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COUNTRY-LEVEL GOVERNANCE AND BUSINESS INNOVATION: A SYSTEMATIC REVIEW OF THE LITERATURE

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Abstract

This systematic review aims to analyze, using the PRISMA 2020 protocol, how the level of governance in countries, and its dimensions, relate to innovative efforts and innovation outcomes in companies, and through which mechanisms this relationship occurs. Open-access articles in the fields of administration and economics were searched in Portuguese, English, and Spanish in the Scopus and Web of Science databases, on August 29, 2025. The criteria for including studies in the review were the use of WGI as the main or control variable for governance at the country level and, as dependent variables, technology transfer, innovation (patents, new products or processes), or innovative effort (R&D). To reduce the risk of bias, only studies published in peer-reviewed journals were used. After screening, the selected articles were read, and the information was extracted and organized in an Excel spreadsheet for subsequent synthesis and presentation of the results. Thirteen studies that met all the predefined criteria and had full text available were included. The results revealed that the institutional environment appears to be a structuring condition for innovation performance in companies. Effective governance, rule of law, political stability, and regulatory quality were identified by the studies as elements that increase investment in R&D and patent filings. The internal characteristics of companies also influence this performance. One limitation of this study was the restriction to open-access articles, which may have restricted the inclusion of potentially relevant studies and may have affected the comprehensiveness of the final sample. Furthermore, the limited number of published studies on the topic may restrict the generalizability of the results. On the other hand, this indicates the existence of a potentially promising research field to be explored. There was no funding for this work, which was registered on the Open Science Framework (OSF) platform under the identifier osf.io/u849k.

Keywords: innovation; research and development; performance; PRISMA 2020
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1. Introduction

Innovation can be considered an engine for economic development (Schmoke, 1966), driving growth through the creation of new products, production

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methods, or services that replace old ones in a process called “creative destruction” (Schumpeter, 1942).

Sustained economic growth, i.e., growth that lasts for long periods of time, stems from innovation (Mokyr, 1992). In this sense, Aghion and Howitt (1992) proposed a model based on Schumpeter's creative destruction, emphasizing that the advancement of knowledge itself can accelerate technological obsolescence. The more promising the research conducted by firms, the less incentive there is for innovation, since today's results can be quickly surpassed. At the same time, free market economies tend to generate excess innovation due to a negative externality associated with obsolescence. Thus, economic growth occurs as a dynamic process of constant renewal, marked by tensions between creation, destruction, and phases of equilibrium (Aghion & Howitt, 1992).

In turn, the creativity that generates technological innovation depends both on the physical environment, which influences the willingness to challenge nature, and on the social environment, which determines receptivity to new ideas. Technological progress, therefore, results from a complex intertwining of cultural, institutional, and material conditions (Mokyr, 1992). According to Dosi (2006), scientific advances have come to play an increasingly important role in the innovation process, contributing to the growing complexity of research and development (R&D) activities. This complexity leads firms to treat innovation as a strategic, long-term process rather than an immediate reaction to market fluctuations. In addition, there is a significant correlation between R&D efforts and innovative results, especially in specific industrial sectors, although this relationship is not uniformly repeated across countries with different demand patterns (Dosi, 2006). Thus, a strengthened institutional environment, with clear policies, a favorable culture, and adequate support structures, is crucial for the generation, protection, and transfer of innovation (Martins et al., 2026).

Therefore, there is interest in investigating the influence of the environment on which organizations operate on their innovation results. For this reason, this systematic review sought to gather the main articles related to this current topic to identify and synthesize advances and gaps in the literature on the relationship

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between the institutional environment, represented by country-level governance indicators, technology transfer, and innovation in companies.

Studies considering governance indicators in countries have expanded over the last decade (Veiga et al., 2020), with emphasis on those published by the World Bank (Worldwide Governance Indicators) (World Bank, 2024). These indicators measure the quality of governance in a country, based on six main dimensions, namely: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption (Dash et al., 2024; Wen et al., 2021). In this study, these indicators were used to represent the institutional environment in which companies operate.

Thus, a research question was developed based on the CIMO (Context, Interest, Mechanism, and Outcome) framework (Denyer & Tranfield, 2009). The context covers countries and international comparisons analyzed at the macroeconomic and institutional levels, seeking to understand how structural and institutional differences between nations influence outcomes in innovation and technology transfer. The interest lies in governance at the country level, measured by the World Bank's governance indicators (WGI), also considering its dimensions. The mechanism assumes that improving the quality of institutions favors the creation of an environment conducive to collaboration between universities and companies, attracting domestic and foreign investment, and protecting intellectual property. Finally, the outcome variables refer to performance in innovative effort and innovation, measured by indicators such as the number of patents and investments in research and development (R&D), in addition to technology transfer contracts.

