how different settings of corporate

Table 3
Summary of themes and intellectual framework by period of analysis.

Periods	Themes	Intellectual Framework Pillars			
		1	2	3	4
1994–2004	Incentives; investments	Ownership structure, investors, and CG in firm innovation	AT and the institutional context for firm innovation	Incentives	
	Ownership structure, firm performance, innovation, CG; boards, takeovers, markets, investors	Separation of ownership and control, causes and consequences of ownership structure, takeovers, shareholder activism, strategy and R&D intensity, institutional investors and firm innovation	AT, agency costs, ownership structure, institutional investors, profiting from technological innovation, innovation systems, institutions of the economic system	Failure of internal controls, CEO payment, organizational changes, competition and corporate finance, agency costs	
2005–2012	Incentives, ownership structure, firm performance, CG, innovation, SME, institutions	Innovation and main CG and innovation theories	Board and ownership structure, and innovation-oriented strategy	AT and the technological opportunities	AT, RDT, IT and international CG
		Separation of ownership and control, ownership structure, investor protection, agency costs and innovations, AT, ST, Absorptive Capacity	Ownership structure and corporate innovation, technological opportunity, R&D strategy, investors in technology-driven industries, firm innovation	Theory of the corporate firm, separation of ownership and control, failure of internal controls, AT-RDT views integration, industrial technological opportunities	AT review, CG mechanisms, institutional isomorphism, strategic change, CG systems, CG codes
2013–2022	R&D, IPOs, ownership structure, fam-firm, controlling shareholders, agency problems, upper echelons theory, market, risks, networks, internationalization-er, AT, ST	Theories and innovation strategy AT, RDT, RBV, separation of ownership and control, UET, corporate innovation, R&D investment strategy	Innovation, CG, and financial landscape Competition and innovation, agency costs, fact of innovation, CG performance and key elements of CG, financial development, market perception and risk aversion, and innovation	Family firms, innovation and CG Innovation, R&D investments, socioemotional wealth, competitive advantage, CG issues	

law affect the innovation activity of firms and whether public policies factually provide incentives for innovation as the need for corporate governance accountability progresses. Building a framework that supports innovation, even if results are not obtained in the short term, is not the same as penalizing those who take a significant level of risk under high uncertainty. This may confront the principles of the law and finance literature that advocate for the empowerment of shareholders, especially minority shareholders, and where more research on the risk of innovation in small and diversified companies is necessary both from a theoretical and empirical point of view.

Another important arena circumscribes the understanding of how the multilayer configuration of institutions frames the relationship between innovation and corporate governance. Multilateral agencies, regional economic agreements, and legal systems originate a variety of settings involving recommendations, policies, regulations, and supervisory agents. The way they combine should have an impact on firms, and the comparison among firms from different countries may vary accordingly. Besides, the evolving regulations introduce more complexity in some contexts and affect not only through taxation but also through legal security. External stakeholders may benefit from it, but changes in the perspectives and mandates of the extant ownership structure are expected and changes in incentives formation could be triggered. The open systems approach may work in the direction of some efforts trying to integrate different theoretical frameworks, as a way to react and adapt to changes in heavily regulated, purpose-driven, or innovative environments. Thus, a contextualized framework depending on the organizational environments would provide a better understanding of corporate governance practices' effectiveness (Aguilera et al., 2008; Scott, 1981; Scott and Davis, 2015). In that sense, we agree with Aguilera and Jackson (2003) regarding the need to consider actors and agency issues, nevertheless.

Furthermore, other angles of study such as stakeholders' governance properly fit into realities like open innovation or environmental sustainability. Considering that corporate governance affects environmental performance through innovation, there is room to delve into the

study of how this connection works, specially under certain circumstances. For instance, it is necessary to comprehend whether the board is understanding and listening to the context, and how it is proceeding. Social movements are pushing some agendas on behalf of the entire society aiming to achieve changes, which should be urgently realized in some cases. These movements may influence matters such as green innovation by modifying the conditions that lead firms to develop new practices (Carberry et al., 2019). Drawing on legitimacy theorists and social movement theory, these movements are "demand side" factors of capabilities, and the activism creates a kind of "institutional innovators" (Khanchel et al., 2023). This approach may antagonize not only the positions of shareholders but also those of relevant stakeholders to the firm. Therefore, the effect of global social movements – pursuing action on climate change, equality, etc., on board directorates also raises interesting questions about the downstream consequences of such responsiveness to activism and the potential imprinting of the social issue on firms.