Based on this framework, the following question was formulated: **How do countries' levels of governance and their dimensions relate to innovative efforts and innovation outcomes in companies, and through which mechanisms?**

To answer this question, the objective of this study is to analyze, through a systematic review of the literature, supported by the PRISMA 2020 protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Page et

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al., 2021) , how the level of governance of countries, as well as their dimensions, relate to innovative effort and innovation outcomes in companies, and through which mechanisms this relationship occurs.

In addition to the main objective of examining the relationship between governance quality and innovation outcomes in companies, this review will also seek to answer the following secondary questions:

a) Are there differences in the impact of country-level governance on innovation among companies?
b) Do institutional or regional factors moderate the relationship between governance and innovation?
c) What are the most commonly used methodological approaches in studies on this topic?

The next section presents a theoretical framework, the methodological aspects of the research, the results obtained, discussion, and other information, as set out in the PRISMA 2020 checklist (PRISMA, 2025).

2. Theories of innovation: a brief approach

Theoretical perspectives on innovation have undergone stages of development over time, mainly regarding its role in the economy. Early analyses considered it a technical element, often associated with changes in production (Costa, 2016). Schumpeter (1942), in his work, highlights the entrepreneur as an agent of "creative destruction", a process in which new inventions replace obsolete technologies and practices, promoting an alternation between cycles of economic growth and cycles of stability. Initially, the author emphasized the role of the individual inventor in this process, but later highlighted entrepreneurs as key figures in promoting innovation (Schumpeter, 1942).

During the 1950s to 1970s, a linear view of innovation prevailed. The technology-push model stated that innovation begins with scientific research, which advances to the development and insertion of new technologies in the market. The demand-pull model, on the other hand, argued that it was market needs that drove

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innovation by directing research efforts (Langrish et al, 1972). Although useful at the time, these models were criticized for simplifying the innovation process, which should be the result of a combination of both (Freeman, 1979; Mowery & Rosenberg, 1979).

From the 1980s onwards, more realistic and dynamic models emerged. The interactive chain model (Kline & Rosenberg, 1986) recognized the feedback between the stages of innovation, breaking with linearity. This model emphasizes the importance of interaction between science, technology, the market, and organizational learning.

The evolutionary theory of economics, or neoschumpeterian theory, emphasized the cumulative, local, and path-dependent nature of technological development (Nelson & Winter, 1982; Dosi et al., 1988). This perspective argues that the innovative process is the result of the interaction of multiple agents, embedded in institutional and market environments, and that collective learning is fundamental to the generation and diffusion of technologies (Nelson & Winter, 1982). Thus, the theoretical contributions of authors linked to the evolutionary approach reinforce the importance of support strategies that recognize the complexity and dynamics of the innovation system, in contrast to the limitations of the neoclassical model (Costa, 2016).

Also in the 1990s, innovation came to be seen as a systemic phenomenon. Authors such as Lundvall (1992) and Nelson (1993) developed the notion of the National Innovation System, which encompasses institutions, public policies, universities, companies, and social interactions that influence the innovative capacity of a country or region, expanding the idea of an institutional and collaborative environment for innovation. The triple helix model (Etzkowitz & Leydesdorff, 2000) proposes that innovation is driven by the synergistic interaction between universities, companies, and governments. Developments of this theory, such as the quadruple and quintuple helix, include civil society and the environment as fundamental dimensions (Carayannis & Campbell, 2009; 2010).

In addition, approaches such as open innovation (Chesbrough, 2003) reinforce the importance of external collaboration between organizations and

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institutions and knowledge sharing. More recently, there has been growing attention to responsible and sustainable innovation, with a focus on social and environmental impacts (Guimarães, Santos, & Almeida, 2024). Innovation has thus been a relevant element for organizational strategy, directly related to obtaining competitive advantages for companies (Porter, 1990). However, we believe that the environment in which organizations operate can influence their propensity to innovate, as well as their results, which has been the primary motivation for this study.

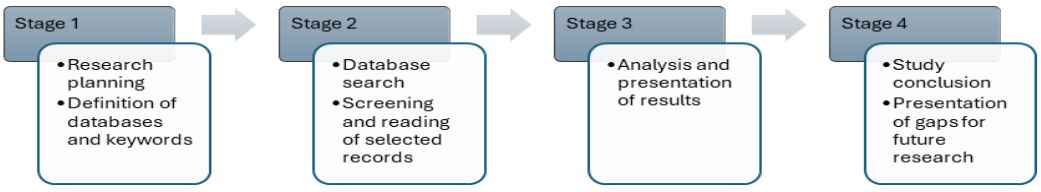
3. Methods

This research sought to analyze, through a systematic review of the literature, anchored in the PRISMA 2020 protocol (Page et al., 2021), how the level of governance of countries, as well as its dimensions, relate to innovative effort and innovation results in companies, and through which mechanisms this relationship occurs. To this end, quantitative empirical, qualitative, or mixed articles related to the topic of interest were gathered.

The main stages of this study are represented in Figure 1.

Figure 1

Steps for preparing the systematic literature review



An initial search containing several terms, including “institutional quality” and “country governance”, was conducted. However, a preliminary screening of the retrieved studies revealed substantial heterogeneity in the operationalization of institutional quality, with many studies employing alternative governance proxies that did not align with the Worldwide Governance Indicators (WGI) framework

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adopted in this review. Other tests were performed until the final string was reached, resulting in the following combination:

> ("Worldwide Governance Indicators" OR WGI OR "rule of law" OR "regulatory quality" OR "government effectiveness" OR "voice and accountability" OR "political stability" OR "control of corruption") AND (innovati* OR patent* OR "technology transfer" OR "knowledge transfer" OR "research and development" OR R&D) AND (compan* OR firm* OR enterprise* OR business* OR organization*)

The search was performed in Elsevier Scopus and Clarivate Web of Science databases, accessed through the Periódicos Capes portal, on August 29, 2025. These databases were selected because of their recognized relevance, broad multidisciplinary coverage, and rigorous indexing standards. They are widely acknowledged in systematic literature reviews because they provide access to high-quality peer-reviewed publications and minimize the inclusion of non-validated or low-impact sources, which would reduce the risk of bias. Furthermore, prior methodological studies have indicated that the combined use of Scopus and Web of Science ensures substantial coverage of internationally relevant scientific production, reducing overlap while maintaining consistency and reliability in bibliometric and systematic review analyses. Therefore, the decision to restrict the search to these two databases aimed to ensure methodological rigor and the retrieval of high-quality literature aligned with the objectives of this review.

In the Scopus database, the search took into account the terms in Title, Abstract, and Keywords. In the Web of Science database, the search option by Topics was selected. In both, after searching for the keywords string, the following filters were applied:

a) Articles: to increase the likelihood that they have been peer reviewed;
b) Open access: to allow access to the full text during the analysis stages, aiming to ensure the reproducibility of the process given institutional access restrictions;
c) Administration and economics: as areas of interest;
d) Languages: English, Portuguese, and Spanish.

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The data were exported in RIS format and imported into Zotero software for analysis. Initially, duplicate records were excluded. Next, records that were chapters or excerpts from books, which had been captured despite the filter, were excluded.

Eligibility criteria were defined a priori and included studies that empirically examined the relationship between governance indicators, represented by WGI aggregate or its dimensions, and innovation-related outcomes. Exclusion criteria comprised non-empirical studies, editorials, conference abstracts without full text, and studies not reporting relevant governance or innovation measures. Thus, the criteria for including studies in the review were:

a) Articles that use WGI (aggregate or dimensions) as the main or control variable for governance;
b) Articles that measure technology transfer, innovation (patents, new products, or processes), and/or innovative effort (R&D investments).

Consequently, the following were excluded from the review:

a) Articles that did not meet the inclusion criteria;
b) Essays or opinions without data;
c) Strictly theoretical literature without evidence;
d) Full texts unavailable for access.

An initial screening of the articles obtained was then carried out by reading the titles and abstracts, focusing on the topic of interest for the research. Next, the full articles were read, which resulted in further exclusions, the reasons for which were recorded. After screening, the selected articles were read, and the information was extracted and organized in an Excel spreadsheet, containing reference, objectives, methodology, variables, results and observations, for subsequent synthesis and presentation of the results.

Study selection and screening were conducted by a single reviewer, under the supervision of her advisors. This may introduce selection bias and subjectivity in eligibility assessment. To mitigate this limitation, eligibility criteria were strictly predefined and consistently applied throughout the screening process. No automation tools were used in this process.

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A meta-analysis wasn't conducted due to heterogeneity in study designs, measurement approaches, governance indicators, and innovation outcomes, which precluded statistical aggregation of effect sizes. Instead, a narrative synthesis approach was adopted.