The intersection of new approaches to governance, organizational democracy, and stakeholder theory might ground new analyses in this arena. Control-based mechanisms indeed fail to consider the overall value that could be created by the firm activity, the owners of this value, and the participation of stakeholders, which may discourage innovation (Bacq and Aguilera, 2022; Mair et al., 2015). Aiming to solve it, recent theoretical frameworks have been elaborated, such as the stakeholder governance model through value allocation (Bacq and Aguilera, 2022) or the integrative vision of the agency and stakeholder theories of Shahzad et al. (2016).

Besides, it seems necessary to develop further taxonomy and retrieve evidence for responsible innovation, bringing more clarity that might avoid some deadlocks like those ESG is facing both in academia and in business practice. Covering various levels of analysis and methodologies, future research on this topic is essential for a better understanding of the determinants of corporate innovation and, therefore, for providing useful prescriptions for the corporate governance of any company, regardless of its size and legal form. Similarly, considering

additional variables that may have a complement and substitute contingent effect on the relationship between corporate governance and innovation, either due to their mediating or moderating role, it is essential both, to analyze the outcomes of innovation and to discover how different governance forms are likely to be most effective. In this context, inconclusive literature regarding the corporate governance effects on innovation in family firms is a precious source of inspiration for future research to reach a better understanding of the particular.

Accordingly, the role of ownership structure in innovation and corporate governance may lead to pointing out an underlying configuration of firms' purpose in which different objectives from diverse stakeholders interplay. AT views (principal-principal), stakeholders' governance, or integrative angle may help to understand its effects. For instance, the way the purpose is conformed, with the help of complementary objectives, may contribute to pushing sustainability in innovation programs sponsored by the board, overcoming external scrutiny, or interiorizing values as the main criteria to select and control investments and innovation expenditure. About the impact of innovation on corporate governance, [Filatotchev et al. \(2020\)](#) pointed to changes in the board structure through the creation of stakeholders committees. In our opinion, since its nature and contents overlap with that of the board, their operative may confront the board itself resulting in the risk of appearing as a "shadow board". Nevertheless, that situation can be mitigated with the help of internal mechanisms to avoid it.

Emerging related themes like risk management can evolve following various tracks. On one hand, when innovation is linked to information, corporate governance may benefit in terms of timing, accuracy, and, more recently with the help of artificial intelligence, option setting for decision-making. If it is the case of the financial industry, it would be necessary to understand how innovation might be balanced with risk management considering that there are players whose DNA heavily relies on technology investments. In this context, the skills of the board of directors would need further training or the appointment of new directors should take into account experience and/or specific knowledge. Industries' approach to innovation along with external exposure may push in the same way in processes of training and appointments to the board.

The recent appearance of new types of organizations also needs to be considered. For instance, new avenues must be explored to understand the impact of frameworks to understand organizations as decentralized bodies (DAO). Under this view, a new view of corporate governance mechanisms may arise by combining elements coming from the agency theory and institutions. Unusual kinds of misalignment of incentives and bottlenecks in parts of the network would have an effect on the understanding of innovation, its opportunity and timing, and the way it is fostered, secured, and supervised by governance mechanisms. It is not clear which intellectual framework best fits this situation and whether conflicts may deteriorate corporate purpose. Also, when analyzing ecosystemic innovation it is necessary to study how corporate governance and complex adaptative systems combine or diverge, and the outcomes in terms of incentives.

Finally, new works may bring different issues related to ethics. Incentives' building, alignment, and evolution might impact and be impacted by ethical decisions. Although there are some consensuses in particular matters, the disparity of theoretical frameworks may drive to different settings. For instance, the case of sustainable innovation may be supported by utilitarian, value-driven, or consequentialist theories but, at the same time, some of them may seed the grounds of diverse corporate irresponsibility issues such as greenwashing. Also, the use of information in data-related innovations raises questions on privacy handling, corporate disclosure, and the policies issued by the board. The impact of innovation programs that lead to downsizing firms, altering social behavior at early stages, and other direct social impacts may collude with some of the values the governance of the firm must keep.

4.2. Limitations

Our investigation has some limitations. On one hand, we considered for our sample those contributions on the Web of Science. Although it is the most reliable database and includes relevant sources, there exists the possibility of missing an impactful contribution published in a journal that is not included in the collection. Also, since we use specific ratios to measure relevance where time since publication plays a significant role, we might be attributing less weight to recent articles despite of their contribution or the debate they are triggering. Nevertheless, that research would be noticeable in the future and computed in future studies.

CRediT authorship contribution statement

Carlos Estévez-Mendoza: Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **Ángeles Montoro-Sánchez:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization.

Data availability

Data will be made available on request.

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