It is important to highlight that endogeneity, reverse causality, and omitted variable bias can be identified as major methodological challenges when investigating the relationship between institutions and innovation. Thus, it is important to note that the robustness of the results will depend on the sophistication of the econometric techniques employed to mitigate these issues.

4. Results

Through the above-mentioned search process, 55 documents were obtained from the Scopus database and 76 from the Web of Science database. Of these, 28 duplicate studies and 3 book chapters were excluded, resulting in 100 articles. After reviewing titles and abstracts, an additional 66 articles were excluded for not meeting the previously established inclusion criteria. Of the remaining 34 articles, one was excluded because it was published in Russian, and another was excluded due to lack of access to the full text. Consequently, 32 articles underwent full-text review. Of these, 19 were excluded because they did not use the WGI or any of its dimensions as a variable, resulting in a final sample of 13 studies included in the systematic review. The results of the screening steps for selection and inclusion of records in the systematic review are detailed in the flowchart shown in Figure 2.

Some studies, at first glance, appeared to meet the inclusion criteria but were excluded because, although they used variables with names similar or identical to some of the WGI dimensions, they were calculated or obtained from other sources. This is the case for the studies by Shumetie and Watabaji (2019) , Rodríguez-Pose and Zhang (2020) and Aldieri et al. (2023).

Figure 2

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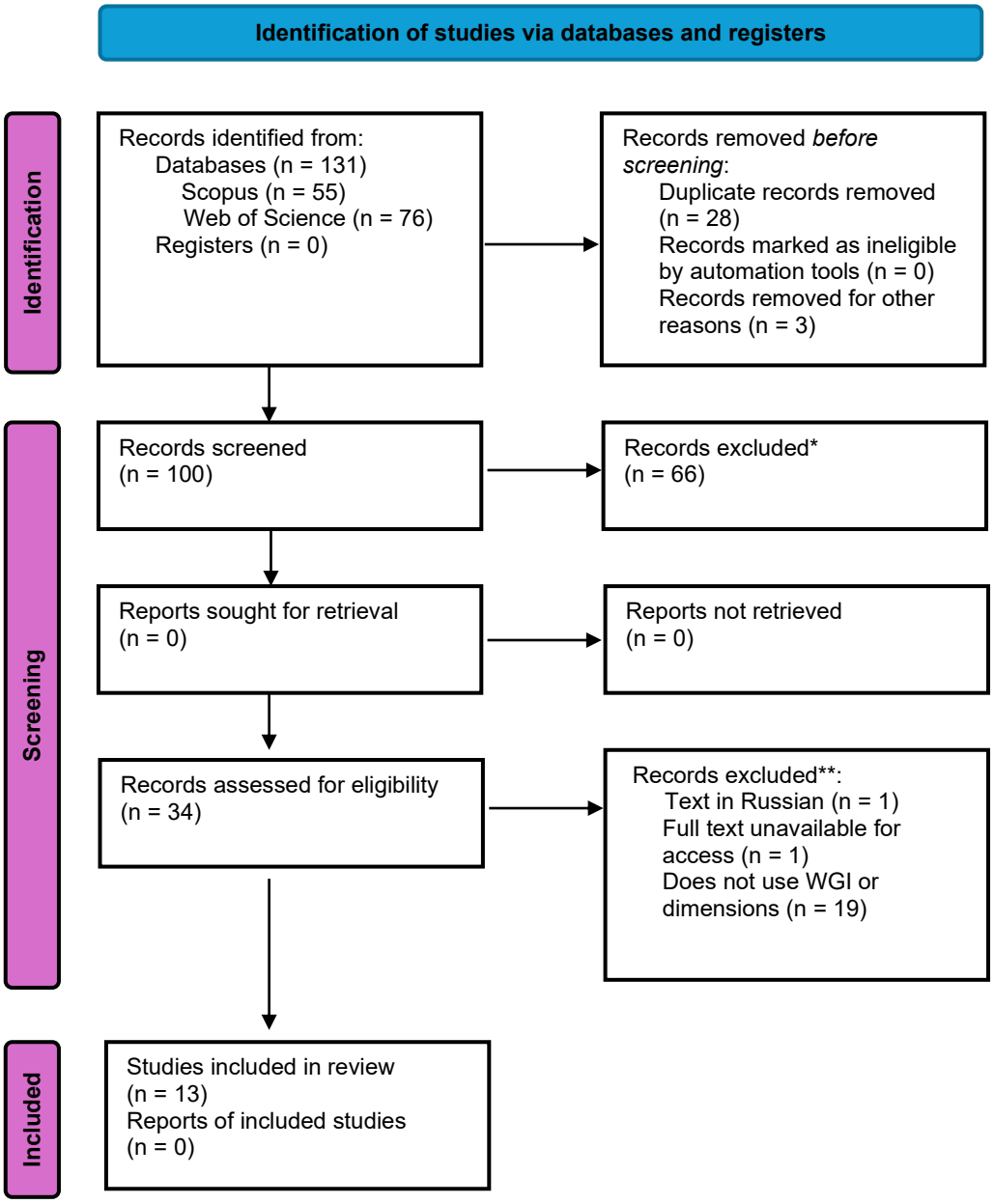
PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



* After reviewing titles and abstracts. ** After reading in full.

All studies included in the systematic review used a quantitative empirical approach, and their main characteristics are presented in Table 1, presented in an appendix. As previously mentioned, to minimize the risk of bias in the studies

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included in the review, we selected articles published in peer-reviewed journals sourced from databases. However, it is acknowledged that the open-access filter criterion may introduce selection bias by excluding studies restricted to paid subscriptions.

Although no publication date limits were set for the searches, the studies were found to be recent, except for Asongu (2017) and Alam et al. (2019), demonstrating the topicality of the subject.

The included studies exhibited considerable methodological heterogeneity regarding data sources, variables, and analytical approaches, which limited the possibility of directly comparing the results. Some of the data used were based on perception-based measures, specifically corruption indicators derived from opinion surveys, which may be subject to reporting biases. Furthermore, differences in sample size, econometric models, and the operationalization of institutional and innovation variables can affect the robustness and comparability of the findings. However, studies utilizing internationally standardized indicators, such as the WGI, tend to demonstrate greater measurement consistency. Consequently, these methodological differences should be considered when interpreting the results synthesized in this review.

The results indicated that both the institutional environment and firm characteristics play a significant role in shaping innovation outcomes.

Regarding the institutional environment, the reviewed studies suggest that the quality of governance represents a central determinant of innovative performance. Factors such as political stability, regulatory quality, effectiveness of legal systems, and control of corruption create favorable conditions for research and development (R&D) investments, internationalization strategies, and the development of innovation capabilities (Alam et al., 2019; Castellacci et al., 2022; Ješić & Jakšić, 2020). In contrast, institutional fragility tends to discourage innovation activities, reducing patent filings and limiting firms' technological development, while stronger rule of law, economic stability, and financial freedom are associated with superior innovation outcomes (Hong et al., 2022; Okrah & Hajduk-Stelmachowicz, 2020). Regional studies reinforce this relationship, showing

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that differences in institutional quality explain unequal innovation performance across countries and sectors, particularly in developing economies, where public policies and governance structures remain critical for technological advancement (Asongu, 2017; Chung et al., 2024).

The relationship between corruption and innovation, however, produced more nuanced findings. Although higher levels of corruption generally undermine national innovative capacity and act as barriers to long-term technological development (Ješić & Jakšić, 2020), some studies found that in contexts characterized by weak institutions and excessive bureaucracy, informal payments may temporarily facilitate business operations by allowing firms to overcome administrative constraints, generating short-term effects on innovation activities (Aghazada & Ashyrov, 2022). Similarly, evidence suggests that in environments with limited corruption control, such practices may be associated with firm-level innovation, whereas in countries with stronger institutional frameworks their effects tend to be predominantly negative, highlighting the context-dependent and ambivalent nature of this relationship (Iorio & Segnana, 2025).

At the firm level, internal organizational characteristics were also identified as relevant determinants of innovation. Company size, sectoral profile, and cash flow directly influence R&D investment behavior, with evidence showing persistent investment trajectories over time depending on industry characteristics (Alam et al., 2019; Kahn et al., 2024). Corporate governance mechanisms also emerged as important factors, particularly board independence, which can mitigate the negative effects of institutional weaknesses and support greater investment in innovation activities, including patenting and R&D expenditures (Sena et al., 2018). Likewise, board gender diversity was positively associated with sustainable innovation performance, especially in countries characterized by stronger institutional quality (Ikyanyon et al., 2025).

In addition, competitive and operational conditions influence firms' innovative behavior. Evidence suggests that competition with informal firms may encourage formal firms to intensify R&D efforts, particularly when supported by stable governance and effective regulatory environments (Amin, 2025). Finally, innovation

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outcomes were shown to vary considerably according to innovation typology, with incremental innovation increasing over time, while radical innovation remained stable and disruptive innovation was rarely observed, suggesting that both institutional context and firm capabilities shape not only the intensity but also the nature of innovation produced (Chung et al., 2024).

Finally, studies employing System GMM or Heckman with instrumental variables demonstrate the greatest methodological robustness within the analyzed literature, as they directly address the endogenous and complex nature of the relationship between the institutional environment and corporate performance. Furthermore, there is a risk of missing results due to the application of the open-access filter.

5. Discussion

The mechanisms of influence of the institutional environment on innovation demonstrated to be complex and multifaceted, dependent on economic, political, and organizational factors that shape the results obtained by the articles analyzed.

The findings of this review reinforce the argument that innovation is not determined exclusively by firm-level capabilities, but is also conditioned by the institutional environment in which firms operate. Across the analyzed studies, governance quality emerged as a central factor influencing innovation outcomes, suggesting that political stability, regulatory effectiveness, rule of law, and corruption control create the structural conditions necessary for firms to engage in long-term innovative activities. These results support the view that institutions reduce uncertainty, strengthen property rights protection, and improve the predictability required for sustained investments in research and development, reinforcing the role of governance as an enabling condition for innovation ecosystems.

At the firm level, the results indicate that internal organizational characteristics interact with institutional conditions in shaping innovation performance. Factors such as sectoral profile, financial capacity, board composition, and governance structures influence firms' ability to allocate resources toward

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innovation activities. This suggests that innovation outcomes are produced through a dynamic interaction between external institutional quality and internal organizational capabilities. In this sense, firms operating in more stable institutional environments may be better positioned to transform available resources into innovation, while firms in fragile contexts face additional barriers that constrain long-term technological development.

Finally, it's important to considerate that although the WGI offers standardized and internationally comparable governance measures, its perception-based and aggregated nature may not fully capture institutional heterogeneity across countries or reflect how firms experience institutional conditions in practice. In addition, national-level indicators may overlook informal institutions, regional disparities, and sector-specific dynamics that directly influence firms' innovative behavior.

6. Final considerations

After analyzing the articles that met the inclusion criteria for this systematic review, it was possible to suggest that the institutional environment appears to be a structuring condition for innovation performance in companies. Effective governance, the rule of law, political stability, and regulatory quality were identified by the studies as elements that promote investment in R&D and patent filings. Corruption, on the other hand, presented a dual characteristic, being favorable to innovation in countries with weak institutions and unfavorable in strong institutional environments. The internal characteristics of firms, such as size, age, and debt ratio, also impact their innovation results.

All analyzed studies adopted quantitative empirical designs, with the Generalized Method of Moments (GMM) model as the predominant analytical approach. This method is considered particularly robust from a methodological perspective, as it directly addresses endogeneity issues and captures the complex relationship between the institutional environment and firms' innovation outcomes.

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This study has some limitations that should be acknowledged. First, the application of the open-access filter during the search process may have restricted the inclusion of potentially relevant studies available only through subscription-based databases, which may have affected the comprehensiveness of the final sample. Second, the screening and selection process was conducted by a single reviewer, without independent validation by a second reviewer, which may have introduced a degree of subjectivity in the application of inclusion and exclusion criteria.

Regarding future research opportunities, an important gap identified in the reviewed literature concerns the absence of studies examining the relationship between governance quality and technology transfer processes, possibly due to the limited availability of reliable data on licensing and technology transfer agreements. In addition, the interaction between macro-level institutional conditions and firm-level dynamics remains underexplored. Future studies may therefore benefit from investigating how governance influences knowledge transfer relationships among firms, universities, and governments, while combining institutional indicators with firm-level variables to provide a more comprehensive understanding of the mechanisms linking governance and innovation outcomes.

7. Other information

This systematic review was registered on the Open Science Framework (OSF) platform under the identifier osf.io/u849k. The registration is under a 12-month embargo to allow for the submission and publication of the results in a scientific journal. The full content will be made publicly available after the embargo period ends.

The work was carried out with our own resources.

The authors declare that there are no conflicts of interest involving this review.

The files obtained from the databases, as well as the PRISMA checklists prepared for this review, can be made publicly available.

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Appendix

Table 1

Characteristics of the studies included in the systematic review

Author (Year)	Title	Journal	Objective	Econometric Model	Country/region, Period, Sample	Unit of analysis	WGI dimensions	Innovation variables	Key results	Observations
Aghazada & Ashyrov (2022)	Corruption and firm innovation: evidence from post-Soviet countries	Post-Communist Economies	To study the relationship between petty corruption and various types of innovation, highlighting the importance of institutional context.	Probit Model; Instrumental Variable (IV) regressions.	Post-Soviet region (Baltic states, Caucasus, Central Asia); 2012–2016; 5,194 responses (BEEPS V).	Firm	Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption	Product, Process, Marketing, and Organizational Innovation; R&D expenditures.	Bribes show a 'grease-the-wheel' effect on innovation in weak institutional environments, but this effect disappears in moderate or strong environments.	Distinguishes three clusters of countries based on WGI scores. Uses an alternative corruption proxy for robustness.

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Alam et al. (2019)	Institutional determinants of R&D investment: Evidence from emerging markets	Technological Forecasting & Social Change	To explore the social, legal, and political institutional determinants of R&D investment in emerging markets.	System GMM	20 emerging markets (e.g., Brazil, China, India, Russia); 2006–2013; 664 firms (3,973 firm-year observations).	Firm	Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption	R&D intensity (R&D expenditure over sales).	Government effectiveness, rule of law, and regulatory quality have positive impacts on R&D, while corruption and political instability have negative impacts.	Corruption was found to be the most influential factor. Institutional factors were deemed more important than firm-level factors.

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Amin (2025)	How does competition from informal firms impact research and development by formal manufacturing small and medium enterprises in the developing and emerging economies?	Kyklos	To estimate the impact of competition from informal firms on the likelihood of R&D activity by formal manufacturing SMEs.	Logit model with Huber-White robust standard errors.	90 developing and emerging countries; 2006-2021; 21,491 formal manufacturing SMEs (WBES).	Formal manufacturing SMEs	Rule of Law, Control of Corruption	R&D spending (dummy), introduction of new products (dummy).	Informal competition significantly increases the likelihood of R&D by formal SMEs. This effect is magnified in countries with weaker rule of law and higher regulatory burdens.	Finds no significant impact of informal competition on R&D for large firms. Supports the 'legalist' view of informal competition.

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Asongu (2017)	Knowledge Economy Gaps, Policy Syndromes and Catch-up Strategies: Fresh South Korean Lessons to Africa	AGDI Working Paper	To investigate knowledge economy gaps between Africa and South Korea and derive catch-up strategies.	Absolute beta and sigma convergence (System GMM).	Africa (53 countries) and South Korea; 1996-2010; World Bank WDI and Financial Development databases.	Country (decomposed by income, legal origin, etc.)	Voice & Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption	STJA; Trademark Applications; Patent Applications (Resident and Nonresident).	Catch-up is visible in innovation and institutional regimes (8.66%–30% per annum), but not apparent in ICT.	Uses PCA to reduce dimensions into single indicators. Identifies landlockedness as a high policy syndrome characteristic.

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Castellacci et al. (2022)	Quality of pro-market national institutions and firms' decision to invest in R&D: evidence from developing and transition economies	Eurasian Business Review	To investigate how the quality of national pro-market institutions affects firm-level decisions to invest in R&D.	Probit regression with country, year, and industry fixed effects.	57 transition and developing countries; 2002-2017; 10,393 manufacturing firms (WBES).	Firm-level	Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption	R&D (Dichotomous: investment in R&D during preceding 3 years).	R&D investment propensity is significantly higher in countries with better pro-market institutions, particularly in less developed economies.	Institutional quality was measured as a composite factor via PCA of all six WGI dimensions.

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Chung, Franses, & Pennings (2024)	Conditions that thrive: from individual entrepreneur to innovation impact	Small Business Economics	To examine how entrepreneurial motives (opportunity vs. necessity) affect different types of innovation and how institutions amplify these effects.	Dynamic multi-level modeling	29 countries (e.g., US, China, Brazil, Germany); 2006-2018; Combined World Bank, Fraser Institute, and GEM data.	Country level	Regulatory Quality	Radical Innovation; Breakthrough Innovation; Disruptive Innovation (all measured as % of entrepreneurs).	Opportunity-driven entrepreneurs drive radical and breakthrough innovation. Regulatory quality significantly amplifies innovation for necessity-driven entrepreneurs.	Distinguishes between informal (culture) and formal (tax, regulation) institutions. Uses the Ansoff matrix for innovation classification.

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Hong, Massini, & Edler (2022)	Governance choice misfit and firm performance in offshoring innovation: the role of institutional environment	R&D Management	To analyse the effect of institutional factors on the relationship between governance choices and business outcomes when offshoring innovation.	Two-stage approach: Heckman-based Probit and Ordered Probit.	Global host countries (China, India, developed nations); 1972–2009; 170 innovation initiatives from 90 companies (ORN database).	Individual offshoring initiative	Rule of Law	Major product innovation(s); R&D intensity in host country; focus on core competencies.	Rule of law does not significantly affect governance mode choice but negatively affects performance. Governance misalignment significantly reduces organizational flexibility.	Highlights that firms use modularization or task disintegration to protect IP in weak institutional environments.

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Ikyanyon et al. (2025)	Board Gender Diversity and Sustainable Innovation in Emerging Market Multinational Enterprises: Do Country-Level Institutions Matter?	Thunderbird International Business Review	To examine the effect of board gender diversity on sustainable innovation in EMNEs and the moderating influence of country-level institutions.	Two-step system GMM; Quantile Regression.	19 emerging economies; 2013-2022; 179 emerging market multinational enterprises (1,790 observations).	Firm-level (EMNEs)	Government Effectiveness, Control of Corruption	Thomson Refinitiv sustainable innovation score.	Board gender diversity positively affects sustainable innovation. Governance effectiveness and control of corruption positively moderate this association.	Combines upper echelons and institutional theory. Sample focuses on EMNEs from BRICS and other emerging nations.

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Iorio & Segnana (2025)	Heterogeneous Links Between Corruption and Innovation in a Global Economy	Journal of Risk and Financial Management	To examine the impact of corruption on business innovation and how this relationship is mediated by institutional configurations and ownership.	Panel probit model with random effects; Linear probability model.	22 Eastern European and Central Asian economies; 2012–2016 and 2018–2019; 3,584 establishments (BEEPS V and VI).	Firm-level	Control of Corruption	Innoprod (binary: new products/services); R&D (binary: R&D expenditures).	Corruption acts as 'grease' in weak institutional environments but as 'sands' in strong ones. 'Greasing' is most relevant for foreign firms in weak environments.	Categorizes countries into three groups based on corruption control. Shows a negative macro-level but positive micro-level correlation in specific contexts.

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Ješić & Jakšić (2020)	The Impact of Institutional Features on R&D in Business Enterprise Sector and Sustainable Growth	Journal of Central Banking Theory and Practice	To analyze the relationship between institutional features, R&D in the business sector, and sustainable economic growth.	Two-step First-Differencing GMM	8 European countries (Visegrad, Bulgaria, Croatia, Romania, Serbia); 2007-2017; Balanced panel.	Country	Government Effectiveness, Control of Corruption	R&D expenditures in the business sector (% of GDP); Total R&D expenditures (% of GDP).	Government effectiveness and control of corruption are particularly important in supporting business sector R&D.	Visegrad group countries generally achieved better institutional scores. Sustainable growth requires inclusive institutions.

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Kahn et al. (2024)	An analysis of the micro- and macro-economic determinants of firm R&D intensity in the South African business sector	African Journal of Science, Technology, Innovation and Development	To identify the micro- and macro-economic drivers of firm-level R&D intensity in the South African business sector.	Two-step system GMM	South Africa; 2008/09 to 2017/18; 603 R&D performing firms (unbalanced panel).	Firm-level	Political Stability and Absence of Violence/Terrorism	R&D intensity (R&D expenditure as % of turnover).	Political stability, public financial support, and firm-level collaboration are positively associated with R&D intensity. Larger firms showed lower R&D intensity.	First South African study to examine both micro and macro drivers; highlights that government funding significantly boosts R&D spending.
Okrah & Hajduk-Stelmachowicz (2020)	Political stability and innovation in Africa	Journal of International Studies	To investigate the impact of institutional factors, primarily political stability, on patenting activity in African countries.	Negative Binomial Estimate; Poisson regression.	26 African countries, 1996-2016, 567 annual observations.	Country	Political Stability and Absence of Violence/Terrorism, Rule of Law	Number of patent applications per resident.	Rule of law has a strong positive effect on patenting; political instability is negatively significant.	Unemployment showed an unexpected positive effect on patents due to 'freedom of entrepreneurship' in uncertain economies.

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Sena et al. (2018)	Board independence, corruption and innovation. Some evidence on UK subsidiaries	Journal of Corporate Finance	To test whether independent boards can insulate a company from the detrimental impact of corruption on innovation in manufacturing subsidiaries.	Two-step Heckman selection model; IV estimator; Negative Binomial regression.	30 countries (e.g., Europe, Eastern Europe, Russia); 2005-2013; 4,100 manufacturing subsidiaries of 1,390 UK multinationals.	Subsidiaries of British MNEs	Government Effectiveness, Control of Corruption	R&D intensity; number of patents (EPO); forward citations per patent.	Independent boards mitigate the negative impact of corruption on innovation. Benefits of board independence decrease as corruption reduces.	Instruments board independence using foreign executive proportions and regional multinational density.